Summary Table of Information

Revision of Regional Standard for Water Services and Regional Specification for Water Services – Version 3.0

What are the Regional Standard for Water Services and the Regional Specification for Water Services?

The Regional Standard for Water Services (RSWS) incorporates the Regional Specification for Water Services (R.Spec). Together, these two documents describe the minimum standards and specifications for the design and construction of stormwater, wastewater and water supply systems that will be vested in council. The documents also include provisions for connections to the networks as well as for maintenance, renewal, decommissioning and upgrade of existing public infrastructure.

The standards and specifications provide a consistent method of design and construction for water services so that assets transferred to council are of good quality and fit for purpose.

We encourage all developments where older versions are referenced to meet the most recent version where possible. This is because the version 3.0 documents provide requirements closer aligned with current best practice.

Why did we make this revision?

The Regional Standard for Water Services and Regional Specification for Water Services are revised on a regular basis to respond to shifts of policy, best practice, referenced standards and legislation.

This revision also included the reformatting of the report-like documents to a format that uses numbered and multi-level paragraphs.

Which topics have the most significant changes?

The most significant revisions focus on the following matters:

- Reformatting - the documents use numbered and multi-level paragraphs
- Seismic resilience - requirements address all three waters
- Building over or near public pipelines – new requirements and specifications
- Hydrological design – a revised method for assessing hydrology
- Stormwater level of service and mitigation – consistency between these requirements
- Stormwater intake structure – revised design standards
- Pumping stations – clearer provisions for wastewater and water supply pump stations
- Manhole safety grilles – new requirements to prevent falls
- Excavation – revised specifications
- Drawings - now included in the R.Spec, including new drawings for backflow prevention and water supply assets.

CONTENTS

Summary Table of Changes in the revised version v3.0 Regional Standard and Regional Specification for Water Services

Underline is used to indicate new wording. Strikeout indicates deleted wording.
Blue text indicates changes made as response to feedback from the consultation on the draft documents v2.9.

Regional Standard for Water Services

Item	RSWS Topic	Clause	Description	Feedback items
1.RSWS	Reformatting	Throughout	The reformatted document includes minor edits to improve readability and to remove obvious errors and inconsistencies.	
2.RSWS	Reformatting	Table of Contents	A Table of Figures and Table of Appendices was added	
3.RSWS	Reformatting	Throughout	References to page numbers have been replaced with references to section headers that are hyperlinked	
4.RSWS	Reformatting	Throughout	Replaced all references to Engineer or Principal, concerning approval, to Wellington Water as Wellington Water is defined in **Section 2.2 Definitions** as the relevant territorial authority in relation to water services asset ownership and approvals; or the Engineer or Principal in relation to contractual approvals.	
5.RSWS	Reformatting	Throughout	Replaced all references to “constructor” with “developer” and modified the definition of “developer” to include “constructor”.	
6.RSWS	Reformatting	1.0 Introduction	Wording has been tidied up and reference to Three Waters Reform Programme moved and updated	
7.RSWS	Reformatting	1.1 Review of Standards	Wording has been tidied up	
8.RSWS	Reformatting	2.0 Using the Regional Standard for Water Services	Clarifies the relationship to bylaws and deletes reference to other council specifications, Added wording that Departures from this standard require the written permission of Wellington Water (in line with the wording in R.Spec **Section 2.1 Departures from this specification**)	34, 35
9.RSWS	Reformatting	2.2 Definitions	Several definitions for words or phrases used are included and a few edits have been made to aid readability.	37 – 42
10.RSWS	Building Over	2.2 Definitions	New definition simplified to account for different scenarios covered in **Section 3.8 Building in close proximity to public pipelines** - **Building Line Restriction (BLR)** - An angled line projecting up to the surface from below the pipeline. ~~from a point 300 mm below the invert of the pipeline, and offset 0.5 x pipe OD from the pipe centreline.~~ ~~The angle of the BLR is typically 45 degrees (1 horizontal : 1 vertical) for cohesive soils and 2 horizontal : 1 vertical for non- cohesive soils, or as determined through geotechnical testing.~~ New definitions: - **Building in close proximity** - Building works near new or existing public pipelines, and/or laying new or upgraded public pipelines near an existing structure or retaining wall. - **Building near** - Building in close proximity within a horizontal distance of 3 m measured from the outside of pipe, or within 5 m for pile driving (see Figure 3 2). - **Building over** - Building in close proximity within a vertical height above the finished ground over a pipe that equals the depth to pipe invert plus 1 m, with a minimum height of 2.4 m, and a vertical depth of 300mm below the pipe invert (see Figure 3 2). - **Building over and near** - Building works within a zone around a pipe bounded horizontally by the lateral distance defined as building near, and the vertical height and depth defined as building over (see Figure 3 2). - **Building works** - Structures, retaining walls, or any other works which may compromise the integrity, durability, or accessibility of a pipe, or be compromised by a pipe. This includes new buildings and structures, modification of existing structures, demolition, temporary works including heavy machinery, excavation works and any work that changes the current form and shape of the ground.	36, 98 - 99
11.RSWS	Bulk water	2.2 Definitions	New definition - **Bulk water pipeline** - Water supply pipeline from the water treatment plants to the network. The pipes are usually larger than 375 mm and can be as large as 1400 mm in diameter. Also referred to as “bulk main”. As a consequential amendment, the definition of Trunk Main (in water supply) has been modified to not refer to the bulk main.	

Item	RSWS Topic	Clause	Description	Feedback items
12.RSWS	Hydraulic neutrality	2.2 Definitions	Added the following definition to clarify clauses in the RSWS: **Hydraulic neutrality** – Land development, including increased imperviousness, does not increase the peak design discharge (post development) to greater than the peak design discharge (pre-development) ~~flood risk in the catchment~~ for all events up to and including the 1% AEP rainfall including the predicted impacts of climate change. Added / amended definitions for clarity: **Overland flow** - See 'secondary flow'. **Secondary flow** - The excess stormwater flow that cannot be contained by the primary network, typically due to extraordinary design storm or network blockage. Also referred to as overland flow or secondary overland flow. Consequential amendments to use of these terms throughout the document.	155, 159
13.RSWS	Wastewater	2.2 Definitions	Deleted definition – ~~**Sewerage** - The collective term for a network of wastewater/sewer pipes.~~	41
14.RSWS	Reformatting	Table 2-2 Abbreviations	The table of abbreviations has been revised to reflect what is used in the document Amendments for accuracy: - Deleted reference to ~~**NZBC** New Zealand Broadcasting Company~~ - Deleted incorrect text in **NZVD2016** NZ vertical datum ~~(0.3407 above MSL)~~	43 – 45
15.RSWS	Reformatting	Table 2-3 Pipe Gradients	The table of pipe gradients has been revised to reflect what is used in the document	
16.RSWS	Reformatting	2.3 ~~Referenced Standards~~ References	**Table 2-4 Referenced documents and standards** has been revised and updated to reflect what is used in the document	46, 47
17.RSWS	Reformatting	3.0 General requirements	Wording has been tidied up and amended to clarify governance and mandate	
18.RSWS	Reformatting	3.1 Subdivision requirements	Wording has been tidied up	
19.RSWS	Reformatting	3.2 Legislative and regulatory requirements	Wording has been tidied up and the list of relevant legislation and regulations amended .	
20.RSWS	Carbon	NEW 3.3.1 Carbon reduction	A new section is added stating Wellington Water will specifically encourage alternative solutions that reduce carbon emissions.	48
21.RSWS	Health & Safety	3.4 Health and Safety in Design obligations	Refers to the Safety in Design Process which will be a standalone document available on the Wellington Water webpage of technical documents - Designers shall follow Safety in Design Process approved by Wellington Water. A copy of the Safety in Design process~~/policy~~ is available online~~by contacting the Wellington Water Health and Safety Manager~~. and the public has been added to (d) to better reflect the Health and Safety at Work Act 2015. Also, minor edit to clause (e) No harm shall occur to workers during or following its de-commissioning and removal. Strikeout of redundant and clauses about Safety in Design and AC pipes.	49 – 53
22.RSWS	Seismic resilience for all three waters	NEW 3.7 Seismic Resilience, 3.7.1 Design earthquake, 3.7.2 Risk of liquefaction, 3.7.3 Design standards, 3.7.4 Determination of seismic criticality, 3.7.5 Seismically resilient pipelines, 3.7.6 Seismically resilient structures, 3.7.7 Connections from pipes to structures	New sections moved from R.Spec and added to the RSWS. The original sections in the R.Spec were specific to water supply. The revised sections in the RSWS contain clauses applicable to each of the three waters. Specifically, the RSWS now identifies which pipelines and structures should be designed as seismically critical. For pipelines the appropriate materials are dependent primarily on its location in liquefiable or non-liquefiable land. For structures, the definition of seismically critical is used to determine the required important level (IL) under AS/NZS 1170 and the design life of the structure. Consequential amendments are also made to RSWS **Section 6.2.1 Durabilit**y and to R.Spec Section 6.14.3. Further amendments made as response to feedback and as consequential tidy ups.	55 – 92

Item	RSWS Topic	Clause	Description	Feedback items
23.RSWS	Building near or over pipes	NEW 3.8 Building ~~over or near~~ in close proximity to public pipelines, 3.8.1 ~~Building works over or near pipelines~~ General requirements, 3.8.2 Laying new or upgraded pipelines near existing structures or retaining walls	New sections supersede the original section 4.4.14 Pipes near buildings (now deleted) and which provide guidance and restrictions around new building works over or near public pipelines and laying new or upgraded pipelines near existing structures and retaining walls. Note that there are also two new sections in the R.Spec, s4.12 Building over or near public pipelines and 4.12.1 Sleeving an existing pipe. Further amendments made as the response to feedback and as consequential tidy ups.	93 – 104
24.RSWS	Hydraulic neutrality	4.2.1 Functionality [Stormwater]	Changed 10% AEP to 1% AEP to the required functionality of designs for hydraulic neutrality. This change is consistent with the current Level of Service that the stormwater networks are managed for – that there is no overland flooding of floor levels at the 1%AEP. Clarified that pre-application advice from GWRC should be sought on diverting water from one catchment to another. Clarified that the full stormwater system (not just structures) should be designed with sufficient flexibility to minimize earthquake damage	105 – 109
25.RSWS	Reformatting	4.2.2 Access	Amended wording for clarity …Wellington Water may ~~request that~~ require the public stormwater asset ~~is~~ to be protected by an easement (see **Section 4.4.12 Easements**) ~~where future development could compromise access~~. This criterion also applies to watercourses and secondary flow paths. Moved (d) Drainage easements are required to provide for the unobstructed flow of design floodwaters and removal of materials that may result in blockages downstream. to **Section 4.4.12 Easements**	n/a
26.RSWS	Reformatting	DELETED ~~4.2.4 Health and Safety~~	Original section ~~**Section 4.2.4 Health and Safety**~~ deleted as this section was redundant with revised **Section 3.4 Health and safety in design obligations.**	n/a
27.RSWS	Reformatting	4.2.5 Climate change	Added reference to Wellington Water *Reference Guide for Design Storm Hydrology*, which is available online	110
28.RSWS	Stormwater secondary level of service	4.2.7 Secondary system level of service	**Table 4-2 Secondary level of service (AEP)** – made the secondary system level of service for building floors consistent across all local authorities – at 1% AEP. Criteria for gully traps is deleted and requirements for gully traps in **Section 5.2.3 Level of service** (wastewater) amended. Bridges and major culverts – wording added to provide clarity that criteria for bridges includes major culverts.	111
29.RSWS	Floor levels	4.2.9 Building floor levels to be identified	Removed requirement to clearly identify local benchmark and level, and added reference to NZVD2016	113
30.RSWS	Environmental quality	MOVED 4.2.11 Environmental quality	This section has been moved down to after the section on water sensitive design.	n/a
31.RSWS	Hydrology method	4.3.1 Hydrological design	This section has been significantly revised. The use of the Rational and Modified Rational Method for calculating stormwater detention volumes has been changed to reference the Wellington Water Reference Guide for Design Storm Hydrology (here). This is because the Rational Method is okay for calculating peak flow for small catchments but is not okay for calculating volumes. Consequential amendments are the deletion of **Section 4.3.1.1 Rainfall intensity** and deletion of **Appendix 1 Hydrological design**, **Appendix 2 Depth duration tables** and **Appendix 3 PCC rainfall intensities zone factors**. For larger urban catchments reference is made to existing Wellington Water stormwater models or the use of other models and methods approved by Wellington Water.	117 – 118
32.RSWS	Hydrology Method	DELETE ~~4.3.1.1 Rainfall intensity~~	Consequential amendment resulting from changes to **Section 4.3.1 Hydrological design**.	n/a
33.RSWS	Reformatting	4.4.1.2 Design and construction drawings	To improve clarity, revision added and sub-catchments to clause (a). The requirement for a legend has also been added.	n/a
34.RSWS	Reformatting	4.4.1.3 Asset operations and maintenance plan	To improve clarity, revision added to require operations and maintenance plan to be submitted as part of the completion documentation and also added and condition assessment to clause (a). Examples of relevant assets added.	120

Item	RSWS Topic	Clause	Description	Feedback items
35.RSWS	Reformatting	4.4.2 Stormwater detention	Revised to use the Wellington Water Standard Hydrology Method for flood routing. Wording has been revised to clarify that a detention structure needs a controlled discharge rather than being able to withstand overtopping or surcharging. Moved section to include **Section 4.4.2.1 On-site stormwater management and disposal**, **Section 4.4.2.2 Soak pits** and **Section 4.4.2.3 On-site Discharge detention and attenuation** as subclauses	134 – 138
36.RSWS	Hydraulic neutrality	4.4.2.1 On-site stormwater management and disposal	Significant revisions to this section to ensure that the stormwater level of service is maintained. New development must not exacerbate flooding or contribute to additional runoff. This includes requiring that the peak discharge from the post-construction development is no greater than the pre-development peak discharge in all flood events up to and including the 1% AEP rainfall event. Deleted reference to flooding "risk". Added references to **Section 4.3.1 Hydrological design** and the Wellington Water Reference Guide for Design Storm Hydrology	121 - 125
37.RSWS	Hydraulic neutrality	4.4.2.2 Soak pits	Additional information added on guidance and outcomes required in the design of soak pits	126 – 127
38.RSWS	Hydraulic neutrality	4.4.2.3 ~~Discharge~~ On-site detention and attenuation	Significant revisions to this section to ensure that the stormwater level of service is maintained. New development must not exacerbate flooding or contribute to additional runoff. This includes requiring that the peak discharge from the post-construction development is no greater than the pre-development peak discharge in all flood events up to and including the 1% AEP rainfall event. Including a new reference to use the Wellington Water *Reference Guide for Design Storm Hydrology*. In addition, reference is added to Wellington Water's set of Approved Solutions for Hydraulic Neutrality. These solutions are suitable for developments of one to ten residential buildings and are available online here.	128 – 133
39.RSWS	Piping overland flow paths	4.4.3 Open watercourses	To achieve the best outcome for protection from flooding, during subdivision ephemeral streams and other watercourses should be retained as ~~overland~~ secondary flow paths and open channels rather than being piped. Also added a requirement for piped streams to have a secondary flow path	
40.RSWS	Reformatting	4.4.3.1 Bridges	Added clause that, design shall include advice from GWRC on potential regional consent requirements.	
41.RSWS	Stormwater laterals and preventing cross connections	4.4.4 ~~Private~~ Lateral connection to public stormwater ~~system~~network	A new clause is added that states private connections may need to provide stormwater treatment to reduce contaminant loading to meet bylaw or resource consent requirements. This adds clarity and provides future proofing for connections that may need to provide water quality treatment before discharging into the public network. To prevent potential cross connections between the stormwater and wastewater connections in the future when a house is built on a new lot, a requirement has been added to colour-code the pipe and cap green. The wording the location of the end of the pipe to be 1 m inside the boundary has also been tidied up. The restriction on private stormwater connections to deep pipes has been revised from 5 m to 3.5 m deep to be consistent with the requirement for private connections to sewer pipes in **Section 5.4.2 Lateral connections to the wastewater network** For clarity, renamed section and amended requirement to lay lateral connections at least 1m inside and within the boundary of empty lots. Added table of acceptable methods for lateral connection to public stormwater pipes.	139 – 143
42.RSWS	Stormwater laterals	NEW 4.4.2.2 Earthenware saddle connections to earthenware or concrete mains	Added section detailing requirements for earthenware saddle connections to earthenware or concrete mains	
43.RSWS	Reformatting	4.4.4.2 ~~Abandoning~~ Decommissioning and reuse of existing private laterals	Change of word to clarify that stormwater and wastewater lateral pipes are decommissioned rather than "abandoned". Added requirements for relining or reuse of existing laterals.	
44.RSWS	Building near or over pipes	4.4.5.4 Location	Amended to refer to new **Section 3.8 Building in close proximity to public pipelines**. Therefore, restrictions on pipes near or under buildings in this section have been deleted. Clarification to location in public land, preferably within carriageways, footpaths, and berms.	145
45.RSWS	Water stops	4.4.5.7 Water stops (Bulkheads)	Edit to the header clarifies that bulkheads are the same as water stops	
46.RSWS	Maintenance shafts	4.4.7.2 Maintenance shafts	Clarified that dispensation is required for maintenance shafts on the public main	

Item	RSWS Topic	Clause	Description	Feedback items
47.RSWS	Seismic Safety	4.4.7.3 Design ~~against~~ to prevent floatation	Wording changes for clarity: (a) ~~In areas of high water table, manholes~~ Manholes shall be designed ~~against~~ to prevent floatation using a factor of safety of 1.25. The design must include consideration of groundwater table and liquefaction potential. Clauses from the R.Spec were moved to this section of the RSWS as they refer to design elements, specifically to design against liquefaction.	149 – 150
48.RSWS	Reformatting	4.4.7.4 Manhole size; Figure 4-1 Manhole layout	The drawing that sits within the text has been redrawn for clarity. Wording in two of the clauses has been revised for clarity.	
49.RSWS	Reformatting	4.4.7.5 Manhole safety grilles	Relocated design preamble on manhole safety grilles from R.Spec, and clarified that grilles shall be fitted for any manhole where a specific safety risk is identified	
50.RSWS	Health & Safety	4.4.7.6 Deep manholes	Deep manholes in this clause are redefined from greater than 5 m deep to greater than 3 m deep. The requirement for a landing has been deleted with the use of the following wording, Landings are not required as they may interfere with safety equipment and rescue operations in confined spaces. If the designer chooses to specify a landing in a manhole for a specific purpose, this shall first be agreed in writing by Wellington Water.	151
51.RSWS	Reformatting	4.4.7.7 Connections to manholes	Moved sub-clause “A 600 mm manhole can accept a maximum of two incoming pipes” from original location in s4.4.8.4.	152
52.RSWS	Intake grilles	4.4.8 Stormwater pipe intakes	The word “Stormwater” is added to the header for “Pipe Intakes” and a sub-clause was deleted that stated intake grilles are not typically required, as this is clarified in the following sub-clause.	
53.RSWS	Intake grilles	4.4.8.1 Stormwater intake grilles	Sub-clause revised so safety grilles typically are **not** required at culverts and **are** required at intake pipes to the stormwater network. The requirement includes the need for a risk assessment, specified bar spacings of 140 mm to prevent toddlers from entry and a total grille opening that is larger than the cross-sectional area of the intake pipe to reduce the potential for blockage. A new graphic has been added for clarity.	
54.RSWS	Reformatting	4.4.9 Outlets	Added a reference that is used by Wellington Water for assessing designs for stormwater outlets – the *Auckland Council Hydraulic Energy Management: Inlet and Outlet Design for Treatment Devices July 2013 Tech Report 2013/018*.	153
55.RSWS	Stormwater sumps	4.4.10 Sumps	Removed council-specific requirement so the standard is regionalized. Also added clarity around determining intake capacity for high capacity sumps from first principles and that specific approval should be obtained from the Roading authority if the sumps are not compliant with the relevant code of practice. A sub-clause has been added requiring stormwater sumps to have baffles to mitigate the conveyance of litter and gross pollutants. A new drawing has also been added to the R.Spec.	154
56.RSWS	Health & Safety	4.4.11 Stormwater pumping stations	New clause regarding fencing added to three sections, this one that is specific to stormwater, as well as to sections on wastewater and water supply pumping stations - If the pumping station building covers less than two thirds of the lot, the lot shall have permanent fencing or other methods to prevent access by the public and livestock.	
57.RSWS	Drainage Easements	4.4.12 Easements	Revision to require width of easement to be related not only to width of pipe but also to the depth of the pipe and to width of overland flow path, if required New clause added specifying that no building works or obstruction to access shall be constructed within a drainage easement without written approval from Wellington Water.	155 – 159
58.RSWS	Building near or over pipes	DELETED ~~4.4.14 Pipes near Buildings~~	DELETED ~~**Section 4.4.14 Pipes near Buildings**~~ – The requirements for building over or near public pipelines are now in a new **Section 3.8 Building in close proximity to public pipelines**	
59.RSWS	Testing requirements	4.4.13 Testing	A new overall clause is added to require records of testing and inspections to be provided. Unless otherwise stated, if records of testing and inspections are required, these records shall be provided to Wellington Water as part of the project completion and as-built documentation. The minimum notice required to be given to council to attend testing is 48 hours, not 24 hours. This reflects the reality of the working week. Removed fragment ~~depending on the council’s specific requirements~~ as this is no longer applicable.	160 – 165
60.RSWS	As-builts	DELETE ~~4.4.16 Benchmarks~~	WCC no longer requires the use or installation of benchmarks	
61.RSWS	As-builts	DELETE ~~4.4.16.1 Installation~~	WCC no longer requires the use or installation of benchmarks	

Item	RSWS Topic	Clause	Description	Feedback items
62.RSWS		5.2.3 Level of service (Wastewater)	Added a sub-clause that acknowledges the requirements of the Resource Management Act. Added note that Where gravity drainage is not practicable, smart pressure sewer systems should be considered. Clause for gully traps amended to provide guidance around required heights. Amended storage requirements for pumping stations to provide maintenance storage of 8 hours ADWF + 12 hours detention volume. Amended detention storage to 12 hours ADWF + maintenance storage. Added general restriction and requirements for acceptance of gravity detention systems.	166
63.RSWS	On-site wastewater disposal	5.2.6 Onsite disposal of grey water and wastewater	Most of this section has been deleted as on-site wastewater disposal systems are not part of the public network. The minimum requirements for these private systems are found in the Regional Plan.	
64.RSWS	Reformatting	5.3.1.3 Residential design flows	Added clarification that PDWF = ADWF x PF and that ADWF = 0.0023 L/s/person (equivalent to 200 L /person/day).	167
65.RSWS	Reformatting	5.3.1.4 High density /Industrial/Commercial design flows	Added high density to the heading to match language in the clauses.	168
66.RSWS	Reformatting	5.3.2.3 Maximum velocity	Amended for clarity, and to account for cases where velocity cannot be reduced: (i) Special provisions shall be made to reduce the velocity,… (ii) Analysis shall be undertaken to demonstrate that there will be no adverse effects from the high velocity.	
67.RSWS	Wastewater design information	5.4.1 Information to be provided	Amended (b) Operations and maintenance guidelines for any pressure sewer system, pumping station, odour treatment or effluent treatment facility to be vested to the council.	169
68.RSWS	Reformatting	5.4.1.2 Design and construction drawings	For clarity, added the basic requirement of a legend as a necessary requirement of design drawings.	
69.RSWS	Reformatting	5.4.1.3 Asset operations and maintenance plan	To improve clarity, revision added to require operations and maintenance plan to be submitted as part of the completion documentation and also added and condition assessment to clause (a).	170
70.RSWS	Wastewater laterals and preventing cross connections	5.4.2 ~~Private~~ Lateral connections to the wastewater network	The use of electrofusion tees on PE pipework has been changed to electrofusion 'Y' saddles or 'Y' junctions. To prevent potential cross connections between the stormwater and wastewater connections in the future when a house is built on a new lot, a requirement is added to colour-code the pipe red. The wording the location of the end of the pipe to be 1 m inside the boundary has also been tidied up. The wording regarding connections to deep pipes has been revised to add clarity. Amended title and acceptable methods for lateral connections. Added requirement for inspection eye at the property boundary. Clarified wording that terminal connections to empty lots shall be laid at least 1 m inside and within the boundary of the property.	171 – 173
71.RSWS	Reformatting	5.4.2.1 ~~Abandoning~~ Decommissioning and reuse of existing ~~private~~ laterals	Change of word to clarify that stormwater and wastewater lateral pipes are decommissioned rather than "abandoned" Added requirements on the relining or reuse of existing lateral.	
72.RSWS	Wastewater laterals	NEW 5.4.2.2 Earthenware saddle connections to earthenware or concrete mains	Added section referring to other new **Section 4.4.4.2 Earthenware saddle connections to earthenware or concrete main** which details requirements for earthenware saddle connections to earthenware or concrete mains	
73.RSWS	Cathodic protection	NEW 5.4.3.4 Cathodic protection for steel pipes	New section that refers to detail contained in a new section under water supply standards (**Section 6.4.11 Cathodic protection for steel pipes**), that requires a cathodic protection system to be designed for all steel pipelines and installed for all steel pipelines larger than 600 mm diameter and longer than 1000 m.	
74.RSWS	Building near or over pipes	5.4.3.5 Location	Consequential amendment – deleted existing text, and now refers to **Section 4.4.5.4 Location**.	
75.RSWS	Building near or over pipes	DELETE ~~5.4.6 Pipes near Buildings~~	DELETED ~~**Section 5.4.6 Pipes near Buildings**~~ – The requirements for building over or near public pipelines are now in a new **Section 3.8 Building in close proximity to public pipelines**	

Item	RSWS Topic	Clause	Description	Feedback items
76.RSWS	As-builts	DELETE ~~5.4.9 Benchmarks (Wastewater)~~	WCC no longer requires the use or installation of benchmarks	
77.RSWS	Wastewater pumping station - public	5.4.8 Wastewater pumping station	Detail moved from R.Spec and put into this section of the RSWS. Added a reference to **Section 5.2.3 Level of Servic**e regarding storage and overflow protection, and **Table 5-5** listing detention, maintenance and total storage volume for public and private wastewater pumping stations. Clarification on design of wet or dry well installations (incl. CBD noise requirements) and added detail on access including the need for station to be on a separate title, vested to council. New clause regarding fencing added to three sections for stormwater, wastewater, and water supply pumping stations - If the pumping station building covers less than two thirds of the lot, the lot shall be secured with permanent fencing or other methods to prevent access by the public and livestock.	174
78.RSWS	Wastewater pumping station - Private	5.4.8.1 Private wastewater pumping station	Detail moved from RSWS to R.Spec new **Section 5.9.7 Private wastewater pumping station** Added a reference to **Section 5.2.3 Level of service** regarding storage and overflow protection. Added wording about additional emergency storage that may be required by resource consent, and requirement for high wet level alarm & overflow alarm. Also, to reduce the potential for overflows and corrosion at a public manhole, the revision ensures that the rising main from a private wastewater pumping station discharges first to a private manhole and from there to a public manhole by gravity. Added clause to detail size requirements for maintenance and (where required) detention.	
79.RSWS	Pressure sewers	5.4.9 Pressure sewer~~age~~ systems	Pressure sewer systems: added <u>The design of the sewer~~age~~ system shall be carried out by a suitable professional and be submitted to Wellington Water for approval.</u> Please note that Wellington Water is currently working on additional guidance for pressure sewer systems.	
80.RSWS	On-site wastewater disposal	DELETE ~~5.4.13 On-site disposal~~	This section and associated sub-sections have been deleted. On-site wastewater disposal systems are not part of the public network. Minimum standards for these systems are contained in the Regional Plan.	
81.RSWS	Seismic resilience for water supply	DELETED ~~6.2.1 Seismic Resilience (Performance criteria for water supply networks)~~	This section has been deleted, as provisions for seismic resilience is now covered upfront in a new **Section 3.7 Seismic Resilience** so that it is applied to all three of the water networks, not just water supply.	
82.RSWS	Reformatting	6.2.1 Durability	Deleted clause (g) on resilience and importance level 4 (IL4) as this is now addressed in the new section 3.7 on seismic resilience.	
83.RSWS	Rider mains	6.2.3 Functionality (Water Supply)	Sub-Clause on rider main not back-feeding around mainline valves is a legacy clause from UHCC from when some rider mains were galvanised and prone to being blown out. This is no longer needed and has been deleted. ~~Rider mains shall not back-feed around mainline valves used to isolate a section of water main.~~ ~~Valves and rider mains shall be arranged so that a section of main can be isolated for maintenance by closing the water main valves only, and without having to close rider main valves~~	
84.RSWS	Level of service for reservoirs	6.2.7.2 Reservoir volume	The design requirements for reservoir storage have been reworded to add clarity around the requirements for seismic resilience and future population projections.	
85.RSWS	Level of service for reservoirs	NEW <u>6.2.7.3 Hydraulic capacity of pipelines supplying a reservoir</u>	This new section provides requirements for the design of the network that supplies a reservoir so that the network is able to appropriately fill and maintain the volumes in a reservoir.	
86.RSWS	Reformatting	6.2.8 Point of supply	Amended to clarify service valves and meters ~~shall~~ <u>should</u> not be located in driveways. This acknowledges that sometimes there is no alternative for the placement.	175
87.RSWS	Testing and reporting	6.3 Design methods	Clarified language about providing testing and calculations to Wellington Water.	

Item	RSWS Topic	Clause	Description	Feedback items
88.RSWS	Reformatting	6.3.1.5 Allowable pipeline losses	Amended wording for clarity: (b) ~~Amendments to these allowable~~ Higher pipeline losses may be considered…	
89.RSWS	Reformatting	6.4.1.3 Asset operations and maintenance plan	To improve clarity, revision added to require operations and maintenance plan to be submitted as part of the completion documentation and also added and condition assessment to clause (a).	
90.RSWS	Water network	6.4.2 Network layout	References to standard detail and other sections have been added.	176
91.RSWS	Reformatting	6.4.2.3 Mains with no through flow (dead ends)	Amended wording and reordered clauses for clarity: Revised the requirement for the maximum length of a dead end and the placement of hydrants to be easier to read and understand.	177
92.RSWS	Reformatting	6.4.2.4 Rail / motorway / stream crossings	Deleted the clause that does not permit pipes to be laid beneath residential or commercial buildings as this is addressed in the new **Section 3.8 Building in close proximity to public pipelines.** C-SP-AE-64322 civil spec has replaced E1322 for the installation of pipelines on railway land.	
93.RSWS	Water Supply Manholes	NEW 6.4.3 Manholes	New section specific to the design of water supply manholes (access schambers). Currently the standards for manholes are specific for the drainage networks.	
94.RSWS	Water Supply Manholes	NEW 6.4.3.1 Design to prevent floatation	New section refers to **Section 4.4.7.3 Design to prevent floatation** as provisions to prevent floatation are the same for all manholes.	
95.RSWS	Water Supply Manholes	NEW 6.4.3.2 Deep manholes	New section refers to **Section 4.4.7.6 Deep manholes** as provisions for deep manholes are the same for all manholes.	
96.RSWS	Easement width	6.4.4 Easements	Revision provides for a wider easement width for principal pipelines larger than 150 mm so that there is sufficient working area for repair and replacement of the pipeline and to reduce the impact of work on the landowner. Minor revision to ensure the bulk main is assessed on a case-by-case basis. (d) Principal pipelines up to and including 150 mm diameter shall be the greater of 3m or the pipe's outside diameter plus 2 x the depth to invert. (e) Principal pipelines larger than 150 mm diameter shall be the greater of 4m or the pipe's outside diameter plus 0.5 m plus 2 x the depth to invert. (f) Bulk and Trunk mains shall be assessed on a case–by-case basis to ensure provisions for future access, maintenance and renewal are accommodated	
97.RSWS	Building near or over pipes	NEW 6.4.6.2 Location	Consequential amendment – NEW section refers to **Section 4.4.5.4 Location**.	
98.RSWS	Cathodic protection	NEW 6.4.11 Cathodic protection for steel pipes	New section requires a cathodic protection system to be designed for all steel pipelines and installed for all steel pipelines larger than 600 mm diameter and longer than 1000 m. Note that there is also a new section under wastewater (**Section 5.4.3.4 Cathodic protection for steel pipes**) that refers to this section.	
99.RSWS	Water meters	6.4.12.1 Commercial water meters	The detail for this section has been moved down in the document to be located under **Section 6.4.23 Water meters**.	178
100.RSWS	Service valve location	6.4.13 Residential service connections	Amended to clarify service valves should not be located in driveways. This acknowledges that sometimes there is no alternative for the placement.	
101.RSWS	Water supply to rural properties	6.4.13.2 Connection to rural properties	The wording has been modified to aid clarity.	
102.RSWS	Backflow prevention	6.4.14 Backflow prevention	Significant revisions to this section include detailed backflow prevention requirements to address hazard classification and obligations under the Health (Drinking Water) Amendment Act. A clause is added to refer the standard details in the Regional Specification and the Approved Products Register.	
103.RSWS	Fire Services	6.4.15 Fire services	Minor amendment to delete the word ~~private~~ from clause (a)	

Item	RSWS Topic	Clause	Description	Feedback items
104.RSWS	Fire services	6.4.16 Secure connections	Minimum separation distance between residential and fire service connection reduced from 2 m to 1 m. This separation distance can be further reduced if the connections have lateral restraint (e.g. flanged or welded) to the minimum clearance distances specified in the R.Spec for water mains from other water mains.	
105.RSWS	Health & Safety	6.4.17 Water supply pumping stations	New clause regarding fencing added to three sections for stormwater, wastewater, and water supply pumping stations - If the pumping station building covers less than two thirds of the lot, the lot shall have permanent fencing or other methods to prevent access by the public and livestock.	
106.RSWS	Water supply pumping stations	6.4.17.1 Pumping stations serving a reservoir	Minor edits to the design requirements including VSD pump control, bellows, and anti-vibration. Pumping rates revised to specify time period for filling. Some detail moved from RSWS to the R.Spec including to a new section in the R.Spec (s6.18.4 Pumping station serving a reservoir)	
107.RSWS	Water supply pumping stations	6.4.17.2 Booster pumping stations	An electrical fault can cause a fire and cause loss of power supply to a booster pumping station. If this event were to occur the pumping station will not provide water to fight the fire. Revisions clarify that booster pump stations are not appropriate for meeting firefighting requirements by revising Clause (c) as 1.5 times ~~firefighting and~~ peak consumer demands…and clause (d) as shall not be used for firefighting supply. Added (e) All fire hydrants shall be supplied by gravity from reservoirs.	
108.RSWS	Reservoirs	6.4.18 Reservoirs	Wording added clarifying the need for secure the site from public access and livestock Amended wording for clarity: including firefighting volume and ~~in conjunction with the~~ storage volume determined from the ultimate development population Added a clause that, vehicle access to the reservoir shall be no steeper than 1 in 6.	
109.RSWS	Reformatting	6.4.19.1 Fire hydrants	Clarified clause (vi) is for chlorine introduction to the mains to reduce ambiguity between (v) and (vi)	
110.RSWS	Discharge of water from scour valves	6.4.20.7 Scour valves	New requirement for scour valves on reticulation larger than 50 mm diameter to include a chamber to facilitate the de-chlorination of the water prior to discharge. Deleted clause ~~Hydrants on pipelines ≤ 200 mm may be used to scour the main instead of a dedicated scour branch and valve.~~ And added clarity to clause discharges to approved locations. Amended requirement that backflow prevention shall be provided immediately ~~downstream~~ upstream of the scour valve.	179
111.RSWS	Thrust blocks	6.4.21.1 Thrust blocks	Consequential amendment from revisions made to the Standard Detail **WS03 – Typical Thrust Block Details**: Amended requirement for factor of safety for calculation of unbalanced thrust from ~~1.8~~ to 1.5	
112.RSWS	Water meters	NEW 6.4.23.1 Commercial meters	The detail for this section has been relocated from **Section 6.4.12.1 Commercial water meters** and that section now refers to this section.	180
113.RSWS	Water meters	6.4.23.3 District area meters	Added reference to council policy, and footnote "For example, please see the Upper Hutt City Manual of Polices 2020, 3.13 Water conservation policy Manual of policies (upperhuttcity.com)"	
114.RSWS	Testing records	6.4.24 Testing and commissioning	A new overall clause is added to require records of testing and inspections to be provided. Unless otherwise stated, if records of testing and inspections are required, these records shall be provided to Wellington Water as part of the project completion and as-built documentation.	
115.RSWS	Hydrology Method	Deleted ~~Appendix 1 - Hydrological design~~ Deleted ~~Appendix 2 Depth duration tables~~ Deleted ~~Appendix 3 PCC rainfall intensities zone factors~~	The use of the Rational and Modified Rational Method for calculating stormwater detention volumes has been changed to reference the Wellington Water *Reference Guide for Design Storm Hydrology* (here). This is because the Rational Method is okay for calculating peak flow for small catchments but is not okay for calculating volumes. Consequential amendments are the deletion of **Section 4.3.1.1 Rainfall intensity** and deletion of **Appendix 1 Hydrological design**, **Appendix 2 Depth duration tables** and **Appendix 3 PCC rainfall intensities zone factors**.	**181**

Item	RSWS Topic	Clause	Description	Feedback items
116.RSWS	Excavation and Trenching	NEW Appendix 5 Pre-construction testing and assessment of load bearing capacity NEW Appendix 6 Migration of fines	New appendices added relating to the excavation and trenching revisions in R.Spec	

Item	R.Spec Topic	Clause	Description	Feedback
1.RSpec	Reformatting	Throughout	The reformatted document includes minor edits to improve readability and remove obvious errors and inconsistencies.	
2.RSpec	Reformatting	Throughout	Specifications for the bulk water network have been incorporated into this document.	
3.RSpec	Reformatting	Table of Contents	A Table of Figures and Table of Appendices was added	
4.RSpec	Reformatting	Throughout	Replaced most references to Engineer or Principal, concerning approval, to Wellington Water as Wellington Water is defined in **Section 2.2 Definitions** as the relevant territorial authority in relation to water services asset ownership and approvals; or the Engineer or Principal in relation to contractual approvals.	
5.RSpec	Reformatting	Throughout	Replaced all references to “constructor” with “developer” and modified the definition of “developer” to include “constructor”.	
6.RSpec	Reformatting	Throughout	Amended all references to Denso to "wrapped with the full Denso system (primer, mastic, petrolatum tape and PVC outer wrap)"	261, 280
7.RSpec	Reformatting	1.0 Introduction	Wording has been tidied up and reference to Three Waters Reform Programme moved and updated.	
8.RSpec	Building Over	2.2 Definitions	New definition simplified to account for different scenarios covered in **Section 4.12 Building in close proximity to public pipelines**- **Building Line Restriction (BLR)** - An angled line projecting up to the surface from below the pipeline. ~~from a point 300 mm below the invert of the pipeline, and offset 0.5 x pipe OD from the pipe centreline.~~ ~~The angle of the BLR is typically 45 degrees (1 horizontal : 1 vertical) for cohesive soils and 2 horizontal : 1 vertical for non- cohesive soils, or as determined through geotechnical testing.~~ New definitions: - **Building in close proximity** - Building works near new or existing public pipelines, and/or laying new or upgraded public pipelines near an existing structure or retaining wall. - **Building near** - Building in close proximity within a horizontal distance of 3 m measured from the outside of pipe, or within 5 m for pile driving. - **Building over** - Building in close proximity within a vertical height above the finished ground over a pipe that equals the depth to pipe invert plus 1 m, with a minimum height of 2.4 m, and a vertical depth of 300mm below the pipe invert. - **Building over and near** - Building works within a zone around a pipe bounded horizontally by the lateral distance defined as building near, and the vertical height and depth defined as building over. - **Building works** - Structures, retaining walls, or any other works which may compromise the integrity, durability, or accessibility of a pipe, or be compromised by a pipe. This includes new buildings and structures, modification of existing structures, demolition, temporary works including heavy machinery, excavation works and any work that changes the current form and shape of the ground.	36, 98 - 99
9.RSpec	Bulk water	2.2 Definitions	New definition - Bulk water pipeline - Water supply pipeline from the water treatment plants to the network. The pipes are usually larger than 375 mm and can be as large as 1400 mm in diameter. Also referred to as “bulk main”. As a consequential amendment, the definition of Trunk Main (in water supply) has been modified to not refer to the bulk main.	
10.RSpec	Secondary flow paths	2.2 Definitions	Added definitions for clarity: **Overland flow** - See ‘secondary flow’. **Secondary flow** - The excess stormwater flow that cannot be contained by the primary network, typically due to extraordinary design storm or network blockage. Also referred to as overland flow or secondary overland flow. Consequential amendments to use of these terms throughout the document.	
11.RSpec	Wastewater	2.2 Definitions	Deleted definition – ~~**Sewerage** - The collective term for a network of wastewater/sewer pipes.~~	
12.RSpec	Reformatting	Table 2-2 Abbreviations	The table of abbreviations has been revised to reflect what is used in the document	
13.RSpec	Reformatting	Table 2-3 Pipe Gradients	The table of pipe gradients has been revised to reflect what is used in the document	
14.RSpec	Reformatting	Table 2-4 Referenced documents and standards	The table of referenced documents and standards has been revised to reflect what is used in the document	

Item	R.Spec Topic	Clause	Description	Feedback
15.RSpec	Reformatting	3.0 General requirements	Wording has been tidied up	
16.RSpec	Reformatting	3.1 Subdivision requirements	Wording has been tidied up	
17.RSpec	Reformatting	3.2 Legislative and regulatory requirements	Wording has been tidied up and the list of relevant legislation and regulations amended	
18.RSpec	Testing and inspection records	NEW 3.3 Testing and inspection records	A new clause is added to the overall general requirements clarifying that where records of testing and inspection are required, they are to be provided to Wellington Water. Unless otherwise stated, if records of testing and inspections are required, these records shall be provided to Wellington Water as part of the project completion and as-built documentation.	
19.RSpec	Health & Safety	4.1 Health and Safety obligations	Additional wording is added to note ~~sections relevant to **Section 4.1.1 Immunisation** and~~ that Wellington Water's minimum health and safety standards are available ~~on request~~ online.	183
20.RSpec	Health & Safety	NEW 4.1.1 Immunisations	This section was originally in ~~**Section 6.1.1 Immunisations**~~ which was specific to water supply. The information has been moved up to **Section 4 General Specifications** which refers to all three waters and has been revised to reflect current immunisation requirements. Clarified immunisation requirements are for staff physically working on the wastewater or water supply networks	
21.RSpec	Discharge of sediment	4.2.1 Water ponding/stormwater management	Revisions make it clear that discharge of sediment may need approval from Greater Wellington Regional council and discharge to the sewer may require a trade waste consent.	184
22.RSpec	Noise	4.2.2 Noise control	Clarified that noise is regulated under the relevant district plan.	
23.RSpec	As-builts for abandoned asbestos pipes	4.4.1 Design for replacement of asbestos cement pipes	Revised to ensure abandoned AC pipes are captured in as-builts as a hazardous material. This is consistent with the new Regional As-Builts Specifications. Removed restriction on on-line replacement of AC via slip lining. Clarified that asset information must be recorded where the AC pipeline ~~is decommissioned in situ~~ remains on site	
24.RSpec	Asbestos pipes	4.4.2 Working with AC pipes	The required references for Health and Safety and Code of Practice for working with asbestos are updated.	
25.RSpec	Trenching and Excavation	DELETE ~~4.5 Excavation,~~ ~~4.6 Bedding, haunching and surrounds,~~ ~~4.7 Backfilling,~~ ~~4.8 Compaction,~~ ~~4.9 Reinstatement~~ NEW 4.5 Excavation 4.6 Typical trench arrangement 4.7 Trench foundation 4.8 Reuse of in situ material 4.9 Pipeline embedment 4.10 General backfill 4.11 Reinstatement	New revised sections replace the deleted sections	185
26.RSpec	Building near or over pipes	NEW 4.12 Building ~~over or near~~ in close proximity to public pipelines	This is a new section that provides guidance and minimum requirements for building over or near public pipelines. There is also a new Standard Detail, DR09, that provides a visual representation of these requirements. This section has been reorganized and some requirements revised / clarified as a result of consultation feedback.	98 – 99, 186
27.RSpec	Building near or over pipes	NEW 4.12.1 Sleeving an existing pipe	Sleeving is currently a requirement for most pipes where building works over and existing public pipeline cannot be avoided, however the current R.Spec does not have any clauses specific to sleeving. Sleeving consists of relaying an existing pipe with a new pipe housed within a new host pipe that is laid at the same time. This new section provides the minimum specifications for sleeving. The minimum requirements include the need to provide sufficient working space within the same lot or adjacent public land to allow for maintenance and removal of the pipe. This section has been reorganized and some requirements revised / clarified as a result of consultation feedback.	98 – 99, 186

Item	R.Spec Topic	Clause	Description	Feedback
28.RSpec	As-builts	4.13 As-builts	Reference is added to the new Regional Draughting Manual. Although the current R.Spec refers to the Regional As-Built Specification, please note that this specification was not available until now.	
29.RSpec	Slip lining pipes	4.14 Slip lining	The list of materials allowed to be slip lined is removed, as it is redundant with restricted materials being stated explicitly. The prohibition on slip lining AC pipes has been removed and replaced with Slip-lining AC pipes should be considered only if there is no other practicable alternative Restraint joint PVC has been added as an allowable material for slip-lining deleted pipelines, and the requirement to externally de-bead butt fusion welded pipes has been changed to where necessary The restriction on slip lining gravity pipes is changed to: ~~Gravity pipelines shall not be slip-lined because it will result in an unacceptable reduction on ID and grade may not be maintained~~ For gravity pipelines, slip-lining shall be assessed for its suitability on a case-by-case basis. Assessment shall include: (i) an options analysis (i.e. comparing risks and benefits of slip-lining to other methods such as open trench pipe replacement), (ii) comment on the effect on grade, and (iii) calculations proving the network will continue to meet hydraulic design requirements despite the loss of internal diameter. Reference to seismic resilience has been removed as this is now covered in RSWS **Section 3.7 Seismic Resilience**	187 – 190
30.RSpec	Slip lining pipes	4.14.1 Slip lining installation	Minor amendments to clarify requirements, both general and specific to PE100 pipe	191 – 195
31.RSpec	Pipe bursting	4.15 Pipe-bursting	The list of materials allowed to be pipe-burst is removed, as it is redundant with restricted materials being stated explicitly. Prohibition on bursting dipped pipes has been replaced by Dips in gravity pipe need to be rectified or assessed to Wellington Water's approval prior to pipe bursting. Clause (d) amended to include consideration of ~~amount of~~ potential for ground heave ~~experienced at the surface~~ and the proximity of other services. Typical suitable maximum difference between OD of pipe and forcing cone has been corrected to ~~10~~ 0.1 times the depth of cover. Minor amendments to clarify type of pipe bursting (dynamic, static) vs methodology (pneumatic, hydraulic) Requirement to externally de-bead PE pipe removed.	196 – 204
32.RSpec	Pipe bursting	4.15.2 Pipe-bursting of gravity pipelines	Consequential amendment from changes to **Section 4.15 Pipe bursting**: Deleted clause ~~(a) Pipe bursting is not suitable to renew gravity pipelines that are affected by dips.~~	
33.RSpec	Pipe bursting	4.14.4 Pipe-bursting installation	Deleted clause ~~(g) Concrete encased pipe shall not be replaced by pipe-bursting.~~ As this is in covered in **Section 4.15 Pipe Bursting**.	209 – 210
34.RSpec	Impact moling	4.16 Impact moling	Deleted clause ~~(a) Pipes DN 50 and smaller may be installed by impact moling (i.e., Grundomat). An impact mole with radio sonde fitted in the front end is preferred.~~ as the size restriction is due to technological limitations, and radio sondes are not typically used.	213
35.RSpec	Directional drilling	4.17.2 Directional drilling pipe installation	Clarified that directional drilling for stormwater pipelines is usually only suitable for less than 450mm, but that larger sizes are possible with appropriate rig and space for establishment. Revised the requirements around scoring for EF saddles to allow increase in depth of peel (with requirements), rather than immediately rejecting. Added detail around remediation of scoring for EF sockets.	214 – 217
36.RSpec	Pipe lining	NEW 4.18 Lining as pipe rehabilitation	Added section acknowledging that specifications for pipe lining have not been included in the Specification at this time, but Wellington Water can provide guidelines on request.	
37.RSpec	Seismic Resilience	DELETE ~~4.15 Seismic resilience~~	All of **Section 4.15 Seismic resilience**, including all sub-sections, is deleted from the R.Spec and this detail has been revised and moved to the RSWS.	
38.RSpec	PE welding	4.19 Polyethylene welding	Corrected reference to PIPA ~~POP002 Industry guidelines. Electrofusion jointing of PE pipes and fittings for pressure applications.~~ POP001 Industry guidelines Polyethylene (PE) pipes and fittings for compressed air.	218
39.RSpec	PE welding	4.19.1 Butt fusion welding	Added clause (j) Gravity PE100 pipes less than or equal to 160 OD and that are laid at a grade less than 2% shall be internally de-beaded.	
40.RSpec	PE welding	4.19.2 Electrofusion welding	Added PI tape suitable for the size of the pipe being welded to the list of necessary plant required to carry out EF welding. Added requirement to cut off visible reversion so the pipe end has a constant OD	219
41.RSpec	PE welding logs	4.19.3 Site QA forms	Amended and clarified list of required information, adding items, and making some items specific to weld type. Clarified language so that welding logs are not submitted as data for as-builts but rather are submitted alongside as-builts.	220
42.RSpec	PE welding	4.19.5 Welding PE pressure pipe	The acceptable welding parameters have been amended to reflect current standards.	221

Item	R.Spec Topic	Clause	Description	Feedback
43.RSpec	PE welding	4.19.7 Work method statement	Amended for clarity and ease of use	
44.RSpec	PE welding	4.19.8 ~~Pre-qualification welding and weld testing~~ Butt fusion welding framework	This section has been spilt in two (added header **4.19.8.1 Pre-qualification welding and weld testing**) so that the butt fusion welding framework and associated Figure 2 sits above the remaining sub-section on pre-qualification welding and weld testing.	222 – 223
45.RSpec	PE welding	4.19.8.1 Pre-qualification welding and weld testing	Deleted two clauses related to payment which belong in a contract rather than in the R.Spec Amended requirements for weld testing labs from ~~a testing laboratory acceptable to Wellington Water~~ to an IANZ registered laboratory Amended requirement in Table 4-14 for DN63 EF socket weld to have 0% brittle decohesion	
46.RSpec	Health & Safety	5.1.1 Drainage hazards	Reference to revised section on Immunisations (**Section 4.1.1 Immunisations**) added ~~as well as reference to Wellington Water's Safety in Design and Confined Space Entry policies.~~	224
47.RSpec	Health & Safety	5.1.2 Drainage network underground entry	Detail removed and replaced with reference to Confined Space Entry Policy.	225
48.RSpec	Drainlayer and Surveyor qualifications	5.2 Setting out	~~Revised wording to delete reference to the National Certificate in Infrastructure Works (Infrastructure Pipelaying Technician) (Level 3) which was discontinued in 2018.~~ Restored reference to National Certificate in Infrastructure Works (Infrastructure Pipelaying Technician) (Level 3), added additional reference to New Zealand Certificate in Pipe Installations (Level 4) Amends the wording for the references to licensed cadastral and registered professional surveyor responsible for the final land transfer pegging.	
49.RSpec	Reformatting	5.2.1 Drains laid on a curve	Reworded for clarity: The tightest radius of curvature for bending shall be 50 x the OD of the pipe, but no ~~less than the manufacturers recommended maximum~~ tighter than the manufacturers recommendation.	
50.RSpec	Clearance from other utilities	5.2.3 Clearances from other utilities	Regarding laying of wastewater pipes lower than water supply mains, the requirement is changed from "shall" to "should" to reflect that this is determined on a case-by-case basis.	226 – 227
51.RSpec	Structural concrete	5.3.6 Structural concrete	Clarified that these are minimum standards that may be superseded by specific design. Clauses added about use of secure formwork and protection from water. Please note that **Section 6.2.2 Concrete** for water supply refers to this section.	
52.RSpec	PE pipes	5.3.7.3 PE100 pipes	Clarified that specifications given apply to gravity drainage pipes, and clarified requirements of minimum wall thickness equating to a maximum of SDR17	
53.RSpec	Fastenings and gaskets	5.3.7.6 Fastenings and gaskets	Revisions address the need to select materials that are compatible and resistant to corrosion.	229
54.RSpec	Reformatting	5.3.8 Manhole covers	Terminology is revised to be consistent. Added word for clarity (d)(v) The cover shall allow a 600 mm diameter minimum clear opening.	
55.RSpec	Health & Safety	5.3.8.1 Hinged Covers	New clause added to require hinges be put on existing manholes during renewals and redevelopment. The clause also references installation requirements in **Section 5.6.11.1 Hinged manhole covers**.	
56.RSpec	Reformatting	5.3.9 Maintenance shaft covers	Reworded and added Higher loadings may be required depending on the anticipated application (e.g. airports or loading yards) for consistency with **Section 5.3.9 Manhole covers**	
57.RSpec	Excavation and trenching	~~DELETED 5.5 Excavation,~~ ~~5.6 Bedding,~~ ~~5.7 Backfilling,~~ ~~5.8 Reinstatement~~	Deleted **Sections 5.5 – 5.8** relating to excavation and trenching, as this is covered in the General Specification **Sections 4.5 – 4.11** and these sections just linked to the general sections	
58.RSpec	Reformatting	5.4.4 Flush jointed concrete pipes	Reverted section from DELETED SECTION **5.8 Reinstatement** to **5.4 Jointing and laying of pipes** (moved in error)	
59.RSpec	Cathodic protection	NEW 5.4.6 Cathodic Protection	New section refers to detail found under the Water Supply pipe laying **Section 6.3.9 Cathodic Protection**.	
60.RSpec	Reformatting	5.6.1 Manhole design	Added reference to **Section 5.6.10 Manhole lid construction** for loading requirements for manhole lids.	

Item	R.Spec Topic	Clause	Description	Feedback
61.RSpec	Seismic Resilience	5.6.1.1 Design against liquefaction	The original section which was located further down in the document, has been deleted and this revised section placed as a subsection under **Section 5.6.1 Manhole Design**. In addition, several of the original clauses have been shifted from the R.Spec to the RSWS. Deleted clauses that were mistakenly duplicated as part of the v2.9 amendments. Consequential amendments are that new sections in the R.Spec have been created specifically for water supply manholes.	234
62.RSpec	Seismic Resilience	DELETE ~~5.11.2.1 Manhole design against liquefaction~~	This section was deleted, and a revised section placed as a subsection under **Section 5.6.1 Manhole Design**. In addition, several of the original clauses have been shifted from the R.Spec to the RSWS. Consequential amendments are that new sections in the R.Spec have been created specifically for water supply manholes	236
63.RSpec	Manhole rungs	5.6.3 Manhole rungs	Clarified that the alignment of the rungs parallel to the flow is for drainage manholes.	
64.RSpec	Health & Safety	NEW 5.6.4 Manhole safety grilles	NEW section added for all new manholes deeper than 3 m to require safety grilles. Landings reduce the maximum possible fall and provide an opportunity for a rest when personnel are climbing down into a deep manhole. However landings in older manholes cannot be guaranteed to hold a person's weight, they can interfere with ropes and ventilation systems and make it difficult to winch someone out in a rescue scenario. It was also noted that all personnel should be wearing a harness to enter deep manholes so this will prevent a fall. The removal of landings was agreed in conjunction with safety grilles being added as a requirement for manholes deeper than 3 m. Design preamble relocated to RSWS.	237
65.RSpec	Manhole false floors	DELETED ~~5.11.4 Manholes with false floors~~	We don't have any evidence that this requirement is achievable, has been complied with in the past, or achieves a good outcome. Therefore, this specification has been deleted.	
66.RSpec	Manholes	5.6.7 Benching of manholes	A clause referencing the use of tiles has been deleted as further detail on the use of tiles is provided in the other clauses.	238
67.RSpec	Health & Safety	DELETED ~~5.11.8 Deep Manholes~~	The old ~~**Section 5.11.8 Deep Manholes**~~ is DELETED given that landings are now not required, and safety grilles are required on manholes deeper than 3 m (see RSWS **Section 4.4.7.5 Manhole safety grilles** and **Section 4.4.7.6 Deep manholes**, R.Spec new **Section 5.6.4 Manhole safety grilles**).	
68.RSpec	Manholes	5.6.9.1 Haunched internal drop structures	A clause specific to internal drop structures rather than haunched internal drops has been deleted from this section and added to the section on Internal drop sections, which follows.	
69.RSpec	Manholes	5.6.9.2 Internal drop structure	A clause specific to internal drop structures has been moved from the preceding section on haunched internal drop structures and added to this section.	
70.RSpec	Manhole lid construction	5.6.10 Manhole lid construction	Clarified the opening size for water supply manholes as: (c) Shall have the nominal 600 mm diameter or 1200 x 600 (for water supply) opening…	239
71.RSpec	Raising a manhole	5.6.10.2 Raising a manhole	Clarified that the requirement for raising a slab of an existing manhole in WCC is relevant to drainage manholes only.	
72.RSpec	Health and safety	5.6.11.1 Hinged manhole covers	A requirement is added that hinged manhole covers are to be installed on existing manholes during renewals, upgrades or where new pipe connections are added.	
73.RSpec	Reformatting	5.8.3 Testing of concrete manholes	The specification uses a confusing mix of "shall not", which implies a prohibition, and "typically", which implies it may occur, followed by two items of potential testing. Therefore, the beginning of the clause was reworded to relate more clearly to the clauses that follow as: (a) Manholes ~~shall not~~ may not be required to be tested, given that the allowable leakage (1 millilitre/millimetre diameter/meter length) over the typically short depth of the manhole is optically difficult to detect. (i) Notwithstanding this, all manhole joints shall be sealed and any obvious sign of infiltration or exfiltration shall be remedied prior to commissioning.	
74.RSpec	Wastewater pumping stations	5.9.1 General (Wastewater pumping stations)	This section has had a few changes, including specifications added for standard fencing. Clarifies that odour control is consented under regional plan rules for discharges to air. Revisions clarify which clauses belong in the R.Spec and which belong in the RSWS and additional detail added to the specification. Additional detail is added to the maximum number of pump starts, odour, the minimum clear opening needed to allow for access, protection needed for the internal walls and the need for slip-resistant flooring for dry wells. Amended requirement to pump 120% of the design PWWF	

Item	R.Spec Topic	Clause	Description	Feedback
75.RSpec	Wastewater pumping stations	5.9.2 Equipment requirements	Clarification that all valves shall be clockwise closing and identified as such. Additional detail is added regarding requirements for a metered water supply with reduced pressure zone backflow preventer.	
76.RSpec	Wastewater pumping stations	5.9.3 Pipework	Clarification made to clause (c) on flanged or spigoted bends, tees and "specials" fabricated from STCL. Clarification made to clause (e) that all fittings in ABS are to be fabricated by the supplier. Additional detail is provided on flanges.	
77.RSpec	Wastewater pumping stations	5.9.4 Pumps	Added (c) Operated using a variable speed drive if rated for 5 kW or greater. For pumps the minimum number of starts per hour has been reduced from 12 to 8 starts to reflect the changes in pump design. Added requirement that pumps be selected to have duty point within ±10% of the best efficiency point (BEP) unless approved by Wellington Water. Added a minimum pump efficiency at the duty point of 50%, and conditions for approval of lower efficiencies.	
78.RSpec	Wastewater pumping stations	5.9.5 Dry well installations	Significantly more detail has been added to the specification for dry well installations including specifications on ventilation, means to lift and move the pumps, working space, measures to manage vibration and noise, and required safety equipment.	
79.RSpec	Wastewater pumping stations	5.9.6 Electrical specification	Minor revision noting that standard design for electrical and SCADA specifications should be obtained from Wellington Water. Added The form of connection (plug or tails) must be approved by Wellington Water.	
80.RSpec	Private wastewater pumping stations	NEW 5.9.7 Private wastewater pumping stations	Much of this detail has been shifted from the RSWS to the R.Spec so that the specifications can be found more easily. Clarified that these requirements are for private wastewater pumping stations that are not associated with a smart pressure sewer system, typically installed in a greenfield development, and that Wellington Water can provide guidance on smart pressure sewer systems. Added restriction on use of 90-degree bends on pipes less that 90mm OD Deleted requirement for the wet-well to be sized to hold ~~24 hours of ADWF plus the volume of the rising main, above the pump start level.~~ As this has been covered in the amendments to **RSWS Section 5.4.8 Wastewater pumping stations Table 5-5 Detention, maintenance and total storage volume for wastewater pumping stations**	244
81.RSpec	Stormwater pumping stations	5.10.1 General (Stormwater pumping stations)	Specifications added for standard fencing. Revision is made for chamber lid loadings regardless of when in trafficked area, given that work vehicles may always be present when maintenance is required.	
82.RSpec	Stormwater pumping stations	5.10.2 Equipment requirements	Deleted the clause regarding chamber lids as this is redundant to the clause in the previous section.	
83.RSpec	Stormwater pumping stations	5.10.4 Pipework	Detail added on flange requirements	
84.RSpec	Stormwater pumping stations	5.10.6 Electrical specification	Minor revision noting that standard design for electrical and SCADA specifications should be obtained from Wellington Water. Please note that these specifications are available online. Amended requirement for provisions for an emergency generator able to power the station to start and maintain the maximum design ~~wet weather~~ flow rate. Added The form of connection (plug or tails) must be approved by Wellington Water.	245
85.RSpec	Health & Safety	6.1 Hygienic practices and immunisations	Reference is made to newly revised **Section 4.1.1 Immunisations**	
86.RSpec	Health & Safety	NEW 6.1.1 Cleanliness	NEW section added. This section was brought over from the bulk water specifications	
87.RSpec	Health & Safety	~~6.1.1 Immunisations~~	Deleted as this section was revised and moved up to **Section 4 General Specifications** as it applies to all waters now, instead of only water supply.	

Item	R.Spec Topic	Clause	Description	Feedback
88.RSpec	Health & Safety	6.1.2 Equipment	Amended wording clarifies what is required for equipment that has been used on non-potable water work so that it is suitably hygienic before use on the water supply network.	
89.RSpec	PVC pipes	6.2.3 PVC pipes	Requirements that are the same for PVC-U and PVC-M pipes have been moved from **Section 6.2.3.1 PVC-U pipes** and **Section 6.2.3.2 PVC-M pipes** up to this higher-level section.	
90.RSpec	PVC pipes	6.2.3.1 PVC-U pipes	Requirements that are the same for PVC-U and PVC-M pipes have been moved up to **Section 6.2.3 PVC pipes**.	
91.RSpec	PVC pipes	6.2.3.2 PVC-M pipes	Requirements that are the same for PVC-U and PVC-M pipes have been moved up to **Section 6.2.3 PVC pipes**.	
92.RSpec	Polyethylene pipes	6.2.4 Polyethylene pipes	~~Two~~ Five clauses are added, ~~one specific to a requirement to test the materials for bulk water pipelines~~ stating how compliance to required standards will be demonstrated, required certification for the testing laboratories, and ~~the second~~ that PE pipe should not be used where there are high concentrations of hydrocarbons.	247
93.RSpec	Ductile iron pipes	6.2.5 Ductile iron pipes	Added new bulk water pipelines to the list of situations where pipelines conforming to AS/NZS 2280 may be used, and exception for bulk pipelines for the requirements in (b) for new pipelines Two clauses added to the general section about jointing and sleeving. This makes it clear that the specification is for all DI pipe (including ISO 2531) to be installed with a polyethylene sleeve regardless of whether it has a protective coating. The current specifications require only AS/NZS 2280 DI pipe to be sleeved. In addition, a table (**Table 6-1)** is added of allowable pipe diameters for use in the bulk water distribution network. This table is also referred to in **Section 6.2.6 Steel pipes**.	248 – 252
94.RSpec	Ductile iron pipes	6.2.5.1 ISO 2531 for new pipelines	Added wording to the header to make it clear that ISO 2531 is for new pipes.	253
95.RSpec	Ductile iron pipes	6.2.5.2 AS/NZS 2280 for repairing bulk water pipelines and existing compatible pipelines	Added wording to the header to make it clear as to that AS/NZS 2280 is for bulk water pipelines and repairing existing ductile iron pipe. Added a clause specific to bulk water mains and removed the clause about sleeving as this clause has been moved up to **Section 6.2.5 Ductile iron pipes** so that it also applies to ISO 2531 ductile iron pipe.	
96.RSpec	Steel pipes	6.2.6 Steel pipes	Correction of error in current R.Spec - For pipes DN~~600~~650 (667 OD) and greater. A reference to **Table 6-1** is added, which is a new table of allowable pipe diameter for use in the bulk water network.	
97.RSpec	Stainless steel pipes	6.2.9 Stainless steel pipes	Deleted use of 304 or 304L for above ground pipes.	
98.RSpec	Manholes (Water supply)	NEW 6.2.10 Manholes (water supply)	New section as current provisions in the R.Spec are specific only to drainage network manholes.	
99.RSpec	Manholes (Water supply)	NEW 6.2.10.1 Bulk water main access manholes	New section specific to the bulk main.	
100.RSpec	Manholes Covers (Water supply)	NEW 6.2.10.2 Manhole covers	New section as current provisions in the R.Spec are specific only to drainage network manholes.	254
101.RSpec	Valves	6.2.11 Valves	Four clauses added that are general to gate and butterfly valves, including coating of the valve body, fitting of key dolly, installation of valve spindle extensions, and installation of a tag or other means to clearly indicate closing direction. Amended valve spindle extension depth to between ~~350 mm and 100mm~~ 150 mm and 450mm of the ground surface, with a target depth of 200 mm.	
102.RSpec	Valves	6.2.11.1 Gate Valves	Added a clause requiring For bulk water pipelines, gate valves shall be flanged to AS/NZS 4331.2. Deleted reference to valves “in chambers” for the requirement for hand-wheels. Amended maximum spindle cap depth to ~~350~~ 450 mm below ground surface Added requirement Extension spindles shall be one piece, secured to the valve spindle, colour-coded white or red to indicate closing direction and epoxy coated.	255 - 256
103.RSpec	Valves	6.2.11.2 Butterfly Valves	Revisions clarify direction of closing (anti-clockwise), valve seal and position indication.	
104.RSpec	Valves	NEW 6.2.11.3 Ball Valves	New section with specifications for ball valves.	

Item	R.Spec Topic	Clause	Description	Feedback
105.RSpec	Valves	6.2.11.4 Hydrant Valves	Amended top of the spindle cap to between ~~115~~ 125 mm and 300 mm of the ~~finished ground level~~ underside of the hydrant lid. This is more consistent with the wording in NZS4522 (Underground fire hydrants).	
106.RSpec	Reformatting	6.2.11.5 Service valves	Deleted ~~The minimum load rating of the box shall be AS 3996 Class B~~ as double up with **Section 6.2.12.1 Service valve boxes**	
107.RSpec	EF Fittings	6.2.13.2 Electrofusion tapping saddles and branch saddles	Amended clause to include branch saddles	
108.RSpec	EF Fittings	NEW 6.2.13.3 Electrofusion reducing couplers and elbows	Added material and installation requirements for EF reducing couplers and elbows	257
109.RSpec	Mechanical compression fittings	6.2.13.4 Mechanical compression fittings	Corrected pipe dimension from DN 63 to 63 OD.	
110.RSpec	Mechanical couplings	6.2.13.6 Mechanical couplings	Added reference examples of permitted connection methods between new and existing mains in the Standard Details (**Appendix 1**) All nuts, bolts and washers shall be 316 stainless steel or hot dip galvanised. At locations requiring installation of mechanical joint couplings, pipe ends shall be cut square and, in the case of spirally welded steel pipe, the spiral welds ground smooth for a sufficient distance to allow installation of the coupling. For bulk water pipelines, the exposed steel shall be prepared and coated with 300 microns of *Carboguard 690* in two layers, or approved alternative potable water protective coating.	
111.RSpec	Bends and tees	6.2.13.8 Bends and tees	Reworded a clause regarding minimum pressure rating. Added detail on the use of sufficient length to allow concrete thrust blocks without encasing the joints in concrete.	
112.RSpec	Formatting	6.2.14 Pressure reducing valves	Added wording to clarify PRV used as the primary source of supply for an area ensures the full range of design flows are achievable through the installation without excessive noise and cavitation, and with an acceptable design life	
113.RSpec	Discharge of water	6.2.14.1 Pressure relief valves	Corrected pipe dimension from DN 63 to 63 OD. Revised sub-clause (f) as, The potential for scour of a natural waterbody must~~Water discharged is to~~ comply with a permitted activity standard in regional plan rule or consent for discharge will be required under RMA	
114.RSpec	Air valves	6.2.16 Air valves	Amended statement that air valves are to prevent negative ~~surges~~ pressures New clause requiring that flange joints encapsulated in the full Denso system (~~paste~~primer, mastic, petrolatum tape and PVC outer wrap).	
115.RSpec	Air valves	6.2.16.1 Chamber	Amended requirement for the chamber to be clear of secondary overland flow	
116.RSpec	Backflow prevention	6.2.18 Backflow preventers Several drawings in Appendix	Revision includes reference to standard AS/NZS 3500.1 and series of drawings in the appendix of drawings	
117.RSpec	Reduced pressure zone device discharge	6.2.18.1 Reduced pressure zone device	Changed clearance distance as follows: (d) The clearance between the paved surface and the discharge point of the RPZ shall not be less than ~~600~~ 300 mm.	
118.RSpec	Excavation and trenching	~~DELETED 6.3 Excavation, 6.4 Bedding, 6.5 Backfilling, 6.6 Reinstatement~~	Deleted **Sections 6.3 – 6.6** relating to excavation and trenching, as this is covered in the General Specification **Sections 4.5 – 4.11** and these sections just linked to the general sections	
119.RSpec	Cover to pipeline	6.3.2 Maximum cover to pipeline	**Table 6-5 Maximum cover to pipelines** Maximum cover to pipeline table has reduced all maximum that are larger than 3m to 2.5m and the table has been simplified.	
120.RSpec	Clearance to pipeline	6.3.3 Minimum clearances from other utilities	**Table 6-6 Minimum water main clearances from utilities** Changed column from “critical” to “bulk” main and revised some of the requirements, including to make it clear that the allowable minimum is the greater of the those in the table or outlined by the other utility.	259
121.RSpec	Grade and change of direction	NEW 6.3.5 Allowable grade	This new section details the allowable grade for bulk water pipelines.	
122.RSpec	Reformatting	6.3.6 Thrust and anchor blocks	Amended to match drawing WS03 and remove ambiguity: (b) ... The bearing face shall be poured against firm, clear and undisturbed natural ground... (c) Pipes larger than DN 300 ~~may~~ require specific design regarding reinforcement and concrete strengths…	

Item	R.Spec Topic	Clause	Description	Feedback
123.RSpec	Warning tape/tracer wire	6.3.8 Warning tape/tracer wire	Added requirement that Tape shall continue through service valve, hydrant and valve enclosures whilst maintaining tape conductivity. This is consistent with the note on drawing WS05.	
124.RSpec	Cathodic protection	NEW 6.3.9 Cathodic protection	New section details the provision for cathodic protection to prevent electrical contact between buried metallic structure and the metallic pipe and pipe fittings.	
125.RSpec	Pipe jointing	6.4 Pipe Jointing	A new clause is added specific to the allowable deflection in the pipe joint.	
126.RSpec	Restraining gaskets	6.4.1.1 Restraining gaskets	Re-ordered some of the wording to add clarity.	
127.RSpec	Connecting to live, in-service PE water pipes	6.4.3 Polyethylene butt fusion and electrofusion	Clarified that electrofusion couplers to in-service mains less than 315 OD is preferred when site conditions allow and for larger mains, or where the conditions for installation of electrofusion couplers cannot be met connections shall be made using an approved PE mechanical compression fittings.	
128.RSpec	Flanges	6.4.4.1 ~~Flanges for~~ General reticulation pipes	Renamed the section and reference to BS EN 1092 added	
129.RSpec	Flanges on bulk mains	6.4.4.3 Bulk water pipelines, trunk pipelines and general reticulation greater than DN500	Renamed the section and reference to AS/NZS 4331.1 added	
130.RSpec	Steel pipe welding	NEW 6.4.6.8 Flanged connections	New section provides details on flanged connections on steel pipe.	
131.RSpec	Steel pipe welding	6.4.6.11 Testing and inspection	A number of edits have been made concerning visual inspection, weld metal standard, pressure testing of double lap welds, recording of results and further testing.	
132.RSpec	Concrete lining	6.4.6.12 Repairs to concrete lining	Amendments around lining application and product use, preparation and required results.	
133.RSpec	Concrete lining	6.4.6.13 Repairs to external coating	Minor edits on use of heat shrink sleeves.	
134.RSpec	Ductile iron pipe	NEW 6.4.7 Ductile iron pipe	New specifications provided on jointing/repairing ductile iron pipe	
135.RSpec	Pressure testing	6.5 Pressure testing of pipelines	Amendments focus on: • changing maximum length of pipe tested from 300 to 400 m and providing an allowance for long steel pipes with slip-in welded joints to be tested in one length; • requirement to release all air during filling operation and to pre-soak for 24 hours prior to testing; • amendments to remove reference to resource consent certification requirements	262
136.RSpec	Pressure testing	6.5.1 Testing of steel, ductile iron, and PVC pipes	"Specified test pressure" replaces the use of "static test pressure". Specified test pressures have been amended. Corrected reference to ~~PN16~~ PN15 PVC pipe	
137.RSpec	Shut down process	6.8 Water supply shutdown (cut ins)	The water supply shut down process has been revised as a series of stand-alone documents that details three levels of shut down. Revisions to the several clauses in the R.Spec ensure that there are not contradictions between the R.Spec and the water supply shut down process documents. General requirements indicate that the correct template for water supply shutdowns, (Level 1, 2 or 3) must be used.	
138.RSpec	Health and Safety	6.8.1 General (Water supply shut-downs (cut-ins))	Added information relevant to section 695 of the Health Act 1956. Added requirement to submit shutdown plans to Wellington Water at least five working days prior to the shutdown	
139.RSpec	Notifications	6.8.2 Notifications	Significant revisions have been made to this section.	263
140.RSpec	Critical and key account customers	6.8.3 Critical and key account customers	Revisions to ensure consistent identification of critical and key account customers.	
141.RSpec	Water supply shut down	6.8.4 Trial shutdown	Revisions reflect the water supply shut down process has been revised.	

Item	R.Spec Topic	Clause	Description	Feedback
142.RSpec	Water supply shut down	6.8.5 ~~Emergency~~ Reactive shutdown	Revisions reflect the water supply shut down process has been revised.	
143.RSpec	Notification	6.8.5.1 Emergency shutdowns during planned construction works	Revisions reflect the proper notification process.	
144.RSpec	Water supply shut down	6.8.6 Temporary supplies	Revisions reflect the water supply shut down process has been revised.	
145.RSpec	Water supply manholes	NEW 6.9 Manholes (water supply)	The current R.Spec does not have specifications for water supply manholes. The new sections are specific to the water supply where necessary and they refer to the provisions for drainage manholes where the requirements are the same.	
146.RSpec	Water supply manholes	NEW 6.9.1 Manhole construction	New section detailing how manholes are to be constructed, based on the Manhole Construction sections in **Section 5 Drainage**	
147.RSpec	Water supply manholes	NEW 6.9.1.1 Manhole design against liquefaction	New section refers to **Section 5.6.1.1 Manhole design against liquefaction** as provisions to counteract liquefaction are the same for all manholes.	
148.RSpec	Water supply manholes	NEW 6.9.2 Manhole rungs	New section refers to **Section 5.6.3 Manhole rungs** as requirements for manhole rungs are the same for all manholes.	
149.RSpec	Water supply manholes	NEW 6.9.3 Manhole lid construction	New section refers to **Section 5.6.10 Manhole lid construction** as requirements for manhole lids are the same for all manholes.	
150.RSpec	Water supply manholes	NEW 6.9.4 Hinged manhole covers	New section based on drainage **Sections 5.3.8.1 Hinged covers** and **5.6.11.1 Hinged manhole covers**, excluding requirements specific to drainage.	
151.RSpec	Water supply manholes	NEW 6.9.5 Manhole safety grilles	New section refers to **Section 5.6.4 Manhole safety grilles** as requirements for manhole safety grilles are the same for all manholes.	
152.RSpec	Connections to the main	NEW 6.10.1 Connections to the bulk water pipeline	New section that clarifies connections to the existing in-service bulk water pipeline are to be carried out by Wellington Water.	
153.RSpec	Service connections	6.10.2 Service connections	Deleted text that is inconsistent with the RSWS, which requires each dwelling on a lot to have a separate connection.	
154.RSpec	Fire service pipe materials	6.11 Fire Services	The current R.Spec requirements are inconsistent with national standards NZS4541:2020 *Automatic fire sprinkler systems.* The revised wording clarifies that the requirement is for the public side of the point of supply only as the national standards are only relevant from the "town supply". Many of the fire services are installed in CBD areas, where underground service congestion often results in the fire service pipe changing in vertical alignment. As a result, metallic pipes are preferred because they are easier to restrain and are more robust in situations where the minimum required depth of cover cannot be attained. Where a fire service is connecting to a PE main, vertical alignment will not vary, and the minimum depth of cover can be achieved, PE fire service mains should be accepted. Therefore the revision adds PE100 (with requirements) and removes copper from the list of fire service materials, clarifies that fire service pipe refers to the pipe between the principal main and the fire service valve, and specifies the preferred location of the fire service valve as being in the berm/footpath (as opposed to the carriageway) at least 500mm from the boundary. A standard drawing has been revised indicating the preferred location of the fire service valve, which denotes the point of supply (town supply). Amended requirements for fire service valve covers to be clearly marked with the letter FS and painted green	264
155.RSpec	Discharge of chlorinated water	6.12.1.1 ~~Disinfection~~Chlorination	Revisions address revised requirements for disinfecting new or relined pipelines. Also address that the permitted level for chlorine concentration to be discharged to water is a matter for the regional plan. This permitted activity standard is currently 0.3ppm. In addition, revisions clarify that discharges to the wastewater system need written approval from Wellington Water which may include the need to consider trade waste bylaws. Amended name to remove redundancy between **Section 6.12 Disinfection** and **Section 6.12.1.1 ~~Disinfection~~Chlorination**	265

Item	R.Spec Topic	Clause	Description	Feedback
156.RSpec	Discharge of cholorinated water	6.12.3 Reservoirs	Added note *Please note that these sections on reservoirs are currently under review and the most up-to-date guidance must be sought from Wellington Water.*	267
157.RSpec	Discharge of water	6.12.3.9 Draining the reservoir	Revisions address that the permitted level for chlorine concentration to be discharged to water is a matter for the regional plan. This permitted activity standard is currently 0.3ppm. In addition, revisions clarify that discharges to the wastewater system need written approval from Wellington Water which may include the need to consider trade waste bylaws.	
158.RSpec	Health & Safety	6.13 Reservoirs	Specifications added for standard fencing	268
159.RSpec	Reservoirs	6.13.3.3 Outlet pipework	Clarified wording around flanging or axially restraining pipe joints.	
160.RSpec	Water supply pumping stations	6.14 Water supply pumping stations	Specification added clarifying that the pumping station should be on a separately titled lot vested to Council with a sealed vehicle access. Detail added for standard fencing. Consequential amendments from RSWS regarding revisions on filling times for reservoirs. Deletion of reference to IL4 as this is now covered in new s3.7 Seismic resilience in the RSWS.	
161.RSpec	Water supply pumping stations	6.14.1 Building	Additional detail on door, gantry system, cooling, lighting, and smoke detector requirements	
162.RSpec	Water supply pumping stations	6.14.2 Pumps	New requirement that all pumps in an arrangement be of the same make model and duty size	
163.RSpec	Water supply pumping stations	6.14.2.1 Pump plinths	Added detail on the required weight of the pump plinth	
164.RSpec	Water supply pumping stations	6.14.3 Pipework	Several amendments have been made to this section. Of note there is an added requirement that the closing direction of gate valves shall be clearly marked and anti-clockwise and revisions on minimum pressure rating, permitted types of stainless steel, specifications for air valves and additional detail on flanges for the local network and for the bulk water supply. Deletion of reference to IL4 as this is now covered in new **Section 3.7 Seismic resilience** in the RSWS.	
165.RSpec	Water supply pumping stations	NEW 6.14.4 Pumping stations serving a reservoir	These clauses have been moved to the R.Spec from the RSWS (**Section 6.4.17.1 Pumping station serving a reservoir**).	

Number	Name	Description for Draft v2.9	Description for Final v3.0
DR01	Manhole details	Added stormwater sump leads. Added more details in manhole lid note. Added note about safety grilles. Changed drawing details into 3 separate manholes	
DR02	Internal drop details	Deleted exception for UHCC (note 3)	
DR03	Typical trench and waterstop details	Changes to notes 1 and 2	Minor amendments to the notes
DR04	Baffled sump	New drawing standard sump and inlet with baffle	
DR05	Trapped yard sump	Added Wellington Water Drawing Template	
DR06	Possible location for stormwater soakage in Upper Hutts	New drawing for stormwater soakage in Upper Hutt	
DR07	~~Private lateral~~ Lateral connections to public stormwater or wastewater main	New drawing of private lateral connections to public stormwater and wastewater main	Cleaning eye detail is added.
DR08	Tree dripline	New drawing of tree dripline	
DR09	Building ~~over and near pipe~~ in close proximity	New drawing of building over & near pipe	Revisions to the notes and labels
WS01	Typical water reticulation layout	- Darkened water mains - Added in legend - Added in dimension of distance between scour valve and gate valve	Scour valves added to rider mains and the typical intersection drawing redone to show rider main detail.
WS02	Water distribution pipe junctions	Changes to notes 1 and 2	Additional notes added
WS03	Typical thrust block details	Changes to note 2	Example calculations changed from 1500 kPa to 1600 kPa to be more representative of specifications. Drawing of in line (puddle flange) thrust block added. Revisions to notes.
WS04	Typical anchor block details	- Changes to notes 1, 2 and 6 - Deleted notes 4 and 5	Example calculations changed from 1500 kPa to 1600 kPa to be more representative of specifications.
WS05	Valve details	- Changes to note 1 - Changes to note 2 - Added dimension of warning tape from pipe	Additional notes added.
~~WS06~~	~~Scour details for mains DN100mm ad larger~~	~~New drawing of scour for mains DN 100 and larger.~~	This draft drawing has been deleted as it is specific to the bulk water network and not is not ready for the inclusion in the R.Spec.
WS06	Rider main scour details	New drawing for rider main scour	Backflow prevention detail added
WS07	Fire hydrant box	- Added in detector tape in drawing - Added in notes on marking and detector tape	Additional note on using the Denso system
WS08	Typical domestic manifold and water meter	New drawing for domestic manifold and water meter	The notes have been amended and drawing altered to show concrete surround if within motorcrossing.
WS09	Below ground meter and backflow installation	New drawing for below ground commercial meter and backflow installation (~~32mm~~ 25mm to 40mm)	Several minor revisions
WS10	Above ground meter and backflow installation	New drawing for above ground commercial meter and backflow installation (32mm to 40mm)	Several minor revisions

WS11	Below ground meter and backflow installation	New drawing for below ground commercial meter and backflow installation (50mm and larger)	Several minor revisions
WS12	Above ground meter and backflow installation	New drawing for above ground commercial meter and backflow installation (50mm and larger)	Several minor revisions
WS13	Fire service and metered supply	New fire service connection and metered supply	Several minor revisions
~~WS15~~	~~Typical trench and leak detection bar~~	~~Drawing originated from the bulk water specification drawing A1-10506-01-BS.~~ ~~Changes to trench details, leak detection bar notes, scour details~~	This draft drawing has been deleted as it is specific to the bulk water network and not is not ready for the inclusion in the R.Spec.
~~WS16~~	~~Slip-in joint, welding band and mitre bend details sections~~	~~Drawing originated from the bulk water specification drawing A1-10506-02-BS~~ ~~- Changes to hemispherical slip-in joint details~~ ~~- Added in triple mitre bend~~	This draft drawing has been deleted as it is specific to the bulk water network and not is not ready for the inclusion in the R.Spec.
~~WS17~~	~~Branch, socket and access cover plate details~~	~~Drawing originated from the bulk water specification drawing A1-10506-03-BS~~ ~~Changes to access branch details and added in 10 more flanges types~~	This draft drawing has been deleted as it is specific to the bulk water network and not is not ready for the inclusion in the R.Spec.
~~WS18~~	~~Access branch chamber details~~	~~From A1-10506-04-BS~~ ~~Change entire access branch chamber details to A1-10552/01-BS~~	This draft drawing has been deleted as it is specific to the bulk water network and not is not ready for the inclusion in the R.Spec.
~~WS19~~	~~Air valves~~	~~Drawing originated from the bulk water specification drawing A1-10506-05-BS~~ ~~New drawings with Air Valves installation off road details~~	This draft drawing has been deleted as it is specific to the bulk water network and not is not ready for the inclusion in the R.Spec.
~~WS20~~	~~Water supply manhole/Access chamber with air valve~~	~~Drawing originated from the bulk water specification drawing A1-10506-06-BS~~ ~~New drawings with Line Valves installation off road details~~	This draft drawing has been deleted as it is specific to the bulk water network and not is not ready for the inclusion in the R.Spec.
~~WS21~~	~~Typical flow meter installation~~	~~Drawing originated from the bulk water specification drawing A1-10506-07-BS~~ ~~Added dismantling joints and flange joints~~	This draft drawing has been deleted as it is specific to the bulk water network and not is not ready for the inclusion in the R.Spec.
WS14	Examples of water main connections	- Added in thrust block - Added in puddle flange with thrust block	The types of connections shown has been simplified and connections for repairs are shown separately.