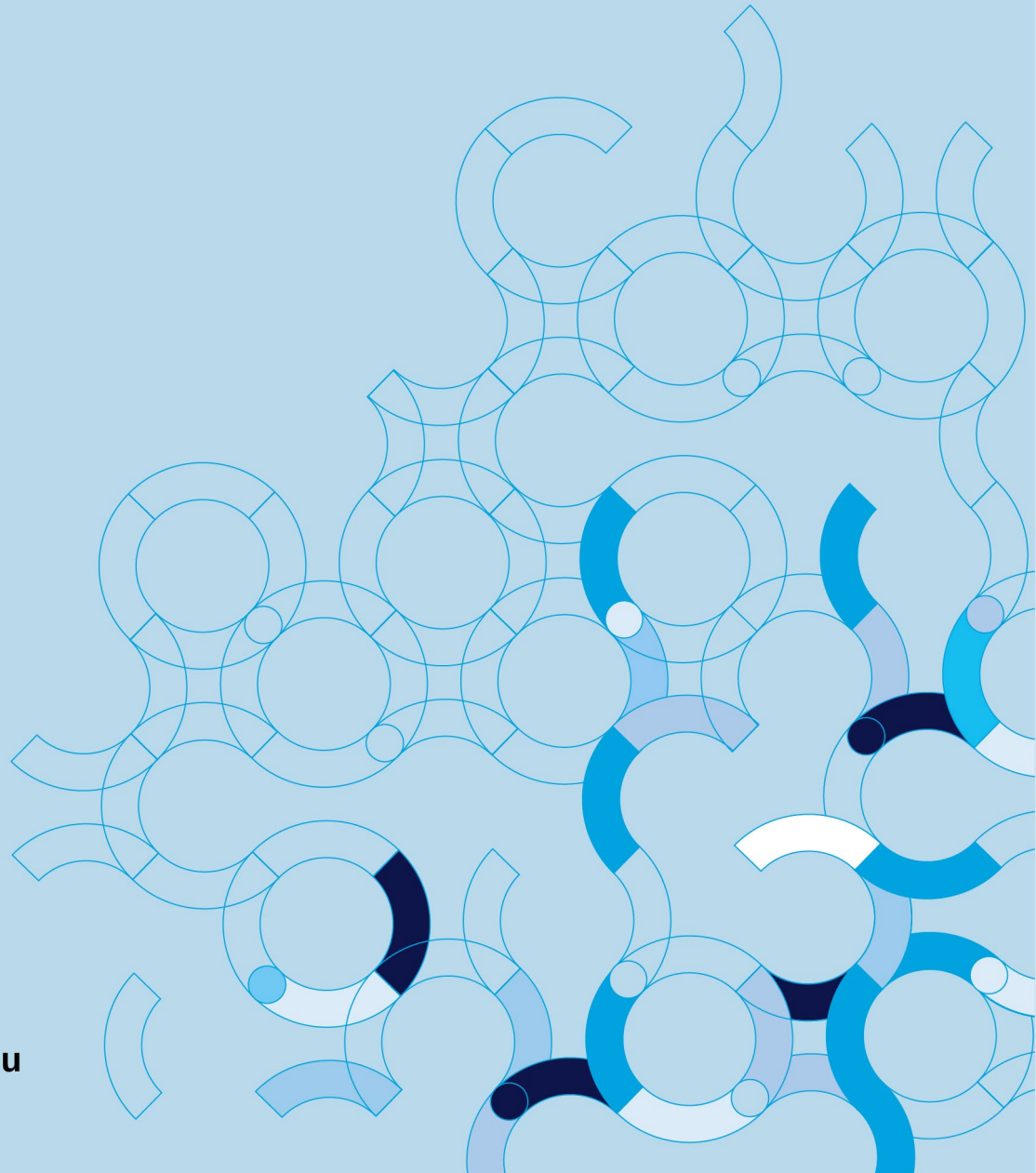
STD-SPE-G-012

Technical Specification

SUPPLEMENT TO WSA 03-2011-3.3 WATER SUPPLY CODE OF AUSTRALIA

December 2025



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Document management

Document authorisation table

Issue	Date	Author	Reviewer	Approver
1	08/03/2018	K. Danenbergsons	N/A	N/A
2	02/07/2018	K. Danenbergsons	Various	D. Eager
3	30/08/2019	K. Danenbergsons	Various	C. Patrick
4	20/03/2022	B. Pearn O. Gould R. Bhandari S. Bursle	S. Asadollahi	N. Vonarx
5	03/05/2022	R. Bhandari	S. Asadollahi	N. Vonarx
6	17/12/2025	C. Allen	R. Bhandari P. Deb Roy	D. Eager

Version control table

Issue	Date	Reason for issue
1	08/03/2018	Initial issue for public and internal consultation
2	02/07/2018	Issued for use
3	30/08/2019	Amended as shown in Appendix B and re-issued for use
4	20/03/2022	Update to align with WSA 03 (Version 3.2)
5	03/05/2022	Minor amendment (clause 5.12.5.2 only)
6	17/12/2025	Adopted WSA 03 Version 3.3, Completed amendments as shown in Appendix B and updated to latest standard specification template.

Document applicability table

Asset area	Applicable (Yes/No)	Asset area	Applicable (Yes/No)
Dams (DAM)	No	Water Network (WAT)	**Yes**
Bulk Water Supply (BWS)	No	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

Contents

1 Introduction

1.1 Background

Icon Water has adopted Water Services Association of Australia (WSAA) codes and specifications as a basis for its own water and sewerage network design and construction standards (aka “Icon Water Standards”). This is to ensure consistency with the majority of Australian urban water agencies thereby making it easier for engineering service providers to better understand Icon Water’s requirements.

This document is Icon Water’s supplement to the 2011 version (3.3) of WSA 03 Water Supply Code of Australia. WSA 03 is available from the WSAA online shop. Refer to https://www.wsaa.asn.au/shop for further details relating to purchasing this code.

This document shall be read in-conjunction with WSA 03, and all details described within this document are mandatory requirements and shall not be amended without the written consent of Icon Water.

1.2 Scope

WSA 03 has been designed to be read in-conjunction with each urban water agency’s specific requirements for asset creation, asset acceptance, and work as executed records and approved products etc. This document (and WSA 03) is applicable to the asset areas shown in the document applicability table (located prior to the table of contents).

This document takes precedence over the requirements detailed in WSA 03. However, designers and constructors must familiarise themselves with the requirements of WSA 03 and shall not rely solely on this document for design and construction requirements.

Specific details relating to property service connections (aka “mains-to-meter” connections) are not included in this document and instead are detailed in Icon Water specification STD-SPE-M-006 Requirements for Property Service Connections and Water Meters as well as in Icon Water’s SD Series of standard drawings. This has been done so that licensed plumbers do not need to purchase and familiarise themselves with WSA 02 and WSA 03 if their scope of work is solely limited to installing water meters and associated consumer premises plumbing from the tie point.

Icon Water is not responsible for the design, operation and maintenance of internal plumbing systems including firefighting systems. Qualified fire engineers and other professionals shall be engaged by the developer or landowner to perform these functions with appropriate approvals from relevant authorities such as ACT Fire & Rescue.

1.3 Purpose

The purpose of this document is to modify some specific requirements of WSA 03:

- In situations where Icon Water believes that the same, or an improved outcome can be achieved through alternative means.
- In situations where the historical practices used in the ACT are still acceptable but in conflict with the requirements of WSA 03 and it is not practical to change these practices.

- When local conditions such as climate, terrain, topography and available materials etc. dictate alternative methods and means are to be employed.
- When ACT legislation or ACT government agencies have alternative requirements.

1.4 Referenced documents

All works carried out shall be in accordance with the requirements of:

- This specification, including all documents referenced by each section of the specification:
- The documents listed in Table 1.4.1.
- The relevant Icon Water Work Instructions (which will be provided where applicable on a project-by-project basis).
- The relevant WorkSafe ACT, WorkCover NSW and SafeWork Australia codes of practice.

The work shall also comply with the requirements of all relevant legislation, bodies and codes. The order of precedence for this specification, from highest to lowest are:

- Legislative requirements
- Icon Water Specifications
- WSAA standards
- Australian Standards

The Designer or Contractor (as applicable) shall notify the Icon Water Representative of any ambiguity or discrepancy discovered. In the event of an ambiguity or discrepancy, the Icon Water Representative shall direct the Designer or Contractor as to the interpretation to be followed in carrying out the work.

Where there is no suitable Australian Standard available, an agreed international standard and/or industry current best practice shall be adopted. If an international standard is proposed in lieu of an Australian Standard, the Contractor shall submit to the Icon Water Representative for approval a detailed assessment to show that the proposed standard is equivalent or superior to the relevant Australian standard.

Drawings are not to be scaled. Where any discrepancy exists between figured and scaled dimensions the figured dimensions shall prevail.

The documents listed in Table 1.4.1 are either referenced by within this specification or shall be read in-conjunction with this specification and be complied with.

Table 1.4.1 – Referenced Documents

Item	Document number	Title
Australian standards		
1	AS 1657	Fixed platforms, walkways, stairways and ladders – Design, construction and installation
2	AS 2419.1	Fire hydrant installations – Part 1: System design, installation and commissioning
3	AS/NZS 2566	Buried flexible pipelines (all parts)
4	AS/NZS 3500	“Plumbing code of Australia”
5	AS 3680	Polyethylene sleeving for ductile iron piping
6	AS 3681	Application of polyethylene sleeving for ductile iron piping
7	AS 3952	Water supply - Spring hydrant valve for waterworks purposes
8	AS/NZS 4853	Electrical Hazards on Metallic Pipelines
WSAA codes and publications		
9	WSA 03	Water Supply Code of Australia
10	WSA 201	Manual for the selection and application of protective coatings
11	None allocated	WSA Product Specifications
Icon Water standards		
12	SD Series	Standard Drawings
13	STD-SPE-G-005	Supplement to WSA 201 Manual for the selection and application of protective coatings
14	STD-SPE-G-008	Technical specification - Design requirements for safe access, egress and working at heights
15	STD-SPE-G-009	Supplement to AS 1657 Fixed Platforms, Walkways, Stairways and Ladders – Design, Construction and Installation
16	STD-SPE-G-017	Water and Sewerage Service and Installation Rules (Document under review, title to be updated)
17	STD-SPE-G-018	Design Standards, Standard Specification Drafting
18	STD-SPE-G-019	Developer Provided Assets Water Supply and Sewerage Asset Creation and Acceptance Process
19	STD-SPE-G-025	Requirements for Working Near Assets

Item	Document number	Title
20	STD-SPE-C-004	Survey and Tolerancing Requirements
21	STD-SPE-E-008	Network Metallic Pipeline Electrical Hazard Design Requirements
22	STD-SPE-M-003	Hydraulically Operated Automatic Water Control (Globe) Valves
23	STD-SPE-M-006	Requirements for Property Service Connections and Water Meters
24	STD-SPE-S-002	Reservoirs
City and Environment Directorate standards		
25	MIS 06	Municipal Infrastructure Standards, Part 6, Verges
Plastics Industry Pipe Association of Australia		
26	POP001	Electrofusion Jointing of PE Pipe and Fittings for Pressure Applications
27	POP003	Butt Fusion Jointing of PE Pipes and Fittings – Recommended Parameters and Practices
Pump Industry Australia		
28	None Allocated	The Australian Pipe Friction Handbook
Crane		
29	TP410	Flow of Fluids
DS Miller (BHR Group)		
30	None Allocated	Internal Flow Systems
Hydraulics Institute		
31	None Allocated	Engineering Data Book

Note: The documents shall be the latest publication at the time of award of contract for execution of the works unless noted otherwise in the project specific documentation.

1.5 Designer qualifications and experience

According to the Professional Engineers Act 2023, a professional engineer is an individual registered under the Act to carry out professional engineering services in one or more areas of engineering including civil, electrical, fire safety, mechanical, and structural. Registered engineers in the ACT are registered with the Professional Engineers Registrar, which is part of the ACT government. This Registrar manages the registration process, including assessing applications, maintaining the register of professional engineers, and ensuring compliance with the Act.

The Designer, or the engineer directly supervising the Designer, must be a professional Engineer registered under the **ACT Professional Engineers Registration Scheme** in the relevant area of Engineering (known herein as a **Registered Engineer**) and hold chartered status with Engineers Australia. The engineer holding such status must be able to demonstrate that they are suitably experienced, and they shall certify in writing that the design complies with the relevant codes, standards, legislative requirements and the requirements of this specification.

2 Amendments and additions to WSA 03 (Version 3.3)

This section provides amendments and additions to WSA 03. These amendments and additions shall be treated by designers, suppliers, specifiers and constructors etc. as being mandatory requirements that either supersede or supplement (as applicable) the requirements of WSA 03.

2.1 Amendments and additions to WSA 03 Introduction and Part 0

Table 2.1.1 details amendments and additions to WSA 03: Introduction and Part 0: Glossary of Terms and Abbreviations.

Table 2.1.1 – Amendments and additions to WSA 03: Introduction and Part 0: Glossary of Terms and Abbreviations

WSA 03 Introduction and Part 0 Page Ref.	Amendment and/or addition
Page 8	**SCOPE OF CODE** Delete paragraph 3 and replace with the following wording: Whilst the Water Supply Code of Australia covers the planning, design and construction of transfer, distribution and reticulation drinking and non-drinking water mains and services pipes up to DN1200, Icon Water only applies the Water Supply Code of Australia to distribution and reticulation drinking water mains up to and including DN750. The concepts may be applied to larger transfer and bulk supply mains should Icon Water's other standards and specifications be "silent" with respect to a particular application.
Page 10	After the section titled "**Water Industry Standards**", add the following section and wording. **Icon Water Standards and Specifications** The latest versions of the following Icon Water standards and specifications are to be complied with in every potable water network supply project: • "SD Series" drawings • STD-SPE-G-005 Supplement to WSA 201, Manual for the Selection and Application of Protective Coatings • STD-SPE-G-006 Approved Products List • STD-SPE-G-008 Design Guidelines for Safe Access, Egress and Working at Heights • STD-SPE-G-009 Supplement to AS 1657 Fixed Platforms, Walkways, Stairways and Ladders – Design, Construction and Installation • STD-SPE-G-017 • STD-SPE-G-018 Design Standards, Standard Specification Drafting • STD-SPE-G-019 Developer Provided Assets Water Supply and Sewerage Asset Creation and Acceptance Process • STD-SPE-G-025 Requirements for Working Near Assets • STD-SPE-C-004 Survey and Tolerancing Requirements • STD-SPE-M-003 Hydraulically Operated Automatic Water Control (Globe) Valves

WSA 03 Introduction and Part 0 Page Ref.	Amendment and/or addition
	• STD-SPE-M-006 Requirements for Property Service Connections and Water Meters • STD-SPE-S-002 Reservoirs The abovementioned listing of standards and specifications is not exhaustive and is subject to change. A full, up-to-date listing and all relevant standards and specifications can be accessed and downloaded from Icon Water's website at www.iconwater.com.au
Pp 37-53	**GLOSSARY OF TERMS** Add a new term "**95th percentile demand**" with the following definition: The flow rate in the water network that Icon Water shall take all reasonable steps to make provision for 95% of the time when determined on an hour-by-hour basis. To calculate the design 95th percentile demand, multiply the design peak hour demand by 0.66. Add the following wording to the definition for "**access chamber"** An access chamber can also be known as a buried maintenance structure, or specifically as a valve chamber or scour chamber etc. within Icon Water's referenced standards and specifications. Add a new term "**ACT**" with the following definition: The Australian Capital Territory. Delete the definition of "**allotment**" and insert the words… Where the term "allotment" or "lot" has been provided within WSA 03, insert the words "block of land". Add a new term "**block of land**" with the following definition: An area of land on the final plan of a subdivision for which a separate Land Act Lease will be issued on completion of the subdivision. Delete the definition of "**Concept Plan**" and insert the words… A package of information provided to the designer by Icon Water to enable the appropriate planning/design of major water system components to be performed. This information package has traditionally been referred to as a "Water Supply and Sewerage Strategy Plan" in some Icon Water documentation. Delete the definition of "**Designer**" and replace with the following definition: A person or organisation engaged by either Icon Water, the Developer or a Constructor to design the works on their behalf. Delete the definition of "**Developer**" and replace with the following definition: Any person or company who undertakes works, either within or outside leased land, which will require modifications or additions to Icon Water's hydraulic networks.

WSA 03 Introduction and Part 0 Page Ref.	Amendment and/or addition
	Add a new term "**Fire Risk Type (FRT)**" with the following definition: A classification system (agreed between ACT Fire and Rescue and Icon Water) used to define the minimum available firefighting water flow requirement for different types of buildings, and building developments, within the ACT (abbreviated as FR). Delete the definition of "**lot**" and insert the words… Where the term "allotment" or "lot" has been provided within WSA 03, insert the words "block of land". Add a new term "**Equivalent Tenement**" with the following definition: Equivalent Tenement (ET) means a proposed or existing dwelling that will have the design demands presented in the residential section of Table **IW.1** of this standard. Add a new term "**Master Plan**" with the following definition: Plan showing the detailed layout and sizes of water supply reticulation mains serving a proposed land package. Plans show the general location of mains, pressure zone boundaries and valve layouts. Add a new term "**NATA**" with the following definition: National Association of Testing Authorities Replace "**peak day demand**" The highest average demand over a day. This could be a measured value or a theoretical value based upon modelling. Add a new term "**peak hour demand**" with the following definition: The average flow rate that occurs in the Water Network during the single hourly period when water consumption is at its highest. The peak hour demand is a calculated (theoretical) value based on the results of system modelling and flow test data. Add a new term "**Pipe Protection Envelope (PPE)**" with the following definition: The term has the same meaning as provided in *STD-SPE-G-017*.

WSA 03 Introduction and Part 0 Page Ref.	Amendment and/or addition
	Add a new term "**residual pressure**" with the following definition: Has the same meaning as provided in *AS 2419.1Fire hydrant installations – Part 1: System design, installation and commissioning*. Add a new term "**CED**" with the following definition: ACT Government City and Environment Directorate. Add a new term "**Technical Authority**" with the following definition: Technical Authority refers to the roles and responsibilities a regulated utility must nominate and establish to verify and approve technical decisions and deliverables related to the obligations of the Water and Sewerage Technical Code (see section 2.3 of Technical Code). The Technical Authority must be clearly defined, for instance as a delegation with reference to the experience, qualifications, registration under the Professional Engineers Act, and accountabilities of each position. Add a new term "**water services**" with the following definition: Has the same meaning and function as provided in Section 12 of the Utilities Act 2000. Add a new term "**water network**" with the following definition: Has the same meaning and function as provided in Section 12 of the *Utilities Act 2000*. Add a new term "**Work as Executed (WAE)**" with the following definition: Has the same meaning as "Work as Constructed" and is traditionally the term used in Icon Water documentation. Refer to "Work as Constructed" for a specific definition. Add a new terms "**RZ"** with the following definition: Residential Zone. The Territory Plan uses zones to specify the planning controls for a particular area or block of land. These zones determine how the land can be used and what can be built. Refer to Territory Plan 2023
Page 53-58	**II ABBREVIATIONS** Add the following abbreviations: ACT — The Australian Capital Territory ACTF&R — ACT Fire and Rescue CED — City and Environment Directorate WAE — Work as executed

2.2 Amendments and additions to WSA 03 Part 1

Table 2.2.1 details amendments and additions to WSA 03 Part 1: Planning and Design.

Table 2.2.1 – Amendments and additions to WSA 03 Part 1: Planning and Design

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 66	**1.1 SCOPE** Add a new paragraph directly after the section title as follows: The details provided in this section shall be taken to be general water agency requirements and shall be read in-conjunction with Icon Water specification *STD-SPE-G-019 Developer Provided Assets Water Supply and Sewerage Asset Creation and Acceptance Process*. The specific requirements of *STD-SPE-G-019* shall take precedence over the generic requirements detailed in this section should any conflict or ambiguity exist.
Page 71	**1.2.5.3 Design outputs** Add a new paragraph at the end of this section … Design Drawings shall comply with Icon Water's drafting standards as detailed in specification *STD-SPE-G-018 Design Standards, Standard Specification Drafting*. Service location survey must be undertaken prior to submission of detailed design documents to Icon Water for all major and complex works.
Page 71	**1.2.6 Design Life** Reword the second paragraph as follows… Minimum asset design lives for water supply distribution items are shown in Table 1.2. Modify Table 1.2 by changing the words "Expected design life, years" to "Minimum required asset design life, years".
Page 73	**2. SYSTEM PLANNING** Insert the following words directly after the section title as follows: The details provided in this section shall be taken to be general water agency requirements and shall be read in-conjunction with Icon Water specification *STD-SPE-G-019 Developer Provided Assets Water Supply and Sewerage Asset Creation and Acceptance Process*. The specific requirements of *STD-SPE-G-019* shall take precedence over the generic requirements detailed in this section should any conflict or ambiguity exist.
Page 75	**2.3.3 Demand assessment** Insert the following words directly after the section title as follows: The details provided in sections 2.3.3.1, 2.3.3.2, 2.3.3.3, 2.3.4.1, 2.3.4.2 and 2.3.4.3 shall be taken to be general water agency requirements and shall be used for information only. The following Icon Water specific details and requirements shall take precedence when determining demand and hence sizing/specifying network elements:

WSA 03 Part 1 Page Ref.	Amendment and/or addition

Table IW.1 Water Network Design Flows

Development Type / Land Use	Definition of Development	Units	Peak Day Demand	Peak Hour Demand	95th Percentile Demand
Residential					
Residential Low Density	<800m^2 to ≥500m^2 block area per dwelling	L / tenement / day	1500	3750	2475
Residential Medium Density	<500m^2 to ≥250m^2 block area per dwelling	L / tenement / day	1200	3000	1980
Residential High Density	<250m^2 block area to ≥100m^2 floor area per dwelling	L / tenement / day	950	2375	1567.5
Residential Super High Density	<100m^2 floor area per dwelling	L / tenement / day	550	2200	1452
Non-Residential					
Suburban hotels or clubs		L / Ha (block area) / s	0.6	1.5	0.99
Neighbourhood and District Centres		L / Ha (block area) / s	0.332	0.83	0.5478
Town or City Centres		L / Ha (block area) / s	0.432	1.08	0.7128
Office Buildings less than three storey		L / Ha (block area) / s	0.24	0.6	0.396
Office Buildings three storey or more		L / Ha (floor area) / s	0.432	1.08	0.7128
Sports Centres		L / Ha (block area) / s	0.6	1.5	0.99
Schools		L / Ha (block area) / s	0.456	1.14	0.7524
Hospitals, Nursing Homes		L / Ha (block area) / s	0.68	1.7	1.122
Other Institutional		L / Ha (block area) / s	0.18	0.45	0.297
Light Industrial		L / Ha (block area) / s	0.216	0.54	0.3564
Playing Fields: Automatic Night Watering	Based on 8hrs at peak flow (3.5L/s)	L / Ha (irrigated area) / s	1.2	3.5	2.31
Future Development Details Unknown		L / Ha (block area) / s	0.6	1.5	0.99

Notes:

1. Table IW.1 provides design values for new developments. Observed peak demands shall be used when estimating the demand requirements of existing developments where possible.
2. 95th percentile demands are calculated by multiplying the Peak Hour Demand by 0.66

WSA 03 Part 1 Page Ref.	Amendment and/or addition

3. In most cases:
    a. Peak Day Factor (PDF) is 2.8 times Average Day Demand.
    b. Peak Hour Factor (PHF) is 2.5 times peak day demand
4. To assess the residential category density for multi-dwellings on a block, use 80% of gross area if shared space has not already been identified.
5. To assess the residential category for multi-dwellings in a building, use 80% of gross floor area if shared space has not already been identified.
6. For residential blocks greater than 800m^2, consult with Icon Water to determine the requirements.
7. Residential High Density covers two types of development:
    a. Single dwelling or town house style development where the block area per dwelling is below 250 m^2.
    b. Where tenements are above other tenements (e.g. multi-story apartments) and the floor area per dwelling is greater than or equal to 100 m^2.
8. Residential High Density and Residential Super High Density may require additional components of demand to be considered at Icon Water's discretion. Icon Water needs to be consulted if swimming pools area sum to >10% of block area or irrigated gardens area sum to >30% of block area.
9. The values provided in the table above assume that there are no specific measures employed that would reduce demand rates (e.g. the adoption of alternative water sources for non-drinking use outside the building code requirements). Where such measures are included, the specific advice of Icon Water shall be sought regarding the design method and demand allowances to be employed.
10. Playing fields and other irrigation: If operational times can be guaranteed to be outside local peak demand periods, then Icon Water may grant exemptions.

Table IW.2 Fire Risk Types and Firefighting Flow Provisions

FRT	New Categories	Flow (L/s)
FRTx	Targeted development does not fit well and requires specific assessment	Specified
FRT1	Residential building (RZ1, RZ2, RZ3)	25
FRT1.5	FRT1 assessed development in a high risk area (as defined by ACTF&R)	32
FRT2	Residential buildings (RZ4+), Parks and Recreation with a building (PRZ1, PRZ2)	45
FRT3	Commercial land use (non-core – i.e. CZ2-CZ6), Community Facility (CFZ)	60
FRT4	Commercial core land use (CZ1)	100
FRT5	Industrial land use (IZ1-IZ2)	150

WSA 03 Part 1 Page Ref.	Amendment and/or addition

Notes:

1. The Minimum Available Firefighting Flow Provision shall be taken to occur concurrently with the 95th percentile demand as calculated from Table IW.1. Pipe sizes shall be designed to allow for the concurrent supply of these demands.
2. The Minimum Available Firefighting Flow Provision is the total required firefighting flow including the internal firefighting system and reticulation hydrants.
3. The Fire Risk Type assessment approvals for new developments are performed by ACTF&R. The developer must provide Icon Water with the written assessment from ACTF&R to ensure the design is for the correct fire flow. Note that in the case where developers require higher flows than approved by ACTF&R or higher than the maximum in local area, augmentation costs could fall on the developer (i.e. not eligible for capital contributions program).
4. FRTx is available for developments that are not easily placed in any of the other categories (for example, hospitals and stadiums) or exceptional circumstances.
5. FRT4 includes town centres like Civic and Belconnen and large shopping centres like Kippax and Erindale
6. FRT5 includes industrial areas of Canberra including Mitchell, Fyshwick and Hume
7. Upon ACTF&R assessment, developments in and adjacent to bushfire prone areas could be rated as FRT1.5. If a higher assessment is made for a development, it will supersede the FRT1.5 assessment.
8. Pipe sizes shall be checked to ensure that while drawing the specified Minimum Available Firefighting Flow at points within 150 metres of the fire ground (concurrently with the 95th percentile demand), residual pressures in Icon Water's mains do not fall below the value stipulated in Table IW.3. The minimum residual pressure is to be achieved with reservoirs at half capacity and an allowance for reservoir losses of 1.5 metres. No performance criteria are set down for firefighting flows with temporary network failures.
9. The minimum available fire flow for FRT1.5 is to be delivered by four consecutive hydrants on the bushfire prone side of the development (>8L/s each). One of the hydrants should be the closest to the development.

On-site fire-fighting requirements

There could be cases where the required firefighting flows cannot be met economically with a network solution, for example because:

- Guaranteed flow is required even in the event of temporary network failure
- Local network meets an older standard
- Other local developments could be impacted negatively by a capacity augmentation (water quality issues).

In these cases, Icon Water and ACTF&R may consider alternative solutions such as local storage tanks. Water cannot be pumped directly from the property service connection without Icon Water's prior written approval. Direct boosting has the potential to generate nuisance or damage in the Icon Water network or surrounding customer property. Refer to *STD-SPE-M-006 Requirements for Property Service Connections and Water Meters* for more details.

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2.4 SYSTEM CONFIGURATION

After Fig. 2.3 add the following text:

Notwithstanding the above-mentioned generic water agency requirements, all elements of Icon Water's water supply system shall be planned and detailed to

WSA 03 Part 1 Page Ref.	Amendment and/or addition
	ensure as high a level of reliability as is reasonable. Elements which should be incorporated into a system layout so that reliability is enhanced include: • for critical mechanical equipment, a standby capacity sufficient to maintain full capacity with any one element out of service. • For distribution systems downstream of reservoirs, a 'looped' rather than 'branched' layout is generally used to provide more than one supply route on distribution systems (i.e. similar to Fig. 2.1(c) above). Valving shall be arranged as per the requirements of Section 8.2. These valving arrangements help to limit the area needing to be shut down when isolating and repairing any section of main. • for all reservoirs, either duplicate tanks or pressure regulated bypass arrangements to maintain a rate of supply to the distribution system equivalent to at least the design bulk supply rate (if the reservoir is out of service). • Emergency storage in reservoirs, which in addition to providing a reserve for firefighting, can be used to maintain a distribution supply for limited periods during bulk supply interruptions. Inter-zone connections or other arrangements can usually be made to maintain some supply. In some extreme cases, it may be necessary to contact consumers and request sparing the use of water until repairs can be completed. The limited periods referred to above, for maintaining supply, range from a few hours during prolonged high demand (in summer) to a few days during low demands in winter. • DN100 mains shall be restricted in length when used in single-ended feeds, to ensure that head losses remain satisfactory, especially under firefighting conditions.
Page 81	**2.5.3.1 Service pressure** Add a third paragraph as follows: Icon Water service pressure requirements are provided in Table IW.3 and take precedence over the values provided in Table 2.3.
Page 81	**2.5.3.2 Maximum allowable service pressure** Add the following text after the fifth (i.e. the last) paragraph as follows: Icon Water maximum pressure requirements are provided in Table IW.3 and take precedence over the values provided in Table 2.3. Designers shall ensure that wherever possible, the maximum static pressure at any point is limited to 75 metres of head. In special circumstances, approval may be sought from Icon Water for static pressures up to 90 metres of head. *Commentary:* *Due to legacy design requirements, there are three areas within the ACT where customers currently receive maximum static heads over 100 metres:* • *The Woden town centre area below contour 587 metres AHD could experience a maximum static head in excess of 100 metres up to 107 metres.* • *The North Canberra area, which comprises the City, Acton, Braddon, Turner, Reid, Lyneham, Dickson and Downer below contour 575 metres AHD, could experience a maximum static head in excess of 100 metres and up to 115 metres.* • *The Hume high zone area below contour 629 metres AHD could experience a maximum static head in excess of 100 metres up to 109 metres.*

<table>
<tr><th>WSA 03 Part 1 Page Ref.</th><th>Amendment and/or addition</th></tr>
<tr><td>Page 81</td><td>

2.5.3.3 Minimum service pressure

Add the following text after the second paragraph (i.e. above Table 2.3) as follows:

Icon Water minimum pressure requirements are provided in Table IW.3 and take precedence over the values provided in Table 2.3.

Add the following table and text at the end of this section:

Table IW.3 Service Pressure Limits

<table>
<tr><th>Service Pressure Limit</th><th>Demand Condition</th><th>Pressure (m H2O)</th></tr>
<tr><td>Maximum Static</td><td>All applications</td><td>75</td></tr>
<tr><td rowspan="4">Minimum residual</td><td>Peak hour demand – for residential development not exceeding three storeys in height and all other developments except those mentioned below.</td><td>20</td></tr>
<tr><td>Peak hour demand – for residential developments in RZ4 and RZ5 and commercial and industrial land uses (refer to Notes 1 and 3).</td><td>30</td></tr>
<tr><td>Peak hour demand – for very large blocks such as institutional campuses.</td><td>Notes 2 & 3</td></tr>
<tr><td>Firefighting – whilst drawing the specified flow stated in Table IW.2 at points (in the water main) within 150 metres of the fire ground, concurrently with 95th percentile demand.</td><td>20</td></tr>
</table>

Notes:

1. Minimal residual pressure for peak hour demands shall be taken at the highest point on the block.
2. Minimal residual pressure for firefighting shall be taken at the water main.
3. For very large blocks, such as institutional campuses, hydraulic modelling shall be undertaken to ensure that the minimum residual pressure can be achieved at the most critical point on the block (with regards to either elevation or distance from the main).
4. The stated minimum residual pressures (for both peak demands and for firefighting conditions) are to be achieved with service reservoirs at half capacity and an allowance for reservoir outlet losses of 1.5 metres of static head.
5. The system shall be checked to ensure that the same residuals can be achieved at the 95th percentile of peak demand with any one element out of service. 95th percentile demand should be estimated using:
   - the calculated values specified in Table IW.1 for new developments
   - 66% of the observed peak demand for existing developments.

   At the system level, additional redundancy might be required at Icon Water's discretion.

Clarification: an element out of service includes any part of the network whose failure would require an isolation. This could be valves, mains, connections, etc. through to outlets from reservoirs or reservoirs themselves. Fire flow requirements do not need to be satisfied for this scenario.

</td></tr>
<tr><td>Page 84</td><td>

2.5.5.1 General

At point (a), change the reference from "see Table 2.3" to "see Table IW.3".

</td></tr>
</table>

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 84	**2.5.5.2 Use of minimum allowable or desirable minimum service pressures** Change any reference to “Table 2.3” to “Table IW.3”.
Page 84-85	**2.5.5.3 Use of desirable minimum static pressure** Change any reference to “Table 2.3” to “Table IW.3”.
Page 86	**2.8 PUMPING STATIONS** Add the following text immediately below the section title: Due to the elevation of the ACT’s main water sources as well as the elevation of Icon Water’s treatment plants, the water network within the ACT has been designed to be primarily a gravity flow system which utilises reservoirs as a means of providing a high level of system reliability, adequate storage of emergency firefighting flows, as well as dedicated pressure control points under normal operating conditions. Icon Water will only consider the use of distribution and pressure boosting pumping stations within the water network when the option of installing an elevated reservoir is significantly more expensive (when both the net present value of capital costs and future operations/maintenance costs are compared) to that of a pump station, and/or when the installation of a reservoir is not considered practicable, and/or when the number of dwellings affected by a pump station outage is limited to fewer than 100.
Page 89	**2.9 SERVICE RESERVOIRS** Add the following text immediately below the section title: The details provided in section 2.9.1 shall be taken to be general water agency requirements and shall be read in-conjunction with Icon Water specification *STD-SPE-S-002 Reservoirs*. The specific requirements of *STD-SPE-S-002 Reservoirs* shall take precedence over the generic requirements detailed in this section should any conflict or ambiguity exist.
Page 90-91	**2.10 TRENCHLESS TECHNIQUES FOR PIPELAYING** Add the following text below after the second paragraph. The proposed use of trenchless techniques requires Designers to provide specific details on their design drawings which indicate the proposed trenchless technique and how the installation method will proceed. The use of trenchless techniques is subject to the written approval of Icon Water Technical Authority. The Designer should request a meeting with Icon Water as early as possible in the design phase so that project specific requirements can be provided.
Page 92	**2.12 SYSTEM REVIEW** Point (e): Substitute the words “peak demand event” for “peak day event”.
Page 93	**3 HYDRAULIC DESIGNS** **3.1.1 General** Add additional text at the end of this section as follows: Icon Water requires that pipes are sized using approved network analysis software and/or approved hydraulic formulas with special attention given to the specification of fire flow capacity. Icon Water approves the use of the Colebrook-White and Swamee-Jain equations for the purposes of determining pipe friction factors, and only the Darcy-Weisbach equation for determining head loss in straight pipes. The Hazen-Williams formula shall not be used. The modified Darcy-Weisbach equation shall be used for

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	determining the head loss in valves and fittings etc. with "K" values taken from one or more of the following approved publications: • The relevant valve or fitting manufacturer's datasheets • *The Australian Pipe Friction Handbook* (published by Pump Industry Australia) • *Crane Technical Paper TP410 Flow of Fluids* (available from www.flowoffluids.com) • *Internal Flow Systems* (authored by DS Miller and published by BHR Group) • *Engineering Data Book* (published by the Hydraulics Institute)
Page 93	**3.1.2 Minimum pipe sizes** Modify the first paragraph to read as follows: Minimum pipe sizes shall comply with Table IW.4 except in the following locations where specific design requirements apply: Delete Table 3.1 and accompanying notes and insert the following table and notes: **Table IW.4 Minimum Sizes of Mains** **Fire Risk Type** / **Minimum Mains Size** FRTx / Based upon equivalent fire flow FRT1 and FRT1.5 / DN100 DICL PN35 (equivalent to DN125 PE100 PN16 SDR11) FRT2 to FRT5 / DN150 DICL PN35 (equivalent to DN180 PE100 PN16 SDR11) **Notes:** 1. The minimum sizes specified for DICL shall be taken to be equivalent for approved PVC, and SCL pipes. Polyethylene (PE100) sizes have been specified in the table above to provide a similar internal diameter to the corresponding DICL size. 2. Reticulation mains of sizes smaller than DN100 may be used in locations (e.g. small cul-de-sacs) where only consumer connections are required, subject to achievement of the minimum pressure residuals during peak demand and firefighting.
Page 93-94	**3.1.3 Empirical sizing of reticulation mains** Delete the first paragraph and replace with the following: Table 3.2 may only be used to establish reticulation main pipe sizes when developing preliminary designs only. All detailed and final sizing must be confirmed by network analysis using approved modelling software or approved hydraulic formulas. DN200 and DN250 sized pipes are not accepted by Icon Water for use within the water network.
Page 94-95	**3.1.5 Fire flows** Delete all text in this section and replace with the following text: Design for fire flows shall be included for water mains located within the ACT. Requirements for fire flows are detailed in amended section 2.3.3.
Page 95-96	**3.1.6.3 Hydraulic roughness values** Add new text after the final paragraph in this section as follows: For mains, regardless of material or velocity, the following design roughness values (which take into account average roughness over the design life of the pipe) shall be used in computer models and calculations which utilise the Colebrook-White or

WSA 03 Part 1 Page Ref.	Amendment and/or addition
	Swamee-Jain equation for determining the friction factor and the Darcy-Weisbach equation for determining head loss: • Reticulation mains, design roughness value k_{S1}: 0.15 mm • Reticulation mains, design roughness value k_{S2}: 0.30 mm • Distribution and transfer mains, design roughness value k_{S2}: 0.30 mm For existing pipelines, regardless of material or velocity, the design roughness values to be used in computer models and calculations shall be determined in consultation with Icon Water and shall not be less than the values specified above for new pipelines. Icon Water may require that results from field tests be used to derive appropriate design roughness values.
Page 98	**3.5 SYSTEM TEST PRESSURE** Delete the text at point (b)(ii) and replace with the following text: (ii) 1400 kPa unless a higher test pressure is stated on Concept or Master Plans or noted otherwise by Icon Water for project specific reasons. Icon Water must be contacted to determine system test pressure for water mains that transfer water from the storages at the treatment plants to town service reservoirs (notionally known as transfer mains). **Note:** Icon Water's thrust block "thrust areas" (depicted in the *SD Series* of drawings) are based on a system test pressure of 1000 kPa (because of WSAA conventions) and therefore the "thrust areas" require adjusting (i.e. multiply stated area by 1.4) to achieve the required size for a 1400 kPa test pressure.
Page 103	**4 PRODUCTS AND MATERIALS** **4.1 GENERAL** Add additional text at the end of this section as follows: Icon Water requires all products and materials to be selected from STD-SPE-G-006 Approved Products List as well as comply with the referenced standards and WSAA product specifications specifically detailed in the Approved Products List for a particular product or material. Compliance with the limits of use stated in the Approved Products List is also required.
Page 108	**4.3 DUCTILE IRON PIPELINE SYSTEM** **4.3.3 Seal coating of lining** Delete the first paragraph and replace with the following text: Unless otherwise notified by Icon Water for a specific project, seal coats are required on internal cement mortar linings for all DICL and SCL pipes sized DN100 – DN300 inclusive. For internal cement mortar lined pipes of sizes larger than DN300, a seal coat is required where residence times exceed 72 hours at any point following pipeline commissioning.
Page 109	**4.3.4 Sleeving** Delete the first paragraph and replace with the following text: Polyethylene sleeving (coloured as per the requirements of Table 4.1) in accordance with *AS 3680 Polyethylene sleeving for ductile iron piping* shall be installed on all ductile iron pipes sized DN225 and above regardless of the external coating type unless the Icon Water Approved Products List specifically states otherwise. For example, Zn/Al externally coated DICL pressure pipes may not require sleeving under certain circumstances.

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	Should any ambiguity exist between WSA 03, this supplement or the Icon Water Approved Products List, the Icon Water Approved Products List shall take precedence.
Page 109 -110	**4.3.7 Coatings** Add additional text at the end of this section as follows: **Note:** Icon Water's requirements for polyethylene sleeving and external coatings for ductile iron pipes are provided in section 4.3.4 and the Icon Water Approved Products List.
Page 111 -112	**4.5 PE PIPELINE SYSTEMS** Insert the following text directly under the section title: Icon Water does not permit polyethylene to be used for new mains construction without written approval from Icon Water Technical Authority. Polyethylene may be used for network renewals projects where specified in the project documentation and for mains-to-meter (aka "property service connection) applications in sizes up to and including DN63 only. Refer to the Icon Water Approved Products List for specific guidance. Should any ambiguity exist between WSA 03, this supplement or the Icon Water Approved Products List, the Icon Water Approved Products List shall take precedence.
Page 114-115	**4.7 GRP PIPELINE SYSTEMS** Insert the following text directly under the section title: Icon Water does not permit GRP to be used for new mains construction unless trenchless techniques are the only viable method of installation, and an additional written approval is sought from the Icon Water Technical Authority.
Page 119-120	**4.8.8 Bolted Connections** Reword the second paragraph as follows: Unless soil aggressivity testing is conducted and the results of such testing dictate otherwise, bolted connections using galvanised steel bolts, nuts and washers (and backing plates if required) of polymeric coated metallic flanged fittings and/or flanged PE pipes and fittings shall be provided with additional corrosion protection in the form of an encapsulating system of bolt head and nut sealing caps filled with corrosion prevention priming paste wrapped with petrolatum tape or with PE sleeving and taped (See Figures 4.3, 4.4 and 4.5). Add a third paragraph as follows: Galvanised steel bolts, nuts and washers shall only be used within buried maintenance structures and aboveground applications when the environment is classified as "moderate" or "low" to Table 2.1 of WSA 201. In such applications, no additional corrosion protection measures are required except isolation ferrules and washers or specific coatings for the purposes of preventing mixed metals interaction (if applicable).
Page 121	**5 GENERAL DESIGN** **5.1 GENERAL REQUIREMENT** **5.1.1 Design Tolerances** Modify the last paragraph as follows: Horizontal alignment shall be in accordance with the requirements of Icon Water specification *STD-SPE-C-004 Survey and Tolerancing Requirements*.

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 123	**5.1.5 Survey Control** Insert the following text directly under the section title: All survey control work shall comply with the requirements of Icon Water specification *STD-SPE-C-004 Survey and Tolerancing Requirements*.
Page 126	**5.4 LOCATION OF WATER MAINS** **5.4.1 General** Add two new paragraphs at the end of this section as follows: Refer to CED requirements as detailed in CED document MIS 06 Verges for specific locations. The requirements specified in the referenced CED document must be adhered to unless notified otherwise in writing by Icon Water as part of the development approval process.
Page 128-130	**5.4.4 Water mains in easements** Insert the following text immediately below the section title: This section is generic in nature and shall be read in conjunction with Icon Water's *STD-SPE-G-017* and *STD-SPE-G-019 Developer Provided Assets Water Supply and Sewerage Asset Creation and Acceptance Process*. If any ambiguity exists, the requirements of the *STD-SPE-G-017* shall take precedence. **Note:** Pressure mains are not to be located on private property.
Page 131	**5.4.7 Water mains near trees** Add a new paragraph at the end of this section as follows: Trees and large shrubs should be planted so that the mature canopy does not encroach into or over the pipe protection envelope of a water network. In a new subdivision, where above is not feasible due to allocated width of verge module for water mains sized smaller than DN300, the minimum centreline-to-centreline clearance from trees shall be 1.2 metres. For water mains sized DN300 and larger, contact Icon Water for specific clearance requirements as these will depend upon a number of factors including tree species, available footprint and pipe joint type etc.
Page 134	**5.4.10 Railway Reserves** Add a new paragraph at the end of this section as follows: Watermain crossing light rail shall be designed in consultation with the Icon Water Technical Authority. Icon Water are currently in the process of developing Light Rail crossing standard drawings, which shall be adhered to once available.
Page 134	**5.4.12 Overhead Power lines and Transmission** Add a new paragraph at the end of the last paragraph as follows: Overhead Power Lines and Transmission Towers shall also comply with Electrical Authority (Evo Energy) specification and requirements. Assets must be designed taking into the safe approach distance specified in their guidelines/standards/specification.
Page 135-136	**5.4.14 Water mains on curved alignments** Delete point (b) as Icon Water prohibits the bending of PVC pressure pipes to achieve curved alignments.

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	Delete the last sentence starting with "Notwithstanding, the nominated minimum bending…" as Icon Water prohibits the bending of PVC pressure pipes to achieve curved alignments. Add a note at the end of this section as follows: **Note:** Icon Water does not allow the use of PE pipe for the construction of new water mains unless other approved materials are considered unsuitable. Refer to Section 4.5.
Page 136	**5.4.16 Marking tape** **5.4.16.2 Mains** Modify the final paragraph of this section as follows: All water mains constructed of trenchless techniques shall also have tracer wire installed unless they are located inside a steel sleeve. The tracer wire shall be of an approved type/make as listed in Icon Water's Approved Products List and shall be installed in accordance with the tracer wire manufacturer's instructions.
Page 138-140	**5.6 SHARED TRENCHING** Add the following text directly under the section title as follows: Icon Water does not have any current agreements in place with other utility owners or authorities for the use of shared trenching. Given this situation, shared trenching shall not be used.
Page 141	**5.9 CONNECTION OF NEW MAINS TO EXISTING MAINS** Add a paragraph directly following the section title as follows: The connection of new mains to existing mains shall be undertaken by Icon Water personnel or by Constructors contracted directly to Icon Water with specific written approval to connect to an existing main using an approved connection method. **Note:** The use of a flanged tee in conjunction with flange-socket connectors is Icon Water's default method of connection and this method will be required to be used unless there is a compelling reason not to.
Page 143-144	**5.10.4 Flushing Points** Delete all content in this section (including Figure 5.8) and replace with the following text: Scour (or drain) outlets with isolating valve control shall be provided at all low points on water mains which do not necessarily require fire hydrants. Where fire hydrants are required on the water main, a hydrant shall be provided at all low points. Scour outlets shall be provided on bulk supply mains to assist in the draining of each section of main between sectioning valves. The size of the scour outlet shall be determined by considering (i) the length of time available for draining the pipe section, and (ii) the facilities available to dispose if the flow.
Page 144-147	**5.11 PROPERTY SERVICES** Delete all content in this section including all content in sections 5.11.1, 5.11.2 and 5.11.3. Add the following text directly under the section heading: The planning and design requirements for property services, including connections to water mains and water meters shall be in accordance with Icon Water specification *STD-SPE-M-006 Requirements for Property Service Connections and Water Meters* and the Icon Water *SD Series* of drawings.

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 148-150	**5.12.5 Underground obstructions and services** **5.12.5.2 Clearance requirements** Delete the existing paragraph and replace with the following text Permanent water pipes, irrigation pipes, sanitary drains, stormwater drains, electricity cables, telephone cables, communication cables, gas pipes, aerial wires, or other services that are not the property of Icon Water are not permissible within the pipe protection envelope or easement. The minimum clearance between high voltage power lines and metallic water pipes must be determined in accordance with *AS/NZS 4853 Electrical Hazards on Metallic Pipelines* to ensure that the condition of Icon Water assets is not compromised, and that work can be performed safely. In addition, a safe approach distance to energised underground cables as specified in Electrical Authority guideline/specification/standard for ordinary workers and a minimum working space under the pipeline must be considered to ensure that Icon Water staff can safely carry out the emergency repair works in the vicinity of the pipe. Add the following sentences immediately after Note 4 in Table 5.5. Where necessary, Designers shall incorporate measures into their designs to prevent cross-contamination. Concrete encasement of the Icon Water mains may be considered as a method for cross-contamination prevention. The application will be assessed on a case-by-case basis.
Page 153-154	**5.13 DISUSED OR REDUNDANT PIPELINES** Add the following paragraphs immediately below section title Decommissioned Icon Water assets to be removed from the site where practicable. Where a design results in the disuse of an existing water main, the Design Drawings and Specification shall detail proposed treatment such as disconnections from the network/customers, grout filling, removal of fittings, and/or capping both ends. The works undertaken on disused water assets shall be recorded as part of the Work As Constructed details.
Page 176	**6.3 PRESSURE REDUCING VALVE INSTALLATIONS** **6.3.1 Planning criteria** Replace any reference to Table 2.3 with Table IW.3. **6.3.2 Design requirements** Modify the first (and only) paragraph to read as follows: The design of pressure reducing valve installations shall satisfy the requirements of the Concept Plan and Icon Water specification *STD-SPE-M-003 Hydraulically Operated Automatic Water Control (Globe) Valves*. An overview of the design requirements is included in Section 8.3.3.
Page 176-177	**6.4 PRESSURE SUSTAINING VALVE INSTALLATIONS** **6.4.1 Planning criteria** Replace any reference to Table 2.3 with Table IW.3. **6.4.2 Design requirements** Modify the first (and only) paragraph to read as follows: The design of pressure sustaining valve installations shall satisfy the requirements of the Concept Plan and Icon Water specification *STD-SPE-M-003 Hydraulically*

WSA 03 Part 1 Page Ref.	Amendment and/or addition
	Operated Automatic Water Control (Globe) Valves. An overview of the design requirements is included in Section 8.3.6.
Page 180-181	**7.4.2 Pipe cover** Replace all references to Table 7.2 with Table IW.5. Delete Table 7.2 and replace with Table IW.5 as follows: **Table IW.5 Minimum Depths of Pipe Cover**

Location	Minimum Cover
Public and private blocks, not subject to vehicular loading	450
Private blocks zoned residential, subject to vehicular loading	450
Embankments	750
Footways, nature strips, industrial and commercial blocks, sealed road pavements (other than major roads subject to vehicular loading)	600
Unsealed road carriageways and verges	750
Major road carriageways and verges	750
Future road, rail and light rail pavements	1200
Freeways, State and National Highways	1200

Page 193-194	**7.9.2 Thrust Block** Insert following paragraph immediately below the section title Standard thrust block configuration as per Icon Water drawings SD -5001-D, SD-5002-D, SD-5003-D shall be used for thrust block arrangements. Where the standard configuration of thrust block cannot be provided due to site specific constraints approval must be sought from Icon Water Technical Authority. For such application designers shall at minimum satisfy the following requirements: • Evidence of the site-specific constraints e.g. photos from service location. • Geotechnical report following geotechnical investigation of the site to verify the soil parameters at the location. • A copy of calculation to be provided for review and record keeping. • Design drawings showing the location and details of the proposed piers/thrust block in plan and cross-section shall be provided. • The thrust block design to be verified and signed off by a Registered Engineer (Structural) with relevant experience in the design.
Page 204-205	**7.9.5 Restrained elastomeric seal joint water mains** Modify the first paragraph as follows: Elastomeric seals incorporating a restrained joint system shall not be used for ductile iron water mains unless an additional written approval is obtained from the Icon Water Technical Authority. This type of joint system is not preferred. Where additional written approval has been obtained, restrained joined ductile iron water mains shall be subject to the following:

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 214-215	**8.1 VALVES** **8.1.5 Plastics identification covers** Delete all content in this section and replace with the following text: Icon Water does not require the installation of colour coded spindle cap plastic covers. However, surface boxes shall be colour coded where indicated on the Icon Water *SD Series* of standard drawings.
Page 215-216	**8.2.2.2 Gate valves** Modify the first paragraph as follows: Valves shall have anti-clockwise rotation of the input spindle for closure. End connections shall be flanged-flanged only. Anchorage shall be in accordance with Section 7.9. Delete the second paragraph (starting with the words *Typical gate valve installation*…)
Page 216	**8.2.2.2 Gate valves** Delete Figure 8.2 and the note below.
Page 216-217	**8.2.2.2 Gate valves** Delete Figure 8.3 and the note below. Modify the final paragraph on the page as follows: A valve chamber shall be provided for all geared gate valves and all valves DN450 and larger. Refer to the Icon Water *SD Series* of standard drawings for mandatory requirements.
Page 217	**8.2.2.2 Gate valves** Delete Figure 8.4 and the note below.
Page 218	**8.2.2.2 Gate valves** Delete Figure 8.5 and the note below.
Page 219	**8.2.2.2 Gate valves** Delete Figure 8.6 and the note below.
Page 219-220	**8.2.2.3 Butterfly valves** Delete all content in this section and replace with the following text: The Designer may propose the use of butterfly valve(s) for isolation purposes in sizes DN600 and larger when the depth of cover requirements for the main cannot be met if gate valves were installed and other measures are not available. In such instances, the Designer shall obtain written direction from Icon Water prior to proceeding. Should Icon Water accept a butterfly valve installation, all butterfly valves shall be installed in a valve chamber complying with the requirements of Icon Water's *SD Series* of standard drawings as well as the following additional requirements: • Access shall be made available to manually actuate the valve. • The valve chamber shall be permanently connected to the stormwater drainage system or drained to the natural surface. • The valve shall be fitted with a hand wheel and a position indicator that can be viewed from street level.

WSA 03 Part 1 Page Ref.	Amendment and/or addition
	• A dismantling joint with appropriate thrust restraint as required must be included for ease of future repairs / replacements.
Page 220-221	**8.2.4 Stop valves for reticulation mains** Replace all references to Table 8.2 with Table IW.6. Add the following paragraphs after the final paragraph on page 220: Stop valves are required on all branches that run from a main of larger size and they shall be installed adjacent to the flange on the branch tee. Stop valves shall not be installed under road pavements and similarly, they shall be located clear of sumps, maintenance holes and driveways etc. All stop valves shall be flanged-flanged connections. Where a main is located within an easement on privately leased land, repairs to a burst may take longer than usual due to potential access difficulties. For mains located within easements, a stop valve shall be provided at each end of the easement, outside the property boundary, with no service connections permitted between the two stop valves. Stop valves are required either side of the property service take-off (i.e. tee) on the main for connections sized DN100 and larger. Icon Water will advise (on a project-by-project basis) if stop valves are required either side of the take-off for smaller sized connections. Refer to Icon Water standard drawings SD-3308, SD-3310 and SD-3312 for an example of stop valves located either side of the take-off.
Page 220-221	**8.2.4 Stop valves for reticulation mains** Delete Table 8.2 and the note directly below it and replace with Table IW.6 and note as follows: **Table IW.6 Stop Valve Spacing Criteria**

Water main size	Number of property services connected	Maximum spacing (metres)
DN100 and DN150	40	300 (city/suburban) 500 (rural)
DN225	50	500
> DN225	100	750

Note:

Notwithstanding the spacing criteria of Table IW.6, additional stop valves shall be required (on a case-by-case basis) on/near mains servicing critical facilities such as but not limited to schools and hospitals. This is to allow Icon Water to perform maintenance and repair work without duly inconveniencing the users of such facilities.

Page 223	**8.2.7 Stop valves – location and arrangements** **8.2.7.2 Arrangement 1** Delete all references to Soc-Soc and Fl-Soc valves. All stop valves installed within the Icon Water network shall be Flanged-Flanged.

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 223	**8.2.7 Stop valves – location and arrangements** **8.2.7.4 Arrangement 3** Delete the first paragraph and replace it with the following text: Pressure zone dividing valve and hydrants shall be installed in accordance with arrangement (B) shown below in Figure 8.10. Arrangement (A) shall not be used and is presented "for information only".
Page 224	**8.2.7 Stop valves – location and arrangements** **8.2.7.8 Arrangement 7** Insert the following text after the first paragraph: Refer to the Icon Water *SD Series* of standard drawings for requirements relating to control valves.
Page 228-230	**8.3.3 Pressure reducing valves (PRV)** Modify the paragraph prior to Figure 8.20 as follows: The Design Drawings shall be prepared in accordance with Icon Water's *SD Series* of standard drawings and Icon Water specification *STD-SPE-M-003 Hydraulically Operated Automatic Water Control (Globe) Valves*. Delete all references to Figures 8.20, 8.21 and 8.22.
Page 232-233	**8.3.3 Pressure reducing valves (PRV)** Delete Figure 8.20 and Figure 8.21 including all notes.
Page 233	**8.3.3 Pressure reducing valves (PRV)** Delete Figure 8.22 including all notes.
Page 231	**8.3.6 Pressure sustaining valves** Modify the second paragraph of this section as follows: The design of the PSV installation, including the type of valve and size, shall satisfy the requirements of the Concept Plan and be prepared in accordance with Icon Water's *SD Series* of standard drawings and Icon Water specification *STD-SPE-M-003 Hydraulically Operated Automatic Water Control (Globe) Valves*.
Page 232	**8.4 AIR VALVES** **8.4.2 Installation design criteria** Delete all content in this section and replace with the following text: Provision shall be made for the release of air from all high points on water mains. In reticulation mains, this should normally be achieved through the use of a fire hydrant, a branch or a service pipe located at the high point. If this is not practicable, an air valve shall be provided and shall be sized in accordance with the air valve manufacturer's instructions noting a minimum allowable size of DN25. On water mains sized greater than DN300 and mains where no hydrants are installed, air release shall be achieved through the use of an air valve.

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 232	**8.4.3 Air valves type** Delete all existing text and replace with the following text: Where air valves are specified, they shall be combination air valves and shall include a surge mitigation function where water hammer is considered to be an operational issue.
Page 233-234	**8.4.5 Air valves location** Delete all references to Figure 8.24. Provide a final paragraph at the bottom of page 233 as follows: Air valve installations shall be in accordance with the Icon Water *SD Series* of standard drawings.
Page 234	**8.4.5 Air valves location** Delete Figure 8.24.
Page 235-237	**8.6 SCOURS AND PUMP-OUT BRANCHES** **8.6.2 Design** Delete all references to Figures 8.25, 8.26, 8.27 and 8.28 and delete these figures. Add the following text as the final paragraph on page 236: Scours and pump-out branches shall be in accordance with Icon Water's *SD Series* of drawings.
Page 238	**8.6.4 Scour size** Replace all references to Table 8.4 with Table IW.7. Delete Table 8.4 and replace with Table IW.7 as follows: **Table IW.7 Minimum Scour Size**

Main Size (DN)	Scour Valve Size (DN)	Scour Outfall Pipe Size (DN)
150 - 200	80	80
225 - 300	100	100
375 - 600	150	100
750	225	150

Page 238-239	**8.7 SWABBING POINTS** Add the following text (as a new first paragraph) directly after the section title: Icon Water shall specify whether swabbing points are required during the development of the Concept Plan and unless specifically noted on the Concept Plan, swabbing points shall not be required.
Page 240	**8.8.4 Hydrant types** Delete all content in this section and replace with the following text: Icon Water's existing installed base of fire hydrants within the water network includes high capacity hydrants, pillar hydrants and spring hydrants. Spring hydrants (refer to Figure 8.29) are the only hydrant type approved for new developments and for mains renewal projects.

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 241	**8.8.5 Hydrant installation** Delete Figure 8.30.
Page 241	**8.8.6 Hydrant outlet connections** Delete all content and replace with the following text: The hydrant outlet connection for a spring hydrant shall be of the claw-type in accordance with *AS 3952 Water supply - Spring hydrant valve for waterworks purposes*.
Page 241	**8.8.7 Hydrant size** Delete all existing content and replace with the following text: Spring hydrants shall be sized DN80 with DN80 flanges and shall be installed on a DN80 riser in accordance with Icon Water's *SD Series* of standard drawings.

<table>
<tr><th>WSA 03 Part 1 Page Ref.</th><th>Amendment and/or addition</th></tr>
<tr><td>Page 241</td><td>

8.8.8 Hydrant spacing

Delete all existing content and insert the following text and table:

Fire hydrants shall be spaced in accordance with Table IW.8. The spacing details provided in Table IW.8 have been agreed with ACT Fire & Rescue.

Table IW.8 Fire Risk Types and Hydrant Spacing

<table>
<tr><th>Fire Risk Type</th><th>Minimum Available Firefighting Flow Provision (L/s)</th><th>Fire Hydrant Spacing</th></tr>
<tr><td>FRT5

FRT4</td><td>150

100</td><td>Two (2) DN80 spring hydrants together shall be located as close as possible to the end of each cul-de-sac and at 135 metre intervals along the main interspersed with one (1) DN80 spring hydrant at 45 metre intervals.</td></tr>
<tr><td>FRT3</td><td>60</td><td>Two (2) DN80 spring hydrants together as close as possible to the end of each cul-de-sac and one (1) DN80 spring hydrant at 60 metre intervals along the main.</td></tr>
<tr><td>FRT2</td><td>45</td><td>Two (2) DN80 spring hydrants together as close as possible to the end of each cul-de-sac and one (1) DN80 spring hydrant at 60 metre intervals along the main.</td></tr>
<tr><td>FRT1.5</td><td>32</td><td>Two (2) DN80 spring hydrants together as close as possible to the end of each cul-de-sac and one (1) DN80 spring hydrant at 60 metre intervals along the main.</td></tr>
<tr><td>FRT1</td><td>25</td><td><u>Mains ≥ DN100</u>: One (1) DN80 spring hydrant as close as possible to the end of each cul-de-sac and one (1) DN80 spring hydrant at 90 metre intervals along the main.
<u>Reticulation Mains < DN100</u>: One (1) DN80 spring hydrant on the DN100 main just prior to tapering down to smaller diameter pipe and one (1) DN80 spring hydrant at the end of the smaller diameter pipe for mains flushing purposes. If there are no other fire hydrants within 150 metres of the end of the cul-de-sac then two (2) DN80 hydrants together shall be provided just prior to tapering down.</td></tr>
<tr><td>FRTx</td><td>Unspecified</td><td>One (1) DN80 spring hydrant at 180 metre intervals along roads in which a main is located and where no fire risk other than vehicle fires is apparent. A DN80 spring hydrant connected by a hydrant bend shall be provided at the end of the main.</td></tr>
</table>

<u>Notes:</u>

1. FRTx requirements should be based upon equivalent fire fighting flow requirement.
2. These hydrant spacings are only for reticulation mains (<DN300)

</td></tr>
<tr><td>Page 242-243</td><td>

8.8.9 Hydrant location

Delete Figure 8.33.

Delete all references to above ground hydrants.

</td></tr>
</table>

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 249	**8.11.2 Marker posts and plates** Add the following text after the first sentence: Icon Water requirements are detailed in Icon Water's *SD Series* of standard drawings.
Page 249	**8.11.3 Pavement markers** Add the following text after the first sentence: Icon Water requirements are detailed in Icon Water's *SD Series* of standard drawings.
Page 249	**8.11.4 Kerb markings** Delete paragraph 2, paragraph 3 and Figure 8.39 and replace with the following text: Icon Water requirements are detailed in Icon Water's *SD Series* of standard drawings.

2.3 Amendments and additions to WSA 03 Part 2

Table 2.3.1 details amendments and additions to WSA 03 Part 2: Construction.

Table 2.3.1 - Amendments and additions to WSA 03 Part 2: Construction

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 259	**11.5 PROTECTION OF PROPERTY AND ENVIRONMENT** **11.5.1 Protection of other services** Insert the following paragraph after point (h): While working near Icon Water assets, activities and works causing additional stress such as vibration and ground movements shall be prevented by nominating alternative low vibration work methods for example compaction equipment that generates smaller vibrations, light roller, plate compactors, static compaction equipment. An engineering assessment report is required to demonstrate there will be no adverse impact on Icon Water's asset. Refer to *STD-SPE-G-025 Requirements for Working Near Assets* for requirements when working near Icon Water assets.
Page 265	**11.9 CUT-IN CONNECTION EQUIPMENT** Add a paragraph directly following the section title as follows: Pressure cut-ins shall be undertaken by Icon Water personnel only. Cut-ins to Icon Water mains shall not be undertaken by any other party.
Page 267	**12 PRODUCTS AND MATERIALS** **12.1 AUTHORISED PRODUCTS AND MATERIALS** **12.1.1 General** Delete all of the existing content and replace with the following content: Only products and materials specifically shown on the Design Drawings and Project Specification shall be used. The make, model, brand, manufacturer etc. of such products and materials shall be in compliance with the details provided in *STD-SPE-G-006 Approved Products List* and the relevant *WSAA product specifications*. Alternative products and materials shall not be used. If any doubt arises, obtain written direction from Icon Water prior to use. If the words “or equivalent” are found in project design documentation, these words shall be taken to be an error by the Designer and shall be interpreted as “or approved equivalent” by the Constructor where the necessary “approval” must be obtained in writing from Icon Water.
Page 271	**12.8.2 Valves** Modify the third sentence as follows: Ensure the direction of closure is anti-clockwise.
Page 274	**13.7 UNDER PRESSURE CUT-IN CONNECTION TO PRESSURE PIPES ≥ DN80** Add a paragraph directly following the section title as follows: Pressure cut-ins shall be undertaken by Icon Water personnel only. Cut-ins to Icon Water mains shall not be undertaken by any other party.

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 284	**15.5 UNDER PRESSURE CUT-IN CONNECTION TO PRESSURE PIPES ≥ DN80** Add a paragraph directly following the section title as follows: Pressure cut-ins shall be undertaken by Icon Water personnel only. Cut-ins to Icon Water mains shall not be undertaken by any other party.
Page 287-288	**15.8 TAPPING OF MAINS, PROPERTY SERVICES AND WATER METERS** Add a paragraph directly following the section title as follows: Mains tapping shall be undertaken by Icon Water personnel only. Tappings to Icon Water mains shall not be undertaken by any other party. Modify the existing 6th paragraph as follows: Where tapping is specified for PE mains, use either: (i) A mechanical tapping-style pipe saddle complying with WSA PS-310, or (ii) An electrofusion tapping saddle complying with WSA PS-329 of a make/model specifically detailed in the Icon Water *STD-SPE-G-006 Approved Products List*.
Page 289	**15.8 TAPPING OF MAINS, PROPERTY SERVICES AND WATER METERS** Modify point (iii) as follows: Maintain a minimum spacing of 1000 mm between tappings, and from a tapping and the end of a pipe; and
Page 289	**15.11 CORROSION PROTECTION OF DUCTILE IRON** Delete all existing content and replace with the following text: Polyethylene sleeving (coloured blue) in accordance with *AS 3680 Polyethylene sleeving for ductile iron piping* shall be installed on all ductile iron pipes sized DN225 and above where indicated in *STD-SPE-G-006 Approved Products List* or where advised by Icon Water in the event of contaminated or aggressive soil being found at the project location. Note: Typically (as per the Icon Water Approved Products List) sleeving is not required for ductile iron pipe externally coated with a ZN/Al coating with an epoxy top-coat unless the soil is aggressive or contaminated. Only polyethylene sleeving from the suppliers listed for ductile iron pipe in Icon Water's Approved Products List shall be installed. When installing polyethylene sleeving, do so in accordance with *AS 3681 Application of polyethylene sleeving for ductile iron piping*. Do not allow sleeved items to be exposed to sunlight for more than seven (7) days.
Page 289	**15.12.3 Tracer Wire** Delete all existing content and replace with the following text: All water mains constructed of trenchless techniques shall have tracer wire installed unless they are located inside a steel sleeve. The tracer wire shall be of an approved type/make as listed in *STD-SPE-G-006 Approved Products List* and shall be installed in accordance with the tracer wire manufacturer's instructions.
Page 289	**15.13 VALVES, HYDRANTS AND SURFACE BOXES AND FITTINGS** **15.13.1 Installation** Modify the second paragraph as follows: Install an extension spindle, as necessary, to ensure the top of spindle is at the required depth as shown on the Icon Water *SD Series* of standard drawings.

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 295-300	**15.21 WELDING OF PE PIPELINES** Delete all existing content and replace with the following text: Where welding of a PE water main is required, butt-fusion welding shall be the preferred method and it shall be conducted outside of the trench so that the PE main is pre-strung prior to being lowered into the trench during installation. Final closures shall be performed using electrofusion welding in the trench or by using approved mechanical couplings as detailed in Icon Water's Approved Products List. Butt-fusion welding shall not be conducted inside trenches. All welding shall be performed by welders who have successfully completed training by a Registered Training Organisation, endorsed by the Plastics Industry Pipe Association of Australia for the relevant welding method(s). The Plastics Industry Pipe Association of Australia provides technical guidelines for electrofusion welding within *POP001 Electrofusion Jointing of PE Pipe and Fittings for Pressure Applications* and butt welding within *POP003 Butt Fusion Jointing of PE Pipes and Fittings – Recommended Parameters and Practices*. Undertake all welding in accordance with the Specification and relevant Design Drawings.
Page 308	**18 SWABBING** **18.1 GENERAL** Delete all of the existing content in this section and replace with the following text: Swabbing of mains is not required by Icon Water unless: a) there is evidence that pipe end caps have been left off overnight or whenever the work site has been unsupervised during the construction of new mains; b) there is evidence that pipes and/or fittings are contaminated with dirt or other foreign material; c) the main was flooded during construction; d) the main fails bacteriological testing (Refer to Clauses 19.7 and 20); or e) The Superintendent has reason to believe it is required.
Page 314	**19.4 HYDROSTATIC PRESSURE TESTING** **19.4.1 General** Delete the first paragraph and add the following text prior to the second paragraph: Icon Water requires that: a) The testing procedure is submitted in writing to Icon Water for acceptance at least five (5) working days prior to the scheduled date of the test. Testing shall not take place without Icon Water's written acceptance of the testing procedure. b) Pressure gauges used for pressure testing purposes shall have current (i.e. not older than 12 month) certification for accuracy from an independent, NATA or equivalent, accredited testing provider. Pressure gauges shall be permanently marked to allow them to be identified against the test certificates. The additional requirements for pressure gauges detailed in Appendix A must also be complied with. c) Copies of the gauge certificates shall be submitted to Icon Water in PDF format during the construction phase and at the handover inspection.

WSA 03 Part 2 Page Ref.	Amendment and/or addition
	d) A PDF copy of certified test certificates be submitted which show that the testing has been conducted in accordance with Icon Water Standards and the submitted testing procedure. Such certificates shall include the test data/results. e) Additional requirements for pressure instrumentation are contained in Appendix A of this supplement. **19.4.2 Mains** Add the following text directly after the first paragraph and prior to the second paragraph: All water mains, including water services and stop cocks, shall be subjected to a hydrostatic field test pressure as follows: • For reticulation pipework, unless a higher test pressure is specified on the Master Plan or Concept Plan, the equivalent of 1400 kPa at any point. • For water mains that transfer water from the storages at the treatment plants to town service reservoirs (notionally known as transfer mains), a test pressure specified by Icon Water. • For all other pipework, a test pressure as specified by Icon Water but not less than the equivalent of 1400 kPa at any point. **19.4.3 Property services** Add the following text directly after the first paragraph and prior to the second paragraph: All property services, shall be subjected to a hydrostatic field test pressure as specified by Icon Water but not less than the equivalent of 1400kPa at any point. **19.4.4 Under pressure cut-in connections** Add a paragraph directly following the section title as follows: Pressure cut-ins shall be undertaken by Icon Water personnel only. Cut-ins to Icon Water mains shall not be undertaken by any other party.
Page 316	**19.7 WATER QUALITY TESTING** **19.7.1 GENERAL** Delete the first paragraph and add the following text: It is compulsory for all new mains to pass water quality acceptance tests. Disinfection of drinking water mains is required to ensure suitable water quality parameters are maintained and to pass microbial tests. Conduct a water quality test on all new mains following satisfactory completion of disinfection process. In preparation for flushing and disinfection each end of laid pipe is required to have flushing arrangements installed. Contractor shall provide water main plans that show injection points (Tanker, fit for the purpose of supplying potable water or existing hydrant), discharge points (sample and flushing), flushing legs, and other details that clearly show how the new water main is flushed and disinfected.
Page 316	**19.7.2 TEST PROCEDURE** Add a paragraph directly following the section title as follows: Following a high velocity pre-disinfection flush (>1 m/s), a sample must be taken for turbidity or clarity testing. A clarity test must be performed by the disinfection contractor prior to the disinfection process. If the acceptance criteria are met, the main can be disinfected. This shall

WSA 03 Part 2 Page Ref.	Amendment and/or addition
	be considered as a hold point and shall be released by the responsible officer of Icon Water. Clarity testing is qualitative, relying on sight to estimate how clear the water is. Following preliminary flushing and prior to disinfection stage, a disinfection contractor must perform a clarity test, with the results recorded in contactor's ITP. • A sample shall be collected in a clean clear glass jar and held up against a white background. • For consistency, descriptions like clear, cloudy/milky, black/brown, yellow/orange, blue/green, and other (provide description) must be used and documented. • Disinfection cannot begin until clarity is recorded as clear or turbidity less than 2 NTU. Post disinfection flushing and sampling must occur within four weeks of the established date for issuing of a connection certificate.
Page 317	**19.7.4 FAILURE OF TEST** Add a paragraph after the first paragraph as follows: Refer to Appendix I section I8.3 for details on non-complaint results.
Page 318	**20 DISINFECTION** **20.1 APPLICATION** Replace the first paragraph with the following After a satisfactory hydrostatic pressure test and pre-disinfection flushing, disinfect the following drinking water mains by adding a disinfectant to the water drawn from the water distribution system or suitable Water Transport Vehicle fit for the purpose of supplying potable water: Add the following paragraph after (c) Disinfection of water mains must be carried out by an Icon Water approved contractor/service provider.
Page 320-321	**21 TOLERANCES ON AS CONSTRUCTED WORK** Delete all content in this section including sections 21.2 through 21.5 inclusive and replace with the following text: Construct all water mains, associated structures and appurtenances in the positions shown on the Design Drawings in accordance with the tolerancing requirements of Icon Water Specification *STD-SPE-C-004 Survey and Tolerancing Requirements.*
Page 322	**22 CONNECTIONS TO EXISTING WATER MAINS** Add a paragraph directly following the section title as follows: Connections to existing water mains shall be undertaken by Icon Water personnel only. Connections to existing water mains shall not be undertaken by any other party.

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 327	**24 WORK AS CONSTRUCTED DETAILS** Delete the first paragraph and replace with the following text: Prepare Work as Constructed (aka "Work as Executed") drawings and documentation in accordance with the requirements of the following Icon Water specifications: • *STD-SPE-G-018 Design Standards, Standard Specification Drafting* • *STD-SPE-G-019 Developer Provided Assets Water Supply and Sewerage Asset Creation and Acceptance Process* • *STD-SPE-C-004 Survey and Tolerancing Requirements* It should be noted that a Qualified Surveyor (as defined in *STD-SPE-C-004*) and a Registered and Chartered Engineer (as defined in section 1.5 in *STD-SPE-G-019*) are required to be engaged for the production of WAE drawings and documentation.
Page 392	**I4.2.1 STORAGE** Add a paragraph after the first paragraph as follows: All pipes must be sealed prior to transportation to the job site (to prevent contamination from conditions at manufacturing warehouses or on truck beds) Pipes must be elevated from the ground (to prevent contamination including rain and vermin intrusion)
Page 399	**I4.3 CLEANING METHODS** Delete the first paragraph and replace with the following text: All new mains DN 100 and larger shall be flushed or swabbed to remove any deleterious material. Swabbing shall be carried out in accordance with Section 18 SWABBING.
Page 394	**I5.1 GENERAL** Add a paragraph after the last paragraph and Table I.1 as follows: An alternative preferred method for disinfection is using continuous-feed method and a contact time of 24 hours (maximum) to exceed the required C.t in Table I.1. Chlorine in the form of sodium hypochlorite dosed into the water main must be used to disinfect all new water mains. The dosing of sodium hypochlorite must be controlled to maintain the initial free chlorine residual prior to chlorinated water entering the water main. This ensures that the desired free chlorine residual is achieved uniformly throughout the water main. Following pre-disinfection flush to remove particulates and turbidity/clarity testing, the continuous-feed method consists of filling the water main with chlorinated water containing an initial free chlorine residual of 20 mg/L, removing the air pockets and leaving in the main for a contact time of maximum of 24 hours. The chlorine solution must be slowly and continuously pumped into the water main until the entire main is filled with the chlorine solution. The contact time will begin when the water main has been completely filled with chlorine solution. The free chlorine residual remaining in the water main at the end of the contact time shall not be less than 10 mg/L. Free chlorine residuals should be measured either along the length of the water main prior to discharge or at regular intervals at the point of discharge.

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 394-395	**I6.2 SAMPLE SET A – EXISTING MAIN** Remove the text and add the following: Sampling must be conducted within 72 hours of successful disinfection. The samples must be representative of the feed water used in the post disinfection flushing processes and shall be taken on the same day as the new asset. Samples must be collected by a sampler from a NATA accredited laboratory. Tanked supply; samples must be taken directly from the tanker. If the feed water was from the existing water main, the sampler shall collect a sample from the same fire hydrant on the existing main suppling the feed water, after the main has been flushed at a minimum flow of 0.5 L/s. Whichever sample point is chosen, it shall be disinfected prior to collection of the sample.
Page 395	**I6.3 SAMPLE SET B – NEW MAIN** Replace the first paragraph with the following: Samples must be collected from the beginning, middle, and discharge end of the new water main. All dead ends in the pipe section must be sampled. For pipe lengths greater than 400m, sampling must take place every 400m along the length of the pipe, as well as at both ends. Samples must be collected by a sampler from a NATA accredited laboratory.
Page 395	**I8.2 NON-COMPLIANT RESULTS FOR SAMPLE SET A** a) For non-compliant test results collected from a tanked supply; the constructor is responsible for rectifying any resultant failures of the equivalent parameters that failed in Sample Set B. b) For non-compliant test results collected from an existing water main; Icon Water may take appropriate action to rectify water quality and resultant failures of the equivalent parameters that failed in Sample Set B.
Page 395-396	**I8.3 NON-COMPLIANT RESULTS FOR SAMPLE SET B – NEW MAIN** All samples must be collected by a sampler from a NATA accredited laboratory. Replace the items (a) and (b) with the following: a) For microbial test results (E.coli, Total coliform and HPC) outside the limits specified in Table IW.2, contractor shall repeat the chlorination and post disinfection flushing steps until such a time that the water main has passed the microbial tests. b) For all other physical and chemical parameters if the test results fails, flush the main and resample until acceptable results are achieved for the parameter that failed.

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 396-397	**ANNEXURE 1 — DRINKING WATER / NON-DRINKING WATER** **DRINKING WATER** Delete the second paragraph and replace Table I.2 with the following text: A Recognised Testing Laboratory (NATA-accredited) must evaluate the water quality samples from the feed water and the new main against Table I.2.

Table I.2 Drinking Water Quality Parameter Acceptance Criteria

Parameter	Units	Sample Set A and B
pH		>6.5 and <8.5
True Colour	PCU	< 15
Turbidity	NTU	< 2
EC	(µS/cm)	< 200
Free chlorine residual	mg/L	>0.2 and <3
Total chlorine residual	mg/L	>0.2 and <3
E.coli	(MPN/100mL or cfu/100ml)	< 1
Total Coliforms	(MPN/100mL or cfu/100ml)	< 1
Heterotrophic Plate Count	(cfu/mL)	<100

Appendix A – Additional requirements for pressure instrumentation

Analogue or digital pressure gauges are both acceptable instrument types for measuring pressure during hydrostatic testing. Table A.1 summarises the mandatory requirements for pressure instrumentation.

Table A.1 Requirements for Pressure Instrumentation – Test pressure = 1400 kPa

Attribute	Analogue gauges	Digital gauges
Gauge (Dial) Size:	100 mm dia. or larger	No requirements
Units:(Note)	"kPa" or "bar"	"kPa" or "bar"
Minimum Accuracy:	± 1.0% of full-scale	± 0.5% of selected range
Gauge Range:	0 to 1600 kPa or 0 to 2500 kPa	User selectable on the proviso that 0.5% of the range is less than or equal to 20 kPa.
Minimum Graduations:	At least every 25 kPa	Not applicable

Note: It is acceptable to have pressure gauge units stated in "bar" in lieu of "kPa" noting that 1 bar is equivalent to 100 kPa. The above-mentioned "kPa" requirements can be converted to "bar". For example, graduation marks "at least every 25 kPa" can be re-stated as graduation marks "at least every 0.25 bar.

Fig. A.1 provides an example of an acceptable analogue pressure gauge for a test pressure of 1400 kPa.

Fig. A.1 Example of an acceptable analogue pressure gauge for hydrostatic testing at 1400 kPa (14 bar)

Appendix B – Update history

B.1 Update History

Issue 1 (08/03/18): Initial issue for public and internal consultation

Issue 2 (02/07/18): Issued for use

Issue 3 (30/08/19): Amended as shown in Appendix B and re-issued for use

Issue 4 (20/03/22): Update to align with WSA 03 (Version 3.2)

Issue 5 (03/05/22): Minor amendment (clause 5.12.5.2 only)

Issue 6 (17/12/25): Amendments as shown in Appendix B

B.2 Issue 6 Updates

Section	Update	Description
Throughout	Amendments	Reviewed WSA 03-2011-3.3 and updated this supplement to suit.
Throughout	Amendments	Updated to latest template for standard documents.
Throughout	Technical Authority	All references to Principal Engineer replaced with Technical Authority to align with ACT Water and Sewerage Technical Code.
Throughout	WSA02 page numbering	All page number references updated to suit WSA 03-2011-3.3.
Throughout	Reference updates	All existing references presented in Table 1.4.1 and throughout document updated to latest document numbering and titles and formatted for consistency.
1.5	Designer Qualifications	New Section 1.5 included with requirements for designer qualifications and experience in alignment with Professional Engineers Act 2023.
Glossary of Terms	Pipe Protection Envelope	Added term of Pipe Protection Envelope
Glossary of Terms	Technical Authority	Added definition of Technical Authority
Glossary of Terms	TCCS/CED	Replaced Transport Canberra City Services with City and Environment Directorate.
Abbreviations	New Section	Added abbreviations section and missing abbreviations.
1.2.5.3	Design Outputs	Included requirement of service location survey for all major and complex works (in alignment with STD-SPE-C-004) and where necessary to prove design feasibility.
2.3.3	Demand Assessment	Added fire flow category FR1.5 and associated requirements to align with Icon Water Deed of Agreement with ACT Fire and Rescue.

Section	Update	Description
2.3.3	Demand Assessment	Included reference to STD-SPE-M-006 for more details for details on Direct Boosting.
2.10	Trenchless Technique for Pipelaying	Included required details and preapproval prior to proceeding with trenchless designs.
3.1.2	Minimum Pipe size	Included minimum pipe size requirement for FRT1.5
3.5(b)(ii)	System Test Pressure	Amended point (b)(ii), Icon Water must be contacted to advise on required 'transfer main' test pressure cognisant of risks related to 'transfer' main and pump operational scenarios.
5.4.10	Railway Reserves	Included requirements for proposed water main crossing light rail
5.4.12	Overhead Power lines and Transmission	Added requirement for overhead power lines and transmission lines to comply with local electrical authority specification, requirements, guidelines for safe approach distance.
5.12.5.2	Clearance Requirement	Updated wording around requirement for other utility assets clear of Pipe Protection Envelope as per STD-SPE-G-017. Added requirement to consider Electrical Authority guideline for safe approach distance. Added measures that can be adopted for cross contamination prevention.
5.13	Disused or Redundant Pipelines	Included requirement that disused assets shall be removed from site where practicable and details of works are shown on design and As Constructed drawings.
7.4.2 Table IW.5	Pipe Cover	Included Freeways, State and National Highways minimum cover requirement in alignment with table already within the *SD Series*.
7.9.2	Thrust Block	Included prerequisites for Icon Water to consider non-standard thrust block arrangement.
8.2.2.3	Butterfly Valves	Included requirement to have dismantling joint for future maintenance.
N/A	Hydrant as air valve	Deleted amendments to 8.4.6 based on WSA 03 3.3 deletion of this section, requirements are addressed by 8.8.10.
8.8.8 Table IW.8	Hydrant spacing	Emboldened hydrant spacing within Table IW.8 to bring designer attention to key criteria.
11.5.1	Working near Icon Water assets	Reference included to new standard *STD-SPE-G-025 Requirements for Working Near Assets* for further requirements when working near Icon Water assets.

Section	Update	Description
15.8	Mechanical Tapping Saddle	Amended incorrect reference, now refers to WSA PS-310.
I6.3	Sample Set B-New Main, and Failed Samples	Added that samples must be collected by a NATA accredited laboratory
19.4.2	Mains Hydrostatic Pressure Testing	Included dot point. Icon Water must be contacted to advise on required ‘transfer main’ test pressure cognisant of risks related to ‘transfer’ main and pump operational scenarios.
20.1	Disinfection	Minor change in wording to reflect the changes in WSA03 3.3

B.3 Issue 4 & 5 Updates

Clause/Section	Description of Updates
Page 17, Clause 5.12.5.2 Clearance requirement STD-SPE-G-012	Additional text inserted for working around high voltage cable.
Page 1, Section 2 STD-SPE-G-012	Icon water not responsible for internal plumbing system
Page 3, Section 5, STD-SPE-G-012	Deleted "which" and replaced with "that"
Page 3 ,Section 5, STD-SPE-G-012	Minor edit of headings
Page 4 ,National standard for construction work, STD-SPE-G-012	Deleted the entire row
Page 4, Glossary of terms, STD-SPE-G-012	Deleted "Availability flow" and replaced with "95th Percentile Demand". Method to derive 95th Percentile Demand added
Page 5, Glossary of terms, STD-SPE-G-012	Minor wording edits for " Fire Risk Type"
Page 5, Glossary of terms, STD-SPE-G-012	Add a new term " Equivalent Tenement" and definition
Page 6-9, Clause 2.3.3 Demand assessment, STD-SPE-G-012	Major changes on how design flows are calculated. Major change on fire risk type and firefighting flows provision.
Page 10,2.5.3.2 Maximum allowable service pressure, STD-SPE-G-012	Deleted " fourth" and replaced with "fifth" from the first sentence
Page 10, Clause, 2.5.3.2 Maximum allowable service pressure, STD-SPE-G-012	Delete fourth paragraph
Page 10, Clause, 2.5.3.2 Maximum allowable service pressure, STD-SPE-G-012	Hume high zone added in area with pressure above 100 m
Page 10-11, Clause, 2.5.3.3 Minimum service pressure, STD-SPE-G-012, Table IW 3	Major changes various
Page 13, Clause, 3.1.2 Minimum pipe Size, STD-SPE-G-012, Table IW 4, Note 2	Minor condition added
Page 14, Clause 4, Products and materials, STD-SPE-G-012	Minor edits on wording
Page 15, Clause 4.5 PE Pipeline system, STD-SPE-G-012	Changes in the Text

Clause/Section	Description of Updates
Page 15, Clause 4.8.8, Bolted connections, STD-SPE-G-012	Deleted “Fusion bonded Plastics". Inserted "Polymeric"
Page 15, Clause 4.8.8 Bolted connections, STD-SPE-G-012	Minor edits on wording
Page 16, Clause 5.4.1, General ,STD-SPE-G-012	Existing text rearranged
Page 16, Clause 5.4.7, Water mains near trees ,STD-SPE-G-012	Additional text added regarding mature canopies not to reach easement or pipe protection envelope.
Page 17, Clause 5.12.5.2 Clearance requirement ,STD-SPE-G-012	Existing text deleted and replaced with new text.
Page 19, Restrained elastomeric sealed joint water mains, STD-SPE-G=012	Inserted clause Number 7.9.5
Page 21, Clause 8.2.7 Stop valves location and arrangement, STD-SPE-G-012	Deleted 8.2.7.2 and inserted 8.2.7.4 for arrangement 3
Page 22, Clause 8.4.5 Air valves locations, STD-SPE-G-012	Corrected clause number from 8.4.4 and replaced with 8.4.5
Page 17, Clause 5.12.5.2 Clearance requirement STD-SPE-G-012	Additional text inserted for working around high voltage cable.
Page 25, Clause 8.8.8, Hydrant Spacing, STD-SPE-G-012	Deleted the table and replace with a new one with new fire categories
Page 26, Pavement markers, STD-SPE-G-012	Inserted clause number 8.11.3
Page 26, Kerb markings, STD-SPE-G-012	Inserted clause number 8.11.4
Page 32, Clause 5.4, Requirement for irrigation system, STD-SPE-G-012	Deleted clause 5.4 , including 5.4.1,5.4.2 and Table 5.4.2.1
Various pages, STD-SPE-G-012	Updated all page numbers to align with WSA03 Version 3.2
Page 107, Clause 4.3.7, WSA03 Version 3.2	Additional text inserted
Page 121, Clause 5.1.5, Survey Control , WSA03 Version 3.2	Inserted additional Text

Clause/Section	Description of Updates
Page 262, Clause ,Protection of property and environment , WSA03 Version 3.2	Inserted additional text for working near Icon Water assets
Page 310, Clause 19.4.3, Property services , WSA03 Version 3.2	Inserted additional text for pressure testing of service mains
Page 312 Clause 19.7.1, Water quality testing, General WSA03 Version 3.2	Inserted additional text
Page 312, Clause 19.7.2, Test procedure , WSA03 Version 3.2	Inserted additional text
Page 313, Clause 19.7.4, Failure of test , WSA03 Version 3.2	Inserted additional text
Page 314, Clause 20.1, Disinfection, Application WSA03 Version 3.2	Inserted additional text
Page 399, Clause I4.2.1, Storage, WSA03 Version 3.2	Inserted additional text
Page 399, Clause I4.3, Cleaning methods, WSA03 Version 3.2	Inserted additional text
Page 400, Clause I5.1, General, WSA03 Version 3.2	Inserted additional text
Page 402, Clause I6.2, sample set A-existing main, WSA03 Version 3.2	Inserted additional text
Page 402, Clause I6.3, sample set B- new main , WSA03 Version 3.2	Inserted additional text
Page 403, Clause I8.2, Non-compliant results for the sample Set-A ,WSA03 Version 3.2	Inserted additional text
Page 403, Clause I8.3, Non-compliant results for the sample set-B-new main ,WSA03 Version 3.2	Inserted additional text
Page 404, Annexture 1, WSA03 Version 3.2	Inserted additional text and Table I.2

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