Queenstown Lakes District Council

Land Development and Subdivision Code of Practice

Amendments and Modifications to NZS 4404:2010

The following amendments are to be applied to NZS4404:2010 Sections 1 to 7 inclusive as the Queenstown Lakes District Council Land Development and Subdivision Code of Practice.

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Any update of NZS 4404:2010 does not automatically update this Queenstown Lakes District Council Land Development and Subdivision Code of Practice.

2020 amendments are shown in purple in the document, 2018 amendments are in green text, and 2015 amendments are blue text. The text in black is the original NZS 4404:2010 text.

Contents

Referenced Documents

NEW ZEALAND STANDARDS

~~NZS 1170:- - - - Structural design actions~~

NZS 3109:1997 Concrete construction

NZS 3114:1987 Specification for concrete surface finishes

NZS 3116:2009 Concrete segmental and flagstone paving

NZS 3604:2011 Timber-framed buildings

NZS 4121:2001 Design for access and mobility: Buildings and associated facilities

NZS 4402:- - - - Methods of testing soils for civil engineering purposes

Part 6:1986 Soil strength tests

NZS 4407:2015 Methods of sampling and testing road aggregates

~~NZS 4405:1986 Helical lock-seam corrugated steel pipes~~

~~NZS 4406:1986 Helical lock-seam corrugated steel pipes – Design and installation~~

NZS 4431:1989 Code of Practice for earth fill for residential development

NZS 4442:1988 Welded steel pipes and fittings for water, sewage and medium pressure gas

NZS 4522:2010 Underground fire hydrants

NZS 5828:2015 Playground equipment and surfacing

NZS/AS 1657:1992 Fixed platforms, walkways, stairways and ladders. Design, construction and installation.

~~NZS/BS 750:1984 Specification for underground fire hydrants and surface box frames and covers~~

SNZ HB 5828.1:2006 General playground equipment and surfacing handbook

SNZ PAS 4509:2008 New Zealand Fire Service firefighting water supplies Code of Practice

JOINT AUSTRALIAN/NEW ZEALAND STANDARDS

AS/NZS 1158:- - - - Road lighting

Part 0:2005 Introduction

Part 1.1:2005 Vehicular traffic (category V) lighting – Performance and design requirements

Part 1.2:2010 Vehicular traffic (Category V) lighting - Guide to design, installation, operation and maintenance

~~Part 1.3:1997 Vehicular traffic (Category V) lighting – Guide to design, installation, operation and maintenance~~

Part 3.1:2005 Pedestrian area (Category P) lighting – Performance and design requirements

AS/NZS 1170 Structural Design Actions

AS/NZS 1254:2010 PVC-U pipes and fittings for stormwater and surface water applications

AS/NZS 1260:2009 PVC-U pipes and fittings for drain, waste and vent application

AS/NZS 1477:2017 PVC pipes and fittings for pressure applications

AS/NZS 1546:- - - - On-site domestic wastewater treatment units

Part 1:2008 Septic tanks

AS/NZS 1547:2012 On-site domestic wastewater management (in preparation)

AS/NZS 2032:2006 Installation of PVC pipe systems

AS/NZS 2033:2008 Installation of polyethylene pipe systems

AS/NZS 2041:2011 Buried corrugated metal structures

Part 1:2011 Design methods

Part 2:2011 Installation

Part 4: 2010 Helically formed sinusoidal pipes

Part 6:2010 Bolted plate structures

AS/NZS 2280:2014 Ductile iron pipes and fittings

AS/NZS 2566:- - - - Buried flexible pipelines

Part 1:1998 Structural design

Part 1 Supp 1:1998 Structural design – Commentary

Part 2:2002 Installation

AS/NZS 2638:- - - - Gate valves for waterworks purposes

Part 2:2011 Resilient seated

AS/NZS 3000:2018 Electrical installations

AS/NZS 3500:- - - - Plumbing and drainage

Part 1:2018 Water services

AS/NZS 3518:2013 Acrylonitrile butadiene styrene (ABS) compounds, pipes and fittings for pressure applications

AS/NZS 3690:2009 Installation of ABS pipe systems

AS/NZS 3725:2007 Design for installation of buried concrete pipes

AS/NZS 3845:- - - - Road safety barrier systems and devices

Part 1:2015 Road safety barrier systems

Part 2:2017 Road safety devices

AS/NZS 3879:2011 Solvent cements and priming fluids for PVC (PVC-U and PVC-M) and ABS and ASA pipes and fittings

AS/NZS 4020:2018 Testing of products for use in contact with drinking water

AS/NZS 4058:2007 Precast concrete pipes (pressure and non-pressure)

AS/NZS 4129:2008 Fittings for polyethylene (PE) pipes for pressure applications

AS/NZS 4130:2018 Polyethylene (PE) pipes for pressure applications

AS/NZS 4131:2010 Polyethylene (PE) compounds for pressure pipes and fittings

AS/NZS 4158:2003 Thermal-bonded polymeric coatings on valves and fittings for water industry purposes

AS/NZS 4441:2017 Oriented PVC (PVC-O) pipes for pressure applications

AS/NZS 4586:2004 Slip resistance classification of new pedestrian surface materials

AS/NZS 4765:2017 Modified PVC (PVC-M) pipes for pressure applications

AS/NZS 4793:2009 Mechanical tapping bands for waterworks purposes

AS/NZS 4998:2009 Bolted unrestrained mechanical couplings for waterworks purposes

AS/NZS 5065:2005 Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications

AUSTRALIAN STANDARDS

AS 1579:2001 Arc-welded steel pipes and fittings for water and waste-water

AS 1741:1991 Vitrified clay pipes and fittings with flexible joints – Sewer quality

AS 1906:- - - - Retroreflective materials and devices for road traffic control purposes

Part 3:1992 Raised pavement markers (retroreflective and non-retroreflective)

AS 2200:2006 Design charts for water supply and sewerage

~~AS 2638:- - - - Gate valves for waterworks purposes~~

~~Part 2:2006 Resilient seated~~

AS 2700:2011 Colour Standards for general purposes

AS 2870:2011 Residential slabs and footings – Construction

AS 2890:- - - - Parking facilities

Part 5:1993 On-street parking

AS 3571:- - - - Plastics piping systems – Glass-reinforced thermoplastics (GRP) systems based on unsaturated polyester (UP) resin

Part 1:2009 Pressure and non-pressure drainage and sewerage

Part 2:2009 Pressure and non-pressure water supply

AS 3681:2008 Application of polyethylene sleeving for ductile iron piping

AS 3996:2019 Access covers and grates

BRITISH STANDARDS

BS EN 295:- - - - Vitrified clay pipes and fittings and pipe joints for drains and sewers

Part 1:2013 Requirements

Part 2:2013 Quality control and sampling

Part 3:2012 Test methods

Part 4:2013 Requirements for special fittings, adaptors and compatible accessories

Part 5:2013 Requirements for Perforated Pipes and Fittings

Part 6:2013 Requirements for vitrified clay manholes

Part 7:2013 Requirements for vitrified clay pipes and joints for pipe jacking

~~Part 10:2005 Performance requirements~~

BS EN 805:2000 Water supply – Requirements for systems and components outside buildings

OTHER PUBLICATIONS

GENERAL

Ministry for the Environment. New Zealand urban design protocol. Wellington: Ministry for the Environment, 2005.

EARTHWORKS AND GEOTECHNICAL REQUIREMENTS

BRANZ. BRANZ Study Report 004, Assessment of slope stability at building sites. BRANZ and Worley Consultants Ltd, 1987.

Cook, D, Pickens, G A, and MacDonald, G. 'The role of peer review', Report by Crawford S A. NZ Geomechanics News (Dec 1995).

Crawford, S A, and Millar, P J. 'The design of permanent slopes for residential building development', EQC Research Project 95/183, NZ Geomechanics News (June 1998).

New Zealand Geotechnical Society Inc. Field description of soil and rock. New Zealand Geotechnical Society Inc, 2005.

New Zealand Geotechnical Society Inc. 'Geotechnical issues in land development'. Proceedings of New Zealand Geotechnical Society Symposium, Hamilton, 1996.

ROADS -

~~Auckland Regional Transport Authority (ARTA). Bus stop infrastructure design guidelines. Auckland: ARTA, 2009.~~

Auckland Transport Code of Practice (ATCOP). Chapter 20: Public Transport – Busses. Auckland: ATCOP, 2017.

Austroads codes and guides, 2009. (Subject to the relevant New Zealand supplement).

Austroads. Guide to road design – Part 3: Geometric design. Austroads, 2009.

Austroads. Guide to traffic management – Part 8: Local area traffic management. Austroads, 2008.

Cement and Concrete Association of Australia. Guide to residential streets and paths. Cement and Concrete Association of Australia, 2004.

Ministry of Transport Government Policy Statement on Land Transport Funding 2018-19 - 2027-28.

Queenstown Lakes District Council (QLDC). *Bus Stop Policy and Standards.* Queenstown: QLDC 2008.

New Zealand Transport Agency.

Bridge manual. (SP/M/022) 3rd ed. Wellington: NZTA, 2016.

Cycle network and route planning guide. Wellington: Land Transport Safety Authority, 2004. Available at: http://www.nzta.govt.nz/resources/cycle-network-androute-planning/cycle-network.html

Pedestrian planning and design guide. Wellington: NZTA, 2009. Available at: http://www.nzta.govt.nz/resources/pedestrian-planning-guide/docs/pedestrianplanning-guide.pdf

Road safety audit procedures for projects (Manual number TFM9). Wellington: Transfund New Zealand, 200

~~RTS 11: Urban roadside barriers and alternative treatments. Wellington: Land Transport Safety Authority, 1995. Available at: http://www.nzta.govt.nz/resources/road-traffic-standards/docs/rts-11.pdf~~

RTS 18: New Zealand on-road tracking curves for heavy vehicles. Wellington: Land Transport New Zealand, 2007. Available at: http://www.nzta.govt.nz/resources/road-traffic-standards/rts-18.html

Stormwater treatment standard for state highway infrastructure. Wellington: NZTA, 2010.

Transit Planning Policy Manual. (SP/M/001) *Appendix 5B Accessway standards and guidelines*. Wellington: NZTA, 2007

New Zealand guide to pavement structural design. Wellington: NZTA, 2017

New Zealand guide to pavement evaluation and treatment design. Wellington: NZTA, 2017

NZTA specifications (available at: http://www.nzta.govt.nz/resources/index.html)

B/2:2005 Construction of unbound granular pavement layers

F/2:2000 Pipe subsoil drain construction

F/2 notes:2000 Notes on pipe subsoil drain construction specification

M/1:2007 Roading bitumens

M/4:2006 Crushed basecourse aggregate

M/10:2014 ~~Asphaltic concrete~~ Dense graded and stone mastic asphalt

P/3:1995 First coat sealing

P/4:1995 Resealing

~~P/9:1975 Construction of asphaltic concrete paving~~

~~T/10:2002 Skid resistance deficiency investigation and treatment selection~~

Queenstown Lakes District Council (QLDC). Southern Light Strategy 2017. Queenstown: QLDC 2017.

United Kingdom Department for Transport. *Manual for streets.* London: Thomas Telford Publishing, 2007.

United Kingdom Transport Research Laboratory. *TRL661 – The manual for streets: evidence and research.* TRL, 2007.

Auckland Traffic Management Unit: Traffic Signals Design Guidelines

STORMWATER, WASTEWATER, AND WATER SUPPLY

~~Auckland Regional Council~~

~~Technical Publication No. 124 (TP124) Low impact design manual for the Auckland region, 2000.~~

~~Technical Report 2008-20 Application of low impact design to brownfield sites (in preparation)~~

~~Technical Report 2009-83 Integration of low impact design, urban design and urban form principles~~

Auckland Council

Stormwater management devices in the Auckland region. Auckland Council Guideline Document, GD2017/001, 2017

Water sensitive design for stormwater. Auckland Council Guideline Document GD2015/004. Prepared by Boffa Miskell for Auckland Council, 2015

Australasian Society for Trenchless Technology (ASTT). Guidelines for horizontal directional drilling, pipe bursting, microtunnelling and pipe jacking. Greenwood, Western Australia: ASTT, 2009.

Austroads. Guide to road design – Part 5: Drainage design. Austroads, 2008.

Hicks, D M, and Mason, P D. Roughness characteristics of New Zealand rivers, Wellington: Water Resources Survey, DSI Marine and Freshwater, 1991.

Janson, Lars-Eric. Plastics pipes for water supply and sewage disposal. 2003.

Lamont, P. 'Metrication: Hydraulic data and formulae.' Water Services Volume 81, numbers 972/3/4 (Reprinted by Kent Meters Ltd, UK)

Ministry for the Environment.

Coastal hazards and climate change – A guidance manual for local government in New Zealand. Wellington: Ministry for the Environment, 2008.

Preparing for climate change – A guide for local government in New Zealand. Wellington: Ministry for the Environment, 2008.

Preparing for coastal change – A guide for local government in New Zealand. Wellington: Ministry for the Environment, 2009.

Preparing for future flooding – A guide for local government in New Zealand. Wellington: Ministry for the Environment, 2010.

Tools for estimating the effects of climate change on flood flow – A guidance manual for local government in New Zealand. Wellington: Ministry for the Environment, 2010.

Ministry of Health. Drinking-water standards for New Zealand 2005 (Revised 2008). Wellington: Ministry of Health 2008.

Najafi, M. Trenchless technology – Pipeline and utility design, construction, and renewal. McGraw-Hill, 2005.

New Zealand Transport Agency. Bridge manual. (SP/M/022) 2nd ed. Wellington: NZTA, 2003.

New Zealand Water and Wastes Association (Water New Zealand). New Zealand pipe inspection manual. Wellington: New Zealand Water and Wastes Association, 2006.

Queenstown Lakes District Council (QLDC). *QLDC Guidelines for Environmental Management Plans.* Queenstown: QLDC June 2019.

Stein, D. Trenchless technology for installation of cables and pipelines. Germany: Stein & Partner, 2005.

Uni-Bell. Handbook of PVC pipe. 4th ed. Dallas: Uni-Bell PVC Pipe Association, 2001.

Water Services Association of Australia (WSAA):

WSA 02-2002 Sewerage Code of Australia – 1999 and 2002

WSA 03-2002 Water Supply Code of Australia – 1999 and 2002

WSA 04-2005 Sewage Pumping Station Code of Australia – 2005

WSA 06-2008 Vacuum Sewerage Code of Australia – 2008

WSA 07-2007 Pressure Sewerage Code of Australia – 2007

NETWORK UTILITY SERVICES

Department of Labour. Guide for safety with underground services. Wellington: Department of Labour, 2002.

New Zealand Utilities Advisory Group (NZUAG). National Code of Practice for utilities' access to the transport corridors. Wellington: NZUAG, 2008.

Note – The NZUAG Code of Practice is an interim measure until a national Code of Practice is approved under the Utilities Access Act 2010

NEW ZEALAND LEGISLATION

The provisions of this Code of Practice shall be read subject to the provisions of regional and district plans and to any applicable statutes, regulations, bylaws, and any subsequent amendments, including (but not limited to):

Building Act 2004, Building Regulations, and New Zealand Building Code (NZBC) 1992

Civil Defence Emergency Management Act 2016

Conservation Act 1987

Electricity Act 1992

~~Health and Safety in Employment Act 1992~~ Health and Safety at Work Act 2015

Health (Drinking Water) Amendment Act 2007

Historic Places Act 1993

Infrastructure (Amendments Relating to Utilities Access) Act 2010

Land Transfer Act 2017

Land Transport Rule (Traffic Control Devices) 2004

Local Government Act 1974 and Local Government Act 2002

Reserves Act 1977

Resource Management Act 1991

Utilities Access Act 2010

Related Documents

When interpreting this Code of Practice it may be helpful to refer to other documents, including but not limited to:

GENERAL

Land Information New Zealand. New Zealand geodetic datum 2000 (NZGD2000)

Ministry for the Environment. Climate change effects and impacts assessment – A guidance manual for local government. 2nd ed. Wellington: Ministry for the Environment, 2008.

Queenstown Lakes District Council Town Centre Design Guidelines 2018

Queenstown Lakes District Council Town Centre Spatial Framework 2018

EARTHWORKS AND GEOTECHNICAL REQUIREMENTS

~~Auckland Regional Council. Technical Publication No. 90 (TP90) Erosion and sediment control: guidelines for land disturbing activities in the Auckland Region. Auckland: Auckland Regional Council, 1999.~~

Fraser Thomas Ltd (B J Brown, P R Goldsmith, J P M Shorten, L Henderson) BRANZ Study Report 120, Soil expansivity in the Auckland region. Judgeford: BRANZ, 2003.

Ministry for the Environment. Planning for development of land on or close to active faults – A guideline to assist resource management planners in New Zealand. Wellington: Ministry for the Environment, 2004.

Sanders, W, and Glassey, P. (Compilers). Guidelines for assessing planning policy and consent requirements for landslide prone land, GNS Science Miscellaneous Series 7. Lower Hutt: Institute of Geological and Nuclear Sciences Limited, 2007.

ROADS

Concrete Masonry Association of Australia. Concrete segmental pavements – Design guide for residential accessways and roads. Sydney: Concrete Masonry Association of Australia, 1997.

Jones, P, Boujenko, N, and Marshall, S. Link and place – A guide to street planning and design. London: Landor Books, 2007.

Ministry of Justice. National guidelines for crime prevention through environmental design in New Zealand Part 1: Seven qualities of safer places, and Part 2: Implementation guide. Wellington: Ministry of Justice, 2005.

Ministry of Transport. *Connecting New Zealand: A summary of the government's policy direction for transport.* Wellington: Ministry of Transport, 2011.

Ministry of Transport Government policy statement on land transport funding 2018-19 - 2027-28. Wellington: Ministry of Transport, May 2009.

Ministry of Transport. Safer journeys – New Zealand's road safety strategy 2010 – 2020. Wellington: Ministry of Transport, 2010.

~~Ministry of Transport. The New Zealand transport strategy 2008. Wellington: Ministry of Transport, 2008.~~

New Zealand Transport Agency

Traffic note 48 – Light vehicle sizes and dimensions: Street survey results and parking space requirements – Information. Land Transport New Zealand, December 2004. Available at: http://www.nzta.govt.nz/resources/traffic-notes/docs/traffic-note48.pdf

Manual of traffic signs and markings (MOTSAM) Parts 1 – 4

NZTA register of network standards and guidelines. Wellington: NZTA, 2009. Available at: http://www.nzta.govt.nz/resources/nzta-register-network-standardsguidelines/

SNZ HB 44:2001 Subdivision for people and the environment. Wellington: Standards New Zealand, 2001.

STORMWATER, WASTEWATER, AND WATER SUPPLY – Amended/Added/Deleted

Auckland City Council. On-site stormwater management manual. Auckland: Auckland City Council, 2002.

Auckland City Council. Soakage design manual. Auckland: Auckland City Council, 2003.

~~Auckland Regional Council. Technical Publication No. 10 (TP10) Design guideline manual stormwater treatment devices, 2003.~~

~~Auckland Regional Council. Technical Publication No. 108 (TP108) Guidelines for stormwater runoff modelling in the Auckland region, 1999.~~

Christchurch City Council. Waterways, wetlands and drainage guide – Part A: Visions and Part B: Design. 2003. Available at: http://www.ccc.govt.nz/cityleisure/parkswalkways/environmentecologywaterwayswetlandsdrainageguide/index.aspx

Environment Protection Authority (EPA) Victoria. Maintaining water sensitive urban design elements. Melbourne: EPA Victoria, 2008.

Greater Wellington Regional Council. Fish friendly culverts. June 2003. Available at: http://www.gw.govt.nz/bridges-and-culverts/

New Zealand Water Environment Research Foundation (NZWERF) On-site stormwater management guideline. Wellington: NZWERF, 2004.

~~North Shore City Council. Bioretention guidelines. Takapuna: North Shore City Council, 2008.~~

Puddephatt, J, and Heslop, V. Guidance on an integrated process – Designing, operating and maintaining low impact urban design and development devices. Landcare Research, July 2008.

Queenstown Lakes District Council (QLDC). *Asbuilt Plan Specification Requirements.* Queenstown: QLDC 2010

Sustainable urban drainage systems (SUDS) design manuals for countries in the United Kingdom

Water sensitive urban design (WSUD) manuals from various Australian states and cities

LANDSCAPE- Amended/Added/Deleted

Queenstown Lakes District Council (QLDC). *Community Open Spaces Asset Management Plan 2015-2030*. Queenstown: QLDC 2015

WEBSITES **-** Amended/Added/Deleted

~~Auckland Regional Council~~	~~http://www.arc.govt.nz~~
Auckland Council	http://www.aucklandcouncil.govt.nz
Austroads	http://www.austroads.com.au
Ministry for the Environment	http://www.mfe.govt.nz
National Pest Plant Accord	http://www.biosecurity.govt.nz/nppa
New Zealand Historic Places Trust	http://www.historic.org.nz
New Zealand Legislation	http://www.legislation.govt.nz
New Zealand Transport Agency	http://www.nzta.govt.nz/
Plastics Industry Pipe Association of Australia:	http://www.pipa.com.au
Trips Database Bureau	http://www.tdbonline.org/home
Water Services Association of Australia	https://www.wsaa.asn.au/

Foreword

(b) - Delete phrase

An emphasis on managing and treating stormwater ‘before it gets into a pipe’, together with a requirement to consider climate change~~ and potential sea level rise~~;

C1.3.1 – delete phrase

Over time, central government may develop other NPS and NES which may affect decision-making by LAs on land development and subdivision, including national policy on freshwater management, ~~sea level rise,~~ and flood risk. The Ministry for the Environment’s website should be referred to for any relevant NPS and NES.

1 General Requirements and Procedures

1.2.2 Definitions

Residential Unit A residential activity which consists of a single self-contained household unit, whether of one or more persons, and includes accessory buildings. Where more than one kitchen and/or laundry facility is provided on the site, other than a kitchen and/or laundry facility in a residential flat, there shall be deemed to be more than one residential unit.

Earthworks ~~Any alteration to the contours, including the excavation and backfilling or recompaction of existing natural ground and the stripping of vegetation and topsoil.~~ The disturbance of land by the removal or deposition on or change to the profile of land. Earthworks includes excavation, filling, cuts, root raking and blading, firebreaks, batters and the formation of roads, access, driveways, tracks and the deposition and removal of cleanfill.

Residential Flat ~~A residential activity that, consists of no more than one flat in the same ownership as the residential unit; and is contained within the same residential unit; and if attached to a detached accessory building does not cover more than 50% of the total Gross Floor Area of the building containing the flat and detached accessory building; and contains no more than one kitchen and one laundry; and does not cover more than 35% of the total Gross Floor Area of the building(s) containing the residential unit and flat (but excluding accessory buildings).~~ A residential activity that comprises a self-contained flat that is ancillary to a residential unit and meets all of the following criteria:

a. The total floor area does not exceed;

   i. 150m^2 in the Rural Zone and the Rural Lifestyle Zone;

   ii. 70m^2 in any other zone;

   not including in either case the floor area of any garage or carport;

b. contains no more than one kitchen facility;

c. is limited to one residential flat per residential unit; and

d. is situated on the same site and held in the same ownership as the residential unit.

Note: A proposal that fails to meet any of the above criteria will be considered as a residential unit.

1.5 Climate Change

Climate change is likely to increase the magnitude of some hazards, therefore it is important to incorporate risk management in the design of infrastructure supporting new developments to maintain the same level of service throughout the design lifetime. The design of infrastructure for land development and subdivision needs to provide for ~~the impact of sea level rise and~~ the increased frequency of extreme weather events.

C1.5

Amendments to the Resource Management Act, the Local Government Act 2002, and the Building Act require LAs

to have particular regard to the effects of climate change when making decisions under these Acts.

~~In coastal areas, the proposed 'New Zealand coastal policy statement' (policy 52) requires LAs to consider the location of any new subdivisions in the context of avoiding or reducing potential coastal hazards.~~

The government is considering the development of a number of other national policy instruments which may affect decision-making by local authorities, including a ~~'National environmental standard on sea level rise' and a~~ 'National policy statement on flood risk'. These would not take effect until they are gazetted.

1.8.7 Vesting 3 Waters Infrastructure in Private Roads

Council's preference is that 3 Waters services are not installed in private property. In situations where 3 Waters infrastructure is required to be placed in private property (including private roads), the planning and development team need to consider who is best positioned to own and hold responsibility for the services prior to obtaining Engineering Acceptance. Council's default position is that water infrastructure should be vested to Council, if designed to Council standard, unless doing so will expose Council to unreasonable risk or expense. Council ownership helps to ensure that an appropriate level of service is provided to the entire community. However, in some situations vesting is not appropriate, these situations include those listed below:

- Where the line services multiple properties on a single lot
- Where the properties could reasonably be supplied by dedicated laterals supplied from the main located within the road reserve
- Where access to the pipe is impeded
- Where the pipe poses a significant risk to adjacent buildings or structures e.g. retaining walls
- Where the private road finish is to a higher standard than a typical Council road and would require special reinstatement treatments
- Where an unacceptable exemption is requested that deviates from the provisions of the Code of Practice
- Any other situation not expressly listed, at Council's sole discretion, is deemed to present an unacceptable risk to Council

If the 3 Waters services are deemed suitable for vesting the Resource Consent must require the developer to provide an Easement in favour of Council in regard to the buried services. This easement shall make mention that Council reinstatements will be asphalt in roadways, and no special reinstatements will be undertaken. In all instances, a written request shall be submitted to Council clearly stating the reason(s) for the intention to vest.

1.8.10

On completion of all subdivision and land development infrastructure, the developer shall provide the LA with the following:

(a) The geotechnical reports and as-built plans required by 2.6 of this Code of Practice;

(b) As-built plans of all infrastructure showing the information set out in Schedule 1D. As-Built plans shall be provided as electronic data and shall be in a format that meets QLDC's GIS and As-built standard;

(c) Evidence that all testing required by this Code of Practice has been carried out and that the test results comply with the requirements of this Code of Practice;

(d) Evidence that reticulation and plant to be taken over by network utility operators have been installed to their standards and will be taken over, operated and maintained by the network utility operator concerned;

(e) Completion certificates as per Schedules 1B and 1C;

(f) Certification by a suitably qualified person where they have recommended a specific design and construction has been undertaken in accordance with that recommendation. The certification shall state that the suitably qualified person supervised the construction and it has been completed in accordance with the recommended design principles;

(g) Other documentation required by the TA including, but not limited to, operation and maintenance manuals for 3 waters facilities, and warranties for new facilities (involving electrical and mechanical plant or stormwater low impact design facilities) and asset valuations for all infrastructures to be taken over by the TA.

(h) A schedule of all assets to be taken over (vested) by Council. The schedule shall utilise either QLDC's Three Waters As-Built Specification or Asset Register Templates, as applicable. Please refer to Council's Vesting of Roads and Reserves Policy 2016 on Council's website.

(i) At practical completion and prior to section 224c, all new ~~assets in reserves and road reserves shall be provided on an asset register or as-built plans as per the approved Council templates~~ asset data in reserves and road reserves shall be provided as per the As-Built/Data Specifications outlined in Schedule 1D. All information shall be accurately recorded as per as built specifications. Assets shall include, but not necessarily be limited to, the following:

- Turf, revegetation and garden areas
- Specimen trees, including species and size at time of planting
- Trail, tracks and paths/walkways including alignment, width and construction
- type
- Irrigation including pipes, connections, valves, controller boxes, and sprinklers
- Built assets including, toilets, seats, picnic tables, barbeques, bollards, fences, barriers, gates, signs, bins, playground equipment and surfacing, car park surfacing, kerbing, drainage etc. The type, make and supplier (where relevant) of each asset shall be identified.

(j) Following completion, the electrical contractor shall supply the following:

- Signed and completed Electrical Certificate of Compliance (CoC) and Electrical Safety Certificate (ESC).
- Signed and completed Record of Inspection (RoI) form.

Schedule 1D As-Built Plans/Asset Data Specification

Roading

As-built Information shall be submitted in accordance with QLDCs Roading RAMM Roading Asset Register; and shall observe the requirements of spatial data, attribution, digital formats, and the method of submission as defined in the document:

a) Road names as approved by the TA

b) Details of above ground roading assets such as road markings, signs, signals, roading drainage (Kerb & Channel, culverts, surface water channels), footpaths and traffic calming, roading retaining walls

c) Road and footpath pavement and surfacing information including installation/construction dates, location

coordinates, areas, widths, layer depths & types, material types, material data (chip size, PSV), and material sources;

d) Street Lighting; Current ICP identifier, GPS location, Lamp Model, Lamp Make, Lamp Description, Lamp Wattage, Gear/Ballast Model, Gear/Ballast Make, Gear/Ballast Description, Gear/Ballast Wattage, Lamp Install date, Pole install date, pole number if assigned, Pole model/make, pole height, mount method, bracket info (tilt, angle), supply point, network owner, Electrical Certificate of Compliance (CoC), Electrical Safety Certificate (ESC), Record of Inspection (RoI) form.

e) Provision of construction schedules to indicate quantities installed in development (financials not required).

f) The results of any testing; i.e. CBR or roughness

g) Details of any warranty's, especially any electrical

Parks and Open Space

As-built Information shall be submitted in accordance with QLDCs Community Open Spaces As-Built/Data Specification when it is completed, at which point it will be added to the QLDC Land Development and Subdivision website; and shall observe the requirements of spatial data, attribution, digital formats, and the method of submission as defined in the document..

a) Reserve or development names where available.

b) Turf and garden areas.

c) Specimen trees; including species and the size at time of planting (tree guard data should be identified where relevant).

d) Trail, tracks and paths/walkways; including alignment, width, construction type, material and layer depths (where relevant).

e) Irrigation including pipes, connections, valves, controller boxes, and sprinklers.

f) Amity Lighting; (as per Roading Street lighting) Current ICP identifier, GPS location, Lamp Model, Lamp Make, Lamp Description, Lamp Wattage, Gear/Ballast Model, Gear/Ballast Make, Gear/Ballast Description, Gear/Ballast Wattage, Lamp Install date, Pole install date, pole number if assigned, Pole model/make, pole height, mount method, bracket info (tilt, angle), supply point, network owner

g) Assets such as public conveniences, seats, public toilets, benches, picnic tables, bollards, fences, barriers, gates, signs, bins, cattle stops, playground equipment, fixed sporting equipment etc. Should have type, material, and manufacturer / supplier (where relevant) identified.

h) Walls, retaining walls, bridges, boardwalks, drainage and culverting etc. should include type, material and dimensional data.

i) Surfaces such as car parks and playgrounds etc. should include installation / construction dates, layer depths, and material types.

2.3.7.2 Protection Measures

Where surface water could cause batter erosion or internal instability through infiltration into the soil, open interceptor drains shall be constructed in permanent materials, and benches in batter faces should be sloped back and graded longitudinally and transversely to reduce spillage of stormwater over the batter.

Water from stormwater systems shall be prevented from flowing into fill or into natural ground near the toe or sides of the fill.

No stormwater or wastewater soakage systems shall be constructed in fill or natural ground which could impair the stability of the ground.

Content requirements for the preparation of Environmental Management Plans (EMP) associated with land development activities shall be in accordance with QLDC Guidelines for Environmental Management Plans.

Protection measures shall include the following as appropriate:

(a) Erosion control mechanisms:

(i) Temporary drains to be constructed at the toe of steep slopes to intercept surface run-off and to lead away for treatment where required before discharge to a stable watercourse or pipe stormwater system

(ii) Surface water to be diverted away from or prevented from discharging over batter faces and other areas of bare earth by bunds formed to intercept surface run-off and treated where required prior to discharge through stable channels or pipes, preferably into stable watercourses or piped stormwater systems

(iii) The upper surface of fills to be shaped and compacted with rubber-tyred or smooth-wheeled plant when rain is impending, or when the site is to be left unattended to minimise water infiltration

(iv) The completed battered surfaces of fills to be topsoiled and vegetated, or otherwise resurfaced to reduce run-off velocities

(v) Control of erosion and sediment discharge may require planting, environmental matting, hydroseeding, drainage channels, or similar measures at an early stage in the earthworks construction phase

(vi) Dust control may require frequent watering during construction along with establishment of the permanent surface at an early stage in the construction phase;

(vii) Where final level organic topsoil is to be re-spread to satisfy erosion and revegetation requirements across the completed earthfills or bare stripped soils and where future buildings are proposed then the thickness of organic topsoil shall be more than 100mm and less than 300mm. this is not applicable in landscaping areas.

(b) Sediment management devices:

(i) The surfaces of fills and cuts to be graded to prevent ponding

(ii) Sediment traps and retention ponds to be constructed where they are necessary. These should be cleaned out, as required, to ensure that adequate sediment storage is maintained, with appropriate plans for decommissioning

(iii) Temporary barriers or silt fences using silt control geotextiles, to be used to reduce flow velocities and

to trap sediment

(iv) Sections of natural ground to be left unstripped to act as grass (or other vegetation) filters for run-off from adjacent areas.

Schedule 2A Clause 2(e)

(e) The original ground not affected by filling and the filled ground are not subject to erosion, falling debris (including soil, rock, snow and ice), subsidence (including liquefaction induced subsidence), inundation (including flooding, overland flow, storm surge, tidal effects and ponding) or slippage in accordance with the provisions of section 106 of the Resource Management Act 1991 provided that:

3.2.5 Network connectivity

Well-connected networks (roads and other links) are achieved with smaller block sizes and regular connections. Network connectivity shall be designed to achieve:

(a) Shorter travel distances;

(b) An increased number of alternative routes for all types of users;

(c) Increased opportunity for interaction;

(d) Improved access to public transport, cycling and walking networks, and access to destinations.

Development design shall ensure connectivity to properties and roads that have been developed, or that have the potential to be developed in the future. The design process should ensure the following maximum walking distances from a lot to a connector/collector or arterial road:

(a) Rural: No maximum distance. The design should maximise future connectivity to a suburban network;

(b) Suburban: 400 m. A shorter distance shall be considered near centres and ~~major~~ public transport routes;

(c) Urban: 300 m;

(d) Centre: 200 m.

Where factors, such as topography or barriers, limit the ability to achieve the network connectivity standard, the designer shall optimise network connectivity and access to the maximum extent practical. The designer shall maximise connectivity to existing development.

3.2.7 Road safety audit

Road safety audits carried out in accordance with the NZTA Road safety audit procedures for projects shall be provided for the design phase of all publicly accessible roads in the Queenstown Lakes District. Post construction road safety audits may be required at Councils discretion.

Road Safety Auditors shall also provide confirmation of the design's compliance with relevant resource consent conditions or identify any deviations from those conditions. Any recommendations of the Safety Audits shall be completed to the Council's satisfaction. Exemption from providing road safety audits shall be granted by the Council at its sole discretion. Road safety audits shall also be provided for private road networks when considered necessary by QLDC.

Safety audits should cover all road users, including the needs of pedestrians, cyclists, and disabled/elderly users. Where appropriate, the requirements of these groups may demand specific audit procedures.

C3.2.4.2

Arterial roads and motorways are not included in this Code of Practice. These roads are subject to specific design standards to be agreed with the road controlling authority to ensure through movement connectivity associated with the broader sector in which such roading is located. The following descriptions are included for information:

(a) ***Minor arterial road:*** *A road that provides access between connector/collector and major arterial roads. Minor arterial roads have a dominant through vehicular movement and carry the major public transport routes. Access to*

property may be restricted and rear servicing facilities may be required. Urban traffic volumes are typically 8,000 vpd to 20,000 vpd and rural from 1,000 to 5,000 vpd with a higher proportion of heavy vehicles. Typical urban operating speeds are 40 to 60 km/h and rural 80 to 100 km/h.

(b) ***Major arterial road:*** *A road that provides interconnections between major sectors of a large area linked with external areas and distributes traffic from major intercity links. Access is generally at grade but may be limited. Urban traffic volumes are typically greater than 20,000 vpd and rural 5,000 vpd with a significant number of heavy vehicles. Typical urban operating speeds are 50 to 70 km/h and rural 80 to 100 km/h.*

(c) ***Motorway:*** *Motorways have the highest link function and have no frontage access. Typical operating speed is 100 km/h.*

Where a development connects to the NZTA state highway network, the developer should refer to the NZTA approval process as per the Transit Planning Policy Manual: Appendix 5B.

3.3.2.2

All roads shall be designed with sight distances that match the target operating speed. Reducing a driver's field of vision in conjunction with other design and management measures is a recognised method for achieving an appropriate speed environment (see 3.3.5).

On connector/collector and arterial roads, sight distance criteria at intersections as well as for stopping, overtaking, on curves, and to avoid obstructions should be applied in accordance with the relevant Austroads or NZTA guides.

Planting within sight lines of pedestrian crossing access areas is to have a maximum mature height of 500mm.

3.3.3 Pavement structural design

Generally pavements shall be flexible designs. Other types of pavements shall be subject to TA approval. Pavements shall be designed in accordance with the NZTA NZ Guide to pavement structural design and NZ guide to pavement evaluation and treatment design with a design life of 25 years.

Where applicable the assessment of Equivalent Standard Axels (ESA) shall include a growth rate of 6% per annum for any existing traffic loading.

3.3.6 Parking, passing, and loading

Public parking and loading can be provided either on-street including indented, or off-street. Facilities shall meet the needs of the area and the requirements of the TA, and shall be addressed in the design and access statement (see 3.2.6). For a residential subdivision, where physically possible the minimum on-street parking provision will be 1 car park per residential unit/lot (based on permitted density) – see C3.3.6 below. Further guidance on parking demand associated with land use can be found on the Trips Database Bureau website http://www.tdbonline.org/home and NZTA Research Report 363.

C3.3.6

The total number of on-street car parks is to be assessed based on the proposed and surrounding land uses and any requirements for on-site parking as specified in the Transport Section of the District Plan. For example, a residential subdivision in the Low Density Residential Zone with no other non-residential activities/land uses in the vicinity will have a minimum on-street parking requirement of 1 car park per residential dwelling/lot (based on permitted

density). This assessment is based on a total (on-street and off-street) parking demand of 3 parking spaces (refer Trips Database Bureau website http://www.tdbonline.org/home and NZTA Research Report 363), with the District Plan requiring 2 of these parking spaces to be provided on-site.

Passing provision shall be in accordance with the design guidance in table 3.2 and the requirements of the TA.

Acceptable and alternative on-street car park and loading dimensions should be taken from AS 2890.5 and/or the Austroads guides. Acceptable dimensions and construction details for indented parallel parking bays in suburban residential areas are shown in Drawing B5-3 Parking Bay. These should have minimum dimensions of 2.5m x 5.4 m for a middle bay, or 6.0 m for an end bay, with appropriate entry and departure tapers. All indented parking bays shall be designed and constructed to avoid sharp corners. Corners shall be designed and constructed with adequate radii to allow for cleaning by street cleaners utilising rotary brushes.

Parking bays should be evenly distributed along the street. When parking bays are located in front of properties, consider the possible location of the property access, which may need restriction by a Consent Notice or Encumbrance. Parking bays are not permitted over a driveway or within 1 m distance from the prolongation of the driveway.

Parking and loading shall not be provided so that it has the potential to obstruct the movement of emergency or service vehicles along a road (e.g. as a result of parking on both sides of the road). Alternate provision within sites may be demonstrated in addition to the requirements of the district plan, particularly when establishing rules for new subdivisions.

3.3.8 No-exit roads

'No-exit' roads should not be provided where through roads and connected networks can be designed. Where no-exit roads are provided, they should ensure connectivity for pedestrians and cyclists.

No-exit roads and lanes shall provide for road turning at the end of the road for an appropriate vehicle as described in RTS 18: New Zealand on-road tracking curves for heavy vehicles. An 8m rigid truck (10m radius) shall be catered for in any areas where rubbish collection will occur. The design of turning facilities for light vehicles shall be in accordance with AS 2890.5. See figure B5-1 and B5-2 for acceptable solutions.

An on-road turning area may provide for parking or landscaping in the centre of the turning area. The minimum kerb gradient around turning heads shall be 0.5%. Appropriate drainage shall be provided.

Areas required for turning shall be suitably marked to maintain access and prevent parking from blocking the turning area. Markings shall be in accordance with clause 3.3.12

3.3.9 Bus Stops

Bus stops shall be provided for on connector/collector roads or arterials in accordance with the TA direction in consultation with the regional transport authority. Bus stops may be designed in accordance with Auckland Transport Code of Practice Chapter 20: Public Transport – Busses, 2017, and the QLDC Bus Stop Policy and Standards, 2008.

3.3.11.2 Cycle paths

Separate cycle paths shall be provided where good design requires separation from the carriageway or a different route to be selected.

Stormwater disposal shall be provided to all off-road cycle paths. ~~Lighting is to be provided where appropriate.~~

Cycle facilities shall be designed to the standards as set out in the Austroads guides and the NZTA Cycle network and route planning guide.

Lighting on cycle paths is to be provided in accordance with QLDCs Southern Light: Part Two – Technical Specifications, or where Council considers appropriate.

3.3.14

All road lighting shall be designed and installed in compliance with the recommendations of AS/NZS 1158, Austroads guides or guidelines adopted by the TA at that time.

All lighting should comply with QLDCs Southern Light Part One – A Lighting Strategy and Part Two – Technical Specifications.

And

All lighting assets including but not limited to columns, lamps and mountings shall be approved by Council's Asset Performance Team

The electrical installation contractor shall carry out all testing and inspections in accordance with the Electricity Act 1992, the Electricity (Safety) Regulations 2010 and the NZ Wiring Rules (AS/NZS 3000).

3.3.16.1 Plan and Gradient Design

Table 3.2 should be used as a guide for the widths of elements required for accesses.

A maximum 3-point turning head in the common area shall be provided at the end of all accesses serving three or more rear lots or dwelling units. Circular, L, T, or Y shaped heads are acceptable. Suitable dimensions are shown in Appendix B Drawing B5-1 and Drawing B5-2.

For accesses serving fewer than three lots or dwelling units, turning heads in the common area are not required where it can be shown that adequate turning area is available within each lot or private area.

Centre line grades should:

(a) Not be steeper than 1 in 5 although gradients of 1 in 4.5 may be used on straight lengths of access over distances of up to 20 m. The first 5 m of any access shall be not steeper than 1 in 8. A greater length of transition shall be provided where necessary on non-residential accesses;

(b) Not be less than 1 in 250.

C3.3.16.1 (a) and (b)

The TA may approve exceptions provided the design includes suitable vertical transitions and adequate safety at the point where the access meets the footpath or road.

All accesses shall be shaped with either crown or crossfall of not less than 3%.

To allow vehicles to pass, accesses shall have widening to not less than 5.5 m over a 15 m length at not more than 50 m spacing. Rural accesses may have passing bays at up to 100 m distances where visibility is available from bay to bay.

3.3.16.3 Pavement Design

Private pavements shall be designed as for public roads but no residential or rural pavement shall have a minimum formation thickness of less than 150 mm for flexible pavements or 100 mm for concrete pavements.

Commercial and industrial pavement shall be provided with adequate supporting design to ensure that it will have a life of 20 years.

Acceptable surfacing for accesses includes asphaltic concrete (25 mm minimum thickness), chipseals, in situ concrete or concrete pavers.

Acceptable asphalt concrete design should be in accordance with the NZTA Specification M/10 and all subsequently referenced NZTA specifications.

3.3.19.6 Kerbs and Channels

Where kerbs and channels are to be provided on carriageways they should comply with Appendix B Drawing B5-8 kerb and Dished Channels, or their slip-formed equivalent may be used subject to the approval of the TA. Pedestrian crossings (pram crossing) should be provided for disability access at regular intervals and at locations where pedestrians are reasonably expected to transition between footpaths and the street. Refer to NZS 4121:2001 for requirements.

When their installation is approved mountable kerbs shall be “Kerbmaster No8” profile.

The historical “Wanaka Kerb” profile should not be used.

3.3.17.1 Urban

Vehicle crossings shall be provided between the edge of the movement lane and the road boundary at the entrance to all private ways and lanes and to any lots, front or rear where access points are clearly identifiable at the subdivision or development stage.

Where access points are not clearly identifiable at the subdivision or development stage, crossings shall be constructed at the building consent stage.

Vehicle crossings shall be designed to enable the 99th percentile car to use them without grounding any part of the vehicle, and shall be designed in accordance with the NZTA Pedestrian planning and design guide. Structural design shall be adequate to carry the loads to be expected over its design life. All crossings shall be surfaced with asphalt or concrete or paving stone as approved by the TA.

Crossings shall be in accordance with diagrams contained in ~~appendix e~~ Appendix B.

Where stormwater drainage is provided by swale or open drain, crossings shall be provided as specified in 3.3.17.2.

Pram and wheelchair crossings shall be provided at all road intersections and pedestrian crossings. The crossings shall be sited to facilitate normal pedestrian movements in the road and where possible sumps shall be sited so as to reduce the flow of stormwater in the channel at the crossing entrance. Pram and wheelchair crossings shall satisfy

the NZTA Pedestrian planning and design guide.

3.3.19.7.4 Sump leads

Sump leads should be designed to be of sufficient size to convey all the design capacity of the sump to the system. The minimum size of the lead for public sumps shall be 200 mm diameter, but 300 mm diameter is desirable to minimise inlet losses and blockage risk. For double sumps with a single outlet and other high capacity sumps, the minimum size of lead required is 300 mm diameter. For private sumps, the minimum diameter should be 150 mm.

3.4.2.2 Sub-base

~~The sub-base layer immediately beneath the basecourse shall have a permeability of at least 10^{4} m/s for a depth of at least 100 mm.~~

~~The material used as sub-base shall be hard rock material with the largest aggregate size not larger than 60% of the depth of the layer or 65 mm. The material shall be sufficiently free draining so as not to be susceptible to undue weakening at highest in-service moisture content.~~

The subbase metal shall be AP 65 and shall meet the following requirements:

- Can be crushed or uncrushed
- At least 60% by mass shall pass the 37.5 mm standard sieve.
- At least 45% by mass shall pass the 19 mm standard sieve.
- Not more than 70% by mass shall pass the 9.5 mm standard sieve.
- Not more than 10% by mass shall pass the 0.300 mm standard sieve.
- Not more than 7% by mass shall pass the 0.075 mm standard sieve;
- Crushing resistance to be greater than 110 kN when tested in accordance with Test 3.10 of NZS 4407.

The sand equivalent shall not be less than 40 when aggregate is tested according to NZS 4407, Test 3.6 Sand Equivalent Test. Where uncrushed AP65 is proposed, it is the contractor's responsibility to ensure that it can achieve the requirements of NZTA B/2 Specification.

3.4.3 Road surfacing

3.4.3.1 Acceptable surfacing materials

All movement lanes shall be provided with a permanent, hard wearing surfacing layer, which shall be either impermeable or formed over an impermeable base. The surfacing shall be capable of carrying all stresses expected during its lifetime.

Acceptable surfacing options may include:

(a) Hot laid asphaltic concrete of minimum compacted thickness in accordance with NZTA M/10, laid over a waterproofing sealcoat;

(b) Other asphaltic concrete mixes such as friction course or macadam wearing mix laid over a waterproofing coat;

(c) Chip seals of various types, providing the equivalent of two bound chip coatings;

(d) Concrete block pavers; and

(e) Stone block surfacing where designed for aesthetic effects.

(f) Metalled surface at the sole discretion of LA.

~~To resist scuffing and local load effects, minimum surfacing standards as given in table 3.3 shall apply to the named facilities.~~ Minimum surfacing standards shall be in accordance with NZTA M/10 Specification, except where given in table 3.3 to the named facilities to resist scuffing and local load effects.

Use of concrete or stone block paving in public traffic areas shall require the specific approval of the ~~TA~~ Council.

Table 3.3 – Recommended surfacing standards

Facility	**Minimum surfacing**
Residential turning head	Segmental concrete pavers, concrete, 30 mm asphaltic concrete
Public carparks (excl. parallel parks)	Segmental concrete pavers, concrete, 30 mm asphaltic concrete
Commercial and industrial turning head	Segmental concrete pavers, concrete, 50 mm asphaltic concrete
Traffic islands and bus stops	Segmental concrete pavers, concrete, 50 mm asphaltic concrete

3.4.3.2 Road surface tolerances and texture

The finished surface of new roads shall have a NAASRA roughness satisfying the TA's standards at the time of construction. No abrupt or abnormal deviations shall occur and no areas shall pond water. The surface shall be of uniform texture expected by best trade practice and satisfy density standards applicable to the surfacing being used. ~~The skid resistance and surface texture of roads where design speeds exceed 70 km/h, shall comply with NZTA specification T/10 and its accompanying notes.~~

Where hard surfacing is required for areas that are not movement lanes, alternative materials and porous pavements that achieve the durability, maintenance, and amenity requirements are acceptable with the approval of the TA.

Roughness readings are not required on lengths 150m or less e.g. cul-de-sacs, as the shape requirements as per TNZ Specifications are expected to be sufficient to control isolated bumps over this short length.

NAASRA is recommended to be undertaken prior to surfacing however it is the finished surface which must satisfy Council Standards. The appropriateness of the NAASRA rating may depend on the road environment, consideration will be taken into account for short, low speed urban roads. It is recognised that survey equipment has operational limits. These include a minimum speed below which the quality of the data collected is compromised. Therefore the

Survey Contractor must advise the Client of the minimum speed and other conditions that adversely affect the data quality and advise how the data may be flagged when these situations are encountered. These limitations must be passed to Council along with the completed survey data.

Surface Ride for new, rehabilitated or reconstructed pavements

The new pavement must have an average dynamic roughness, when measured over a length of 100m, of less than 60 NAASRA counts/km for any three consecutive results and no individual value greater than 70 within the extent of the re-surfacing area unless it can be clearly attributable to a permanent feature such as a bridge joint.

Surface Ride for Resurfacing Sites

The pre-resurfacing site roughness measure must be obtained from RAMM database – high speed roughness count. Where these measures do not exist, testing must be performed. The average roughness count must be used to benchmark the resurfacing works, as described below.

The new surface when measured over a length of 100m must achieve an average NAASRA roughness less than the value calculated using the formula below. No two consecutive counts must exceed 70 and no individual count greater than 80 within the extent of the resurfacing are permitted unless this can be clearly attributable to a permanent feature such as a bridge joint.

NAASRA Count Criteria = 0.7D + 5 (D = average NAASRA roughness measure determined before the commencement of asphalt resurfacing.)

Where the roughness improvement criteria is not satisfied, remedial works must be undertaken to bring the roughness to the acceptable limit at no additional cost to ~~Auckland Transport~~ Council.

Surface Irregularities

The new pavement must be free from depressions or areas that pond water, any abrupt surface level, including service covers and irregularities exceeding 6 mm when measured with a 5m straight edge.

All service covers must be raised during new surfacing or resurfacing operations to be flush with the adjacent finished pavement surface level.

Density

The density requirements for the compacted mat are as defined in the NZTA M/10 specification or as stated in the specific contract requirements.

Flushing, Shoving, Segregation and other Defects

The asphalt surfacing must not exhibit any signs of flushing, shoving or segregation following completion of the works and at completion of the defect liability period. Water cutting is not an acceptable remedy for flushed surfaces.

4 Stormwater

4.1 Scope

Where community specific guidelines are available these shall be taken into consideration throughout the design and construction of subdivisions and development.

This section sets out requirements for the design and construction of stormwater systems for land development and subdivision. The significant issues for stormwater management are the protection of people, property, infrastructure, and the receiving environment. Stormwater management requires the integration of land use, roading, and ecological factors. A catchment-based approach is required with consideration of changes in catchment hydrology, and rainfall patterns from climate change effects. ~~, and sea level rise from climate change effects.~~

Opportunities exist with stormwater design to use or replicate the natural drainage system. Grassed swales, natural or artificial waterways, ponds and wetlands, for example, may in certain circumstances be not only part of the stormwater system, but also a preferred solution especially if low impact on receiving waters downstream is critical. Low impact design is the preferred approach, particularly where there is a requirement to replicate the pre-development hydrological regime. Nevertheless piped stormwater systems will often be required either in support of low impact systems or as the primary system.

Stormwater systems serve a number of purposes including the management of storm surface water run-off, treatment of such run-off, and groundwater control. All aspects need to be considered in design and achieved with minimal adverse effects on the environment.

4.2.1 Objectives

The designer shall agree the approach to be taken for stormwater with the Property and Infrastructure Team of Council prior to commencing any work or applying for resource consent.

The primary objective of a stormwater system is to manage storm surface water run-off to minimise flood damage and adverse effects on the environment.

The stormwater system shall include provision for:

(a) A level of service to the TA's customers in accordance with the authority's policies;

(b) Minimised adverse environmental and community impact;

(c) Protection from potential adverse effects to aquatic ecosystems;

(d) Compliance with environmental requirements;

(e) Adequate system capacity to service the fully developed catchment;

(f) Long service life with consideration of maintenance and life-cycle cost;

(g) Application of low impact design solutions;

(h) Climate change.

4.2.9 Climate Change

Climate change is expected to increase the intensity and frequency of heavy rainfall events, even in areas where mean annual rainfall is predicted to decrease. ~~In low-lying coastal areas higher sea levels will also affect rivers, streams, and stormwater outfalls. The performance of stormwater systems in these areas will need to take into~~

~~account higher predicted downstream sea levels.~~

Rainfall design charts shall be adjusted to take into account the predicted increase in rainfall intensities from the effects of climate change.

4.3.5 Design criteria

When the design process includes the use of a hydrological or hydraulic model, all underlying assumptions (such as run-off coefficients, time of concentration, and catchment areas) shall be clearly stated so that a manual check of calculations is possible. A copy of the model may be required by the TA for either review or records or both.

The design shall accommodate all upstream catchments. (The catchment area shall be based on geographical and topographical boundaries and not development boundaries).

Discharge to an existing reticulated network, or other Council owned stormwater network, shall require consent/permission from the Council.

Discharge to be at a rate no greater than would have occurred for the ~~underdeveloped~~ undeveloped catchment during a 60-minutes 5-year ARI rainfall event with no initial infiltration unless greater capacity in the downstream stormwater network can be proven through modelling or first principle hydraulic calculations. The designer shall undertake the necessary design and prepare design drawings compatible with the TA's design and performance parameters. Designers shall ensure the following aspects have been considered and where appropriate included in the design:

(a) The size of pipes, ponds, swales, wetlands, and other devices in the proposed stormwater management system;

(b) How the roading stormwater design is integrated into the overall stormwater system;

(c) The type and class of materials proposed to be used;

(d) System layouts and alignments including:

  (i) Route selection showing infrastructure to be vested located on Council Land only, unless specifically agreed with QLDC;

  (ii) Topographical and environmental aspects (see 5.3.4.3);

  (iii) Easements - The stormwater infrastructure shall be centrally located within the easement. Easements of a minimum width of 3.0m shall be provided for all storm water systems that are to be vested in Council or the system owner where they cross any private land;

  (iv) Clearances from underground services and structures (see 5.3.7.9 and 5.3.7.10);

  (v) Provision for future extensions;

  (vi) Location of secondary flowpaths;

(e) Hydraulic adequacy (see 4.3.9.5); and

(f) Property service connection locations and sizes (see 4.3.11).

The designer should liaise with the TA, prior to commencement of design, to ensure that sufficient prerequisite information is available to undertake the design.

For catchments less than 50 ha, surface water run-off using the Rational Method will generally be accepted. For larger catchments, or where significant storage elements (such as ponds) are incorporated, surface water run-off should be determined using an appropriate hydrological or hydraulic model.

The New Zealand Building Code (NZBC) clause E1/VM1 provides guidance in the design of pipes, culverts, and open channel hydraulics.

4.3.5.3 Tidal Areas

~~In tidal areas, design criteria should be discussed with the LAs at an early stage. Storm surge, tsunami hazards, and climate change, and sea level rise need to be taken into account in accordance with the proposed NES on sea level rise and assessed in line with the Ministry for the Environment guidance manual Coastal hazards and climate change – A guidance manual for local government in New Zealand.~~

C4.3.6

~~Sea level rise scenarios may need to be assessed in line with the proposed NES on sea level rise. Such assessments are likely to indicate the need to design for or at least plan for stormwater pumping in the future to ensure levels of service are maintained throughout asset life.~~

C4.3.7

Useful guidance on low impact design practices can be found in the following Auckland Council GD01 "Stormwater Management Devices", and GD04 "Water Sensitive Design for Stormwater" ~~*Auckland Regional Council (ARC) publications: 'Low impact design manual for the Auckland region, Technical Publication 124'; 'Application of low impact design to brownfield sites, Technical Report 2008-20'; and 'Integration of low impact design, urban design and urban form principles, Technical Report 2009-83'.*~~

Additional guides that may be useful are listed in Referenced Documents and Related Documents.

4.3.9.3 Minimum pipe sizes – amend clause

Minimum pipe sizes for public mains and sump leads unless otherwise specified shall be:

Single sump with single outlet	–	200 mm internal diameter
Double sump with double outlet	–	200 mm internal diameter
Public mains	–	200 mm internal diameter where only taking house leads
	–	300 mm internal diameter for all other mains and double sump leads with single outlets.

4.3.9.8 Outfall water levels

Where a pipeline or waterway discharges into a much larger system the peak flows generally do not coincide. Backwater profiles should produce satisfactory water levels when assessed as follows:

(a) Determine the time of concentration and set the design rainfall event for the smaller system;
(b) Determine the peak flow for the design event;
(c) Determine receiving waterway peak water level for the design rainfall event in (a);
(d) Starting with the level from (c) determine the smaller system profile at a flow of 75% of the flow from (b);
(e) Determine the receiving waterway mean annual flood water level;
(f) Starting with the level from (e) determine the smaller system water profile at the flow from (b);

(g) Select the higher of the two profiles determined for design purposes.

Similarly, for tidal outfalls, peak flow may or may not coincide with extreme high tide levels. A full dynamic analysis and probability assessment may be required.

~~Sea level rise shall be taken into account (see 4.3.5.3).~~

4.3.10.1 Manholes

Access chambers or MHs shall be provided at all changes of direction, gradient and pipe size, at branching lines and terminations and at a distance apart not exceeding 100 m unless approved otherwise. They shall be easily accessible and located clear of any boundary. All public mains shall terminate with a MH at the upstream end.

See 5.3.8.2 and 5.3.8.3 of this Code of Practice for further guidance on the location of MHs.

On pipelines equal to or greater than 1 m diameter, the spacing of MHs may be extended with the approval of the TA.

Appendix B drawings B1-5, B1-6, B1-7, and B1-13 ~~CM – 004, CM – 005, and CM – 006~~ for manholes may be adopted for stormwater systems.

4.3.10.3 Size of manholes

The standard internal diameter of circular MHs is 1050 mm and preferred nominal internal diameters are 1050 mm, 1200 mm, and 1500 mm.

When considering the appropriate MH diameter, consideration shall be given by the designer to the base layout to ensure hydraulic efficiency and adequate working space in the chamber. Where the effective working space is reduced by internal drop pipes, a larger diameter may be required. Where there are several inlets, consultation with the TA on the layout of the chamber is recommended.

The base layout of MHs shall comply with 5.3.8.4.2 of this Code of Practice. ~~and Appendix B drawings CM – 004 and CM – 005.~~

5 Wastewater

C5.3.5.3

~~*For infill situations, particularly where upgrading of existing DN 100 connections in sound condition and at reasonable grades would be impractical, it is common practice for up to six dwelling units to use the existing connection. However, such connections would not normally be taken over as public pipes by the TA.*~~

5.3.5.6 Maximum velocity

The preferred maximum velocity for peak wet weather flow is 3.0 m/s. Where a steep grade that will cause a velocity greater than 3.0 m/s is unavoidable or where a pipe of grade >7 % drains to a manhole, the following precautions shall be taken:

~~(a) Steep grades shall be continuous through the manhole at the same grade.~~

(a) Depth of a manhole to exceed 1.5m to invert for 150mmØ and 225mmØ pipes.

(b) Depth of a manhole is to exceed 2.0m deep for 300mmØ pipes.

(c) Change of direction at the manhole is not to exceed 45º.

(d) No drop junctions or verticals shall be incorporated in a manhole.

(e) Inside radius of channel inside a manhole is to be greater than 6 times the pipe diameter and benching is to extend 150mm above the top of the inlet pipe.

To avoid excessively deep channels within manholes, steep grades (>7 %) shall be "graded-out" at the design phase where practicable. The design of pipelines on gradients over 7% must be agreed with Council.

5.3.8.4.5 Effect of steep grades oh MHs

Where a pipe of grade >7% drains to a MH, the following precautions shall be taken if the topography and the connection pipes allow for:

(a) No change of grade is permitted at inlet to a MH;

~~(b) Steep grades are to be continuous through the MH at the same grade;~~

(b) Depth of MH is to exceed 1.5 m to invert for DN 150, DN 200, and DN 225 pipes;

(c) Depth of MH is to exceed 2.0 m deep for DN 300 pipes;

(d) Change of direction at the MH is not to exceed 45º;

(e) No drop junctions or verticals are to be incorporated in the MH;

(f) Inside radius of channel inside the MH is to be greater than 6 times the pipe diameter; and

(g) Benching is to be taken 150 mm above the top of the inlet pipe.

To avoid excessively deep channels within MHs, steep grades (>7%) shall be 'graded-out' at the design phase where practicable.

Grading the channel of the MH shall be limited to falls through MHs of up to 0.15 m. Where the depth of the channel within the MH would be greater than 2 x pipe diameter, then an internal or external drop structure shall be provided.

5.3.11 Pumping stations and pressure mains

Pressure mains shall be designed and installed in accordance with the standards of the TA. If the TA has no applicable standards, then they shall be designed in accordance with Sewage Pumping Station Standard WSA 04.

Wastewater and public toilets with pump stations or septic tanks shall be designed in accordance with Appendix G – Sewer Pump Station. Design of electrical systems shall be in accordance with the QLDC Electrical & SCADA Standard Network Flowmeters Standard (2010).

Surge analysis and protection against surge pressures will be also required for wastewater pump/ pumping main system.

All products and components including pumps shall be approved by the Council prior to submitting a design for acceptance. Deviations from the CoP may be considered at the Council's discretion.

All pressure main pipework shall be PE100.

Tracer wire shall be included on all pressure mains. Refer to section 6.5.3.4 for detail of form of wire and testing. For

pressure wastewater mains, the tracer wire shall run continuously between valves. At each valve the wire shall be ducted to the surface level through a length of polyethylene pipe ending immediately below the lid. The tracer wire shall be long enough to extend 600mm minimum above ground level when uncoiled. The excess length shall be neatly coiled in the valve box.

5.3.7.9 Clearance from underground services

Where a pipe is designed to be located in a road which contains other services, the clearance between the pipe and the other services shall comply with SNZ HB 2002, unless the TA has its own specific requirements.

For normal trenching and trenchless technology installation, clearance from other service utility assets shall not be less than the minimum vertical and horizontal clearances shown in table 5.6. Written agreement on reduced clearances and clearances for shared trenching shall be obtained from the TA and the relevant service owner.

Table 5.6 – Clearances between wastewater pipes and other underground services – add note

Utility **(Existing service)**	**Minimum horizontal clearance for new pipe size ≤DN 300** (mm)	**Minimum vertical clearance** (1) (mm)
Gas mains	300(2)	150
Telecommunication conduits and cables	300(2)	150
Electricity conduits and cables	500	225
Drains	300(2)	150
Water mains	1000(3)/600	500

NOTE –

(1) Vertical clearances apply when wastewater pipes and other underground services cross one another, except in the case of water mains when a vertical separation shall always be maintained, even when the wastewater pipe and water main are parallel. The wastewater pipe should always be located below the water main to minimize the possibility of backflow contamination in the event of a main break.

(2) Clearances can be further reduced to 150 mm for distances up to 2 m when passing installations such as poles, pits, and small structures, providing the structure is not destabilised in the process.

(3) When the wastewater pipe is at the minimum vertical clearance below the water main (500mm) maintain a minimum horizontal clearance of 1000 mm. This minimum horizontal clearance can be progressively reduced to 600 mm as the vertical clearance increases to 750 mm.

(4) Where possible, stormwater pipes should be located above wastewater pipes to prevent possible contamination if the wastewater pipe were to fail. Any instance where this is not planned needs to be specifically raised and agreed to by QLDC.

6 Water Supply

6.3.6.1 Materials

All parts of the water supply system in contact with drinking water shall be designed using components and materials that comply with AS/NZS 4020.

All pipes shall be HD PE100. Unless otherwise agreed in writing by the Council. Acceptance of design documentation without separate written approval shall not constitute acceptance of an alternative material.

Refer to clause 3.1.8 - Council Approved Materials List.

6.3.10.1 Standard Pipe Sizes

~~The principal main shall be standardised as DN 100, 150, 200, 250, 300, 375, 450, 525, 575, or 600 mm nominal diameter only. When larger pipes are required the exact diameter will be determined by the TA.~~ The principal main shall be as per manufacturers standard sizes that are readily available in New Zealand, and specifically the Otago region.

6.3.10.2 Minimum pipe sizes

The minimum pipe and fittings PN to be used for water reticulation mains shall be ~~PN 12~~ PN 12.5 ~~(see Appendix A for list of pressure pipe and fittings Standards)~~ (see clause 3.1.8 - Council Approved Materials List).

(a) DN 50 for rider mains in residential zones;

(b) DN 100 for residential zones;

(c) DN 150 for industrial or commercial zones.

The TA may also specify minimum pipe diameters for other identified areas such as CBDs.

6.3.10.3.2 Nominated pipe PN

The minimum pipe and fittings PN to be used for water reticulation mains shall be PN~~9~~ PN 12.5 ~~(see Appendix A for list of pressure pipe and fittings Standards)~~ (see clause 3.1.8 - Council Approved Materials List). Designers shall verify the TA's minimum requirement before specifying the required pipe PN.

6.3.16.2 Tapping bands

Each Residential Unit shall be provided with a 20mm (ID) dia connection. The connection to each Residential Unit shall include a 20mm (ID) dia Acuflo Manifold including internal backflow prevention located within an Acuflo manifold box on the property boundary within the road reserve.

For Multi-unit developments and multiple rears lots that exceed 5 lots or units then a suitably designed rider main can be installed with the toby valves located within the ROW adjacent to the individual properties or units.

Where it is not practical to install all the meters within the road reserve (i.e. multiple dwellings of three levels or greater), QLDC may at its sole discretion, consent to remote water meters being installed within the property, where they are readily accessible for reading, maintenance or replacement. In addition to separate meters within the property, multi-unit developments must also have a single property meter located on QLDC's side of the point of

supply.

The Acuflo manifold box shall be extended and the Acuflo manifolds shall be located with 550-650mm cover to ground level for all 20mm connections. The toby valve for all other service connections shall be located with 550-650mm cover to ground level within a standard valve box.

Valves shall be located clear of vehicle manoeuvring areas, where practicable. Where this cannot be achieved, the valve shall be protected within a pre-approved trafficable valve box.

Where the District Plan permits two or more Residential Units to be constructed on a single Lot, individual 20mm (ID) dia service connections shall be provided to each Residential Unit or one 25mm (ID) dia service connection for a maximum of two Residential Units. Each service connection shall be connected to the nearest trunk water main or rider water main. 25mm dia water connections shall be divided and reduced to a 20mm dia water connection to each Residential Unit served.

Tapping saddle fittings used with polyethylene pipe must comply with AS/NZS 4129. All other tapping bands should be in accordance with AS/NZS 4793. Mechanical saddles are acceptable for pipe sizes between DN63 and DN180. Electrofusion saddles are acceptable for pipe sizes between DN63 to DN315. A Tee shall be installed on pipe sizes over 315 mm diameter. Gunmetal tapping bands on polyethylene pipe is not permitted.

6.5.3.4 Tracer wire

Tracer wire in the form of a continuous 4 mm^2 multi strand (minimum 4) polythene sleeved copper cable, shall be installed with all non-metallic pipes to allow detection. The wire shall be strapped to the pipe wall by means of a minimum of two complete wraps of heavy duty adhesive tape, at a maximum of 3.0 m intervals. The wire shall have some slack to allow for bends in laying and for future installation of tapping saddles.

The tracer wire shall run continuously between valves and hydrants. At each valve or hydrant the wire shall be ducted to surface level through a length of polyethylene pipe ending immediately below the lid, The tracer wire shall be long enough to extend 600 mm minimum above ground level when uncoiled. The excess length shall be neatly coiled in the valve or hydrant box.

The tracer wire shall be tested for continuity between surface boxes using an electronically generated tone and detector probe or alternative approved method.

Note tracer wire is not required on water laterals.

7 Landscape

7.2.1 Approval

Consultation with the Council on landscape design and construction at an early stage, and prior to submission of any engineering designs for acceptance, is required. New planting plans are to be signed off by the Parks and Open Spaces Planning Manager prior to planting or establishment of planting areas.

Each TA may have specific landscape guidelines which will be detailed in district plans or codes of practice and some areas may be subject to special landscape requirements which will need assessment through a resource consent process. These may be subject to specific design consideration and approval by the TA. Stormwater systems including secondary flow paths shall be considered when landscape designs are determined, so as to avoid conflict or failure of these systems.

7.3.1 Location

Landscaping and planting should be designed to respond to the overall environmental context such as vegetation and water bodies, cultural and heritage elements, local road geometry, stormwater and reserve design, and utilities placement. Planting may include specimen trees, edible gardens, rain gardens, swales, and other amenity garden features. Refer to the Queenstown Lakes District Council Street Tree Planting Guidelines.

Infrastructural services should be planned at the same time as the landscape design so that tree and garden planting location does not compromise the integrity and efficient operation of services. If particular landscape conditions or objectives are required for a subdivision or development then these will need to be taken into account prior to undertaking detailed engineering design.

Detailed development plans showing distances of trees from paths, structures and underground services shall be provided for the approval of Queenstown Lakes District Council's Operations [Parks] department so as to reduce the potential for future conflicts between trees and infrastructure. All trees and vegetation planted near high voltage transmission lines must comply (including when maturity is reached) with the Electrical (Hazards from Trees) Regulations 2003.

All new trees in reserves and road reserves require the approval of the QLDC Arborist unless tress are approved species from QLDC Street Tree Planting Guidelines Appendix ~~L~~ I. ~~Refer Appendix I for QLDC Street Tree Planting Guidelines.~~

7.3.7 Quality Control

All plants shall be sound, healthy, vigorous, and free of any defects which may be detrimental to plant growth and development. In addition plants should have vigorous root and branch systems and plants supplied in pots should not be root bound. To ensure that plants adapt and thrive once planted they should be 'hardened off' prior to planting. Only species adapted to the site conditions shall be planted.

Biodegradable plant protectors/guards are only to be used (no plastic).

7.3.12 Playgrounds

New playground designs are to be signed off by the Parks and Open Spaces Planning Manager before resource consent is issued.

As-builts for all new assets are to be received by Council before 224c is approved.

7.4.4.3

All grass areas within a road corridor that has a speed limit in excess of 50km/h are to be planted with high fescue grass on screened soil.

7.4.11.1 Planting period and irrigation

Landscape plans shall ensure that future maintenance requirements have been considered so that ongoing costs are minimised. The maintenance period will vary depending on the nature type of planting and should be covered in specifications and as required by the TA.

The developer shall:

(a) Remove from the area all temporary services, machinery, and surplus materials that have been used for the construction, and leave the site in a tidy condition;

(b) Clean all paths and surrounding areas;

(c) Remove all plant labels;

(d) Clear and weed all channels;

(e) Ensure that all damaged, vandalised, stolen, or dead plants are replaced to maintain numbers and unity of display;

(f) Ensure that amenity planting beds are cleaned to remove prunings, dead or damaged leaves, and any other object or material, including retail attachments such as labels. The edges of the beds shall be left evenly shaped and sloped.

Land to be vested for reserves purposes shall as a minimum meet the following general requirements:

(g) The land is to be free of noxious weeds (Old Man's beard, Broom, Hemlock, Gorse, all Contoneaster species, all Buddleia species, Briar Rose, Darwin's Barberry, Blackberry, Grey Willow, Cracked Willow, Contorta Pine, Ragword, all Thistle species, Spanish Heath, Tree Lupin, Hawthorn, Sycamore, Silver Birch and all other plants as listed and updated on the Otago Regional Councils website for Pest Plant control), tree stumps (above ground) and other specified vegetation identified.

(h) All previous fences, farm utilities, building remains, and rubbish are to be removed or disposed of to the satisfaction of the TA;

(i) Land to be mown shall be accessible to suitable mowing equipment, and is to have an established turf type seed grass cover;

(j) Drainage reserves, ponds, lakes, channels, and streams requiring maintenance shall have suitable access for machinery;

(k) All boundaries are to be surveyed and clearly pegged or fenced where required;

(l) Any rights of way or easements are to be formalised at no cost to the TA;

(m) Any proposed landscape planting or furniture/structures shall be completed.

Appendix A – Acceptable Pipe and Fitting Materials

Appendix B - Standard Construction Drawings

Table of Drawings

Drawing B1-1: Typical Combined Service Trench Detail

Drawing B1-2: Standard Pipe Embedment

Drawing B1-3: Typical Pipe Bedding & Backfill for Carriageways

Drawing B1-4: Typical Pipe Bedding & Backfill for Vehicle Crossings & non trafficable

Drawing B1-5: Manhole Detail A –Typical Plan view

Drawing B1-6: Manhole Details B

Drawing B1-7: Manhole Detail C

Drawing B1-8: Mini & Drop Manhole Detail

Drawing B1-9: Stormwater or Wastewater DN375 to DN750

Drawing B1-10: Manhole Detail – Typical Cross Section

Drawing B1-11: PVC Inspection Chamber (Residential Only)

Drawing B1-12: Lateral Connections for two Properties

Drawing B1-13: Manhole: Typical Heavy Duty Frame & Lid

Drawing B1-14: Domestic Drainage (Shallow Connection) Detail

Drawing B1-15: Domestic Drainage (Deep Connection) Detail

Drawing B1-16 Anti-Scour Blocks For Steep Lines

Drawing B2-1 Fire Hydrant

Drawing B2-2 Fire Hydrant Cover

Drawing B2-3 Typical Cast Iron Valve Box

Drawing B2-4: Typical Service Connection

Drawing B2-5: Sluice Valve Detail

Drawing B2-6: Typical Thrust Block Details

Drawing B2-7: Residential Fire System Connection with Potable Supply

Drawing B2-8: Commercial Fire System Connection with Potable Supply

Drawing B2-9: Water Supply with Bulk Flow Meter

Drawing B2-10: PRV Valve Chamber

Drawing B2-11: Water Sampling Point

Drawing B3-1: Private Pressure Sewer Main Connection to Sewer Lateral

Drawing B3-2: Pump Station: Split Access Hatch

Drawing B3-3: Pump Station: Split Access Hatch Sections

Drawing B3-4: Pump Station: Split Access Hatch Frame Details

Drawing B3-5: Pump Station: Split Access Hatch Cover Details

Drawing B4-1: Inlet & outlet Structures

Drawing B4-2: Concrete Capping Detail

Drawing B4-3: Rip Rap Lined Swale

Drawing B4-4: Rip Rap Lined Swale

Drawing B4-5: Scruffy Dome Detail

Drawing B4-6: Soak Pit

Drawing B5-1: Dimensions of No-Exit Road Turning Areas

Drawing B5-2: Turning Areas for No-Exit Roads

Drawing B5-3: Parking Bay

Drawing B5-4: Subsoil drains - Roadside

Drawing B5-5: Typical swale detail (1)

Drawing B5-6: Typical Swale Detail (2)

Drawing B5-7: Typical Check Dam Detail

Drawing B5-8: Kerbs and Dished Channels

Drawing B5-9: Typical sump to driveway or right of way

Drawing B5-10: Flat channel or Yard Sump – Private Only

Drawing B5-11: Road Sump Detail

Drawing B5-12: Different Grate Layouts

Drawing B5-13: Standard Section Through Grate

Drawing B5-14: An Alternative Sump for Hillside Situations

Drawing B5-15: Double back-entry sump for road low points and alternative

Drawing B5-16: Traversable Grates for Precast Headwalls 255mm to 450mm culverts

Drawing B5-17: Mountable Grates for Precast Headwalls 255mm to 450mm Culverts

Drawing B5-18: Road Sump Detail: Heavy Duty Frame & Grate

Drawing B5-19: Light Sump Frame & Grate

Drawing B5-20: Berm Sump Detail

Drawing B5-21: Vehicle Crossing - Residential

Drawing B5-22: Vehicle Crossing – Commercial / Industrial

Drawing B5-23: Private Rural Access

Drawing B5-24: Non-Precast Headwall Detail

Drawings B5-25: Heavy Duty Footpath

Drawing B5-26: Footpath - Asphalt & Gritted Detail

Drawing B5-27: Pedestrian Crossing Detail

Drawing B5-28: Pram Crossing Construction Detail

Drawing B5-29: Low Retaining Wall: Stacked Rock

Drawing B5-30: Low Retaining Wall: Post & Plank

Drawing B5-31: Low Retaining Wall: Gabion

Drawing B6-1: 7 Wire Plain Fence

Drawing B6-2: Street Lighting: Ground Planted Columns

Drawing B6-3: Street Sign: Pole Mounted

Drawing B7-1:CM – 001 Embedment & Trenchfill Arrangement

Drawing B7-2: CM003 Bulkheads & Trench stop Standard Details

Drawing B7-3: WS – 001 Typical mains construction –Reticulation main arrangements

Drawing B7-4: WS – 002 Typical Mains Construction – Distribution And Transfer Mains

Drawing B7-5: WS – 003 Property Services – Connection to Main

Drawing B7-6: WS – 005 Thrust and anchor blocks – Gate valves and vertical bends

Drawing B7-7: WS - 006 Valve and Hydrant Identification Marker Posts

Drawing B7-8: WW – 001 Pipelaying – Typical arrangements

Drawing B7-9: WW – 002 Property connections – Buried interface method

Drawing B7-10: WW – 003 Maintenance shafts – Typical installation

Drawing B7-11: WW – 004 Maintenance shafts – MS and variable bend installations

Drawing B7-12: WW – 005 Maintenance shafts – TMS and connection installations

Drawing B7-13: WW – 005 Maintenance shafts – Typical MS cover arrangements

Appendix C – Field Testing of Pipelines

Appendix D – Water Supply Disinfection Specification

Appendix E – Typical Plan and Cross Section Figures from Table 3.2

Appendix F – Irrigation System

Appendix G – Sewer Pump Station

G1 General Requirements

13 Public Toilets

i. All new public toilet facilities with a pump station or septic tank must be connected to SCADA and comply with this Electrical and SCADA Standard.

ii. The following parameters should be monitored for new public toilets connected to SCADA:

- Well levels
- Pump status
- High/low warnings
- Any faults
- Loss of communications

i. Spare capacity in the RTU should be provided for a flow meter to be installed in the future.

Appendix H – Water Supply Pump Station Design Guidelines

Appendix I – Street Tree Planting Guidelines

Appendix J – Cycle Trail and Track Design Standards & Specifications

Appendix K – Three Waters Facility Asset Identification Specification