Section 6

WATER SUPPLY

Page

6.1 Introduction

Metrowater currently retails water and wastewater services to a population of nearly 440,000 in some 130,000 homes and business over 153 square kilometres. The majority of the water consumed in Metrowater's area is supplied from reservoirs in the Hunua and Waitakere ranges and from ground water source at Onehunga. In addition, these resources are now supplemented from the Waikato River. The raw water is stored in reservoirs behind nine dams and then conveyed to filter stations for treatment. Watercare Services Limited is responsible for the collection, treatment and provision of the bulk of water to Metrowater and to five other water retailers in the Auckland region.

Policy

The objective of Metrowater's reticulated water supply system is to provide an adequate supply of potable water to each site to meet the requirements of the *Local Government Act* 1974, and to any land use permitted thereon by the District Plan, and to ensure that the water supply is adequate for fire-fighting purposes in accordance with the Fire Service's Code of Practice. Provision of a safe and adequate supply of potable water has a major effect on public health.

For these reasons, **any work on the public water supply system (including private connections) can only be carried out by Metrowater's Network Maintenance Contractor** (**NMC**).

6.2 Compliance with Legislation

Policy

Metrowater and Auckland City Environments (ACE) (acting as agents for Auckland City Council) ensure that all new connections and/or extensions to the water supply system comply with the legislation, Codes of Practice, Bylaws and Customer Charters listed below. Compliance with these documents ensures water supplied to customers remains of a high quality and that fire prevention standards are maintained.

Key Documents

- Building Act 2004
  Building Act - Department of Building and Housing
- Building Regulations 1992 (and Amendments)
  Building regulations - Department of Building and Housing
- Local Government Act 1974 (and Amendments)
  Local Government Act 1974 No 66 (as at 01 April 2008), Public Act – New Zealand Legislation
- Local Government Act 2002 (and Amendments)
  Local Government Act 2002 No 84 (as at 01 April 2008), Public Act – New Zealand Legislation
- Health and Safety in Employment Act 1992 (and Amendments)
  Health and Safety in Employment Act 1992 (HSE Act)
- Health and Safety in Employment Regulations 1995 (and Amendments)
  http://www.osh.govt.nz/law/hse-regulations.shtml
- Resource Management Act 1991 (and Amendments)
- Food Act 1991 (and Amendments)
  Regulation of Food in New Zealand
- Rating Valuations Act 1998
  http://gpacts.knowledge-basket.co.nz/gpacts/public/text/1998/an/069.html
- Fire Service Act 1975 (and Amendments)
  http://rangi.knowledge-basket.co.nz/gpacts/public/text/1975/an/042.html
- Crimes Act 1961 (and Amendments)
  http://gpacts.knowledge-basket.co.nz/gpacts/reprint/text/1999/an/020.html
- Health Act 1956 (and Amendments)
  http://gpacts.knowledge-basket.co.nz/gpacts/reprint/text/1956/an/065.html
- Water Supplies Protection Regulations (and Amendments) 1961
  Water Supplies Protection Regulations 1961 (SR 1961/86) (as at 03 September 2007) – New Zealand Legislation
- Draft Water Supply Bylaw 2008 [Auckland City Council]
  http://www.aucklandcity.govt.nz/council/documents/bylaw/
- AS/NZS 2845.1:1998: Water Supply – Backflow Prevention Devices – Materials, Design and Performance Requirements
  http://shop.standards.co.nz/productdetail.jsp?sku=2845.1%3A1998%28AS%2FNZS%29
- AS/NZS 3500.1:2003: National Plumbing and Drainage – Water Services (Part 1)
  http://shop.standards.co.nz/productdetail.jsp?sku=3500.1%3A2003%28AS%2FNZS%29

6.2 (cont) Compliance with Legislation

Key Documents (cont)

- NZS 4404:2004: Land Development and Subdivision Engineering (Part V)
  http://shop.standards.co.nz/productdetail.jsp?sku=4404%3A2004%28NZS%29CADPDF
- SNZ/PAS 4509:2003: New Zealand Fire Service Fire Fighting Water Supplies Code of Practice
  http://shop.standards.co.nz/productdetail.jsp?sku=4509%3A2003%28SNZ%2FPAS%29
- NZS 4541:2003: Automatic Fire Sprinkler Systems
  http://shop.standards.co.nz/productdetail.jsp?sku=4541%3A2003%28NZS%29
- District Plan (Isthmus Section) [Auckland City Council]
  District Plan - Isthmus section
- District Plan (Central Area Section) [Auckland City Council]
  District plan - central area section
- Development of Drinking-Water Management in New Zealand since 1992 2002 [Ministry of Health]
  http://www.moh.govt.nz/moh.nsf/49ba80c00757b8804c256673001d47d0/6054566e16ac4ae0cc256c67000c3807?OpenDocument
- Drinking-Water Standards for New Zealand 2000 [Ministry of Health]
  http://www.moh.govt.nz/moh.nsf/238fd5fb4fd051844c256669006aed57/70727db605b9f56a4c25696400802887?OpenDocument
- Code of Practice for Firefighting Water Supplies [New Zealand Fire Service]
  See above
- Backflow Code of Practice 2003 [New Zealand Water and Wastes Association]
  Bookshop
- Code of Urban Subdivision and Development 1999 [Auckland City Council]
  (Hard Copy Only)
- Metrowater Customer Charter 2002 [Metrowater]
  http://www.metrowater.co.nz/pdfs/charter.pdf
- Metrowater Customer Contract 2002 [Metrowater]
  http://www.metrowater.co.nz/pdfs/contract.pdf
- Disinfection Code of Practice [Metrowater]
  [Hard copy only]
- Backflow Cross-Connection Policy [Metrowater]
  [Hard copy only]
- Metered Standpipe Policy [Metrowater]
  [Hard copy only]

6.3 Network Upgrade Charge

Refer to:

- Section 2: *Development,* sub-section 2.14: *Network Upgrade Charge.*

The Network Upgrade Charge is imposed by Metrowater to recover a fair share of infrastructure investment costs attributable to growth from those contributing to increased growth and demand.

Policy

The Trigger for Metrowater charging a Network Upgrade Charge typically occurs when an authorisation for a new or upsized service connection (water or wastewater) is approved by Metrowater, or when a Building Consent is approved by Auckland City Council.

Key Documents

- Network Upgrade Charge Policy (2007)
- http://helios.metrowater.co.nz/SiteCollectionDocuments/Metrowater_NUC_Policy_Final_07_(3).pdf

6.4 Access to Metrowater's Water Supply System

Policy

Network Maintenance Contractor
Only Metrowater's Network Maintenance Contractor can access the public water supply network. The NMC has exclusive permission to:

- perform shutdowns (and associated cut-in works); and,
- install all new connections on behalf of Metrowater.

Public Water Supply System
Where a development is planned involving extensions to the public water supply system, subject to an Engineering Plan Approval issued by Development Engineering (DE), these works can be undertaken by the developer's contractor. It is still recommended however, that an approved Metrowater contractor be used for such works. As above, all cut-in works must be carried out by Metrowater's NMC.

Key Documents

- Building Act 2004
- Building Regulations 1992 (and Amendments)
- Local Government Act 1974 (and Amendments)
- Local Government Act 2002 (and Amendments)
- Health and Safety in Employment Act 1992 (and Amendments)
- Health and Safety in Employment Regulations 1995 (and Amendments)
- Resource Management Act 1991 (and Amendments)
- Food Act 1991 (and Amendments)
- Rating Valuations Act 1998
- Fire Service Act 1975 (and Amendments)
- Crimes Act 1961 (and Amendments)
- Health Act 1956 (and Amendments)
- Water Supplies Protection Regulations (and Amendments) 1961
- Draft Water Supply Bylaw 2008 [Auckland City Council]

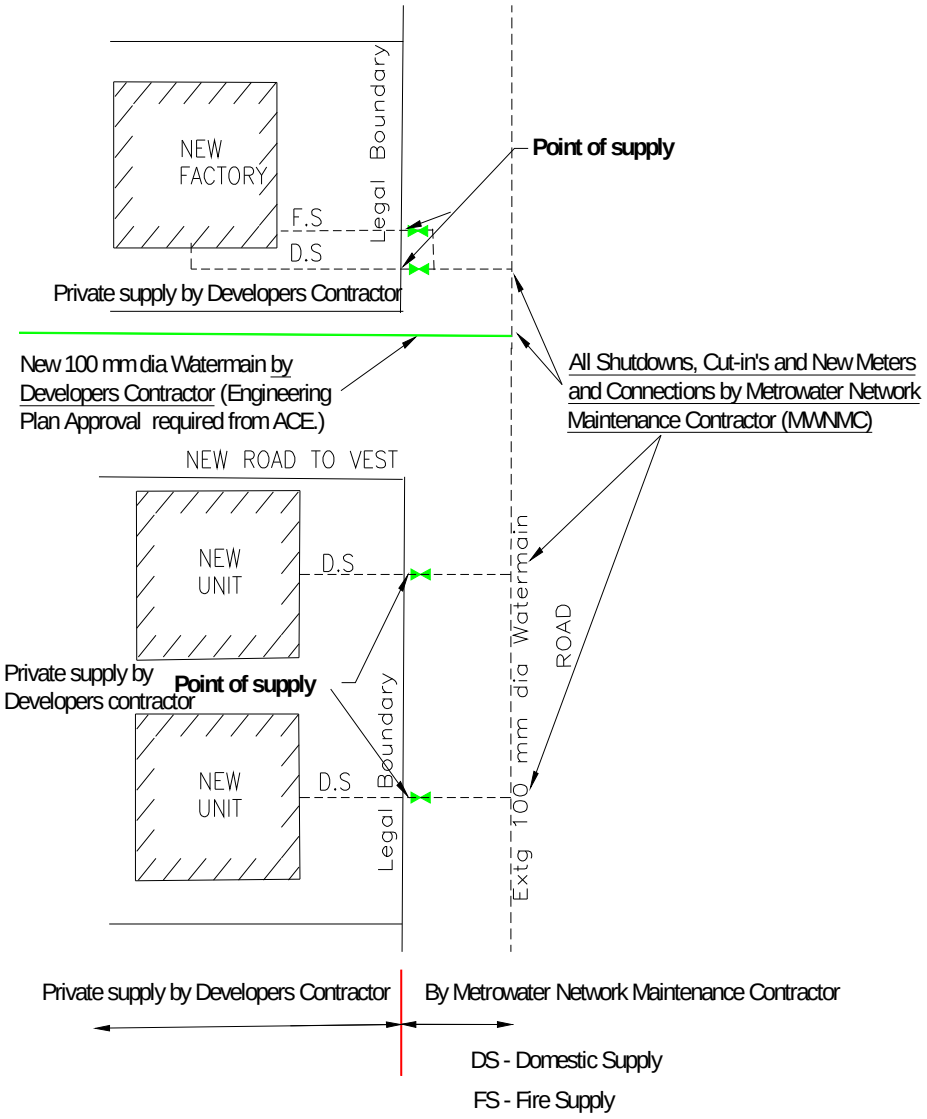
6.4 (cont) Access to Metrowater's Water Supply System

Key Documents (cont)

- AS/NZS 2845.1:1998: Water Supply – Backflow Prevention Devices – Materials, Design and Performance Requirements
- AS/NZS 3500.1:2003: National Plumbing and Drainage – Water Services (Part 1)
- NZS 4404:2004: Land Development and Subdivision Engineering (Part V)
- SNZ/PAS 4509:2003: New Zealand Fire Service Fire Fighting Water Supplies Code of Practice
- SNZ/PAS 4509:2008: New Zealand Fire Service Fire Fighting Water Supplies Code of Practice
- NZS 4541:2003: Automatic Fire Sprinkler Systems
- District Plan (Isthmus Section) [Auckland City Council]
- District Plan (Central Area Section) [Auckland City Council]
- Development of Drinking-Water Management in New Zealand since 1992 2002 [Ministry of Health]
- Drinking-Water Standards for New Zealand 2000 [Ministry of Health]
- Code of Practice for Firefighting Water Supplies [New Zealand Fire Service]
- Backflow Code of Practice 2003 [New Zealand Water and Wastes Association]
- Code of Urban Subdivision and Development 1999 [Auckland City Council]
- Metrowater Customer Charter 2002 [Metrowater]
- Metrowater Customer Contract 2002 [Metrowater]
- Disinfection Code of Practice [Metrowater]
  [Hard copy only]
- Backflow Cross-Connection Policy [Metrowater]
  [Hard copy only]
- Metered Standpipe Policy [Metrowater]
  [Hard copy only]

6.4 (cont) Access to Metrowater's Water Supply System

Diagrams Typical Access to Infrastructure



6.5 The Metrowater Network Maintenance Contractor

Policy

Roles of The Network Maintenance Contractor

- Metrowater's Network Maintenance Contractor (NMC) performs the shutdowns, installs new connections (with associated cut-in works) and new meters.
- The NMC installs valves and/or hydrants (with its associated cut-in works) on Metrowater's existing water supply system.
- The NMC installs large service and fire connections from the points of supply to the main connections.
- The NMC maintains the Water Supply network and carries out planned and unplanned repairs.
- Subject to an Engineering Plan Approval issued by Development Engineering (DE), private contractors may construct new watermains. Private contractors/developers must apply to Metrowater for any new connection.

6.6 Approved Materials

Refer also to:

- Section 7 *Standard Drawings;*
- Appendix Q, *Approved Materials for Water Supply.*

Watermains and fittings are selected based on criteria such as: economic life; strength; pressure rating; durability; corrosion resistance; ease of tapping and repair; and ability to maintain water quality. Watermains must be properly installed to minimise future maintenance problems and to provide public health protection.

Policy

Approved Materials List

All new watermain materials and fittings must comply with the approved materials list. Refer to Appendix Q, *Approved Materials for Water Supply*. This list applies to alterations to existing systems, that is, repairs, relays and diversions. New watermains will not be accepted as public assets where non-approved materials and fittings have been used.

Watermain Installation

Watermain installation must be in accordance with current Metrowater Installation and Disinfection Code Of practice as well as Standard Engineering Drawings. Refer to Section 7 *Standard Drawings*.

Private Plumbing

Private plumbing materials and fittings must be capable of withstanding a test pressure of 1600kPa and rated for a minimum working pressure of 900kPa and comply with relevant New Zealand and/or Australian Standards.

Key Documents

- AS/NZS 2845.1:1998: Water Supply – Backflow Prevention Devices – Materials, Design and Performance Requirements
- AS/NZS 3500.1:2003: National Plumbing and Drainage – Water Services (Part 1.2)

6.7 Network Capacity Analysis

Refer also to:

- sub-section 6.9 *Design Standards;*
- Appendix Q, *Approved Materials for Water Supply.*

Where significant development is proposed (refer to Appendix Q, *Approved Materials for Water Supply*), or where specifically requested for the purposes of a Resource Consent or for a public watermain extension, a capacity analysis of a water supply system is required. This involves a comparison of the capacities of the public system (usually based on testing) with the peak demand requirements and fire-fighting requirements of the proposed development.

Policy

The development system must be designed to deliver the fire flows specified in SNZ PAS 4509: 2003. Alternatively, subject to Metrowater approval, the applicant may provide more detailed demand analysis. Metrowater may be able to assist with existing system constraints on capacity by analysis using water supply system models. The Metrowater Development team must be contacted in the first instance. Approval may be declined if the specification of the proposed system exceeds Metrowater's existing agreed operational or forecast level of service commitment.

Key Documents

- NZS 4404:2004: Land Development and Subdivision Engineering
- District Plan (Isthmus Section) (for Zonings and Land Use to MPD) [Auckland City Council]
- AMIS/GIS-based Asset Records: Service Plans [Auckland City Council] [Hard copy only]

Diagrams

Fire Flow Requirements and Zones

Sizing for individual meters and connections to Metrowater's system should be based on the methods defined in AS/NZS 3500.1.2:1998. The applicant's fire engineer must provide calculations and a producer statement showing that their development meets SNZ PAS 4509:2003. Where the fire fighting requirements of the development exceeds the fire flow provided by the public water supply network, as identified by the Metrowater Fire-flow Level of Service Map, the applicant's fire engineer should consider an alternative design to provide onsite sprinklers and/or on-site fire-fighting storage (e.g. header tanks). In accordance with the Water Bylaw (2008), any on-site pumps which supply a fire-fighting header tank (or storage reservoir) shall not draw water directly from the mains in excess of flows provided by the Level of Service.

Fire Risk Classification

Metrowater and the New Zealand Fire Service have agreed a level of service for the existing network. The agreed level of service, shown on the Metrowater Fire-flow Level of Service Map, identifies target fire flows at 60% of peak demand. Hydrant flow requirements for new developments will be assessed under SNZ PAS 4509: 2003, and any additional flow requirements over and above the Metrowater Fire-flow Level of Service Map is the responsibility of the developer to meet or mitigate.

6.8 Reticulation Requirements

The objective of a water supply is to provide an adequate supply of potable water to each site meeting the requirements of permitted land use while ensuring ease of access and maintenance.

Policy

Requirements

- The development must be reticulated with a piped water system;
- The minimum size for principal or mains used for fire-fighting must be 100mm diameter for residential areas and 150mm diameter for commercial/industrial areas;
- All public mains must be fitted with fire hydrants spaced as specified in the Fire Service's Code of Practice;
- The reticulation layout must be designed so that mains are laid continuously from one road intersection to the next;
- When it is necessary to construct dead-end mains, 100mm pipe is the minimum size required for a maximum pipe length of 120m serving a maximum of ten to twelve customers.

6.9 Design Standards

Refer also to:

- sub-section 6.2 *Compliance with Legislation;*
- sub-section 6.7 *Capacity Analysis;*
- Section 7 *Standard Drawings*, 12908/503;
- Appendix Q*, Approved Materials for Water Supply.*

The design of a water distribution system may rely entirely on detailed calculation of system hydraulics, or may depend in part on minimum design standards as defined below. Designs based on minimum standards generally meet or exceed hydraulic requirements under ordinary system needs. These standards ensure that all mains are sized large enough to provide for domestic, commercial, industrial, and fire protection flows to the area to be served.

Policy

Minimum Requirements

- The system must be designed to provide an uninterrupted supply of water during peak hourly demand with a minimum supply pressure of 250kpa at the supply point for Maximum Probable Development (MPD) and for an economical life of not less than 50 years;
- The design of the reticulation must ensure that the fire flow requirements for each fire risk classification can be achieved as set out in the Fire Service's Code of Practice. Otherwise, the fire hazard in the premises must be reduced;
- The minimum fire-fighting running head max water pressure must be 100kPa at any hydrant;
- The minimum residual water pressure in the reticulation at peak demand must be 250kpa at the ground at the point of supply;
- The maximum static pressure at the point of supply must be limited to 700kPa;
- All watermains are required to deliver peak demands or fire flows plus average daily flow, whichever is greater;
- Maximum head losses in the pipes at peak demand must be limited to:
  - 2m per 1000m for distributor mains (250mm diameter and greater) > 1000m in length
  - 4m per 1000m for distributor mains (250mm diameter and greater) < 1000m in length
  - 2m per 1000m for principal mains (100mm to 200mm diameter) double-ended mains
  - 4m per 1000m for principal mains in cul-de-sacs;

- The public water supply system must be designed MPD of the entire subdivision and any undeveloped land beyond and in accordance with the relevant documents as set out in the Appendices;
- Design for residential areas must be on the basis of 200 litres/person/day, with a peaking factor of 5;
- Design for commercial and industrial areas (and residential areas as an option) must be based on specific analysis. Refer to maximum head loss at peak demand as above;
- Air releases may be required at high points. Refer to Section 7 *Standard*
- *Drawings*, 12908/503.

6.9 (cont) Design Standards

Policy (cont)

Minimum Diameters

Minimum diameters of public watermains in the following situations are outlined below:

- Where hydrants are to be placed on the main: 100mm;
- Residential areas, on at least one side of through roads: 100mm;
- Residential areas, as a rider main: 50mm (this can be increased to 100mm at Metrowater's discretion);
- Commercial and industrial areas, on both sides of roads: 150mm.

Mains under Vehicle Crossings and Roads

Where a proposed new road or vehicle crossing will leave a watermain with insufficient protection (taking account of the pipe material) the main must be lowered or re-laid in another material to Metrowater's satisfaction. Metrowater's Network Maintenance Contractor will perform this work. The cost will be met by the customer. A minimum of 3 working days' notice must be given to Metrowater, advising of exposed mains that require lowering or re-laying.

- **Valves**
  Generally, valves must be located adjacent to connections from other mains.
- No valves can be located within carriageways.
- Line Valves must be installed on principal mains where the distance between other control valves exceeds 250m.

Works Near Public Watermains

- Public watermains may not be built over;
- Watermains must be adequately protected from all loading and other effects of any development;
- It is preferred that no structure is placed within 1m of any public watermain. If this is not possible, Metrowater will need to be consulted for appropriate solutions and the existing watermain material, ground conditions and type of construction activity will be taken into account. Where it is necessary to divert the lines to achieve the minimum distance requirement, costs will be met by the developer;
- A clearance of at least 300mm must be maintained between Metrowater water supply assets and other services.

6.10 Bedding, Laying and Cover

Refer also to:

- Section 7 *Standard Drawings*, 12908/102.

Policy

Public water supply works must be constructed to the following minimum standards.

Bedding and Protection

- All pipelines must be bedded and covered with suitable well hand-compacted granular material as shown in the standard drawings and to manufacturers specifications. Refer to Section 7 *Standard Drawings,* 12908/102;
- All pipelines must be designed and constructed at a depth to withstand the likely loads on them over their service life. Where a pipeline is to be constructed through soft ground, either any unsuitable material must be removed and replaced with approved material, or another construction method approved by the engineer must be used so to adequately support the pipe. Refer to Section 7 *Standard Drawings,* 12908/102;
- The manufacturers recommendations for pipe storage, handling, protection and laying must be followed;
- End caps must be used and due care must be exercised to prevent entry of clay and other foreign materials into the pipeline during construction. If the pipe end is temporarily open, a minimum clearance of 300mm must be maintained at all times between the invert of the open-ended pipe to be laid and the ground (or water) surface;
- **A metallic detection tape must be laid along all new non-metallic watermains installed by trenching**.

Anchor Blocks and Support

Cast in-situ concrete anchor blocks must be provided where there is an unbalanced thrust. All concrete must be a minimum of 17.5 MPa at 28 days and cannot encase the fitting or flange or fastening bolts.

Cover and Maximum Depth

Watermains must have at least 600mm cover in berms and footpaths and 900mm in carriageways. Where minimum cover cannot be achieved, additional protection is required which requires specific design and approval from Metrowater. Watermains cannot be laid deeper than 1200mm without specific approval.

Lubricants

Lubricants for joints must contain bactericidal agent approved for potable water use.

Trench-less Installation

Use of trench-less methods is subject to specific approval from Metrowater.

Key Documents

- NZS 4404:2004: Land Development and Subdivision Engineering (Part V)

6.11 Extensions to the Public Water Supply

Refer also to:

- sub-section 6.6 *Approved Materials;*
- sub-section 6.7 *Capacity Analysis;*
- sub-section 6.9 *Design Standards;*
- Section 2 *Development,* sub-section 2.4 *Testing and Acceptance;*
- Section 2 *Development,* sub-section 2.5 *As-Builts;*
- Section 2 *Development,* sub-section 2.11 *Right-of-Way Sites;*
- Section 7 *Standard Drawings;*
- Appendix H, *Form: Certificate of Construction Aspects of Development Works*;
- Appendix T, *Testing Requirements for New Public Assets.*

All public water supply extensions must be in accordance with the District Plan and Auckland City Council*'s* Code of Urban Subdivision and Development requirements.

Policy

Development

Extensions and upgrades to the public water supply system may be required as part of a development. Engineering Plan Approval for construction must be obtained from ACE Development Engineering (DE). Public water supply extensions must be constructed to the relevant standards as presented and referenced in this manual. All proposed public watermain extensions require consultation with Metrowater prior to approval by ACE.

A public water supply will be required:

- Where new roads to vest in Auckland City Council are constructed;
- Where a fire hydrant is required (to comply with fire-fighting requirements of the District Plan and Fire Service's Code of Practice);
- Where it will upgrade or improve existing water supply in an area (or can be later extended to achieve this).

New Public Water Supply Extensions in Private Property

Where Metrowater requires extension of the public water supply through private property, an easement will be registered on the title to protect the water supply service, for fire-fighting purposes, and to enable Metrowater and Auckland City Council access for maintenance. Access must be unlimited and must not be restricted by locked gates. Testing and As-Built requirements must be to expected standards. Refer to Section 2 *Development,* sub-section 2.5 *As-Builts,* and Appendix H, *Form: Certificate of Construction Aspects of Development Works* and Appendix T, *Testing Requirements for New Public Assets – Disinfection Code of Practice.*

Retrospectively Vesting Private Fire Supplies as Public

Metrowater may retrospectively take over as public, privately installed mains and feeders (whether or not they include fire supplies) if they meet the public watermain standards. A Retrospective Engineering Plan Approval is required from Development Engineering (DE). If the private pipes that Metrowater are to adopt as public are located within private land, an easement will be registered on the title, to protect the water supply service and to enable Metrowater and Auckland City Council access for maintenance. Access must be unlimited and must not be restricted by locked gates. Testing and As-Built requirements must be to expected standards. Refer to Section 2 *Development,* sub-section 2.5 *As-Builts,* and Appendix H, *Form: Certificate of Construction Aspects of Development Works* and Appendix T, *Testing Requirements for New Public Assets– Disinfection Code of Practice.*

Key Documents

- NZS 4404:2004: Land Development and Subdivision Engineering (Part V)
- Disinfection Code of Practice [Metrowater]
  [Hard copy only]

6.12 Fire Prevention Connections

Refer also to:

- sub-section 6.17 *Fire Hydrants;*
- sub-section 6.22 *Shutdowns of the Water Supply.*

Metrowater provides fire prevention services to Auckland City Council. Metrowater carries out the fire prevention functions under sections 647 and 648 of the Local Government Act and section 30(3) of the Fire Services Act 1975 which ensure the requirements of the District Plan and the Code of Urban Subdivision and Development are met.

Policy

Requirements

- Only approved Metrowater contractors are to install fire prevention connections. Applications are to be made at Metrowater. Metrowater will provide technical assessment and assess operability;
- At the time of application for ACC consent, and again at the time of application to Metrowater for fire prevention connection (to a sprinkler, and/or fire hydrant approved under ACC consent), the applicant must engage Metrowater (or a contractor approved by Metrowater) to carry out flow testing on the public hydrant(s) closest to the proposed development, in accordance with Metrowater's standard procedure. The full cost of supervision, flow testing and submission of flow test results must be borne by the applicant.
- Metrowater Standard Procedure:
  - The testing and inspection of public hydrants used for the flow/pressure testing must be carried out by a contractor approved by Metrowater;
  - Inspection, testing and recording of test results of the hydrant flow test must be in accordance with the Metrowater Fire Flow Testing Procedure;
  - The minimum details to be recorded during the flow test shall be:
    - Identification of flow testing contractor
    - Name of Metrowater representative witnessing the flow testing
    - Date
    - Time
    - Plan showing the location/address/identifier of both the flowing hydrant(s) and the pressure hydrant; and the location of the proposed fire prevention connection to Metrowater main;
    - Measured simultaneous flow(s) (L/sec) from each hydrant;
    - Static Pressure (kPa)
    - Running Pressure (kPa)
    - Diameter of water main(s) (mm)
    - Vertical height difference between the flow and pressure hydrants.
  - Record of fire hydrant inspection shall include the condition of the hydrants and valves used for the flow test and leakage and defects observed during the flow test.
  - A Metrowater representative must be present for the duration of the flow test (minimum 5 days notice to Metrowater will be required).
  - A current calibration certificate to ISO 9000 issued by an accredited testing agency for the pressure gauge and flow meter(s) to be used for the flow test must be submitted to Metrowater's representative before testing commences.
  - The current Metrowater Fire-flow Level of Service Map must be used to determine the Metrowater target LoS for the area; and the type of hydrant (single or comprehensive) flow test required to be carried out by the applicant.

- Discharge of chlorinated water into the environment when flushing hydrants and during hydrant flow testing must comply with Metrowater's *Code of Practice for Water Reticulation Disinfection* (2008).

- Metrowater's NMC **must** carry out cut-in;
- Fire prevention connections and supplies will not be used for any other purposes other than for fire protection related activities;
- Metrowater owns and maintains the public fire prevention connection up to the property boundary; or to the hydrant, where a public main feeds the fire hydrant within the development.
- Minimum nominal size for a dedicated fire protection connection is 50mm;
- Metrowater is under no obligation to provide supply pressure greater than 200Kpa. The developer may design a sprinkler system to operate above 200Kpa, but if the supply pressure falls below the design pressure, the owner must undertake the necessary remedial work to ensure that the sprinkler system complies with the appropriate standards;
- Metrowater may require metering of fire prevention connections;
- Fire hose reels will not be connected to an un-metered fire prevention connection;
- Prior to the physical installation of the fire protection connection, an approved backflow prevention device must be fitted (by the customer), at the boundary or closest approved practical point;

Private Fire Supplies
Private Fire Supplies must to be installed as per the Fire Service's Code of Practice.

Metrowater Fire Flow Level of Service (LoS) Map
Metrowater Fire-flow Level of Service Map indicates the total fire flow in litres per second that Metrowater aims to provide from public hydrants within each area identified by the colour coding. For new developments, Metrowater's target level of service (LoS) is to provide the total flows indicated in the LoS map **always** at a running pressure of **100kPa** from a combination of hydrants within the maximum radial distances stipulated in the NZFS Code of Practice (1992).

Fire Risk Aspects of Applications
Information on consultation with and approval from the Fire Service must be included as part of Building and Resource Consent applications where relevant, and referred by Development Engineering (DE) to Metrowater.

Key Documents

- Local Government Act 1974 (and Amendments)
- Local Government Act 2002 (and Amendments)
- Code of Practice for Water Reticulation Disinfection (2008)
- Metrowater

Key Documents

- Fire Service Act 1975 (and Amendments)
- District Plan (Isthmus Section) [Auckland City Council]
- Code of Practice for Firefighting Water Supplies [New Zealand Fire Service]
- Code of Urban Subdivision and Development 1999 [Auckland City Council] (Hard Copy Only)

6.13 Drawing of Mains Water

Refer also to:

- Sub-section 6.17 *Fire Hydrants.*

Policy

Requirements

Persons wishing to draw mains water via a fire hydrant from the public water supply mains must obtain a Fire Hydrant Permit from Metrowater (fees are based on requirements).

Key Documents

- Water Supplies Protection Regulations (and Amendments) 1961
- Draft Water Supply Bylaw 2008 [Auckland City Council]
- Code of Practice for Firefighting Water Supplies [New Zealand Fire Service]
- Backflow Code of Practice 2003 [New Zealand Water and Wastes Association]
- Metered Stand Pipe Policy [Metrowater]
  [Hard copy only]
- Fire Hydrant Permit application form [Metrowater]
  [Hard copy only]

6.14 Private Water Supply

Private water supply systems are generally described as systems that service 'private' development or sites. These systems are maintained by the respective property owners, and in most cases connect to Metrowater's 'public' water supply system.

Policy

Requirements

- Water supply pipes are a private responsibility from the 'point of supply' (the consumer side of the Metrowater meter) onwards; or the boundary if the meter is installed inside the boundary.
- Requirements for materials and performance for these private systems are given in the relevant sections of the *Building Code* 1992, *Building Act* 2004, *Plumbers Gasfitters and Drainlayers Act* 1976, *Local Government Act* 1974, and various Bylaws;
- Private systems are controlled through the Building Consent approval process and are installed to the satisfaction of Auckland City Environments (ACE) Building Inspectors. An Engineering Plan Approval from ACE may be necessary if the private main can potentially vest with Metrowater as a public asset.

Key Documents

- AS/NZS 3500:2003: Plumbing and Drainage
- Building Controls Approved Documents (§ G12, G13, G14)

6.15 Easements: Private Water Supply on Private Land

Where private water supply pipes are laid through other lots, the service should be noted and protected with an easement. As-Builts of completed works should be filed on site files for all sites involved.

Policy

Location of Private Water Supply Pipes

Whenever possible, the entire length of private pipes should be located in the lot that they serve, and in the public road reserve where connection is made to the public watermain.

Private pipes may sometimes need to be run through adjacent private land. In these cases, the easement or other rights over that land must enable access and maintenance of the water pipe and also ensure that the line will not be damaged through use of that land.

6.16 Easements: Public Water Supply on Private Land

Refer also to:

- Section 2 *Development,* sub-section 2.11 *Right-of-Way Sites.*

Where Metrowater has agreed to take over ownership of a watermain located within private land as public, an easement is required. The access available to the service must comply with the District Plan. Refer to diagram in Section 2 *Development,* sub-section 2.11 *Right-of-Way Sites.*

Policy

Applications

Metrowater require privately installed mains feeding fire hydrants to comply with public water main standards, to enable these systems to be declared public. If the pipes that Metrowater has decided will be adopted as public are not located in a public road or public right-of-way, an easement must be registered on the title to protect the water supply service and to enable Metrowater and Auckland City Council access for maintenance.

Metrowater will consider each application for new public watermains on private driveways and right-of-ways on a case-by-case basis and will accordingly provide advice to Auckland City Environments (ACE) on the vesting of the main.

Public or Common Land

Public water reticulation should be laid within public or common land whenever possible.

Key Documents

- Local Government Act 1974 (and Amendments)
- Local Government Act 2002 (and Amendments)
- Draft Water Supply Bylaw 2008 [Auckland City Council]
- District Plan (Isthmus Section) (esp. § 11.5.3) [Auckland City Council]
- Code of Urban Subdivision and Development 1999 [Auckland City Council] (Hard Copy Only)

6.17 Fire Hydrants

Refer also to:

- Section 2 *Development,* sub-section 2.11 *Right-of-Way Sites;*
- Section 7 *Standard Drawings,* 12908-514 and 515, 12908-523, 12908-524, 12908-525;
- Appendix Q, *Approved Materials for Water Supply.*

Fire hydrants are required mainly for fire extinguishing purposes and must be constructed where necessary as part of development and to meet the requirements of the District Plan. The risk classification for building and development must concur with the Fire Service's Code of Practice.

Policy

Requirements

Fire hydrants must:

- be installed on all mains 100mm diameter and larger;
- be located clear of carriageways and vehicle crossings;
- be installed in accordance with NZS 4404 and Metrowater's standard engineering details. Refer to Section 7 *Standard Drawings,* 12908-514 and 515, 12908-523, 12908-524, 12908-525;
- comply in all respects with the Fire Service's Code of Practice;
- comply with the requirements of the District Plan.

Fire hydrants must be placed at no more than:

- 135m apart in residential areas;
- 90m apart in commercial and industrial areas;
- 65m from the end of a cul-de-sac;
- 135m from the furthest part of any building and/or lots as measured 'as the hose lies';
- 90m from any risk in classes A, B or C.

Fire Service Access

Adequate provision for Fire Service access must be made (refer to the District Plan esp. § 11.5.3) and the Fire Service's Code of Practice and Building Act.

Drainage

A drainage system for disposing of water from hydrant use may be required to control water flows during flushing or testing.

Metered Standpipes

Only metered standpipes with non-return valves from Metrowater can be used for drawing water from hydrants on Metrowater's watermains.

Key Documents

- Local Government Act 1974 (and Amendments)
- Local Government Act 2002 (and Amendments)
- NZS 4501:1972A1: Code of Practice for the Location Marking of Fire Hydrants (Amendment to NZS 4501:1972)
- SNZ/PAS 4509:2003: New Zealand Fire Service Fire Fighting Water Supplies Code of Practice

6.17 (cont)	**Fire Hydrants**
Key Documents (cont)	• District Plan (Isthmus Section) (esp. § 11.5.3) [Auckland City Council] • Code of Practice for Firefighting Water Supplies [New Zealand Fire Service] • Code of Urban Subdivision and Development 1999 [Auckland City Council] (Hard Copy Only)

6.18 Valves

Refer also to:

- Section 7 *Standard Drawings,* 12908/516, 12908/517,12908/526, 12908/527
- Appendix Q, *Approved Materials for Water Supply.*

Valves are necessary for the operation of the water distribution system.

Policy

Requirements

- The maximum spacing of 250m between valves on new public watermains with consumer connections unless approved by Metrowater;
- When a system is laid out in a grid pattern, two isolation valves must be installed at each intersection;
- Control valves may be allowed but require Metrowater's prior written approval;
- Valves shall be located clear of the carriageway and vehicle crossings;
- Valves must be installed in accordance with Metrowater's standards. Refer to Section 7 *Standard Drawings,* 12908/516,12908/517,12908/526,12908/527

6.19 Water Meters

Refer also to:

- sub-section 6.3 *Network Upgrade Charge;*
- sub-section 6.20 *Bodies Corporate;*
- sub-section 6.21 *Service Connections;*
- Section 7 *Drawings,* 12908/501 to 12908/510;
- Appendix Q, *Approved Materials for Water Supply.*

Water meters are the basis for consumer charges. Metrowater retains sole ownership of water meters and is responsible for the ongoing maintenance and for the supply of fixtures and fittings thereon. Applications for new water meters must be made to Metrowater.

Policy

Requirements

- All new or redeveloped residential and non residential units, whether individually titled or not, must have individual water meters installed for each individually occupied unit or premise;

- Meters must be located in the road reserve within the berm area on Metrowater's side of the point of supply (out of any vehicle paths) and must be readily accessible at all times for reading and maintenance;

- Where it is not practical to install all the meters within the road reserve, Metrowater may at its sole discretion, consent to separate meters being installed within the property. In this case:
    - Each meter must be readily accessible for reading, maintenance or replacement;
    - Meters must not be located inside actual units/apartments or within ceiling cavities;
    - Integrated remote reading devices must be installed when a meter is located behind a door or gate (locked or unlocked), fence or within an area protected by security systems. The remote reading device must be easily accessible to a meter reader. Any remote reading device must be approved by Metrowater.
    - In addition to separate meters within the property, multi unit developments must also have a bulk meter located on Metrowater's side of the point of supply.

- Where an existing development requires individual water meters to be installed, a registered plumber's As-Built plan showing that each individually occupied unit has separate plumbing will be required by Metrowater;

- Metrowater may require a water meter to be installed on a fire prevention connection;

- Meters shall only be installed by Metrowater's Network Maintenance Contractor in accordance with Metrowater's standards. Refer to Section 7 *Standard Drawings,* 12908/501 to 12908/510;

The meter-size for the development will be determined by Metrowater. Demand flow requirements must be provided when the water connection is applied for.

6.19 Water Meters

- All water meters are owned by Metrowater;
- All residential meters must be certified as conforming to ISO 4064/BS 5728 Class C, or any other standard approved by Metrowater;
- All commercial meters must be certified as conforming to ISO 4064/BS 5728 Class B or C, or any other standard approved by Metrowater;
- All meters on domestic supplies must be fitted with a double non-return valve or dual check valve;
- Strainers may be required. This will be determined by Metrowater on a case-by-case basis.

Key Documents

- Draft Water Supply Bylaw 2008 [Auckland City Council]
- Code of Urban Subdivision and Development 1999 [Auckland City Council] (Hard Copy Only)
- Metrowater Customer Contract [Metrowater]

6.20 Service Connections

Refer also to:

- sub-section 6.19 *Meters;*
- Section 7 *Standard Drawings,* 12908/501 to 12908/510.

A service connection is the section of underground water pipe between the Metrowater watermain and the point of supply (usually the water meter).

Policy

Applications

Forms can be downloaded from the Metrowater website.
http://www.metrowater.co.nz/pdfs/New_Connection_Pack.pdf
Completed forms should be sent to Metrowater by post, email or fax.

Connections

Any connection to the public water supply can only be made by the Metrowater Network Maintenance Contractor (NMC). All service connections must have a water meter installed. Where a service connection will pass under a proposed carriageway or driveway, a suitable and durable duct must be provided.

Connection Sizes

In residential zones, service connections must be of a **minimum 20mm diameter**. In business and commercial zones, service connections are sized for future likely use of the site. The applicant must provide details of intended site uses to Metrowater to enable sizing of service connections. Metrowater will provide technical assessment and approval.

Private Water Supply Pipes

The internal plumbing system's design; installation and maintenance (both in its component parts and its entirety) must comply with the *Building Act 2004* and the New Zealand Building Code. Quick-closing valves of any kind or any other equipment, which may cause pressure surges to be transmitted, must not be used on any piping close to the service connection.

Key Documents

- Building Act 2004
- Building Regulations 1992 (and Amendments) (esp. § G12/AS1.5.5)
- AS/NZS 3500.1:2003: National Plumbing and Drainage – Water Services (esp. § 5.10)
- Metrowater Customer Contract [Metrowater]
- Connecting to Metrowater's Water Supply: Large Connections (>= 50mm) and/or Fire Connections [Metrowater]
- Connecting to Metrowater's Water Supply: Small Connections (<= 40mm) [Metrowater]
- Backflow brochures [Metrowater]
  [Hard copy only]
- Water Charges brochures [Metrowater]
  [Hard copy only]

6.21 Shutdowns of the Water Supply

Metrowater is responsible for managing planned and unplanned repairs and maintenance to the water supply system. Planned shutdowns to the system are often required for installation of new connections.

Policy

Requirements

- Metrowater's Network Maintenance Contractor (NMC) is responsible for organising all shutdowns and shutdown notifications upon approval by Metrowater;
- When practical and possible, all planned shutdowns will be organised outside peak demand periods;
- Affected customers will be given prior notification (as per Metrowater's Customer Charter);
- Applications for temporary shutdowns must be made to Metrowater.

Key Documents

- Code of Practice for Firefighting Water Supplies [New Zealand Fire Service]
- Dialysis Records
- Metrowater Customer Contract [Metrowater]

6.22 Surface Boxes

Refer also to:

- Section 7 *Standard Drawings*, 12908/523, 12908/525, 12908/526.

Policy

Surface Boxes

The location of valves and fire hydrant surface boxes must be marked and painted in colours as shown in Section 7 *Standard Drawings*, 12908/523.

Installation

The top of all surfaces boxes must be flush with the reinstated surface.

Redundant Markings

Redundant or incorrect markings including 'vee' cuts in kerbs indicating previous valve locations, must be removed by sand blasting or any other approved technique. Merely painting over existing markings is unacceptable.

6.23 Watercare Services Limited

Refer also to:

- sub-section 6.1 *Introduction.*

Watercare Services Limited (WSL) own and operate the bulk trunk-water supply and wastewater drainage systems. WSL provides supply of water as well as wastewater disposal services to the Auckland region either through the territorial authority or the local city councils.

Policy

Work Near Watercare Services' Systems

No work is to take place within 10m of a WSL sewer or watermain, or 20m if blasting, without specific written prior approval of WSL. Auckland City Environments (ACE) advises applicants of this requirement, and will not approve any Consent until WSL Building Approval Permit for the proposed work has been received. WSL bulk water supply fittings/assets can only be accessed by WSL and their approved contractors. An application fee applies.

Key Documents

- Code of Urban Subdivision and Development 1999 (§ 3.6.3) [Auckland City Council]
  [Hard copy only]
- Form: Developments near Watercare Watermains and Sewers [Watercare Services Limited]
  [Hard copy only]

6.24 Backflow Prevention

Backflow prevention devices are used to ensure that contaminants (or gas) cannot be drawn or pumped into the potable water supply system. By legislation, Metrowater (on behalf of Auckland City Council) is required to maintain a register of all backflow prevention devices (including type, size and location, hazard rating, and maintenance) to ensure that annual testing and audits take place on new and existing devices.

Policy

Queries
All queries should be directed to the Metrowater Backflow Prevention Team.

New Connections for Domestic Residential Buildings
A double non-testable check valve is required on all domestic residential new connections.

Residential Buildings
Where no backflow device exists in the following situations, backflow prevention devices are required:

- Multiple dwellings, four or more, with one supply;
- Where special fittings/fitments are connected to the potable water supply. The type of valve required depends on the type of hazard on the site. Refer to the 2004 Building Act's List of Hazards and to the Public Health Risk Management Plan;
- In the cases of some home-based businesses, for example, hair-dressing or bulk-cooking;
- When an auxiliary water supply (water tank) is being used and is connected to Auckland City Council's supply lines;
- All properties with swimming pools and spa pools where potential backflow or back pressure can occur;
- Where the main into a development is more than 5m long.

Commercial and Industrial Buildings
A (testable) backflow prevention device is required in all commercial and industrial buildings as close as possible to the boundary.

Marinas
Backflow prevention is required for all ship and marina water supplies.

Private Water Reticulation and Bores
Backflow prevention is required for all private water reticulation and bores.

Hydrant Stand Pipes
A physical air break is required where hydrants are used to fill tanks. Only approved metered standpipes with non-return valves are to be used.

Installation
Application approval for installation of backflow devices is based on the nature of the development. Prior to installation, Metrowater's approval is required, and after installation, Metrowater will carry out an audit inspection.

6.24 (cont) Backflow Prevention

Key Documents

- Building Act 2004
- Building Regulations 1992 (and Amendments) (esp. § G12.3.5 (a))
- Water Supplies Protection Regulations (and Amendments) 1961
- Backflow Code of Practice 2003 [New Zealand Water and Wastes Association]
- AS/NZS 3500.1:2003: National Plumbing and Drainage – Water Services (esp. § T4)
- Public Health Risk Management Plan Guide: Distribution System – Backflow Prevention (Version 1, Ref D2.4) 2001 [Ministry of Health]
- Code of Practice for Backflow Devices [Metrowater]
  [Hard copy only]

6.25	Non – Potable Water Supply
	Non - Potable water supply uses recycled water or treated stormwater to reduce potable water demand.
Policy	Non - potable water schemes must not impact on the integrity or quality of potable water supplies; The design of non – potable water schemes must meet Metrowaters design standards for 3rd pipe supplies. Non – potable water must be fit for the purpose it was designed for. In providing for a non – potable water system, the potable water supply system shall not be compromised. For this reason, all work on the 3rd pipe supply public reticulation system can only be carried out by the Metrowater Network Maintenance Contractor (NMC). Internal plumbing works (i.e. from the point of supply) should only be carried out by a registered plumber. Design and construction of the non – potable system shall comply with 3rd Pipe Supply (Amendment to the Development and Connection Standards) April 2006.
Key Documents	• AS/NZS 3500.1:2003: National Plumbing and Drainage – Water Services • 3rd Pipe Supply (Amendment to the Development and Connection Standards) April 2006. (Hard Copy only)