

**STD-SPE-G-012
SUPPLEMENT TO WSA 03-2011-3.2
WATER SUPPLY CODE OF AUSTRALIA**





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Document management

Document authorisation table

Issue	Date	Author	Reviewer	Approver
1	08/03/18	K. Danenbergsons	N/A	N/A
2	02/07/18	K. Danenbergsons	Various	D. Eager
3	30/08/19	K. Danenbergsons	Various	C. Patrick
4	20/03/2022	Bridey Pearn Owen Gould, Rajesh Bhandari, Sonia Bursle	Sol Asadollahi	Nicole Vonarx
5	03/05/2022	Minor amendment by Rajesh Bhandari	Sol Asadollahi	Nicole Vonarx

Version control table

Issue	Date	Reason for issue
1	08/03/18	Initial issue for public and internal consultation
2	02/07/18	Issued for use
3	30/08/19	Amended as shown in Appendix B and re-issued for use
4	20/03/22	Update to align with WSA 03 (Version 3.2)
5	03/05/22	Minor amendment (clause 5.12.5.2 only)

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

Table of Contents

1	Background	1
2	Scope	1
3	Purpose	1
4	Referenced documents	2
5	Amendments and additions to WSA 03 (Version 3.2).....	3
5.1	Amendments and additions to WSA 03 Introduction and Part 0	3
5.2	Amendments and additions to WSA 03 Part 1	7
5.3	Amendments and additions to WSA 03 Part 2	28
6	Appendix A – Additional requirements for pressure instrumentation	37
7	Appendix B – Update history.....	38

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 (3.2) 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.

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 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.

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.

4 Referenced documents

The documents listed in Table 4.1 are either referenced by this specification or are required to be read in conjunction with this specification. It should be noted that Icon Water specification *STD-SPE-G-019 Asset Creation Approval Process* provides overarching requirements for developers, designers and constructors and how they should interact with Icon Water in the planning, approvals, construction, testing, acceptance and handover phases of a new water and sewerage network asset's lifecycle.

Table 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
WSAA codes and publications		
7	WSA 03-2011.3.2	Water Supply Code of Australia
8	WSA 201	Manual for the selection and application of protective coatings
9	None allocated	WSA Product Specifications
Icon Water standards		
10	<i>SD Series</i>	Standard Drawings
11	STD-SPE-G-005	Supplement to WSA 201 Manual for the selection and application of protective coatings
12	STD-SPE-G-008	Technical specification - Design requirements for safe access, egress and working at heights
13	STD-SPE-G-009	Supplement to AS 1657 Fixed Platforms, Walkways, Stairways and Ladders – Design, Construction and Installation
14	STD-SPE-G-018	Drafting Standards
15	STD-SPE-G-019	Asset Creation and Approval Process
16	STD-SPE-C-004	Survey and Tolerancing Requirements
17	STD-SPE-M-003	Globe Valves for Water Network Applications
18	STD-SPE-M-006	Property Service Connections and Water Meters
19	STD-SPE-S-002	Reservoirs
Transport Canberra and City Services standards		
20	MIS 06	Municipal Infrastructure Standards, Part 6, Verges

5 Amendments and additions to WSA 03 (Version 3.2)

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.

5.1 Amendments and additions to WSA 03 Introduction and Part 0

Table 5.1.1 details amendments and additions to WSA 03: Introduction and Part 0: Glossary of Terms and Abbreviations.

Table 5.1.1 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 7	<p>Scope of Code</p> <p>Delete para. 3 and replace with the following wording:</p> <p>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.</p>
Page 9	<p>After the section titled "Water Industry Standards", add the following section and wording...</p> <p>Icon Water Standards and Specifications</p> <p>The latest versions of the following Icon Water standards and specifications are to be complied with in every potable water network supply project:</p> <ul style="list-style-type: none"> • "SD Series" drawings • <i>STD-SPE-G-005 Supplement to WSA 201, Manual for the Selection and Application of Protective Coatings</i> • <i>STD-SPE-G-006 Approved Products List</i> • <i>STD-SPE-G-008 Design Guidelines for Safe Access, Egress and Working at Heights</i> • <i>STD-SPE-G-009 Supplement to AS 1657-2013 Fixed Platforms, Walkways, Stairways and Ladders – Design, Construction and Installation</i> • <i>STD-SPE-G-018 Drafting Standards</i> • <i>STD-SPE-G-019 Asset Creation and Approval Process</i> • <i>STD-SPE-C-004 Survey and Tolerancing Requirements</i> • <i>STD-SPE-M-003 Globe Valves for Water Network Applications</i> • <i>STD-SPE-M-006 Property Service Connections and Water Meters</i> • <i>STD-SPE-S-002 Reservoirs</i>

WSA 03 Introduction and Part 0 Page Ref.	Amendment and/or addition
	<p>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</p>
Pp 38-54	<p>GLOSSARY OF TERMS</p> <p>Add a new term “95th percentile demand” with the following definition:</p> <p>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.</p> <p>Add the following wording to the definition for “access chamber”</p> <p>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.</p> <p>Add a new term “ACT” with the following definition:</p> <p>The Australian Capital Territory.</p> <p>Delete the definition of “allotment” and insert the words...</p> <p>Where the term “allotment” or “lot” has been provided within WSA 03, insert the words “block of land”.</p> <p>Add a new term “block of land” with the following definition:</p> <p>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.</p> <p>Delete the definition of “Concept Plan” and insert the words...</p> <p>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.</p> <p>Delete the definition of “Designer” and replace with the following definition:</p> <p>A person or organisation engaged by either Icon Water, the Developer or a Constructor to design the works on their behalf.</p> <p>Delete the definition of “Developer” and replace with the following definition:</p> <p>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.</p>

WSA 03 Introduction and Part 0 Page Ref.	Amendment and/or addition
	<p>Add a new term “Fire Risk Type (FRT)” with the following definition:</p> <p style="padding-left: 40px;">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).</p> <p>Delete the definition of “lot” and insert the words...</p> <p style="padding-left: 40px;">Where the term “allotment” or “lot” has been provided within WSA 03, insert the words “block of land”.</p> <p>Add a new term “Equivalent Tenement” with the following definition:</p> <p style="padding-left: 40px;">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.</p> <p>Add a new term “Master Plan” with the following definition:</p> <p style="padding-left: 40px;">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.</p> <p>Add a new term “NATA” with the following definition:</p> <p style="padding-left: 40px;">National Association of Testing Authorities</p> <p>Replace peak day demand</p> <p style="padding-left: 40px;">The highest average demand over a day. This could be a measured value or a theoretical value based upon modelling.</p> <p>Add a new term “peak hour demand” with the following definition:</p> <p style="padding-left: 40px;">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.</p> <p>Add a new term “residual pressure” with the following definition:</p> <p style="padding-left: 40px;">Has the same meaning as provided in <i>AS 2419.1-2017 Fire hydrant installations – Part 1: System design, installation and commissioning</i>.</p> <p>Add a new term “TCCS” with the following definition:</p> <p style="padding-left: 40px;">Transport Canberra and City Services.</p> <p>Add a new term “water services” with the following definition:</p> <p style="padding-left: 40px;">Has the same meaning and function as provided in Section 12 of the <i>Utilities Act 2000</i>.</p>

WSA 03 Introduction and Part 0 Page Ref.	Amendment and/or addition
	<p>Add a new term “water network” with the following definition:</p> <p style="padding-left: 40px;">Has the same meaning and function as provided in Section 12 of the <i>Utilities Act 2000</i>.</p> <p>Add a new term “Work as Executed (WAE)” with the following definition:</p> <p style="padding-left: 40px;">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.</p> <p>Add a new terms “RZ” with the following definition:</p> <p style="padding-left: 40px;">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 2008</p>

5.2 Amendments and additions to WSA 03 Part 1

Table 5.2.1 details amendments and additions to WSA 03 Part 1: Planning and Design.

Table 5.2.1 Amendments and additions to WSA 03 Part 1: Planning and Design

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 64	<p>1.1 SCOPE</p> <p>Add a new paragraph directly after the section title as follows:</p> <p style="padding-left: 40px;">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 <i>STD-SPE-G-019 Asset Approval Creation Process</i>. The specific requirements of <i>STD-SPE-G-019</i> shall take precedence over the generic requirements detailed in this section should any conflict or ambiguity exist.</p>
Page 69	<p>1.2.5.3 Design outputs</p> <p>Add a new paragraph at the end of this section ...</p> <p style="padding-left: 40px;">Design Drawings shall comply with Icon Water’s drafting standards as detailed in specification <i>STD-SPE-G-018</i>.</p>
Page 69	<p>1.2.6 Design Life</p> <p>Reword the second paragraph as follows...</p> <p style="padding-left: 40px;">Minimum asset design lives for water supply distribution items are shown in Table 1.2.</p> <p>Modify Table 1.2 by changing the words “Expected design life, years” to “Minimum required asset design life, years”.</p>
Page 71	<p>2 SYSTEM PLANNING</p> <p>Insert the following words directly after the section title as follows:</p> <p style="padding-left: 40px;">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 <i>STD-SPE-G-019 Asset Approval Creation Process</i>. The specific requirements of <i>STD-SPE-G-019</i> shall take precedence over the generic requirements detailed in this section should any conflict or ambiguity exist.</p>

WSA 03 Part 1 Page Ref.	Amendment and/or addition																																																																																																																		
Page 74	<p>2.3.3 Demand assessment</p> <p>Insert the following words directly after the section title as follows:</p> <p>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:</p> <p>Table IW.1 Water Network Design Flows</p> <table border="1"> <thead> <tr> <th>Development Type/Land use</th> <th>Definition of Development</th> <th>Units</th> <th>Peak Day Demand</th> <th>Peak Hour Demand</th> <th>95th Percentile Demand</th> </tr> </thead> <tbody> <tr> <td colspan="6">Residential</td> </tr> <tr> <td>Residential low density</td> <td>< 800m² block area per dwelling ≥ 500m² block area per dwelling</td> <td>Litres/tenement/day</td> <td>1500</td> <td>3750</td> <td>2475</td> </tr> <tr> <td>Residential medium density</td> <td>< 500m² block area per dwelling ≥ 250m² block area per dwelling</td> <td>Litres/tenement/day</td> <td>1200</td> <td>3000</td> <td>1980</td> </tr> <tr> <td>Residential high density</td> <td>< 250m² block area per dwelling ≥ 100m² floor area per dwelling</td> <td>Litres/tenement/day</td> <td>950</td> <td>2375</td> <td>1567.5</td> </tr> <tr> <td>Residential super high density</td> <td>< 100m² floor area per dwelling</td> <td>Litres/tenement/day</td> <td>550</td> <td>2200</td> <td>1452</td> </tr> <tr> <td colspan="6">Non-Residential</td> </tr> <tr> <td>Suburban hotels or clubs</td> <td></td> <td>L/block area ha/s</td> <td>0.6</td> <td>1.5</td> <td>0.99</td> </tr> <tr> <td>Neighbourhood and District centres</td> <td></td> <td>L/block area ha/s</td> <td>0.332</td> <td>0.83</td> <td>0.5478</td> </tr> <tr> <td>Town or City centres</td> <td></td> <td>L/block area ha/s</td> <td>0.432</td> <td>1.08</td> <td>0.7128</td> </tr> <tr> <td>Office buildings less than three-storey</td> <td></td> <td>L/block area ha/s</td> <td>0.24</td> <td>0.6</td> <td>0.396</td> </tr> <tr> <td>Office buildings three storey or more</td> <td></td> <td>L/floor area ha/s</td> <td>0.432</td> <td>1.08</td> <td>0.7128</td> </tr> <tr> <td>Sports centres</td> <td></td> <td>L/block area ha/s</td> <td>0.6</td> <td>1.5</td> <td>0.99</td> </tr> <tr> <td>Schools</td> <td></td> <td>L/block area ha/s</td> <td>0.456</td> <td>1.14</td> <td>0.7524</td> </tr> <tr> <td>Hospitals, Nursing Homes</td> <td></td> <td>L/block area ha/s</td> <td>0.68</td> <td>1.7</td> <td>1.122</td> </tr> <tr> <td>Other Institutional</td> <td></td> <td>L/block area ha/s</td> <td>0.18</td> <td>0.45</td> <td>0.297</td> </tr> <tr> <td>Light Industrial</td> <td></td> <td>L/block area ha/s</td> <td>0.216</td> <td>0.54</td> <td>0.3564</td> </tr> <tr> <td>Playing fields: automatic night watering</td> <td>based on 8hrs at peak flow (3.5)</td> <td>L/irrigated area ha/s</td> <td>1.2</td> <td>3.5</td> <td>2.31</td> </tr> <tr> <td>Future development details unknown</td> <td></td> <td>L/block area ha/s</td> <td>0.6</td> <td>1.5</td> <td>0.99</td> </tr> </tbody> </table> <p>Notes:</p> <ol style="list-style-type: none"> 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. 95th percentile demands are calculated by multiplying the Peak Hour Demand by 0.66 In most cases: <ol style="list-style-type: none"> Peak Day Factor (PDF) is 2.8 times Average Day Demand. Peak Hour Factor (PHF) is 2.5 times peak day demand 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. 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. For residential blocks greater than 800m², consult with Icon Water to determine the requirements. Residential High Density covers two types of development: <ol style="list-style-type: none"> Single dwelling or town house style development where the block area per dwelling is below 250 m². Where tenements are above other tenements (e.g. multi-story apartments) and the floor area per dwelling is greater than or equal to 100 m². 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 	Development Type/Land use	Definition of Development	Units	Peak Day Demand	Peak Hour Demand	95th Percentile Demand	Residential						Residential low density	< 800m ² block area per dwelling ≥ 500m ² block area per dwelling	Litres/tenement/day	1500	3750	2475	Residential medium density	< 500m ² block area per dwelling ≥ 250m ² block area per dwelling	Litres/tenement/day	1200	3000	1980	Residential high density	< 250m ² block area per dwelling ≥ 100m ² floor area per dwelling	Litres/tenement/day	950	2375	1567.5	Residential super high density	< 100m ² floor area per dwelling	Litres/tenement/day	550	2200	1452	Non-Residential						Suburban hotels or clubs		L/block area ha/s	0.6	1.5	0.99	Neighbourhood and District centres		L/block area ha/s	0.332	0.83	0.5478	Town or City centres		L/block area ha/s	0.432	1.08	0.7128	Office buildings less than three-storey		L/block area ha/s	0.24	0.6	0.396	Office buildings three storey or more		L/floor area ha/s	0.432	1.08	0.7128	Sports centres		L/block area ha/s	0.6	1.5	0.99	Schools		L/block area ha/s	0.456	1.14	0.7524	Hospitals, Nursing Homes		L/block area ha/s	0.68	1.7	1.122	Other Institutional		L/block area ha/s	0.18	0.45	0.297	Light Industrial		L/block area ha/s	0.216	0.54	0.3564	Playing fields: automatic night watering	based on 8hrs at peak flow (3.5)	L/irrigated area ha/s	1.2	3.5	2.31	Future development details unknown		L/block area ha/s	0.6	1.5	0.99
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	<p>to be consulted if swimming pools area sum to >10% of block area or irrigated gardens area sum to >30% of block area.</p> <p>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.</p> <p>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.</p> <p>Table IW.2 Fire Risk Types and Firefighting Flow Provisions</p> <table border="1"> <thead> <tr> <th>FRT</th> <th>New Categories</th> <th>Flow (L/s)</th> </tr> </thead> <tbody> <tr> <td>FRTx</td> <td>Targeted development does not fit well and requires specific assessment</td> <td>Specified</td> </tr> <tr> <td>FRT1</td> <td>Residential buildings (RZ1, RZ2, RZ3)</td> <td>25</td> </tr> <tr> <td>FRT2</td> <td>Residential buildings (RZ4, RZ5), Parks and Recreation with a building (PRZ1, PRZ2)</td> <td>45</td> </tr> <tr> <td>FRT3</td> <td>Commercial land use (non-core - i.e. CZ2-CZ6), Community Facility (CFZ)</td> <td>60</td> </tr> <tr> <td>FRT4</td> <td>Commercial core land use (CZ1)</td> <td>100</td> </tr> <tr> <td>FRT5</td> <td>Industrial land use (IZ1-IZ2)</td> <td>150</td> </tr> </tbody> </table> <p>Notes:</p> <ol style="list-style-type: none"> 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. The Minimum Available Firefighting Flow Provision is the total required firefighting flow including the internal firefighting system and reticulation hydrants. 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). FRTx is available for developments that are not easily placed in any of the other categories (for example, hospitals and stadiums) or exceptional circumstances. FRT4 includes town centres like Civic and Belconnen and large shopping centres like Kippax and Erindale FRT5 includes industrial areas of Canberra including Mitchell, Fyshwick and Hume <p>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.</p>	FRT	New Categories	Flow (L/s)	FRTx	Targeted development does not fit well and requires specific assessment	Specified	FRT1	Residential buildings (RZ1, RZ2, RZ3)	25	FRT2	Residential buildings (RZ4, RZ5), 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
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WSA 03 Part 1 Page Ref.	Amendment and/or addition
	<p>On-site fire-fighting requirements</p> <p>There could be cases where the required firefighting flows cannot be met economically with a network solution, for example because:</p> <ul style="list-style-type: none"> • 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). <p>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 services.</p>
Page 77	<p>2.4 SYSTEM CONFIGURATION</p> <p>After Fig. 2.1(c) add the following text:</p> <p>Notwithstanding the above mentioned generic water agency requirements, all elements of Icon Water's water supply system shall be planned and detailed to 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:</p> <ul style="list-style-type: none"> • 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.

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 79	<p>2.5.3.1 Service pressure</p> <p>Add a third paragraph as follows:</p> <p style="padding-left: 40px;">Icon Water service pressure requirements are provided in Table IW.3 and take precedence over the values provided in Table 2.3.</p>
Page 79	<p>2.5.3.2 Maximum allowable service pressure</p> <p>Add the following text after the fifth (i.e. the last) paragraph as follows:</p> <p style="padding-left: 40px;">Icon Water maximum pressure requirements are provided in Table IW.3 and take precedence over the values provided in Table 2.3.</p> <p style="padding-left: 40px;">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.</p> <p><u>Commentary:</u></p> <p style="padding-left: 40px;"><i>Due to legacy design requirements, there are three areas within the ACT where customers currently receive maximum static heads over 100 metres:</i></p> <ul style="list-style-type: none"> • <i>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.</i> • <i>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.</i> • <i>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.</i>
Page 80	<p>2.5.3.3 Minimum service pressure</p> <p>Add the following text after the second paragraph (i.e. above Table 2.3) as follows:</p> <p style="padding-left: 40px;">Icon Water minimum pressure requirements are provided in Table IW.3 and take precedence over the values provided in Table 2.3.</p> <p>Add the following table and text at the end of this section:</p>

Table IW.3 Service Pressure Limits

Service Pressure Limit	Demand Condition	Pressure (m H ₂ O)
Maximum Static	All applications	75
Minimum residual	Peak hour demand – for residential development not exceeding three storeys in height and all other developments except those mentioned below	20
	Peak hour demand – for residential developments in RZ4 and RZ5 and commercial and industrial land uses (refer to Notes 1 and 3)	30
	Peak hour demand – for very large blocks such as institutional campuses	Notes 2 & 3
	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 95 th percentile demand	20

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.

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 82	<p>2.5.5.1 General</p> <p>At point (a), change the reference from “see Table 2.3” to “see Table IW.3”.</p>
Page 82	<p>2.5.5.2 Use of minimum allowable or desirable minimum service pressures</p> <p>Change any reference to “Table 2.3” to “Table IW.3”.</p>
Page 82-83	<p>2.5.5.3 Use of desirable minimum static pressure</p> <p>Change any reference to “Table 2.3” to “Table IW.3”.</p>
Page 84	<p>2.8 PUMPING STATIONS</p> <p>Add the following text immediately below the section title:</p> <p style="padding-left: 40px;">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.</p>
Page 88	<p>2.9 SERVICE RESERVOIRS</p> <p>Add the following text immediately below the section title:</p> <p style="padding-left: 40px;">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 <i>STD-SPE-S-002 Technical Specification, Reservoirs</i>. The specific requirements of <i>STD-SPE-S-002</i> shall take precedence over the generic requirements detailed in this section should any conflict or ambiguity exist.</p>
Page 91	<p>2.12 SYSTEM REVIEW</p> <p>Point (e): Substitute the words “peak demand event” for “peak day event”.</p>
Page 92	<p>3 HYDRAULIC DESIGNS</p> <p>3.1.1 General</p> <p>Add additional text at the end of this section as follows:</p> <p style="padding-left: 40px;">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.</p> <p style="padding-left: 40px;">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</p>

WSA 03 Part 1 Page Ref.	Amendment and/or addition								
	<p>determining the head loss in valves and fittings etc. with “K” values taken from one or more of the following approved publications:</p> <ul style="list-style-type: none"> • The relevant valve or fitting manufacturer’s datasheets • <i>The Australian Pipe Friction Handbook</i> (published by the Australian Pump Industry Association) • <i>Crane Technical Paper TP410 Flow of Fluids</i> (available from www.flowoffluids.com) • <i>Internal Flow Systems</i> (authored by DS Miller and published by BHR Group) • <i>Engineering Data Book</i> (published by the Hydraulics Institute) 								
Page 92	<p>3.1.2 Minimum pipe sizes</p> <p>Modify the first paragraph to read as follows:</p> <p style="padding-left: 40px;">Minimum pipe sizes shall comply with Table IW.4 except in the following locations where specific design requirements apply:</p> <p>Delete Table 3.1 and accompanying notes and insert the following table and notes:</p> <p>Table IW.4 Minimum Sizes of Mains</p> <table border="1" data-bbox="373 1059 1426 1191"> <thead> <tr> <th>Fire Risk Type</th> <th>Minimum Mains Size</th> </tr> </thead> <tbody> <tr> <td>FRTx</td> <td>Based upon equivalent fire flow</td> </tr> <tr> <td>FRT1</td> <td>DN100 DICL PN35 (equivalent to DN125 PE100 PN16 SDR11)</td> </tr> <tr> <td>FRT2 to FRT5</td> <td>DN150 DICL PN35 (equivalent to DN180 PE100 PN16 SDR11)</td> </tr> </tbody> </table> <p>Notes:</p> <ol style="list-style-type: none"> 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 as per Appendix B. 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. 	Fire Risk Type	Minimum Mains Size	FRTx	Based upon equivalent fire flow	FRT1	DN100 DICL PN35 (equivalent to DN125 PE100 PN16 SDR11)	FRT2 to FRT5	DN150 DICL PN35 (equivalent to DN180 PE100 PN16 SDR11)
Fire Risk Type	Minimum Mains Size								
FRTx	Based upon equivalent fire flow								
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FRT2 to FRT5	DN150 DICL PN35 (equivalent to DN180 PE100 PN16 SDR11)								
Page 92	<p>3.1.3 Empirical sizing of reticulation mains</p> <p>Delete the first paragraph and replace with the following:</p> <p style="padding-left: 40px;">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.</p> <p style="padding-left: 40px;">DN200 and DN250 sized pipes are not accepted by Icon Water for use within the water network.</p>								

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 93	<p>3.1.5 Fire flows</p> <p>Delete all text in this section and replace with the following text:</p> <p style="padding-left: 40px;">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.</p>
Page 94	<p>3.1.6.3 Hydraulic roughness values</p> <p>Add new text after the final paragraph in this section as follows:</p> <p style="padding-left: 40px;">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 Swamee-Jain equation for determining the friction factor and the Darcy-Weisbach equation for determining head loss:</p> <p style="padding-left: 80px;">Reticulation mains, design roughness value k_{S1}: 0.15 mm</p> <p style="padding-left: 80px;">Reticulation mains, design roughness value k_{S2}: 0.30 mm</p> <p style="padding-left: 80px;">Distribution and transfer mains, design roughness value k_{S2}: 0.30 mm</p> <p style="padding-left: 40px;">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.</p>
Page 97	<p>3.5 SYSTEM TEST PRESSURE</p> <p>Delete the text at point (b)(ii) and replace with the following text:</p> <p style="padding-left: 40px;">(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.</p> <p style="padding-left: 40px;">Note: Icon Water's thrust block "thrust areas" (depicted in the <i>SD Series</i> 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.</p>
Page 101	<p>4 PRODUCTS AND MATERIALS</p> <p>4.1 GENERAL</p> <p>Add additional text at the end of this section as follows:</p> <p style="padding-left: 40px;">Icon Water requires all products and materials to be selected from Icon Water's 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.</p>
Page 106	<p>4.3.3 Seal coating of lining</p> <p>Delete the first paragraph and replace with the following text:</p> <p style="padding-left: 40px;">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</p>

WSA 03 Part 1 Page Ref.	Amendment and/or addition
	<p>– 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.</p>
Page 106	<p>4.3.4 Sleeving</p> <p>Delete the first paragraph and replace with the following text:</p> <p>Polyethylene sleeving (coloured as per the requirements of Table 4.1) in accordance with AS 3680 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.</p> <p>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.</p>
Page 107	<p>4.3.7 Coatings</p> <p>Add additional text at the end of this section as follows:</p> <p>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.</p>
Page 109	<p>4.5 PE PIPELINE SYSTEMS</p> <p>Insert the following text directly under the section title:</p> <p>Icon Water does not permit polyethylene to be used for new mains construction without written approval from the relevant Icon Water Principal Engineer. 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.</p> <p>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.</p>
Page 112	<p>4.7 GRP PIPELINE SYSTEMS</p> <p>Insert the following text directly under the section title:</p> <p>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 relevant Icon Water Principal Engineer.</p>
Page 117	<p>4.8.8 Bolted Connections</p> <p>Reword the second paragraph as follows:</p> <p>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</p>

WSA 03 Part 1 Page Ref.	Amendment and/or addition
	<p>corrosion prevention priming paste wrapped with petrolatum tape or with PE sleeving and taped (See Figures 4.3, 4.4 and 4.5).</p> <p>Add a third paragraph as follows:</p> <p style="padding-left: 40px;">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).</p>
Page 119	<p>5 GENERAL DESIGN 5.1 GENERAL REQUIREMENT 5.1.1 Design Tolerances</p> <p>Modify the last paragraph as follows:</p> <p style="padding-left: 40px;">Horizontal alignment shall be in accordance with the requirements of Icon Water specification <i>STD-SPE-C-004 Survey and Tolerancing Requirements</i>.</p>
Page 121	<p>5.1.5 Survey Control</p> <p>Insert the following text directly under the section title:</p> <p style="padding-left: 40px;">All survey control work shall comply with the requirements of Icon Water specification <i>STD-SPE-C-004 Survey and Tolerancing Requirements</i>.</p>
Page 124	<p>5.4 LOCATION OF WATER MAINS 5.4.1 General</p> <p>Add two new paragraphs at the end of this section as follows:</p> <p style="padding-left: 40px;">Refer to TCCS requirements as detailed in TCCS document <i>MIS 06 Verges</i> for specific locations. The requirements specified in the referenced TCCS document must be adhered to unless notified otherwise in writing by Icon Water as part of the development approval process.</p>
Page 126	<p>5.4.4 Water mains in easements</p> <p>Insert the following text immediately below the section title:</p> <p style="padding-left: 40px;">This section is generic in nature and shall be read in conjunction with Icon Water’s Service and Installation Rules (aka “S&I Rules”) and <i>STD-SPE-G-019 Asset Creation and Approval Process</i>. Should there be any ambiguity arising from the requirements of this section and the S&I Rules, the requirements of the S&I Rules shall take precedence. Note: Pressure mains are not to be located on private property.</p>
Page 129	<p>5.4.7 Water mains near trees</p> <p>Add a new paragraph at the end of this section as follows:</p> <p style="padding-left: 40px;">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.</p>

WSA 03 Part 1 Page Ref.	Amendment and/or addition
	<p>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.</p>
Page 133	<p>5.4.14 Water mains on curved alignments</p> <p>Delete point (b) as Icon Water prohibits the bending of PVC pressure pipes to achieve curved alignments.</p> <p>Delete the last sentence starting with “<i>Notwithstanding, the nominated minimum bending...</i>” as Icon Water prohibits the bending of PVC pressure pipes to achieve curved alignments.</p> <p>Add a note at the end of this section as follows:</p> <p style="padding-left: 40px;">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.</p>
Page 134	<p>5.4.16 Marking tape 5.4.16.2 Mains</p> <p>Modify the final paragraph of this section as follows:</p> <p style="padding-left: 40px;">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.</p>
Peg 136	<p>5.6 SHARED TRENCHING</p> <p>Add the following text directly under the section title as follows:</p> <p>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.</p>
Page 139	<p>5.9 CONNECTION OF NEW MAINS TO EXISTING MAINS</p> <p>Add a paragraph directly following the section title as follows:</p> <p style="padding-left: 40px;">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.</p>
Page 142	<p>5.10.4 Flushing Points</p> <p>Delete all content in this section (including Figure 5.8) and replace with the following text:</p> <p style="padding-left: 40px;">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</p>

WSA 03 Part 1 Page Ref.	Amendment and/or addition
	<p>hydrants are required on the water main, a hydrant shall be provided at all low points.</p> <p>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.</p>
Page 143-147	<p>5.11 PROPERTY SERVICES</p> <p>Delete all content in this section including all content in sections 5.11.1, 5.11.2 and 5.11.3.</p> <p>Add the following text directly under the section heading:</p> <p>The planning and design requirements for property services, including connections to water mains and water meters shall be in accordance with Icon Water specification <i>STD-SPE-M-006 Property Service Connections and Water Meters</i> and the Icon Water <i>SD Series</i> of drawings.</p>
Page 148	<p>5.12.5 Underground obstructions and services 5.12.5.2 Clearance requirements</p> <p>Delete the existing paragraph and replace with the following text</p> <p>Minimum clearance requirement shall be according to requirement as specified in Table 5.5. The minimum clearance between high voltage power lines and metallic water pipes must be determined in accordance with AS 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 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.</p>
Page 177	<p>6.3 PRESSURE REDUCING VALVE INSTALLATIONS 6.3.1 Planning criteria</p> <p>Replace any reference to Table 2.3 with Table IW.3.</p> <p>6.3.2 Design requirements</p> <p>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 <i>STD-SPE-M-003 Hydraulically Operated Automatic Water Control (Globe) Valves</i>. An overview of the design requirements is included in Clause 8.3.3.</p>
Page 178-179	<p>6.4 PRESSURE SUSTAINING VALVE INSTALLATIONS 6.4.1 Planning criteria</p> <p>Replace any reference to Table 2.3 with Table IW.3.</p> <p>6.4.2 Design requirements</p> <p>Modify the first (and only) paragraph to read as follows:</p> <p>The design of pressure sustaining valve installations shall satisfy the requirements of the Concept Plan and Icon Water specification <i>STD-SPE-M-003 Hydraulically</i></p>

WSA 03 Part 1 Page Ref.	Amendment and/or addition																
	<p><i>Operated Automatic Water Control (Globe) Valves.</i> An overview of the design requirements is included in Clause 8.3.6.</p>																
Page 182	<p>7.4.2 Pipe cover</p> <p>Replace all references to Table 7.2 with Table IW.5.</p> <p>Delete Table 7.2 and replace with Table IW.5 as follows:</p> <p>Table IW.5 Minimum Depths of Pipe Cover</p> <table border="1" data-bbox="373 701 1453 1518"> <thead> <tr> <th data-bbox="373 701 983 779">Location</th> <th data-bbox="983 701 1453 779">Minimum Cover</th> </tr> </thead> <tbody> <tr> <td data-bbox="373 779 983 857">Public and private blocks, not subject to vehicular loading</td> <td data-bbox="983 779 1453 857">450</td> </tr> <tr> <td data-bbox="373 857 983 981">Private blocks zoned residential, subject to vehicular loading</td> <td data-bbox="983 857 1453 981">450</td> </tr> <tr> <td data-bbox="373 981 983 1059">Embankments</td> <td data-bbox="983 981 1453 1059">750</td> </tr> <tr> <td data-bbox="373 1059 983 1261">Footways, nature strips, industrial and commercial blocks, sealed road pavements (other than major roads subject to vehicular loading)</td> <td data-bbox="983 1059 1453 1261">600</td> </tr> <tr> <td data-bbox="373 1261 983 1339">Unsealed road carriageways and verges</td> <td data-bbox="983 1261 1453 1339">750</td> </tr> <tr> <td data-bbox="373 1339 983 1417">Major road carriageways and verges</td> <td data-bbox="983 1339 1453 1417">750</td> </tr> <tr> <td data-bbox="373 1417 983 1518">Future road, rail and light rail pavements</td> <td data-bbox="983 1417 1453 1518">1200</td> </tr> </tbody> </table>	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
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																
Page 204	<p>7.9.5 Restrained elastomeric seal joint water mains</p> <p>Modify the first paragraph as follows:</p> <p>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 relevant Icon Water Principal Engineer. 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:</p>																
Page 215	<p>8.1 Valves 8.1.5 Plastics identification covers</p> <p>Delete all content in this section and replace with the following text:</p> <p>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 <i>SD Series</i> of standard drawings.</p>																

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 216	<p>8.2.2.2 Gate valves</p> <p>Modify the first paragraph as follows:</p> <p style="padding-left: 40px;">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 Clause 7.9.</p> <p>Delete the second paragraph (starting with the words <i>Typical gate valve installation...</i>)</p>
Page 217	<p>8.2.2.2 Gate valves</p> <p>Delete Figure 8.2 and the note below.</p>
Page 218	<p>8.2.2.2 Gate valves</p> <p>Delete Figure 8.3 and the note below.</p> <p>Modify the final paragraph on the page as follows:</p> <p style="padding-left: 40px;">A valve chamber shall be provided for all geared gate valves and all valves DN450 and larger. Refer to Icon Water's <i>SD Series</i> of standard drawings for mandatory requirements.</p>
Page 219	<p>8.2.2.2 Gate valves</p> <p>Delete Figure 8.4 and the note below.</p>
Page 220	<p>8.2.2.2 Gate valves</p> <p>Delete Figure 8.5 and the note below.</p>
Page 221	<p>8.2.2.2 Gate valves</p> <p>Delete Figure 8.6 and the note below.</p>
Page 221	<p>8.2.2.3 Butterfly valves</p> <p>Delete all content in this section and replace with the following text:</p> <p style="padding-left: 40px;">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.</p> <p style="padding-left: 40px;">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 <i>SD Series</i> of standard drawings as well as the following additional requirements:</p> <ul style="list-style-type: none"> • 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.

WSA 03 Part 1 Page Ref.	Amendment and/or addition												
	<ul style="list-style-type: none"> The valve shall be fitted with a hand wheel and a position indicator that can be viewed from street level. 												
Page 222	<p>8.2.4 Stop valves for reticulation mains</p> <p>Replace all references to Table 8.2 with Table IW.6.</p> <p>Add the following paragraphs after the final paragraph on page 222:</p> <p>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.</p> <p>Stop valves shall not be installed under road pavements and similarly, they shall be located clear of sumps, maintenance holes and driveways etc.</p> <p>All stop valves shall be flanged-flanged connections.</p> <p>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.</p> <p>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 <i>SD-3308</i>, <i>SD-3310</i> and <i>SD-3312</i> for an example of stop valves located either side of the take-off.</p>												
Page 223	<p>8.2.4 Stop valves for reticulation mains</p> <p>Delete Table 8.2 and the note directly below it and replace with Table IW.6 and note as follows:</p> <p>Table IW.6 Stop Valve Spacing Criteria</p> <table border="1" data-bbox="373 1435 1426 1749"> <thead> <tr> <th>Water main size</th> <th>Number of property services connected</th> <th>Maximum spacing (metres)</th> </tr> </thead> <tbody> <tr> <td>DN100 and DN150</td> <td>40</td> <td>300 (city/suburban) 500 (rural)</td> </tr> <tr> <td>DN225</td> <td>50</td> <td>500</td> </tr> <tr> <td>> DN225</td> <td>100</td> <td>750</td> </tr> </tbody> </table> <p>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.</p>	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
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											

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 225	<p>8.2.7 Stop valves – location and arrangements 8.2.7.2 Arrangement 1</p> <p>Delete all references to Soc-Soc and FI-Soc valves. All stop valves installed within the Icon Water network shall be Flanged-Flanged.</p>
Page 226	<p>8.2.7 Stop valves – location and arrangements 8.2.7.4 Arrangement 3</p> <p>Delete the first paragraph and replace it with the following text:</p> <p style="padding-left: 40px;">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”.</p>
Page 227	<p>8.2.7 Stop valves – location and arrangements 8.2.7.8 Arrangement 7</p> <p><i>Insert the following text after the first paragraph:</i></p> <p style="padding-left: 40px;"><i>Refer to the Icon Water SD Series of standard drawings for requirements relating to control valves.</i></p>
Page 231	<p>8.3.3 Pressure reducing valves (PRV)</p> <p>Modify the final paragraph at the bottom of page 232 as follows:</p> <p style="padding-left: 40px;">The Design Drawings shall be prepared in accordance with Icon Water’s <i>SD Series</i> of standard drawings and Icon Water specification <i>STD-SPE-M-003 Hydraulically Operated Automatic Water Control (Globe) Valves</i>.</p> <p>Delete all references to figures 8.20, 8.21 and 8.22.</p>
Page 232-233	<p>8.3.3 Pressure reducing valves (PRV)</p> <p>Delete Figure 8.20 and Figure 8.21 including all notes.</p>
Page 233	<p>8.3.3 Pressure reducing valves (PRV)</p> <p>Delete Figure 8.22 including all notes.</p>
Page 234	<p>8.3.6 Pressure sustaining valves</p> <p>Modify the second paragraph of this section as follows:</p> <p style="padding-left: 40px;">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 <i>SD Series</i> of standard drawings and Icon Water specification <i>STD-SPE-M-003 Hydraulically Operated Automatic Water Control (Globe) Valves</i>.</p>

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 235	<p>8.4. AIR VALVES 8.4.2 Installation design criteria</p> <p>Delete all content in this section and replace with the following text:</p> <p style="padding-left: 40px;">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.</p> <p style="padding-left: 40px;">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.</p>
Page 235	<p>8.4.3 Air valves type</p> <p>Delete all existing text and replace with the following text:</p> <p style="padding-left: 40px;">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.</p>
Page 236	<p>8.4.5 Air valves location</p> <p>Delete all references to Figure 8.24.</p> <p>Provide a final paragraph at the bottom of page 236 as follows:</p> <p style="padding-left: 40px;">Air valve installations shall be in accordance with the Icon Water <i>SD Series</i> of standard drawings.</p>
Page 237	<p>8.4.5 Air valves location</p> <p>Delete Figure 8.24.</p>
Page 237	<p>8.4.6 Use of hydrants as an alternative to air valves</p> <p>Delete all content in this section and replace with the following text:</p> <p style="padding-left: 40px;">Fire hydrants shall only be used as an alternative to air valves in reticulation mains where practicable as per section 8.4.2.</p>
Page 238-240	<p>8.6 SCOURS AND PUMP-OUT BRANCHES 8.6.2 Design</p> <p>Delete all references to Figures 8.25, 8.26, 8.27 and 8.28 and delete these figures.</p> <p>Add the following text as the final paragraph on page 239:</p> <p style="padding-left: 40px;">Scours and pump-out branches shall be in accordance with Icon Water's <i>SD Series</i> of drawings.</p>

WSA 03 Part 1 Page Ref.	Amendment and/or addition															
Page 241	<p>8.6.4 Scour size</p> <p>Replace all references to Table 8.4 with Table IW.7.</p> <p>Delete Table 8.4 and replace with Table IW.7 as follows:</p> <p>Table IW.7 Minimum Scour Size</p> <table border="1" data-bbox="373 577 1426 797"> <thead> <tr> <th>Main Size (DN)</th> <th>Scour Valve Size (DN)</th> <th>Scour Outfall Pipe Size (DN)</th> </tr> </thead> <tbody> <tr> <td>150 - 200</td> <td>80</td> <td>80</td> </tr> <tr> <td>225 - 300</td> <td>100</td> <td>100</td> </tr> <tr> <td>375 - 600</td> <td>150</td> <td>100</td> </tr> <tr> <td>750</td> <td>225</td> <td>150</td> </tr> </tbody> </table>	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
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 241	<p>8.7 SWABBING POINTS</p> <p>Add the following text (as a new first paragraph) directly after the section title:</p> <p style="padding-left: 40px;">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.</p>															
Page 243	<p>8.8.4 Hydrant types</p> <p>Delete all content in this section and replace with the following text:</p> <p style="padding-left: 40px;">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.</p>															
Page 243-244	<p>8.8.5 Hydrant installation</p> <p>Delete Figure 8.30.</p>															
Page 244	<p>8.8.6 Hydrant outlet connections</p> <p>Delete all content and replace with the following text:</p> <p style="padding-left: 40px;">The hydrant outlet connection for a spring hydrant shall be of the claw-type in accordance with AS 3952.</p>															
Page 245	<p>8.8.7 Hydrant size</p> <p>Delete all existing content and replace with the following text:</p> <p style="padding-left: 40px;">Spring hydrants shall be sized DN80 with DN80 flanges and shall be installed on a DN80 riser in accordance with Icon Water's <i>SD Series</i> of standard drawings.</p>															
Page 245	<p>8.8.8 Hydrant spacing</p> <p>Delete all existing content and insert the following text and table:</p>															

WSA 03 Part 1 Page Ref.	Amendment and/or addition																		
	<p>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.</p> <p>Table IW.8 Fire Risk Types and Hydrant Spacing</p> <table border="1" data-bbox="373 488 1426 1704"> <thead> <tr> <th data-bbox="373 488 491 725">Fire Risk Type</th> <th data-bbox="491 488 683 725">Minimum Available Firefighting Flow Provision (L/s)</th> <th data-bbox="683 488 1426 725">Fire Hydrant Spacing</th> </tr> </thead> <tbody> <tr> <td data-bbox="373 725 491 887">FRT5 FRT4</td> <td data-bbox="491 725 683 887">150 100</td> <td data-bbox="683 725 1426 887">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 data-bbox="373 887 491 1016">FRT3</td> <td data-bbox="491 887 683 1016">60</td> <td data-bbox="683 887 1426 1016">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 data-bbox="373 1016 491 1146">FRT2</td> <td data-bbox="491 1016 683 1146">45</td> <td data-bbox="683 1016 1426 1146">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 data-bbox="373 1146 491 1514">FRT1</td> <td data-bbox="491 1146 683 1514">25</td> <td data-bbox="683 1146 1426 1514"> <p><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.</p> <p><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.</p> </td> </tr> <tr> <td data-bbox="373 1514 491 1704">FRTx</td> <td data-bbox="491 1514 683 1704">Unspecified</td> <td data-bbox="683 1514 1426 1704">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> </tbody> </table> <p>Notes:</p> <ol style="list-style-type: none"> 1. FRTx requirements should be based upon equivalent fire fighting flow requirement. 2. These hydrant spacings are only for reticulation mains (<DN300) 	Fire Risk Type	Minimum Available Firefighting Flow Provision (L/s)	Fire Hydrant Spacing	FRT5 FRT4	150 100	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.	FRT3	60	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.	FRT2	45	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.	FRT1	25	<p><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.</p> <p><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.</p>	FRTx	Unspecified	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.
Fire Risk Type	Minimum Available Firefighting Flow Provision (L/s)	Fire Hydrant Spacing																	
FRT5 FRT4	150 100	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.																	
FRT3	60	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.																	
FRT2	45	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.																	
FRT1	25	<p><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.</p> <p><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.</p>																	
FRTx	Unspecified	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.																	
Page 245 and page 246	<p>8.8.9 Hydrant location</p> <p>Delete Figure 8.33.</p> <p>Delete all references to above ground hydrants.</p>																		

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 253	<p>8.11.2 Marker posts and plates</p> <p>Add the following text after the first sentence:</p> <p style="padding-left: 40px;">Icon Water requirements are detailed in Icon Water's <i>SD Series</i> of standard drawings.</p>
Page 253	<p>8.11.3 Pavement markers</p> <p>Add the following text after the first sentence:</p> <p style="padding-left: 40px;">Icon Water requirements are detailed in Icon Water's <i>SD Series</i> of standard drawings.</p>
Page 253	<p>8.11.4 Kerb markings</p> <p>Delete paragraph 2, paragraph 3 and Figure 8.39 and replace with the following text:</p> <p style="padding-left: 40px;">Icon Water requirements are detailed in Icon Water's <i>SD Series</i> of standard drawings.</p>

5.3 Amendments and additions to WSA 03 Part 2

Table 5.3.1 details amendments and additions to WSA 03 Part 2: Construction.

Table 5.3.1 Amendments and additions to WSA 03 Part 2: Construction

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 262	<p>11.5 Protection of Property and Environment 11.5.1 Protection of other services Insert the following paragraph after point (h)</p> <p>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</p>
Page 269	<p>11.9 CUT-IN CONNECTION EQUIPMENT</p> <p>Add a paragraph directly following the section title as follows:</p> <p style="padding-left: 40px;">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.</p>
Page 271	<p>12 PRODUCTS AND MATERIALS 12.1 AUTHORISED PRODUCTS AND MATERIALS 12.1.1 General</p> <p>Delete all of the existing content and replace with the following content:</p> <p style="padding-left: 40px;">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 Icon Water's 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.</p> <p style="padding-left: 40px;">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.</p>
Page 274	<p>12.8.2 Valves</p> <p>Modify the third sentence as follows:</p> <p style="padding-left: 40px;">Ensure the direction of closure is anti-clockwise.</p>
Page 277	<p>13.7 UNDER PRESSURE CUT-IN CONNECTION TO PRESSURE PIPES ≥ DN80</p> <p>Add a paragraph directly following the section title as follows:</p> <p style="padding-left: 40px;">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.</p>

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 285	<p>15.5 UNDER PRESSURE CUT-IN CONNECTION TO PRESSURE PIPES ≥ DN80</p> <p>Add a paragraph directly following the section title as follows:</p> <p style="padding-left: 40px;">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.</p>
Page 289	<p>15.8 TAPPING OF MAINS, PROPERTY SERVICES AND WATER METERS</p> <p>Add a paragraph directly following the section title as follows:</p> <p style="padding-left: 40px;">Mains tapping shall be undertaken by Icon Water personnel only. Tappings to Icon Water mains shall not be undertaken by any other party.</p> <p>Modify the existing 6th paragraph as follows:</p> <p style="padding-left: 40px;">Where tapping is specified for PE mains, use either (i) a mechanical tapping-style pipe saddle complying with WSA PS-329, or (ii) an electrofusion tapping saddle complying with WSA PS-329 of a make/model specifically detailed in the Icon Water Approved Products List.</p>
Page 289	<p>15.8 TAPPING OF MAINS, PROPERTY SERVICES AND WATER METERS</p> <p>Modify point (c) as follows:</p> <p style="padding-left: 40px;">Maintain a minimum spacing of 1000 mm between tappings, and from a tapping and the end of a pipe; and</p>
Page 290	<p>15.11 CORROSION PROTECTION OF DUCTILE IRON</p> <p>Delete all existing content and replace with the following text:</p> <p style="padding-left: 40px;">Polyethylene sleeving (coloured blue) in accordance with AS 3680 shall be installed on all ductile iron pipes sized DN225 and above where indicated in <i>STD-SPE-G-006 Approved Products List</i> 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.</p> <p style="padding-left: 40px;">Only polyethylene sleeving from the suppliers listed for ductile iron pipe in Icon Water's Approved Products List shall be installed.</p> <p style="padding-left: 40px;">When installing polyethylene sleeving, do so in accordance with AS 3681. Do not allow sleeved items to be exposed to sunlight for more than seven (7) days.</p>
Page 290	<p>15.12.3 Tracer Wire</p> <p>Delete all existing content and replace with the following text:</p> <p style="padding-left: 40px;">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 Icon Water's Approved Products List and shall be installed in accordance with the tracer wire manufacturer's instructions.</p>

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 290-291	<p>15.13 VALVES, HYDRANTS AND SURFACE BOXES AND FITTINGS 15.13.1 Installation</p> <p>Modify the second paragraph as follows:</p> <p style="padding-left: 40px;">Install an extension spindle, as necessary, to ensure the top of spindle is at the required depth as shown on the Icon Water <i>SD Series</i> of standard drawings.</p>
Page 296	<p>15.21 WELDING OF PE PIPELINES</p> <p>Delete all existing content and replace with the following text:</p> <p style="padding-left: 40px;">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.</p> <p style="padding-left: 40px;">All welding shall be performed by welders who have successfully completed training by a Registered Training Organisation, endorsed by the Plastics Industry Pipe Association for the relevant welding method(s).</p> <p style="padding-left: 40px;">The Plastics Industry Pipe Association provides technical guidelines for electrofusion welding – POP001 and butt welding – POP003.</p> <p style="padding-left: 40px;">Undertake all welding in accordance with the Specification and relevant Design Drawings.</p>
Page 304	<p>18 SWABBING 18.1 GENERAL</p> <p>Delete all of the existing content in this section and replace with the following text:</p> <p style="padding-left: 40px;">Swabbing of mains is not required by Icon Water unless:</p> <ul style="list-style-type: none"> 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.

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 310	<p>19.4 HYDROSTATIC PRESSURE TESTING</p> <p>19.4.1 General</p> <p>Delete the first paragraph and add the following text prior to the second paragraph:</p> <p style="padding-left: 40px;">Icon Water requires that:</p> <ol style="list-style-type: none"> 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. 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. <p>19.4.2 Mains</p> <p>Add the following text directly after the first paragraph and prior to the second paragraph:</p> <p style="padding-left: 40px;">All water mains, including water services and stop cocks, shall be subjected to a hydrostatic field test pressure as follows:</p> <ul style="list-style-type: none"> • 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 other pipework, a test pressure as specified by Icon Water but not less than the equivalent of 1400 kPa at any point. <p>19.4.3 Property services</p> <p>Add the following text directly after the first paragraph and prior to the second paragraph:</p> <p>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.</p>

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 311	<p>19.4 PRESSURE TESTING 19.4.4 Under pressure cut-in connections</p> <p>Add a paragraph directly following the section title as follows:</p> <p style="padding-left: 40px;">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.</p>
Page 312	<p>19.7 WATER QUALITY TESTING 19.7.1 GENERAL</p> <p>Delete the first paragraph and add the following text:</p> <p style="padding-left: 40px;">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.</p> <p style="padding-left: 40px;">In preparation for flushing and disinfection each end of laid pipe is required to have flushing arrangements installed.</p> <p style="padding-left: 40px;">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.</p>
Page 312	<p>19.7.2 TEST PROCEDURE</p> <p>Add a paragraph directly following the section title as follows:</p> <p style="padding-left: 40px;">Following a high velocity pre-disinfection flush (>1 m/s), a sample must be taken for turbidity or clarity testing.</p> <p style="padding-left: 40px;">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 be considered as a hold point and shall be released by the responsible officer of Icon Water.</p> <p style="padding-left: 40px;">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 contractor's ITP.</p> <ul style="list-style-type: none"> - 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. <p style="padding-left: 40px;">Post disinfection flushing and sampling must occur within four weeks of the established date for issuing of a connection certificate.</p>

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 313	<p>19.7.4 FAILURE OF TEST</p> <p>Add a paragraph after the first paragraph as follows:</p> <p>Refer to Appendix I section I8.3 for details on non-complaint results.</p>
Page 314	<p>20 DISINFECTION 20.1 APPLICATION</p> <p>Delete the first paragraph and add the following text prior to the second paragraph:</p> <p style="padding-left: 40px;">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:</p> <p style="padding-left: 40px;">(a) New water mains (except where an exemption has been granted by Icon Water) before they are placed in service even if the new main will not be providing water to properties immediately after being placed in service.</p> <p style="padding-left: 40px;">(b) Existing water mains that are taken out of service during construction.</p> <p style="padding-left: 40px;">(c) Renewed, including relined, water mains (except where an exemption has been granted, by the Water Agency, for mains of particular diameters).</p> <p style="padding-left: 40px;">Disinfection of water mains must be carried out by an Icon Water approved contractor/service provider.</p>
Page 316-317	<p>21 TOLERANCES ON AS CONSTRUCTED WORK</p> <p>Delete all content in this section including sections 21.2 through 21.5 inclusive and replace with the following text:</p> <p style="padding-left: 40px;">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 <i>STD-SPE-C-004 Survey and Tolerancing Requirements</i>.</p>
Page 318	<p>22 CONNECTIONS TO EXISTING WATER MAINS</p> <p>Add a paragraph directly following the section title as follows:</p> <p style="padding-left: 40px;">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.</p>
Page 323	<p>24 WORK AS CONSTRUCTED DETAILS</p> <p>Delete the first paragraph and replace with the following text:</p> <p style="padding-left: 40px;">Prepare Work as Constructed (aka “Work as Executed”) drawings and documentation in accordance with the requirements of the following Icon Water specifications:</p> <ul style="list-style-type: none"> • <i>STD-SPE-G-018 Drafting Standards</i>

WSA 03 Part 2 Page Ref.	Amendment and/or addition
	<ul style="list-style-type: none"> • <i>STD-SPE-G-019 Asset Creation Approval Process</i> • <i>STD-SPE-C-004 Survey and Tolerancing Requirements</i> <p>It should be noted that a Qualified Surveyor (as defined in <i>STD-SPE-C-004</i>) and a Chartered Engineer (as defined in <i>STD-SPE-G-019</i>) are required to be engaged for the production of WAE drawings and documentation.</p>
Page 399	<p>I4.2.1 STORAGE</p> <p>Add a paragraph after the first paragraph as follows:</p> <p style="padding-left: 40px;">All pipes must be sealed prior to transportation to the job site (to prevent contamination from conditions at manufacturing warehouses or on truck beds)</p> <p style="padding-left: 40px;">Pipes must be elevated from the ground (to prevent contamination including rain and vermin intrusion)</p>
Page 399	<p>I4.3 CLEANING METHODS</p> <p>Delete the first paragraph and replace with the following text:</p> <p style="padding-left: 40px;">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 18 SWABBING.</p>
Page 400	<p>I5.1 GENERAL</p> <p>Add a paragraph after the last paragraph and table I.1 as follows :</p> <p style="padding-left: 40px;">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.</p> <p style="padding-left: 40px;">Chlorine in the form of sodium hypochlorite dosed into the water main must be used to disinfect all new water mains.</p> <p style="padding-left: 40px;">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.</p> <p style="padding-left: 40px;">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.</p> <p style="padding-left: 40px;">The chlorine solution must be slowly and continuously pumped into the water main until the entire main is filled with the chlorine solution.</p> <p style="padding-left: 40px;">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.</p>

WSA 03 Part 2 Page Ref.	Amendment and/or addition
	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.
Page 402	<p>I6.2 SAMPLE SET A – EXISTING MAIN</p> <p>Remove the text and add the following :</p> <p>Sampling must be conducted within 72 hours of successful disinfection.</p> <p>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.</p> <p>Tanked supply; samples must be taken directly from the tanker.</p> <p>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 supplying the feed water, after the main has been flushed at a minimum flow of 0.5 L/s.</p> <p>Whichever sample point is chosen, it shall be disinfected prior to collection of the sample.</p>
Page 402	<p>I6.3 SAMPLE SET B – NEW MAIN</p> <p>Replace the first paragraph with the following:</p> <p>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.</p>
Page 403	<p>I8.2 Non-Compliant Results for Sample Set A</p> <ul style="list-style-type: none"> (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 403	<p>I8.3 NON-COMPLIANT RESULTS FOR SAMPLE SET B – NEW MAIN</p> <p>Replace the items (a) and (b) with the following:</p> <ul style="list-style-type: none"> (a) For microbial test results (<i>E.coli</i>, Total coliform and HPC) outside the limits specified in table I.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 404	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

6 Appendix A – Additional requirements for pressure instrumentation

Analogue or digital pressure gauges are both acceptable instrument types for measuring pressure during hydrostatic testing. Table 6.1 summarises the mandatory requirements for pressure instrumentation.

Table 6.1 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. 6.1 provides an example of an acceptable analogue pressure gauge for a test pressure of 1400 kPa.



Fig. 6.1 Example of an acceptable analogue pressure gauge for hydrostatic testing at 1400 kPa (14 bar)

7 Appendix B – Update history

Amendments in this issue (5) are provided in the table below.

Clause/Section	Description of Updates
Page 17, Clause 5.12.5.2 Clearance requirement STD-SPE -G012	Additional text inserted for working around high voltage cable.

Amendments in the previous issue (4) are provided in the table below for reference.

Clause/Section	Description of Updates
Page 1, Section 2 STD-SPE -G 012	Icon water not responsible for internal plumbing system
Page 3, Section 5, STD-SPE-G012	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-G012	Deleted "Availability flow" and replaced with "95th Percentile Demand". Method to derive 95th Percentile Demand added
Page 5, Glossary of terms, STD-SPE-G012	Minor wording edits for " Fire Risk Type"
Page 5, Glossary of terms, STD-SPE-G012	Add a new term " Equivalent Tenement" and definition
Page 6-9, Clause 2.3.3 Demand assessment, STD-SPE-G012	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 -G012	Deleted " fourth" and replaced with "fifth" from the first sentence
Page 10, Clause, 2.5.3.2 Maximum allowable service pressure, STD-SPE -G012	Delete fourth paragraph
Page 10, Clause, 2.5.3.2 Maximum allowable service pressure, STD-SPE -G012	Hume high zone added in area with pressure above 100 m
Page 10-11, Clause, 2.5.3.3 Minimum service pressure, STD-SPE -G012, Table IW 3	Major changes various
Page 13, Clause, 3.1.2 Minimum pipe Size, STD-SPE -G012, Table IW 4, Note 2	Minor condition added
Page 14, Clause 4, Products and materials, STD-SPE -G012	Minor edits on wording
Page 15, Clause 4.5 PE Pipeline system, STD-SPE -G012	Changes in the Text
Page 15, Clause 4.8.8, Bolted connections, STD-SPE -G012	Deleted "Fusion bonded Plastics". Inserted "Polymeric"
Page 15, Clause 4.8.8 Bolted connections, STD-SPE -G012	Minor edits on wording
Page 16, Clause 5.4.1, General, STD-SPE -G012	Existing text rearranged
Page 16, Clause 5.4.7, Water mains near trees, STD-SPE -G012	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 -G012	Existing text deleted and replaced with new text.
Page 19, Restrained elastomeric sealed joint water mains, STD-SPE -G012	Inserted clause Number 7.9.5
Page 21, Clause 8.2.7 Stop valves location and arrangement, STD-SPE -G012	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 -G012	Corrected clause number from 8.4.4 and replaced with 8.4.5


Clause/Section	Description of Updates
Page 17, Clause 5.12.5.2 Clearance requirement STD-SPE -G012	Additional text inserted for working around high voltage cable.
Page 25, Clause,8.8.8,Hydrant Spacing, STD-SPE -G012	Deleted the table and replace with a new one with new fire categories
Page 26,Pavement markers, STD-SPE -G012	Inserted clause number 8.11.3
Page 26,Kerb markings, STD-SPE -G012	Inserted clause number 8.11.4
Page 32, Clause 5.4, Requirement for irrigation system, STD-SPE -G012	Deleted clause 5.4 , including 5.4.1,5.4.2 and Table 5.4.2.1
Various pages, STD-SPE-G012	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
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,Annixture 1, WSA03 Version 3.2	Inserted additional text and table I.2

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Talk to us

E talktous@iconwater.com.au

T 02 6248 3111

 @IconWater

GPO Box 366,
Canberra ACT 2601

iconwater.com.au