



**STD-SPE-G-012
SUPPLEMENT TO WSA 03-2011-3.1
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
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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

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

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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 (3.1) 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, 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.

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 03-2011.3.1	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

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 which either supersede or supplement (as applicable) the requirements of WSA 03.

5.1 Amendments and additions to WSA 03 Part 0

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

Table 5.1.1 Amendments and additions to WSA 03 Part 0: Glossary of Terms and Abbreviations

WSA 03 Part 0 Page Ref.	Amendment and/or addition
Page 9	<p>Scope of Code</p> <p>Delete para. 3 and replace with the following wording:</p> <p style="padding-left: 40px;">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 11	<p>After the section titled "Water Industry Standards", add the following section and wording...</p> <p style="text-align: center;">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-007 WSA Product Specifications – Icon Water Edition</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 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>
Page 11 Para. 1	<p>NATIONAL STANDARD FOR CONSTRUCTION WORK</p> <p>Delete existing web link in para. 1 and replace with:</p> <p>https://www.safeworkaustralia.gov.au/doc/national-standard-construction-work-nohsc1016-2005</p>
Pp 12 - 25	<p>GLOSSARY OF TERMS</p> <p>Add a new term "95% availability flow" with the following definition:</p> <p style="padding-left: 40px;">The flow rate required to satisfy the 95th percentile of daily maximum demands (over 10 years). This (theoretical) value has been converted to a percentage of the maximum hourly rate and is calculated based on the results of system modelling and flow test data.</p> <p>Add the following wording to the definition for "access chamber"...</p> <p style="padding-left: 40px;">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 style="padding-left: 40px;">The Australian Capital Territory.</p> <p>Delete the definition of "allotment" 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 "block of land" with the following definition:</p> <p style="padding-left: 40px;">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 style="padding-left: 40px;">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 style="padding-left: 40px;">A person or organisation engaged by either Icon Water, the Developer or a Constructor to design the works on their behalf.</p>

WSA 03 Part 0 Page Ref.	Amendment and/or addition
	<p>Delete the definition of “Developer” and replace with the following definition:</p> <p style="padding-left: 40px;">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> <p>Add a new term “fire risk type” with the following definition:</p> <p style="padding-left: 40px;">A classification system (developed by ACT Fire and Rescue) used to define the minimum firefighting water flow requirement for different types of buildings, and building developments, within the ACT.</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 “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>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> <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>

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 48	<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 53	<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 53	<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 55	<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>
Page 58	<p>2.3.3 Demand assessment</p> <p>Insert the following words directly after the section title as follows:</p> <p style="padding-left: 40px;">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>

Table IW.1 Water Network Design Flows

Development Type	Max. Hourly Rate (L/s/net ha)	Peak Hour Demand (% of Max. Hourly Rate)	95% Availability Flow (% of Max. Hourly Rate)	Comments
Standard detached housing	1.5	100	70	Based on block area
Group housing and duplex	1.5	100	70	Based on block area
Low rise flats	1.5	100	70	Based on block area
High rise flats	1.5	100	70	Based on floor area
Suburban hotels or clubs	1.5	100	70	Based on site area
Neighbourhood and district centres	1.1	75	70	Based on site area
Town or city centres	1.8	60	70	Based on site area
Office buildings less than three storeys	1.0	60	70	Based on site area including parking
Office buildings three storeys or more	1.8	60	70	Based on floor area
Sports centres	1.5	100	70	Based on site area
Schools	1.9	60	70	Based on site area
Hospitals, nursing homes	1.7	100	70	Based on site area
Other institutional	0.9	50	70	Based on site area
Light industrial	0.9	60	70	Based on site area
Playing fields – automatic night watering	3.5	43	70	Based on irrigated area assuming 38 mm per week over 30 hours
Future development – details unknown	1.5 or 1.05	100 100	70 70	Based on block area Note 3

Notes:

1. *Peak Hour Demand (L/s)* and *95% Availability Flow (L/s)* are calculated by multiplying the stated *Percentage of Maximum Hourly Rate* (as a decimal) by the *Maximum Hourly Rate (L/s/ha)* for a given development area (ha).
2. The values provided in the table above are based on historical district water meter data or traditional values and are subject to regular review.

WSA 03 Part 1 Page Ref.	Amendment and/or addition																						
	<p>3. Based on gross area which includes local streets and walkways but excludes arterial roads, floodways and all other non-consuming areas.</p> <p>4. 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). 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 style="text-align: center;">Table IW.2 Fire Risk Types and Firefighting Flow Provisions</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Fire Risk Type</th> <th style="text-align: center;">Type of Development</th> <th style="text-align: center;">Minimum Firefighting Flow Provision^(Notes 1 & 2) (L/s)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">F1</td> <td>Town centres; major shopping centres</td> <td style="text-align: center;">200</td> </tr> <tr> <td style="text-align: center;">F2</td> <td>Major industry; major hospitals; major office developments</td> <td style="text-align: center;">150</td> </tr> <tr> <td style="text-align: center;">F3</td> <td>Large offices; large educational establishments; very large shopping areas</td> <td style="text-align: center;">100</td> </tr> <tr> <td style="text-align: center;">F4</td> <td>Light industry; large institutions; large places of public assembly; large shopping centres; schools and colleges (unless classified as Fire Risk Type F3); group centres; higher risk residential areas individually classified as Fire Risk Type F4</td> <td style="text-align: center;">60</td> </tr> <tr> <td style="text-align: center;">F5</td> <td>Minor shopping areas; small institutions; small places of public assembly; medium density housing, duplex, flats and dwelling units more than one self-contained unit high unless individually classified as Fire Risk Type F4</td> <td style="text-align: center;">45</td> </tr> <tr> <td style="text-align: center;">F6</td> <td>Detached housing; medium density housing, duplex, flats and dwelling units not more than one self-contained unit high</td> <td style="text-align: center;">25</td> </tr> </tbody> </table> <p>Notes:</p> <ol style="list-style-type: none"> The Minimum Firefighting Flow Provision shall be taken to occur concurrently with the Peak Hour Demand stated in Table IW.1. The Minimum Firefighting Flow Provision includes firefighting flows for building sprinkler systems and internal fire hydrants. Hence, if these demands are concurrent, the fire flows available from the water network are reduced accordingly. <p>Pipe sizes shall be designed to allow for the Minimum Firefighting Flow Provision (shown in Table IW.2) for one frontage taken concurrently with the Peak Hour Demand (shown in Table IW.1).</p> <p>Whilst values for 95% Availability Flow have been provided in Table IW.1, and whilst some urban water agencies use the 95% Availability Flow for determining firefighting flow requirements, Icon Water is yet to adopt this design basis and has provided these 95% Availability Flow values at this stage “for information only”.</p>		Fire Risk Type	Type of Development	Minimum Firefighting Flow Provision ^(Notes 1 & 2) (L/s)	F1	Town centres; major shopping centres	200	F2	Major industry; major hospitals; major office developments	150	F3	Large offices; large educational establishments; very large shopping areas	100	F4	Light industry; large institutions; large places of public assembly; large shopping centres; schools and colleges (unless classified as Fire Risk Type F3); group centres; higher risk residential areas individually classified as Fire Risk Type F4	60	F5	Minor shopping areas; small institutions; small places of public assembly; medium density housing, duplex, flats and dwelling units more than one self-contained unit high unless individually classified as Fire Risk Type F4	45	F6	Detached housing; medium density housing, duplex, flats and dwelling units not more than one self-contained unit high	25
Fire Risk Type	Type of Development	Minimum Firefighting Flow Provision ^(Notes 1 & 2) (L/s)																					
F1	Town centres; major shopping centres	200																					
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WSA 03 Part 1 Page Ref.	Amendment and/or addition
	<p>Pipe sizes shall be checked to ensure that while drawing the specified Minimum Firefighting Flow at points within 150 metres of the fireground (concurrently with the Peak Hour 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 combined firefighting flows and breakdowns.</p> <p>When the required firefighting flows are higher than those tabulated in Table IW.2 within private firefighting systems, or where guaranteed flow is required even under breakdown conditions, additional private storage tanks and/or booster pumping may be required. In certain circumstances direct boosting from Icon Water's mains may be permitted, however, details of any such proposal must be submitted for approval by Icon Water to ensure that there is no adverse effect on the adjacent public system.</p>
Page 63	<p>2.4 SYSTEM CONFIGURATION</p> <p>After Fig. 2.1(c) add the following text:</p> <p>Notwithstanding the abovementioned 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 enough 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, especially 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 63	<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 63	<p>2.5.3.2 Maximum allowable service pressure</p> <p>Add the following text after the fourth (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 style="padding-left: 40px;">A suitable note shall be placed on design drawings stating that a pressure reducing valve (PRV) is required for each individual premises affected by pressures greater than 500 kPa (as per the requirements of AS/NZS 3500).</p> <p><u>Commentary:</u></p> <p style="padding-left: 40px;"><i>Due to legacy design requirements, there are two areas within the ACT where maximum static heads over 100 metres currently exist:</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>
Page 64	<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>

WSA 03 Part 1 Page Ref.	Amendment and/or addition		
	Table IW.3 Service Pressure Limits		
	Service Pressure Limit	Demand Condition	Static Head (metres)
	Maximum	All applications	75
	Minimum residual	Peak Hour Demand – for domestic development not exceeding two storeys in height (refer to Notes 1 and 3)	20
		Peak Hour Demand – for domestic development exceeding two stories and for shopping, commercial and industrial developments (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 fireground, concurrently with Peak Hour Demand flows (refer to Note 3)	10
	<p>Notes:</p> <ol style="list-style-type: none"> 1. Minimal residual pressure for Peak Hour Demands shall be taken at the highest point on the block. 2. For very large blocks such as institutional campuses, an extra allowance of 5 metres head for every 1000 metres distance, between the main and the most critical point on the block (with regards to either elevation or distance from the main) is permitted. 3. The stated minimum residual pressures (for both Peak Hour 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. The system shall be checked to ensure that the same residuals can be achieved at 50% of peak demand with any one element out of service. 		
Page 66	<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 66	<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 67	<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>		

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 68	<p>2.8 PUMPING STATIONS</p> <p>Add the following text immediately below the section title:</p> <p>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 71	<p>2.9 SERVICE RESERVOIRS</p> <p>Add the following text immediately below the section title:</p> <p>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 74	<p>2.12 SYSTEM REVIEW</p> <p>Point (e): Substitute the words "peak demand event" for "peak day event".</p>
Page 75	<p>3 HYDRAULIC DESIGN</p> <p>3.1.1 General</p> <p>Add additional text at the end of this section as follows:</p> <p>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>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 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)

WSA 03 Part 1 Page Ref.	Amendment and/or addition						
Page 75	<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 style="text-align: center;">Table IW.4 Minimum Sizes of Mains</p> <table border="1" data-bbox="373 667 1426 763"> <thead> <tr> <th data-bbox="373 667 587 701">Fire Risk Type</th> <th data-bbox="587 667 1426 701">Minimum Mains Size</th> </tr> </thead> <tbody> <tr> <td data-bbox="373 701 587 734">F1 to F5</td> <td data-bbox="587 701 1426 734">DN150 DICL PN35 (equivalent to DN180 PE100 PN16 SDR11)</td> </tr> <tr> <td data-bbox="373 734 587 763">F6</td> <td data-bbox="587 734 1426 763">DN100 DICL PN35 (equivalent to DN125 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. These locations could otherwise experience reduced water quality due to long retention times or sediment build-up. 	Fire Risk Type	Minimum Mains Size	F1 to F5	DN150 DICL PN35 (equivalent to DN180 PE100 PN16 SDR11)	F6	DN100 DICL PN35 (equivalent to DN125 PE100 PN16 SDR11)
Fire Risk Type	Minimum Mains Size						
F1 to F5	DN150 DICL PN35 (equivalent to DN180 PE100 PN16 SDR11)						
F6	DN100 DICL PN35 (equivalent to DN125 PE100 PN16 SDR11)						
Page 75	<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>						
Page 76	<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 77	<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>						

WSA 03 Part 1 Page Ref.	Amendment and/or addition
	<p>Reticulation mains, design roughness value k_{s1}: 0.15 mm</p> <p>Reticulation mains, design roughness value k_{s2}: 0.30 mm</p> <p>Distribution and transfer mains, design roughness value k_{s2}: 0.30 mm</p> <p>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 79	<p>3.5 SYSTEM TEST PRESSURE</p> <p>Delete the text at point (b)(ii) and replace with the following text:</p> <p>(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. 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 83	<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>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. The limits of use stated in the Approved Products List shall be adhered to.</p>
Page 86	<p>4.3.3 Seal coating of lining</p> <p>Delete the first paragraph and replace with the following text:</p> <p>Unless otherwise notified by Icon Water for a specific project, seal coats are required on internal cement mortar linings for all DICL and SCL pipes sized DN100 – DN300 inclusive. For internal cement mortar lined pipes of sizes larger than DN300, a seal coat is required where residence times exceed 72 hours at any point following pipeline commissioning.</p>
Page 87	<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>

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 88	<p>4.5 PE PIPELINE SYSTEMS</p> <p>Insert the following text directly under the section title:</p> <p style="padding-left: 40px;">Icon Water does not permit polyethylene to be used for new mains construction unless a curved mains alignment is required or trenchless techniques are the only viable method of installation and an additional written approval is sought 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 style="padding-left: 40px;">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 90	<p>4.7 GRP PIPELINE SYSTEMS</p> <p>Insert the following text directly under the section title:</p> <p style="padding-left: 40px;">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 94	<p>4.8.8 Bolted Connections</p> <p>Reword the second paragraph as follows:</p> <p style="padding-left: 40px;">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 fusion-bonded plastics coated metallic flanged fittings and/or flanged PE pipes and fittings shall be provided with additional corrosion protection in the form of an encapsulating system of bolt head and nut sealing caps filled with corrosion prevention priming paste wrapped with petrolatum tape or with PE sleeving and taped (See Figures 4.3, 4.4 and 4.5).</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 above-ground 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 97	<p>5 GENERAL DESIGN</p> <p>5.1 GENERAL REQUIREMENT</p> <p>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>

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 102	<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 and clearances between water mains and other buried utilities. 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 104	<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 106	<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;">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 111	<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 or not as attractive for a particular application.</p>
Page 112	<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>

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 114	<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 117	<p>5.9 CONNECTION OF NEW MAINS TO EXISTING MAINS</p> <p>Add a paragraph directly following the section title as follows:</p> <p>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 mains 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 120	<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>Scour (or drain) outlets with isolating valve control shall be provided at all low points on water mains which do not necessarily require fire hydrants. Where fire hydrants are required on the water main, a hydrant shall be provided at all low points.</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>
Pp 120 - 125	<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 126	<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>For trenched and trenchless installations, clearances from other service utility assets shall be in accordance with TCCS requirements as detailed in TCCS document <i>MIS 06 Verges</i>. Should the referenced TCCS document be “silent” with respect to clearances, then the relevant clearance(s) detailed in Table 5.5 shall apply noting that Actew AGL require a 300 mm clearance for high voltage cables.</p>

WSA 03 Part 1 Page Ref.	Amendment and/or addition																
Page 154	<p>6.3 PRESSURE REDUCING VALVE INSTALLATIONS</p> <p>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 155	<p>6.4 PRESSURE SUSTAINING VALVE INSTALLATIONS</p> <p>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: 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 Operated Automatic Water Control (Globe) Valves</i>. An overview of the design requirements is included in Clause 8.3.6.</p>																
Page 159	<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 style="text-align: center;">Table IW.5 Minimum Depths of Pipe Cover</p> <table border="1" data-bbox="373 1402 1426 2049"> <thead> <tr> <th data-bbox="373 1402 968 1464">Location</th> <th data-bbox="968 1402 1426 1464">Minimum Cover</th> </tr> </thead> <tbody> <tr> <td data-bbox="373 1464 968 1529">Public and private blocks, not subject to vehicular loading</td> <td data-bbox="968 1464 1426 1529">450</td> </tr> <tr> <td data-bbox="373 1529 968 1624">Private blocks zoned residential, subject to vehicular loading</td> <td data-bbox="968 1529 1426 1624">450</td> </tr> <tr> <td data-bbox="373 1624 968 1686">Embankments</td> <td data-bbox="968 1624 1426 1686">750</td> </tr> <tr> <td data-bbox="373 1686 968 1839">Footways, nature strips, industrial and commercial blocks, sealed road pavements (other than major roads subject to vehicular loading)</td> <td data-bbox="968 1686 1426 1839">600</td> </tr> <tr> <td data-bbox="373 1839 968 1901">Unsealed road carriageways and verges</td> <td data-bbox="968 1839 1426 1901">750</td> </tr> <tr> <td data-bbox="373 1901 968 1964">Major road carriageways and verges</td> <td data-bbox="968 1901 1426 1964">750</td> </tr> <tr> <td data-bbox="373 1964 968 2049">Future road, rail and light rail pavements</td> <td data-bbox="968 1964 1426 2049">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																
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Future road, rail and light rail pavements	1200																

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 180	<p>Restrained elastomeric seal joint water mains</p> <p>Modify the first paragraph as follows:</p> <p style="padding-left: 40px;">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 188	<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 style="padding-left: 40px;">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>
Page 189	<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 190	<p>8.2.2.2 Gate valves</p> <p>Delete Figure 8.2 and the note below.</p>
Page 191	<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 192	<p>8.2.2.2 Gate valves</p> <p>Delete Figure 8.4 and the note below.</p>
Page 193	<p>8.2.2.2 Gate valves</p> <p>Delete Figure 8.5 and the note below.</p>
Page 194	<p>8.2.2.2 Gate valves</p> <p>Delete Figure 8.6 and the note below.</p>

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 194	<p>8.2.2.3 Butterfly valves</p> <p>Delete all content in this section and replace with the following text:</p> <p>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>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. • The valve shall be fitted with a handwheel and a position indicator that can be viewed from street level.
Page 195	<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 195:</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>

WSA 03 Part 1 Page Ref.	Amendment and/or addition												
Page 196	<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 style="text-align: center;">Table IW.6 Stop Valve Spacing Criteria</p> <table border="1" data-bbox="373 517 1426 826"> <thead> <tr> <th data-bbox="373 517 719 607">Water main size</th> <th data-bbox="719 517 1075 607">Number of property services connected</th> <th data-bbox="1075 517 1426 607">Maximum spacing (metres)</th> </tr> </thead> <tbody> <tr> <td data-bbox="373 607 719 701">DN100 and DN150</td> <td data-bbox="719 607 1075 701">40</td> <td data-bbox="1075 607 1426 701">300 (city/suburban) 500 (rural)</td> </tr> <tr> <td data-bbox="373 701 719 763">DN225</td> <td data-bbox="719 701 1075 763">50</td> <td data-bbox="1075 701 1426 763">500</td> </tr> <tr> <td data-bbox="373 763 719 826">> DN225</td> <td data-bbox="719 763 1075 826">100</td> <td data-bbox="1075 763 1426 826">750</td> </tr> </tbody> </table> <p><u>Note:</u> 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											
Page 198	<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 199	<p>8.2.7 Stop valves – location and arrangements 8.2.7.2 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 200	<p>8.2.7 Stop valves – location and arrangements 8.2.7.8 Arrangement 7</p> <p>Insert the following text after the first paragraph:</p> <p style="padding-left: 40px;">Refer to the Icon Water <i>SD Series</i> of standard drawings for requirements relating to control valves.</p>												
Page 205	<p>8.3.3 Pressure reducing valves (PRV)</p> <p>Modify the final paragraph at the bottom of page 205 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>												

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 206	<p>8.3.3 Pressure reducing valves (PRV)</p> <p>Delete Figure 8.20 and Figure 8.21 including all notes.</p>
Page 207	<p>8.3.3 Pressure reducing valves (PRV)</p> <p>Delete Figure 8.22 including all notes.</p>
Page 208	<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>
Page 209	<p>8.4. AIR VALVES</p> <p>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 209	<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 210	<p>8.4.4 Air valves location</p> <p>Delete all references to Figure 8.24.</p> <p>Provide a final paragraph at the bottom of page 210 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 211	<p>8.4.4 Air valves location</p> <p>Delete Figure 8.24.</p>

WSA 03 Part 1 Page Ref.	Amendment and/or addition															
Page 211	<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 213 and page 214	<p>8.6 SCOURS AND PUMP-OUT BRANCHES</p> <p>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 213:</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>															
Page 215	<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 style="text-align: center;">Table IW.7 Minimum Scour Size</p> <table border="1" data-bbox="373 1099 1426 1323" style="margin-left: auto; margin-right: auto;"> <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 215	<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 217	<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 218	<p>8.8.5 Hydrant installation</p> <p>Delete Figure 8.30.</p>															

WSA 03 Part 1 Page Ref.	Amendment and/or addition
Page 218	<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 218	<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>

WSA 03 Part 1 Page Ref.	Amendment and/or addition																		
Page 218	<p>8.8.8 Hydrant spacing</p> <p>Delete all existing content and insert the following text and table:</p> <p style="text-align: center;">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 style="text-align: center;">Table IW.8 Fire Risk Types and Hydrant Spacing</p> <table border="1" data-bbox="373 607 1426 1794"> <thead> <tr> <th data-bbox="373 607 491 815">Fire Risk Type</th> <th data-bbox="491 607 683 815">Minimum Firefighting Flow Provision (l/s)</th> <th data-bbox="683 607 1426 815">Fire Hydrant Spacing</th> </tr> </thead> <tbody> <tr> <td data-bbox="373 815 491 976">F1 F2 F3</td> <td data-bbox="491 815 683 976">200 150 100</td> <td data-bbox="683 815 1426 976">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="373 976 491 1106">F4</td> <td data-bbox="491 976 683 1106">60</td> <td data-bbox="683 976 1426 1106">Three (3) 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 1106 491 1236">F5</td> <td data-bbox="491 1106 683 1236">45</td> <td data-bbox="683 1106 1426 1236">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 1236 491 1603">F6</td> <td data-bbox="491 1236 683 1603">25</td> <td data-bbox="683 1236 1426 1603"> <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 DN63 PE100 pipe and one (1) DN80 spring hydrant at the end of the DN63 PE100 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 1603 491 1794">-</td> <td data-bbox="491 1603 683 1794">Unspecified</td> <td data-bbox="683 1603 1426 1794">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>	Fire Risk Type	Minimum Firefighting Flow Provision (l/s)	Fire Hydrant Spacing	F1 F2 F3	200 150 100	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.	F4	60	Three (3) 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.	F5	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.	F6	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 DN63 PE100 pipe and one (1) DN80 spring hydrant at the end of the DN63 PE100 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>	-	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.
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Page 220 and page 221	<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 227	<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 227	<p>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 227	<p>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 249	<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 250	<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 253	<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 256	<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>
Page 264	<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>

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 267	<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 268	<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 268	<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 269	<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>
Page 269	<p>15.13 VALVES, HYDRANTS AND SURFACE BOXES AND FITTINGS</p> <p>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>

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 274	<p>15.21 WELDING OF PE PIPELINES</p> <p>Delete all existing content and replace with the following text:</p> <p>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>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>The Plastics Industry Pipe Association provides technical guidelines for electrofusion welding – POP001 and butt welding – POP003.</p> <p>Undertake all welding in accordance with the Specification and relevant Design Drawings.</p>
Page 280	<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>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; and/or c) the main was flooded during construction; and d) the main fails bacteriological testing (Refer to Clauses 19.7 and 20) and/or e) the Superintendent has reason to believe it is required.

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 284	<p>19.4 HYDROSTATIC PRESSURE TESTING 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. <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.
Page 285	<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>

WSA 03 Part 2 Page Ref.	Amendment and/or addition
Page 287	<p>20 DISINFECTION</p> <p>Add a paragraph directly under the section title as follows:</p> <p style="padding-left: 40px;">Disinfection, if required, shall be undertaken by Icon Water personnel or by Constructors contracted directly to Icon Water who have specific written approval from (and have been directed by) Icon Water to undertake mains disinfection. Disinfection of Icon Water mains shall not be undertaken by any other party.</p>
Page 288	<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 290	<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 295	<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> • <i>STD-SPE-G-019 Asset Creation Approval Process</i> • <i>STD-SPE-C-004 Survey and Tolerancing Requirements</i> <p style="padding-left: 40px;">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>

5.4 Requirements for irrigation systems

WSA 03 does not specifically address requirements for irrigation systems. This section provides specific design requirements for irrigation systems that require water to be drawn from the potable water network.

5.4.1 General

Irrigation systems are regarded as a water service and as such are subject to the normal requirements for approval, permits and inspection procedures etc. as detailed in Icon Water specification *STD-SPE-G-019 Asset Creation Approval Process*.

5.4.2 Design requirements

Irrigation systems shall:

- a) Be fully compliant with TCCS design standards for irrigation.
- b) Only draw from the potable water network between the hours of 10:00 pm and 6:00 am (i.e. per night) and shall not have a total water usage greater than 76 kL during this timeframe.
- c) Have an instantaneous draw-off that does not exceed 3.5 L/s/ha for areas greater than 1.0 hectare.
- d) Have an instantaneous draw-off not exceeding 3.5 L/s for areas less than or equal to 1.0 hectare.
- e) Be compliant with the requirements of Table 5.4.2.1.

Table 5.4.2.1 Irrigation Rates and Times

Area	Application Rate Conditions	Watering Depth	Maximum Allowable Time for Watering
Sections of watered area	Maximum for any period	10 mm/hr	1 hr/night
Net irrigated area	Standard (use at least an 8 station controller)	38 mm/wk	40 hrs/wk
Net irrigated area	Severe drought	50 mm/wk	56 hrs/wk

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 (3) are provided in the table below.


Section	Update
Doc Mngt	<ul style="list-style-type: none"> Issue 2 updated to Issue 3
WSA 03 Glossary of Terms	<ul style="list-style-type: none"> Corrected an error with the definition of <i>TCCS</i> Added a definition for <i>NATA</i>
WSA 03 Section 5.4.4	<ul style="list-style-type: none"> Pressure mains are not to be located in private property
WSA 03 Section 5.4.14	<ul style="list-style-type: none"> PVC pressure pipes cannot be bent to form curved alignments
WSA 03 Section 8.2.4	<ul style="list-style-type: none"> Stop valves are required either side of the tee (on the main) when a take-off sized DN100 or larger is installed. Otherwise, for smaller connections to mains, Icon Water will advise if two stop valves are required.
WSA 03 Section 15.11	<ul style="list-style-type: none"> Requirements for sleeving of DI/CL pipes now updated to be in-line with the requirements shown in the Icon Water <i>Approved Products List (STD-SPE-G-006)</i>.
WSA 03 Section 19.4.1	<ul style="list-style-type: none"> Requirements for pressure gauges updated (for hydrostatic testing).
Appendix A	<ul style="list-style-type: none"> New appendix added titled “Additional requirements for pressure instrumentation” which details specific requirements for pressure instrumentation (for hydrostatic testing).
Appendix B	<ul style="list-style-type: none"> New appendix added titled “Update history” which provides a tabulation of updates between issues of this specification.

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