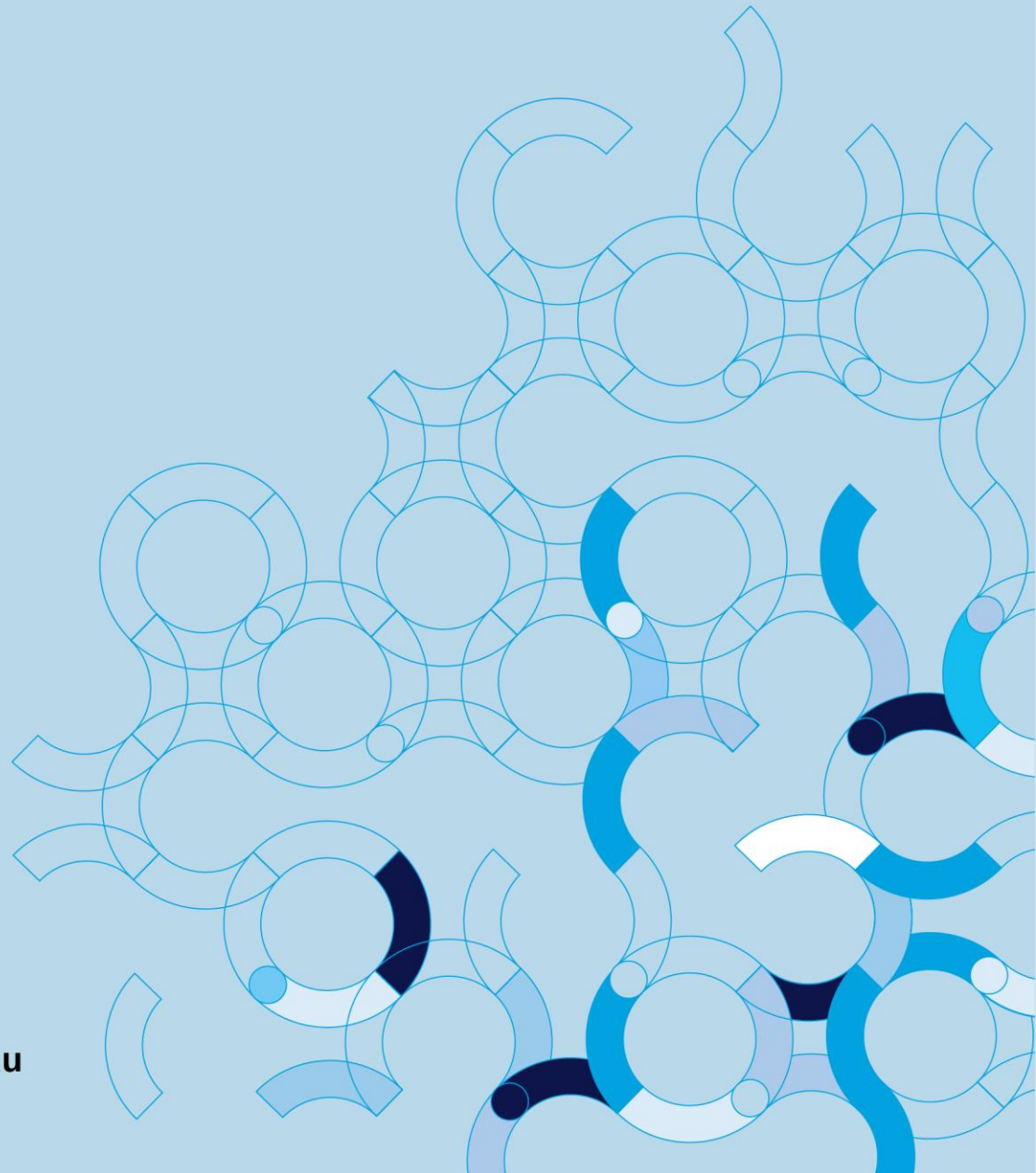
STD-SPE-G-006

Technical Specification

APPROVED PRODUCTS LIST

October 2025



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Document management

Document authorisation table

Issue	Date	Author	Reviewer	Approver
1	12/07/17	K. Danenbergsons	Various	N/A
2	02/01/18	K. Danenbergsons	Various	D. Eager
3	17/07/18	K. Danenbergsons	V. Gallagher	D. Eager
4	22/03/19	K. Danenbergsons	V. Gallagher	C. Patrick
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7	23/07/21	K. Danenbergsons M. Tarlinton	V. Meredith	D. Eager
8	01/03/22	K. Danenbergsons	V. Meredith	N. Vonarx
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Version control table

Issue	Date	Reason for issue
1	12/07/17	Initial issue for stakeholder feedback and review (internal and external)
2	02/01/18	Issued for mandatory use
3	17/07/18	Additional products and materials listed. Re-issued for mandatory use.
4	22/03/19	Additional products and materials listed. Re-issued for mandatory use.
5	20/03/20	Additional products and materials listed. Re-issued for mandatory use.
6	01/07/20	Minor EI&C amendments as well as minor amendments to DI pipe and fittings and property service ball valves. Re-issued for mandatory use.
7	23/07/21	Additional products and materials listed. Re-issued for mandatory use.
8	01/03/22	Additional products and materials listed. Re-issued for mandatory use.
9	09/10/24	Additional products and materials listed. Re-issued for mandatory use.
10	21/10/25	Additional products and materials listed, template updated and re-issued for mandatory use.

Document applicability table

Asset area	Applicable (Yes/No)	Asset area	Applicable (Yes/No)
Dams (DAM)	**Yes**	Water Network (WAT)	**Yes**
Bulk Water Supply (BWS)	**Yes**	Sewerage Network (SEW)	**Yes**
Water Treatment Plants (WTP)	**Yes**	Sewage Pump Stations (SPS)	**Yes**
Water Pump Stations (WPS)	**Yes**	Sewage Treatment Plants (STP)	**Yes**
Reservoirs (RES)	**Yes**	Recycled Water Systems (REC)	**Yes**

Contents

Abbreviations

Acronym	Full form
ACT	Australian Capital Territory
APL	Approved Products List
AS, AS/NZS	Australian Standard; Australian/New Zealand Standard
BOM	Bill of Materials
CAR	Corrective Action Request
CI	Cast Iron
DI	Ductile Iron
DICL	Ductile Iron Cement Lined
EI&C	Electrical, Instrumentation and Control (including telemetry)
GRP	Glass Reinforced Plastic
NCR	Non Conformance Report
PA	Product Appraisal
PE	Polyethylene
PP	Polypropylene
PS	Product Specification
PVC	Polyvinyl Chloride
PVC-O	Orientated Polyvinyl Chloride
PVC-M	Modified Polyvinyl Chloride
PVC-U	Unplasticised Polyvinyl Chloride (aka “uPVC”)
RRJ	Rubber Ring Joint
SCL	Steel Cement Lined (formerly known as Mild Steel Cement Lined (MSCL))
SCJ	Solvent Cement Joint
SO	Socket
SP	Spigot
TBA	To be advised
WSA, WSAA	Water Services Association of Australia
WS&SS	Water Supply and Sewerage Standards

1 Introduction

Icon Water's Approved Products List (APL) is a resource that enables users to explore and obtain details about products and materials currently accepted by Icon Water for pipeline systems and associated infrastructure works. This document is intended for use by Icon Water personnel, consultant engineers, and construction contractors involved in the design, construction, and maintenance of Icon Water's infrastructure. It also serves as a reference for product manufacturers, suppliers, and other stakeholders dealing with Icon Water's water and wastewater infrastructure.

The document has undergone technical review to ensure alignment with Icon Water standards and incorporates feedback from stakeholders. It serves as a starting point for product selection, though inclusion in this list does not imply universal suitability across all applications within Icon Water infrastructure. Each product must be evaluated by a registered engineer to confirm its suitability for specific design and project conditions. In addition, non-technical considerations, such as procurement requirements, logistics, compatibility with existing infrastructure, and environmental impact, should be assessed on a case-by-case basis.

Starting in March 2025, all professional engineering recommendations for Icon Water infrastructure projects must be reviewed by a registered engineer to ensure compliance with the ACT's Professional Engineers Act 2023 and its requirements.

Only products listed in this document are authorised for use within specified areas and limits, and additional project-specific factors must be considered. Therefore, product selection must be supported by a registered engineer's assessment, ensuring alignment with project requirements. Manufacturers interested in gaining product approval for future APL editions should notify Icon Water of any product changes that could affect previously granted approvals. More details on the approval process are available in Appendices A and B of this document. If a product outside this APL is being considered for a project, consult the Icon Water Technical Authority for guidance. Approval for non-APL products will be project-specific and will not set a precedent for other projects.

Products and materials not listed in the current APL are not permitted for use within Icon Water's networks and facilities. If unlisted products are used, they may be removed and replaced at the designer's or constructor's expense. Icon Water maintains strict approval obligations, endorsing only APL-listed items to ensure consistency across its asset base, which facilitates efficient spares management and streamlined training. All product approvals, including project-specific ones, must be granted by the Icon Water Technical Authority.

The APL is reviewed on a regular basis, adding new products that meet Icon Water standards and removing others that no longer comply due to changes in product specifications, supply chains, or suitability.

Regards,

Sol Asadollahi

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2 Potable Water Network – Hydraulic Products

The products and materials listed in Section 2 of this APL are approved for use within the potable water network. This network also includes potable water pumping stations and potable water reservoirs.

The primary intent of this section is to provide a list of approved (hydraulic-related) products and materials which can be used for the asset types described within WSA 03 Water Supply Code of Australia (as amended by Icon Water in *STD-SPE-G-012*).

The following applicability table is relevant to the products and materials listed in Section 2 of this APL:

Asset area	Applicable (Yes/No)	Asset area	Applicable (Yes/No)
Dams (DAM)	Ref. Section 7	Water Network (WAT)	**Yes**
Bulk Water Supply (BWS)	Ref. Section 7	Sewerage Network (SEW)	No
Water Treatment Plants (WTP)	No	Sewage Pump Stations (SPS)	No
Water Pump Stations (WPS)	**Yes**	Sewage Treatment Plants (STP)	No
Reservoirs (RES)	**Yes**	Recycled Water Systems (REC)	No

For non-hydraulic products and materials approved for use within the potable water network, refer to Section 4 of this APL.

2.1 Ductile Iron Cement Lined (DICL) Pressure Pipes – Potable Water Network

Item	Supplier	Product	Appraisals
1	Crevet Iplex Pipelines	Brand: **XINAL 400+** Sizes: DN100 – DN750 Rating: PN35 and Flange Class Joints: SP-SO RRJ and flanged to AS 4087 PN16 Internal Lining: GP Portland Cement with seal coat[5] External Coating: Zn/Al with two part epoxy finish coat	WSAA PA 1611 Issue 2
2	Viadux Reece Civil	Brand: **DIMAX TYTONXCEL Z+** Sizes: DN100 – DN750 Rating: PN35 and FLCL (Flange Class) Joints: SP-SO RRJ and flanged to AS 4087 PN16 and PN35 Internal Lining: SR Cement with seal coat[5] External Coating: Zn/Al with two part epoxy finish coat	WSAA PA 1920
3	Clover	Brand: **PAM HYDROCLASS ZINALIUM** Sizes: DN100 – DN750 Rating: PN35 Joints: SP-SO RRJ and flanged to AS 4087 PN16 Internal Lining: GP Portland Cement with seal coat[5] External Coating: Zn/Al with resin finish coat	WSAA PA 1418
4	Crevet Iplex Pipelines	Brand: **IRONTITE** (formerly known as "**Jindal SAW**") Sizes: DN100 – DN750 Rating: PN35 and Flange Class Joints: SP-SO RRJ and flanged to AS 4087 PN16 Internal Lining: SR Cement with seal coat[5] External Coating: Zn/Al with blue epoxy finish coat	WSAA PA 1802
5	Vinidex	Brand: **ZAP-GP** and **ZAP-GPSC** Sizes: DN100 – DN750 Rating: PN35 and Flange Class Joints: SP-SO RRJ and flanged to AS 4087 PN16 Internal Lining: GP Portland Cement with seal coat[5] External Coating: Zn/Al with blue epoxy finish coat	WSAA PA 1605

Limits of Use:

1. DN200 and DN250 sized pipes are not accepted by Icon Water for use within the water network.
2. Direct tapping for service connections is not permitted.
3. Polyethylene sleeving is not required for pipes with a Zn/Al external coating in-conjunction with an epoxy or synthetic resin finish coat if the soil resistivity along the pipeline alignment is greater than 500 Ohms.cm. If sleeving is required, only manufacturers/suppliers from the table above must be sourced from and the sleeving must be coloured blue.
4. AS 4087 PN16 flanges shall incorporate 3.0 mm EPDM gaskets (to WSA-109) and stainless steel 316 bolts and nuts which have threads lubricated at the time of installation using an approved Nickel-based anti-seize compound. Alternatively, Molybdenum-coated nuts shall be used.
5. Unless otherwise notified by Icon Water for a specific project, seal coats are required on internal cement mortar linings for all DICL pipes sized DN100 - DN300 inclusive (due to alkalinity levels of 10 – 40 mg/l in the raw water supply system and 30 – 50 mg/l in the potable water supply network).

General Notes:

1. Epoxy or resin finish coats are the only approved external over-coating options.
2. Relevant standards and specifications: AS/NZS 2280, AS/NZS 4020 and WSA PS-200.

2.2 Ductile Iron (DI) Fittings – Potable Water Network

Item	Supplier	Product		Appraisals
1	Crevet Iplex Pipelines	Brands: Sizes: Rating: Joints: Coating: Types:	**CREVET (PN16 & PN35),** **CREVET SL (PN20) & NIBF (PN16)** DN80 – DN750 PN16, PN20 and PN35 RRJ and flanged to AS 4087 PN16 Thermal bonded polymeric coating or fusion bonded epoxy coating Bends, tees, connectors, tapers, crosses, wyes, bell-mouths, caps, hydrant risers and blank flanges	WSAA PA 1611
2	Viadux Reece Civil	Brands: Sizes: Rating: Joints: Coating: Types:	**SUREFLOW** DN80 – DN750 PN16 and PN35 RRJ and flanged to AS 4087 PN16 Thermal bonded polymeric coating or fusion bonded epoxy coating Bends, tees, connectors, tapers, crosses, wyes, bell-mouths, caps, hydrant risers and blank flanges	WSAA PA 1016
3	Vinidex	Brands: Sizes: Rating: Joints: Coating: Types:	**SUPERLINK** and **SUPERLINK II** DN100 – DN150 PN16 and PN35 RRJ and flanged to AS 4087 PN16 Thermal bonded polymeric coating or fusion bonded epoxy coating Bends, tees, tapers, connectors and end caps	WSAA PA 06/11
4	Derwent Industries Hygrade Water (for hydrants and risers)	Brands: Sizes: Rating: Joints: Coating: Types:	**DERWENT (TAS)** DN80 – DN750 PN16 and PN35 RRJ and flanged to AS 4087 PN16 Thermal bonded Rilsan/Nylon 11 Bends, tees, connectors, tapers, crosses, wyes, bell-mouths, collars caps, hydrant risers and blank flanges	WSAA PA 10/03
5	Clover	Brands: Sizes: Rating: Joints: Coating: Types:	**GALVIN "TRADITIONAL"** **GALVIN "LIGHTWEIGHT"** DN80 – DN300 PN16 RRJ and flanged to AS 4087 PN16 Fusion bonded epoxy coating Bends, tees, connectors and tapers	WSAA PA 1403
6	Hygrade Water	Brands: Sizes: Rating: Joints: Coating: Types:	**GILLIES METALTECH "TRADITIONAL"** **GILLIES METALTECH "LIGHTWEIGHT"** DN80 – DN150 PN16 RRJ and flanged to AS 4087 PN16 Thermal bonded polymeric coating Bends, tees, connectors, tapers and hydrant risers	WSAA PA 1431

Item	Supplier	Product		Appraisals
7	Daemco	Brands: Sizes: Rating: Joints: Coating: Types:	**DAEMCO (PN16 & PN35)** DN80 – DN375 PN16 and PN35 RRJ and flanged to AS 4087 PN16 Thermal bonded polymeric coating Bends, tees, connectors, tapers and hydrant risers	WSAA PA 1805
8	AVK	Brand: Sizes: Rating: Joints: Coating: Types:	**AVK** DN80 – DN750 PN16 and PN35 RRJ and flanged to AS 4087 PN16 and PN35 Thermal bonded polymeric coating or fusion bonded epoxy coating Bends, tees, connectors, tapers, crosses, wyes, bell-mouths, caps, hydrant risers and blank flanges	WSAA PA 2204
9	Clover	Brands: Sizes: Rating: Joints: Coating: Types:	**CLOVER** DN80 – DN150 PN16 RRJ and flanged to AS 4087 PN16 Thermal bonded polymeric coating Bends, tees, connectors (excludes pre-tapped connectors), hydrant risers, flushing bends.	WSAA PA 1727

Limits of Use:

1. AS 4087 PN16 flanges shall incorporate 3.0 mm EPDM gaskets (to WSA-109) and stainless steel 316 bolts and nuts which have threads lubricated at the time of installation using an approved Nickel-based anti-seize compound. Alternatively, Molybdenum-coated stainless steel nuts shall be used.
2. Spring hydrants and pre-tapped connectors are not included in the list of approved DI fitting types shown above. Refer to the separate “Spring Hydrant Valves” and “Pre-Tapped Connectors” approved products listings shown elsewhere in this document.
3. For ductile iron elastomeric fittings, the maximum allowable joint deflection must be limited to 4 degrees for sizes ranging DN100-DN300, 3 degrees for DN375 and 1.5 degrees for sizes larger than DN375. These limits must be adhered to ensure the integrity of the joints within the water network system.

General Notes:

1. Internal cement mortar internal linings (with seal coats for DN100 – DN300) to AS/NZS 2280 and in accordance with AS/NZS 4020 etc. provided by the above-listed manufacturers are acceptable in lieu of thermal bonded polymeric coatings or fusion bonded epoxy coatings.
2. Relevant standards and specifications: AS/NZS 2280, AS/NZS 4020, AS/NZS 4158 and WSA PS-201.

2.3 Ductile Iron (DI) Fittings – Pre-Tapped Connectors - Potable Water Network

Item	Supplier	Product		Appraisals
1	Daemco	Brands: Sizes: Rating: Joints: Coating: Type:	**DAEMCO** DN100 – DN225 PN16 RRJ Thermal bonded polymeric coating Pre-tapped connector	WSAA PA 1805
2	Viadux Reece Civil	Brands: Sizes: Rating: Joints: Coating: Type:	**DIMAX MAXITAP** DN100 and DN150 (Quad port) PN16 RRJ Thermal bonded polymeric coating or fusion bonded epoxy coating Pre-tapped connector for connection ¾" and 1".	WSAA PA 1942

Limits of Use:

1. DI pre-tapped connectors are not suitable for use with polyethylene mains.
2. The previous versions of the pre-tapped connectors are no longer accepted, and the fittings shall comply with AS/NZS 2280:2020 Amdt 1:2021. Only connectors built and tested to the latest standard shall be used going forward.

General Notes:

1. Relevant standards and specifications: AS/NZS 2280, AS/NZS 4020, AS/NZS 4158 and WSA PS-201.

2.4 Polyvinylchloride (PVC) Pressure Pipes – Potable Water Network

Item	Supplier	Product		Appraisals
1	Iplex Pipelines	Brand: Material: Sizes: Rating: Joints:	**BLUE RHINO** PVC-M DN100 – DN375 PN16 SP-SO RRJ	No current WSAA PA
2	Pipemakers Viadux	Brand: Material: Sizes: Rating: Joints:	**PIPEMAKERS ENVIROMAIN** PVC-M DN100 and DN375 PN16 and PN20 SP-SO RRJ	WSAA PA 14/01
3	Iplex Pipelines	Brand: Material: Sizes: Rating: Joints:	**APOLLO BLUE** PVC-O DN100 – DN375 PN16 SP-SO RRJ	No current WSAA PA
4	Vinidex	Brand: Material: Sizes: Rating: Joints:	**SUPERMAIN** PVC-O DN100 – DN375 PN16 SP-SO RRJ	No current WSAA PA
5	Pipemakers Viadux Clover Pipelines	Brand: Material: Sizes: Rating: Joints:	**PIPEMAKERS ALPHAMAIN** PVC-O DN100 – DN375 PN16 SP-SO RRJ	WSAA PA 1520
6	Pipemakers Clover Pipelines	Brand: Material: Sizes: Rating: Joints:	**PIPEMAKERS TOM** PVC-O DN100 – DN375 PN16 SP-SO RRJ	WSAA PA 14/15

Limits of Use:

1. DN200 and DN250 sized pipes are not accepted by Icon Water for use within the water network.
2. DN375 is the maximum PVC pipe size allowed within the water supply network.
3. Direct tapping for service connections is not permitted.
4. Only approved Series 2 ductile iron fittings shall be used for bends, tees and hydrant risers etc.
5. PVC-M and PVC-O pipe dimensions are to be Series 2 to AS/NZS 4441 and AS/NZS 4765.

General Notes:

1. Relevant standards and specifications - PVC-M: WSA PS-209, AS/NZS 4765 and AS/NZS 4020.
2. Relevant standards and specifications - PVC-O: WSA PS-210, AS/NZS 4441 and AS/NZS 4020.

2.5 Polyethylene (PE) Pressure Pipes – Potable Water Network

Item	Supplier	Product		Appraisals
1	Poly Pipe	Brand: Material: Sizes: Rating: Joints ≤ DN63: Joints ≥DN125:	**POLY PIPE** PE100 DN25, 32, 40, 50, 63, 125 and 180 PN16 (SDR 11) Butt weld, electrofusion coupler (or compression fittings for temporary supplies) Butt weld, electrofusion coupler, approved mechanical coupling or butt-weld/electrofusion stub for flanging to AS 4087 PN16 with a loose backing ring flange.	WSAA PA 8/12
2	Iplex Pipelines	Brand: Material: Sizes: Rating: Joints ≤ DN63: Joints ≥DN125:	**POLIPLEX and MILLENIUM** PE100 DN25, 32, 40, 50, 63, 125 and 180 PN16 (SDR 11) Butt weld, electrofusion coupler (or compression fittings for temporary supplies ≤ DN40) Butt weld, electrofusion coupler, approved mechanical coupling or butt-weld/electrofusion stub for flanging to AS 4087 PN16 with a loose backing ring flange	WSAA PA 1610 (for Millennium)
3	Vinidex	Brand: Material: Sizes: Rating: Joints ≤ DN63: Joints ≥DN125:	**VINIDEX** PE100 DN25, 32, 40, 50, 63, 125 and 180 PN16 (SDR 11) Butt weld, electrofusion coupler (or compression fittings for temporary supplies ≤ DN40) Butt weld, electrofusion coupler, approved mechanical coupling or butt-weld/electrofusion stub for flanging to AS 4087 PN16 with a loose backing ring flange	No current WSAA PA
4	Enviropipes	Brand: Material: Sizes: Rating: Joints ≤ DN63: Joints ≥DN125:	**ENVIROPRESSURE** PE100 DN25, 32, 40, 50, 63, 125 and 180 PN16 (SDR 11) Butt weld, electrofusion coupler (or compression fittings for temporary supplies ≤ DN40) Butt weld, electrofusion coupler, approved mechanical coupling or butt-weld/electrofusion stub for flanging to AS 4087 PN16 with a loose backing ring flange	WSAA PA 1310

Item	Supplier	Product		Appraisals
5	Reece Civil Hygrade Water Tradelink	Brand: Material: Sizes: Rating: Joints ≤ DN63: Joints ≥DN125:	**CROMFORD PIPE "IDENTI-PIPE"** PE100 DN25, 32, 40, 50, 63, 125 and 180 PN16 (SDR 11) Butt weld, electrofusion coupler (or compression fittings for temporary supplies ≤ DN40) Butt weld, electrofusion coupler, approved mechanical coupling or butt-weld/electrofusion stub for flanging to AS 4087 PN16 with a loose backing ring flange	WSAA PA 14/29
6	Pipe Couplings Australasia (PCA)	Brand: Material: Sizes: Rating: Joints ≤ DN63: Joints ≥DN125:	**PCA** PE100 DN25, 32, 40, 50, 63, 125 and 180 PN16 (SDR 11) Butt weld, electrofusion coupler (or compression fittings for temporary supplies ≤ DN40) Butt weld, electrofusion coupler, approved mechanical coupling or butt-weld/electrofusion stub for flanging to AS 4087 PN16 with a loose backing ring flange	WSAA PA 2305

Limits of Use:

1. DN25, 32, 40, 50 and 63 polyethylene pipe shall only be installed in (i) mains-to-meter (i.e. property service connections) in one continuous length (between the mains tap and water meter copper riser) without any joints or (ii) temporary, above-ground water supplies when network renewals or repair projects are being conducted under the direct control of Icon Water.
2. DN125 and DN180 polyethylene pipe shall only be used for network renewal projects or repair projects under the direct control of Icon Water and shall not be used for the construction of new "Gifted Asset" sections of network. Only approved/accredited constructors who have delivery contracts directly with Icon Water shall be engaged for such work.
3. "Blue" coloured stripes on black, a co-extruded "blue" outer sheath or solid "blue" shall be used to indicate potable water applications.
4. AS 4087 PN16 flanges shall be of the loose backing ring type, of stainless steel 316 construction and incorporate 3.0 mm EPDM gaskets (to WSA-109) and stainless steel 316 bolts and nuts which have threads lubricated at the time of installation using an approved Nickel-based anti-seize compound. Alternatively, Molybdenum-coated stainless steel nuts be used.
5. Hydrant risers for DN125 and DN180 PE100 polyethylene water mains shall be ductile iron as per the approved items shown elsewhere in this document. Polyethylene risers are not approved.
6. PE100 pipes are not suitable for use in contaminated areas.

General Notes:

1. PE pipe dimensions are Series 1 to AS/NZS 4130.
2. Relevant standards and specifications: WSA PS-207, WSA PS-215, and AS/NZS 4130.
3. Electrofusion couplers are not preferred. Ideally, they should only be used for final, in-trench closure joints if other jointing means are not practicable.

2.6 Polyethylene (PE) Compression & Press-Fit Fittings – Potable Water Network

Item	Supplier	Product		Appraisals
1	Philmac Vinidex Viadux	Brand: Sizes: Joint Type: Rating: Fitting Types:	**PHILMAC 3G METRIC** DN25, 32 and 40 Mechanical/Compression PN16 Not currently approved for permanent installations; approval for temporary above-ground installations only.	WSAA PA 8/12
2	Plasson	Brand: Sizes: Joint Type: Rating: Fitting Types:	**PLASSON METRIC** DN32 and 40 Mechanical/Compression PN16 Metric male adaptor with male brass thread 32 x 1", 40 x 1", 40 x 1 ¼" 90° metric male elbow with brass thread 32 x ¾", 32 x 1", 40 x 1", 40 x 1 ¼"	No current WSAA appraisal
3	Tradelink Reece Civil	Brand: Sizes: Joint Type: Rating: Fitting Types:	**VIEGA GEOPRESS K** (Limit 3) DN25 – DN63 Press fit (via press/crimping tool) PN16 All "Geopress K" fittings excluding Geopress K tapping saddle/tapping valves	No current WSAA appraisal

Limits of Use:

1. Polyethylene **compression** fittings of the above-mentioned brands from all of the above-mentioned suppliers may be used without limitation in **above-ground applications** for **temporary** water supplies during maintenance and renewal projects under the direct supervision of Icon Water. Press fit/crimped fittings (i.e. Viega Geopress K) may be used in above or below ground applications whether they be temporary or otherwise for "Gifted Assets" as well as projects under Icon Water's direct control.
2. Plasson Metric compression fittings of the types specifically listed above have been approved for property service (aka "mains-to-meter") applications where transition between the mains-tap (ball valve) and polyethylene pipe, or between the polyethylene pipe and copper riser at the water meter is required. This is achieved through metal-to-metal (i.e. brass threaded) fit-up. See the figures below for further detail.
3. For Geopress fittings, a press gun and a pinch jaw and Viega Geopress K press rings are required.
4. All screwed components must be "metal-to-metal" fit-up. Screwed plastic-to-plastic or screwed metal-to-plastic must not be used. Refer over-the-page for acceptable examples.

General Notes:

1. Relevant standards and specifications: WSA PS-208 and AS/NZS 4129.

Plasson Metric male adaptor with male brass thread

Plasson Metric 90° male elbow with brass thread

Viega Geopress K adaptor Model 9711

Viega Geopress K adaptor Model 9712

Note: On the proviso that brass-to-brass or stainless steel-to-stainless steel fittings are screw connected to the metallic-threaded insert section of the above-depicted fittings, then the above fittings are examples of what has been specifically approved for use. Plastic screw-threaded components are prohibited.

2.7 Polyethylene (PE) Electrofusion Fittings – Potable Water Network

Item	Supplier	Product		Appraisals
1	Georg Fischer Iplex	Brand: Sizes: Joint Type: Rating: Fitting Types:	**ELGEF** DN25 – DN180 Electrofusion PN16 All with exception as per Note 2	No current WSAA appraisal
2	Philmac	Brand: Sizes: Joint Type: Rating: Fitting Types:	**DURAFUSE** DN25 – DN180 Mechanical/Compression PN16 All with exception as per Note 2	No current WSAA appraisal
3	Plasson	Brand: Sizes: Joint Type: Rating: Fitting Types:	**PLASSON (no brand name)** DN25 – DN180 Electrofusion PN16 All with exception as per Note 2	WSAA PA Report 1604
4	Vinidex	Brand: Sizes: Joint Type: Rating: Fitting Types:	**FRIATEC** DN25 – DN180 Electrofusion PN16 All with exception as per Note 2	WSAA PA Report 1515
5	FusionPlast Australia	Brand: Sizes: Joint Type: Rating: Fitting Types:	**FUSAMATIC** DN25 – DN180 Electrofusion PN16 All with exception as per Note 2	WSAA PA Report 1127

Limits of Use:

1. Electrofusion fittings shall only be used for network renewal or repair projects under the direct control of Icon Water and shall not be used for the construction of new “Gifted Asset” sections of network. Only approved constructors who have delivery contracts directly with Icon Water shall be engaged for such work.
2. Polyethylene fittings with the threaded elements constructed of polyethylene, whether they be male threaded or female threaded, are not approved for use within the water supply network due to issues with stress relaxation and/or bending stresses which lead to leakage and/or failure at the threaded connection. All threaded components must be metallic (i.e. metal-to-metal fit-up). Metal-to-metal fit-up can be achieved using fittings such as transition adaptors (PE/Brass construction) which are connected to the polyethylene pipe using an electrofusion coupling.

General Notes:

1. Relevant standards and specifications: WSA PS-208 and AS/NZS 4129.
2. Electrofusion couplers are not preferred. Ideally, they should only be used for final, in-trench closure joints if other jointing means are not practicable.

2.8 Restrained DI Fittings for Polyethylene (PE) Pipes – Potable Water Network

Item	Supplier	Product		Appraisals
1	Hygrade Water	Brand: Material: Size: Type: Rating: Models:	**HAWLE SYSTEMS 2000** Epoxy powder coated Ductile Iron DN63 – DN355 Fully restrained for PE PN16 Hawle Systems 2000 Fittings comprising: - Straight Coupling – Restrained - Long Radius Bend – Restrained - Tee (Flanged Take-Off) – Restrained - Tee (Coupling Take-Off) – Restrained - Flange Adaptor – Restrained - Wash-Out Bend (Flanged) - Restrained	WSAA PA 2304
2	Daemco	Brand: Material: Size: Type: Rating: Models:	**XCEL** FBE coated Ductile Iron DN63 – DN315 Fully restrained for PE PN16 XCEL Fittings comprising: - Straight Coupling – Restrained - Flange Adaptor - Restrained	WSAA PA 1624
3	Reece Civil	Brand: Material: Size: Type: Rating: Model:	**VICTAULIC "REFUSE TO FUSE"** FBE coated Ductile Iron body SS316 gripping rings EPDM elastomers Fasteners zinc electroplated with fluoropolymer over-coat (Xylan 1424) Weathered steel (hardened) washers DN63 - DN180 Fully restrained for PE PN16 Victaulic Style 905	WSAA PA 1706

Limits of Use:

1. Hawle Systems 2000 couplings, Daemco Xcel couplings and Victaulic "Refuse to Fuse" couplings shall only be installed on polyethylene pipes.
2. Mechanical couplings shall not be used for new construction unless specifically shown on Icon Water's standard drawings.
3. Hawle Systems 2000 valves are not approved for use. All valves in the potable water network shall be flanged-flanged connections.
4. Restrained ductile iron fittings for polyethylene pipes is suitable for SDR13.6 PE and SDR11 PE and this joint does not allow for any deflection.

General Notes:

1. Relevant standards and specifications: WSA PS-245, EN 12842 and AS/NZS 4020.

2.9 Copper Tube – Potable Water Network

Item	Supplier	Product		Appraisals
1	No limitation	Brand: Material: Sizes: Rating: Joint Type:	**KEMBLA** and any other brand which has Watermark certification and is also certified as conforming to AS 1432 Type B seamless copper tube DN15 – DN100 in “hard drawn” straight lengths DN15 and DN20 in “bendable” straight lengths DN15 - DN25 in “annealed” coils Dependent upon DN - refer to General Note 2 Plain end, joined by press-fit or brazing	Not applicable

Limits of Use:

1. Press-fit fittings shall be of the approved makes/models shown elsewhere in this document.
2. Brazed joints shall only be made using silver brazing alloy complying with alloy designation B4 of AS 1167.1 Table 2.
3. Water meter risers shall be constructed of hard drawn tube.

General Notes:

1. Relevant standards and specifications: WSA PS-214, AS 1167.1, AS/NZS 4020, AS 3500.1 and AS 1432.
2. The Safe Working Pressure of seamless Type B copper tubes to AS 1432 (for temperatures ≤ 50°C) are as follows:

   DN15 5,290 kPa
   DN20 3,970 kPa
   DN32 2,780 kPa
   DN40 2,300 kPa
   DN50 1,710 kPa
   DN65 1,370 kPa
   DN80 1,520 kPa
   DN100 1,200 kPa

   However, the rating of the system is limited by the lowest rated component (e.g. valve, flange, tube or fitting etc.)

2.10 Fittings for Copper Pipe – Potable Water Network

Item	Supplier	Product		Appraisals
1	Tradelink	Brand: Sizes: Joint Type: Rating: Fitting Types:	**VIEGA PROPRESS** DN15 – DN100 Mechanical press-fit fitting PN16 Copper alloy press-fit	No current WSAA appraisal
2	No limitation	Brand: Sizes: Joint Type: Rating: Fitting Types:	**KEMBLA** and any other brand which has Watermark certification and is also certified as conforming to AS 3688. DN15 – DN100 Brazing PN16 Capillary and DN high pressure	No current WSAA appraisal
3	No limitation	Brand: Sizes: Joint Type: Rating: Fitting Types:	**COPAMATE** DN50 – DN100 Brazing PN16 Flange Adaptor, Buried Flange Adaptor	No current WSAA appraisal
4	Reece Civil	Brand: Sizes: Joint Type: Rating: Fitting Types:	**CONEX >B< PRESS FIT SYSTEM** DN15 – DN100 Mechanical press-fit fitting with black EPDM seals PN16 Copper alloy press-fit	No current WSAA appraisal

Limits of Use:

1. Copper tube and fittings shall only be used for property service (aka “mains-to-meter”) applications, fire services, sewage pumping station RPZD applications and valve or flowmeter pit pilot or instrument tubing applications.
2. Brazed joints shall only be made using silver brazing alloy complying with alloy designation B4 of AS 1167.1 Table 2.
3. Mechanical press-fit joints utilising VIEGA PROPRESS fittings or CONEX >B< PRESS fittings shall only be made using three-point press tooling approved by their respective manufacturers. Some tooling may be used for both fittings as shown in the following table.

APPROVED TOOLING (3-point press system)	VIEGA PROPRESS	CONEX >B< PRESS
Romax Compact (Rothenberger)	Not Approved	Approved
Romax 3000 (Rothenberger)	Not Approved	Approved
Picco (Viega)	Approved	Approved
PT3-AH & 4B (Viega)	Approved	Approved
Ridgid RP340	Not Approved	Approved

General Notes:

1. Relevant standards and specifications: AS/NZS 4020, AS 2129, AS 1167.1, AS 1566 and AS 3688.

2.11 Steel Cement Lined (SCL) Pressure Pipes – Potable Water Network

Item	Supplier	Product	Appraisals
1	Steel Mains	Brand: **SINTAKOTE** Sizes: DN100 – DN750 Rating: Application specific Joints: Application specific from a choice of: Sintajoint Rubber Ring Spherical Slip-In (Welded) Ball and Socket (Welded) Plain End Butt Joint (Welded) Butt Joint and Collar (Welded) Flanged to AS 4087 Internal Lining: Portland Cement(General Note 3) External Coating: Sintakote	WSAA PA 1818
2	Pipe Lining and Coating	Brand: No specific branding Sizes: DN100 – DN750 Rating: Application specific Joints: Application specific from a choice of: Plain End Butt Joint (Welded) Butt Joint and Collar (Welded) Flanged to AS 4087 Internal Lining: Portland Cement(General Note 3) External Coating: Fusionkote (Fusion Bonded Medium Density Polyethylene) or application specific in accordance with WSA 201 as amended by *STD-SPE-G-005*.	WSAA PA 1830

Limits of Use:

1. SCL pressure pipes are designed specifically for a particular application rather than being an "off-the-shelf" product. Icon Water may select their own approved designers (from the Icon Water Design Panel) should SCL pressure pipe be required for a particular project.
2. SCL pressure pipe shall only be specified for applications within the potable water network if an additional written approval is obtained from the Icon Water Technical Authority. Applications may include reservoir pipework or larger water pumping station pipework.
3. Sintalock rubber ring joints (Types 1 and 2) shall not be used unless an additional written approval is obtained from the Icon Water Technical Authority.

General Notes:

1. Fabricated fitting, flange and bolting options shall be designed to suit the pressure rating of the specific application.
2. Relevant standards and specifications: AS 1579, AS 1281, AS/NZS 4020 and WSA PS-203.
3. Designers shall ensure that the correct internal cement mortar lining option is chosen to cater for the typical alkalinity levels of 10 – 40 mg/l in the raw water supply system and 30 – 50 mg/l in the potable water supply network. Internal seal coats are a mandatory requirement for pipe sizes up to and including DN300.

2.12 Resilient Seated Gate Valves – Potable Water Network

Item	Supplier	Product		Appraisals
1	Crevet Iplex AVK	Brand: Sizes: Connections: Rating: Models:	**AVK SERIES 570** DN80 – DN750 Flange-Flange AS 4087 PN16 PN16 Series 570	WSAA PA 1703 Issue 9
2	Challenger Valves & Actuators	Brand: Sizes: Connections: Rating: Models:	**CHALLENGER** DN80 – DN750 Flange-Flange AS 4087 PN16 PN16 RSGV (Stem cap), RSGVC/A-HW (H/wheel)	WSAA PA 06-09
3	Derwent International	Brand: Sizes: Connections: Rating: Models:	**DERWENT INTERNATIONAL** DN80 – DN600 Flange-Flange AS 4087 PN16 PN16 Stem cap Bypass Valve (DN450 – DN600)	WSAA PA 1511
4	Hygrade Water	Brand: Sizes: Connections: Rating: Models:	**HAWLE-A and HAWLE-E3** DN80 - DN150 Flange-Flange AS 4087 PN16 PN16 and PN21 Hawle-A (Stem cap, DN80 – DN150) Hawle-E3 (Stem cap, DN100 and DN150)	WSAA PA 1904
5	Daemco	Brand: Sizes: Connections: Rating: Models:	**DAEMCO** DN50 – DN300 Flange-Flange AS 4087 PN16 PN16 Daemco (Stem cap, DN50 – DN300)	WSAA PA 1517
6	Viadux Reece Civil	Brand: Sizes: Connections: Rating: Models:	**SUREFLOW** DN80 – DN600 Flange-Flange AS 4087 PN16 PN16 2570 2570-96 OS&Y (DN80 – DN300)	WSAA PA 1707
7	Viadux Reece Civil	Brand: Sizes: Connections: Rating: Models:	**DIMAX** DN80 – DN300 Flange-Flange AS 4087 PN16 PN16 DIMAX (Stem cap or handwheel) DIMAX OS&Y (Rising stem type)	WSAA PA 1925
8	Clover	Brand: Sizes: Connections: Rating: Models:	**BETTA** DN80 – DN300 Flange-Flange AS 4087 Fig B5 PN16 DN80 – DN300 Flange – Flange with stem	WSAA PA 1121

Limits of Use:

1. Water Network: All gate valves sized DN80 and larger shall be anti-clockwise close and shall have flanged-flanged connections. DN50 and DN65 gate valves shall only be installed in (i) water meter pits and cabinets in mains-to-meter applications or (ii) in bypass lines and minor pipe runs such as those found in valve chambers. In such instances, these valves may have either flanged-flanged or threaded-threaded end connections as appropriate and may be clockwise close (if anti-clockwise close is unavailable).
2. Resilient seated gate valves shall not be selected for throttling applications or for any application involving high velocity flow or high wear rates where a metal seated valve would be a more appropriate choice (e.g. scouring applications).

3. Extension spindles, hand wheels, gearboxes or electric actuators to be fitted in-conjunction with or in-lieu of stem caps where applicable. The designer shall consider frequency of use, access limitations and actuation torque requirements when selecting such items. Extension spindles must comply with AS 2638.2 and WSA PS-262.
4. Directional arrows indicating the direction of opening/closing shall be shown at the point of operation of all valves. Refer to Icon Water's standard drawings.
5. For PN25 resilient seated gate valves each instance requires approval from the Technical Authority on a case-by-case basis. This means the specifications and the context of its application must be reviewed.

General Notes:

1. Relevant standards and specifications: WSA PS-260, WSA PS-262, AS/NZS 4020 and AS 2638.2.

2.13 Metal Seated Gate Valves – Potable Water Network

Item	Supplier	Product		Appraisals
1	Viadux Reece Civil	Brand: Sizes: Connections: Rating: Models:	**SUREFLOW** DN80 – DN300 Flange-Flange AS 4087 Fig B5 PN16 2580	WSAA PA 2048
2	AVK AVK Flow Control Iplex/Crevet	Brand: Sizes: Connections: Rating: Models:	**AVK** DN80 – DN300 Flange-Flange AS 4087 Fig B5 AS 4087 Fig B6 PN16 and PN35 Series 580 (580/90, 580/92 and 580/93)	WSAA PA 2049
3	Zetco Viadux	Brand: Sizes: Connections: Rating: Models:	**ZETCO SERIES 1706** DN50 and DN65 BSP female threaded both ends PN20 Zetco Bronze WaterMarked Gate Valve F&F	No current WSAA appraisal
4	Australian Valve & Engineering	Brand: Sizes: Connections: Rating: Models:	**BRAEMAR T SERIES** DN50 and DN65 BSP female threaded both ends PN40 and PN20 Fig. T59 Bronze gate valve screwed (PN40) Fig. T59M Bronze gate valve screwed (PN20)	No current WSAA appraisal
5	Dobbie Iplex/Crevet	Brand: Sizes: Connections: Rating: Models:	**DOBBIE** DN80 – DN300 Flange-Flange AS 4087 PN16 PN16 VGM16	No current WSAA appraisal

Limits of Use:

1. Water Network: All gate valves sized DN80 and larger shall be anti-clockwise close and shall have flanged-flanged connections. DN50 and DN65 gate valves shall only be installed in (i) water meter pits and cabinets in mains-to-meter applications or (ii) in bypass lines and minor pipe runs such as those found in valve chambers. In such instances, these valves may have either flanged-flanged or threaded-threaded end connections as appropriate and may be clockwise close (if anti-clockwise close is unavailable).
2. Directional arrows indicating the direction of opening/closing shall be shown at the point of operation of all valves. Refer to Icon Water's standard drawings.
3. Metal seated gate valves shall only be specified for (i) isolation within water meter pits and cabinets (ii) scour valve applications, and (iii) for pipelines of sizes DN600 and larger unless specified otherwise in Icon Water's standard drawings or water supply and sewerage standards.
4. Extension spindles, hand wheels, gearboxes or electric actuators to be fitted in-conjunction with or in-lieu of stem caps where applicable. The designer shall consider frequency of use, access limitations and actuation torque requirements when selecting such items. Extension spindles must comply with AS 2638.1 and WSA PS-262.
5. Bronze-bodied gate valves (i.e. Zetco and Braemar) shall only be installed in copper or galvanised steel piping systems.
6. Valves ≥DN375 shall have an integral bypass
7. Icon Water has experienced failures with metal seated gate valves and the press fit rings. For valves larger than DN300 Icon Water Technical Authority must be consulted.

General Notes:

1. Relevant standards and specifications: WSA PS-261, WSA PS-262, AS 1628, AS/NZS 4020 and AS 2638.1

2.14 Air Valves – Potable Water Network

Item	Supplier	Product		Appraisals
1	Ventomat Australia	Brand: Sizes: Connections: Rating: Models:	**VENTOMAT** DN50 – DN150 DN50: Threaded BSP or flanged ≥DN80: Flanged to AS 4087 PN16 PN16 RBX Series, RBXc Series	No WSAA appraisal
2	Viadux	Brand: Sizes: Connections: Rating: Models:	**BERMAD** DN50 and DN80 only DN50: Threaded BSP DN80: Flanged to AS 4087 PN16 PN16 C70-SP Combination Air Valve (fitted with down outlet and drain valve)	WSAA PA 1614

Limits of Use:

1. Ventomat air valves are approved for use in both urban and rural areas. Bermad air valves shall only be used when air valve chambers are required in urban areas and a Ventomat valve is unsuitable due to the larger overall size.
2. Bermad air valves are limited to sizes DN50 and DN80 only and shall be fitted with a drain outlet and drain valve.
3. When ordering Ventomat air valves, state “Icon Water Standard Build” so that the correct configuration is supplied.
4. All air valves shall have a test port of a minimum size DN15 complete with an isolation ball valve and test plug fitted.

General Notes:

1. Relevant standards and specifications: WSA PS-265, AS/NZS 4020 and AS 4956.

2.15 Butterfly Valves – Potable Water Network

Item	Supplier	Product		Appraisals
1	Challenger Valves & Actuators	Brand: Sizes: Connections: Rating: Models:	**CHALLENGER** DN50 – DN300 Lugged to AS 4087 PN16 PN16 BFL (lugged, resilient seat, seal on body, DN50 – DN300)	WSAA PA 1519
2	Ebro Armaturen Pacific	Brand: Sizes: Connections: Rating: Models:	**EBRO** DN50 – DN750 Lugged or double flanged to AS 4087 PN16 PN16 Z014-A (lugged, resilient seat, seal on body, DN50 – DN600) F012-A (double-flanged, vulcanised rubber, seal on body, DN150 – DN750) F012-K (double flanged, replaceable liner, seal on body, resilient seat, DN100 – DN750)	No WSAA appraisal
3	Pentair Valves & Controls	Brand: Sizes: Connections: Rating: Models:	**KEYSTONE** DN100 – DN750 Double flanged to AS 4087 PN16 PN16 Figure 631 (bi-directional, double flanged, resilient seat, seal on body)	No WSAA appraisal
4	AVK Crevet Iplex	Brand: Sizes: Connections: Rating: Models:	**AVK** DN80 – DN500 Double flanged to AS 4087 PN16 PN16 813/82 (double flanged, loose liner, resilient seat, concentric, seal on body)	No WSAA appraisal
5	Metaval	Brand: Sizes: Connections: Rating: Models:	**VAG** DN100 – DN750 Double flanged to AS 4087 PN16(General Note 2) PN16 EKN H Series (double flanged, double eccentric, seal on disc)	No WSAA appraisal
6	Hygrade Water	Brand: Sizes: Connections: Rating: Models:	**OZKAN** DN150 – DN750 Double flanged to AS 4087 PN16 PN16 WS Series (seal on disc)	No WSAA appraisal
7	AVK Flow Control AVK	Brand: Sizes: Connections: Rating: Models:	**WOUTER WITZEL** DN50 – DN750 Double flanged and wafer-lugged to AS 4087 PN16 EVFS Series (double-flanged, seal on body) EVUS Series (double-flanged, seal on body)	No WSAA appraisal

Limits of Use:

1. Wafer-type butterfly valves are not to be used within the water network.
2. Position indicators shall be fitted.
3. Gearboxes to be installed on all valves of sizes larger than DN150. An additional position indicator shall be installed at the non-gearbox end.
4. Flow velocities shall be limited to a maximum of 3.5 m/s.

General Notes:

1. Relevant standards and specifications: WSA PS-263, AS/NZS 4020, AS 4795.1 and AS 4795.2.
2. VAG EKN H Series butterfly valves have flanges drilled to EN1092. This drilling pattern is sufficiently compatible with AS 4087 PN16 in the approved size range for this valve. This valve can also be supplied with locking pins to obviate the need for double isolation in some circumstances. This variant may be used subject to an Icon Water Technical Authority project specific approval.

2.16 Non-Return Valves – Potable Water Network

Item	Supplier	Product		Appraisals
1	AVK Crevet Iplex	Brand: Sizes: Connections: Rating: Models:	**AVK SERIES 41** DN50 – DN600 Flange-Flange AS 4087 PN16 PN16 41/25 (Swing check, resilient seat, DN50) 41/82 (Swing check, resilient seat, DN80 – DN300) 41/36 (Swing check, metal seat, DN350 – DN600)	No WSAA appraisal
2	Dobbie Crevet Iplex	Brand: Sizes: Connections: Rating: Models:	**DOBBIE** DN80 – DN600 Flange-Flange AS 4087 PN16 PN16 Dobbie metal seated swing check VSCM16	No WSAA appraisal
3	Challenger	Brand: Sizes: Connections: Rating: Models:	**CHALLENGER (KARON)** DN80 – DN375 Flange-Flange AS 4087 PN16 PN16 RSSC (Swing check, resilient seat, DN80 – DN375)	WSAA PA1513
4	Viadux	Brand: Sizes: Connections: Rating: Models:	**SUREFLOW SWING CHECK** DN100 and DN150 Flange-Flange AS 4087 PN16 PN16 Swing Check (Swing check, resilient seat, DN100 and DN150)	No WSAA appraisal
5	Metaval	Brand: Sizes: Connections: Rating: Models:	**VAG** DN200 - DN600 (SKR Series) DN80 – DN300 (RETO-STOP) Flange-Flange AS 4087 PN16 PN16 SKR Series (Slanted seat tilting disc) RETO-STOP (Rubber-flap type)	No WSAA appraisal
6	Ebro Armaturen Pacific	Brand: Sizes: Connections: Rating: Models:	**EBRO TDC SERIES** DN150 - DN750 Flange-Flange AS 4087 PN16 PN16 TDC 16 (Tilting disc)	No WSAA appraisal
7	Crevet/Iplex	Brand: Sizes: Connections: Rating: Models:	**DOBBIE** DN80 - DN750 Flange-Flange AS 4087 PN16 PN16 VSCM16 (Swing check, metal seat)	No WSAA appraisal
8	AVK Flow Control AVK	Brand: Sizes: Connections: Rating: Models:	**FAST CHECK** DN50 - DN700 Wafer type for insertion between AS 4087 PN16 flanges PN16 VCW Series (Nozzle check, anti-slam) (4)	No WSAA appraisal

Item	Supplier	Product		Appraisals
9	Metaval	Brand: Sizes: Connections: Rating: Models:	**GRAYLOC (OCEANEERING)** DN25 – DN750 Flange-Flange ANSI/ASME CL150 CL150 Grayloc (Nozzle check, anti-slam) (4)	No WSAA appraisal
10	Viadux Reece Civil	Brand: Sizes: Connections: Rating: Models:	**DIMAX WAFER CHECK VALVE** DN50 – DN300 Flange-Flange AS 4087 PN16 PN16 5306	No WSAA appraisal. WaterMark certified: WM020013

Limits of Use:

1. All swing and tilting disc check valves shall be fitted with a lever and weight attachment unless shown otherwise on Icon Water's standard drawings.
2. Limit/proximity switches shall be fitted to swing and tilting disc check valves where indicated on Icon Water's standard drawings.
3. Rubber-flap type check valves shall only be used if swing check or tilting disc check valves are inappropriate for the application and written approval has been obtained from the Icon Water Technical Authority.
4. Nozzle check valves shall only be used when water hammer modelling shows that this valve type is mandatory for the application and/or written approval has been obtained from the Icon Water Technical Authority.
5. The swing check valve with lever and weight has two options of mounting arrangement (RHS and LHS) which shall be assessed and specified before placing the order.

General Notes:

1. Relevant standards and specifications: WSA PS-264, AS/NZS 4020 and AS 4794.

2.17 Ball Valves – Potable Water Network

Item	Supplier	Product		Appraisals
1	Challenger	Brand: Sizes: Connections: Rating: Model:	**CHALLENGER WATERMARK BRASS BALL VALVE** DN15 – DN50 Threaded BSP (Parallel) PN30 (DN15 – DN25) PN25 (DN32 – DN50) BRB061	No WSAA appraisal
2	Challenger	Brand: Sizes: Connections: Rating: Model:	**CHALLENGER STAINLESS STEEL WATERMARK BALL VALVE** DN15 – DN100 Flange-Flange AS 2129 Table E or Threaded BSP F&F (for sizes ≤ DN80) ANSI Class 150 (equivalent to PN20) SSRV2F (Flanged 2-piece) SSRV2 (Threaded 2-piece)	No WSAA appraisal
3	Zetco	Brand: Sizes: Connections: Rating: Model:	**ZETCO WATERMARKED 2-PIECE STAINLESS STEEL BALL VALVE F&F LOCKABLE** DN15 – DN80 Threaded BSP (Parallel) PN40 Series 4400	No WSAA appraisal
4	Reece Civil	Brand: Sizes: Connections: Rating: Model:	**DURA EAGLE WATERMARK CHROME-PLATED DZR BRASS BALL VALVE** DN15 – DN50 Threaded BSP (Parallel) PN20 and PN21 Product Codes: 1003880 through 1003885 Product Codes: 1003690 through 1003695	No WSAA appraisal

Limits of Use:

1. The ball valves detailed above are not to be used for property service connections or any direct buried application. They are limited to use within water pumping stations, water sample points, air valve isolations and similar applications.
2. Threaded valves and pipe connections are limited to a maximum size of DN80 unless written approval is obtained from Icon Water.

General Notes:

1. Refer elsewhere in this document for ball valves specifically used for property service connections.
2. Relevant standards and specifications: WSA PS-274, AS/NZS 4020 and AS 4796.

2.18 Ball Valves for Property Service Connections – Potable Water Network

Item	Supplier	Product		Appraisals
1	Zetco Viadux Reece Civil	Brand: Sizes: Material: Connections: Rating: Models:	**ZETCO SERIES 6401 and 6402** DN20 and DN25 DZR Brass Threaded x Compression (TOF Push) PN16 Model 6401001, DN20 x DN25 (brass x poly) Model 6401003, DN25 x DN32 (brass x poly) Model 6402001, DN20 x DN25 (brass x poly) Model 6402003, DN25 x DN32 (brass x poly)	No WSAA appraisal
2	Zetco Viadux Reece Civil	Brand: Sizes: Material: Connections: Rating: Models:	**ZETCO SERIES 1245** DN20 DZR Brass Threaded M&F PN16 Model 1245020, ball valve 90°, lockable	No WSAA appraisal
3	Strongcast	Brand: Sizes: Material: Connections: Rating: Models:	**STRONGCAST "c" SERIES** DN20 and DN25 DZR Brass Threaded BSP (Brass) x Compression (Poly) Threaded BSP (Brass) x Swivel Nut (Brass) PN16 Model SC8243 Tapping Valve, DN20 x PE25 (brass x poly) Model NC7094 Straight Through Valve, DN20 x PE25 (brass x poly) Model b2520 Straight Through Female End, DN20 F x DN20 swivel nut (brass x brass)	No WSAA appraisal
4	Elster	Brand: Sizes: Material: Connections: Rating: Models:	**ELSTER** DN20 and DN25 DZR Brass Threaded – Threaded PN16 Water service ball valve, lockable Water service ball valve 90°	No WSAA appraisal
5	Viadux Reece Civil	Viadux stock approved DN20 "mains-to-meter" kits for polyethylene mains-to-meter pipe runs. The kit comprises (i) mains isolation valve (ii) water meter isolation valve, and (iii) copper riser with fitting to attach to polyethylene pipe and meter isolation valve. Refer to the graphic over-the-page. Code ZZZE1280025 20BSP x 25PE Actew Meter Kit Code ZZZE6602002 20BSP x 32PE Actew Meter Kit		No WSAA appraisal
6	Reece Civil	Brand: Sizes: Material: Connections: Rating: Models:	**LOGI Valve (by Austworld Commodities)** DN20 – DN50 Brass Threaded – Threaded (F&F) PN25 LOGI Valve UWF Series Lever Handle	No WSAA appraisal

Item	Supplier	Product		Appraisals
7	Reece Civil	Brand: Sizes: Material: Connections: Rating: Models:	**LOGI Valve (by Austworld Commodities)** DN25 and DN32 Brass Threaded x Compression PN16 WPE2025ML, DN20 x DN25 (brass x poly) WPE2532ML, DN25 x DN32 (brass x poly) WPE2025FL, DN20 x DN25 (brass x poly) WPE2532FL, DN25 x DN32 (brass x poly)	WSAA PA 1320

Limits of Use:

1. The use of plastic threaded components is not allowed within the water network. All threaded components must have a metal-to-metal (e.g. brass-to-brass or brass-bronze) fit-up.
2. Strongcast c8127 Right Angled Meter Tail Unions are approved for use in-conjunction with Strongcast ball valves.

General Notes:

1. Relevant standards and specifications: WSA PS-274, AS 5200 and AS 4796.
2. Refer to Section 2.6 for approved polyethylene-to-threaded brass fittings.

Viadux DN20 mains-to-meter kit (polyethylene to copper)

(Note: The kit utilises the Zetco Series 1280 upstand with Zetco ball valves)

2.19 Automatic Control Valves – Potable Water Network

Item	Supplier	Product		Appraisals
1	Challenger	Brand: Sizes: Connections: Rating: Models:	**CLA-VAL** DN40 – DN450 Flanged-Flange AS 4087 PN16 PN16 CLA-VAL. Refer to Limits of Use Note 1	No WSAA appraisal
2	Reece Civil	Brand: Sizes: Connections: Rating: Set Pressure: Models:	**TOMSON** DN20 and DN25 BSP Female-Female PN20 Adjustable from 100 – 600 kPa Straight Adjustable PRV Model 9504091 (DN20) and 9504092 (DN25)	No WSAA appraisal

Limits of Use:

1. CLA-VAL automatic control valves and ancillary items (e.g. limit switches and solenoid valves) shall meet the requirements of Icon Water specification STD-SPE-M-003.
2. Tomson straight adjustable PRVs shall only be specified for use within locked cabinets, pits and enclosures.

General Notes:

1. Relevant standards and specifications: WSA PS-268.

2.20 Spring Hydrant Valves – Potable Water Network

Item	Supplier	Product		Appraisals
1	AVK Crevet Iplex Cadia	Brand: Size: Connections: Rating: Model:	**AVK MODEL 30** DN80 Flanged to AS 4087 PN16 PN16 Model 30/00 spring hydrant	No WSAA appraisal
2	Derwent International Hygrade Water	Brand: Size: Connections: Rating: Model:	**DERWENT INTERNATIONAL** DN80 Flanged to AS 4087 PN16 PN16 Derwent spring hydrant	WSAA PA 1510
3	Viadux	Brand: Size: Connections: Rating: Model:	**SUREFLOW** DN80 Flanged to AS 4087 PN16 PN16 Sureflow spring hydrant	WSAA PA 1016
4	Viadux Reece Civil	Brand: Size: Connections: Rating: Model:	**DIMAX** DN80 Flanged to AS 4087 PN16 PN16 DIMAX spring hydrant	WSAA PA 2058
5	Clover	Brand: Size: Connections: Rating: Model:	**BETTA** DN80 Flanged to AS 4087 PN16 PN16 Betta DN80 spring hydrant	WSAA PA 1128

Limits of Use:

1. DN80 is the only allowable size as per ACT Fire & Rescue requirements.

General Notes:

1. Relevant standards and specifications: WSA PS-267, AS/NZS 4020 and AS 3952.

2.21 Reduced Pressure Zone Devices – Potable Water Network

Item	Supplier	Product		Appraisals
1	All Valve Industries	Brand: Size: Connections: Rating: Models:	**CALEFFI 570 SERIES** DN20, DN25 and DN50 Threaded BSP PN10 Model No. 570 005 DN20 RPZD Model No. 570 006 DN25 RPZD Model No. 570 009 DN50 RPZD	No WSAA appraisal
2	Cadia	Brand: Size: Connections: Rating: Models:	**WATTS 009 SERIES** DN20, DN25 and DN50 Threaded BSP PN10 Cadia Part No. 79676 DN20 RPZ kit Cadia Part No. 79675 DN25 RPZ kit Cadia Part No. 79672 DN50 RPZ kit	No WSAA appraisal
3	Reece Civil	Brand: Size: Connections: Rating: Models:	**ZURN** DN65 – DN250[3] Flanged to AS 2129 Table D or Table E PN12 Model 375	No WSAA appraisal

Limits of Use:

1. The RPZDs listed above shall be purchased as a complete RPZD kit comprising dual check valve with tapping/test points, upstream and downstream isolation valves and y-strainer.
2. RPZDs shall be installed in accordance with AS 3500.1.
3. Where required, DN200 and DN250 RPZDs may be installed in lieu of a DN225 RPZD.

General Notes:

1. Relevant standards: AS 3500.1, AS/NZS 2845.1 and AS/NZS 4020.

2.22 Repair Clamps (for Steel, DI and CI) – Potable Water Network

Item	Supplier	Product		Appraisals
1	Viadux	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Models:	**WANG Tapped Offtake Repair Clamp** 316 stainless steel and Nitrile rubber gasket DN100 – DN400 DN20 – DN50 Threaded (female) BSP branch connection PN16 K2, K3, K4, K5 and K10 model prefixes	No WSAA appraisal
2	Viadux	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Models:	**WANG Flanged Offtake Repair Clamp** 316 stainless steel and Nitrile rubber gasket DN100 – DN450 DN80 – DN300 AS 4087 PN16 branch connection PN16 K8, K10, K14 and K20 model prefixes	No WSAA appraisal
3	Viadux	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Model:	**WANG Stainless Steel Repair Clamp** 316 stainless steel and Nitrile rubber gasket DN50 – DN450 Not applicable – repair to header only Not applicable – repair to header only PN16 K2, K4, K10 model prefixes	No WSAA appraisal
4	Derwent International	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Models:	**DERWENT TYPE R Tapped Offtake Repair Clamp** 316 stainless steel and Nitrile rubber gasket DN80 – DN300 DN20 – DN50 Threaded (female) BSP branch connection PN16 Type R	WSAA PA 1833
5	AVK	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Models:	**AVK REPAIR CLAMP** 316 stainless steel and Nitrile rubber gasket DN50 – DN450 Not applicable – repair to header only Not applicable – repair to header only PN16 748-90	WSAA PA 1809
6	AVK	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Models:	**AVK REPAIR CLAMP WITH FLANGED OFFTAKE** 316 stainless steel and Nitrile rubber gasket DN100 – DN450 DN80 – DN300 AS 4087 PN16 branch connection PN16 748-91	WSAA PA 1809
7	AVK	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Models:	**AVK REPAIR CLAMP WITH THREADED OFFTAKE** 316 stainless steel and Nitrile rubber gasket DN100 – DN400 DN20 – DN50 Threaded (female) BSP branch connection PN16 748-92	WSAA PA 1809

Limits of Use:

1. Tapping of water mains for property service connections and repairs to existing mains shall only be undertaken by Icon Water maintenance personnel.
2. Clamps shall not be rotated after being assembled on the header pipe.
3. The repair clamps listed above are not to be used on polyethylene or PVC-O pipes.
4. Repair clamps are only designed for repairs to existing pipes with minor cracks, holes or splits and are not to be used for large splits, separated pipes, misaligned pipes or for pipe-joining.

General Notes:

1. Relevant standards and specifications: WSA PS-310, WSA PS-313, AS/NZS 4020 and AS 4181.

2.23 Repair Clamps (for PVC-O and PE) – Potable Water Network

Item	Supplier	Product		Appraisals
1	Stauff Corp. Hydraulic Doctors	Brand: Material: Size: Type: Rating: Additional: Models:	**TEEKAY PLASTLOCK COUPLING** 316SS with EPDM gasket DN40 – DN150 Restrained for PE only Up to PN16 (size dependent) c/w 2 x SS inserts per coupling TEEKAY Plastlock Pipe Coupling	No WSAA appraisal
2	Reece Civil	Brand: Material: Size: Type: Rating: Model:	**VICTAULIC "REFUSE TO FUSE"** FBE coated Ductile Iron body SS316 gripping rings EPDM elastomers Fasteners zinc electroplated with fluoropolymer over-coat (Xylan 1424) Weathered steel (hardened) washers DN63 - DN180 Fully restrained for PE PN16 Victaulic Style 905 Coupling	WSAA PA 1706

Limits of Use:

1. Teekay Plastlock couplings shall be used as a slip coupling when a section of polyethylene pipe requires cutting out and replacing. Two couplings are required (i.e. one at each end of the new section). Do not use Teekay Plastlock coupling for PVC-O.
2. Do not use Victaulic "Refuse to Fuse" couplings for PVC-O.
3. Refer to the manufacturer's datasheets for pressure ratings (based on size) before purchasing.
4. Repair clamps/couplings shall not be used for new construction unless specifically shown on Icon Water's standard drawings.

General Notes:

1. There are no repair clamps currently approved for PVC-O pipes. Manufacturers and suppliers are welcome to submit applications for such products to be included in the approved list.
2. Relevant standards and specifications: WSA PS-245, EN 12842 and AS/NZS 4020.

2.24 Mechanical Couplings and Dismantling Joints – Potable Water Network

Item	Supplier	Product		Appraisals
Dismantling Joints				
1	Vinidex	Brand: Material: Size: Type: Rating: Models:	**VIKING JOHNSON DISMANTLING JOINTS** Rilsan Nylon 11 coated Ductile Iron DN50 – DN600 Flange-Flange (thrust type) PN16 Viking Johnson 59XXX Series - thrust type (e.g. 59580 = DN80)	No WSAA appraisal
2	Viadux	Brand: Material: Size: Type: Rating: Models:	**SUREFLOW DISMANTLING JOINTS** Polymeric coated Ductile Iron DN100 – DN750 Flange-Flange (thrust type) PN16 Sureflow – thrust type	No WSAA appraisal
3	AVK	Brand: Material: Size: Type: Rating: Models:	**AVK** Polymeric coated Ductile Iron DN100 – DN750 Flange-Flange (thrust type) PN16 AVK Series FD10 and 265 – thrust type	No WSAA appraisal
4	Steelmains	Brand: Material: Size: Type: Rating: Models:	**STEELMAINS** Polymeric coated carbon steel DN100 – DN750 Sandwiched between flanges (thrust type) PN16 Compact Dismantling Joint	WSAA PA 2056
Gibault-style couplings				
5	AVK Crevet Iplex Cadia	Brand: Material: Size: Type: Rating: Models:	**AVK SERIES 601 & 602** Polymeric coated Ductile Iron or 316SS DN100 – DN400 Unrestrained PN16 Series 601 Universal Unrestrained Coupling Series 602 Unrestrained Stepped Coupling	WSAA PA 1502
6	AVK	Brand: Material: Size: Type: Rating: Models:	**AVK FABRICATED STRAIGHT COUPLING SERIES 258** FBE coated Ductile Iron DN300 – DN600 Unrestrained PN16 258/30	No WSAA appraisal
7	Viadux Cadia	Brand: Material: Size: Type: Rating: Models:	**WANG VARIGIB** Polymeric coated DI or 316SS DN80 – DN600 Unrestrained PN16 VariGIB Unrestrained Coupling	No WSAA appraisal

Item	Supplier	Product		Appraisals
8	Hygrade Water	Brand: Material: Size: Type: Rating: Models:	**HAWLE SYNOFLEX** Epoxy powder coated Ductile Iron DN100 – DN300 Restrained for CI, DI, steel, PVC and PE PN16 Hawle Synoflex Coupling Model 7974 Hawle Synoflex Flanged Adapter Model 7994	WSAA PA 1208
9	Deks Industries	Brand: Material: Size: Type: Rating: Models:	**DEKS FLEXI-GIB GIBAULT** 316SS with DI end rings DN80 – DN600 Unrestrained PN16 DGB Long Series	WSAA PA 12/04
10	Derwent Industries	Brand: Material: Size: Type: Rating: Models:	**DERWENT** 316SS with DI end rings DN100 – DN250 Unrestrained, short and long barrel types PN16 DERWENT COUPLING KJC Series	WSAA PA 1908
11	Daemco	Brand: Material: Size: Type: Rating: Models:	**Daemco** Polymeric coated Ductile Iron DN80 – DN150 Short Barrel DN80 – DN600 Long Barrel Unrestrained PN16 Reinoversal Unrestrained Coupling	WSAA PA 1518
Couplings suitable for joining PE pipe (in lieu of butt-fusion welding or electrofusion welding)				
12	Hygrade Water	Brand: Material: Size: Type: Rating: Models:	**HAWLE SYSTEMS 2000** Epoxy powder coated Ductile Iron DN63 – DN355 Fully restrained for use with PE only PN16 Hawle Systems 2000 Straight Coupling	WSAA PA 2304
13	Daemco	Brand: Material: Size: Type: Rating: Models:	**XCEL** FBE coated Ductile Iron DN63 – DN315 Fully restrained for use with PE only PN16 XCEL Straight Coupling	WSAA PA 1624
14	Hygrade Water	Brand: Details:	**HAWLE SYNOFLEX** Refer to Item 8 on previous page.	WSAA PA 1208
15	Stauff Corp. Hydraulic Doctors	Brand: Material: Size: Type: Rating: Additional: Models:	**TEEKAY PLASTLOCK COUPLING** 316SS with EPDM gasket DN40 – DN150 Restrained for PE only Up to PN16 (size dependent) c/w 2 x SS inserts per coupling TEEKAY Plastlock Pipe Coupling	No WSAA appraisal

Item	Supplier	Product		Appraisals
16	Reece Civil	Brand: Material: Size: Type: Rating: Model:	**VICTAULIC "REFUSE TO FUSE"** FBE coated Ductile Iron body SS316 gripping rings EPDM elastomers Fasteners zinc electroplated with fluoropolymer over-coat (Xylan 1424) Weathered steel (hardened) washers DN63 - DN180 Fully restrained for PE PN16 Victaulic Style 905 Coupling	WSAA PA 1706
Couplings - other				
17	Vinidex	Brand: Material: Size: Type: Rating: Models:	**STRAUB** 316SS with EPDM sealing sleeves DN25 – DN200 Unrestrained and restrained for CI, DI and stainless steel only PN16 STRAUB-FLEX, STRAUB OPEN-FLEX, STRAUB-GRIP L and STRAUB METAL GRIP / GRIP L	No WSAA appraisal
18	Stauff Corp. Hydraulic Doctors	Brand: Material: Size: Type: Rating: Models:	**TEEKAY** 316SS with EPDM gasket DN63 – DN150 Unrestrained and restrained for DI, CI, GRP and steel only PN16 AXIFLEX, AXILOCK-S and AXILOCK	No WSAA appraisal

Limits of Use:

1. AVK, Deks, Derwent and Wang unrestrained mechanical couplings are only suitable for CI, DI, steel, PVC-U, PVC-M and PVC-O pipes. They shall not be installed on polyethylene pipes.
2. Straub mechanical couplings are only suitable for CI, DI and steel, pipes. They shall not be installed on polyethylene or PVC pipes.
3. Teekay Axiflex, Axilock-S and Axilock mechanical couplings are only suitable for CI, DI, GRP and steel pipes and shall not be installed on polyethylene or PVC pipes.
4. Hawle Systems 2000 couplings, Daemco Xcel couplings, Teekay Plastlock couplings and Victaulic Refuse to Fuse couplings shall only be installed on polyethylene pipes (i.e. network renewals projects or "gifted assets" that have had an additional written approval for polyethylene to be used by the Icon Water Technical Authority).
5. Mechanical couplings shall not be used for new construction unless specifically shown on Icon Water's standard drawings. Dismantling joints shall be specified for new construction where it is likely that valves will require easier removal for maintenance (e.g. within valve chambers and pump station buildings).
6. Straub-Flex, Straub Open-Flex, Teekay Axilock-S and Teekay Axiflex couplings shall only be installed in conjunction with tie-rods for axial restraint in above-ground installations as shown in the Icon Water suite of standard drawings.
7. Unrestrained couplings may be used for repairs of existing pipework and shall not be used in new installations without written acceptance from Icon Water.

General Notes:

1. Relevant standards and specifications: WSA PS-245, WSA PS-270, WSA PS-284, AS/NZS 4020, AS/NZS 4998 and EN 12842.

2.25 Tapping Saddles – Potable Water Network

Item	Supplier	Product		Appraisals
1	Viadux	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Model:	**WANG RIGI-TAP TAPPING SADDLE** 316 stainless steel and Nitrile rubber gasket DN225 – DN400 DN20 – DN50 Threaded (female) BSP branch connection PN16 KT4	No WSAA appraisal
2	Viadux	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Model:	**WANG FLEXI-TAP TAPPING SADDLE** 316 stainless steel and Nitrile rubber gasket DN225 – DN375 DN20 – DN50 Threaded (female) BSP branch connection PN16 KTFS4	No WSAA appraisal
3	Hygrade Water	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Model:	**HAWLE HAKU PIPE SADDLE – THREADED OFFTAKE** Epoxy powder coated DI DN125 – DN315 (PE100 mains only) DN25 – DN50 Threaded (female) BSP branch connection PN16 AWM15	WSAA PA 1206
4	Hygrade Water	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Model:	**HAWLE HAKU PIPE SADDLE – FLANGED OFFTAKE** Epoxy powder coated DI DN180 – DN315 (PE100 mains only) DN80 – DN100 Threaded (female) BSP branch connection PN16 AWM14	WSAA PA 1206
5	Reece Tradelink Cadia Plumbing Plus Group	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Model:	**VIEGA GEOPRESS TAPPING VALVE** Plyamide-GF, Silicon-bronze DN63, DN125 and DN180 (PE100 SDR11 mains only) DN25 – DN63 Press connection with Geopress connection pieces PN16 (SDR11) 9690 TW	WSAA PA 1811

Limits of Use:

1. Tapping of water mains for property service connections and repairs to existing mains shall only be undertaken by Icon Water maintenance personnel. Asbestos pipes shall not be directly tapped.
2. Only approved pre-tapped connectors (e.g. Ready Tap) which are shown elsewhere in this document shall be used for new mains construction. The tapping saddles listed above shall only be used when additional/replacement property service connections are required to be installed into an existing main.
3. Clamps shall not be rotated after being assembled on the header pipe.
4. Wang Rigi-Tap tapping saddles are not suitable for PVC or PE pipes. The pipe must be classed as being “rigid” (e.g. steel, CI or DI).
5. Wang Flexi-Tap tapping saddles shall only be used on PVC-U, PVC-M and PVC-O mains pipes. They are not approved for mains constructed of any other material.
6. Wang stainless steel repair clamps with either threaded or flanged offtakes (shown elsewhere in this document) may also be used for creating additional/replacement tapping connections in existing mains (by Icon Water maintenance personnel only) but shall not be used for new mains construction.

7. Hawle Haku pipe saddles shall only be installed on polyethylene (PE100) mains as part of network renewals work or when additional written approval from the Icon Water Technical Authority has been obtained for “gifted assets”.
8. VIEGA GEOPRESS TAPPING VALVES shall only be installed on polyethylene (PE100 SDR11 PN16) mains and the tapping valve consists of a tapping band with an internal valve and a cutter that allows under pressure tapping. For Geopress fittings, a press gun and a pinch jaw and Viega Geopress K press rings are required.

General Notes:

1. Relevant standards and specifications: WSA PS-310, WSA PS-327 and AS/NZS 4129 and AS/NZS 4793.

2.26 Water Meters – Potable Water Network

Item	Supplier	Product		Appraisals
1	Elster	Brand: Sizes: Connection: Rating: Model:	**ELSTER V100** DN20, DN25, DN32 and DN40 Threaded (female) BSP for DN20 and DN25 Flange, 2 bolt type, for DN32 and DN40 PN16 DN20, c/w integrated dual check valve DN25, c/w integrated single check valve DN32, c/w integrated single check valve DN40, c/w integrated single check valve	No WSAA appraisal
2	Elster	Brand: Sizes: Connection: Rating: Model:	**ELSTER V300** DN50 Flange, 2 bolt type PN16 DN50 (without any integrated check valve)	No WSAA appraisal
3	Elster	Brand: Sizes: Connection: Rating: Model:	**ELSTER C4000 COMBINATION METER** **KENT C4200 COMBINATION METER** DN50/20, DN80/20 and DN100/20 (C4000) DN150/32 (C4200) Flanged to AS 4087 PN16 PN16 Elster C4000 Combination Meter Kent C4200 Combination Meter	No WSAA appraisal
4	Elster	Brand: Sizes: Connection: Rating: Model:	**H5000 WOLTMANN METER** DN50, DN80, DN100 and DN150 Flanged to AS 4087 PN16 PN16 Elster H5000 Woltmann Meter	No WSAA appraisal
6	Sensus	Brand: Sizes: Connection: Rating: Model:	**SENSUS MEISTREAM PLUS** DN50, DN80, DN100 and DN150 Flanged to AS 4087 PN16 PN16 Meistream Plus, DN50 – DN150	No WSAA appraisal
7	Sensus	Brand: Sizes: Connection: Rating: Model:	**SENSUS MEITWIN COMPOUND METER** **SENSUS WPVD 150 COMPOUND METER** DN50/20, DN80/20, DN100/20 (MEITWIN) DN150/32 (WPVD) Flanged to AS 4087 PN16 PN16 Sensus Meitwin Compound Meter Sensus WPVD 150 Compound Meter	No WSAA appraisal
8	Sensus	Brand: Sizes: Connection: Rating: Model:	**SENSUS 620 METER** DN20 Threaded (male) BSP PN16 Sensus 620	No WSAA appraisal

Limits of Use:

1. With the exception of Elster V100 and V300 water meters (which don't require minimum straight lengths), the minimum straight pipe length upstream and downstream of water meters sized DN50 and larger (excluding Elster Kent C4200 combination meters) shall be 5D and 3D respectively (where D = nominal pipe diameter). The straight pipe lengths shall be free of fittings (e.g. bends, tees, reducers) and valves. Elster Kent C4200 combination meters require a minimum straight length of pipe upstream of the meter of 10D.

2. As of 1 October 2025, Icon Water has transitioned to the use of only nut and tail arrangement for water meters.
3. The approval is based upon the current industry requirements regarding lead content within products. In accordance with Icon Water's plan to transition to lead-free products, the approval for these meters shall be revoked as of 1 January 2026. Should the applicant wish to retain their product(s) on the Approved Products List, a follow-up application will need to be made proving the product's adherence to the new WaterMark lead-free requirement.

General Notes:

1. Water meters shall be purchased from Icon Water's Mitchell facility located at 12 Hoskins Street, Mitchell, ACT.
2. Relevant standards and specifications: AS 2345, AS 3565.1, AS 3561.1 and AS/NZS 4020.
3. Refer to STD-SPE-M-006 for the water meter sizing schedule.

2.27 Dirt Boxes – Potable Water Network

Item	Supplier	Product		Appraisals
1	Bermad Sensus	Brand: Material: Sizes: Connection: Rating: Model:	**SENSUS WP-F** Powder coated CI with stainless steel sieve DN40 – DN200 Flanged to AS 4087 PN16 PN16 WP-F dynamic protection filter	No WSAA appraisal
2	Elster	Brand: Material: Sizes: Connection: Rating: Model:	**ELSTER KENT H4010** Powder coated CI with stainless steel sieve DN50, DN80, DN100 and DN150 Flanged to AS 4087 PN16 PN16 H4010 in-line strainer	No WSAA appraisal

Limits of Use:

1. Dirt boxes shall be provided upstream of all Woltmann (aka “Helix”) type water meters sized DN50 and larger. Other water meter types do not require an upstream dirt box.

General Notes:

1. No relevant WSA product specification applies to dirt boxes.

2.28 Centrifugal Pumps – Potable Water Network

Centrifugal pumps for the potable water network shall be installed in dedicated pump stations. During the design of a water pumping station, the designer shall look at options for the type of pump required based on the duty. For example, depending upon the head and flow requirements, axial split casing pumps may be the more suitable choice when compared to horizontal end-suction centrifugal pumps. In all cases, the final selection of pump (i.e. make, model, size and type) shall be at the discretion of Icon Water based on detailed (and fully priced) submissions from each manufacturer/supplier.

The manufacturers/suppliers tabulated below are pre-approved for tendering purposes. Designers may nominate other potential suppliers/manufacturers for review and inclusion in the tendering process.

Item	Supplier/Manufacturer	Products/Applications	Appraisals
1	Flowserve	Centrifugal water pumps	N/A
2	Grundfos		
3	KSB		
4	Sulzer		
5	Xylem		
6	Caprari		

Limits of Use:

1. Pumps shall only be installed in dedicated water pumping stations.
2. The final selection of the pump make, model and size shall be at the discretion of Icon Water.
3. Soft starters shall be used by default rather than DOL. Otherwise, for motor sizes > 7.5 kW, soft starters or variable speed drives shall be used with the final selection dependent upon whether a wide duty range (or flow matching etc.) is required.

General Notes:

1. Relevant standards and specifications: WSA PS 403, WSA PS 404, WSA 130 and WSA 131.

2.29 Scour Chambers – Potable Water Network

Item	Supplier	Product		Appraisals
1	Civilmart Group	Brand: Material: Sizes: Configurations: Ancillaries:	**CIVILMART GROUP** Pre-cast reinforced concrete DN1200 and DN1500 As per Icon Water standard drawings DN600 access covers (Class B and Class D) to Icon Water standard drawings	No WSAA appraisal
2	Premier Precast	Brand: Material: Sizes: Configurations: Ancillaries:	**PREMIER PRECAST** Pre-cast reinforced concrete DN1200 and DN1500 As per Icon Water standard drawings DN600 access covers (Class B and Class D) to Icon Water standard drawings	No WSAA appraisal
3	Humes	Brand: Material: Sizes: Configurations: Ancillaries:	**HUMES** Pre-cast reinforced concrete DN1200 and DN1500 As per Icon Water standard drawings DN600 access covers (Class B and Class D) to Icon Water standard drawings	No WSAA appraisal

Limits of Use:

1. All scour chambers shall be in full compliance with WSA-03 (as amended by Icon Water) and the Icon Water suite of standard drawings.

General Notes:

1. Relevant standards and specifications: WSA PS-323 shall be used in lieu of any other applicable WSA product specification currently being available.
2. Icon Water has updated Capital Precast products to Precast Civil Industries Pty Ltd (Civilmart Group) to align with the new ownership structure that was formally communicated to Icon Water with a letter dated 24/05/2024.

2.30 Storage Tanks and Reservoirs – Potable Water Network

There are currently no storage tank manufacturers or suppliers, other than bolted (panel) tank and polyethylene tank suppliers, approved for the potable water network. Manufacturers and suppliers of other tank types are welcome to submit applications for such products to be included in the approved list.

Larger reservoirs will typically be of cast in-situ reinforced concrete construction or welded steel construction (with an appropriate liner) and will be selected via a formal quotation or tender process.

Should a tank or reservoir be required, Icon Water shall provide details specific for the application/project as part of (i) a formal tendering process (for projects directly controlled by Icon Water) or (ii) initial concept level discussions (for "Major Works Complex" gifted assets provided by Developers).

Item	Supplier	Product	Appraisals
Bolted Steel Panel Tanks			
1	Kingspan	Brand: **PERMASTORE and RHINO (COMMERCIAL)** Material/Type: Glass-fused-to-steel (Permastore) Polyethylene lined steel (Rhino Commercial) Sizes: Various Requirements: As per *STD-SPE-S-001* and Icon Water project specific documentation	No WSAA appraisal
2	Tasman Tank Co.	Brand: **TASMAN** Material/Type: Bolted Galvanised Liner Tank (Series TS600) Bolted Stainless Steel Tank (Series TS700-SS) Fusion Bonded Tank (Series FBE) Sizes: Various Requirements: As per *STD-SPE-S-001* and Icon Water project specific documentation	No WSAA appraisal
3	Hunt Engineering (Tank Industries)	Brand: **TANK INDUSTRIES** Material/Type: Bolted Galvanised Liner Tank (L Series) Sizes: Various Requirements: As per *STD-SPE-S-001* and Icon Water project specific documentation	No WSAA appraisal
4	Pioneer Water Tanks	Brand: **PIONEER** Material/Type: Glass-fused-to-steel Lined steel (Commercial/Industrial Range) Sizes: Various Requirements: As per *STD-SPE-S-001* and Icon Water project specific documentation	No WSAA appraisal
Polyethylene Tanks			
5	Bushmans Industrial	Brand: **BUSHMANS INDUSTRIAL** Material/Type: Polyethylene Sizes: Various Requirements: As per *STD-SPE-S-001* and Icon Water project specific documentation	No WSAA appraisal

Limits of Use:

1. Polyethylene tanks shall only be used as a temporary (e.g. emergency) storage measure.
2. Tanks are to be of "industrial" duty rather than "rural" or "commercial" duty from the above-listed suppliers/manufacturers.

General Notes:

1. Relevant standards and specifications: AS/NZS 4766, AS/NZS 4020.

2.31 Pre-Fabricated Pipe Spools – Potable Water Network

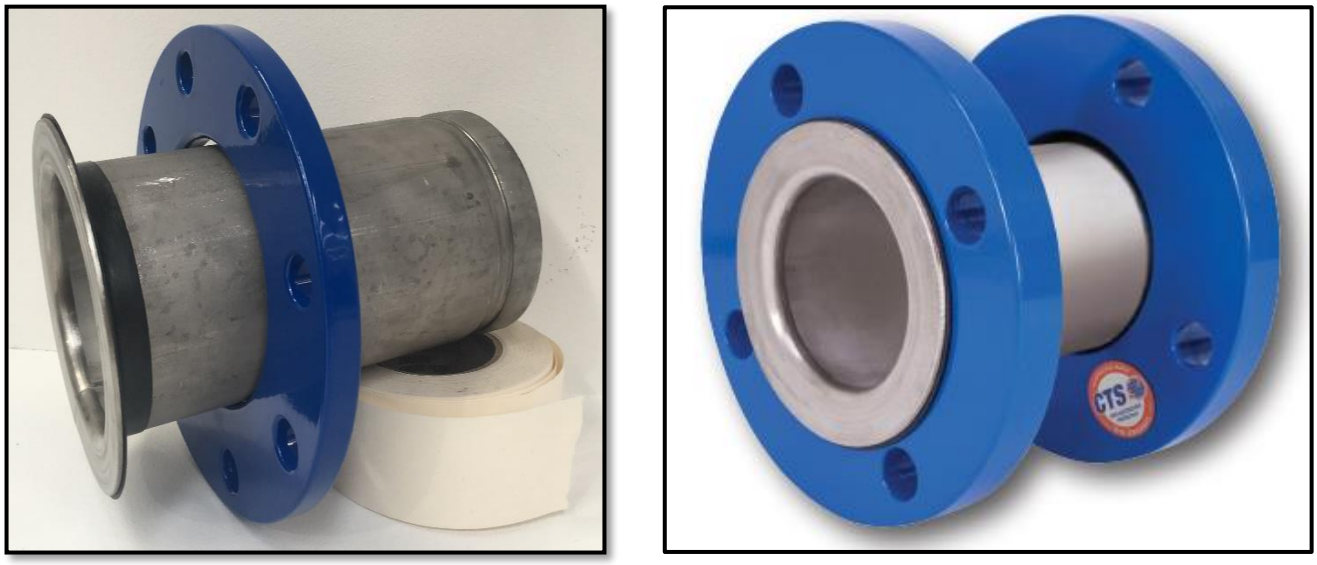
Item	Supplier	Product		Appraisals
1	CTS	Brand: Material: Sizes: Connection: Rating: Model:	**CTS Flanged Pipe Spool** SCHED 10S Stainless Steel 316/316L pipe Powder coated steel flanges with EPDM insulator DN65 – DN200 AS 2129 Table E flanges 1400 kPa Not applicable – fabricated to order	No WSAA appraisal

Limits of Use:

1. Approved for use in pits and enclosures for water meters, fire service lines, RPZDs and pressure reducing valve stations.
2. Stainless steel pipe must be WaterMark approved for use with potable water.
3. Flange bolting to be hot-dipped galvanised property class 4.6.

General Notes:

1. Relevant standards and specifications: AS/NZS 4020.
2. The spools listed above are proprietary products from the listed manufacturer/supplier. Non-proprietary products may continue to be used in accordance with Icon Water's design and construction standards (e.g. flange class DICL, SCHED40S stainless steel 316/316L etc.)



CTS Flanged Pipe Spools – Pre-fabricated
(SS316 SCHED 10S pipe and powder coated carbon steel flanges with EPDM insulators)

2.32 Pressure Gauges – Potable Water Network

Item	Supplier	Product		Appraisals
1	Various	Brand: Material: Sizes: Connection: Rating: Range: Units: Models:	**FLOYD** Stainless steel 63, 100 and 150 3/8” (DN10) and ½” (DN15) BSPT Application specific Application specific Application specific ASG General Purpose PBX Industrial/Heavy-Duty	No WSAA appraisal
2	Various	Brand: Material: Sizes: Connection: Rating: Range: Units: Models:	**WIKA** Stainless steel 100 and 160 ½” (DN15) BSPT Application specific Application specific Application specific 233.30 233.50 433.50 (diaphragm type)	No WSAA appraisal

Limits of Use:

1. All pressure gauges shall be liquid-filled unless noted otherwise on Icon Water’s suite of standard drawings.

General Notes:

1. Relevant standards and specifications: AS 1349

2.33 Chemical Dosing Units – Potable Water Network

Chemical dosing units (CDUs) for the potable water network shall be installed within water pumping stations and reservoir facilities.

The manufacturers/suppliers tabulated below are pre-approved for tendering purposes when CDUs are required to be installed in a dedicated building. It is Icon Water's preference in such instances that the CDU designer/supplier also designs/supplies the CDU building and factory acceptance tests, the installation off-site prior to transporting the complete building (including the CDU) to the site and craning it into position. Designers may nominate other potential suppliers/manufacturers for review and inclusion in the tendering process.

Item	Supplier/Manufacturer	Products/Applications	Appraisals
1	deMaher	Chemical dosing units	N/A
2	Ixom		

Limits of Use:

1. Chemical dosing units shall only be installed in fully secured facilities.
2. The final selection of chemical dosing unit manufacturer/supplier (or whether a chemical dosing unit is required at all) shall be at the discretion of Icon Water.

General Notes:

1. Relevant standards and specifications: No relevant standards or specifications.

2.34 Ventilation – Water Service Reservoir

Item	Supplier	Product		Appraisals
1	Airocle	Brand: Material: Type: Operation: Models: Sizes:	**AIROCLE 4 SERIES RIDGE AND SLOPE VENTILATOR** Aluminimum 5005H34 or Colorbond Ultra Natural ridge (RV) and slope (SV) ventilator Static 4RV/SV.1530, 4RV/SV.2030, 4RV/SV.3030 1500 mm (W) x 3000 mm (L), 2000 mm (W) x 3000 mm (L) and 3000 mm (W) x 3000 mm (L)	No WSAA appraisal

Limits of Use:

1. Airocle 4 Series RV and SV ventilators shall only be designed for installation at newly installed reservoir roofs, either as part of Icon Water roof replacement program or newly built reservoir. The supporting purlin design must be discussed with the manufacturer before finalising the design.
2. The product shall be used with an aperture mesh size of 4.18 mm. A written approval from the Technical Authority will be required where the mesh size exceeds this limit.
3. Icon Water requires a ventilation assessment and sizing to be carried out as part of the design process determining the appropriate dimensions for both the exhaust and inlet vents.
4. Dissimilar metals shall not be specified when selecting ventilation materials.
5. The installation shall follow the “Airocle 4 Series High Capacity Installation Instructions”.

Airocle 4 Series roof ventilator (Source: Airocle)

2.35 Water Sub-meter Box Kit for Inground Installation – Potable Water Network

Item	Supplier	Product		Appraisals
1	All Valve	Brand: Sizes: Connections: Rating: Models:	**All Valve Industries** DN20 BSP x flat face meter union PN16 AVMB-2BSP-IW AWMB-2BSP-IW/BP (with spool)	No WSAA appraisal
All Valve sub-meter inground box kit comprises of three main components				
1.1	All Valve	Product: Brand: Sizes: Material: Connections: Rating: Models:	**Ball Valve** **Airaga** DN20 Brass BSP x flat face meter union PN16 019400506R1	WSAA PA 1927
1.2	All Valve	Product: Brand: Sizes: Material: Connections: Rating: Models:	**Meter Box** **Draper** DN20 (445L * 288W * 320D) High Density Polyethylene N/A Class A AVMB-DRA/20/1	No WSAA appraisal
1.3	All Valve	Product: Brand: Sizes: Material: Rating: Models:	**Meter Spacer** **Thomas Gooden Foundry** DN20 Copper PN16 BP20S-H6	No WSAA appraisal
Item	**Supplier**	**Product**		**Appraisals**
2	Strongcast	Brand: Sizes: Connections: Rating: Models:	**Strongcast** DN20 BSP Male – female nut to suit standard domestic water meter PN16 SCMB2BSP SCMB2BSP/S (with spool)	No WSAA appraisal
Strongcast sub-meter inground box kit comprises of three main components				
2.1	Strongcast	Product: Brand: Sizes: Material: Connections: Rating: Models:	**Ball Valve** **Strongcast** DN20 Brass BSP Male – female nut to suit standard domestic water meter PN16 QC9746	WSAA PA 2024
2.2	Strongcast	Product: Brand: Sizes: Material: Connections: Rating: Models:	**Meter Box** **Strongcast** DN20 (427L * 267W * 316D) High Density Polyethylene N/A Class A SCMBL	No WSAA appraisal

Item	Supplier	Product		Appraisals
2.3	Strongcast	Product: Brand: Sizes: Material: Rating: Models:	**Meter Spacer** **Strongcast** DN20 Composite PN16 SCDN2014TPI	No WSAA appraisal

All Valve DN20 sub-meter box kit for inground installation

Strongcast DN20 sub-meter box kit for inground installation

Typical plastic debris guard

Limits of Use:

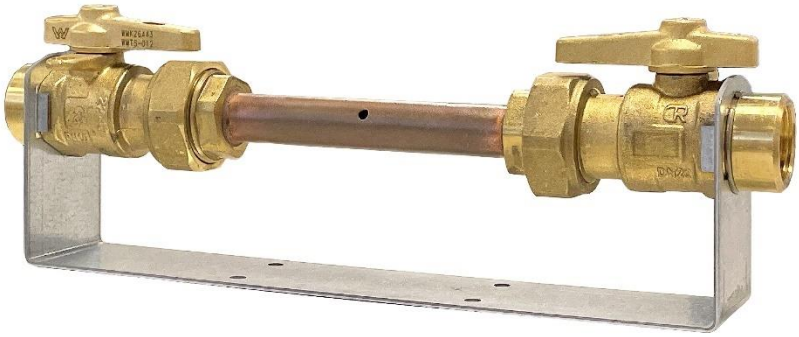
1. The use of plastic threaded components is not allowed within the water network. All threaded components must have a metal-to-metal fit-up.
2. The installation must ensure that ball valve unions are not overtightened. The appropriate tightening is defined as hand tight plus a quarter to a half turn with a spanner. Overtightening can lead to damage of the rubber washer and may result in a noticeable reduction in water service's flow rate. Conversely, not tightening sufficiently can result in leakage. Note that Icon Water is not responsible for any leakage issues downstream of the master meter.
3. For inground installations, the meter box must be supplied with the plastic debris guard. The plastic debris guard must be fitted from the outside of the meter box without the use of any fixings to avoid causing damage to the meter box.

General Notes:

1. Refer to STD-SPE-M-006 Requirements for Property Service Connections and Water Meters for additional information on Icon Water sub-metering requirements.
2. The approval for the ball valves is valid until January 2026 and the ball valve must have lead-free approval from 2026 onwards. The approval will no longer be valid if this certification cannot be provided.

2.36 Water Sub-meter Wall Bracket Kit for Cabinet Installation – Potable Water Network

Item	Supplier	Product		Appraisals
1	All Valve	Brand: Sizes: Connections: Rating: Models:	**All Valve Industries** DN20 BSP x flat face meter union PN16 SMLIMSS-BP	No WSAA appraisal
All Valve sub-meter wall bracket kit comprises of three main components				
1.1	All Valve	Product: Brand: Sizes: Material: Connections: Rating: Models:	**Ball Valve** **Airaga** DN20 Brass BSP x flat face meter union PN16 019400506R1	WSAA PA 1927
1.2	All Valve	Product: Brand: Sizes: Material: Connections: Rating: Models:	**Bracket** **Airaga** Suit DN20 isolation valves Stainless Steel N/A N/A DI01SS/194	No WSAA appraisal
1.3	All Valve	Product: Brand: Sizes: Material: Rating: Models:	**Meter Spacer** **Thomas Gooden Foundry** DN20 Copper PN16 BP20S-H6	No WSAA appraisal
Item	**Supplier**	**Product**		**Appraisals**
2	Strongcast	Brand: Sizes: Connections: Rating: Models:	**Strongcast** DN20 BSP Male – female nut to suit standard domestic water meter PN16 SCMLIM20Q30GF/S	No WSAA appraisal
Strongcast sub-meter wall bracket kit comprises of three main components				
2.1	Strongcast	Product: Brand: Sizes: Material: Connections: Rating: Models:	**Ball Valve** **Strongcast** DN20 Brass BSP Male – female nut to suit standard domestic water meter PN16 QC9746	WSAA PA 2024
2.2	Strongcast	Product: Brand: Sizes: Material: Connections: Rating: Models:	**Bracket** **Strongcast** Suit DN20 isolation valves Stainless Steel / Composite N/A N/A SCMLIM20Q30GF/	No WSAA appraisal
2.3	Strongcast	Product: Brand: Sizes: Material: Rating: Models:	**Meter Spacer** **Strongcast** DN20 Copper PN16 SCDN2014TPI	No WSAA appraisal



All Valve sub-meter wall bracket kit

Strongcast sub-meter wall bracket kit

Limits of Use:

1. The use of plastic threaded components is not allowed within the water network. All threaded components must have a metal-to-metal fit-up.
2. The installation must ensure that ball valve unions are not overtightened. The appropriate tightening is defined as hand tight plus a quarter to a half turn with a spanner. Overtightening can lead to damage of the rubber washer and may result in a noticeable reduction in water service's flow rate. Conversely, not tightening sufficiently can result in leakage. Note that Icon Water is not responsible for any leakage issues downstream of the master meter.

General Notes:

1. Refer to STD-SPE-M-006 Requirements for Property Service Connections and Water Meters for additional information on Icon Water sub-metering requirements.
2. The approval for the ball valves is valid until January 2026 and the ball valve must have lead-free approval from 2026 onwards. The approval will no longer be valid if this certification cannot be provided.

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3 Sewerage Network – Hydraulic Products

The products and materials listed in Section 3 of this APL are approved for use within the sewerage network. This network also includes sewage pumping stations and rising (aka “pressure”) mains.

The primary intent of this section is to provide a list of approved (hydraulic-related) products and materials which can be used for the asset types described within WSA 02 Gravity Sewerage Code of Australia (as amended by Icon Water in STD-SPE-G-011) and within WSA 04 Sewage Pumping Station Code of Australia (as amended by Icon Water in STD-SPE-G-010).

The following applicability table is relevant to the hydraulic-related products and materials listed in Section 3 of this APL:

Asset area	Applicable (Yes/No)	Asset area	Applicable (Yes/No)
Dams (DAM)	No	Water Network (WAT)	No
Bulk Water Supply (BWS)	No	Sewerage Network (SEW)	**Yes**
Water Treatment Plants (WTP)	No	Sewage Pump Stations (SPS)	**Yes**
Water Pump Stations (WPS)	No	Sewage Treatment Plants (STP)	No
Reservoirs (RES)	No	Recycled Water Systems (REC)	No

For non-hydraulic products and materials approved for use within the sewerage network and sewerage pumping stations, refer to Sections 4 of this APL.

3.1 Ductile Iron Cement Lined (DICL) Pressure Pipes – Sewerage Network

Item	Supplier	Product	Appraisals
1	Crevet Iplex Pipelines	Brand: **XINAL 400+** Sizes: DN100 – DN600 Rating: PN35 and Flange Class Joints: SP-SO RRJ and flanged to AS 4087 PN16 Internal Lining: Calcium Aluminate Cement (CAC) External Coating: Zinc with two part epoxy finish coat	WSAA PA 1611 Issue 2
2	Viadux Reece Civil	Brands: **DIMAX TYTONXTREME Z+** Sizes: DN100 – DN750 Rating: PN35 and FLCL (Flange Class) Joints: SP-SO RRJ and Flanged to AS4087 PN16 Internal Lining: Calcium Aluminate Cement (CAC) External Coating: Zn/Al with two part epoxy finishing coat	WSAA PA 1920
3	Clover	Brand: **PAM INTEGRAL ZINALIUM** Sizes: DN100 – DN600 Rating: PN3 and FLCL (Flange Class) Joints: SP-SO RRJ and flanged to AS 4087 PN16 Internal Lining: High Alumina Cement (HAC) External Coating: Zn/Al with resin finish coat	WSAA PA 1418
4	Crevet Iplex Pipelines	Brand: **IRONTITE** (formerly known as "**Jindal SAW**") Sizes: DN100 – DN600 Rating: PN35 and Flange Class Joints: SP-SO RRJ Internal Lining: Calcium Aluminate Cement (CAC) External Coating: Zn/Al with red epoxy finish coat	WSAA PA 1802
5	Vinidex	Brand: **ZAP-HAC** Sizes: DN100 – DN750 Rating: PN35 and Flange Class Joints: SP-SO RRJ and flanged to AS 4087 PN16 Internal Lining: High Alumina Cement (HAC) External Coating: Zn/Al with blue epoxy finish coat	WSAA PA 1605

Limits of Use:

1. DN200 and DN250 sized pipes are not accepted by Icon Water for use within the sewerage network.
2. Polyethylene sleeving is not required for pipes with a Zn/Al external coating in-conjunction with an epoxy or synthetic resin finish coat if the soil resistivity along the pipeline alignment is greater than 500 Ohms.cm. If sleeving is required, only manufacturers/suppliers from the table above must be sourced from and the sleeving must be coloured cream.
3. AS 4087 PN16 flanges shall incorporate 3.0 mm EPDM gaskets (to WSA-109) and stainless steel 316 bolts and nuts which have threads lubricated at the time of installation using an approved Nickel-based anti-seize compound. Alternatively, Molybdenum-coated nuts shall be used.
4. DICL shall not be used for gravity sewerage network.

General Notes:

1. Epoxy or resin finish coats are the approved external over-coating option.
2. Relevant standards and specifications: AS/NZS 2280 and WSA PS-200.

3.2 Ductile Iron (DI) Fittings – Sewerage Network

Item	Supplier	Product		Appraisals
1	Crevet Iplex Pipelines	Brands: Sizes: Rating: Joints: Coating: Types:	**CREVET (PN16 & PN35)** **CREVET SL (PN20)** & **NIBF (PN16)** DN80 – DN600 PN16, PN20 and PN35 RRJ and flanged to AS 4087 PN16 Thermal bonded polymeric coating or fusion bonded epoxy coating Bends, tees, connectors, tapers, crosses, wyes, bell-mouths, collars caps and blank flanges	WSAA PA 1611
2	Viadux Reece Civil	Brands: Sizes: Rating: Joints: Coating: Types:	**SUREFLOW** DN80 – DN600 PN16 and PN35 RRJ and flanged to AS 4087 PN16 Thermal bonded polymeric coating or fusion bonded epoxy coating Bends, tees, connectors, tapers, crosses, wyes, bell-mouths, collars caps and blank flanges	WSAA PA 1016
3	Vinidex	Brands: Sizes: Rating: Joints: Coating: Types:	**SUPERLINK** and **SUPERLINK II** DN100 – DN150 PN16 and PN35 RRJ and flanged to AS 4087 PN16 Thermal bonded polymeric coating or fusion bonded epoxy coating Bends, tees, tapers, connectors and end caps	WSAA PA 06/11
4	Derwent International	Brands: Sizes: Rating: Joints: Coating: Types:	**DERWENT (TAS)** DN80 – DN600 PN16 and PN35 RRJ and flanged to AS 4087 PN16 Thermal bonded Rilsan/Nylon 11 Bends, tees, connectors, tapers, crosses, wyes, bell-mouths, collars caps and blank flanges	WSAA PA 10/03
5	Clover	Brands: Sizes: Rating: Joints: Coating: Types:	**GALVIN "TRADITIONAL"** **GALVIN "LIGHTWEIGHT"** DN80 – DN300 PN16 RRJ and flanged to AS 4087 PN16 Fusion bonded epoxy coating Bends, tees, connectors and tapers	WSAA PA 1403
6	Hygrade Water	Brands: Sizes: Rating: Joints: Coating: Types:	**GILLIES METALTECH "TRADITIONAL"** **GILLIES METALTECH "LIGHTWEIGHT"** DN80 – DN150 PN16 RRJ and flanged to AS 4087 PN16 Thermal bonded polymeric coating Bends, tees, connectors, tapers and hydrant risers	WSAA PA 1431

Item	Supplier	Product		Appraisals
7	DAEMCO Reece Civil Viadux Iplex Pipelines	Brands: Sizes: Rating: Joints: Coating: Types:	**DAEMCO (PN16 & PN35)** DN80 – DN375 PN16 and PN35 RRJ and flanged to AS 4087 PN16 Thermal bonded polymeric coating Bends, tees, connectors, tapers and hydrant risers	WSAA PA 1805
8	AVK	Brand: Sizes: Rating: Joints: Coating: Types:	**AVK** DN80 – DN750 PN16 and PN35 RRJ and flanged to AS 4087 PN16 and PN35 Thermal bonded polymeric coating or fusion bonded epoxy coating Bends, tees, connectors, tapers, crosses, wyes, bell-mouths, caps, hydrant risers and blank flanges	WSAA PA 2204
9	Clover	Brands: Sizes: Rating: Joints: Coating: Types:	**CLOVER** DN80 – DN150 PN16 RRJ and flanged to AS 4087 PN16 Thermal bonded polymeric coating Bends, tees, connectors (excludes pre-tapped connectors), hydrant risers, flushing bends.	WSAA PA 1727

Limits of Use:

1. AS 4087 PN16 flanges shall incorporate 3.0 mm EPDM gaskets (to WSA-109) and stainless steel Grade 316 bolts and nuts which have threads lubricated at the time of installation using an approved Nickel-based anti-seize compound. Alternatively, Molybdenum-coated stainless steel nuts shall be used.
2. For ductile iron elastomeric fittings, the maximum allowable joint deflection must be limited to 4 degrees for sizes ranging DN100 - DN300, 3 degrees for DN375 and 1.5 degrees for sizes larger than DN375. These limits must be adhered to ensure the integrity of the joints within the sewer network system.

General Notes:

1. Internal calcium aluminate cement mortar internal linings to AS/NZS 2280 provided by the above-listed manufacturers are acceptable in lieu of thermal bonded polymeric coatings.
2. Relevant standards and specifications: AS/NZS 2280 and WSA PS-201.

3.3 PVC-U Non-Pressure (DWV) Pipes – Sewerage Network

Item	Supplier	Product		Appraisals
1	Iplex Pipelines	Brand: Material: Sizes: Rating: Joints:	**IPLEX PVC-U DWV** PVC-U DN100 – DN375 SN10 (for DN100) SN8 (for DN150 – DN375) SCJ (DN100 – DN300) RRJ (DN150 – DN375)	WSAA PA 1625
2	Vinidex	Brand: Material: Sizes: Rating: Joints:	**VINIDEX DWV SEWER PIPE RRJ** **VINIDEX DWV SEWER PIPE SCJ** PVC-U DN100 – DN375 SN10 (for DN100) SN8 (for DN150 – DN300) SCJ (DN150 – DN300) RRJ (DN150 – DN300)	No WSAA appraisal
3	Viadux	Brand: Material: Sizes: Rating: Joints:	**PLASPIPE DWV PIPE SYSTEMS** PVC-U DN100 – DN375 SN10 (for DN100) SN8 (for DN150 – DN300) SCJ (DN100 – DN300) RRJ (DN150 – DN375)	No WSAA appraisal
4	Pipemakers	Brand: Material: Sizes: Rating: Joints:	**PIPEMAKERS PVC-U DWV** PVC-U DN100 – DN375 SN10 (for DN100) SN8 (for DN150 – DN375) SCJ (DN100 – DN225) RRJ (DN150 – DN300)	WSAA PA 11/03
5	Pipe King Reece Civil Sthn Plumbing Plus	Brand: Material: Sizes: Rating: Joints:	**PIPE KING PVC-U DWV** PVC-U DN100 – DN225 SN10 (for DN100) SN8 (for DN150 – DN225) SCJ (DN100, 150 and DN225) RRJ (DN150 and DN225)	WSAA PA 1522

Limits of Use:

1. DN200 and DN250 sized pipes are not accepted by Icon Water for use within the sewerage network. DN150 is the minimum allowable size for gravity sewer mains.
2. Only approved PVC-U DWV fittings shall be used for bends and tees etc.
3. PVC-U DWV shall not be used (i) for pressure applications such as sewage pump station rising mains (ii) where extreme ground movements are predicted (iii) where organic solvents are present in the surrounding soil, or (iv) within, nor up to 1 km downstream of industrial areas or hospitals.
4. Only solvent cement from the above-nominated suppliers shall be used.
5. Purchased lengths shall be 3.0 metres for all applications with the exception of DN100 SN10 SCJ sewer ties where 6.0 metre lengths are acceptable.

General Notes:

1. Relevant standards and specifications: WSA PS-230 and AS/NZS 1260.

3.4 PVC-U Non-Pressure (DWV) Fittings – Sewerage Network

Item	Supplier	Product		Appraisals
1	Iplex Pipelines	Brand: Material: Sizes: Rating: Joints:	**IPLEX PVC-U DWV FITTINGS** PVC-U DN100 – DN375 SN8 minimum SCJ (DN100 – DN300) RRJ (DN150 – DN375)	WSAA PA 1625
2	Vinidex	Brand: Material: Sizes: Rating: Joints:	**VINIDEX DWV SEWER FITTINGS RRJ** **VINIDEX DWV SEWER FITTINGS SCJ** PVC-U DN100 – DN300 SN8 minimum SCJ (DN150 – DN300) RRJ (DN150 – DN300)	No WSAA appraisal
3	Viadux	Brand: Material: Sizes: Rating: Joints:	**PLASPIPE DWV PIPE SYSTEMS** PVC-U DN100 – DN375 SN8 minimum SCJ (DN100 – DN300) RRJ (DN150 – DN375)	No WSAA appraisal
4	Viadux	Brand: Material: Sizes: Rating: Joints:	**FABFIT (HOLMAN)** PVC-U DN100 – DN375 SN6 (moulded); SN8 (fabricated) Fabricated (DN100 – DN375): SCJ Fabricated (DN100 – DN375): RRJ Moulded (DN150 – DN300): SCJ	WSAA PA 1301
5	Pipemakers Clover Pipelines	Brand: Material: Sizes: Rating: Joints:	**PIPEMAKERS PVC-U DWV FITTINGS** PVC-U DN100 – DN300 SN8 minimum SCJ (DN100 – DN300) RRJ (DN150 – DN375)	WSAA PA 11/03
6	Pipe King Reece Civil Sthn Plumbing Plus	Brand: Material: Sizes: Rating: Joints:	**PIPE KING PVC-U DWV FITTINGS** PVC-U DN100 – DN225 SN6 minimum SCJ (DN100, 150 – DN225) RRJ (DN150 and DN225)	WSAA PA 1522
7	Plastec	Brand: Material: Sizes: Joints:	**PLASTEC FLEXITEC** PVC-U (AS1260) DN100 – DN225 SWJ	WaterMark approval 23289
8	Plastec	Brand: Material: Sizes: Rating: Joints:	**PLASTEC HEAVY DUTY DWV RANGE** PVC-U DWV DN100 – DN150 SN8 minimum SWJ	WSAA PA 1404

Limits of Use:

1. DN200 and DN250 sized pipes are not accepted by Icon Water for use within the sewerage network.
2. PVC-U DWV shall not be used (i) for pressure applications such as sewage pump station rising mains (ii) where extreme ground movements are predicted (iii) where organic solvents are present in the surrounding soil, or (iv) within, nor up to 1 km downstream of industrial areas or hospitals.
3. All PVC-U DWV pipes laid on horizontal or vertical curvatures shall be solvent welded (i.e. SCJ).

4. It is preferred that heavy duty PVC-U fittings are used for junctions, connections of jump-ups, and bends located at the bottom of the jump-ups. This also applies to external drop manhole connections given observed failures in these areas with unreinforced PVC fittings.

General Notes:

1. Relevant standards and specifications: WSA PS-230 and AS/NZS 1260.

3.5 Polyethylene (PE) Pressure Pipes – Sewerage Network

Item	Supplier	Product		Appraisals
1	Poly Pipe	Brand: Material: Sizes: Rating: Joints:	**POLY PIPE** PE100 DN125, 180, 280, 355, 400 and 450 PN16 (SDR 11) Butt weld, electrofusion coupler, approved mechanical coupling or butt-weld/electrofusion stub for flanging to AS 4087 PN16 with a loose backing ring flange.	WSAA PA 8/12
2	Iplex Pipelines	Brand: Material: Sizes: Rating: Joints:	**POLIPLEX and MILLENIUM** PE100 DN125, 180, 280, 355, 400 and 450 PN16 (SDR 11) Butt weld, electrofusion coupler, approved mechanical coupling or butt-weld/electrofusion stub for flanging to AS 4087 PN16 with a loose backing ring flange.	WSAA PA 1610 (for Millennium)
3	Vinidex	Brand: Material: Sizes: Rating: Joints:	**VINIDEX** PE100 DN125, 180, 280, 355, 400 and 450 PN16 (SDR 11) Butt weld, electrofusion coupler, approved mechanical coupling or butt-weld/electrofusion stub for flanging to AS 4087 PN16 with a loose backing ring flange.	No current WSAA appraisal
4	Enviropipes	Brand: Material: Sizes: Rating: Joints:	**ENVIROPRESSURE** PE100 DN125, 180, 280, 355, 400 and 450 PN16 (SDR 11) Butt weld, electrofusion coupler, approved mechanical coupling or butt-weld/electrofusion stub for flanging to AS 4087 PN16 with a loose backing ring flange.	WSAA PA 1310
5	Reece Civil Hygrade Water Tradelink	Brand: Material: Sizes: Rating: Joints:	**CROMFORD PIPE "IDENTI-PIPE"** PE100 DN125, 180, 280, 355, 400 and 450 PN16 (SDR 11) Butt weld, electrofusion coupler, approved mechanical coupling or butt-weld/electrofusion stub for flanging to AS 4087 PN16 with a loose backing ring flange.	WSAA PA 14/29
6	Pipe Couplings Australasia (PCA)	Brand: Material: Sizes: Rating: Joints:	**PCA** PE100 DN125 and 180 PN16 (SDR 11) Butt weld, electrofusion coupler, approved mechanical coupling or butt-weld/electrofusion stub for flanging to AS 4087 PN16 with a loose backing ring flange.	WSAA PA 2305

Limits of Use:

1. Polyethylene pressure pipe and fittings shall not be used for sewerage applications without the additional written approval of the Icon Water Technical Authority. Should written approval be granted, only Icon Water approved constructors (i.e. polyethylene welders) shall be used for pipeline construction.
2. “Cream” coloured stripes on black or a co-extruded “cream” outer sheath or solid “cream” shall be used to indicate sewerage applications.
3. AS 4087 PN16 flanges shall be of the loose backing ring type, of stainless steel 316 construction and incorporate 3.0 mm EPDM gaskets (to WSA-109) and stainless steel 316 bolts and nuts which have threads lubricated at the time of installation using an approved Nickel-based anti-seize compound. Alternatively, Molybdenum-coated stainless steel nuts be used.
4. Butt-fusion welding shall be used as the default joining method. The internal weld bead shall be removed for sewage applications.

General Notes:

1. PE pipe dimensions are Series 1 to AS/NZS 4130.
2. Relevant standards and specifications: WSA PS-207, WSA PS-215, and AS/NZS 4130.
3. Polyethylene is incompatible with hydrocarbons and other contaminants found within industrial areas. Soil sampling may be a requirement prior to written approval being obtained from Icon Water for the use of polyethylene pipes and fittings for a particular application.
4. PN8 (SDR21) may be used for sewer renewals projects undertaken by constructors who are contracted directly to Icon Water if specifically stated on the project specific design documentation package otherwise the use of polyethylene (PE100) within the sewerage system shall be limited to the construction of rising mains and shall have a minimum rating of PN16 (SDR 11).

3.6 Polyethylene (PE) Fittings – Sewerage Network

Item	Supplier	Product		Appraisals
1	Iplex Pipelines	Brand: Material: Sizes: Rating: Joints:	**GEORG FISCHER ELGEF** PE100 DN125, 180, 280 and 355 PN16 (SDR 11) Electrofusion	WSAA PA 05/06.4
2	Vinidex	Brand: Material: Sizes: Rating: Joints:	**NTG PLASTIK** PE100 DN125, 180, 280, 355, 400 and 450 PN16 (SDR 11) Butt weld or electrofusion	WSAA PA 1525
3	Enviropipes	Brand: Material: Sizes: Rating: Joints:	**ENVIROPIPES** PE100 DN125, 180, 280, 355, 400 and 450 PN16 (SDR 11) Butt weld or electrofusion	No current WSAA appraisal

Limits of Use:

1. Polyethylene pressure pipe and fittings shall not be used for sewerage applications without the additional written approval of the Icon Water Technical Authority. Should written approval be granted, only Icon Water approved constructors (i.e. polyethylene welders) shall be used for pipeline construction.
2. Flanged DI or DICL fittings may be used in lieu of butt-welded or electrofusion coupled polyethylene fittings.
3. AS 4087 PN16 flanges shall be of the loose backing ring type, of stainless steel 316 construction and incorporate 3.0 mm EPDM gaskets (to WSA-109) and stainless steel 316 Grade 50 bolts and nuts which have threads lubricated at the time of installation using a Nickel-based anti-seize compound. Alternatively, Molybdenum-coated stainless steel nuts be used.

General Notes:

1. Relevant standards and specifications: WSA PS-208 and AS/NZS 4129.
2. Polyethylene is incompatible with hydrocarbons and other contaminants found within industrial areas. Soil sampling may be a requirement prior to written approval being obtained from Icon Water for the use of polyethylene pipes and fittings for a particular application.

3.7 Restrained DI Fittings for Polyethylene (PE) Pipes – Sewerage Network

Item	Supplier	Product		Appraisals
1	Hygrade Water	Brand: Material: Size: Type: Rating: Models:	**HAWLE SYSTEMS 2000** Epoxy powder coated Ductile Iron DN63 – DN355 Fully restrained for PE PN16 Hawle Systems 2000 Fittings comprising: - Straight Coupling – Restrained - Long Radius Bend – Restrained - Tee (Flanged Take-Off) – Restrained - Tee (Coupling Take-Off) – Restrained - Flange Adaptor – Restrained - Wash-Out Bend (Flanged) - Restrained	WSAA Appraisal 2304
2	Daemco	Brand: Material: Size: Type: Rating: Models:	**XCEL** FBE coated Ductile Iron DN63 – DN315 Fully restrained for PE PN16 XCEL Fittings comprising: - Straight Coupling – Restrained - Flange Adaptor - Restrained	WSAA PA 1624
3	Reece Civil	Brand: Material: Size: Type: Rating: Model:	**VICTAULIC "REFUSE TO FUSE"** FBE coated Ductile Iron body SS316 gripping rings EPDM elastomers Fasteners zinc electroplated with fluoropolymer over-coat (Xylan 1424) Weathered steel (hardened) washers DN63 - DN180 Fully restrained for PE PN16 Victaulic Style 905	WSAA PA 1706

Limits of Use:

1. Polyethylene pressure pipe shall not be used for sewerage applications without the additional written approval of the Icon Water Technical Authority.
2. Hawle Systems 2000 couplings, Daemco Xcel couplings and Victaulic "Refuse to Fuse" couplings shall only be installed on polyethylene pipes used for rising (pressure) main applications within the sewerage network.
3. Mechanical couplings shall not be used for new construction unless specifically shown on Icon Water's standard drawings.
4. Hawle Systems 2000 valves are not approved for use. All valves in the sewerage network shall be flanged-flanged connections.
5. Restrained ductile iron fittings for polyethylene pipes is suitable for SDR13.6 PE and SDR11 PE and this joint does not allow for any deflection.

General Notes:

1. Relevant standards and specifications: WSA PS-245, EN 12842 and AS/NZS 4020.

3.8 Vitrified Clay (VC) Pipe – Sewerage Network

Item	Supplier	Product		Appraisals
1	Leap Australasia	Brand: Sizes: Rating: Joints:	**HEPWORTH SUPERSLEVE** DN100, 150, 225 and 300 PN6 Coupling	WSAA PA 98/8

Limits of Use:

1. For non-pressure sewerage applications only.
2. DN150 is the minimum allowable size for gravity sewer mains.

General Notes:

1. VC pipe and fittings shall only be specified for industrial areas or for contaminated ground conditions where PVC-U is incompatible.
2. Relevant standards and specifications: AS 1741 (or EN 295 in lieu of AS 1741) and WSA PS-231.

3.9 Vitrified Clay (VC) Fittings – Sewerage Network

Item	Supplier	Product		Appraisals
1	Leap Australasia	Brand: Sizes: Rating: Joints: Types:	**HEPWORTH** DN100, 150, 225 and 300 PN6 Coupling Bends, junctions, plugs and tapers	WSAA PA 98/8

Limits of Use:

1. For non-pressure sewerage applications only.

General Notes:

1. VC pipe and fittings are typically specified for industrial areas or for contaminated ground conditions where PVC-U may be incompatible.
2. Relevant standards and specifications: AS 1741 (or EN 295 in lieu of AS 1741) and WSA PS-231.

3.10 Polypropylene (Corrugated) Non-Pressure Pipe – Sewerage Network

Item	Supplier	Product		Appraisals
1	Vinidex	Brand: Sizes: Rating: Joints:	**SEWERPRO** DN150 – DN600 SN8 minimum SP-SO (RRJ)	WSAA PA 1506
2	Iplex Pipelines	Brand: Sizes: Rating: Joints:	**SEWERMAX** DN225 – DN600 SN10 SP-SO (RRJ)	WSAA PA 03/05

Limits of Use:

1. For non-pressure sewerage applications only.
2. DN200 and DN250 sized pipes are not accepted by Icon Water for use within the sewerage network.
3. Vinidex SEWERPRO for use only with the Vinidex PRO range of fittings.
4. Iplex SEWERMAX for use only with the Iplex range of SEWERMAX fittings.
5. Pipe exterior shall be coloured either grey or black; pipe interior shall be coloured either white or cream.
6. DN150 is the minimum allowable size for gravity sewer mains.

General Notes:

1. Relevant standards and specifications: AS/NZS 5065 and WSA PS-240.

3.11 Polypropylene Non-Pressure Pipe Fittings – Sewerage Network

Item	Supplier	Product	Appraisals
1	Vinidex	Brand: **PRO** Sizes: DN150 – DN600 Rating: SN8 minimum Mat'l: PP or PVC Joints: RRJ Types: Couplings, junctions, tees, bends, caps and shorts	No current WSAA appraisal
2	Iplex Pipelines	Brand: **SEWERMAX** Sizes: DN225 – DN600 Rating: SN10 Mat'l: GRP, PVC and Stainless Steel Joints: RRJ Types: Couplings, junctions, tees, bends, caps, shorts, adapters and clamps	No current WSAA appraisal

Limits of Use:

1. For non-pressure sewerage applications only.
2. DN200 and DN250 sized pipes are not accepted by Icon Water for use within the sewerage network.
3. Vinidex PRO fittings are only for use with the Vinidex SEWERPRO range of polypropylene (profile wall) non-pressure pipe.
4. Iplex SEWERMAX fittings are only for use with the Iplex SEWERMAX range of polypropylene (profile wall) non-pressure pipe.

General Notes:

1. Relevant standards and specifications: AS/NZS 5065 and WSA PS-240.

3.12 Glass Reinforced Plastics (GRP) Pipes – Sewerage Network

Item	Supplier	Product		Appraisals
1	Reece Civil	Brand: Material: Sizes: Rating: Joints:	**HOBAS SEWERLINE** **HOBAS CC-GRP JACKING PIPE** GRP (centrifugally cast) DN300 – DN675 SN 10000 minimum for non-pressure PN16 minimum for rising mains Coupling or flanged to AS 4087 PN16	WSAA PA 1014 Part 3 (for jacking pipe)
2	RPC Pipe Systems Iplex Pipelines	Brand: Material: Sizes: Rating: Joints:	**FLOWTITE** **FLOWTITE JACKING PIPE** GRP (filament wound) DN300 – DN675 SN 10000 minimum for non-pressure PN16 minimum for rising mains Coupling or flanged to AS 4087 PN16	WSAA PA 1211 WSAA PA 1322 for jacking pipe
3	Clover	Brand: Material: Sizes: Rating: Joints:	**SUPERLIT FW GRP PIPE** **SUPERLIT FW GRP JACKING PIPE** GRP (filament wound) DN300 – DN675 SN 10000 minimum for non-pressure PN16 minimum for rising mains Coupling or flanged to AS 4087 PN16	WSAA PA 1420 WSAA PA 1816 for jacking pipe

Limits of Use:

1. GRP pipe and fittings shall not be used for sewerage applications without the written approval of Icon Water.
2. SN and PN ratings to be application specific and equal to or higher than the minimum values shown above.
3. AS 4087 PN16 flanges shall be of the loose backing ring type, of stainless steel 316 construction and incorporate 3.0 mm EPDM gaskets (to WSA-109) and stainless steel 316 bolts and nuts which have threads lubricated at the time of installation using an approved Nickel-based anti-seize compound. Alternatively, Molybdenum-coated stainless steel nuts be used.
4. DN150 is the minimum allowable size for gravity sewer mains.

General Notes:

1. Relevant standards and specifications: WSA PS-205S, WSA PS-237S and AS 3571.1.

3.13 Glass Reinforced Plastics (GRP) Fittings – Sewerage Network

Item	Supplier	Product		Appraisals
1	Global Pipe	Brand: Material: Sizes: Rating: Joints: Types:	**HOBAS SEWERLINE** **HOBAS CC-GRP JACKING PIPE** PE100 DN300 – DN675 SN 10000 minimum for non-pressure pipes PN16 minimum for rising mains Coupling or flanged to AS 4087 PN16 Bends, tees, wyes, saddles, reducers, blinds chamber connections and structural adapters	WSAA PA 1014 Part 3 (for HOBAS jacking pipe)
2	RPC Pipe Systems Iplex Pipelines	Brand: Material: Sizes: Rating: Joints: Types:	**FLOWTITE** **FLOWTITE JACKING PIPE** GRP (filament wound) DN300 – DN675 SN 10000 minimum for non-pressure pipes PN16 minimum for rising mains Coupling or flanged to AS 4087 PN16 Bends, tees, wyes, saddles, reducers, blinds and chamber connections	WSAA PA 1211 WSAA PA 1322 for jacking pipe)
3	Clover	Brand: Material: Sizes: Rating: Joints: Types:	**SUPERLIT FW GRP PIPE** **SUPERLIT FW GRP JACKING PIPE** GRP (filament wound) DN300 – DN675 SN 10000 minimum for non-pressure PN16 minimum for rising mains Coupling or flanged to AS 4087 PN16 Bends, tees, wyes, saddles, reducers, blinds and chamber connections	WSAA PA 1420 WSAA PA 1816 for jacking pipe

Limits of Use:

1. GRP pipe and fittings shall not be used for sewerage applications without the written approval of Icon Water.
2. SN and PN ratings to be application specific and equal to or higher than the minimum values shown above.
3. AS 4087 PN16 flanges shall be of the loose backing ring type, of stainless steel 316 construction and incorporate 3.0 mm EPDM gaskets (to WSA-109) and stainless steel 316 bolts and nuts which have threads lubricated at the time of installation using an approved Nickel-based anti-seize compound. Alternatively, Molybdenum-coated stainless steel nuts be used.

General Notes:

1. Relevant standards and specifications: WSA PS-205S, WSA PS-237S and AS 3571.1.

3.14 Resilient Seated Gate Valves – Sewerage Network

Item	Supplier	Product		Appraisals
1	Crevet Iplex AVK	Brand: Sizes: Connections: Rating: Models:	**AVK SERIES 570** DN80 – DN750 Flange-Flange AS 4087 PN16 PN16 Series 570	WSAA PA 1703 Issue 9
2	Challenger Valves & Actuators	Brand: Sizes: Connections: Rating: Models:	**CHALLENGER** DN80 – DN600 Flange-Flange AS 4087 PN16 PN16 RSGV (Stem cap), RSGVC/A-HW (H/wheel)	WSAA PA 06-09
3	Derwent International	Brand: Sizes: Connections: Rating: Models:	**DERWENT INTERNATIONAL** DN50 – DN600 Flange-Flange AS 4087 PN16 PN16 Stem cap, Bypass Valve (DN450 and above)	WSAA PA 1511
4	Hygrade Water	Brand: Sizes: Connections: Rating: Models:	**HAWLE-A and HAWLE-E3** DN80 - DN150 Flange-Flange AS 4087 PN16 PN16 and PN21 Hawle-A (Stem cap, DN80 – DN150) Hawle-E3 (Stem cap, DN100 and DN150)	WSAA PA 1904
5	Daemco	Brand: Sizes: Connections: Rating: Models:	**DAEMCO** DN50 – DN300 Flange-Flange AS 4087 PN16 PN16 Daemco (Stem cap, DN80 – DN300)	WSAA PA 1517
6	Viadux Reece Civil	Brand: Sizes: Connections: Rating: Models:	**SUREFLOW** DN80 – DN600 Flange-Flange AS 4087 PN16 PN16 2570 2570-96 OS&Y (DN80 – DN300)	WSAA PA 1707
7	Viadux Reece Civil	Brand: Sizes: Connections: Rating: Models:	**DIMAX** DN80 – DN300 Flange-Flange AS 4087 PN16 PN16 DIMAX (Stem cap or handwheel) DIMAX OS&Y (Rising stem type)	WSAA PA 1925
8	Clover	Brand: Sizes: Connections: Rating: Models:	**BETTA** DN80 – DN300 Flange-Flange AS 4087 Fig B5 PN16 DN80 – DN300 Flange – Flange with stem	WSAA PA 1121

Limits of Use:

1. Sewerage Network: All gate valves shall be clockwise close and shall have flange-flange connections.
2. Directional arrows indicating the direction of opening/closing shall be shown at the point of operation of all valves. Refer to Icon Water's standard drawings.
3. Resilient seated gate valves shall not be selected for throttling applications or for any application involving high velocity flow or high wear rates where a metal seated valve would be a more appropriate choice (e.g. scouring applications).

4. Extension spindles, hand wheels, gearboxes or electric actuators to be fitted in-conjunction with or in-lieu of stem caps where applicable. The designer shall consider frequency of use, access limitations and actuation torque requirements when selecting such items. Extension spindles must comply with AS 2638.2 and WSA PS-262.
5. For PN25 resilient seated gate valves each instance requires approval from the Technical Authority on a case-by-case basis. This means the specifications and the context of its application must be reviewed.

General Notes:

1. Gate valves are typically installed in sewage pumping stations.
2. Relevant standards and specifications: WSA PS-260, WS PS-262 and AS 2638.2.

3.15 Metal Seated Gate Valves – Sewerage Network

Item	Supplier	Product		Appraisals
1	Viadux	Brand: Sizes: Connections: Rating: Models:	**SUREFLOW** DN100 – DN300 Flange-Flange AS 4087 Fig B5 PN16 2580	WSAA PA 2048
2	AVK AVK Flow Control Iplex/Crevet	Brand: Sizes: Connections: Rating: Models:	**AVK FLOW CONTROL** DN80 – DN300 Flange-Flange AS4087 Fig B5 AS4087 Fig B6 PN16 and PN35 Series 580 (580/90, 580/92 and 580/93)	WSAA2049
3	Dobbie Iplex/Crevet	Brand: Sizes: Connections: Rating: Models:	**DOBBIE** DN80 – DN300 Flange-Flange AS 4087 PN16 PN16 VGM16	No current WSAA appraisal

Limits of Use:

1. Sewerage Network: All gate valves shall be clockwise close and shall have flange-flange connections.
2. Directional arrows indicating the direction of opening/closing shall be shown at the point of operation of all valves. Refer to Icon Water's standard drawings.
3. Extension spindles, hand wheels, gearboxes or electric actuators to be fitted in-conjunction with or in-lieu of stem caps where applicable. The designer shall consider frequency of use, access limitations and actuation torque requirements when selecting such items. Extension spindles must comply with AS 2638.1 and WSA PS-262.
4. Icon Water has experienced failures with metal seated valves and the press fit rings. For valves larger than DN300 the Icon Water Technical Authority must be consulted.

General Notes:

1. Metal seated gate valves are preferred for pressure sewer applications.
2. Relevant standards and specifications: WSA PS-261, WSA PS-262 and AS 2638.1.

3.16 Knife Gate Valves – Sewerage Network

Item	Supplier	Product		Appraisals
1	Challenger	Brand: Sizes: Connections: Rating: Models:	**CHALLENGER KGV SERIES** DN80 – DN600 Lugged AS 4087 PN16 PN10 KGV 99 Resilient Seated Knife Gate Valve	No current WSAA appraisal
2	AVK AVK Flow Control	Brand: Sizes: Connections: Rating: Models:	**ORBINOX BT SERIES 22** DN50 – DN600 Lugged AS 4087 PN16 PN10 Orbinox BT Series 22 Resilient Seated Knife Gate Valve	No WSAA appraisal
3	Ebro Armaturen Pacific	Brand: Sizes: Connections: Rating: Models:	**STAFSJO** DN50 – DN600 Lugged AS 4087 PN16 PN10 WB14 (DI body) WB14E (stainless steel body)	No WSAA appraisal

Limits of Use:

1. Sewerage Network: All knife gate valves shall be clockwise close and shall have flange-flange connections.
2. Directional arrows indicating the direction of opening/closing shall be shown at the point of operation of all valves. Refer to Icon Water's standard drawings.
3. Extension spindles, hand wheels, gearboxes or electric actuators to be fitted in-conjunction with or in-lieu of stem caps where applicable. The designer shall consider frequency of use, access limitations and actuation torque requirements when selecting such items. Extension spindles must comply with AS 2638 and WSA PS-262.

General Notes:

1. Relevant standards and specifications: WSA PS-266, WSA PS-262, and MSS-SP-81.

3.17 Air Valves – Sewerage Network

Item	Supplier	Product		Appraisals
1	Ventomat Australia	Brand: Sizes: Connections: Rating: Models:	**VENTOMAT** DN50 – DN150 DN50: Threaded BSP or flanged ≥DN80: Flanged to AS 4087 PN16 PN16 RGX Series (stainless steel body)	No WSAA appraisal

Limits of Use:

1. Air valves shall be located in sewage pumping stations only and shall not be located within the sewerage network proper without the written permission of Icon Water.

General Notes:

1. Relevant standards and specifications: WSA PS-275 and AS 4883.

3.18 Non-Return Valves – Sewerage Network

Item	Supplier	Product		Appraisals
1	AVK Crevet Iplex	Brand: Sizes: Connections: Rating: Models:	**AVK SERIES 41** DN50 – DN600 Flanged-Flange AS 4087 PN16 PN16 41/25 (Swing check, resilient seat, DN50) 41/82 (Swing check, resilient seat, DN50 – DN300) 41/36 (Swing check, metal seat, DN350 – DN600)	No WSAA appraisal
2	AVK Crevet Iplex	Brand: Sizes: Connections: Rating: Models:	**AVK SERIES 53** DN50 – DN300 Flanged-Flange AS 4087 PN16 PN16 53/50 (Ball check, resilient seat, DN100 – DN300)	No WSAA appraisal
3	Dobbie Crevet Iplex	Brand: Sizes: Connections: Rating: Models:	**DOBBIE** DN80 – DN600 Flange-Flange AS 4087 PN16 PN16 Dobbie metal seated swing check VSCM16	No WSAA appraisal
4	Challenger	Brand: Sizes: Connections: Rating: Models:	**CHALLENGER (KARON)** DN100 – DN375 Flanged-Flange AS 4087 PN16 PN16 RSSC (Swing check, resilient seat, DN100 – DN375)	WSAA PA1513
5	Viadux Reece Civil	Brand: Sizes: Connections: Rating: Models:	**SUREFLOW SWING CHECK** DN100 and DN150 Flanged-Flange AS 4087 PN16 PN16 Swing Check(Swing check, resilient seat, DN100 and DN150)	No WSAA appraisal
6	Metaval	Brand: Sizes: Connections: Rating: Models:	**VAG** DN100 – DN300 Flange-Flange AS 4087 PN16 PN16 RETO-STOP (Rubber-flap type)	No WSAA appraisal
7	No limitation	Brand: Sizes: Connections: Models:	**TIDEFLEX DUCKBILL** DN100 – DN750 Flanged Series 35-1	No WSAA appraisal
8	Viadux Reece Civil	Brand: Sizes: Connections: Rating: Models:	**DIMAX WAFER CHECK VALVE** DN50 – DN300 Flange-Flange AS 4087 PN16 PN16 5306	No WSAA appraisal. WaterMark certified: WM020013

Limits of Use:

1. All swing check valves shall be fitted with a lever and weight attachment unless shown otherwise on Icon Water's standard drawings.
2. Limit/proximity switches shall be fitted to swing check valves where indicated on Icon Water's standard drawings or where requested by Icon Water.
3. Ball check valves (e.g. AVK Series 53) and rubber-flap valves (e.g. VAG RETO-STOP) shall not be used without the written approval of Icon Water. Swing check valves are the default selection.

4. The swing check valve with lever and weight has two options of mounting arrangement (RHS and LHS) which shall be assessed and specified before placing an order.
5. TIDEFLEX DUCKBILL Series 35-1 check valve shall be used in low pressure applications such as wastewater overflow systems. The designer shall consider the minimum pressure required at the upstream for the check valve to open. It is important to ensure the required pressure does not adversely impact the required performance.

General Notes:

1. Relevant standards and specifications: WSA PS-264 and AS 4794.

3.19 Ball Valves – Sewerage Network

Item	Supplier	Product		Appraisals
1	Zetco	Brand: Sizes: Connections: Rating: Model:	**ZETCO WATERMARKED 2-PIECE STAINLESS STEEL BALL VALVE F&F LOCKABLE** DN15 – DN80 Threaded BSP (Parallel) PN40 Series 4400	No WSAA appraisal
2	Prochem	Brand: Sizes: Connections: Rating: Model:	**PROCHEM** DN15 – DN80 Threaded BSP (Parallel) PN20 Full Bore 2-Piece Stainless BSP WOG	No WSAA appraisal
3	Challenger	Brand: Sizes: Connections: Rating: Model:	**CHALLENGER STAINLESS STEEL WATERMARK BALL VALVE** DN15 – DN100 Flange-Flange AS 2129 Table E or Threaded BSP F&F (for sizes ≤ DN80) ANSI Class 150 (equivalent to PN20) SSRV2F (Flanged 2-piece) SSRV2 (Threaded 2-piece)	No WSAA appraisal
4	Challenger	Brand: Sizes: Connections: Rating: Model:	**CHALLENGER STAINLESS STEEL 3 PIECE LEVER HANDLE BALL VALVE** DN15 – DN80 Threaded BSPT F&F 1000 psi (PN70) SS2013N	No WSAA appraisal
5	Reece Civil	Brand: Sizes: Connections: Rating: Model:	**DURA EAGLE WATERMARK CHROME-PLATED DZR BRASS BALL VALVE** DN15 – DN50 Threaded BSP (Parallel) PN20 and PN21 Product Codes: 1003880 through 1003885 Product Codes: 1003690 through 1003695	No WSAA appraisal

Limits of Use:

1. The ball valves detailed above are limited to use within sewage pumping stations, sample points, air valve isolations and similar applications.
2. Threaded valves and pipe connections are limited to a maximum size of DN80 unless written approval is obtained from Icon Water.

General Notes:

1. Relevant standards and specifications: No applicable WSAA product specifications.

3.20 Repair Clamps (for Steel, DI and CI) – Sewerage Network

Item	Supplier	Product		Appraisals
1	Viadux	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Models:	**WANG Tapped Offtake Repair Clamp** 316 stainless steel and Nitrile rubber gasket DN100 – DN400 DN20 – DN50 Threaded (female) BSP branch connection PN16 K2, K3, K4, K5 and K10 model prefixes	No WSAA appraisal
2	Viadux	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Models:	**WANG Flanged Offtake Repair Clamp** 316 stainless steel and Nitrile rubber gasket DN100 – DN450 DN80 – DN300 AS 4087 PN16 branch connection PN16 K8, K10, K14 and K20 model prefixes	No WSAA appraisal
3	Viadux	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Model:	**WANG Stainless Steel Repair Clamp** 316 stainless steel and Nitrile rubber gasket DN50 – DN450 Not applicable – repair to header only Not applicable – repair to header only PN16 K2, K4, K10 model prefixes	No WSAA appraisal
4	AVK	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Models:	**AVK REPAIR CLAMP** 316 stainless steel and Nitrile rubber gasket DN50 – DN450 Not applicable – repair to header only Not applicable – repair to header only PN16 748-90	WSAA PA 1809
5	AVK	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Models:	**AVK REPAIR CLAMP WITH FLANGED OFFTAKE** 316 stainless steel and Nitrile rubber gasket DN100 – DN450 DN80 – DN300 AS 4087 PN16 branch connection PN16 748-91	WSAA PA 1809
6	AVK	Brand: Material: Size - Mains: Size – Branch: Connection: Rating: Models:	**AVK REPAIR CLAMP WITH THREADED OFFTAKE** 316 stainless steel and Nitrile rubber gasket DN100 – DN400 DN20 – DN50 Threaded (female) BSP branch connection PN16 748-92	WSAA PA 1809

Limits of Use:

1. Clamps shall not be rotated after being assembled on the header pipe.
2. The repair clamps listed above are not to be used on polyethylene or PVC-U pipes.
3. Repair clamps are only designed for repairs to existing pipes with minor cracks, holes or splits and are not to be used for large splits, separated pipes, misaligned pipes or for pipe-joining.

General Notes:

1. Relevant standards and specifications: AS 4181.

3.21 Repair Clamps (for PVC-U and PE) – Sewerage Network

Item	Supplier	Product		Appraisals
1	Stauff Corp. Hydraulic Doctors	Brand: Material: Size: Type: Rating: Additional: Models:	**TEEKAY PLASTLOCK COUPLING** 316SS with EPDM gasket DN40 – DN150 Restrained for PE only Up to PN16 (size dependent) c/w 2 x SS inserts per coupling TEEKAY Plastlock Pipe Coupling	No WSAA appraisal
2	Reece Civil	Brand: Material: Size: Type: Rating: Model:	**VICTAULIC "REFUSE TO FUSE"** FBE coated Ductile Iron body SS316 gripping rings EPDM elastomers Fasteners zinc electroplated with fluoropolymer over-coat (Xylan 1424) Weathered steel (hardened) washers DN63 - DN180 Fully restrained for PE PN16 Victaulic Style 905 Coupling	WSAA PA 1706
3	Derwent International	Brand: Material: Size: Type: Rating: Model:	**DERWENT INTERNATIONAL** 316SS with EPDM gasket DN100 DN450 Un-restrained for PVC-U and VC gravity sewers Non-pressure (gravity) sewers only Sewer OB Junction Clamp	No WSAA appraisal

Limits of Use:

1. Teekay Plastlock couplings shall be used as a slip coupling when a section of polyethylene pipe requires cutting out and replacing. Two couplings are required (i.e. one at each end of the new section). Do not use Teekay Plastlock coupling for PVC-U.
2. Do not use Victaulic "Refuse to Fuse" couplings for PVC-U.
3. Sewer OB junction clamps shall not be used on pipe materials other than PVC-U and VC.
4. Refer to the manufacturer's datasheets for pressure ratings (based on size) before purchasing.
5. Repair clamps/couplings shall not be used for new construction unless specifically shown on Icon Water's standard drawings.

General Notes:

1. Relevant standards and specifications: WSA PS-245, EN 12842 and AS/NZS 4020.

3.22 Mechanical Couplings and Dismantling Joints – Sewerage Network

Item	Supplier	Product		Appraisals
Dismantling Joints				
1	Vinidex	Brand: Material: Size: Type: Rating: Models:	**VIKING JOHNSON DISMANTLING JOINTS** Rilsan Nylon 11 coated Ductile Iron DN50 – DN600 Flange-Flange (thrust type) PN16 Viking Johnson 59XXX Series - thrust type (e.g. 59580 = DN80)	No WSAA appraisal
2	Viadux	Brand: Material: Size: Type: Rating: Models:	**SUREFLOW DISMANTLING JOINTS** Polymeric coated Ductile Iron DN100 – DN750 Flange-Flange (thrust type) PN16 Sureflow – thrust type	No WSAA appraisal
3	AVK Flow Control Iplex/Crevet	Brand: Material: Size: Type: Rating: Models:	**AVK DISMANTLING JOINTS** Polymeric coated Ductile Iron DN100 – DN750 Flange-Flange (thrust type) PN16 AVK FD10 and Series 265 – thrust type	No WSAA appraisal
Gibault-style couplings				
4	AVK Crevet Iplex Cadia	Brand: Material: Size: Type: Rating: Models:	**AVK SERIES 601 & 602** Polymeric coated Ductile Iron or 316SS DN100 – DN400 Unrestrained PN16 Series 601 Universal Unrestrained Coupling Series 602 Unrestrained Stepped Coupling	WSAA PA 1502
5	AVK	Brand: Material: Size: Type: Rating: Models:	**AVK FABRICATED STRAIGHT COUPLING SERIES 258** FBE coated Ductile Iron DN300 – DN600 Unrestrained PN16 258/30	No WSAA appraisal
6	Viadux Cadia	Brand: Material: Size: Type: Rating: Models:	**WANG VARIGIB** Polymeric coated DI or 316SS DN80 – DN600 Unrestrained PN16 VariGIB Unrestrained Coupling	No WSAA appraisal
7	Hygrade Water	Brand: Material: Size: Type: Rating: Models:	**HAWLE SYNOFLEX** Epoxy powder coated Ductile Iron DN100 – DN300 Restrained for CI, DI, steel, PVC and PE PN16 Hawle Synoflex Coupling Model 7974 Hawle Synoflex Flanged Adapter Model 7994	WSAA PA 1208
8	Deks Industries	Brand: Material: Size: Type: Rating: Models:	**DEKS FLEXI-GIB GIBAULT** 316SS with DI end rings DN80 – DN600 Unrestrained PN16 DGB Long Series	WSAA PA 12/04

Item	Supplier	Product		Appraisals
9	Derwent Industries	Brand: Material: Size: Type: Rating: Models:	**DERWENT** 316SS with DI end rings DN100 – DN250 Unrestrained, short and long barrel types PN16 DERWENT COUPLING KJC Series	WSAA PA 1908
10	Daemco	Brand: Material: Size: Type: Rating: Models:	**Daemco** Polymeric coated Ductile Iron DN80 – DN150 Short Barrel DN80 – DN600 Long Barrel Unrestrained PN16 Reinoversal Unrestrained Coupling	WSAA PA 1518
Couplings suitable for joining PE pipe (in lieu of butt-fusion welding or electrofusion welding)				
11	Hygrade Water	Brand: Material: Size: Type: Rating: Models:	**HAWLE SYSTEMS 2000** Epoxy powder coated Ductile Iron DN63 – DN355 Fully restrained for use with PE only PN16 Hawle Systems 2000 Straight Coupling	WSAA PA 2304
12	Daemco	Brand: Material: Size: Type: Rating: Models:	**XCEL** FBE coated Ductile Iron DN63 – DN315 Fully restrained for use with PE only PN16 XCEL Straight Coupling	WSAA PA 1624
13	Hygrade Water	Brand: Details:	**HAWLE SYNOFLEX** Refer to Item 7 on previous page.	WSAA PA 1208
14	Stauff Corp. Hydraulic Doctors	Brand: Material: Size: Type: Rating: Additional: Models:	**TEEKAY PLASTLOCK COUPLING** 316SS with EPDM gasket DN40 – DN150 Restrained for PE only Up to PN16 (size dependent) c/w 2 x SS inserts per coupling TEEKAY Plastlock Pipe Coupling	No WSAA appraisal
15	Reece Civil	Brand: Material: Size: Type: Rating: Model:	**VICTAULIC “REFUSE TO FUSE”** FBE coated Ductile Iron body SS316 gripping rings EPDM elastomers Fasteners zinc electroplated with fluoropolymer over-coat (Xylan 1424) Weathered steel (hardened) washers DN63 - DN180 Fully restrained for PE PN16 Victaulic Style 905 Coupling	WSAA PA 1706
Couplings - other				
16	Vinidex	Brand: Material: Size: Type: Rating: Models:	**STRAUB** 316SS with EPDM sealing sleeves DN25 – DN200 Unrestrained and restrained for CI, DI and stainless steel only PN16 STRAUB-FLEX, STRAUB OPEN-FLEX, STRAUB-GRIP L and STRAUB METAL GRIP / GRIP L	No WSAA appraisal

Item	Supplier	Product		Appraisals
17	Stauff Corp. Hydraulic Doctors	Brand: Material: Size: Type: Rating: Models:	**TEEKAY** 316SS with EPDM gasket DN63 – DN150 Unrestrained and restrained for DI, CI, GRP and steel only PN16 AXIFLEX, AXILOCK-S and AXILOCK	No WSAA appraisal
18	No limitation	Brand: Material: Size: Type: Product Code:	**FRENCO SHEAR BANDED COUPLING** EPDM and SS316 DN100 – DN300 Unrestrained for PVC, AC, EW, VC and RC SC150 (OD 125 mm - 150 mm), SC200 (OD 175 mm – 200 mm) SC215 (OD 190 mm – 215 mm)	WSAA PA 1829

Limits of Use:

1. AVK, Deks, Derwent and Wang unrestrained mechanical couplings are only suitable for CI, DI, steel, PVC-U, PVC-M and PVC-O pipes. They shall not be installed on polyethylene pipes.
2. Straub mechanical couplings are only suitable for CI, DI and steel, pipes. They shall not be installed on polyethylene or PVC pipes.
3. Teekay Axiflex, Axilock-S and Axilock mechanical couplings are only suitable for CI, DI, GRP and steel pipes and shall not be installed on polyethylene or PVC pipes.
4. Hawle Systems 2000 couplings, Daemco Xcel couplings, Teekay Plastlock couplings and Victaulic Refuse to Fuse couplings shall only be installed on polyethylene pipes (i.e. network renewals projects or “gifted assets” that have had an additional written approval for polyethylene to be used by the Icon Water Technical Authority).
5. Mechanical couplings shall not be used for new construction unless specifically shown on Icon Water’s standard drawings. Dismantling joints shall be specified for new construction where it is likely that valves will require easier removal for maintenance (e.g. within valve chambers and pump station buildings).
6. Straub-Flex, Straub Open-Flex, Teekay Axilock-S and Teekay Axiflex couplings shall only be installed in conjunction with tie-rods for axial restraint in above-ground installations as shown in the Icon Water suite of standard drawings.
7. For FERNCO SHEAR BANDED COUPLING, the pipe outside diameter shall be confirmed before installation to ensure compatibility. If the difference between the pipe’s outside diameter and the inside of the coupling exceeds 5 mm, a suitable adaptor bush must be utilised for a watertight arrangement. The adaptor bush is available in different thicknesses and a maximum allowable thickness of 24 mm. The installer shall consider the specified torque requirements when tightening the coupling. For the plastic pipe, a smooth outside surface using a 190 mm wide coupling is recommended.
8. Unrestrained couplings may be used for repairs of existing pipework and shall not be used in new installations without written acceptance from Icon Water.

General Notes:

1. Relevant standards and specifications: WSA PS-245, WSA PS-270, WSA PS-284, AS/NZS 4020, AS/NZS 4998 and EN 12842.

3.23 Submersible Sewage Pumps – Sewerage Network

Item	Supplier	Product		Appraisals
1	Xylem	Brand: Models:	**FLYGT N SERIES** Flygt N Series	No WSAA appraisal
2	Xylem	Brand: Models:	**FLYGT CONCERTOR** NP6020 and NP6030	No WSAA appraisal

Limits of Use:

1. Submersible sewage pumps shall only be used in dedicated sewage pumping stations.
2. The final selection of the pump make, model and size shall be at the discretion of Icon Water.
3. Soft starters are the default starting method. The only allowable exceptions to this are when the sewage pump station feeds a process (e.g. sewage treatment plant) that requires flow matching (via VSD) or when the pump motor requires a VSD for efficiency gains and increased diagnostic capability.
4. For submersible duty/standby setups, a Xylem Flygt Type 4901 flush valve shall be installed on one pump.
5. Pump controllers (e.g. Xylem Flygt MAS controller) shall be supplied with each pump as recommended by the manufacturer for the application.
6. The Flygt Concertor series pumps shall include Flygt N-hydraulics and hard iron impeller. A five-year warranty that covers the motor, drive and controller must be provided by the supplier.

General Notes:

1. Relevant standards and specifications: WSA 101, WSA PS 400 and WSA-04 (as amended by Icon Water).

3.24 Packaged Sewage Pumping Stations – Sewerage Network

Icon Water does not currently allow the use of packaged sewage pumping stations and all future pump stations shall be either (i) designed by Icon Water in-house personnel, or (ii) designed by Icon Water Design Panel members.

Until further notice, all sewage pumping stations shall (i) be of reinforced concrete construction (ii) utilise cast in-situ construction techniques for the wet well and emergency storage tank (if required), and (iii) be in full compliance with WSA-04 as amended by Icon Water and any project specific documentation issued by Icon Water.

3.25 Odour Control Units – Sewerage Network

There are currently no odour control unit manufacturers/suppliers or makes/model approved for the sewerage network. Manufacturers and suppliers are welcome to submit applications for such products to be included in the approved list. In the meantime, should odour control units be required, Icon Water shall provide details specific for the application/project as part of a formal tendering process.

3.26 Chemical Dosing Units – Sewerage Network

Chemical dosing units for the sewerage network shall be installed within sewage pumping stations. During the design of a sewage pumping station, the designer shall look at whether chemical dosing is required in the initial stages of the pump station's operation. In all cases, the final selection of whether a chemical dosing unit is required shall be at the discretion of Icon Water based on detailed information from the designer as well as detailed (and fully priced) submissions from each chemical dosing unit manufacturer/supplier.

The manufacturers/suppliers tabulated below are pre-approved for tendering purposes. Designers may nominate other potential suppliers/manufacturers for review and inclusion in the tendering process.

Item	Supplier/Manufacturer	Products/Applications	Appraisals
1	deMaher	Chemical dosing units	N/A
2	Ixom		

Limits of Use:

1. Chemical dosing units shall only be installed in sewage pumping stations or fully secured facilities.
2. The final selection of chemical dosing unit manufacturer/supplier (or whether a chemical dosing unit is required at all) shall be at the discretion of Icon Water.

General Notes:

1. Relevant standards and specifications: No relevant standards or specifications.

3.27 Buried Maintenance Holes – Sewerage Network

Item	Supplier	Product		Appraisals
1	Civilmart Group	Brand: Material: Sizes: Configurations: Ancillaries:	**CIVILMART GROUP** Pre-cast reinforced concrete DN1050, DN1200 and DN1500 As per Icon Water standard drawings DN600 access covers (Class B and Class D) to Icon Water standard drawings	No WSAA appraisal
2	Premier Precast	Brand: Material: Sizes: Configurations: Ancillaries:	**PREMIER PRECAST** Pre-cast reinforced concrete DN1050, DN1200 and DN1500 As per Icon Water standard drawings DN600 access covers (Class B and Class D) to Icon Water standard drawings	No WSAA appraisal
3	Humes	Brand: Material: Sizes: Configurations: Ancillaries:	**HUMES** Pre-cast reinforced concrete DN1200 and DN1500 (Ref: Limits of Use 2) As per Icon Water standard drawings DN600 access covers (Class B and Class D) to Icon Water standard drawings	No WSAA appraisal
4	Viadux Reece	Brand: Material: Sizes: Configurations: Accessories:	**REHAU AWASHAFT** (Limit 3) Polypropylene DN1000 As per Icon Water standard drawings Bearing ring rubber seal 625 mm, Element seal DN1000 type M, Cone DN1000, AWADOCK connection, Base Type M (Socket connection), Flexseal with steel band	WSAA PA 1508

Limits of Use:

1. All buried maintenance holes shall be in full compliance with WSA-02, WSA-03 and WSA-04 (as amended by Icon Water) and the Icon Water suite of standard drawings.
2. Humes DN1050 pre-cast maintenance holes are not accepted by Icon Water.
3. The following conditions will apply to the REHAU AWASHAFT manholes:
    a. The REHAU AWASHAFT shall only be use in non-trafficable areas and the installation must be carried out over existing sewer mains.
    b. The designer shall ensure the approved manhole base is considered in the design process to prevent any deflection outside the manhole eliminating the need for internal drop.
    c. The maximum depth for this manhole shall be limited to 4.5 meters with a minimum installation depth of 1.5 meters.
    d. For installation over existing sewer, specially different pipe materials, Fernco shear banded couplings (SC150, SC200 and SC215) with the appropriate moulded bush shall be considered.
    e. Any external drop shall be connected to the manhole with 150 mm clearance from the joint. External drop shall not be connected on the ladder side and the conical section.
    f. This product is sensitive to depth measurements and accurate measurements and survey must be obtained before ordering parts to ensure proper fit and installation.
    g. The access cover shall be Class B and include concrete surround to ensure stable installation. The cover shall be installed above the finished surface level based on Icon Water standard drawing SD-2204.

General Notes:

1. Relevant standards and specifications: WSA PS-232, AS 3996 and AS 4198.
2. Icon Water has updated Capital Precast products to Precast Civil Industries Pty Ltd (Civilmart Group) to align with the new ownership structure that was formally communicated to Icon Water with a letter dated 24/05/2024.

3.28 Sewer Maintenance Shafts – Sewerage Network

Item	Supplier	Product		Appraisals
1	Amyroo Reece Civil	Brand: Material: Sizes: Configurations:	**AMYROO** PVC-U DN225 riser and DN300 riser As per Icon Water standard drawings including: - Inline - Elbow (up to a max. 45° deflection) - 90° Junction (for DN100 property service connection only)	WSAA PA 0210 and WSAA PA 1610

Limits of Use:

1. Size, configuration and installation details shall be in accordance with Icon Water's standard (SD series) drawings.
2. Installation shall be limited to DN150 and DN225 sewer mains only.
3. Only DN100 property service connections can be made via a 90° junction. Branch sewers are not allowed to be connected to maintenance shafts.

General Notes:

1. Relevant standards and specifications: WSA PS-321 and AS/NZS 4999.

3.29 Pressure Gauges – Sewerage Network

Item	Supplier	Product		Appraisals
1	Various	Brand: Material: Sizes: Connection: Rating: Range: Units: Models:	**FLOYD** Stainless steel 63, 100 and 150 3/8” (DN10) and ½” (DN15) BSPT Application specific Application specific Application specific ASG General Purpose PBX Industrial/Heavy-Duty	No WSAA appraisal
2	Various	Brand: Material: Sizes: Connection: Rating: Range: Units: Models:	**WIKA** Stainless steel 100 and 160 ½” (DN15) BSPT Application specific Application specific Application specific 233.30 233.50 433.50 (diaphragm type)	No WSAA appraisal

Limits of Use:

1. All pressure gauges shall be liquid-filled and be isolated from the fluid using gauge protectors.

General Notes:

1. Relevant standards and specifications: AS 1349.

3.30 Pressure Sewer System – Sewerage Network

Icon Water only accepts pressure sewer systems in the existing network that are under its operation and maintenance such as the Uriarra Village. Any proposals for new pressure sewer systems will not be accepted and must receive prior approval from the Icon Water Technical Authority.

Item	Supplier	Product	Appraisals
1	Aquatec Fluid Systems	Brand: **AQUATEC PRESSURE SEWER SYSTEM** Material: Injection Moulded Polyethylene (tank) Size: 950L Tank mode: PSS950 - Polyethylene tank Pump model: OGT 0.75kW 240V Single Phase Turbine Grinder Controller model: Omnismart 6000B System model: S/PSS950/20612 Boundary assembly kit: Aquatec	WSAA PA 1319

Limits of use:

1. The approved pressure sewer system is limited to the size and equipment models listed above. If a larger volume than 950 L is required, approval from the Icon Water Technical Authority must be obtained.
2. Control panels must be positioned within 10 m of the pressure sewer tank, with the centre of the box positioned 1.4 m above the finished surface level.
3. Concrete ballast volume requirements must be determined to suit existing ground conditions to ensure stability and prevent buoyancy issues.
4. The pressure sewer tank must only be installed in non-trafficable areas with a working area of 2 meters around the access cover.
5. The boundary assembly kit must not be constructed in trafficable areas.
6. The inbuilt AUF float switches must be used for level control.
7. All metallic materials and fitting inside the tanks shall Grade 316 stainless steel.
8. The tank lid must be provided with a profile seal to avoid inflow and infiltration to the network.

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4 Non-hydraulic Products

The products and materials listed in Section 4 of this APL are approved for use within all of Icon Water's asset areas, not just within the water and sewerage network.

The following applicability table is relevant to the non-hydraulic products and materials listed in Section 4 of this APL:

Asset area	Applicable (Yes/No)	Asset area	Applicable (Yes/No)
Dams (DAM)	**Yes**	Water Network (WAT)	**Yes**
Bulk Water Supply (BWS)	**Yes**	Sewerage Network (SEW)	**Yes**
Water Treatment Plants (WTP)	**Yes**	Sewage Pump Stations (SPS)	**Yes**
Water Pump Stations (WPS)	**Yes**	Sewage Treatment Plants (STP)	**Yes**
Reservoirs (RES)	**Yes**	Recycled Water Systems (REC)	**Yes**

4.1 Stop Valve Boxes and Hydrant Boxes (and Covers)

Item	Supplier	Product		Appraisals
1	Premier Precast	Brand: Products:	**PREMIER PRECAST** Cast Iron Hydrant Box (with precast concrete surround) Cast Iron Hydrant Box (without precast concrete surround) Cast Iron Stop Valve Cover (with precast concrete surround) Cast Iron Stop Valve Cover (without precast concrete surround)	Not applicable
2	Civilmart Group	Brand: Products:	**CIVILMART GROUP** (**ROMWOOD)** Cast Iron Hydrant Box (with precast concrete surround) Cast Iron Hydrant Box (without precast concrete surround) Cast Iron Stop Valve Cover (with precast concrete surround) Cast Iron Stop Valve Cover (without precast concrete surround)	Not applicable
3	Cadia	Brand: Products: stop	**CADIA** Reinforced plastic surround for cast iron hydrant box Reinforced plastic surround for cast iron valve cover	Not applicable
4	Hygrade Water	Brand: Products:	**HYGRADE WATER** Reinforced plastic surround for cast iron hydrant box. Model SBC004. Reinforced plastic surround for cast iron stop valve cover. Drg No. E4-606A.	Not applicable
6	Iplex Pipelines, Crevet	Brand: Products:	**NORTHERN IRON & BRASS FOUNDRY (NIBF)** & **IPLEX** Reinforced plastic surround for cast iron hydrant box, square. Iplex Drg No. 5781. Reinforced plastic surround for cast iron stop valve cover, round. Iplex Drg No. 5783. Cast iron hydrant cover (to suit plastic hydrant box surround). NIBF P/N: WHL2220, NIBF Drg E4-607. Cast iron stop valve cover (to suit plastic stop valve box surround. NIBF P/N: WVSCSYDL, NIBF Drg E4-606.	Not applicable
7	Daemco	Brand: Products: stop	**DAEMCO** Reinforced plastic surround for cast iron hydrant box. Reinforced plastic surround for cast iron valve cover.	Not applicable
8	Reece Tradelink Clover Crevet Hygrade Water Iplex Viadux Cadia	Brand: Products:	**REPEAT PLASTICS** Reinforced plastic surround for cast iron hydrant lid Reinforced plastic surround for cast iron stop valve lid	Not applicable

Limits of Use:

1. To be manufactured/supplied in accordance with Icon Water's standard drawings.
2. Plastic surrounds for stop valves and hydrant boxes shall only be installed in non-trafficable areas and shall be rated a minimum of Class B to AS 3996. No limitations apply for concrete surrounds.
3. Whilst the surrounds of boxes and covers can be constructed of plastic, the actual boxes and covers themselves shall be constructed of cast iron and not from plastic or any other material. Refer to the figures over-the-page.
4. Before installation, the colour of the surface box shall be checked according to its intended use. Stop valve surface boxes are required to be colour coded for special installations as follows:
    a) Zone Valve = Yellow
    b) Fire Service = Red
    c) Kidney Dialysis Patient = Blue
    d) General Isolation Valve = Grey

General Notes:

1. AS 3996. No relevant WSAA product specifications.
2. Icon Water has updated Capital Precast products to Precast Civil Industries Pty Ltd (Civilmart Group) to align with the new ownership structure that was formally communicated to Icon Water with a letter dated 24/05/2024

PLASTIC SV COVER - NOT APPROVED

CAST IRON SV COVER - APPROVED

4.2 Protective Surface Coatings

Protective surface coatings encompass paints, hot-dipped galvanising, heat shrink sleeves, chlorinated rubber spray on coatings and petrolatum-based tapes amongst other coating and surface protection products. Icon Water has adopted *WSA 201 Manual for Selection and Application of Protective Coatings* (which is available for purchase from the Water Services Association of Australia (WSAA) webstore). Icon has also published a supplement to WSA 201 which is known as *STD-SPE-G-005* and this document is available via the Icon Water website. *STD-SPE-G-005* gives full details on approved protective surface coatings.

4.3 Pipe Tracer Wire

Item	Supplier	Product		Appraisals
1	Viadux Iplex Vinidex Polyfabrics Australasia	Brand: Material: Sheath Colour: Wording: Model/Type: Ancillaries:	**TAPEX COPPERHEAD** Copper-clad steel wire with HDPE sheath Blue Not applicable Copperhead Reinforced Tracer Wire Systems ▪ SuperFlex (SF) ▪ High Strength (HS) ▪ SoloShot (EHS) ▪ SoloShot (Xtreme) Snakebite locking connector Snakebite pipe burst connector DryConn 3-way direct bury lug connector DryConn direct bury twist on connector Grounding anode Snakepit test stations	WSAA PA 1609
2	Various	Brand: Material:	No restriction on brand on the proviso that the tracer wire fully complies with WSA PS-343 2.0 mm Stainless Steel Grade 316 with a minimum tensile strength of 600 MPa	

Limits of Use:

1. TAPEX tracer wire applications: Tracer wire to be installed in the trench above or beside the pipe. Tracer wire must not be wrapped or taped to the pipe. All tracer wire joins to be done with the direct bury twist on connectors.
2. TAPEX tracer wire selections: SuperFlex (SF) for conventional trenching; High Strength (HS) for open-cut including ploughing; SoloShot (EHS) for horizontal directional drilling; SoloShot (Xtreme) for pipe bursting.
3. Stainless steel (2.0 mm dia.) tracer wire to only be used for polyethylene (PE) mains-to-meter pipe runs installed by conventional open trenching. Otherwise, use the appropriate TAPEX product depending upon the installation method.

General Notes:

1. Tracer wire – relevant standards and specifications: WSA PS-343.

4.4 Marker Posts and Underground Marker Tape

Item	Supplier	Product		Appraisals
MARKER POSTS				
1	Delnorth	Brand: Size: Material: Finish Colour: Model: Labelling:	**DELNORTH STEEL-FLEX** 1.2 x 100 x 1340 mm (T x W x L) 1.2 mm flexible steel, ArmoGalv and coated With a 70 micron DFT powder coating “Blue” for potable water applications “Cream” for sewerage applications “Green” for raw water applications Steel-Flex Utility Marker SFMP Series Refer to Icon Water’s standard drawings for labelling details for buried pipelines, hydrants and valves	Not applicable
UNDERGROUND MARKER TAPE				
2	Viadux Iplex Vinidex	Brand: Material: Width: Colour: Wording: Model/Type:	**TAPEX, TAPEX WAVELAY** Polyethylene 100 mm minimum “Blue” for potable water applications “Cream” for sewerage applications “DANGER BURIED DRINKING WATER MAIN BELOW” or “DANGER BURIED SEWER MAIN BELOW” Tapex non-detectable marker tape Tapex Wavelay detectable marker tape	No WSAA appraisal
3	Reece Civil Viadux	Brand: Material: Width: Colour: Wording: Model/Type:	**421 PRODUCTS (by Rain Harvesting)** **BRIDGLAND (for Reece by Rain Harvesting)** Polyethylene 100 mm minimum “Blue” for potable water applications “Green” for raw water applications “Cream” for sewerage applications “DANGER BURIED WATER MAIN BELOW” or “DANGER BURIED SEWER MAIN BELOW” or “DANGER PRESSURE SEWER BURIED BELOW” 421 PRODUCTS or BRIDGLAND Detectable and non-detectable marker tapes	WSAA PA 1213
4	Wenac	Brand: Material: Width: Colour: Wording: Model/Type:	**WENAC** Polyethylene 100 mm minimum “Blue” for potable water applications “Cream” for sewerage applications “CAUTION: DRINKING WATER MAIN BURIED BELOW” or “CAUTION: SEWER MAIN BURIED BELOW” Non-detectable marker tape Detectable marker tape	WSAA PA 1902

Limits of Use:

1. Marker tape shall be installed 150 mm above the pipe run regardless of whether it is detectable (for non-metallic pipes) or non-detectable (for metallic pipes). Detectable tape shall be brought to the surface at valves to allow for the direct connection of a signal transmitter.

General Notes:

1. Marker posts - relevant standards: AS 1742.2.
2. Marker tape – relevant standards and specifications: WSA PS-318, WSA PS-319, AS 2700 and AS 2648.1.
3. Use of recycled non-potable water main, underground marking tape (Lilac P23) must be considered in the design documentation. This requirement shall be made clear at the time of order to ensure compliance with Icon Water standards.

4.5 Access Covers, Make-up Rings and Frames for Buried Maintenance Structures

Icon Water has designed its own range of access covers and access hatches for use generally within its water pumping stations, sewage pumping stations and other facilities. However, for the potable water network and sewerage network proper, proprietary access covers and frames are required for buried maintenance structures (e.g. maintenance holes and scour chambers) located within public areas. The items tabulated below are approved for use in these applications where indicated on Icon Water's suite of standard drawings.

Item	Supplier	Product		Appraisals
1	Civilmart Group	Brand: Material: Sizes: Configurations:	**CIVILMART GROUP** Pre-cast reinforced concrete DN610 clear opening (Class B and D[5]) As per Icon Water standard drawings	No WSAA appraisal
2	Premier Precast	Brand: Material: Sizes: Configurations:	**PREMIER PRECAST** Pre-cast reinforced concrete DN610 clear opening (Class B and D[5]) As per Icon Water standard drawings	No WSAA appraisal
3	Humes	Brand: Material: Sizes: Configurations:	**HUMES** Pre-cast reinforced concrete DN610 clear opening (Class B and D[5]) As per Icon Water standard drawings	No WSAA appraisal
4	Gatic	Brand: Description:	**GATIC** 300S Cover Circular Solid Top DN610 clear opening (Class B and D) 300C Cover Circular Concrete Infilled DN610 clear opening (Class B and D) Ductile Iron Rectangular Cover 610 x 610 clear opening (Class B) Cover Square (1 Part) Concrete Infilled 914 x 914 clear opening (Class D)	No WSAA appraisal
5	EJ	Brand: Description:	**EJ** Paver Infill Cover (NOR series) 600 x 600 clear opening (Class D) 600 x 1200 clear opening, two part (Class D) Cover Circular Concrete Infilled (A60 series) DN614 clear opening (Class B and D) MAESTRO PKSR EN124 D400 KM (Class D) Circular Ductile Iron Cover, 600 clear opening with hexagonal frame TP800E 4L FRA (Class D) Circular Ductile Iron Cover, 610 clear opening	No WSAA appraisal

Item	Supplier	Product		Appraisals
6	ACO Polycrete	Brand: Description:	**RHINOCAST** Cover Circular Concrete Infilled DN615 clear opening (Class B and D) Model No. 600RB and 600RD Cover Circular Solid Top, Ductile Iron DN615 clear opening (Class B and D) Model No. 600SB and 600SD	No WSAA appraisal
7	Webforge	Brand: Description:	**WEBFORGE** Circular Ductile Iron Access Cover DN615 clear opening (Class B and Class D) Model No. DCC6BB2 (Class B) Model No. DCC6DB2LT (Class D)	WSAA PA 1324
8	Weldlok	Brand: Description:	**WELDLOK** Circular Ductile Iron Access Cover DN600 clear opening (Class B and Class D) Model No. STDC6S-2B (Class B) Model No. STDC6SW-2D (Class D)	No WSAA appraisal
9	Hygrade Water	Brand: Description:	**HYGRADE** Circular Ductile Iron Access Cover DN615 clear opening (Class B and Class D) Model No. CSA60B1 (Class B) Model No. CSA60D1 (Class D)	WSAA PA 1613
10	ISC Services	Brand: Description: Material: Sizes: Configuration: Accessories:	**PRIME COMPOSITE** Reinforced plastic access cover Fibre reinforced plastic DN600 clear opening (Class B) As per Icon Water standard drawings Sealing gasket from Hultec Asia Pacific Pty Ltd	WSAA PA 1916
11	ISC Services	Brand: Description: Models:	**CRETEX PRO-RING** Make-up rings (Grade, finish and angle rings) Grade rings: 36-24G-200, 36-24G-400, 36-24G-600, 36-24F-200, Finsih rings: 36-24F-400, 36-24F-600 and Angle ring: 36-24A-100	No WSAA Appraisal
12	Civilmart Group EJ	Brand: Description: Sizes: Product Code:	**EJ** Circular Ductile Iron Access Cover DN375 clear opening (Class D) - Overall cover diameter of 475 mm with a cover depth of 60 mm complying to AS3996. TC40DLFSEW	No WSAA Appraisal
13	Iplex	Brand: Description: Sizes:	**GATIC** Ductile Iron Top Hat DN250 clear opening (Class D) - with frame depth of 300mm and width of 495 mm complying with SD-2209-D Rodding Point Access Covers	No WSAA Appraisal

Item	Supplier	Product		Appraisals
14	Smartstream	Brand: Description: Sizes:	**SMARTSTREAM** Cast Iron Class D maintenance shaft cover DN450 clear opening with a depth of 330 mm	No WSAA Appraisal
Replacement Access Covers (Note: Replacement only. Not to be used for new developments)				
15	ACO Polycrete	Brand: Description:	**SAKU** Thermoplastic Access Cover Cast iron frame DN615 clear opening (Class B) Tamper-proof bolts to be specified Model No. SAKU Class B	WSAA PA 1324

Limits of Use:

1. Class B covers shall be used in non-trafficable areas. Class D covers shall be used in trafficable areas.
2. Access covers shall be clearly marked "SEWER" for sewerage applications. Otherwise, for potable water applications (e.g. scour chambers), access covers do not require marking.
3. Concrete infill covers shall be filled in accordance with AS 3996. A minimum concrete strength of 32MPa at 28 days and cement content of 400 kg/m³ is required. Concrete shall be vibrated to eliminated air pockets.
4. Covers shall be bolted down where indicated in WSA 02, WSA 03 or WSA 04 as amended by Icon Water.
5. When Civilmart Group, Humes or Premier Precast supply Class D covers as part of a construction project, they shall only supply the approved makes/models shown (i.e. Gatic, EJ, Webforge, Weldlok, Hygrade Water or ACO). Other makes/models will not be accepted without additional written approval from the Icon Water Technical Authority.
6. Until further notice, ACO Polycrete "SAKU Class B" thermoplastic covers shall only be installed (by Icon Water personnel) in Class B cover replacement applications in areas not subject to bushfire. These cover types shall not be installed by anyone other than Icon Water personnel and shall not be used for new developments.
7. When installing PRIME COMPOSITE access covers and CRETEX PRO-RING Chemlink M1 shall be used between the cover frame and Pro-ring spacer. The Chemlink M1 shall be positioned centrally either as the single bead or as two separate beads if required. Composite access covers have tightening bolts which shall be considered for opening of the cover. The product shall be used by Icon Water staff when replacing Class B access covers in backyard of private properties only.
8. The CRETEX PRO-RING make-up rings shall only be used in non-trafficable areas and is not suitable for use in fire prone areas, and should be avoided in regions that are at risk of bushfire.
9. EJ, GATIC and SMARTSTREAM covers and frames shall be installed for rodding points and the dead ends based on details in drawing SD-2209-D. A minimum clearance of 50 mm under the metal cover shall be maintained.

General Notes:

1. Circular access covers are preferred to lift-off rectangular access covers as they cannot be dropped through the surrounding frame.
2. Solid top covers are preferred to concrete infill covers due to the reduced manual handling load.
3. EJ acquired Havestock in 2010.
4. Rubber sealed covers are preferred. If metal-to-metal contact is a function of the cover/frame design, sealing grease shall be applied in accordance with the manufacturer's instructions.
5. Refer to Icon Water specification *STD-SPE-G-008 Design Requirements for Safe Access, Egress and Working at Heights* for specific design details relating to hazardous manual tasks and access/egress requirements for buried maintenance structures.
6. Relevant standards: WSA 132, WSA PS-293, EN 124-6 and AS 3996.
7. Icon Water has updated Capital Precast products to Precast Civil Industries Pty Ltd (Civilmart Group) to align with the new ownership structure that was formally communicated to Icon Water with a letter dated 24/05/2024.

4.6 Bollards

Icon Water has designed its own range of safety bollards and these are detailed in the Icon Water suite of standard drawings. However, the products tabulated below may be used in lieu of the Icon Water designed bollards at the designer's discretion on the proviso that the limits of use detailed below are fully complied with.

Item	Supplier	Product		Appraisals
1	LSP Safety Products	Brand: Products:	**LSP SAFETY PRODUCTS** - Light Duty Fixed Plate Steel Bollard, Φ75 x 900 finished height (Code BB75-BP) - Heavy Duty Industrial Base Plate Steel Bollard Φ114 x 1066 finished height (Code SD 114-IG) - Heavy Duty Industrial In-Ground Steel Bollard Φ114 x 1066 finished height (Code SD 114-BP) - Removable In-Ground Bollard, Φ90 x 950 finished height (Code RB90-COMBO)	Not applicable
2	Blackwoods	Brand: Products:	**POLITE ENTERPRISES CORPORATION** - Standard Duty Base Plate Steel Bollard, Φ90 x 1243 finished height (Code BOL SRA-5Y; P/N 0104 7106) - Heavy Duty Base Plate Steel Bollard, Φ165 x 1295 finished height (Code BOL HRA-7Y; P/N 0104 7140) - Heavy Duty In-Ground Steel Bollard, Φ165 x 1200 finished height (Code BOL HRB-8Y; P/N 0104 7157)	Not applicable

Limits of Use:

1. All bollards shall be finished in Y14 "Golden Yellow to AS 2700 (aka "Safety Yellow") and have a Class 1 "red" reflective tape band of 50 mm width applied to each bollard as per Icon Water's suite of standard drawings. The red reflective band may either be applied by the manufacturer or on the job site.

General Notes:

1. Heavy duty bollards are to be used to prevent vehicles from entering a particular area. Light or standard duty bollards will not necessarily prevent vehicles from entering a particular area but will act as a deterrent and damage vehicles if impacted.
2. No relevant WSAA product specifications.

4.7 Flange Insulation Kits and Insulating Top Hats

Item	Supplier	Product		Appraisals
1	No limitation	Brand: Product: Materials:	Various Insulating Top Hats Acetyl Co-Polymer Acetyl Homo-Polymer (Delrin®) Mineral Reinforced Nylon (Minlon®)	Not applicable
2	Crevet Iplex Viadux	Brand: Product: Materials:	No branding Insulating Sleeves (for bolts) 0.5 mm thick Polyolefin opaque pigment variety – Bowthorpe Insultite FP 301; Raychem Thermofit RT 21	Not applicable
3	Crevet Iplex Viadux	Brand: Product: Materials:	No branding Insulating Washers (for bolts) 5 mm thick Acetyl Co-Polymer M-90 Thermoplastic Sheet or 5 mm thick Acetyl Homo-Polymer (Delrin®) Thermoplastic Sheet	Not applicable
4	No limitation	Brand: Product: Materials:	**KLINGER** Flange Insulation Kit Type E - Full Face Gasket Flange Insulation Kit Type F - Ring Gasket A choice of either (i) Reinforced Phenolic sleeves and washers, or Mylar sleeves and washers in-conjunction with either (i) KLINGERSIL C-4430 gaskets or KLINGER TOP-CHEM 2000 gaskets.	Not applicable

Limits of Use:

1. M16 and M24 may have too tight a fit for some brands of insulating top hats. In such instances, drilling out the flange bolt holes is strictly prohibited. Instead, do not use insulating top hats and use an insulating washer in-conjunction with a thin PE sleeve.

General Notes:

1. When ordering flange insulating kits, the supplier must be informed of the flange details so they can supply correctly sized components.

4.8 Pipe Penetration Seals, Construction Joints, Waterstops and Grout

Item	Supplier	Product		Appraisals
1	No limitation	Brand: Product: Description:	**FOSROC** **HYDROTITE DSS0220, CJ072, CJ1020 and RSS** Water swell-able waterstop	Drinking Water Approval: AWQC Report 308541
2		Brand: Product: Description:	**FOSROC** **CONSEAL CS231** Low Expansion Sealing Gasket (for pre-cast concrete)	Not applicable
3		Brand: Product: Description:	**FOSROC** **NITOSEAL PU250, PU400 and SC600** Polyurethane joint sealant	Drinking Water Approval: AWQC Report 339139, 314208 and 314211
4		Brand: Product: Profiles:	**SIKA SIKASWELL** **SIKA WATERBAR** Water swell-able waterstop All profiles allowed as applicable	Not applicable
5		Brand: Product:	**SIKA SIKADUR COMBIFLEX SG** Joint and crack sealing system	Not applicable
6		Brand: Product:	**SIKAFLEX PRO & SIKA PRIMER 3N** Joint sealing system	Not applicable
7		Brand: Product:	**EPIREZ 633 EPOXY MORTAR** Non-sag epoxy mortar binder	Not applicable
8		Brand: Product: Description:	**FOSROC** (Limit 4) **NITOFILL LV** Epoxy crack injection system	Drinking Water Approval: AWQC Report 326461
9		Brand: Product: Description:	**FOSROC** (Limit 5) **NITOFILL PU150** Hydrophilic flexible polyurethane grout	Drinking Water Approval: AWQC Report 350774
10		Brand: Product: Description:	**FOSROC** (Limit 6) **RENDEROC G** Acid resistant repair mortar	Drinking Water Approval: AWQC Report 310871
11		Brand: Product: Description:	**FOSROC** (Limit 7) **HB40 (class R3 EN1504), HB70, HB70 PLUS** High-build repair mortar	Drinking Water Approval: AWQC Report 311757, 311761, 326452
12		Brand: Product: Description:	**FOSROC** (Limit 8) **LA55 and LA55 PLUS** High-build repair mortar	Drinking Water Approval: AWQC Report 310866
13		Brand: Product: Description:	**FOSROC** (Limit 9) **NITOMORTAR AP** Multupurpose epoxy adhesive repair paste (could be used as an adhesive for Nitofill LV and Expoband F bandage)	Drinking Water Approval: AWQC Report 312170
14		Brand: Product: Description:	**FOSROC** (Limit 10) **EXPOBAND F** Highly flexible, chemically resistant, flexible polyolefin (FPO), joint bandage membrane repair system	Drinking Water Approval: AWQC Report 312170
15		Brand: Product: Description:	**FOSROC** (Limit 11) **VANDEX BB75E-Z** Crack accommodating surface applied cement paste render	Drinking Water Approval: AWQC Report 308493

Item	Supplier	Product		Appraisals
16		Brand: Product: Description:	**LEAKMASTER** (Limit 12) **LEAKMASTER** Non-moving polyurethane swelling water joint sealant for bounding hydrotight profile to rough concrete surfaces	Drinking Water Approval: AWQC Report 323761
17		Brand: Product: Description:	**FOSROC** (Limit 13) **CONBEXTRA GP** General purpose non-shrink cementitious grout	Drinking Water Approval: AWQC Report 372382
18		Brand: Product: Description:	**FOSROC** (Limit 14) **CONBEXTRA EP65 Plus** Ultra high-strength epoxy grout	Drinking Water Approval: AWQC Report 323631

Limits of Use:

1. All seals, jointing compounds and waterstops must be installed in accordance with the manufacturer's instructions. In particular, attention shall be paid to (i) the maximum allowable width, depth and thickness of the required seal, and (ii) whether or not a primer is required to be applied prior to installing the main sealing element/compound.
2. Epirez 633 meets AS/NZS 4020 requirements for contact with drinking water and may be mixed with quartz sand to form grout for use in pipe penetrations through concrete walls.
3. HYDROTITE waterstops shall be placed correctly to ensure proper water tight arrangement. It shall not misaligned as this will cause concrete failure. Concrete compaction shall be done adequately to prevent water leakage and minimum cover of 100 mm must be maintained to meet the requirements of the manufacturer.
   DSS0220: 2mm x 20mm section; suitable for minimal movement joints; floor to wall joints
   CJ0725 7mm x 25mm section; suitable for low movement joints (up to 2mm)
   CJ1020 10mm x 20mm section; suitable for low movements joints (up to 3mm).
   RSS – round sections used for retrofitting into "failed" joints; sealing tie bolt holes through walls.
4. The NITOFILL LV is designed for repairing cracks in concrete and is a low viscosity epoxy resin for injecting into cracks with 0.15 mm and shall not be used for a moving joint and shall be used with Nitofill LV flange FC344222.
5. The NITOFILL P150 is a hydrophilic polyurethane shall be used for sealing leaking cracks. It reacts with water and creates a flexible repair.
6. The RENDEROC G is a repair mortar for structural concrete repair specifically where chemical resistance is required with a geopolymer repair product to repair and reline potable water structures and repair sewer assets and shall not be applied below 10 mm thickness. It can be applied with trowel, wet or dry spray.
7. The HB40, HB70 AND HB70 PLUS are used for vertical and overhead surfaces and the plus version is ideal for new construction defect repairs. The product shall be selected based on compressive strength of the host concrete and the application method shall be trowel or wet spray with a minimum depth of 10 mm up to 40 mm. For priming of reinforced steel, apply Nitoprime Zincrich (zinc rich epoxy resin primer compliant with AS4020) to protect the steel from corrosion.
8. The LA55 and LA55 PLUS shall be used for application depth of 50 mm to 200 mm and the application method shall be via form and pour.
9. The NITOMORTAR AP shall be used for permanent patch repair and also for embedding Expoband F, and high movement joint applications. Maximum repair thickness is up to 15 mm.
10. The EXPOBAND F is intended to be used for repair purposes and should not be considered a leak tight solution for new assets. For new installations appropriate and durable arrangement must be designed to ensure long-term leak tight performance. Negative pressure shall be taken into account during the design and installation to avoid sealing system failure.
11. The VANDEX BB75E-Z shall be used with Vandex Cemelast (elasticised water proofing slurry).
12. The LEAKMSATER must not be used for expansion joints or for joints subjected to significant movements. It is not approved for use in open-faced joints.
13. The CONBEXTRA GP shall only be used for static loads for gap sizes between 10 mm – 100 mm. It can be applied with dry-pack, trowel and form and pour. Grouting of voids and gaps between the baseplate and substrate such as bollards and stanchions.

14. The CONBEXTRA EP65 Plus shall only be used for dynamic loads for gap sizes between 10 mm – 100 mm and resistance to mild acids and alkalis. The application shall be via form and pour.

General Notes:

1. The list above is not exhaustive. The designer is free to nominate other products depending upon the application for review and acceptance by Icon Water. The products listed above have been nominated so that the designer does not have to experience any potential project delays by requesting a specific product approval.
2. Regardless of whether a product is approved in the table above, it must be suitable for the intended application and must be installed in accordance with the manufacturer's instructions. The designer is responsible for specifying the appropriate product for the application subject to review and acceptance by Icon Water.
3. The products application guide must be strictly followed to ensure proper installation and optimal performance and outcome.
4. The majority of the abovementioned products have been assessed specifically for drinking water applications (refer to the Appraisals column). Other grouts must be referred to the Technical Authority for review and assessment.

4.9 Guardrails and Handrails

Item	Supplier	Product		Appraisals
1	Webforge	Brand: Product:	**WEBFORGE MONOWILLS** Tubular Handrail and Stanchion System, permanent and fully welded	Not applicable
2	Kennedy Aluminium	Brand: Product:	**RAILSAFE** Portable (temporary) tubular guardrail system	Not applicable
3	SAYFA Systems	Brand: Product:	**SENTRY GUARDRAIL SYSTEM** Bolt-together rooftop (permanent) guardrail system for office and workshop type buildings	Not applicable

Limits of Use:

1. All guardrailing systems shall be designed and installed in compliance with AS 1657 as amended by Icon Water (by specification *STD-SPE-G-009*) as well as the Icon Water *SD Series* of drawings.
2. For permanent systems (excluding rooftop systems) fully welded joints/connections are required. Tack-welding handrails to stanchions is not acceptable.
3. Kennedy Railsafe systems shall not be specified without the additional written permission of the Icon Water Technical Authority. Refer to Icon Water specification *STD-SPE-G-008* for specific requirements relating to guardrails and the use of portable edge protection systems.
4. Bolt-together rooftop systems shall only be used on the roofs of office buildings, workshop buildings and the like. They shall not be used on reservoir roofs or any other water/wastewater asset structure that has a roof. Only permanent, full-welded tubular handrail and stanchion systems shall be employed.

General Notes:

1. With the exception of roof-top applications, bolt-together permanent guardrail systems are not currently approved for use within Icon Water asset areas. However, manufacturers or suppliers are welcome to provide submissions for approvals.

4.10 Specialty Grating Products

Item	Supplier	Product		Appraisals
1	Webforge	Brand: Product: Materials:	**WEBFORGE** Patterns A, B and C Grating Carbon Steel (Hot-dipped galvanised after fabrication) Aluminium (mill finish) Stainless Steel Grade 316 (mill finish)	Not applicable
2		Brand: Product: Materials:	**WEBPLATE** WP3 series or WP5 series Webplate Carbon Steel (Hot-dipped galvanised after fabrication) Aluminium (mill finish)	Not applicable
3		Brand: Product: Materials:	**WEBMESH** WM series Webmesh Grating Carbon Steel (Hot-dipped galvanised after fabrication) Aluminium (mill finish) Stainless Steel Grade 316 (mill finish)	Not applicable
4	Nextep	Brand: Product: Materials:	**NEXTEP FRP GRATING** FRP Grating FRP	Not applicable
5	Treadwell	Brand: Product: Materials:	**TREADWELL FRP GRATING** FRP Grating FRP	Not applicable

Limits of Use:

1. Webforge grating pattern C is preferred when plain grating is specified.
2. When cut-outs are required in grating panels (e.g. for valve spindles) these shall be banded.
3. Grating panels shall be banded all-round.
4. Carbon steel grating shall be hot-dipped galvanised after fabrication. The use of “cold-galvanising” is not approved.
5. Fixed Webforge grating panels shall be secured with either Webforge “Webclips” or other means (e.g. bespoke fastening arrangements or welding) as required.
6. FRP grating shall only be considered for use in secure locations (i.e. no public access) in environments classified as either “High”, “Immersion” or “Extreme” to Table 2.1 of WSA 201.

General Notes:

1. Webforge grating pattern C is preferred unless a greater resistance to surface impact is required or if the grating will be used in areas which will be wet and greasy. In these instances, Pattern A or Pattern B shall be selected.
2. Refer to Icon Water’s suite of standard specifications and standard drawings for design loading requirements, approved applications and approved layouts etc.

4.11 Trenchfill, Embedment and Geotextile Materials

Trenchfill and embedment materials shall be in accordance with the Icon Water *SD Series* drawings and the relevant TCCS and WSAA product specifications.

The materials tabulated below may be obtained from any supplier without limitation on the provisos that for every project (i) they fully comply with the stated product specification, and (ii) test certificates are provided to Icon Water showing the required material properties.

Icon Water shall consider the specification and/or installation of unapproved/inappropriate trenchfill and embedment material as a major defect which will require rectification to the satisfaction of Icon Water for works to proceed any further.

Designers and constructors should note that whilst additional trenchfill and embedment materials exist and are used within other water agency jurisdictions, Icon Water (and it's nominated consultants) have performed a rigorous analysis of all materials and are only prepared to accept those listed below.

Item	Supplier	Product		Product Specification
Trenchfill Material				
1	No limitation	Material:	Road base	TCCS DGS20 TCCS DGS40 TCCS GMS40
2		Material:	Crushed rock, 20mm nom. size Crushed scoria, 20mm nom. size Crushed concrete, 20 mm nom. Size	WSA PS-363
Embedment Material				
3	No limitation	Material:	Compaction sand	WSA PS-350
4		Material:	Processed aggregates for pipe embedment	WSA PS-351
5		Material:	Controlled low strength materials for pipe Embedment	WSA PS-352
6		Material:	Embedment/concrete sand, size < 5 mm	WSA PS-360
7		Material:	Embedment/5mm minus crushed rock	WSA PS-361
8		Material:	Graded recycled materials for pipe embedment (crushed concrete, crushed brick, and reclaimed asphalt)	WSA PS-364
9	Sewer pipe bedding only and supplied by RE GROUP only	Material: Supplier:	Recycled glass sand RE GROUP	WSA PS-368 as amended by Icon Water(Note1)
Geotextile Material				
10	No limitation	Material:	Geotextile filter fabric	WSA PS-355

Note 1:

Icon Water departures from *WSA PS-368 Recycled Glass Sand for Pipe Embedment*

Icon Water has amended *WSA PS-368* as follows:

Replace Table 368.1 in its entirety with the following table:

RECYCLED GLASS SAND GRADING

Sieve Size (mm)	Mass of Sample Passing (%)
4.75	100
3.35	90 – 100
2.36	80 – 95
1.18	55 – 80
0.60	35 – 60
0.30	15 – 35
0.15	5 – 13
0.075	3 - 8

4.12 Ant Barriers for Spring Hydrant Installations

Item	Supplier	Product		Appraisals
1	Hydrant Protection	Brands: Product:	**HYDRAGUARD** **RETROGUARD 2** Ant barrier for spring hydrant installations	WSAA PA1730

Limits of Use:

1. Icon Water spring hydrants are DN80 for a DN80 riser. Purchase Hydraguard and Retroguard specifying DN80 (not DN100).
2. Hydraguard shall be installed as part of all new spring hydrant installations as per Icon Water's *SD Series* drawings.
3. Retroguard shall be installed (where specified by Icon Water) on existing spring hydrant installations.

General Notes:

1. No relevant standard or WSAA product specification.
2. Hydrant Protection Pty Ltd formerly known (pre-2018) as Hydratect Pty Ltd.

4.13 Insulation Products

Item	Supplier	Product		Appraisals
1	No limitation	Brand: Product: Size: Material: Temp. Range:	**ARMAFLEX FRV** by Armacell Australia Pipe insulation DN6 – DN100 pipes Closed-cell nitrile rubber -50°C to 105°C	Not applicable
2	No limitation	Brand: Product: Size: Material: Temp. Range:	**ARMAFLEX Solar UT** by Armacell Australia Pipe insulation DN15 and DN20 pipes Closed-cell EPDM -40°C to 150°C	Not applicable
3	No limitation	Brand: Product: Size: Material: Temp. Range:	**CLIMAFOAM XPS** by Knauf Insulation Insulation boards – walls and floors 30 – 75 thickness; various board sizes Polystyrene -40°C to 150°C	Not applicable

Limits of Use:

1. The products listed above are approved for use in exposed metallic pipe installations subject to freezing as well as above-ground enclosure applications (e.g. PRV enclosures, water meter enclosures etc.)

General Notes:

1. All exposed metallic pipework carrying water-based fluids up to and including DN50 is required to be protected from freezing.

4.14 Plastic Encapsulated Step Irons

Item	Supplier	Product		Appraisals
1	Aymroo	Brand: Sizes: Material:	**AYMROO PLASTIC ENCAPSULATED STEP IRONS** Width 200 mm Plastic encapsulated steel	No WSAA appraisal
2	C&C Plastics and Toolmaking	Brand: Sizes: Material:	**POSiSTEP PLASTIC ENCAPSULATED STEP IRONS** Width 200 mm Plastic encapsulated steel	No WSAA appraisal

Limits of Use:

1. Step irons shall be in accordance with section 4 of AS 4198:2022 and installed as per Icon Water standard drawing SD-8108-D and shall only be installed in DN1050 maintenance holes.
2. Performance testing of installed step irons shall be conducted in accordance with section 4.3 of AS 4198:2022 with the results provided to Icon Water.

5 Limited Free-fall Arrest Equipment

The equipment listed in Section 5 of this APL are approved for use within all asset areas as per the Applicability Table detailed below.

The primary intent of this section is to provide a list of approved limited free-fall arrest equipment so that designers can take into account safe access, egress and height safety requirements etc. when designing for specific sites. For detailed information relating to access, egress and height safety requirements, the designer should review the following Icon Water specifications:

- *STD-SPE-G-008 Technical specification, Design requirements for safe access, egress and working at heights*
- *STD-SPE-G-009 Supplement to AS 1657-2018 Fixed platforms, walkways, stairways and ladders – design, construction and installation.*

The following applicability table is relevant to the limited free-fall arrest equipment listed in Section 5 of this APL:

Asset area	Applicable (Yes/No)	Asset area	Applicable (Yes/No)
Dams (DAM)	**Yes**	Water Network (WAT)	**Yes**
Bulk Water Supply (BWS)	**Yes**	Sewerage Network (SEW)	**Yes**
Water Treatment Plants (WTP)	**Yes**	Sewage Pump Stations (SPS)	**Yes**
Water Pump Stations (WPS)	**Yes**	Sewage Treatment Plants (STP)	**Yes**
Reservoirs (RES)	**Yes**	Recycled Water Systems (REC)	**Yes**

5.1 Permanently Mounted Davit Bases

Item	Supplier	Product	Appraisals
1	Bullivants	Brand: **3M SAFETY PRODUCTS (DBI SALA)** Product: Centre Mounting Sleeve DBI SALA Part No. 8516563 Stainless Steel Grade 304 Limits of Use: • To be used for new or existing concrete works. • Shall be installed as per the manufacturer's instructions and the Icon Water suite of standard drawings. • Only suitable for limited free fall. • Zinc-plated sleeves shall not be used. • Removable Sleeve posts shall be installed when not in use. • For 1080 mm maximum offset davit mast. • Rated Loads: Moment = 8.8 kNm; Vertical = 8 kN • Substrate or support structure to be designed for the following structural loads: Ultimate Moment = 16.5 kNm Ultimate Vertical Load = 15 kN	Not applicable
2	Bullivants	Brand: **3M SAFETY PRODUCTS (DBI SALA)** Product: Flush Mount Sleeve (Cast In) DBI SALA Part No. 8512828 304 Stainless Steel DBI SALA Part No. 8510311 Galvanised Carbon Steel Limits of Use: • A cast-in davit base which is to be used for new concrete works (i.e. cast in-situ reinforced concrete). • Shall be installed as per the manufacturer's instructions and the Icon Water suite of standard drawings. • Only suitable for limited free fall. • Removable sleeve caps shall be installed when not in use. • For 1080 mm maximum offset davit mast. • Rated Loads: Moment = 8.8 kNm; Vertical = 8 kN • Substrate or support structure to be designed for the following structural loads: Ultimate Moment = 16.5 kNm Ultimate Vertical Load = 15 kN	Not applicable

Item	Supplier	Product	Appraisals
3	Bullivants	Brand: **3M SAFETY PRODUCTS (DBI SALA)** Product: Advanced Wall Mount Sleeve DBI SALA Part No. 8518348 304 Stainless Steel DBI SALA Part No. 8518504 Galvanised Carbon Steel <u>Limits of Use</u>: • To be used for new or existing concrete works. • Shall be installed as per the manufacturer's instructions and the Icon Water suite of standard drawings. • Only suitable for limited free fall. • Removable Sleeve posts shall be installed when not in use. • For 1080 mm maximum offset davit mast. • Rated Loads: Moment = 8.8 kNm; Vertical = 8 kN Shear = 18.7 kN • Substrate or support structure to be designed for the following structural loads: Ultimate Moment = 16.5 kNm Ultimate Vertical Load = 15 kN Ultimate Shear Load = 38.8 kN	Not applicable
4	Bullivants	Brand: **3M SAFETY PRODUCTS (DBI SALA)** Product: Core Mount Sleeve DBI SALA Part No. 8510110 304 Stainless Steel <u>Limits of Use</u>: • A cored-in davit base which is permanently installed in existing reinforced concrete and is not to be used for new concrete works. • Shall be installed as per the manufacturer's instructions and the Icon "SDG" series of standard drawings. • Only suitable for limited free fall. • Removable sleeve posts shall be installed when not in use. • For 1080 mm maximum offset davit mast. • Rated Loads: Moment = 8.8 kNm; Vertical = 8 kN • Substrate or support structure to be designed for the following structural loads: Ultimate Moment = 16.5 kNm Ultimate Vertical Load = 15 kN	Not applicable

<u>Limits of Use</u>:

1. If the ultimate moment and vertical load combination of 16.5 kNm and 15 kN for the substrate and/or support structure is not practicable, then these loads may be reduced to 13.2 kNm and 12 kN respectively.
2. To only be used in conjunction with Type 3 SRLs which limit the maximum arrest force to 4 kN.
3. Refer to Icon Water specification *STD-SPE-G-008* for davit base substrate design as well as davit base inspection and testing requirements upon installation (i.e. prior to asset acceptance by Icon Water). Arranging for inspection and testing in accordance with Icon Water requirements shall be the responsibility of the constructor. Appropriate design shall be the responsibility of the designer.

General Notes:

1. The design and specification of height safety equipment such as permanently-mounted davit bases can be considered to be a specialist area of engineering that in the experience of Icon Water is not necessarily well-handled by “generalist” structural engineers. Constructors are advised to seek the assistance of specialist height safety engineers and/or discuss specific requirements with Icon Water prior to preparing steelwork and reinforced concrete works which will ultimately have a davit base permanently installed.
2. Relevant standards and specifications: AS/NZS 1891 series and AS/NZS 5532.

5.2 Portable Davit Bases

Item	Supplier	Product		Appraisals
1	Bullivants	Brand: Product: Limits of Use: • A portable tow-bar mounted davit base for installation on Icon Water vehicles fitted with “Heavy Duty” tow bars. • For 1080 mm maximum offset davit mast. • Only suitable for limited free fall. • May be used in conjunction with the DBI SALA Universal Joint Assembly (Part No. 8520886) when uneven ground conditions are encountered.	**3M SAFETY PRODUCTS (DBI SALA)** Advanced Vehicle Hitch Mount Sleeve DBI SALA Part No. 8510140	Not applicable

Limits of Use:

1. Tow-bars must be sufficiently rated for davit loads. “Heavy Duty” tow-bars must be installed.
2. To only be used in conjunction with full-body harnesses and Type 3 SRLs which limit the maximum arrest force to 4 kN.

General Notes:

1. Portable edge protection systems are recommended when using portable davit bases and associated equipment.
2. Relevant standards and specifications: AS/NZS 1891 series and AS/NZS 5532.

5.3 Portable Offset Davits, Offset Masts, Lower Masts and Extensions

Item	Supplier	Product	Appraisals
1	Bullivants	Brand: **3M SAFETY PRODUCTS (DBI SALA)** Product: Advanced Lower Mast DBI SALA Part No. 8518002 Limits of Use: • For use as a lower mast or mast extension. • Height = 838 mm. • Mass = 8.2 kg. • Only approved for use in-conjunction with DBI SALA Part No. 8518006AU to a maximum height of 2527 mm.	Not applicable
2	Bullivants	Brand: **3M SAFETY PRODUCTS (DBI SALA)** Product: Advanced Lower Mast DBI SALA Part No. 8518003 Limits of Use: • For use as a lower mast or mast extension. • Height = 1143 mm. • Mass = 8.2 kg. • Only approved for use in-conjunction with DBI SALA Part No. 8518006AU to a maximum height of 2527 mm.	Not applicable

Limits of Use:

1. To only be used in conjunction with full body harnesses and Type 3 SRLs which limit the maximum arrest force to 4 kN.
2. Relevant standards and specifications: AS/NZS 1891 series and AS/NZS 5532.

5.4 Integrated Portable Davit/Barrier Systems (aka “Manhole Guards”)

Item	Supplier	Product	Appraisals
1	Australian Lifting & Safety Bullivants	Brand: **SPANSET XTIRPA** Products: • Portable Manhole Guard 42” (992 x 947 outside) P/N: XTIN2108 • Portable Manhole Guard 52” (1313 x 1320 outside) P/N: XTIN2324 • 2 ft. (600 mm) Davit Arm & Third Bracket (fits both the 42” and 52” Manhole Guards) P/N: XTIN2210 • Stabiliser for Manhole Guard (fits both the 42” and 52” Manhole Guards) P/N: XTA2108-18 • Manhole Guard Extension Panel (965 mm width; fits both the 42” and 52” Manhole Guards) P/N: XTA2101-07 • Rubber Feet Set For Manhole Guard (fits both the 42” and 52” Manhole Guards) P/N: XTA2001-33 • Multi-Function Barricade (does not allow for any davit attachment; 965 x 965 outside) P/N: XTA2101 • Carry Bag for 42” Manhole Guard P/N: XTP2108-025 • Carry Bag for 2 ft. (600 mm) Davit Arm P/N: XTP2002-046	Not applicable

Limits of Use:

1. Portable davits with integrated barriers can only be used on relatively level surfaces in accordance with the manufacturer’s instructions and in-conjunction with approved full-body harnesses and Type 3 SRLs which limit the maximum arrest force to 4 kN.

General Notes:

1. Contact the Icon Water Technical Authority if any doubt exists as to the right choice of portable davit and limited free-fall arrest equipment for a particular application.
2. Relevant standards and specifications: AS/NZS 1891 series and AS/NZS 5532.

5.5 Full Body Harnesses

Item	Supplier	Product		Appraisals
1	Bullivants	Brand: Products:	**3M SAFETY PRODUCTS** (**DBI SALA)** DBI SALA (Delta) Part No. 823S1018 Part No. 823M1018 Part No. 823L1018 etc.	Not applicable

Limits of Use:

1. Only this make/model of harness shall be purchased by Icon Water for use with “limited free fall arrest” davit systems. However, any full-body harness meeting the requirements of the AS/NZS 1891 series of standards may be used if (i) it is already in working order and has been inspected/tested etc. by a competent person, or (ii) a contractor is using an alternative fully-body harness which also meets the requirements of the AS/NZS 1891 series of standards.
2. “S”, “M” and “L” in the part number refers to “Small”, “Medium” and “Large” sizing etc. Inappropriately sized harnesses shall not be worn.

General Notes:

1. Relevant standards and specifications: AS/NZS 1891 series.

6 Electrical, Instrumentation & Control Equipment

The primary intent of this section is to provide a list of approved electrical, instrumentation and control (EI&C) equipment that:

- Allows for minimum spares holding
- does not require additional training for Icon Water EI&C personnel
- is of a proven, reliable and robust design, and
- is compatible with Icon Water's suite of standard drawings, operating procedures and SCADA requirements etc.

The EI&C equipment listed in Section 6 of this APL is applicable to all Icon Water asset areas as indicated by the following table.

Asset area	Applicable (Yes/No)	Asset area	Applicable (Yes/No)
Dams (DAM)	**Yes**	Water Network (WAT)	**Yes**
Bulk Water Supply (BWS)	**Yes**	Sewerage Network (SEW)	**Yes**
Water Treatment Plants (WTP)	**Yes**	Sewage Pump Stations (SPS)	**Yes**
Water Pump Stations (WPS)	**Yes**	Sewage Treatment Plants (STP)	**Yes**
Reservoirs (RES)	**Yes**	Recycled Water Systems (REC)	**Yes**

Icon Water may choose to free issue EI&C equipment to a contractor. Whether the equipment is free issued to a contractor or not, the following mandatory requirements shall apply:

a) The approved EI&C equipment listings shall include all associated accessories and ancillary devices applicable to the primary equipment within that category whether individually listed or not.

b) When Icon Water chooses to free issue nominated equipment and devices, this will be clearly specified in the project specification and design consultants and contractors shall be required to provide to Icon Water (within an appropriate timeframe considering equipment lead times) a comprehensive Bill of Materials (BOM) of all EI&C equipment required to be free issued. The BOM shall include all accessories and ancillary items necessary to complete the required works independent of how small or minor. If an item is not identified in the BOM it will not be ordered for free issue. Responsibility for delays resulting from the omission of items from the BOM shall rest solely with the design consultant or contractor (or originator of the BOM).

6.1 Electrical Equipment

Application/Item	Manufacturer	Preferred Family/Model	Additional Information
Area Lighting	Matelec	Oxford IP66 LED FLU-12036	36W, 5700K temperature, 130lm/W and weatherproof
Cable and Wire Markers	Grafoplast and Brady	**Cable Markers:** Grafoplast SI2K series – yellow background, black text minimum of 5 mm high font (Do Not Condense text), UV stabilised sleeves and cable ties. **Wire Number Sleeves**: Grafoplast sleeves **Wire Number Markers:** Black text, white background. Min. font size 6 (point size 10, approx. 2.5mm high). Grafoplast medium sized number markers, correct sized sleeves OR Brady insert labels.	Grafoplast SI2K – 5500 tags p/h capability
Condensation Breather	Clipsal NHP	56D DD084	Condensation drain plug

Conduit - flexible	Flexicon AdapterFlex	**Flexicon LTP:** Black sheath c/w metal fittings either nickel plated brass or stainless steel as required **Flexicon LPC:** Black PVC for outdoors applications or as otherwise required. Orange sheath for indoors applications. Complete with metal fittings either nickel plated brass or stainless steel as required. **Flexicon:** other types as suited to specific applications and each application accepted by the Principal Electrical Engineer. **AdapterFlex SPL:** Black sheath. Complete with metal fittings either nickel plated brass or stainless steel as required.	Standard process area flex conduit: Flexible sheathed metal conduit for use as specified, or where required for screening/earthing, or for protection Heavy duty flexible plastic conduit used instead of flexible metal conduit where corrosion is an issue and where specifically accepted by the Principal Electrical Engineer. Nylon fittings not accepted. Flexible sheathed metal conduit for use as listed above.
Control Systems – ControlLogix – 1756 Series			For major plants
ControlLogix 1756 Controller/Processor	Rockwell Automation	1756-L8xES	Model to be confirmed by the Principal Electrical Engineer To be used for new installations
EtherNet Bridge	Rockwell Automation	1756-EN4TR	To be used in ControlLogix L8x Processor applications
ControlLogix 1756 Controller/Processor	Rockwell Automation	1756-L7x	Model to be confirmed by the Principal Electrical Engineer To be used in existing applications
ControlLogix 1756 Controller Redundancy Model	Rockwell Automation	1756-RM2	

ControlLogix 24VDC Power Supply	Rockwell Automation	1756-PB75	
ControlLogix Chassis Rack	Rockwell Automation	1756-A10/C(series c)	10 slots in the rack
ControlNet Bridge – Redundant Media	Rockwell Automation	1756-CN2R	ControlNet is not to be used for new installations
ControlNet Bridge – Single Media	Rockwell Automation	1756-CN2	ControlNet is not to be used for new installations
DeviceNet Bridge	Rockwell Automation	1756-DNB	
EtherNet Bridge	Rockwell Automation	1756-EN2TR	I/O PRC (packets/sec) = 25000 [with Firmware 3.6 or later]
Control Systems – MicroLogix – 1762 Series			For smaller control systems – Principal Electrical Engineer approval required as this series is being phased out
Programmable Controller	Rockwell Automation	ML1400 1766-L32BXB	24VDC supply. Special purpose I/O points
Analog Input Module	Rockwell Automation	1762-IF4	4-way analogue input module 4-20mA
Analog Output Module	Rockwell Automation	1762-OF4	4-way analogue output module 4-20mA
Digital Input Module	Rockwell Automation	1762-IQ16	16 way digital input module
Digital Output Module	Rockwell Automation	1762-OW16	16 way digital output module
Control Systems – Mircro800		2080 Series	For smaller control systems
Programmable Controller	Rockwell Auomation	2080-L70E-24QWBN	24VDC supply, Relay output

Analog Input Module	Rockwell Auomation	2080-IF4	4 way analogue input plug in module 4-20mA
Analog Output Module	Rockwell Auomation	2080-OF2	2 way analogue output plug in module 4-20mA
Analog Input Module	Rockwell Auomation	2085-IF4	4 way analogue input expansion module 4-20mA
Analog Output Module	Rockwell Auomation	2085-OF4	4 way analogue output expansion module 4-20mA
Digital Input Module	Rockwell Auomation	2080-IQ4	4 way digital input plug in module
Digital Output Module	Rockwell Auomation	2080-OW4	4 way digital output plug in module
Digital Input Module	Rockwell Auomation	2085-IQ16	16 way digital input expansion module
Digital Output Module	Rockwell Auomation	2085-OW16	16 way digital output expansion module
Control System Remote I/O		1794 Series	
Flex I/O 10x DI / 6x DO Combination Module	Rockwell Automation	1794-IB10XOB6	Non-preferred configuration – only applicable when multiple starter auxiliaries are not practical.
Flex I/O 24VDC 16pt Sink Digital Input Module	Rockwell Automation	1794-IB16	
Flex I/O 24VDC 2pt In / 2pt Out Analog Combination Module	Rockwell Automation	1794-IF2X0F2I	Applicable when only one output required
Flex I/O 24VDC 4pt Isolated Analog Output Module	Rockwell Automation	1794-OF4I	
Flex I/O 24VDC 4pt Isolated Analog Input Module	Rockwell Automation	1794-IF4I	

Flex I/O 24VDC 8pt RTD Input Module	Rockwell Automation	1794-IT8	
Flex I/O 3-wire Terminal Base Unit	Rockwell Automation	1794-TB3	Primarily intended for use with input modules when using 3-wire input proximity switches – can also be used with output modules
Flex I/O ControlNet Communications Adapter	Rockwell Automation	1794-ACN15	ControlNet is not to be used for new installations
Flex I/O DeviceNet Communications Adapter	Rockwell Automation	1794-ADN	
Flex I/O EtherNet Communications Adapter	Rockwell Automation	1794-AENTR	
Flex I/O Fused Relay Sink/Source Digital Output Module	Rockwell Automation	1794-OW8	
Flex I/O Fused Terminal Base Unit	Rockwell Automation	1794-TBNF	Used with 1794-OW8 Output Module
Flex I/O Temperature Terminal Base Unit	Rockwell Automation	1794-TB3T	Used with Thermocouple Inputs
Control System Remote I/O		5094 Series	Only for use in ControlLogix L8x Processor applications
Flex 5000 24VDC Digital 16-point Sinking Input Module	Rockwell Automation	5094-IB16	Requires Terminal Block 5094-RTB3 Requires Mounting Block 5094-MB
Flex 5000 Digital 8-point Isolated Relay Output Module	Rockwell Automation	5094-OW8I	Requires Terminal Block 5094-RTB3W Requires Mounting Block 5094-MB
Flex 5000 Analog 8-channel Isolated Current/Voltage/HART/Digital Input Sensor Module	Rockwell Automation	5094-IF8IH	Requires Terminal Block 5094-RTB3I Requires Mounting Block 5094-MB
Flex 5000 Analog 8-channel Isolated Current/Voltage/HART Output Module	Rockwell Automation	5094-OF8IH	Requires Terminal Block 5094-RTB3I Requires Mounting Block 5094-MB

Flex I/O 24VDC 8pt RTD Input Module	Rockwell Automation	5094-IY8	Requires Terminal Block 5094-RTB3T Requires Mounting Block 5094-MB
Flex 5000 EtherNet Communications Adapter	Rockwell Automation	5094-AENTR	
Flex 5000 Terminal Base	Rockwell Automation	5094-RTB3	Used with 5094-IB16
Flex 5000 Terminal Base	Rockwell Automation	5094-RTB3W	Used with 5094-OW8I
Flex 5000 Terminal Base	Rockwell Automation	5094-RTB3I	Used with 5094-IF8IH and 5094-OF8IH
Flex 5000 Terminal Base	Rockwell Automation	5094-RTB3T	Used with 5094-IY8
Flex 500 Mounting Bases	Rockwell Automation	5094-MB	Used with all IO Modules
Control System Communications			
PLC – Field Distributed I/O Network	Rockwell Automation	EtherNet/IP	
PLC – MCC Distributed I/O Network (and miscellaneous drives & field equipment)	Rockwell Automation	DeviceNet	Using KwikLink Flat Media Cabling System
PLC – PLC – Zone Network	Rockwell Automation	EtherNet/IP	Dual Redundant Fibre Optic
PLC – SCADA Network	Rockwell Automation	EtherNet/IP	
PLC – SCADA System Network	-	EtherNet/IP	
ControlNet Taps	Rockwell Automation	1786-TPYS (Y Tap) 1786-TYPR (Y Tap with right angle end)	ControlNet is not to be used for new installations

		1786-TPR (T Tap) 1786-XT (Coax Terminator)	
ControlNet to DeviceNet	Rockwell Automation	1788-CN2DN	ControlNet is not to be used for new installations
DeviceNet Kwiklink Network Cabling – Trunk	Rockwell Automation	DeviceNet Class 1 Flat Cable 1485-CP1E	For field DN networks (e.g. Actuators). Use of thick round trunk cable in combination with junction boxes is preferred. Part #: 1485PC-P1Axx
Ethernet Media Converter	Moxa Technologies	IMC-101G	Industrial Gigabit Ethernet-to-fiber media. SFP's to be determined during design. converter.
Ethernet Network Isolator	Phoenix Contact	FL ISOLATOR 100-RJ/RJ (2313931)	2 x RJ45 connectors to allow insertion in line.
Ethernet Switch – Managed	Moxa Technologies	EDS-518E-4GTXSFP	SFP's to be determined during design.
Ethernet Switch – Managed	Moxa Technologies	EDS-510E-3GTXSFP	SFP's to be determined during design.
Ethernet Switch – Managed	Moxa Technologies	EDS-P506E-4PoE-2GTXSFP	Used where ethernet devices require power over Ethernet. SFP's to be determined during design.
Ethernet Switch – Managed	Moxa Technologies	IKS-G6524A-4GTXSFP	To be used where a switch is required in a 19" Rack SFP's to be determined during design.
Modbus gateway RTU/ASCII/TCP to EtherNet/IP	Moxa Technology	MGate 5105-MB-EIP	Master capabilities Suitability dependant on the on-site PLC configuration. Typically used on ControlLogix and CompactLogix systems.
Modbus gateway Serial to Ethernet	Moxa Technology	MGate MB3170I	Slave only. Where the previous model MB3180 has been used, an Element14 cable #1216699 is required. Suitability dependant on the on-site PLC configuration Typically used on MicroLogix systems.

Media Coverter (copper to fibre)	Moxa Technology	IMC-21GA	SFP's to be determined during design.
Serial to Fibre converters	Moxa Technology	ICF-1150I-M-ST ICF-1150I-S-ST	Model Dependant of fibre type. Normally used in pairs
PoE Power Injector	Moxa Technology	INJ-24A	
Ethernet to DeviceNet	Rockwell Automation	1788-EN2DN	
Ethernet Tap & Fibre Repeaters	Rockwell Automation	1783-ETAP3T 1783-ETAP2T1SFP 1783-ETAP1T2SFP 1783-ETAP3TXT	
Ethernet Copper Cable			Cat 6 cable shall be used. Cat 5E patch leads can be used.
Fibre Optic Cable	MOLEX	Subject to application. (AFOLH012OS1 has been used for Telemetry)	For runs within a facility, multimode OM3 cables shall be used. FO cable and equipment must be installed by a MOLEX certified installer to achieve 25 year warranty.
Fibre Optic Modem	Rockwell Automation	1786-RPA + 1786-RPFM	ControlNet only. Not rack/chassis mounted – generally mounted within Fibre Optic Termination Cubicle or similar.
FOBOT – Fibre Termination Module – DIN Rail Mounted	AFC	FDE-12C1-P SPLCASS-MS_HD-6/12	Loaded on DIN rail enclosure with 12F SC for patching Splice Cassette Mini Stack HD combs with clear lid.
Network Cabling – Drop Cables	Rockwell Automation	1485K-P1F5-C (1m drop cable) 1485K-P6F5-C (6m drop cable)	DeviceNet Network
Network Connections	Rockwell Automation	1485P-P1E4-R5 (IP67 Micro Module & Base)	Lower IP rating is acceptable within MCC or other panels with min IP54 rating.

		1485A-T1E4 (IP67 Terminator & Base)	At Stromlo, 1485P-P1H4 was installed. Open style module used only for DeviceNet network power supply connections
Industrial Displays			
PanelPC VersaView 17” TFT, Touch Screen, Win7, HMI	Rockwell Automation	6181P-17A2SW71AC	Embedded ethernet port
PanelView (HMI) - Large	Rockwell Automation	2711PT12CW22D9PB	Ethernet/IP communications support to PLC.
PanelView (HMI) - Small	Rockwell Automation	2711PT7C22D8SB	Ethernet/IP comms support to PLC
PanelView Plus 12” Colour Touchscreen with EtherNet Interface	Rockwell Automation	2711PRDB12C	
Current Transformer Test Terminals	Phoenix Contact	URTK/S (0311087)	
Earth Leakage Relay	Schneider NHP/IME	Vigirex RH10M: 30mA-240V (56130) Vigirex RH10M: 30mA-415V (56140) Vigirex RH21M: 30/300mA-24V (56160) RD3AF1N (24 V AC) RD3AF12 (110vac) RD3AF14 (240VAC) RD3AF15 (415vac)	
RCD Compliance Tester	Rapid Test System	Master Module Combined: NRTMC8F5 Channel Board: NRTRB24F	

Electronic 24V Circuit Breakers	Phoenix Contact	CBM E8 24DC/0.5-10A NO-R (2905744)	Multi-channel, electronic device circuit breaker with active current limitation for protecting eight loads at 24 V DC in the event of overload and short circuit. With nominal current assistant and electronic locking of the set nominal currents. For installation on DIN rails.
Enclosures and Junction Boxes – General Purpose	B&R Enclosures	Connector TE Series – 316 Stainless Steel Universal NI Series – 316 Stainless Steel	All Junction Boxes, enclosures to be supplied with mounting pan/panel. Use of insulating material where practical is preferred. NI series to be supplied with NI020/S lock. A junction box for an equipment item may be combined with the Local Control Station for that same equipment item only where specifically accepted by the Principal Electrical Engineer.
Live Line Indicator	NHP	RL24IC	
Field Enclosures and Start/Stop Stations	Rockwell Automation	800F-nP (Poly Carbonate) for indoor applications unless there is risk of mechanical damage in which case refer to outdoor requirements. 800F-nM (Cast Metal) or 800F (Stainless Steel) where exposed to UV or where increased mechanical protection is required.	Where ‘n’ in the part number is the number of holes. Where chemical compatibility is an issue, then enclosure material chosen should be appropriate for the application
Float Switch	Clipsal Xylem	PDL FS5 Flygt ENM-10	FS5 – 250V/20A ENM-10 – 250V/10A 20m integral cable

No-Flow Switches -	IFM-Efector		Specific models variants to be proposed for acceptance by the Principal Electrical Engineer for each application
Flow Switch	IFM-Efector	SI6600 + EVM003	Cable should be 10m long with a m12 connector
Flowmeter – Electromagnetic Flowmeter (Full bore type)	Endress+Hauser Siemens ABB	Proline Promag W 400 MAG 5000/6000 Transmitter MAG 5100 W Flow Tube WaterMaster – Model specification as appropriate to the application **(only to be used where existing ABB flow tube is to be re-used)**	0DN, Ethernet, Factory Potted if direct buried, NATA certified point Cal, Earth Rings, with additional Earth to Transmitter Meters being used for the abstraction of water from the environment must be pattern approved by the relevant commonwealth department and endorsed by the principal engineer Remote Transmitter required unless otherwise accepted by the Principal Electrical Engineer Specific model details to be selected based upon individual application requirements Preferred options: • Ethernet IP communications • Factory potted • NATA certified 5 point calibration • Earth rings
Flowmeter Variable Area - Rotameters	Kytola	Model 2851R-5CA-A –H Scale 0.05 to 0.5 Litres/min of water complete with hand knob and 2851 Constant Flow Regulator Model LH-8SA-HR Scale 0.2 to 0.6 Litres/min of water, ¼" BSP Female 316	The models listed are generally used for Water Quality instrumentation sample lines. Other models to cater for greater flows to be accepted by the Principal Electrical Engineer for each application.

		stainless steel, rear connections with hand knob	
Fuse Holder	NHP	NV Range	
Inline Suspended Solids Measurement	Cerlic	CMC	
Intrinsically Safe Barrier – Analogue Input	Pepperl & Fuchs	KFD2-STC4-Ex1.20 (dual output) KFD2-STC4-Ex1 (single output)	Current sourcing output, single channel
Intrinsically Safe Barrier – Digital Input	Pepperl & Fuchs	KFD2-SR2-Ex2.W	Dual channel model
Level Controller – Liquid Level (to be used with Electrodes mounted in the pump with the module elsewhere)	Carlo Gavazzi Vega	CLD2ETC1C230 (240VAC for use with existing sites where 24VDC controls are not available) CLD2ET1CM24 (24VDC for use in all new sites & site upgrades) Vegamet 391	To be used for “no water” detection in Pleuger Pumps that are fitted with factory installed probes in the shroud. 240VAC unit for maintenance replacement use only.
Level Sensor – Radar Liquid Level	Endress+Hauser Vega	FMR20-IBPBNWDEXR08 or FMR50 Range Vegapuls 6X Vegapuls C23 Vegapuls 31	FMR20 range requires E+A RIA15 for display. FMR50 comes with display mounted in the body. **All radars to be optioned with Bluetooth connectivity**
Level Sensor – Radar Solid Level	Siemens	Sitrans LR560	100m range

Level Sensor – Suspended Hydrostatic	Endress+Hauser	WaterPilot: FMX2165-****, model as appropriate to the application	
Level Switch – Vibrating Liquid/Solid	Endress+Hauser	FTM50	
Lighting – Cubicle	Ip enclosures	IP-LEDLAMP3210-24VDC	
Lightning Surge/Protection	Phoenix Contact	**Primary POE, Main Switchboards, MCCs:** 3 Phase -> FLT-SEC-T1+T2-3C-350/25-FM (2905469) Single Phase -> FLT-SEC-T1+T2-1C-350/25-FM (2905465) **24V Supply Surge Protection:** PLT-SEC-T3-24-FM-UT (2907916) **24V Simple Surge Protection:** TTC-6P-2-HC-24DC-UT-I (2906811) **24V Surge Protection with Knife Terminals for Analogs:** TTC-6P-1X2-M-24DC-UT-I (2906738) **Serial Comms Surge Protection:** TTC-6P-HF-F-12DC-UT-I (2906786) **Field Instrument Surge Protection:** S-PT-EX-24DC (2800034)	

		Surge Protection Remote Signalling Set: TTC-6-FRMS-UT (2907810) **Ethernet Surge Protection:** DT-LAN-CAT.6+ (2881007)	IP20 rating, rail mounting available, CAT6
Loop Powered LCD Process Indicator, 4-20mA	Endress+Hauser	RIA15	For use with FMR20
Low Voltage VVVF	Danfoss ABB Allen Bradley	FC302 for up to 160% starting torque FC202 for up to 110% starting torque ACQ580 Series for low power, simple installations ACS880 Series for high power, complex installations PowerFlex 753, 750 or 755T serries	Accessories to match the specific application and Icon Water requirements including but not limited to DeviceNet or EtherNet communications c/w DC standby capability, Harmonic and Sine filters, and extended I/O functionality. Range and model as appropriate to the specific application.
Low Voltage Current Transformers	Crompton	MA5G Range	Ebony moulded case
Low Voltage Load Break Switches	Schneider	Interpact INS/INV	
Low Voltage Motor Starter & Control Equipment	Schneider	**Contactors (<150A):** LC1-D range **Contactors (>150A):** LCF-1 range	Contactors generally with 240V 50Hz coils. Surge suppression modules to be provided if supplied from UPS.

Low Voltage Switchgear (not including LV Distribution Centres and MCBs)	Schneider	**Up to 250A:** ComPact NSX System TeSys GV4L**S for motor protection up to 37kW TeSys GV2P or L for motor protection up to 8kW **Above 250A:** Masterpact MTZ range featuring MicroLogic trip unit. Model of circuit breaker and trip unit to be approved by Principal Electrical Engineer for each specific application Load break switches/isolators – Interpact INS range	Molder case circuit breakers up to 630A
Low Voltage Distribution Centres and MCBs	Schneider	SAU series <250A MSC series >=250A	
Miniature Circuit Breaker Auxiliary Contact	Schneider NHP	A9A26929 DTAUXAL	
Miniature Circuit Breakers	Schneider NHP	iC60H DTCBx/DTMx DSRCD/DTRCD DSRCB/DTRD DSRCBH/DTRL DSRCBT/DTRT	Protection curve to be chosen to suit the application

Motion Sensor	Clipsal	Infrascan 750WPR	Include external switch to override motion operation
Motor Control Centre Distributed I/O Hardware	Rockwell Automation	DeviceNet Starter Auxiliary	Flex I/O combination modules to be used if DeviceNet Starter Auxiliary not appropriate.
Motor Control Centres	B&R Enclosures	Signature SE series, demountable cells (i.e. use of bus plugs), min. cell size – 2.	
Motor Soft Starter	Rockwell Automation	SMC – Flex with Ethernet/IP SMC-3	For motors > 32A For motors < 32A
Plug / Socket	Marechal	**Socket outlet:** 01M4 081 **Inlet:** 01M8 081 **Socket Outlet Sleeve:** 01NA 027 **Inlet Handle:** 01NA 253 32P	Small loads – including flow switches, no water probes, water jackets PT100's
Power Connectors (up to 63A)	Marechal	**Socket outlet:** 6164 013 972 **Inlet:** 6168 013 972 **Socket Outlet Sleeve:** 616A 027 **Inlet Handle:** 616A 253 40P	Large loads – including pumps and generators
Power Monitor	Schneider Carlo Gavazzi	PM5580 EM21072DAV53XOSX EM210 ENERGY METER 5A RS485	24VDC supply, Class 0.2S Measurement. With Modbus TCP, Ethernet IP and Ethernet Modbus communications Use with CT's ***/5. Quantity = 3 Use with 282CT1CT Test/Disconnect terminals. Quantity =

	Socomec	48250500 Socomec DIRIS A-40 Quick Connect Multifunction Meter RS485 3I 2O	3 To be used in site retrofits (not switchboard replacements)
Power Outlets – Process/Outdoor/Workshop Areas	Clipsal	56 Series Outlets, and matching plugs as appropriate to application	Note: Requirement for round earth pin for EP outlets. Chemical compatibility with materials of construction to be confirmed for chemical storage/batching/dosing areas.
Power Supplies – AC/DC	Phoenix Contact	Essential-PS/1AC/24DC/240W/EE	
Power Supply DC/DC Single Output Converter 12VDC to 24VDC	Mean Well	DDR-120A-24	
Pressure Instrument Manifold – 2 Valve Manifold for Isolation & Venting	ABB (Oliver) Wika	G12FMS/PP IV202 1/2NPTF-1/2NPTM A316 1/4NPTF PTFE 6k	Suitable for approved gauge pressure or absolute pressure switches with ½“ NPTF connection
Pressure Instrument Manifold – 3 Valve Manifold for Isolation & Equalisation	ABB (Oliver)	Y34S	Suitable for approved differential pressure switches with ½“ NPTF connection
Pressure Instrument Manifold – 5 Valve Manifold for Isolation, Venting & Equalisation	ABB (Oliver) Wika	Y53S/PP IV51G 1/2NPTF-IECB A316 1/4NPTF PTFE 6k	Suitable for PEL differential pressure switches with ½“ NPTF 316 SS
Pressure Switch	United Electric	400 Series, Type J400 Model to suit application	Adjustable set point ranges. Site specific selection of equipment range is required. ½“ NPTF connection Ranges: 300 inches water column vacuum to 250 inches water column vacuum (-746.7 to 622.3 mbar)

	IFM	Various	Pressure: 30 inches Hg vacuum to 6000PSI (-1.0 to 413.7 bar) Differential Pressure: 1 inches water column differential to 200PSI differential
Pressure Switch – Differential	United Electric	400 Series, Type J400K	Adjustable set point ranges. Site specific selection of equipment range is required. ½“ NPTF connection Differential Pressure: 3 to 100PSI differential (0.2 to 6.9 bar differential)
Pressure Transmitter – Differential	ABB	266DSHFSSA2B1V1E8L5B2S2N4 (replaces ABB 264DSFSSA1B1-V1-E5-B2, C/W AR0328 INTERNAL SURGE PROTECTION)	0-40kPa range Loop Powered 4-20mA
Pressure Transmitter – Water main	ABB	266HSHPSBB1E8L5B2S2N4 (replaces ABB 264HSPSBB1-E5-B2, C/W AR0328 INTERNAL SURGE PROTECTION)	0-2400kPa range Loop Powered 4-20mA
Pressure Transmitters	ABB Endress & Hauser	266HSHMSBB1E8L5B7S2N4 (0-600kPa) 266HSHPSBB1E8L5B7S2N4 (0-2400kPa) 266DSHFSSA2B1V1E8L5B7S2N4 (0-40kPa) CeraBar PMP71B-AABAFJF6AA3SCA1VNJA1+EHQ1 – 4Mpa gauge pressure DeltaBar PMD75B-AABAFJA37FDASAJA1B –	Fitted with integral transient and surge protection module. Other transmitters depending on the application from the ABB range may be accepted by the Principal Electrical Engineer

		500mbar differential pressure	
Process Chlorine Analysers	Hach	CL17 CL17sc with SC4500 CL17SC Ultra Low Range with SC4500	
Process Chlorine Gas Detectors	Draeger	Polytron 7000 CL2	
Process Conductivity Analysers	Endress+Hauser	Transmitter: refer pH transmitters for detail	Electrode model dependant on application to be proposed for acceptance for each application by the Principal Electrical Engineer
Process Dissolved Oxygen Analysers	WTW Optical IQ		
Process Gas Detectors	Draeger	Polytron 8000 PIR for LEL Polytron 7000 for H2s, Cl2, SO2, O2	
Process ORP Analysers	Endress+Hauser	**Transmitter:** Same family as pH	Model variants appropriate to the application
Process pH Analysers	Endress+Hauser	**Transmitter:** CPM253/-MR0105 or CM442-AA-M2-A4-F2-6-0-A-AA (24VDC supply model which is std, use of 240VAC model is subject to approval) **Electrode:** CPS-11D7BA21 **Flow Chamber (where required):** CPA250-A00	Electrode model variant listed is for standard applications. For non-standard applications, different model variants to be proposed by the Principal Electrical Engineer

		Electrode Cable: CYK10-A**1	
Process Turbidity Analysers	SWAN Analytical Instruments	Monitor AMI Turbiwell w/LED Auto-drain AC, 240VAC Model: A25-411.700.2 Device approved for: a. Turbidity measurement of non-filtered raw waters or wastewaters where turbidity is expected to be <100 NTU. b. measurement of dual-media filtered, tertiary treated wastewater	Additional instrument functionality (specifically sample degassers and flow sensors) may be required in specific applications. Advice should be sought from Senior Process Engineer (Major Plants, or delegate) and/or Instrumentation Maintenance Supervisor (Major Plants, or delegate) before purchase.
	Lovibond Tintometer (supplied by Thermo Fisher Scientific)	Lovibond PTV6000 with Flow Indicator, Ethernet and Bluetooth; Laser Model: TIN6154624 To be optioned with Fluidics Manager Assembly for PTV-series (TIN-19806-056) and Panel Mount Assembly for PTV-	

	WTW	series (TIN19806-088) This is the sole device approved for measuring the turbidity of filtered drinking water and membrane filtered treated wastewater Visoturb IQ SensorNet for low precision submersion applications in channels and tanks only	
Proximity Switches	IFM-Efector	IF5397, 2 wire, 24VDC PNP or other to suit application	Specific model variants to be proposed for acceptance by the Principal Electrical Engineer for each application
Pump “No Water” Sensor (to be used with electrodes and module mounted in pump)	Hawk Measurement Systems	Gladiator Admittance Switch – Smart Probe AS2100BS212TN05XPO5	To be used with Pleuger Pumps that are fitted with suitable threaded spigot in the pump shroud
Pushbuttons and Switches	Rockwell Automation	**Pushbuttons:** 800FP-F range **Latch or E-Stop:** 800FP-MT44 or MP44 **Pilot Lights:** 800FP-Px (C/w separate LED cluster type bulb e.g. 800E-N157R) **Selector Switches:** 800FP-P S range	Lamps to be “push to test” for lamp test function Lamp colours: **Red:** Running/Open **Green:** Stopped/Closed **Amber:** Fault **White:** Available

		Volt/Current Selector Switch and Actuator: 194L-E12 range + 194L-HC range	
Relay - Protection (Intelligent Motor Protection)	Rockwell Automation	E300: 193-ESM-IG… for motors up to and including 33kW. Above this, 193-ESM-VIG is required	Ethernet is the preferred protocol but DeviceNet is acceptable where interfacing to existing networks
Relay - Protection	Schneider	Easergy	
Relay - Control applications	Schneider	RXM4AB2BDPVS	To be installed with plugin flyback diode protection module
Relay interposing 24VDC Coil (Double Pole Change over Contact)	Finder	563290240540 + 9674	12A, Plug in type
Relay interposing 24VDC Coil (Single Pole Change over Contact)	Finder	385124VACDC (relay includes integral base)	Use bridging link 93.20 (for ganging)
Relay interposing 240VAC Coil (Single Pole Change over Contact)	Finder	3851240VACLCS (relay includes integral base)	Use bridging link 93.20 (for ganging)
Signal Converter – I/P	ABB	TEIP811 18311 182110100	Or other make and models depending on application to be proposed for acceptance by the Principal Electrical Engineer
Signal Converters	Weidmuller	ITX Plus Series	Loop powered, multi input, 4-20mA output
Signal Converters/Isolators	Weidmuller	Mann Series Process Instruments	For example ITX Plus range. Range and specific model to be selected to suit specific applications
Small Extra Low Voltage UPS	Phoenix Contact	QUINT4-UPS/24DC/24DC/20/EIP	Uninterruptible power supply with IQ technology for DIN rail mounting, input: 24 V DC, output: 24 V DC/10 A and 12

			V DC/5 A, including mounted universal DIN rail adapter UTA 107/30
Small Extra Low Voltage UPS Battery	Phoenix Contact	UPS-BAT/PB/24DC/12AH (1274119)	
Smoke Detector	Hochiki Corp	SLV-AS Series	12/24VDC external power, ionisation smoke detector, latching LED indicator
Solenoid Valve/Actuators	Burkett or ASCO	Model as appropriate to application	Unless otherwise accepted supply voltages will be 240VAC or 24VDC (generally 240VAC will be used for non-critical applications)
Submersible Pump Seal Fail Relay	ATC	G78562	
Submersible Pump Thermistor Relay	ATC Schneider	G79242 LT3-SM00ED (24VAC)	
Temperature Sensor – Cabinet	Ocean Controls	KTD-267	4-20mA output
Temperature Sensor – Wall	Siemens	SYMARO QAA2071	4-20mA output 0-50 degrees (default – can be jumper changed)
Temperature Switch –Heat/Cool Thermostat	NHP	KTS01141(cooling) KTO01140 (heating)	
Temperature Switches	United Electrics IFM-Efector	F300 ranges TBC	
Temperature Transmitter	ABB Endress & Hauser	PT100 – TH102 TM131	For water reticulation network TM131-AABLBAB1CA5IIAB3AA1AA1+MDNQ Installation via a DN100 branch with ½" NPT socket

Terminals	Schneider Phoenix Contact	NSYTRV Range (Grey Colour for Std Terminals) Power & Control: NSYTRV range – min size 6mm width i.e. NSYTRV42 Instrumentation: NSYTRV42ST Fuse Terminals: NSYTRV42SF5 Earth Terminals: NSYTRV**PE Control: UT2.5 Grey Power: UT (UKH) range: UT6, UT10, UT16, UT35, UKH50, UKH70, UKH95, UKH150, UKH240 Grey Instrumentation: UT4-MT Grey Fuse Terminals: UK 5-HESI Black Earth Terminals: UT **-PE range (Green/Yellow)	
Thermal Overload	Schneider	LRD	
Thermistor Relay	Schneider	LT3SA00MW	
Large High Voltage UPS	Eaton	9155 and 9SX ranges. Specific model to be selected based upon application	Tower Style 8-15kVA

		requirements and each application accepted by the Principal Electrical Engineer	
Small Low Voltage UPS	Eaton	9SX Relay-MS relay card Specific model to be selected based upon application requirements and each application accepted by the Principal Electrical Engineer	Tower Style 600-7000VA Simple sites that include revenue metering to have 24 hours UPS backup for MagMaster meter power supply. Other simple sites to have 4 hours UPS backup UPS to be double conversion type Additional option relay card must be included to provide: UPS On Battery, Low Battery, UPS Operational and UPS Bypassed as a minimum
Valve Electric Actuators – Modulating Control, Isolation, Open/Close, ¼ turn Small ¼ turn applications	Limitorque AUMA Rotork Rotork	Limitorque MX series Seven series Rotork, series as appropriate and approved but general IQ3 Pro series. Rotork – ROM Series	Required make and model of actuator shall be specified for each individual project and accepted by the Principal Electrical Engineer. Use of discrete monitoring and controls for actuator or use of communication network, e.g. Modbus for control and monitoring to be accepted by the Principal Electrical Engineer for each specific project.
Vibration Accelerometer	Rockwell Automation - Entek	General purpose Accelerometer 9000A, Pt #: EK-43781L	For use with Rockwell Automation – Entek XM series Vibration Modules
Vibration Monitoring	Rockwell Automation - Entek	Dynamix 1444 Integrated Condition Monitoring System	

Voltage Monitor Relay	Carlo Gavazzi	DPB-01-CM48W4 DPC-01-DM48 DUB-02-CT23	3 phase with single output contact, relay will measure ph-ph on ln-n but needs neutral regardless 3 phase with double output contacts, relay will measure ph-ph or ln-n but does not need neutral conductor if ph-ph Single phase
Voltage Monitoring Relay	Carlo Gavazzi	DPB01CM48	
Voltmeter, Ammeters, CTs and Current Transducers	Crompton	Voltmeter: 244 Series Ammeter/MDI: 244 Series CTs: MA5H Class 1 Current Transducer: 252 Series with 4-20mA output	The use of voltmeters, ammeters and current transducers will typically only be accepted for basic and low power applications
VSD Harmonic Filters	Danfoss	To match associated VSD size	May be required subject to location and Electricity Networks direction
VSD Sine Filters	Danfoss	To match associated VSD size	1. May be required where the pump has integral unscreened flex power cables 2. May be required when the pump motor has inadequate class insulation to be suitable for use with VSD

7 Dams & Bulk Water Supply – Hydraulic Products

The asset applicability table shown below defines the asset areas which are covered by dams and bulk water supply.

Asset area	Applicable (Yes/No)	Asset area	Applicable (Yes/No)
Dams (DAM)	**Yes**	Water Network (WAT)	No
Bulk Water Supply (BWS)	**Yes**	Sewerage Network (SEW)	No
Water Treatment Plants (WTP)	No	Sewage Pump Stations (SPS)	No
Water Pump Stations (WPS)	**Yes**(Note 1)	Sewage Treatment Plants (STP)	No
Reservoirs (RES)	**Yes**(Note 1)	Recycled Water Systems (REC)	No

Notes:

1. "Water Pump Stations" and "Reservoirs" as shown in the above table shall be taken to be for raw water and not for potable water.
2. The designer shall adhere to the list of approved hydraulic products detailed in Section 7.1. This list is not exhaustive and it is expected that the designer will be required to collaborate with Icon Water throughout the design phase of the project and potentially specify products which are not currently approved but may be granted a project specific approval by the Icon Water Technical Authority. This stance has been taken as:
    a) Icon Water's dams and bulk water supply assets only undergo augmentations on an infrequent basis and the available product technology moves forward in between augmentations and upgrades which quickly renders a fully detailed approved list of products out-of-date.
    b) The design of dams and bulk water supply assets is directly controlled by Icon Water's Project Delivery Team and hence Icon Water can be more flexible with regards to providing project specific approvals.
    c) Some aspects of the design and construction of critical infrastructure such as dams and reservoirs are to be treated as confidential information on water security grounds and as such a fully detailed list is not appropriate for publishing within the public domain.
    d) Minor upgrades to existing dam or bulk water assets can be achieved through "like-for-like" replacements of equipment such as valves or pipe. That is, a modern equivalent from the same manufacturer can be used to replace an existing, worn-out or defunct item of equipment.

7.1 Dams and Bulk Water Supply – Hydraulic Products

The following table details the approved hydraulic products and materials for dams and bulk water supply assets. Where the term "as per Section…" is used, the designer and constructor shall ensure that only the suppliers, brands and specific products previously detailed in the referenced section of this APL are specified and installed and all "Limits of Use" are fully complied with.

Item	Product or Material	Requirements
1	Ductile Iron Cement Lined (DICL) Pipes and Fittings	DICL pipes and fittings shall be as per Sections 2.1 and 2.2 of this APL with the following additions: a) PN20 also allowed. b) Flange bolting for flange ratings higher than PN16 shall be in accordance with Icon Water's suite of standard drawings.
2	Polyethylene (PE100) Pipes and Fittings	PE100 pipes and fittings shall be as per Sections 2.5, 2.7 and 2.8 of this APL with the following additions/amendments: a) Allowable size range increased to DN1000. b) Pressure ratings greater than PN16 also allowed. c) Flange bolting for flange ratings higher than PN16 shall be in accordance with Icon Water's suite of standard drawings. d) Electrofusion welding is limited to a maximum size of DN180. No size limitation on butt fusion. e) Compression fittings (Section 2.6) shall not be used.
3	Copper Pipes and Fittings	Copper pipes and fittings shall be as per Sections 2.9 and 2.10 of this APL.
4	Steel Cement Lined (SCL) Pipes and Fittings	SCL pipes and fittings shall be as per Section 2.11 of this APL with the following additions: a) Allowable size range increased to DN1000. b) Flange bolting for flange ratings higher than PN16 shall be in accordance with Icon Water's suite of standard drawings.
5	Plastic pipe for chemical storage, makeup and dosing applications	Georg Fischer Australia is an approved manufacturer/supplier of plastic pipes and fittings for use in chemicals storage, makeup and dosing applications. The designer shall ensure the correct specification of products and plastic types and grades for specific chemical-related applications.
6	Resilient Seated Gate Valves	Resilient seated gate valves shall be as per Section 2.12 of this APL. Size range increased to DN1000 for AVK manufactured valves only. All other manufacturers are limited to the sizes shown in Section 2.12.

Item	Product or Material	Requirements
7	Metal Seated Gate Valves	Metal seated gate valves shall be as per Section 2.13 of this APL with the following additions: a) Viadux Sureflow allowable size range increased to DN1000 and allowable flange rating increased to PN35. b) AVK metal seated gate valves (with and without bypass) also allowed to DN1000. Note: The Viadux and AVK valves listed above are pre-approved for renewals work or new construction. However, in the event of a major augmentation or new construction where multiple valves are required, alternative manufacturers and suppliers will be permitted to provide tender submissions.
8	Air Valves	Air valves shall be as per Section 2.14 of this APL with the following additions: a) Pressure ratings greater than PN16 also allowed. b) Flange bolting for flange ratings higher than PN16 shall be in accordance with Icon Water's suite of standard drawings.
9	Butterfly Valves	Butterfly valves shall be as per Section 2.15 of this APL with the following additions: a) VAG manufactured butterfly valves (inc. those with disc locking pins) up to DN1000 are preliminarily approved. The designer shall select an appropriate model and submit to Icon Water for final approval. b) Allowable size range increased to DN1000 for the existing approved models where they are available in this increased size range. c) Pressure ratings greater than PN16 allowed. d) Flange bolting for flange ratings higher than PN16 shall be in accordance with Icon Water's suite of standard drawings. Note: The valves listed in Section 2.15 and above are pre-approved for renewals work or new construction. However, in the event of a major augmentation or new construction where multiple valves are required, alternative manufacturers and suppliers will be permitted to provide tender submissions.
10	Non-Return Valves	Non-return valves shall be as per Section 2.16 of this APL. Note: The valves listed in Section 2.16 are pre-approved for renewals work or new construction. However, in the event of a major augmentation or new construction where multiple valves are required, alternative manufacturers and suppliers will be permitted to provide tender submissions.

Item	Product or Material	Requirements
11	Ball Valves	Ball valves shall be as per Section 2.17 of this APL with the following additions: Supplier: PROCHEM Pipeline Products Models: 1-Piece Stainless BSP 800 WOG DN15 – DN50 1-Piece High Pressure Stainless BSP WOG DN15 - DN50 Full Bore 2-Piece Stainless BSP WOG DN15 – DN80 Full Bore 3-Piece Stainless BSP WOG DN15 – DN80 3-Way Reduced Bore Stainless BSP 800 WOG, DN15 – DN50 Split-Body ANSI-ISO Stainless Steel Flanged DN25 – DN100, AS 2129 drilling patterns Note: The valves listed in Section 2.17 and above are pre-approved for renewals work or new construction. However, in the event of a major augmentation or new construction where multiple valves are required, alternative manufacturers and suppliers will be permitted to provide tender submissions.
12	Automatic Control Valves	Automatic control valves shall be as per Section 2.19 of this APL with following additions: a) Allowable size range increased to DN600 for the existing approved models where they are available in this increased size range.
13	Reduced Pressure Zone Devices	Reduced pressure zone devices shall be as per Section 2.21 of this APL.
14	Repair Clamps	Repair clamps shall be as per Section 2.22 of this APL.
15	Mechanical Couplings and Dismantling Joints	Mechanical couplings and dismantling joints shall be as per Section 2.24. Note: The products listed in Section 2.24 and above are pre-approved for renewals work or new construction for PN16 rated pipelines and piping systems. However, in the event of a higher PN rating requirement, larger pipe size, a major augmentation or new construction where multiple couplings or dismantling joints are required, then alternative manufacturers and suppliers will be permitted to provide tender submissions.
16	Scour Chambers	Scour chambers shall be as per Section 2.29.
17	Pressure Gauges	Pressure gauges shall be as per Section 2.32.

Item	Product or Material	Requirements
18	Pre-fabricated Pipe Spools	Pre-fabricated pipe spools may be as per Section 2.31 or via an alternative if accepted by Icon Water.
19	Chemical Dosing Units	Chemical dosing units shall be as per Section 2.33.

8 Recycled Water Systems – Hydraulic Products

The asset applicability table shown below defines the asset areas which are covered by Recycled Water Systems and by Section 8 of this APL.

Asset area	Applicable (Yes/No)	Asset area	Applicable (Yes/No)
Dams (DAM)	No	Water Network (WAT)	No
Bulk Water Supply (BWS)	No	Sewerage Network (SEW)	No
Water Treatment Plants (WTP)	No	Sewage Pump Stations (SPS)	No
Water Pump Stations (WPS)	No	Sewage Treatment Plants (STP)	No
Reservoirs (RES)	No	Recycled Water Systems (REC)	**Yes**

8.1 Recycled Water Systems – Hydraulic Products

Icon Water does not currently have a dedicated approved products listing for recycled water systems. Manufacturers and suppliers are welcome to submit products and materials for review and approval.

The Icon Water Technical Authority shall furnish a listing to the selected designer(s) of future recycled water systems prior to either selecting the designer(s) or at project kick-off.

9 Treatment Plants

The asset applicability table shown below defines the asset areas which are covered by treatment plants and by Section 9 of this APL.

Asset area	Applicable (Yes/No)	Asset area	Applicable (Yes/No)
Dams (DAM)	No	Water Network (WAT)	No
Bulk Water Supply (BWS)	No	Sewerage Network (SEW)	No
Water Treatment Plants (WTP)	**Yes**	Sewage Pump Stations (SPS)	No
Water Pump Stations (WPS)	No	Sewage Treatment Plants (STP)	**Yes**
Reservoirs (RES)	No	Recycled Water Systems (REC)	No

9.1 Treatment Plants

Icon Water has implemented the following policy with regards to the specification of approved products for water and sewage treatment plants:

a) An approved listing of products and materials will not be made available in the public domain. A listing of approved products and materials will only be made available to designers and constructors contracted directly to Icon Water for a specific treatment plant related project and such a listing shall remain “commercial-in-confidence” in accordance with the contract terms and conditions governing the project.

b) For minor works (e.g. repair, replacement and minor augmentation of existing treatment plants), a policy of “like-for-like” replacement for hydraulic products such as pipe, fittings and ancillaries shall be adopted. In other words, the replacement items shall be new and a modern version of the items they are replacing and preferably from the same manufacturer.

c) For major works (e.g. the installation of major equipment such as centrifuges, blowers, high capacity pumping units, cranes, clarifiers etc.) there will be no dedicated approved products listing. Manufacturers and suppliers shall be required to provide fully detailed tender submissions so that tender evaluations in accordance with Icon Water’s procurement policies can be enacted.

d) For water treatment plants where drinking quality water is in contact with wetted components, all materials and components shall be in full compliance with AS/NZS 4020. The hydraulic items listed in Section 2 of this APL may be used where appropriate within water treatment plant facilities. The designer and constructor should refer directly to the technical specification which forms part of the contract documentation package for further details.

e) For sewage treatment plants, the hydraulic items listed in Section 3 of this APL may be used where appropriate. The designer and constructor should refer directly to the technical specification which forms part of the contract documentation package for further details.

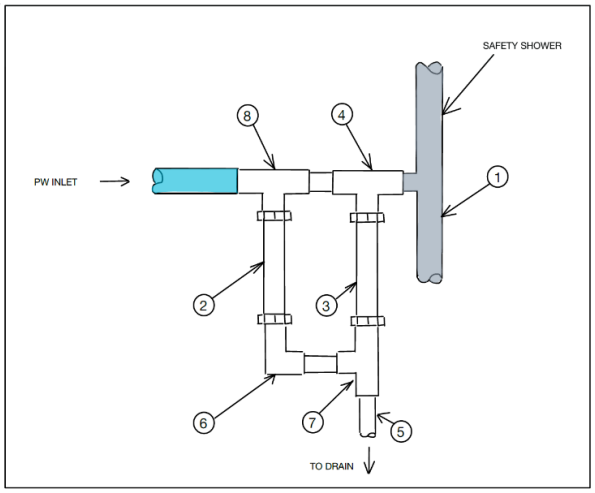
f) Icon Water is open to innovative solutions such as prototype products which can be evaluated within a controlled, fully-staffed treatment plant environment. Manufacturers and suppliers are welcome at any time to provide submissions relating to innovative and forward thinking technologies and products which will benefit the operability and maintainability of Icon Water’s treatment plants (and other facilities and networks).

9.2 Emergency Safety Shower

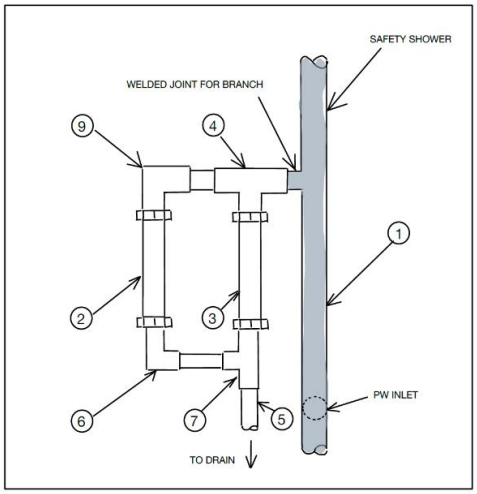
Item	Supplier	Product		Appraisals
1	Enware	Brand: Model:	**ENWARE EMERGENCY SAFETY SHOWER** ECE270 Emergency stainless steel combination shower with hand/foot operated eye/face wash – brushed stainless finish EAA971 ½" Anti-freeze valve, BSP threaded EFE390 Emergency Eye/Face Wash Pedestal Mounted Hand/Foot Operated – Brushed Stainless Finish EAATRV-F Thermal Relief Valve – Factory Fitted ESS100 Insulation – Thermal Reflective Insulation (Fitted)	No WSAA appraisal

Limits of Use:

1. The safety shower has been reviewed and approved for Icon Water treatment plant facilities. The provision of tepid water must be assessed and confirmed with Icon Water Technical Authority prior to installation in other locations.
2. STD-CHK-G-004 AS4775 Emergency Eyewash and Shower Equipment – Compliance Checklist shall be used to verify the proper installation of safety shower as a check.



OPTION A - EXISTING SHOWER RETROFIT INSTALLATION



OPTION B - NEW SHOWER INSTALLATION

PARTS LIST		
ITEM	**DESCRIPTION**	**MODEL**
1	ENWARE EMERGENCY STAINLESS STEEL COMBINATION SHOWER	ECE270
2	½" ANTI-FREEZE VALVE, BSP THREADED	EAA971
3	½" THERMAL RELIEF VALVE, BSP THREADED	EAATRV-F
4	1"x 1/2" REDUCING TEE FITTING FOR THERMAL RELIEF VALVE INSTALLATION	ESS100
5	1" PVC-U PIPE	EAATRV-RETROKITX
6	1" 90DEG PVC-U ELBOW	
7	1" EQUAL TEE PVC-U	
8	1"x 1/2" REDUCING TEE STAINLESS STEEL, BSP THREADED	
9	1" 90DEG STAINLESS STEEL ELBOW	

Appendix A – Product Approval Guidelines

The primary purpose of this Appendix is to provide manufacturers and suppliers with a guide as to how to provide Icon Water with sufficient details so that products and materials can be evaluated for inclusion in Icon Water's Approved Products List (APL).

Introduction

The Water and Sewerage Network (Design and Maintenance) Code made under the *Utilities (Technical Regulation) Act 2014* requires Icon Water to develop, maintain and implement design standards. The Icon Water Approved Products List (APL) forms part of Icon Water's suite of design standards.

Icon Water has a history of issuing "Product Acceptance Certificates" to suppliers and manufacturers to formally indicate that a particular product or material is approved for use by Icon Water within certain asset areas and with certain limitations. The historical practice of issuing certificates has now ceased (as at 2017) and the official record of whether or not a product or material is approved for use by Icon Water is the Icon Water Approved Products List (Icon Water Document No. STD-SPE-G-006). This document will be made available via the Icon Water website. A supplier or manufacturer is however free to request a letter/certificate from Icon Water confirming product approval if they desire.

Unapproved Products and Materials

Unless specifically indicated otherwise, products and materials which are not included in the current APL are not approved for use within Icon Water's networks and facilities and shall, at the discretion of Icon Water, be removed and replaced at the designer's or constructor's cost (as applicable). If the designer or constructor is in any doubt as to whether a product or material is approved for a specific application they should contact Icon Water prior to purchasing.

Icon Water Approval Obligations

Icon Water is under no obligation to approve for use any products or materials which are not specifically listed in Icon Water's APL (regardless of whether any manufacturer, supplier, constructor or designer believes such alternative products or materials are equivalent to those listed in the APL). This stance is taken so that Icon Water can have consistency within its installed asset base. This consistency allows for more efficient spares holding; more specific worker training programs for installation, operations and maintenance; and generally a more reliable and affordable water supply and sewerage system for the residents of the ACT.

In some product categories, the number of competing (approved) products has been limited for the reasons stated above. Manufacturers and suppliers should note that non-approval by Icon Water does not necessarily mean that their product is inferior, it may be just not practicable at the time to provide such an approval as additional costs may be required which cannot be justified at the time. Such costs could also include the cost of reviewing products when product testing and trials are required.

Approving Authority

Product approvals, whether they be related to the APL or whether they be project specific approvals, can only be provided by the Icon Water Technical Authority or their authorised delegate.

Annual Review and Approval Expiry Dates

The APL will be reviewed annually. Any products which have been submitted for approval within the previous 12 months and have been found to be of benefit to Icon Water will be approved and included in the next issue of the APL. As part of the review process, some products which were previously approved may have their approval withdrawn. This may be due to a number of reasons such as but not limited to (i) a product detail change by the manufacturer or supplier (ii) a change in the supply chain, or (iii) that particular product being found to be inferior or out-of-date etc. compared to a newly included product (when the number of competing products has been limited). As such, there will no longer be an expiry date on product and material approvals. If a product or material is still relevant, still holds the necessary certifications, is still fit-for-purpose and still provides value-for-money compared to competing products (not currently approved) then it will as a general rule remain on the APL.

Pathways to Product Approval

There are two pathways to receiving a product approval. These are:

Pathway	Requirements
Desktop Evaluation Pathway	The manufacturer or supplier submits sufficient documentation so that Icon Water can conduct a desktop evaluation of the product(s) requiring approval. This pathway is recommended when the manufacturer or supplier already has (i) a WSAA appraisal (ii) WaterMark certification and/or an AS/NZS 4020 compliance certificate for potable water applications, and (iii) a history of approval at MRWA, Sydney Water and Hunter Water (or other Australian Tier 1 urban water authorities). Note 1: Relevant overseas experience may in certain circumstances, and at the discretion of Icon Water, be substituted in lieu of local approvals and WSAA appraisals etc. Note 2: Inspection of the physical product will also be a requirement in many instances. Icon Water will request this if the application has sufficient merit for further evaluation.
Testing Pathway	The manufacturer provides, at no charge to Icon Water, actual products for physical testing and trials. Icon Water will then either (i) install such products and evaluate them either under normal operating conditions for an extended period, or (ii) engage a reputable laboratory to perform accelerated or long-term testing. Alternatively, the manufacturer arranges and pays for testing at a reputable laboratory based on the user requirements provided by Icon Water. Note: This pathway is recommended when the product is new to the market and is yet to receive an approval from any Australian Tier 1 urban water authority and/or a WSAA appraisal.

Manufacturer/Supplier Commitment to Product Support

Icon Water requires that all products and materials submitted for approval be supported by the supplier and manufacturer. Product support includes:

a) Prior notification of any change to the product itself, place of manufacture, method of manufacture, supply chain, quality assurance practices and other relevant details.

b) Training of Icon Water personnel and Icon Water contractors in the installation, use, operation and maintenance of the product or material upon initial approval of the product or material.

c) Notification to Icon Water of any non-conformance report (NCR) or corrective action request (CAR) issued to the applicant or a supplier in regards to the product or material.

d) Notification to Icon Water of any expiry or termination in regards to the certification of the product or material by one of the submitted certifying bodies (e.g. WaterMark, WSAA etc.)

e) Commitment to action and remedy a notification issued by Icon Water of any NCR or CAR issued to the applicant or supplier of the approved product or material.

Application for Product and Material Approval

The applicant should address all applications for product and material approval to the Icon Water Technical Authority:

Att: Technical Authority
Icon Water Ltd
GPO Box 366
Canberra ACT 2601
Email: talktous@iconwater.com.au , technicalassurance@iconwater.com.au

Icon Water reserves the right to reject an application. If Icon Water considers that the application has sufficient merit but is lacking in some way, then it may seek further information from the applicant. If CAD drawing(s) and/or 3D model file(s) of the product are not submitted with the application, then Icon Water may request this.

By making an application, the applicant is deemed to agree to the publishing of details of approval or rejection of products and materials by Icon Water.

A checklist has been provided in Appendix B of this APL which provides requirements for the type and level of detail required for Icon Water to undertake a desktop evaluation of the product or material. If the applicant would prefer that the “testing pathway” be used to approve a specific product or material, then they should contact the Icon Water Technical Authority to request a meeting in the first instance prior to making a detailed application.

Appendix B – Product Approval Application Checklist

The checklist provided in this section is required to be submitted by the applicant in-conjunction with the requested details so that Icon Water can evaluate the product for approval and potential future inclusion in the APL.

Application Checklist

Instructions: This checklist shall be completed with cross reference to the page of the submission containing the information and the properties of the tick box changed to "checked" if the submission includes the information:

- Product family, or families (e.g. 2.1 Ductile Iron Pipes etc.) ☐
- Applicant details: Submission page no …….. ☐
- Manufacturer: ☐
- Factory address: ☐
- Manufacturer quality accreditation: ☐
- Manufacturer's approval for supplier to distribute: ☐
- Supplier company: ☐
- Supplier contact Name: ☐
- Supplier contact Phone numbers: ☐
- Supplier quality accreditation: ☐
- Product or material: Submission page no ……. ☐
- Brand name: ☐
- Model No: ☐
- Description: ☐
- Specification (and Australian and/or international standards included) ☐
- Proposed use (and any limits on use examples pressure limit, flow limit, strength limit, indoor or outdoor use, IP rating, temperature range etc.); Submission page no …… ☐
- CAD drawing files and/or 3D model files: ☐
- Other Certifications: Submission page no …….. ☐
- WaterMark certified product No: ☐
- WaterMark certification level: ☐
- WSAA appraisal No: ☐
- Laboratory certification of compliance with AS/NZS 4020 ☐
- Other Australian water utility acceptance (Name and number): ☐
- Third party acceptance (in accordance with Standards Australia HB 18.67 or equivalent) ☐
- Name of conformity assessment body: ☐
- Assessment system No (e.g. HB 18.67) ☐
- Assessment No: ☐
- Applicant commitment to product support (refer to Appendix A) ☐
- Commitment to prior notification of any change ☐
- Details of product or material training available: ☐
- Commitment to provide NCRs and CARs to Icon Water: ☐
- Commitment to provide terminations by certification bodies: ☐
- Commitment to remedy NCRs and CARs issued by Icon Water: ☐

Appendix C – Designer and Contractor Requirements

Designers and contractors (aka “constructors” or “builders”) are required to interpret this *Approved Products List* document in accordance with the requirements of this appendix as well as comply with all requirements detailed in this appendix.

Requirements for Designers

Icon Water requires Designers to specify products and materials which are specifically listed in the Icon Water *Approved Products List*. Products and materials not specifically listed in the Icon Water *Approved Products List* shall not be specified by Designers unless written authorisation has been obtained from Icon Water. For some projects, depending upon the circumstances, Icon Water will provide a project specific list of products and materials to supplement the Icon Water *Approved Products List*. This will typically be provided early in the design phase of the project. Designers shall treat such a project specific list in the same way that they are required to treat the Icon Water *Approved Products List*.

Designers shall not use the words “or equivalent” in specifications or on drawings as Designers are required to specifically name the chosen product or material in sufficient detail so that it can be easily procured by the Contractor and easily checked for compliance by the Icon Water Representative during construction. Otherwise, if this cannot be done for some compelling reason, the words “or approved equivalent” shall be used.

Requirements for Contractors

Icon Water requires Contractors to construct in accordance with the project specific design documentation package which will include specifications and drawings. The Contractor shall only use products and materials specifically shown/detailed in the project specific drawings and specifications.

If the specifications and drawings do not nominate a product or material specifically (e.g. by make and model) then the Contractor shall refer to the Icon Water *Approved Products List* and only purchase and install a product or material specifically detailed in the Icon Water *Approved Products List* for the relevant product or material type.

If the design drawings or specification show the words “or equivalent” when referring to a particular product or material, the Contractor shall treat this as an error on behalf of the Designer and shall interpret these words as “or approved equivalent”. The words “or approved equivalent” indicate that the Contractor must use the product or material specifically nominated by the Designer unless a written approval is obtained from Icon Water prior to installation of an alternative product or material.

If an exceptional circumstance arises such as the design documentation package and the Icon Water *Approved Products List* are both “silent” for a particular product or material type, then the Contractor shall contact Icon Water as soon as possible (and prior to procuring and/or installing such a product or material type) so that Icon Water can provide a written approval or rejection.

In the event that the Contractor installs an unapproved product, Icon Water shall consider this a defect and the Contractor shall be required to rectify such defects at their cost and to the satisfaction of Icon Water using approved products and materials. Rectification shall include but not be limited to complete removal of the product or material from the site and replacement with an approved product or material.

Icon Water is not obliged to provide retrospective approvals for unapproved products and materials already installed by the Contractor and is not obliged to provide any requested retrospective approval in a timeframe that suits the Contractor’s project schedule.

The Contractor shall not be entitled to make a claim for delay or damages if they install an unapproved product or material which is rejected by Icon Water.

Appendix D – Product and Material Update History

A.1 Update History

Issue 1 (12/07/17): Issued for stakeholder feedback and review (internal and external)

Issue 2 (02/01/18): Issued for mandatory use

Issue 3 (17/07/18): Re-issued for mandatory use with the updates tabulated below

Issue 4 (22/03/19): Re-issued for mandatory use with the updates tabulated below

Issue 5 (20/03/20): Re-issued for mandatory use with the updates tabulated below

Issue 6 (01/07/20): Re-issued for mandatory use with the updates tabulated below

Issue 7 (23/07/21): Re-issued for mandatory use with the updates tabulated below

Issue 8 (01/03/22): Re-issued for mandatory use with the updates tabulated below

Issue 9 (09/10/24): Re-issued for mandatory use with the updates tabulated below

Issue 10 (21/10/25): Additional products and materials listed, template updated and re-issued for mandatory use.

A.2 Issue 10 Updates

Section	Update (Note1)	Description
Entire document	Format	Document updated to incorporate new template.
2.3	Daemco	DN225 Daemco Pre-tapped Connectors added.
2.3	Limits of Use	Limit of Use 2 deleted and replaced with the pre-tapped connectors to comply with the requirements of AS 2280:2020 Amdt 1:2021.
2.5	Limit of Use	Limit of Use 6 added to reflect that PE pipes are not suitable for use in contaminated areas.
2.5	Pipe Couplings Australasia (PCA)	PCA PE100 SDR 11 pipes added.
2.24	Daemco	Daemco Reinoversal Unrestrained Mechanical Couplings added.
2.24	Limits of Use	Limit of Use 7 added for use of unrestrained mechanical couplings.
2.26	Sensus	Sensus 620 Water Meter added.
2.26	Limits of Use	Limit of Use 2 added regarding transition to nut and tail arrangement for water meters.
2.26	Limits of Use	Limit of Use 3 added regarding Icon Water's transition to lead-free products.
2.35	Entire section	Entire section updated.
2.36	Entire section	Entire section updated.
3.1	Limits of Use	Limit of Use 4 added.
3.3	Limits of Use	Limit of Use 4 in previous version (issue 9) regarding horizontal and vertical curvature removed.

Section	Update (Note1)	Description
3.5	Pipe Couplings Australasia (PCA)	PCA PE100 SDR 11 pipes added.
3.22	Daemco	Daemco Reinoversal Unrestrained Mechanical Couplings added.
3.22	Limits of Use	Limit of Use 7 added for use of unrestrained mechanical couplings.
3.23	Xylem	Xylem Concertor range pumps added.
3.23	Limits of Use	Limit of Use 6 added for Flygt Concertor range pumps.

Note:

1. The updates in the table above refer to changes in Issue 10 (compared to Issue 9) unless shown otherwise.

A.3 Issue 9 Updates

Section	Update(Note 1)	
Page 1	Introduction	Section revised with an updated introduction.
2.1	Viadux / Reece Civil	DIMAX TYTONXCEL Z+ PN35 pressure pipes added.
	Clover	Viadux and Reece Civil removed as suppliers for PAM HYDROCLASS ZINALIUM.
	Limits of Use	Limit of Use 6 for PAM HYDROCLASS ZINALIUM removed.
2.2	Viadux / Reece Civil	AUSLITE and AUSFLANGE removed. These are no longer available/obsolete.
	AVK	AVK PN16 and PN35 fittings added.
	Clover	Clover PN16 fittings added.
	Limits of Use:	Limit of Use 3 regarding maximum allowable joint deflection for elastomeric ductile iron fittings added.
2.3	Crevet / Iplex Pipelines	CREVET and NIBF pre-tapped connectors removed from list due to amendment to AS/NZS 2280:2021.
	Viadux / Reece Civil	SUREFLOW READY TAP pre-tapped connectors removed from list due to amendment to AS/NZS 2280:2021.
	Vinidex	READY TAP pre-tapped connectors removed from list due to amendment to AS/NZS 2280:2021.
	Derwent Industries	DERTAP pre-tapped connectors removed from list due to amendment to AS/NZS 2280:2021.
	Viadux / Reece Civil	DIMAX MAXITAP pre-tapped connectors added.

Section	Update[Note 1]	
2.4	Pipemakers / Viadux	PIPEMAKERS ENVIROMAIN PN20 pressure pipes added.
2.6	Philmac / Vinidex / Viadux	Viadux added as supplier for PHILMAC 3G METRIC.
	Viadux	SUPREME PE fittings removed as Viadux no longer supplies this product.
	Limits of Use:	Limit of Use 3 regarding Geopress K tapping saddles/valves updated.
2.7	Vinidex	Brand updated to FRIATEC.
2.8	Hygrade Water	Sizes for HAWLE SYSTEMS 2000 updated and WSAA appraisal number added.
	Limits of Use:	Limit of Use 4 added regarding suitability of ductile iron fittings for SDR13.6 and SDR11 PE pipes.
2.12	Crevet / Iplex	AVK SERIES 55 gate valves removed. This product has been superseded by Series 570.
	Crevet / Iplex / AVK	AVK added as supplier, Models updated and WSAA appraisal issue number added to AVK SERIES 570.
	Hygrade Water	Brand updated to HAWLE-A and HAWLE-E3. PN21 gate valves included and WSAA Appraisal number updated.
	Daemco	Sizes for DAEMCO updated.
	Viadux / Reece Civil	SUREFLOW AUSLITE AND AUSLITE II removed. The AUSLITE range is no longer available and has been superseded by SUREFLOW.
	Viadux / Reece Civil	Sizes and Models and WSAA appraisal number updated for SUREFLOW.
	Viadux / Reece Civil	SUREFLOW AUSLITE III removed. The AUSLITE range is no longer available and has been superseded by SUREFLOW.
	Clover	BETTA resilient seated gate valve range added.
	Limits of Use:	Limit of Use 4 for Hawle and Daemco RSGV removed to avoid duplication.
	Limits of Use:	Limits of Use 5 added regarding seeking approval to install PN25 RSGV in the network.
2.13	Viadux / Reece Civil	Sizes, Models and WSAA appraisal number updated for SUREFLOW.
	AVK / AVK Flow Control / Iplex / Crevet	AVK added as supplier and Brand, Sizes, Connections, Rating, Models and Appraisals updated for AVK.

Section	Update[Note 1]	
	Dobbie / Iplex / Crevet	Sizes for DOBBIE updated.
	Limits of Use:	Limit of Use 6 added regarding valves ≥ DN375 requiring integral bypass.
	Limits of Use:	Limit of Use 7 added regarding seeking approval to install metal seated gate valves larger than DN300.
2.15	AVK / Crevet / Iplex	AVK added as supplier for AVK butterfly valves.
	AVK Flow Control / AVK	AVK added as supplier for WOUTER WITZEL.
2.16	AVK / Crevet / Iplex	AVK added as supplier for AVK SERIES 41.
	Viadux	Brand and Models updated for “SUREFLOW SWINGCHECK”.
	AVK / AVK Flow Control	AVK added as supplier and Sizes updated for FAST CHECK.
	Viadux / Reece Civil	DIMAX WAFER CHECK VALVE check valves added.
	Limits of Use:	Limit of Use 5 regarding assessment of mounting options added.
2.20	AVK	Brand updated to AVK MODEL 30.
	Viadux / Reece Civil	DIMAX spring hydrant valves added.
	Clover	BETTA spring hydrant valves added.
2.22	AVK	AVK REPAIR CLAMP stainless steel repair clamps added.
	AVK	AVK REPAIR CLAMP WITH FLANGED OFFTAKE stainless steel repair clamps with flanged offtake added.
	AVK	AVK REPAIR CLAMP WITH THREADED OFFTAKE stainless steel repair clamps with threaded offtake added.
2.24	Hygrade Water	Sizes updated and WSAA appraisal number added for HAWLE SYSTEMS 2000.
	Hygrade Water	Details for HAWLE SYNOFLEX updated to refer to item 8.
2.25	Reece / Tradelink / Cadia / Plumbing Plus Group	VIEGA GEOPRESS TAPPING VALVE added as item 5.
	Limits of Use:	Limit of Use 8 regarding Geopress tapping valves on PE pipes added.

Section	Update[Note 1]	
2.29	Civilmart Group	Reference to Capital Precast updated to Civilmart Group under item 1.
	General Notes:	Note 2 added regarding change of ownership of Capital Precast to Precast Civil Industries Pty Ltd (Civilmart Group).
2.34	Ventilation – Water Service reservoir	New section added.
	Airocle	AIRCOLE 4 SERIES RIDGE AND SLOPE VENTILATOR added.
	Limits of Use:	Limits of Use 1- 5 added for the AIROCLE RIDGE AND SLOPE VENTILATORS.
2.35	Water Sub-meter Box Kit for Inground Installation	New section added.
	All Valve	ALL VALVE INGROUND WATER METER KIT added.
	Strongcast	STRONGCAST INGROUND WATER METER KIT ADDED.
	Limits of Use:	Limits of Use 1 and 2 added.
	General Notes:	General Notes 1 and 2 added.
2.36	Water Sub-meter Bracker Kit for Cabinet Installation	New section added.
	All Valve	ALL VALVE WALL BRACKET METER KIT added.
	Strongcast	STRONGCAST WALL BRACKET KIT ADDED.
	Limits of Use:	Limits of Use 1 and 2 added.
	General Notes:	General Notes 1 and 2 added.
3.1	Clover	Viadux and Reece Civil removed as suppliers for PAM INTEGRAL ZINALIUM based on feedback from supplier.
	Limits of Use:	Limit of Use 4 for PAM INTEGRAL ZINALIUM removed.
3.2	Viadux / Reece Civil	AUSLITE and AUSFLANGE removed. These are no longer available/obsolete.
	AVK	AVK ductile iron fittings added as new item.
	Clover	CLOVER ductile iron fittings added as new item.
	Limits of Use:	Limit of Use 2 regarding maximum allowable joint deflection for elastomeric ductile iron fittings added.

Section	Update[Note 1]	
3.4	Plastec	PLASTEC FLEXITEC added.
	Plastec	PLASTEC HEAVY DUTY DWV RANGE added.
	Limits of Use:	Limit of Use 4 added regarding use of heavy duty PVC-U fittings.
3.7	Hygrade Water	Sizes updated and WSAA appraisal number added for HAWLE SYSTEMS 2000.
	Limits of use:	Limit of Use 5 added regarding suitability of ductile iron fittings for SDR13.6 and SDR11 PE pipes.
3.14	Crevet / Iplex	AVK SERIES 55 removed. This product has been superseded by Series 570.
	Crevet / Iplex / AVK	AVK added as supplier, Models updated, and WSAA appraisal issue number added to the AVK SERIES 570.
	Hygrade Water	Brand updated to HAWLE-A and HAWLE-E3. PN21 gate valves included and WSAA Appraisal number updated.
	Daemco	Sizes updated and reference to Note 5 deleted for DAEMCO.
	Viadux / Reece Civil	SUREFLOW AUSLITE AND AUSLITE II removed. The AUSLITE range is no longer available and superseded by SUREFLOW.
	Viadux / Reece Civil	Models and WSAA appraisal number updated for SUREFLOW.
	Viadux / Reece Civil	SUREFLOW AUSLITE III removed. The AUSLITE range is no longer available and superseded by SUREFLOW.
	Clover	BETTA resilient seated gate valves added.
	Limits of Use:	Limit of Use 5 for Hawle and Daemco RSGV removed to avoid duplication.
	Limits of Use:	Limit of Use 5 added regarding seeking approval to install PN25 RSGV in the network.
3.15	Viadux	Sizes, Models and WSAA appraisal number updated for SUREFLOW.
	AVK / Iplex / Crevet	AVK added as supplier, Brand, Connections, Rating. Models and Appraisals updated for AVK FLOW CONTROL.
	Dobbie / Iplex / Crevet	Sizes for DOBBIE updated.
	Limits of Use:	Limit of Use 4 added regarding seeking approval to install metal seated gate valves larger than DN300.
3.16	AVK / AVK Flow Control	AVK added as supplier for ORBINOX BT SERIES 22.

Section	Update[Note 1]	
3.18	AVK / Crevet / Iplex	AVK added as supplier and Sizes and Models updated for AVK SERIES 41.
	AVK / Crevet / Iplex	AVK added as supplier and Sizes updated for AVK SERIES 53.
	Viadux / Reece Civil	Brand and Models updated for “SUREFLOW SWINGCHECK”.
	No limitation	TIDEFLEX DUCKBILL non-return valve added.
	Viadux / Reece Civil	DIMAX WAFER CHECK VALVE check valves added.
	Limits of Use:	Limit of Use 4 regarding assessment of mounting options added.
	Limits of Use:	Limit of Use 5 added regarding application of TIDEFLEX DUCKBILL.
3.20	AVK	AVK REPAIR CLAMP stainless steel repair clamps added.
	AVK	AVK REPAIR CLAMP WITH FLANGED OFFTAKE stainless steel repair clamps with flanged offtake added.
	AVK	AVK REPAIR CLAMP WITH THREADED OFFTAKE stainless steel repair clamps with threaded offtake added.
3.22	Hygrade Water	Sizes and Appraisal updated for HAWLE SYSTEMS 2000.
	No limitation	FERNCO SHEAR BANDED COUPLING added.
	Limits of Use:	Limit of use 7 regarding application and installation of FERNCO SHEAR BANDED COUPLING added.
3.27	Civilmart Group	Reference to Capital Precast updated to Civilmart Group under item 1.
	Viadux / Reece	REHAU AWASHAFT maintenance holes added.
	Limits of Use:	Limit of Use 3 for condition regarding application and installation of REHAU AWASHAFT added.
	General Notes:	Note 2 added regarding change of ownership of Capital Precast to Precast Civil Industries Pty Ltd (Civilmart Group).
3.30	Pressure Sewer System – Sewerage Network	New section added.
	Aquatec fluid Systems	AQUATEC PRESSURE SEWER SYSTEM added.
	Limits of Use:	Limits of Use 1 – 8 added for AQUATEC PRESSURE SEWER SYSTEM.

Section	Update[Note 1]	
4.1	Civilmart Group	Reference to Capital Precast updated to Civilmart Group under item 2.
	Reece / Tradelink / Clover / Crevet / Hygrade Water / Iplex / Viadux / Cadia	REPEAT PLASTICS reinforced plastic surrounds for cast iron hydrant and stop valve lid added.
	Limits of Use:	Item 4 updated.
	General Notes:	Note 2 added regarding change of ownership of Capital Precast to Precast Civil Industries Pty Ltd (Civilmart Group).
4.4	General Notes:	Note 3 regarding requirements of marking tape for recycled non-potable water main added.
4.5	Access Covers, Make-up rings and Frames for Buried Maintenance Structures	Section heading updated.
	Civilmart Group	Reference to Capital Precast updated to Civilmart Group under item 1.
	ISC Services	PRIME COMPOSITE access covers added.
	ISC Services	CRETEX PRO-RING make-up rings added.
	Civilmart Group / EJ	EJ circular ductile iron access cover added.
	Iplex	GATIC ductile iron top hat added.
	Smartstream	SMARTSTREAM cast iron maintenance shaft cover added.
	Limits of Use:	Reference to Capital Precast updated to Civilmart Group under item 5.
	Limits of Use:	Limits of Use 7 added for requirements for the PRIME COMPOSITE AND CRETEX PRO-RING.
	Limits of Use:	Limits of Use 8 added for suitability of CRETEX PRO-RING in non-trafficable and bushfire prone areas.
	Limits of Use:	Limits of Use 9 added for installation of covers as per SD-2209-D.
	General Notes:	Note 2 added regarding change of ownership of Capital Precast to Precast Civil Industries Pty Ltd (Civilmart Group).

Section	Update[Note 1]	
4.8	No limitation	PARCHEM HYDROTITE updated to FOSROC HYDROTITE. Product and Description updated and Drinking Water Approval report number added.
		PARCHEM CONSEAL CS231 updated to FOSROC CONSEAL CS231.
		PARCHEM EMER-SEAL updated to FOSROC NITOSEAL. Description and Drinking Water Approval report number added.
		FOSROC NITOFILL LV added.
		FOSROC NITOFILL PU150 added.
		FOSROC RENDEROC G added.
		FOSROC HB40, HB70 AND HB70 PLUS added.
		FOSROC LA55 AND LA55 PLUS added.
		FOSROC NITOMORTAR AP added.
		FOSROC EXPOBAND F added.
		FOSROC VANDEX BB75E-Z added.
		LEAKMASTER added.
		FOSROC CONBEXTRA GP added.
		FOSROC CONBEXTRA EP65 PLUS added.
	Limits of Use:	Limit of Use 3 regarding use of FOSROC HYDROTITE added.
		Limit of Use 4 regarding use of FOSROC NITOFILL LV added.
		Limit of Use 5 regarding use of FOSROC NITOFILL P150 added.
		Limit of Use 6 regarding use of FOSROC RENDEROC G added.
		Limit of Use 7 regarding use of FOSROC HB40, HB70, HB70 PLUS added.
		Limit of Use 8 regarding use of FOSROC LA55 and LA55 PLUS added.
		Limit of Use 9 regarding use of FOSROC NITOMORTAR AP added.
		Limit of Use 10 regarding use of FOSROC EXPOBAND F added.
		Limit of Use 11 regarding use of FOSROC VANDEX BB75E-Z added.
		Limit of Use 12 regarding use of LEAKMASTER added.

Section	Update[Note 1]	
		Limit of Use 13 regarding use of FOSROC CONBEXTRA GP added.
		Limit of Use 14 regarding use of FOSROC CONBEXTRA EP65 PLUS added.
	General Notes:	Items 3 and 4 added.
4.14	Plastic Encapsulated Step Irons	New section added.
	Aymroo	AYMROO PLASTIC ENCAPSULATED STEP IRONS added.
	C&C Plastics and Toolmaking	POSiSTEP PLASTIC ENCAPSULATED STEP IRONS added.
	Limits of Use:	Limits of Use 1 and 2 added.
5	Limited Free-fall Arrest Equipment	Reference to AS1657-2018 updated (para. 2).
5.1	Bullivants	3M SAFETY PRODUCTS (DBI SALA) Advanced Floor Mount Sleeve part number 8518347 and 8518503 removed Icon Water has had challenges sourcing these products.
5.2	Bullivants	3M SAFETY PRODUCTS (DBI SALA) Advanced 3 Piece Expandable Base part number 8518008AU removed as Icon Water has had challenges sourcing this product.
	Bullivants	3M SAFETY PRODUCTS (DBI SALA) Universal Joint Assembly part number 8520886 removed as Icon Water has had challenges sourcing this product.
5.3	Bullivants	3M SAFETY PRODUCTS (DBI SALA) Advanced One Piece Adjustable Offset Davit 8518386 removed as Icon Water has had challenges sourcing this product.
	Bullivants	3M SAFETY PRODUCTS (DBI SALA) Advanced Upper Offset Mast 8518006AU removed as Icon Water has had challenges sourcing this product..
9.2	Emergency Safety Shower	New section added.
	Enware	ENWARE EMERGENCY SAFETY SHOWER added.
Multiple	-	All reference to Principal Engineer in sections 2, 3, 4, 5, 7 and Appendix A updated to Technical Authority.
Multiple	-	All reference to Engineering Services team in sections 4, 8 and Appendix A updated to Technical Authority.

Notes:

1. The updates in the table above refer to changes in Issue 9 (compared to Issue 8) unless shown otherwise.

A.4 Issue 8 Updates

Section	Update[Note 1]	
Page 1	Version update:	Issue 7 changed to Issue 8 (para. 2).
2.1	Beaver Process:	Deleted as a supplier of Jindal SAW branded pipe.
	Iplex/Crevet:	Added as a supplier of “IRONTITE” branded pipe (which was formerly known as “Jindal SAW”).
2.2	Daemco:	DAEMCO PN16 and PN35 DI fittings added.
2.3	Daemco:	DAEMCO pre-tapped connectors added.
2.11	Steelmains:	Error correction: WSAA PA1818 now included.
2.12	Reece Civil/Viadux:	DIMAX OS&Y (rising stem) RSGVs added.
	Limits of Use:	LOU No. 2 changed to specifically state that RSGVs shall not be used for high velocity and/or high wear applications.
2.24	Vinidex:	Straub Metal Grip / Grip L added and size range increased to DN200 (from DN150 previously) for PN16.
2.28	Limits of Use:	LOU No. 3: Soft starters are now the default starting method. DOL is no longer preferred for smaller motors.
3.1	Beaver Process:	Deleted as a supplier of Jindal SAW branded pipe.
	Iplex/Crevet:	Added as a supplier of “IRONTITE” branded pipe (which was formerly known as “Jindal SAW”).
3.2	Daemco:	DAEMCO PN16 and PN35 DI fittings added.
3.14	Reece Civil/Viadux:	DIMAX OS&Y (rising stem) RSGVs added.
	Limits of Use:	LOU No. 3 changed to specifically state that RSGVs shall not be used for high velocity and/or high wear applications.
3.22	Vinidex:	Straub Metal Grip / Grip L added and size range increased to DN200 (from DN150 previously) for PN16.
3.23	Limits of Use:	LOU No. 3: Soft starters are now the default starting method. DOL is no longer preferred for smaller motors.

A.5 Issue 7 Updates

Section	Update[Note 1]	
Page 1	Version update:	Issue 6 changed to Issue 7 (para. 2).

Section	Update[Note 1]	
2.1	Clover: Viadux/Reece Civil:	Reinstated PAM HYDROCLASS ZINALIUM DICL pipe.
	Viadux/Reece Civil:	Removed DIMAX TYTONXCEL pipe due to Icon Water's new requirement for all DICL pipes to have a Zn/Al external coating in-conjunction with an epoxy/synthetic resin finish coat.
	Limits of Use:	Limit of Use No. 3 modified in-line with DIMAZ TYTONXCEL being removed and the impact this has on sleeving requirements. Limit of Use No. 6 added to clarify the supply position for PAM HYDROCLASS ZINALIUM.
2.2	Clover:	Galvin Engineering "Traditional" and "Lightweight" DI fittings added.
	Hygrade Water:	Gillies Metaltech "Traditional" and "Lightweight" DI fittings added.
2.12	Crevet/Iplex:	AVK SERIES 57 now remove due to being superseded by the AVK 570 series.
	Crevet/Iplex:	AVK SERIES 570 size range increased to DN750.
	Viadux/Reece Civil:	DIMAX resilient seated gate valves added.
	Derwent:	Resilient Seated Bypass Valve in the size range DN450 – DN600; updated range from DN80 and included WSAA appraisal details.
2.13	AVK Flow Control Iplex/Crevet:	Series 580 metal seated gate valve added included supply by Iplex/Crevet in sizes up to and including DN600.
	Dobbie:	Dobbie metal seated gate valve model VGM16 added.
2.15	Hygrade Water:	OZKAN butterfly valves are now supplied by Hygrade Water and not Ebro Armaturen Pacific.
	AVK Flow Control:	Wouter Witzel EVFS and EVUS series added.
2.16	Crevet/Iplex:	Dobbie metal seated swing check VSCM16 added.
	AVK Flow Control:	Fast Check anti-slam, nozzle type check valve added with specific limits of use as per LOU No. 4.
	Metaval:	Grayloc (Oceaneering) anti-slam, nozzle type check valve added with specific limits of use as per LOU No. 4.
	Limits of Use:	Limit of Use No. 4 added specifically for nozzle check valves.
2.18	Reece Civil:	Additional LOGI Valve product offering added to include brass x poly ball valves (i.e. threaded x compression). LOGI Valve branding clarified at Item 6 and 7 to include the company "Austworld Commodities".

Section	Update[(Note 1)]	
2.24	AVK	AVK Series FD10 added.
	Steelmains:	Compact dismantling joint added.
	Hygrade Water:	Hawle Synoflex Flanged Adapter Model 7994 added.
	Derwent Industries:	Derwent coupling KJC series added.
	Limits of Use:	LOU No. 1 modified to now include Derwent.
	General Notes:	WSA PS-284 now included.
2.27	Bermad:	Bermad added as a supplier of SENSU WP-F dirt boxes. WP-F dirt box approved size range now DN40 – DN200.
3.1	Clover: Viadux/Reece Civil:	Reinstated PAM INTEGRAL ZINALIUM DICL pipe.
	Viadux/Reece Civil:	Removed DIMAX TYTONEXTREME pipe due to Icon Water's new requirement for all DICL pipes to have a Zn/Al external coating in-conjunction with an epoxy/synthetic resin finish coat.
	Limits of Use:	Limit of Use No. 2 modified in-line with DIMAZ TYTONXCEL being removed and the impact this has on sleeving requirements. Limit of Use No. 4 added to clarify the supply position for PAM INTEGRAL ZINALIUM.
3.2	Clover:	Galvin Engineering "Traditional" and "Lightweight" DI fittings added.
	Hygrade Water:	Gillies Metaltech "Traditional" and "Lightweight" DI fittings added.
3.12	Clover:	SUPERLIT FW GRP PIPE (inc. jacking pipe) added.
3.13	Clover:	SUPERLIT FW GRP fittings (inc. jacking pipe fittings) added.
3.14	Crevet/Iplex:	AVK Series 570 RSGV size range re-stated to DN750.
	Derwent International:	Re-clarified that integral bypass valves are available for sizes DN450 and above.
	Viadux/Reece Civil:	DIMAX resilient seated gate valves added.
3.15	AVK Flow Control: Iplex/Crevet:	Series 580 metal seated gate valve added.
	Dobbie: Iplex/Crevet:	Dobbie VGM16 metal seated gate valve added.
3.22	Hygrade Water:	Hawle Synoflex Flanged Adapter Model 7994 added.
	Derwent Industries:	Derwent coupling KJC series added.

Section	Update(Note 1)	
	Limits of Use:	LOU No. 1 modified to now include Derwent.
4.1	Capital Pre-Cast:	ROMWOOD castings now supplied instead of ACO castings.
	Daemco:	Reinforced plastic surrounds for stop valves and hydrant valves added.
4.11	RE GROUP:	Recycled glass sand added specifically for sewer pipe embedment only.
	Notes:	Note 1 added to show Icon Water's amendments to WSA PS-368.
4.12	Hydrant Protection:	RETROGUARD 2 replaces the superseded RETROGUARD.
7.1	Item 9 – Butterfly Valves	Clarified that VAG butterfly valves with disc locking pins are also preliminarily approved.
Section 6 Electrical, Instrumentation and Control Updates		

- Complete list now shown in alphabetical order by application/item.
- Condensation breather, Clipsal brand, model corrected to "56D".
- Rockwell 100-DNY42R added for DeviceNet Starter Auxilliary Modules
- Electromagnetic flowmeter models updated for E+H, Siemens and ABB.
- Model correction for Pepperl & Fuchs intrinsically safe barriers.
- Additional note requiring Bluetooth connectivity for E+H radar level sensors.
- Added Ip Enclosures model for cubicle lighting.
- Added notes for Modbus gateway components for two items.
- Miscellaneous updates to relay equipment.
- NHP temperature switches – new model numbers specified.
- Clarification on electric actuators that Rotork actuators are not preferred and can only be selected when replacing existing Rotork actuators with approval by the Principal Electrical Engineer.

Notes:

1. The updates in the table above refer to additional product approvals in Issue 7 (compared to Issue 6) unless shown otherwise.

A.6 Issue 6 Updates

Section	Update(Note 1)	
Page 1	Version update:	Version 5 changed to Version 6 (para. 2).
2.1	Viadux/Reece Civil:	DIMAX TYTONXCEL and DIMAX TYTONXCEL Z+ replace the previous product offering.
	Vinidex:	PN35 fittings added.

Section	Update[Note 1]	
2.18	Strongcast	Valve code c8243 superseded by code SC8243. Valve code c8300 superseded by code NC7094 in DN20 x PE25 (i.e. 20mm meter ball valve with PE25 compression union). Valve codes c8319 and c8298 deleted (i.e. no longer in production).
3.1	Viadux/Reece Civil:	DIMAX TYTONXTREME and DIMAX TYTONXTREME Z+ replace the previous product offering.
	Vinidex:	PN35 fittings added.
Section 6 Electrical, Instrumentation and Control Updates		
• Power monitors now changed to 24 volt DC version. • Typo correction – “Contractors” now amended to “Contactors” • MCB boards now have encapsulated chassis.		

Notes:

1. The updates in the table above refer to additional product approvals in Issue 6 (compared to Issue 5) unless shown otherwise.

A.7 Issue 5 Updates

Section	Update[Note 1]	
Page 1	Version update:	Version 4 changed to Version 5 (para. 2) and minor wording changes (para. 4).
2.1	Vinidex:	ZAP-GP and ZAP-GPSC DICL pipe with Zn/Al external coating added.
2.2	Hygrade Water:	Supplier of DN80 (Derwent) hydrants risers added.
2.2	Crevet/Iplex:	NIBF branded DI fittings added.
2.3	Crevet/Iplex:	NIBF branded DI fittings added.
2.6	Section Title:	Section title now updated to include press-fit fittings.
	Viega:	Viega Geopress K fittings added (except tapping saddles/valves).
	Limits of Use:	Update to limits of use and acceptable examples of metal-to-metal threaded fit-up.
2.11	Pipe Lining and Coating:	Typo corrected with regards to Fusionkote. This is an external not internal coating. Other application specific external coatings may be used in accordance with WSA 201 as amended by *STD-SPE-G-005*.
	General Notes:	General Note No. 3 updated to specifically state that seal coats are required on all SCL pipes of sizes up to and included DN300.

Section	Update[(Note 1)]	
2.15	Ebro Armaturen Pacific:	Model F012-A butterfly valve added.
	General Notes:	General Note No. 3 updated to state that the locking pin variant of VAG's EKN H Series may be used upon receipt of an Icon Water Principal Engineer's approval for a specific project.
2.16	Metaval:	Error correction: VAG SKR Series valve range corrected to be DN200 – DN600. Previously, DN80 – DN600 was shown. VAG RETO-STOP valves added.
	Limits of Use:	Update to Limits of Use No. 3 – stating that rubber-flap type check valves shall only be used if swing check or tilting disc check valves are inappropriate for the application and written approval has been obtained from the Icon Water Principal Engineer.
2.18	General Notes:	Added General Note No. 2.
2.20	Derwent International:	Hygrade Water now included as a supplier of Derwent branded spring hydrant valves.
2.22	Derwent International:	Derwent Type R tapped offtake repair clamps added.
2.25	Limits of Use:	Modification to Limit of Use No. 1 – "Asbestos pipes shall not be directly tapped".
2.26	General Notes:	Added General Note No. 3 (reference to *STD-SPE-M-006* for the water meter sizing schedule).
2.30	Storage Tanks and Reservoirs:	Major wording changes including a new table of approved tank suppliers/types as well as limits of use and general notes.
	Bolted Steel Panel Tanks:	New category. Kingspan, Tasman, Hunt Engineering (Tank Industries) and Pioneer added.
	Polyethylene:	New category. Bushmans Industrial added.
2.31	General Notes:	General Note No. 2 added stating that non-proprietary pipe spools may continue to be used in accordance with Icon Water's design and construction standards.
3.1	Vinidex:	ZAP-HAC DICL pipe with Zn/Al external coating added.
	Limit of Use No. 1:	Wording added as follows "DN150 is the minimum allowable size for gravity sewer mains". Note: This was an omission from previous issues of the APL.
3.2	Crevet/Iplex:	NIBF branded DI fittings added.
3.3	Limit of Use No. 1:	Wording added as follows "DN150 is the minimum allowable size for gravity sewer mains". Note: This was an omission from previous issues of the APL.

Section	Update[Note 1]	
3.8	Limit of Use No. 2:	New limit of use. DN150 is the minimum allowable size for gravity sewer mains. Note: This was an omission from previous issues of the APL.
3.10	Limit of Use No. 6:	New limit of use. DN150 is the minimum allowable size for gravity sewer mains. Note: This was an omission from previous issues of the APL.
3.12	Limit of Use No. 4:	New limit of use. DN150 is the minimum allowable size for gravity sewer mains. Note: This was an omission from previous issues of the APL.
3.16	Ebro Armaturen Pacific:	Stafsjo PN10 knife gate valve added.
3.18	Metaval:	VAG RETO-STOP valves added.
	Limits of Use:	Update to Limits of Use No. 3 – stating that rubber-flap type check valves shall not be used without the written permission of the Icon Water Principal Engineer.
4.1	Hygrade Water:	Hygrade Water supplied stop valve cover surrounds and hydrant cover surrounds (in reinforced plastic) added.
	Iplex Pipelines / Crevet:	NIBF CI stop valve covers (and Iplex reinforced surrounds) as well as NIBF CI hydrant covers (and Iplex reinforced surrounds) added.
4.4	Wenac:	Wenac detectable and undetectable marker tape added for potable water and sewer mains.
7.1	Item 6 - Resilient Seated Gate Valves:	Size range increased to DN1000 for AVK manufactured valves only. All other manufacturers are limited to the sizes shown in Section 2.12.
App. D	Update History:	Product and material update history (for Issue 4) added.

Section 6 Electrical, Instrumentation and Control Updates

Product	Brand	Part #	Reason for change or addition
Float Switch	Clipsal Xylem	PDL-SF5 Flygt ENM-10	Added the two part numbers for each corresponding switch.
Level Switch – Vibrating Liquid/Solid	Endress+Hauser	FTM50	Updated to newer model as older one (FTM30) is discontinued.
Lightning and Surge Protection	Phoenix Contact	DT-LAN-CAT.6+ (2881007)	Added Ethernet Surge Protection.

Section	Update[Note 1]		
Large High Voltage UPS	Eaton	9130	Product has reached EOL and has been superseded by 9SX range. Changed description to suit changes in UPS nomenclature.
Small Low Voltage UPS	Eaton	PW9130	Product has reached EOL and has been superseded by 9SX range. Changed description to suit changes in UPS nomenclature.
Small Extra Low Voltage UPS	Phoenix Contact	QUINT-UPS/24DC/12DC/5/24DC/10	Changed name to suit changes to UPS nomenclature.
Small Extra Low Voltage UPS Battery	Phoenix Contact	UPS-BAT/VRLA/24DC/12AH (2320322)	Changed name to suit changes to UPS nomenclature.

Notes:

1. The updates in the table above refer to additional product approvals in Issue 5 (compared to Issue 4) unless shown otherwise.

A.8 Issue 4 Updates

Section	Update(Note 1)	
Page 1	Version Update:	Version 3 changed to Version 4 (para. 2).
Various	Reece Civil:	Due to a change in ownership structure, Reece Civil can now supply products that were previously sourced from Viadux. This APL has been updated to show Reece Civil as a supplier where appropriate.
2.1	Crevet/Iplex: Beaver Process: Limits of Use Update:	Irontite deleted and replaced with the Xinal 400+ product. Jindal SAW zinc/aluminium coated product Sleeving not necessarily required depending upon the soil aggressivity and the external pipe coating.
2.3	Viadux; Reece Civil:	Sureflow Readytap approved size range increased to include DN300. Limits of use updated to notify potential purchasers of the the approximate lead time for these items.
2.8	Victaulic:	Victualic Style 905 “Refuse-to-Fuse” coupling. Added EN12842 in General Note 1 as it is relevant to the Victualic product.
2.12	AVK: Challenger: Derwent: Viadux: Limits of Use:	Approved size range extended down to DN50. Approved size range extended to DN750. Approved size range extended from DN50 to DN600. Sureflow Fig. 500R range extended down to DN50. The previous Challenger and Derwent limits of use (No. 4) amended as per the size range increase above. Extension spindle requirements added to.
2.13	Limits of Use Update:	Extension spindle requirements added to.
2.14	Limits of Use Update:	Bermad to only be purchased if Ventomat valves are impracticable due to size/space considerations.
2.15	Challenger:	Approved size range extended to DN300.

Section	Update(Note 1)	
2.16	Crevet/Iplex: Ebro Armaturen:	Dobbie branded metal-seated swing check valves. Error correction – size range now DN150 to DN750.
2.17	Challenger:	SSRV2 BSPT SS Watermarked ball valve.
2.18	Reece Civil:	LOGI Valve UWF Series.
2.21	Reece Civil: Limits of Use Update:	Zurn RPZD kits DN200 and DN250 RPZDs may be installed in the network.
2.23	Victaulic:	Victualic Style 905 “Refuse-to-Fuse” coupling. Added EN12842 in General Note 2 as it is relevant to the Victualic product.
2.24	Victaulic:	Victualic Style 905 “Refuse-to-Fuse” coupling. Added EN12842 in General Note 1 as it is relevant to the Victualic product.
2.28	Caprari:	Caprari pump range added to pre-approved tenderer list.
2.31	Re-named Section:	New section for pre-fabricated pipe spools.
2.32	Moved Section:	Pressure gauges moved from Section 2.31 to 2.32.
2.33	New Section:	Chemical Dosing Units – Potable Water Network
3.1	Crevet/Iplex: Beaver Process: Limits of Use Update:	Irontite deleted and replaced with the Xinal 400+ product. Jindal SAW zinc/aluminium coated product Sleeving not necessarily required depending upon the soil aggressivity and the external pipe coating.
3.7	Victaulic:	Victualic Style 905 “Refuse-to-Fuse” coupling. Added EN12842 in General Note 1 as it is relevant to the Victualic product.
3.14	AVK: Challenger: Derwent: Viadux: Limits of Use:	Approved size range extended down to DN50. Approved size range extended to DN600. Approved size range extended from DN50 to DN600. Sureflow Fig. 5000R range extended down to DN50. The previous Challenger and Derwent limits of use (No. 5) amended as per the size range increase above. Extension spindle requirements added to.
3.15	AVK: Limits of Use Update:	AVK Flow Control metal seated gate valves. Extension spindle requirements added to.
3.16	Limits of Use Update:	Extension spindle requirements added to.
3.18	Crevet/Iplex:	Dobbie branded metal-seated swing check valves.
3.19	Challenger:	SSRV2 BSPT SS Watermarked ball valve. SS2013N 3-piece ball valve.
3.21	Victaulic: Derwent:	Victualic Style 905 “Refuse-to-Fuse” coupling. Added EN12842 in General Note 1 as it is relevant to the Victualic product. Sewer OB clamps.
3.22	Victaulic:	Victualic Style 905 “Refuse-to-Fuse” coupling.
3.27	Humes:	DN1050 maintenance holes no longer approved.
4.1	Limit of Use Update:	Plastic surrounds shall be Class B and installed in non-trafficable areas.
4.5	Webforge: Weldlok: Hygrade Water: ACO Polycrete:	Circular access covers DCC6BB2 and DCC6DB2LT. Circular access covers STDC6S-2B and STDC6SW-2D. Circular access covers CSA60B1 and CSA60D1. SAKU thermoplastic cover (for replacement covers only)
4.8	Parchem: General Notes Update:	Emer-Seal CR. General Note No. 2 added.
4.9	SAYFA Systems: Limits of Use: Generate Notes Update:	Sentry Guardrail System (for rooftop applications) Modification/addition to limits of use. Modification to General Note 1.
4.12	Hydrant Protection:	Company name change (formerly Hydratect).
4.13	New Section:	Insulation Products

Section	Update(Note 1)	
6	EI&C:	Minor updates – not listed. Refer to Icon Water's Engineering Services Team for specific details.
7.1	Pre-fabricated Spools: Chemical Dosing Units:	Added and in accordance (preferably) with Section 2.32 Added and in accordance with Section 2.33.
App. D	Product and material update history (for Issue 4) added.	

Notes:

1. The updates in the table above refer to additional product approvals in Issue 4 (compared to Issue 3) unless shown otherwise.

A.9 Issue 3 Updates

Section	Update(Note 1)	
2.3	Derwent Industries:	Dertap pre-tapped connectors
2.5	Cromford Pipe:	Polyethylene PE100 pipe, SDR 11 (PN16) "Identi-Pipe"
2.6	Error correction:	Plasson DN20 and DN25 PE compression fittings not available
2.10	Ridgid:	Ridgid RP340 tooling for Conex >B< Press
2.12	Viadux: Error Correction:	Sureflow III RSGV AVK Series 570 RSGVs available up to and including DN400. Previously shown as only available up to and including DN150.
2.16	VAG: Ebro:	SKR Series slanted tilting disc check valves Ebro TDC Series check valves
2.17	DURA:	Dura Eagle Watermark ball valves
2.18	Zetco: Viadux:	Series 1245 DN20 ball valve "ACTEW" water meter valve and riser kits
2.23	Teekay:	Teekay Plastlock repair clamps (for polyethylene pipe)
2.24	Viking Johnson: Viadux: AVK: Teekay: Straub:	Viking Johnson dismantling joints Sureflow dismantling joints Series 265 dismantling joints Axiflex, Axilock-S and Axilock couplings Grip-L couplings
2.26	Limits of Use Update:	Elster V100 and V300 water meters do not require straight lengths of pipe to be fitted either side. All others require minimum straight lengths either side.
2.31	WIKA:	Pressure gauges, liquid-filled
3.3	Pipe King: Limits of Use Update:	Pipe King PVC-U non-pressure (DWV) pipes Pipe lengths to be 3.0 metres except for DN100 SN10 sewer ties
3.4	Holman: Pipe King:	FabFit (Holman) PVC-U non-pressure (DWV) fittings Pipe king PVC-U non-pressure (DWV) fittings
3.5	Cromford Pipe:	Polyethylene PE100 pipe, SDR 11 (PN16) "Identi-Pipe"
3.14	Viadux: Error Correction:	Sureflow III RSGV AVK Series 570 RSGVs available up to and including DN400. Previously shown as only available up to and including DN150.
3.16	AVK:	Orbinox BT Series 22 knife gate valves
3.19	DURA:	Dura Eagle Watermark ball valves
3.21	Teekay:	Teekay Plastlock repair clamps (for polyethylene pipe)
3.22	Viking Johnson: Viadux: AVK: Teekay: Straub:	Viking Johnson dismantling joints Sureflow dismantling joints Series 265 dismantling joints Axiflex, Axilock-S and Axilock couplings Grip-L couplings
3.29	WIKA:	Pressure gauges, liquid-filled
4.1	Limits of Use Update:	Plastic stop valve covers and plastic hydrant boxes specifically prohibited. Plastic surrounds are acceptable with cast iron stop valve covers and hydrant boxes.

Section	Update(Note 1)	
4.3	Tracer Wire:	2.0 mm SS316 tracer wire for mains-to-meter applications, unbranded
4.4	Error Correction: 421 Products: Bridgland:	TAPEX range corrected. TAPEX tape wording corrected. Underground detectable and non-detectable marker tape Underground detectable and non-detectable marker tape
4.8	Epirez: Sikaflex:	Epirez 633 epoxy mortar Sikaflex Pro, Sika Primer 3N
4.9	Limits of Use Update:	Handrails and stanchions shall be fully welded
4.10	Treadwell:	Treadwell FRP grating
4.11	Trenchfill: Embedment: Geotextile Fabric:	TCCS specifications DGS20, DGS40 and GMS40 WSA PS-363 WSA PS-350, WSA PS-351, WSA PS-352, WSA PS-360, WSA PS-361, WSA PS-364 WSA PS-355
4.12	Hydratect:	Hydraguard and Retroguard ant barriers for spring hydrant installations
App. A	Minor wording change	
App. B	Minor wording change	
App. C	New appendix added to show designer and contractor usage requirements	
App. D	New appendix added to show product and material update history	

Notes:

1. The updates in the table above refer to additional product approvals in Issue 3 (compared to Issue 2) unless shown otherwise.

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