CS7 – Water

Contents

CS7 Water

7.1 Scope

This section sets out the requirements for the construction or upgrade and maintenance of the district water supply. It covers the specifications for constructing, testing and maintaining the water supply and related ancillary items such as Pumpstations & Treatment plants.

Road works shall be maintained throughout the maintenance period. Maintenance shall include but not be limited to sound engineering practices.

Evidence of a regular maintenance contract, including contact details shall be submitted for Council approval prior to the consideration by Council of the release of either the s224 certificate or certificate of practical completion.

7.2 Definitions

Definitions are set out in Section 1 of the Development Code: Design, unless otherwise described.

7.3 Related Documents

The following Drawings and other documents form part of this contract Document as listed:

Design Standard CS7:	Water
Drawings Number……	….and Name
Construction Standard CS7:	Water

7.4 Materials

Materials shall be as listed in the appropriate section of the Development Code: Construction, or as defined in this document.

Materials shall be as specified within this document, unless otherwise specifically agreed with Council.

7.5 General

Where the word "Contractor" is used below, it shall apply to all work undertaken by either the Consent Holder's Contractor or Council's appointed contractor (i.e. where works are undertaken by Council). The following construction specifications apply to the water supply system. Ref: National Code of Practice for Utilities Access to Road and Rail Corridors.

7.6 Existing Utility Services

Before commencing any excavation, all service utility providers shall be contacted as described in the WUN form, and any approvals necessary for excavating in the vicinity of their services shall be obtained. Any conditions stipulated by the utility provider in regard to working in the vicinity of their service shall be followed.

RON's from 'In3 Roads' and Approvals from 'The New Zealand Transport Agency' must be obtained prior to working on Local Roads or State Highways and. Requirements of the HPT are to be followed at all times and where necessary an Archaeological Authority to be applied for and approved prior to commencing works on site.

7.7 Construction

7.7.1 Alignment

The alignment of the watermains shall be set out with reference to permanent land transfer pegs or temporary boundary marks placed by the licensed cadastral surveyor responsible for the final land transfer pegging. The alignments shall reflect the design in the approved engineering drawings for the development.

Laying by reference to the kerbline should only be carried out where the surveyor has confirmed that it is the correct designed distance from the land transfer peg positions.

The location of water mains within the road reserves shall be shown as on the drawings.

7.7.2 Depth of Watermains

Both principal mains and rider mains shall have the minimum covers as per DS7 – Water Supply Design, except in circumstances where specific design has been approved and requiring special protection. Greater depth shall only be provided if required and / or approved by the Authorised Officer. The sections of mains adjacent to a carriageway crossing shall be gradually deepened, to allow the required cover under the carriageway without necessitating vertical bends.

Water Mains under State Highways shall be constructed to the required depths as per the requirements and specifications from New Zealand Transport Agency (NZTA).

Service connection pipes shall have the minimum covers as per DS7 – Water Supply Design. Similar provision shall be made to give the necessary cover over valve spindles, i.e. 350mm cover.

7.7.3 Excavation

Excavations in roading reserves shall conform to Council's Road opening procedures. Watermains shall be thrust (or directionally drilled) under existing roads, permanent surfaces and vehicle entrances. Where it is not possible using trenchless technology to thrust or drill under existing carriageways and roads open excavations shall only be carried out with the approval from Council prior to any excavations commencing. This must be carried out in a safe manner with the minimum disruption to traffic and/or pedestrians. Refer Drawings

7.7.4 Pipe Bedding

Water main pipes shall be bedded on suitable fine, non-cohesive, granular material, either insitu natural or imported that complies with the design and the manufacturer's specification. All water mains under carriageways shall have sand or fine granular bedding and surround (except when the water main has been thrust or drilled).

All Pipe bedding shall be in accordance with the manufacturer's specification and a design approved by Council.

There shall be no sharp stones or large clay lumps in the bedding or surround. Bedding material immediately around the pipe or fittings shall not contain particulate matter greater than 12mm.

Each pipe shall be laid so that the barrel of the pipe is supported for at least 90% of its circumference along its entire length. The bottom of the trench shall be cut out to sufficient size to permit jointing of the pipes and all pipes shall be supported upon their barrels only. Refer Drawings.

7.7.5 Pipe Laying

Pipes shall be accurately laid to the alignments, levels and gradients shown on the drawings and in accordance with manufacturer's specifications. During pipe laying, the inside of the pipes shall be at all times kept free from dirt and debris and shall at the end of the construction be thoroughly cleaned and fittings shall be inspected for faults or damage and any faulty pipes or fittings shall be marked and rejected.

All watermain pipes that are labeled shall be laid with product labelling uppermost in the trench. Night caps (or dust caps) shall be fitted to the end pipes in the construction zone at the end of each working day to avoid contamination of the inside of the pipe outside of the working hours.

When necessary, pipes shall be cut, or ends turned by approved means or turning machine in accordance with the manufacturer's recommendations. Exposed steel or buried steel pipe and fittings shall be protected from corrosion.

7.7.6 Jointing

All jointing shall be installed in accordance with the manufacturer's specification. Care shall be taken to ensure that the rubber rings are not twisted and are located evenly around the joint. The spigot end shall be pushed firmly into the socket such that the gap between the two pipes is within the manufacturer's specified tolerance and such that the witness mark is just visible. All seal rings shall be thoroughly cleaned of any dirt and grit, particularly on the sealing faces, before lubricant application and assembly.

Where polyethylene butt or electro fusion joints are made all work must be carried out in accordance with the manufacturer's specifications, and by a registered PE welder having been assessed competent to the requirements of POLYTEC Electro fusion or Butt Welding accreditation Program v3.0.

All Joints will be marked with the welder's PIN number and date of the weld. A minimum of two sample welds must be destructively tested, by a qualified testing facility for bending and tensile strength. One sample will be taken from the pipeline in the construction zone. The results must be submitted as part of the QA documentation.

7.7.7 Tolerances

All works shall be constructed within the tolerances set out in this clause.

Horizontal: + 100mm
Vertical: -0mm, +100mm (tolerances as per DS7 – Water Supply Design.)

Where the above tolerances are unable to be met then specific approval from Council is required prior to construction.

7.7.8 Fittings

Pipe fittings such as tees, hydrant tees, crosses, tapers, hydrant risers, blank caps, plugs, bends of various degrees, shall be of ductile iron. All ductile iron fittings shall have anti corrosive epoxy /

polymer coatings. Spigot and socket PVC bends (long radius) may be used. (Galvanised iron or steel fittings are not acceptable).

All steel joints and fittings incorporating threads or galvanised bolts, nuts and washers shall be wrapped in Denso Putty and Denso inner and outer Tape, or with heat shrink protective sleeve. As an alternative, 316 grade stainless steel bolts may be approved by the Authorising Officer. All fittings and valves shall have anti-corrosion protective epoxy/polymer coatings.

7.7.9 Hydrants

Hydrants shall be screw-down type to NZS/BS 750 clockwise closing. The use of ball hydrants is not permitted.

All hydrants are to be nylon coated to AS/NZS 4158.

Drain holes for frost protection are not permitted. If the hydrant is drilled for this purpose, the hole shall be plugged.

Hydrant tees shall be flanged if laid next to other flanged fittings. Otherwise flexible joints are permitted (gibault or supertite).

Hydrant risers shall be used, or the watermain laid deeper, where necessary, in order to ensure that the top of the spindle is between 100mm and 250mm below finished surface level.

Where approved by Council, hydrants to be installed on trunk mains shall be fitted with an isolating valve. The tee will be positioned facing horizontal. All fittings shall be flanged. A complying anchor block shall be constructed at the Tee.

7.7.10 Hydrant Boxes

The manufacture and installation of hydrant boxes shall be as shown on Drawings.

Hydrant boxes and risers should be fitted with lifting cleats to assist installation.

Surface boxes set in bitumen or concrete surfaces (carriageway or actual footpaths) shall be surrounded by such edging and with the immediately adjacent concrete set within a rectangular boxed-out construction joint if required. Refer drawings.

7.7.11 Location, Marking of Fire Hydrants

The marking and position of markings of fire hydrants shall be to New Zealand Firefighting Water Supplier Code of Practice SNZ PAS 4509:2003 and subsequent amendments, subject to the following clarification:

i. The lid and concrete surround is to be painted yellow (to TNZ M7).

ii. A triangle is required with its base next to the road centerline.

iii. Blue cats eye double sided reflective marker to be on centerline of road perpendicular to the hydrant.

iv. In any street with special paving (e.g. cobblestones) it is not desirable to paint a yellow triangle on the paving. In these cases the blue cats-eyes and the marker post are required and a 500mm length of the kerb is to be painted yellow.

v. In kerbed residential streets the kerb is to be painted on both the face and top for a length of 500mm and a marker post is not required.

vi. In un-kerbed streets and rural areas concrete indicator posts, if required, shall be of an approved type, set vertically in the ground within 300mm of the lot boundary and immediately opposite the hydrant which it indicates. Each post shall be firmly set to a depth below ground level of at least one third of its overall height and shall bear the inscribed letter “H”. Hydrant indicator posts shall be painted yellow and in accordance with NZS 4404 and this Code.

vii. Where a hydrant is in the carriageway, a painted yellow triangle and blue cats eye marker are also required.

7.8 Valves

7.8.1 Sluice Valves

Only resilient seated, anticlockwise closing sluice valves shall be used on watermains 50mm diameter and greater, to AS 2638.2.

Sluice valves shall be installed to ensure the spindle is always vertically positioned and there is no impedance or debris preventing the operation or maintenance of the valve.

All sluice valves 100mm dia and larger shall be flanged and anchored to a concrete anchor block with galvanized steel angles. Refer to the Drawings.

Sluice valves must be kept open during pressure tests.

7.8.2 Gate Valves

The gate valves on 50mm diameter rider mains shall be resilient seated. Gate valves shall be clockwise closing to AS 2638:2.

An extension spindle shall be incorporated as necessary to ensure the top of the spindle is 350 mm below the Finished Surface Level.

7.8.3 Valve Boxes

Valve boxes shall be constructed in accordance with the drawings or to such other established local practice as may be permitted or required by the Authorising Officer.

Each valve shall be installed with the concrete valve surrounds, riser pipe, steel edge and the cast iron valve box set flush with the surface. These must be installed centrally over the valve spindle to ensure there is no impedance to restrict the operation and maintenance of the valve. Valves shall have the same internal diameter as the main on which they are installed.

7.8.4 Valve Indicator Posts and Markings

The position of all valves on principal mains and rider mains shall be indicated by means of a concrete indicator posts as described above (hydrants) except that the posts shall bear the inscribed letter “V”. Valve indicator posts shall be painted white and in accordance with NZS 4404 Appendix A drawing WS-006. Paint shall be to TNZ M7 1998.

7.8.5 Service Connection Box

Service connection boxes, manifolds and backflow preventers require specific approval of the Authorising Officer and shall be installed at the time of subdivision. Each connection shall have a Water Connection Application Form completed and approved by Council prior to issue of 224 Certificate.

7.9 Reinstatement

7.9.1 Backfilling

In public areas, backfilling shall keep pace with the laying of pipes so that not more than 20m of pipeline shall be left exposed in an open trench where this could represent a danger to the public. Care shall be taken during backfilling to prevent displacement of the laid pipes.

Except as specified below, material excavated from the trench shall be used for backfilling trenches.

In paved areas where in material excavated from the trench is unsatisfactory for backfilling purposes, imported granular material shall be used to the satisfaction of the Authorised Officer and in accordance with manufacturer's specifications and the design.

Under roads the trench shall be backfilled in accordance with DS4 – Transportation.

Backfill material immediately around the pipe or fittings shall not contain particulate matter greater than 12mm.

7.9.2 Compaction

Trenches under paved areas shall be backfilled and compacted in layers commensurate with the compaction equipment to a density of at least 95% of the maximum dry density. Field compaction shall be tested using the New Zealand standard compaction test or a nuclear densometer or a dynamic cone penetrometer. Testing by alternative methods may be approved, but shall be subject to the approval of the Engineer.

Under roads the trench shall be compacted and tested in accordance with DS4 – Transportation.

The Contractor shall undertake sufficient tests to demonstrate that the specified compaction standards have been achieved throughout.

Compaction testing of fill material shall be in accordance with NZS 4402 - Methods of Testing Soils for Civil Engineering Purposes.

Trenches outside road reserves and not under paved areas shall be backfilled in layers not exceeding 300 mm thick and well compacted with mechanical compaction equipment.

7.9.3 Repair of Damage

The Contractor shall be responsible for and notify all damage caused to existing services and shall complete all reinstatement to the same or better condition that existed at the commencement of the work.

7.9.4 Final Reinstatement

The Contractor shall complete the reinstate trenches within 7 days or as soon as practicable after the backfilling has been completed.

All surfaces shall be reinstated at least to their original condition or as otherwise specified. The finished reinstatement shall have a neat appearance with clean long straight lines parallel to the kerb or footpath.

Permanent reinstatement materials shall be similar in type, quality, texture, skid resistance and strength to the surrounding materials.

The surface level of the reinstated trench shall match the surrounding surface level.

Reinstatement of roads and pavements shall be in accordance with DS7 – Transportation.

Drains, fences and other structures shall be put back in their original place to their original condition or better. In the case of damage, repairs shall be effected using similar materials.

7.10 Cleaning, Testing, Disinfecting and Acceptance

7.10.1 General

All watermains and connections shall be properly cleaned, tested and disinfected before connection to an existing watermain in accordance with Council's "Hygiene Code of Practice (HCoP) For Water Supply Systems' (appended) and the specifications in this document.

The HCoP stipulates specific documentation to be completed as part of the procedure.

Note: For the purpose of supplying water to pig, clean, disinfect, test and liven the water main, prior to a section 224 being issued or vesting in Council, a temporary 20mm metered water connection fitted with a double check valve may be applied for from Council. On completion of the works the connection will be permanently disconnected following the commissioning and connection of the new mains to Council's water supply network.

7.10.2 Cleaning

All detritus is to be removed from the pipe by flushing (and in some cases 'pigging') and then flushing again.

The main shall be flushed through its entire length and extremities using suitable hydrants and scours, until the water runs clean and clear.

The contractor's independent Quality Manager will issue a certificate, which will record: the date, the location, the length of pipeline flushed and disinfected.

Testing and records shall be provided prior to the issue of a 224 Certificate or practical completion.

7.10.3 Disinfection

After backfilling, pigging and flushing and successful testing, and before being put into service, all pipes, valves, house connections and other fittings shall be disinfected in accordance with Council's HCoP.

The disinfection procedure and results must be recorded and verified by the Consent Holders Representative. These results will form part of the QA documentation for the new mains and be submitted to Council.

7.10.4 Testing

For Watermain Pressure Testing Procedure refer to NZS 4404, Appendix B.

i. The system pressure acceptance test will be undertaken after completion of construction of the system including all water connections. The acceptance test will be undertaken prior the connection of the new main by a contractor approved by Council to any existing Council reticulation system.

ii. Before undertaking the acceptance test the system being tested will have been filled with water and held at local mains pressure for at least 24 hours. The system shall then be pre-tested by the Contractor in the presence of the Consent Holder's representative to confirm that the system meets the required acceptance test prior to contacting Council for observation of the final acceptance test.

iii. Each section of the reticulation system shall be tested by the developer in the presence of the Consent Holder's Representative and a representative from Council. The test shall be conducted by the Consent Holder's representative and the Contractor with all test equipment supplied by the same.

iv. The reticulation system being tested shall meet the following (which ever is the greater) minimum pressure:

- 1400 kPa measured at the lowest point of the reticulation system under test,

Or

- 1.25 times the working pressure for PVC-O pipes.
- 1.25 times the working pressure for MDPE pipes.
- 1.50 times the working pressure for all other pipe materials.

Note: the test method must be appropriate to the pipe material. Recommended test procedures for flexible plastic pipelines from AS / NZS 2566 Part 2 Appendix M are:

- Long pipelines in PVC-O and PVC-M, DI, and steel from DN 100 – DN 575 – Method M4
- Long pipelines in PE from DN 125 and larger – Method M5
- Long pipelines in PE not exceeding DN 315 – Method M7
- Short length pipelines (less than 200m length), or small diameter PE or PVC pipelines from 50mm nominal Bore (DN 63) or smaller, – Method M8

Note: In particular, methods designed for long, large bore PE pipelines, based on detection of viscoelastic response SHOULD NOT be used for short length or small diameter PE pipes, or for PVC, as the response is effectively un-detectable.

During the period of the test leakage from the system under test **shall not** exceed **one litre/ten mm pipe diameter/km length of pipeline/hr**.

Council may require a more rigorous test of reticulation system constructed from PE pipe materials. The test required is specified in Appendix B of NZS4404 sB2.

7.10.5 Watermains to be Kept Charged

After any watermain has been laid and tested and disinfected, it shall be kept continually charged with water, and under pressure. The pressure shall be maintained while electrical and other underground services are being laid in the vicinity of the main and until the main is commissioned.

7.11 Connections to Existing Water Reticulation

The physical work of connecting to the existing reticulation shall only be done by a contractor who is authorised by Council under contract to undertake such work. This can be undertaken only once the new reticulation has successfully passed all necessary acceptance tests. The operating of the valves and hydrants to effect a shutdown of the water supply to an area where new mains are to be

connected in to the reticulation system can only be done by Councils Water Maintenance Contractor.

Where such connections are required the consent holder shall terminate the new main approximately 1m from the existing main at the appropriate level.

7.12 Connection Process

Any connection or work to Council's water system requires an advanced notice to Council by the contractor. This notice will be by completion and submission of Form UM13 in the Water Section of this document.

i. The contractor is to provide a shutdown plan to the Authorising Officer for approval. The plan shall be submitted a minimum of seven working days prior to the shutdown in order to allow Council to publicly advertise the shutdown if necessary. The contractor shall deliver letters to all properties that could be affected advising of the shutdown. These letters shall be delivered at least 72 hours before the time for the shutdown.

ii. Shutdowns affecting schools or industrial / commercial premises may be required to be carried out after 5.00pm or on Saturdays or Sundays, at the discretion of the Authorising Officer.

iii. The shutdown plan shall include a map showing the location of the works, identifying all valves and hydrants to be used, the extent of affected customers, date, time and duration of the shutdown. The contractor shall have actively located and tested the action of all valves and hydrants that are required for the shutdown prior to submitting the map.

iv. When the shutdown is likely to exceed 1 hour duration, a copy of the shutdown plan and map shall be provided to the New Zealand Fire Service and the shutdown shall be confirmed to them by telephone shortly before the actual event.

7.13 Marking Trunk Supply Pipelines

Where principal or trunk watermains are laid "across country" or outside urban districts or not parallel to boundary lines, the location of the watermain is to be marked by concrete valve/Hydrant posts, painted white, without the H or V mark.

Watermains laid 'across country' or outside urban districts shall have a warning tape with wire trace placed above the pipe in the trench to help identify the location of the pipeline. Wire traces to be electrically continuous between valves/hydrants and anchored to those fittings.

Where watermains are thrust or drilled the warning tape shall be replaced with a 2.5mm multi strand copper insulated cable which shall be wrapped around the pipe at a 2.0m pitch (i.e. 1 revolution every 2.0m) and taped to the pipe with electrical insulating tape at 2.0m intervals. The wire shall be electrically continuous and shall be looped up to the surface and down to the pipe at each sluice valve and hydrant, within the valve and hydrant risers/boxes.

Tauranga City Council and

Western Bay of Plenty District Council

HYGIENE
CODE OF PRACTICE
FOR WATER SUPPLY SYSTEMS

APRIL 2024

Revision History

Version No	Prepared By	Description	Date
0	Peter Bahrs	Draft	25 November 2008
1	Peter Bahrs	Final	29 January 2009
2	Graeme Mills/Paul Van den Berg	2010 annual update	20 April 2010
3	Peter Bahrs	2022 Revision	September 2022
4	Peter Free (GHD Limited)/ Peter Bahrs (TCC), Paul van den Berg (WBOPDC)	2023/24 Update	April 2024

Approved for Release:

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16/05/2024

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16/05/2024

Table of Contents

1.0 Revision History

Summary of changes made in Revision 1 of this code included the following:

- Amalgamation of the Tauranga City Council (TCC) and Western Bay of Plenty District Council (WBOPDC) Hygiene Code of Practice (HCoP) to ensure consistent hygiene practise in the Bay of Plenty region covered by the two Councils.
- To update the HCoP to incorporate requirements of the Health (Drinking Water) Amendment Act 2007.
- To align the HCoP to the principles of NZS 4404: 2004 Land Development and Sub-Division Engineering which covers disinfection of new pipes.
- To have a single HCoP to deal with new and existing water systems.
- To apply a risk-based approach to hygiene practice when undertaking pipe maintenance / repairs.

Summary of changes made in Revision 2 of this code included the following:

- Updating the document to include changes arising from the Health Drinking Water Amendment Act (2007) to incorporate the requirements of the Public Health risk Management Planning process.
- To incorporate changes required for the Infrastructure Development Codes for the respective councils

Summary of changes made in Revision 3 of this code included the following:

A rewrite of the document to bring it up to date, to incorporate the changes arising from Water Regulatory changes arising from the Water Services Act 2021 (WSA) requirement, moving from the Ministry of Health to Taumata Arowai, the Water Regulator and incorporating the requirements of the Drinking Water Quality Assurance Rules (DWQAR). The Hygiene Code of Practice is a requirement under the legislation and is key to managing and mitigating a number of Water Supply Risks as part of the Water Safety Plans, required to manage water safety, to meet legislated requirements and to ensure community health and safety. Update was not formally issued.

Summary of changes made in the current revision(4) of this code included the following:

- Reference updating
- Additional definitions
- Added tanker filling facilities, backflow and meter servicing
- Include debris as well as organisms - Section 4.1.1
- Include drones as well as divers - Section 4.3.2
- Removal of reference to Public Health Grading Criteria
- Where appropriate, aim to exceed compliance requirements
- Add aesthetic considerations
- Provide clarity around the “controlling officer ” and definition of approved and licensed contractor
- Add additional activities to improve hygiene practices

2.0 Change Control and Updates to the HCoP

This Code of Practice is a controlled document and is to be reviewed as needed but at least every two years, by at least two suitably competent representatives of each Council(or their delegates), to maintain good hygiene practice in the sub-region.

The changes together with reasons for the change is to be included as part of the revision history of this document. Changes to be agreed and signed by the Council Representatives and the page countersigned by the Director City Waters TCC and the Director Water Services WBOPDC.

It is noted that changes to the documents for typographical or reasons that do not change the intent of the content of the document will be implemented without the need for formal updating and approval.

3.0 Definitions

Appointed Representative — a representative appointed in writing and has the authority to act on behalf of the principal or client
Approved Water Tanker — Water tankers compliant with the New Zealand Drinking Water Standard
Authorised Officer — Authorised Officer of either TCC or WBOPDC. Instruction under this code can only be received from the authorised officer for the Council for which they hold authority
AWWA — American Water Works Association
BoPRC —Bay of Plenty Regional Council
CAC - Council Approved Contractor — Contractor approved through Council's Licensing and/or other approval system
Controlling Officer— The responsible, competent person who ensures on site activities (including disinfection) are undertaken according to the HCoP. Nominally the Water Services Manager (TCC) and Director Water Services (WBOPDC) or an approved delegate or the responsible person nominated in the approved contractor approval
Drinking water – means water used for human consumption, oral hygiene, preparing food/drink and washing utensils that are used for eating and drinking.
DWQAR - Drinking Water Quality Assurance Rules
DWSNZ – Water Services (Drinking Water Standards for New Zealand) Regulations 2022 (Supersedes the DWSNZ 2005 (amended 2018)
Engineer (Chartered Professional Engineer) — has the meaning as set out in the Chartered Professional Engineer Act of New Zealand
FAC — Free Available Chlorine
HCoP - Hygiene Code of Practice for WBOPDC and TCC
High Risk — Any condition that has the potential to cause death
IANZ Laboratory — Laboratory approved by IANZ to undertake water quality analysis. Taumata Arowai has appointed International Accreditation New Zealand (IANZ) as the accreditation body for laboratories under the Water Services Act 2021
Low Risk — Any condition that would constitute a nuisance by colour, taste or odour but not injure or endanger health
Medium Risk — Any condition that has the potential to injure or endanger health
MSDS - Material safety Data Sheet
OSH — Occupational Safety and Health
Principal/Client — the person who employs the contractor to undertake infrastructure installation, testing and disinfection
RMA — Resource Management Act

Safe Drinking Water – drinking water that is unlikely to cause a serious risk of death, injury, or illness, immediately or over time.
TCC — Tauranga City Council
Te Mana o te Wai -- has the meaning set out in the National Policy Statement for Freshwater Management (as that term is defined in Section 5 of this Act). It essentially refers to ensuring health and well-being of water is protected and human health needs are provided for before enabling other uses of water.
WBOPDC - Western Bay of Plenty District Council
WSA - Water Services Act 2021 legislation which ensures that water suppliers provide safe drinking water to consumers. This followed the change of the water regulator from the Ministry of Health to Taumata Arowai, the Water Regulator as a result of the Taumata Arowai Water Services Regulation Act 2020.
WSP – Water Safety Plan, which a water supplier must provide to Taumata Arowai in accordance with Section 30 of the Water Services Act 2021.
WHO — World Health Organisation

4.0 Objectives of the Hygiene Code of Practice

The importance to the community of a consistently safe water supply cannot be overstated. Therefore, it is vital that all personnel working with the water supply take the strictest possible precautions to avoid any contamination which might endanger public health. This HCoP has been developed as a mandatory document outlining work practices required to prevent the contamination of the Council's public water supplies.

All personnel operating, maintaining, working on or extending the water supply are required to be fully aware of the Code's contents and shall comply with the requirements of the Code at all times. The Code applies equally to Council employees, contractors' employees, sub-contractors and all other personnel working on the Council's water supply system.

The objectives of the HCoP are to:

- Comply with the Water Services Act (WSA) 2021 (which supersedes the Health (Drinking Water) Amendment Act 2007). The Drinking Water Quality Assurance Rules (DWQAR) made under section 49 of the Act requires a Drinking Water Supplier to prepare a hygiene code of practice for people working on a water supply (see DWQAR G11).
- Ensure that the water supplied to customers is safe to drink and meets (or exceeds) the legislative, compliance and good water practise requirements.
- That the HCoP is entrenched in mitigating risk as detailed in the Water Safety Plan (WSP) which is required under the WSA.
- Meet (as a minimum) the current New Zealand Drinking Water Standard (or as amended) and the DWQAR's.
- Comply with the Resource Management Act, 1991 and the principles of Te Mana o te Wai.

- Afford a high level of security against water contamination due to commissioning of / or maintenance on the water supply systems whether this is new or existing infrastructure.

The purpose of HCoP is to eliminate sources of contamination, which can lead to negative public health impacts which can occur during the construction, commissioning, operation or repair of water infrastructure, or during the storage and handling of pipes, fittings, pumps etc. prior to installation.

All practicable steps to meet or exceed Aesthetic Issues, (as defined in the Aesthetic Values for Drinking Water notice 2022 – Taumata Arowai) must be taken.

5.0 General Information / Requirements

5.1 Coverage

This document outlines the recommended practice for hygiene procedures and disinfection of the water supply systems. Where possible, use has been made of existing standards or reference material, to provide a more consistent approach to hygiene and disinfection practices.

The key situations covered are:

- Installation of new mains and connections together with their associated valves and fittings.
- Repairs and maintenance of existing mains and associated valves and fittings
- Newly installed reservoirs or tanks
- Existing reservoirs or tanks
- Water pumpstations
- The operation and use of fire hydrants
- The operation and use of tanker filing facilities
- Repairs and maintenance of backflow prevention devices and meters

Any work on the network which may make contact with the drinking water.

5.2 Competency

5.2.1 As a starting point, the Council adopted the Water Supply Management and Operator Qualifications, as outlined in the Public Health Grading of Community Drinking-Water Supplies 2003, Appendix C as a basis of competency (can be supplied on request). This requires that the qualification held by the operational staff directly responsible for the day-to-day operation of the water distribution system must hold, as a minimum, a National Certificate in Water Reticulation (Service Person) (Level 3) with strands in water and wastewater or equivalent. Equivalent qualifications include a National Certificate in Infrastructure Works Pipe Installation (Level 4) with strands in Trenched and Trenchless installation and/or National Certificate in Utilities Maintenance (Level 4) with strands in Water , Wastewater and Stormwater. The current qualification is Pipeline Construction and Maintenance (Level 4)

5.2.2 The Councils have implemented an “Approved Contractor scheme, where a contracting company receives approval from Council to carry out work on Council’s Water Reticulation Networks. Only Approved Contractors, subject to

their approved category, are allowed to undertake work on Councils live water supply system. The approval is subject to the contractor providing evidence of having supervisors and staff who are competent, suitably experienced, and skilled in undertaking the work on council's live water supply.

5.2.3 The Controlling Officer and/or the person performing the work must be fully aware of all legislative requirements which govern this code of practice.

5.2.4 The Controlling Officer and/or the person performing the operation, maintenance or work on the water supply system must be qualified and competent to perform the task to be undertaken, to understand the risks associated with the task and to ensure public health of the water supply system is maintained.

5.2.5 The Councils will hold an up-to-date list of all named staff members (and their qualification) who can perform the duties of a controlling officer – including approved delegates.

5.3 Testing

All chemical and bacteriological testing required under this code shall be done by an IANZ accredited laboratory chosen by the Contractor. The contractor shall organise (including appropriate advance notice) and pay for the testing, and forward copies of results to the Council or the Councils' representative as soon as practical after the tests are completed. This is required prior to Council considering approval to continue with any further activity unless otherwise agreed.

5.4 Cleanliness and Hygiene Practice for Vehicles, Tools and Equipment

The following practices are required to mitigate the potential for tools and equipment to introduce sources of contamination when water distribution systems are being constructed or have been opened for repairs:

5.4.1 All materials used in construction and repairs must be free of visible contamination and remain protected from contamination until installation. The Contractor should consider bagging all fittings and pipe ends, which could come into contact with drinking water.

All tools contacting the water supply or its parts, particularly cutting surfaces, must be adequately disinfected prior to commencing work and subsequently as necessary when tools contact soil or backfill material.

Where necessary, all equipment that can come into contact with water, but has also come into contact with dirt and debris, is to be cleaned of the dirt and debris and disinfected (using 100 mg/L chlorine solution) before use.

5.4.2 Vehicles, tools and maintenance workers equipment and clothing for water supply and sewage / stormwater operations shall be segregated[1]. A high standard of cleanliness is required for vehicles interiors (including the backs of utes, trucks etc). The contractor is to show, through their quality assurance and health and safety plans, that they have mitigated all potential risks. In the event that there is a possibility that separation of services could be breached,

[1] Vehicles used for carrying or handling sewage or sludge or have been used to transport contaminated equipment shall only enter a water treatment or catchment site with the specific authorisation of water treatment staff and once the hygiene control methodology is exercised.

in cases of emergency, the contractor must prepare a hygiene control methodology for approval and this procedure must be implemented as needed.

5.4.3 All vehicles are to have hand cleaning agents (soap; preferably antiseptic) available for staff.

5.4.4 Sufficient supplies of cleaning detergents, disinfectant solutions, anti-bacterial lubricants, etc. to undertake the task, must be available and used, to ensure contamination of the water supply system is prevented.

5.5 Hygiene Practice for Personnel

The following steps shall be taken to minimize the potential for personnel being the source of contamination when water distribution systems are being constructed or have been opened for repairs:

5.5.1 Wherever practical personnel should be dedicated to working on the water supply system, and not alternate between water and wastewater / stormwater supplies. A clear hygiene control methodology must be approved and followed under circumstances where this movement is undertaken.

5.5.2 The importance of all personnel maintaining a high standard of personal hygiene cannot be overstressed.

5.5.3 Self Certification –

All personnel that undertake maintenance or construction work that involves, or potentially involves direct contact with water in the system must certify in writing that they are not carriers of potentially water borne diseases under the following conditions:

- prior to commencing any work on the water system;
- following overseas travel to countries with endemic water borne disease;
- following any gastrointestinal illness see 5.5.4 below.

It is the authorised contractor's responsibility ensure that they obtain certification from personnel in these instances and maintain a record of these certifications which shall be made available to Council on reasonable request.

5.5.4 Medical Health –

All personnel should be actively encouraged to report medical issues without prejudice to their employment situation and be supported with medical leave to recover. If personnel have suffered diarrhoea or any notifiable disease or gastrointestinal illness, with or without vomiting, they shall not undertake work that involves or potentially involves direct contact with water supplies until the authorised contractor's representative is satisfied that the personnel in question have recovered from the illness and a certification has been obtained (as per 5.5.3). Should there be any doubt if the personnel in question have recovered from the illness, it is recommended that a medical certificate is obtained from the appropriate medical professional.

5.5.5 Site Facilities - Satisfactory toilet arrangements must be made for all personnel working on water supply activities and hands must be washed thoroughly after using any toilet facilities. It is imperative that a lack of toilet arrangements does not lead to contamination of water supplies. Where permanent or temporary toilet facilities are provided on site, these must be maintained in a clean and hygienic condition and arrangements made for regular and safe

disposal of toilet wastes. For work on sites where there are no toilet facilities, alternative hygienic arrangements must be agreed locally, and all personnel concerned formally told of the arrangement. In all situations involving water supply work, adequate hand washing, using soap and water or a suitable anti-septic hand cream/solution, and where needed a suitable method of hand drying, must be provided.

5.6 Other Considerations:

Other points of hygiene consideration include:

- An approved methodology must be provided and followed when drinking water is used for filling, testing and disinfecting a new water system including service connections.
- Bactericidal lubricant is to be used for all rings and gaskets coming into contact with the water in the system.
  - Manufacturer's guidelines of their installation and operation of pipes and fittings must be followed.
  - In addition, the "precautionary working practices" as outlined in Appendix B must be adhered to.

6.0 Method of Cleaning and Disinfection

All bacteriological testing, where required under this code of practice, shall be done by an Approved IANZ Laboratory chosen by the Contractor. The contractor shall organise (including appropriate advance notice) and pay for the testing, and forward copies of results to the Council or the Councils' representative as soon as practical after the tests are completed. This is required before approval will be given to commission and to connect the system to bring it online for water supply.

Cleaning and disinfection requirements for the various activities/work required on the water supply network depend on the risk profile of the specific activity. Use the flow chart in Figure 1 below to determine the appropriate reference in this document for the activity being undertaken:

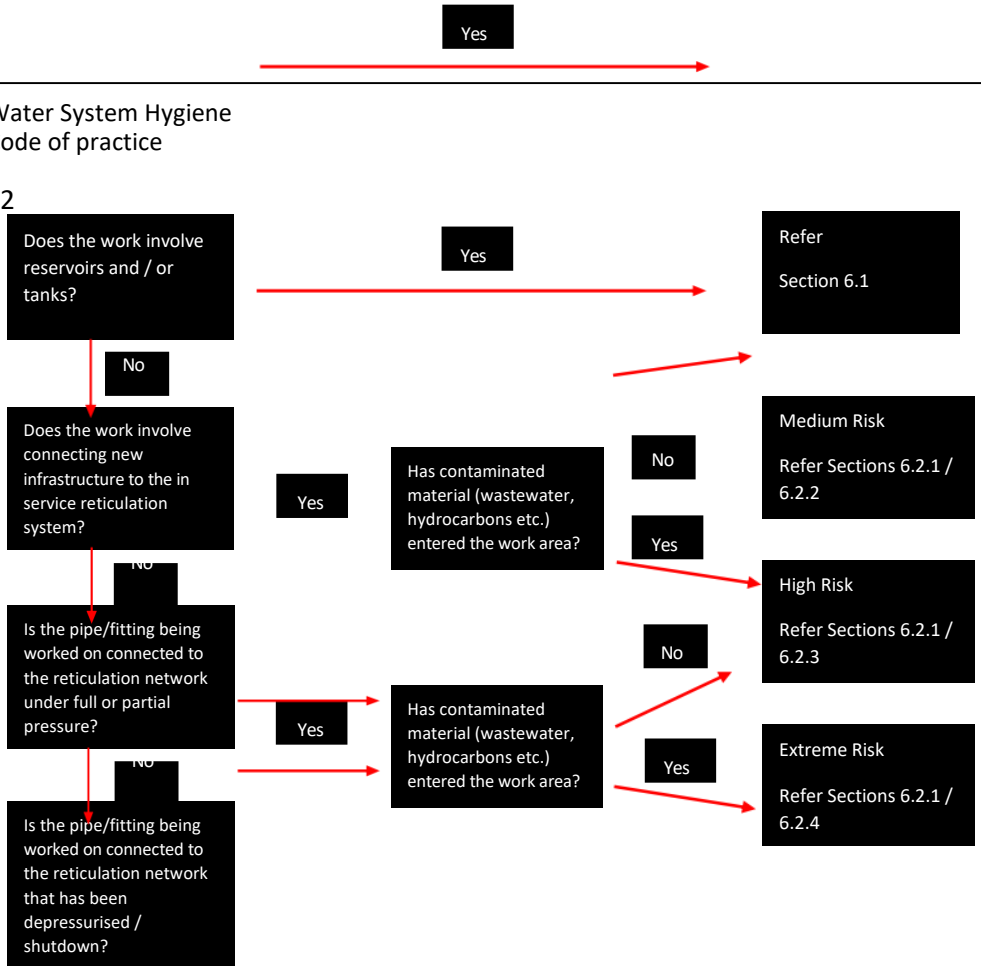

Figure 1 – Cleaning and Disinfection Reference requirements.

6.1 New Main and Associated Fittings

6.1.1 General Conditions

Before being put into service, each section of new water main, including all fittings and service connection pipes, shall be disinfected to protect the health and safety of the water consumers. New water mains will not be accepted to be put into service until all of the requirements below have been successfully completed, and copies of the successful tests and associated documentation have been received and approved by the council or the council's representative.

The principle adopted is to achieve water main disinfection in a practical manner while minimising the impact on the environment. The key outcome is to ensure the main and associated fittings are free of organisms and debris that could impact on public health or cause aesthetic issues to the water as detailed in Taumata Arowai's "Aesthetic Values for Drinking Water Notice 2022".

6.1.2 Installation Practice

All manufacturers' installation requirements for pipes and the associated fittings must be met.

6.1.3 Mains Cleaning

Prior to pressure testing and subsequent disinfection, all pipes, valves, service connections and other fittings shall be flushed and then cleaned of dirt and pipe shavings using an appropriately sized foam swab (for pipes equal or greater than 50mm internal diameter).

The cleaning of the main prior to disinfection is as important at the disinfection process itself.

Smaller diameter pipes (<50mm) must be thoroughly flushed in sections through wash out points with sufficient volume and velocity (minimum velocity of 1.5 m/s) of water to remove all foreign matter. This is particularly important to ensure that any debris and swarf in the pipe does not clog the supply point meter etc.

The flushing and cleaning process must ensure all parts of the pipe network and associated fittings have been adequately cleaned prior to the next steps of testing. A general rule is that the flushing volume should be equivalent to at least three pipe volumes.

Consideration must be given to water volume displaced, velocity, removal of debris, clarity of the flushed water etc.).

The water used for flushing must be dinking water and must be applied by either:

- Connecting to a live water main, with appropriate backflow device or
- An Approved Drinking Water Carrier / Tanker filled with drinking water.

Where the minimum velocity or swabbing cannot be achieved a cleaning methodology is to be submitted for approval by council.

If Council water is used for flushing, a reasonable estimate of water used shall be forwarded to Council for the purpose of recording water loss information.

Council reserves the right to request that any main is CCTV inspected prior to any connection approval being issued.

6.1.4 Levels of Disinfection

The disinfection of new mains will follow successful leak and pressure testing of the mains and shall be undertaken in accordance with the principles of NZS 4404: 2010 with the following requirements:

After mains cleaning, the main shall be slowly filled with drinking water and sufficient disinfectant to achieve a uniform concentration of free available chlorine with a FAC concentration of no less than 15 mg/l in the main. This is to be confirmed by FAC testing.

The disinfectant to be used will be sodium hypochlorite[1] solution with sufficient active Chlorine to achieve disinfection levels indicated below. A

[1] The use of hypochlorite powder, granules or tablets dumped into the pipe or through hydrants is not acceptable under any circumstance.

concentrated sodium hypochlorite solution contains 10%-15% of Chlorine. When polyethylene pipe is being disinfected the concentrated chlorine solution must not come into contact with the pipe as concentrations greater than 12% can chemically attack and degrade polyethylene. Note: the concentration of sodium hypochlorite solution deteriorates on storage, particularly if containers are dirty, exposed to sunlight or left in a warm place. Concentrated Sodium Hypochlorite should be used within specified use-by dates, checked for strength before use and should preferably be appropriately diluted and stored in clearly labelled dark plastic containers.

The desired level of chlorine concentration, to ensure a minimum of 15 mg/l FAC once introduced into the pipe, is produced by thoroughly mixing sufficient sodium hypochlorite (NaOCl) with drinking water. The initial solution is recommended to be greater than the minimum level of FAC to ensure final FAC on filling is at the required level. Note: some pipe linings may exert additional chlorine demand and, in these instances, a higher chlorine dose must be applied to ensure the required disinfection levels are achieved. Sodium Hypochlorite is a hazardous substance. Ensure that the appropriate Health and Safety measures are followed by referencing the MSDS and adhering to the manufacturer's guidelines for handling sodium hypochlorite at all times.

The disinfection mixture can be prepared in the following ways:

- Mix a suitable amount of drinking water with the required amount of sodium hypochlorite in a tanker. The water shall be tested for chlorine concentration before use and contain sufficient free available chlorine (FAC) to produce a uniform concentration of at least 15 mg/l in the pipe.
- If pre-mixed chlorinated water is not used, the chlorine solution must be injected at a continuous rate to ensure a concentration of at least 15 mg/l in the pipe and is in contact with every part of the pipe system. This can be achieved by pumping in the chlorine solution or by using a chlorine injector while the pipe is being filled with water.

A suitable solution of chlorinated water shall be introduced at the filling point of the section of the main to be disinfected and filled in such a way to ensure no air is trapped in the system. The method of filling shall be such that the chlorine concentration is consistent when tested and recorded along the length of the pipe.

While in contact with chlorinated water, all valves, hydrants and other fittings on the pipe section shall be operated at least once to allow the chlorinated water to pass through them and under valves seats etc. to ensure all parts of the main to be disinfected, are reached. The main shall then be left full of this chlorinated water for a minimum of 12 hours.

Between 18 and 24 hours the residual chlorine concentration must not be less than 7.5 mg/L FAC or 50% of the initial dosed FAC level. This to be confirmed by testing the FAC. This test to be evidenced by Council. If this requirement is not achieved, the chlorination procedures shall be repeated.

When this disinfection requirement is achieved, the higher chlorinated water in the main and service connection pipes shall then be flushed out and safely disposed of. This can be done by one of the following processes:

- discharging to the nearest sewer (consent to be obtained from the Council's Waste Services Department),
- de-chlorination while draining method[1], or by mixing in a tanker with de-chlorination chemicals prior to disposal. Water to be de-chlorinated to a maximum FAC of 0.5mg/l to land and 0.02 mg/l to water, before discharging (a discharge resource consent may be required for this discharge). The FAC levels indicated are maximums for discharge and will depend on the location of discharge and the receiving environment.
- tankering off site for safe disposal.

The pipe shall be emptied of the super-chlorinated water and the ingress of any contaminants prevented. This can be achieved by purging the super-chlorinated water with drinking water from the Council's Water Supply. The pipe to be flushed out until the pipe has been purged of all super-chlorinated water (confirmed by FAC testing at the point of draining). The FAC to be same as FAC of mains drinking water, (typically between 0.4 and 1mg/l).

Following a successful chlorination procedure above and prior to connecting to the reticulation system, the main shall be tested for the presence of E. coli.

E. coli Sampling Procedure:

- Only once sufficient flushing and the typical FAC has been achieved, can E.coli sampling be undertaken.
- Sampling must be undertaken by a suitably trained person using suitably laboratory prepared bacteriological sampling bottles (containing sodium thiosulphate) and submitted for testing in accordance with an IANZ accredited testing laboratories requirements for E.coli testing. The samples are to be sent to an IANZ accredited laboratories to perform E.coli tests.
- Once sampling has been completed, any sampling flows are to be turned off and the pipe must be kept full of water prior to approval to connect to the live reticulation network.
- If the testing shows the presence of any E.coli organisms, the flushing and disinfection process will need to be repeated until test results demonstrate compliance.
- E.coli testing takes approximately 24 hours.

Once a pipe has had a successful bacteriological test and the connection is approved by Council, the pipe must remain charged prior to connection to prevent contamination. The Council Representative will notify the Engineer that the testing has been successful and that the connection can be completed.

6.1.5 Connection Procedure / Hook Up

[1] See TS-7.3 Disinfection Mixture de-chlorination calculator available in IDC Toolbox, for sodium thiosulphate/other de-chlorination chemicals) on TCC Website

It is important to note the restrictions faced when undertaking disinfecting and testing procedures. Once a pipe has had a successful bacteriological test and the connection is approved by Council, it must either be connected to the mains system within seven days.

If it is not connected within seven days , it must be reflushed and must be connected within the next seven days.

If it is not connected within this period, then it must be re-disinfected, re-sampled and then the time for connection restarts.

For this reason, it is essential that persons undertaking this work adhere to the Council shutdown procedures and liaise with Council to plan the connection processes (including shutdown methodology approval, public notification etc.), otherwise the connection may not be available before the period expires.

Once the new water system has met the requirements of Council including Code of Practice and these have been accepted by Council the contractor shall complete a "Water Connection Application". Upon receipt Council will issue "Water Connection Approval" to allow the connection to the live reticulation system to be undertaken.

- The hook up must be undertaken by a CAC.
- The connection process is considered as a medium risk situation and therefore the CAC will adopt the appropriate disinfection procedure for the risk.

6.1.6 Compliance

The Principal/Contractor shall provide the documentation to as required in Appendix A below. Council reserves the right to be present during compliance testing. Written notification is required at least 2 working days prior to testing.

The pipe cleaning / disinfection / bacterial testing / de-chlorination producer statement documentation must be signed by the Principal / Client or the Contractor's representative.

6.2 Existing Mains and Associated Fittings Repairs

6.2.1 General Conditions

This covers work on existing mains while they are in service; this includes the repair and maintenance arising during normal operation and installation, replacement, and removal of fittings during connection of new mains and disconnection of redundant mains. Only Council's Maintenance Contractor is allowed to undertake this type of work. The contractor shall follow the hygiene and disinfection procedures outlined below:

- To prevent ingress of contamination at the point of work, draining water mains through hydrants shall be done where all of the section of pipe being drained is fully intact, i.e., where the pipe has no cut or broken areas. A "Contractors" type standpipe is to be used for de-

pressurising water mains. Where no hydrant is fitted, an appropriate scour point will be used.

- Water mains that have been cut or broken shall only be drained through the cut or broken area (e.g., where a piece of pipe has been removed to install a branch tee). During these operations the level of the water in the trench must be drained and kept well below (at least 500 mm) the cut area of the pipe. Where practical, a positive pressure must be maintained in the section of pipe at the point of work (or damage,) until the excavation of at least 500mm below the bottom of the pipe, is achieved, minimise any chance of ingress of contaminated water.
- When using hydrants, ensure that any detritus or debris is removed from the hydrant box to "below the standpipe connection flange" prior to fitting standpipe. When a scour is used, the scour and associated operation must be assessed to ensure contamination can not enter the network through the scour point at any stage of the operation.

6.2.2 The Medium (see Figure 1) Risk procedure shall be:

- Undertake assessment to determine the risk of contamination of the network and the procedures required to minimise the risk. Record findings.
- Take necessary steps to minimise the contamination risk at the point of maintenance / repair.
- Spray all surfaces of fittings, and the interior of both open ends of the water main (as applicable) with 1% m/v Chlorine (10,000mg/l) solution. The maintenance contractor shall have an approved methodology in place to prepare the required Chlorine solution.
- After completion of the work, flush the water main out through hydrants on either end of the work. The principles of flushing must be consistent with those outlined in the section on mains cleaning above (6.1.3).

6.2.3 The High (see Figure 1) Risk procedure shall include:

- Undertake all steps for medium risk above plus
- Immediately inform the Authorised Officer of Council or Council's Water Operations & Maintenance Engineer when the situation arises.
- Wherever possible positive pressure shall be maintained to prevent contamination. This will not be possible for pipe breaks on larger pipe sizes so extreme care shall be exercised in these circumstances.
- Isolate the main to prevent travel of contaminated water. If practical, also isolate all affected service connections.
- Apply liberal amounts of HTH powder or 1 % m/v Chlorine solution using the spray bottle to spray around the work area to reduce the risk of contamination.
- Drain the water main through the cut section while keeping the trench water level well below the level of the cut pipe.
- While maintaining this water level in the trench, flush as much of the contaminated material as possible from the water main through

the cut area by opening valves at either end of the reticulation system.

6.2.4 The Extreme (see Figure 1) Risk procedure shall include:

- Undertake all steps for high risk above plus
- Isolate the watermain to prevent further travel of the contaminated water.
- Isolate all affected service connections. If a service connection cannot be isolated the customer must be advised not to use water until the main has been commissioned.
- Approval from the Controlling Officer (or delegate) of the proposed cleaning, disinfection and reinstatement methodology must be obtained before the water main can be repaired.
- In cases when the system must be returned to service as soon as possible, a sodium hypochlorite solution with a FAC of 20 mg/l with a contact time of at least 15 minutes[1] may be used. The affected section may only be flushed and returned to service provided the FAC is not less than 20 mg/l at the end of the 15-minute period. Ensure all chlorination, disposal of super chlorinated water and flushing procedures are followed. Record chlorine levels during / after chlorination and after flushing and ensure levels are at normal operational levels.
- This chlorination procedure should only be undertaken if the isolation valves are deemed reliable and not by passing to ensure that the exposure of customers to high concentration chlorine does not occur.
- Water used for flushing must be fed using a remote hydrant with suitable backflow protection or water tanker (with suitable backflow protection); not through a valve used to isolate the area.
- For all extreme risk situations a minimum of two (2) bacteriological water samples shall be taken upstream and downstream of the repair, by an individual that has received appropriate training in water sampling procedures, and samples to be sent to an accredited laboratory, (note samples to be packaged and maintained as specified by the laboratory).
- Where entry of a chemical contaminant into the main may have occurred, sampling should also be undertaken to confirm that its concentration is not a health risk.
- Although the laboratory results may not be available until after the water main has been livened the sampling is intended to provide a record of the effectiveness of the cleaning and disinfection procedures. In the event of a positive result appropriate actions in accordance with incident plans will be implemented.
- The Controlling Officer is required to verify that the cleaning, disinfection, and reinstatement methodology has been followed before the watermain is returned to service.
- In the event that the residual risk, after exercising the remedial work and associated methodology, remains uncertain, then the

[1] *300 mg/L/min as per the Australian Water Supply Code

Controlling Officer will advise whether to keep the main offline pending the outcome of the water quality results or to return to service with a boil water / do not drink precautionary notification etc. The incident management plans to be followed in these instances.

6.3 Reservoirs and Tanks

6.3.1 General Conditions

Before being put into service, each reservoir or tank, including all fittings, shall be disinfected to protect the health and safety of the water consumers. New, refurbished or cleaned reservoirs will not be accepted to be put into service until the requirements of an agreed cleaning and disinfection methodology have successfully been met and copies of the successful tests and associated documentation have been received and approved by the Authorised Officer or Appointed Representative. All safety protocols including working at height and confined space entry works will be carried under Health and Safety at Work requirements and Council's health and safety policies.

6.3.2 In situ Inspections / Cleaning with Divers/Drones and Suction Lines

There are instances where a reservoir or tank is inspected and/ or cleaned while still in operation using divers or Drones. Prior to any in situ cleaning or inspection an access, cleaning, hygiene and disinfection methodology specific to each reservoir / tank, must be produced and approved by the Authorised Officer or Appointed Representative. All requirements of an agreed methodology must be demonstrated and documented. All relevant documentation must be provided following completion of the work to the Council or Council's representative.

6.3.3 Principles Required by Methodology

Divers / persons or Drones entering the reservoir to meet health requirements associated with working in a drinking water reservoir / tank.

The methodology of cleaning and disinfection of diving suit and footwear must be provided and approved by Authorised Officer or Appointed Representative prior to any work being undertaken. If a drone is used, a methodology for cleaning and disinfection of the drone must be provided. To avoid contamination of water in reservoir, all diving, cleaning, inspection equipment and clothing used by the diver(s) should be disinfected immediately prior to use within the water storage and reservoir. A chlorine footbath is to be used at the reservoir site for use prior to any tank entry.

Council will arrange bacteriological testing of the water in the facility following any diving, inspections, cleaning, etc. This would be required either for audit purposes or where the risk is high this will be needed prior to placing the reservoir back in service.

6.3.4 Inspections, Cleaning and Maintenance Requiring the Draining of the Drinking Water Reservoir or Tank

The Council maintenance contractor to provide a methodology to drain and clean the reservoir and this must be approved by the Authorised Officer

prior to work commencing. This methodology needs to ensure that the draining does not negatively impact on the water supply quality and any discharges to the environment meet consent compliance criteria (including but not restricted to the RMA, BoPRC discharge limitations, Freshwater Plans, BOP Regional Water & Land Plan). If clean water is to be disposed to a water course, particular attention is to be given to the potential of the discharge to cause downstream erosion or alteration to the natural water course.

Methodology to ensure, as a minimum, that the following interventions are included once any sediment has been removed:

- Removal of materials that are not part of the structural or operating facilities of the tank (i.e. all scaffolding, planks, tools, rags, etc).
- The method of cleaning the surfaces of the walls, floor, and operating facilities (this could include thorough cleaning using a high-pressure water jet, sweeping, scrubbing, or alternative effective means).
- The removal of all water, dirt, and foreign material accumulated in this cleaning operation and how this will be discharged or removed from the storage facility. This to include any material that may have accumulated in the outlet and / or

scour pipe.

- Similarly the methodology should as a minimum deal with the following once the cleaning operation is complete.
- Checking all potential contamination access points for functionality and condition (i.e. vent screen, overflow screen, and any other screened openings).
- Methods to be taken to prevent the introduction of dirt or other foreign material once cleaning has been completed.

6.3.5 Disinfection of Reservoir or Tank

This to be undertaken as per an agreed approved methodology. For routine inspections, the objective of the disinfection procedure is to achieve full disinfection of the reservoir floor, while at the same time minimising the inconvenience associated with disposing of a large volume of highly chlorinated water. Council will arrange bacteriological testing of the water once all activities are completed and once disinfection has been undertaken. A negative E. coli result is required prior to placing the reservoir back in service. A failed bacteriological test may require the reservoir to be emptied (with due consideration for discharge requirements) and then re-disinfected.

7.0 References:

- Tauranga City Council Water Supply Hygiene Code of Practice 2005
- Western Bay of Plenty District Council Water Reticulation Disinfection Code of Practice 2006
- Western Bay of Plenty District Council Water Supply System Cleaning Code of Practice 2006
- Tauranga City Council Code of Practice for Development 2006 (or subsequent amendment to IDC)
- Water Service Act 2021
- Drinking Water Standards Nov 2022
- Drinking Water Quality Assurance Rules Nov 2022
- Aesthetic Values Nov 2022
- NZS 4404:2010 Land Development and Subdivision Engineering Appendix C
- Water Supply Disinfection Specification.
- 2004 World Health Organization. Safe Piped Water: Managing Microbial Water Quality in Piped Distribution Systems. Edited by Richard Ainsworth.
- ISBN: 1 84339 039 6. Published by WA Publishing, London, UK.
- Chapter 4 Maintenance and survey of distribution systems, Dammika, Vitanage, Francis Pamminger and Tony Vourtsanis
- Chapter 5 Precautions during construction and repairs Richard Ainsworth and David Holt
- Water Services Association of Australia 'Water Supply Code of Australia
- Drinking Water Safety Planning Guidance for Very Small communities - Taumata Arowai
- Drinking Water Safety Planning Guidance for Small communities - Taumata Arowai
- Drinking Water Safety Planning Guidance for Medium communities - Taumata Arowai
- Water Safety Plan Guide – WHO 2009

Appendix A

The following producer statement / documentation will be provided by a separate link to approved users of this HCoP.

This documentation is required to show how pipelines are suitably cleaned, disinfected / chlorinated how the super chlorinated water is de-chlorinated and safely disposed of and the results of any bacterial testing that is required to ensure contamination risks are mitigated.

APPENDIX B - Precautionary Working Practices

The following is taken from the World Health Organisation (2004) Safe Piped Water: Managing Microbial Water Quality in Piped Distribution Systems Chapter 5 'Precautions during construction and repairs" and was previously abstracted from two sets of guidelines viz. Water UK, 1998 and AWWA, 1999.

- When working with pipes and fittings on site, ensure that they are protected from contamination by storing off the ground, capping the ends of pipes and liners, and keeping fittings in wrappings until the time of use.
- Ensure that the open ends of pipes in trenches are plugged and watertight when not being worked on or when there is a risk of the trench flooding.
    - Excavate trenches to below the pipe level to provide a sump and keep as dry as possible to prevent water entering a pipe or fitting.
- Ensure that sealing materials and lubricants are clean and certified as suitable for contact with drinking water supplies.
- Protect unattended trenches and engineering sites from vandals and animals.

▪If a part of the distribution system has been taken out of service for an extended period, treat it as a potentially contaminated new installation. Apply the flushing, disinfection and microbiological sampling procedures that are normally applied to new installations.

▪If a part of the distribution system is to be abandoned, ensure that all boundaries with the live system are effectively closed with especially secure and marked valves, or are capped. Create boundaries to minimize dead legs on the live system and ensure that the location of the abandoned system is recorded for future reference.

- When planning new installations and renovation works, make sure that the plans include valves, injection, and washout points to facilitate effective cleaning and disinfection of the pipe work.

Joint TCC and WBOPDC Hygiene Code of Practice - Final April 2024

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