

Porirua City Council Code of Land Development and Subdivision Engineering

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Contents

Preamble	4
Introduction.....	4
Innovative, creative alternative solutions; Performance-based Code.....	7
General Requirements and Procedures	8
Performance Goals	8
Performance Criteria	8
Special Provisions:	8
Land Stability, Foundations and Earthworks.....	11
Performance Goal.....	11
Performance Criteria	11
Special Provisions: Land Stability, Foundations and Earthworks.....	13
Roading and Access.....	17
Performance Goals	17
Performance Criteria	17
Special Provisions: Roading and Access.....	21
Stormwater Drainage	31
Performance Goal.....	31
Performance Criteria	31
Special Provisions: Stormwater Drainage	34
Wastewater.....	42
Performance Goal.....	42
Performance Criteria	42
Special Provisions: Wastewater	46
Water Supply	54
Performance Goal.....	54
Performance Criteria	54
Special Provisions: Water Supply	57

Landscape Design and Practice 61

Reserves 61

Power, Telecommunications, Gas..... 62

 Performance Goal..... 62

 Performance Criteria 62

 Special Provisions: Power, Telecommunications, Gas 64

Appendix: Council Specifications 66

Preamble

Pursuant to Section 31(1)(a) of the Resource Management Act 1991, the Porirua City Council has resolved at its meeting on 24 February 2010 to adopt as its Code of Land Development and Subdivision Engineering:

- (a) The Goals set out in this document;
- (b) The Performance Criteria set out in this document;
- (c) New Zealand Standard NZS 4404:2004:"Land Development and Subdivision Engineering"; and
- (d) Additions and amendments to NZS 4404:2004 as set out in the Porirua City Council Special Provisions, set out in this document.

Introduction

Porirua City Council's Code of Land Development and Subdivision Engineering ("the Code") provides a guide for development and subdivision in Porirua City. It integrates sustainable principles of land development intended to enhance water quality, to minimise land disturbance, to preserve native vegetation and to minimise impervious surfaces.

Council has agreed, through its Long Term Council Community Plan, to work towards the long-term outcomes of a healthier, safer, better-connected, more habitable and more sustainable city. This Code helps to achieve these goals through promoting sustainable management of natural and physical resources. It provides for a mixture of preferred or required engineering standards and best environmental practice for earthworks, open space, roading and stormwater.

Through requiring certain assets to be designed and built to approved engineering standards the Code provides the cornerstone of public health and safety. The provision of adequate potable water supplies and treatment and disposal of wastewater are not open to many alternative solutions, as these services must be compliant, as a minimum, with the following legislation:

- Resource Management Act 1991
- Building Act 2004
- Local Government Act 2002
- Land Drainage Act 1908
- Health Act 1956
- Forest and Rural Fires Act 1977
- Soil Conservation and Rivers Control Act 1941
- Civil Defence Emergency Management Act 2002
- Health and Safety in Employment Act 1992
- Drinking Water Standards for New Zealand 2005

This Code has been written to complement the District Plan by providing more detailed technical standards necessary for land development and subdivision. Should there be a discrepancy between the District Plan and this Code, the District Plan takes precedence.

The primary purpose of this Code is to provide a standard technical document for all users. It is intended for planners, designers and developers servicing the land development industry and for work done on behalf of the Council for asset construction, relocation, replacement and renewal.

The procedures and standards used for rural subdivisions are generally the same as for urban subdivisions, except as modified in the relevant chapters.

The Code is set out in sections relating to specific infrastructure categories:

- a) Earthworks;
- b) Roothing;
- c) Stormwater;
- d) Wastewater;
- e) Water Supply; and
- e) Other Utilities.

There is some overlap between these categories (for example, roading performance requires adequate stormwater drainage, and the location of various services must be coordinated). Reference should be made to all sections as appropriate.

This Code supersedes the 1983 PCC Code of Urban Subdivision, which was based on NZS4404:1981: Code of Practice for Urban Land Subdivision.

This new PCC Code has been prepared in response to significant changes since 1983, including the introduction of the Resource Management Act 1991 and NZS4404:2004, and taking into account submissions, comments and meetings with interested parties during the drafting of the Code.

The coverage of the new PCC Code has been widened to apply throughout the city to all urban and rural areas, and applies to all works, whether for land developers or for power, telephone or gas utility service operators wishing to provide new services within Porirua.

This Code should be read in conjunction with Porirua City Council's standard specifications for engineering works. A list of Council specifications is included as an Appendix.

The new Code is structured into three tiers:

- (a) Overarching performance goals;
- (b) Performance criteria; and
- (c) Acceptable solutions.

Level	Section	Location	Purpose
	District Plan Objectives and Policies	District Plan	Sets relevant planning policy under the Resource Management Act which must be met by the Code of Practice
1	Performance Goal	PCC's Code of Land Development and Subdivision	Sets the primary outcome required for properly performing infrastructure
2	Performance Criteria	PCC's Code of Land Development and Subdivision	Sets the performance requirements of the PCC. Fulfilment of these may be by any means including the specified Acceptable Solution.

Level	Section	Location	Purpose
3	Acceptable Solution	PCC's Code of Land Development and Subdivision together with NZS 4404:2004 – the New Zealand Standard for Land Development and Subdivision Engineering,	Provides one set of methods by which the Performance Goals and Criteria may be met. These are detailed provisions that can be used to design infrastructure suitable for Porirua conditions. Equivalent alternatives are not precluded from consideration.

Acceptable Solutions and Relationship with NZS 4404:2004

In using this Code an acceptable solution comprises:

- (a) NZS4404:2004 which provides a means of satisfying general engineering requirements throughout New Zealand. (This national standard establishes general engineering requirements that provide the required level of servicing that would satisfy developers, property owners and Asset Managers);

together with any:

- (b) Special Provisions specific to Porirua City that amends and adds to NZS4404:2004. (All territorial authorities set their own specific requirements relating to their own local authority conditions and requirements).

This Code and NZS 4404:2004 go hand in hand. They work in conjunction with each other to outline the requirements for the provision of infrastructure to support the development of Porirua City. The combination of PCC's Code and NZS 4404:2004 is referred to as the “PCC Code of Practice”.

The Council, in determining the conditions to be imposed on a resource consent for subdivision or land use, shall have regard to the Code of Practice and the extent to which the development achieves the outcome and meets the guidelines set out in this document.

Reference should also be made to the District Plan provisions for development and financial contributions that are required under the Local Government Act and the District Plan.

For the most part, in the third section of the Code of Practice, 'Acceptable Solutions' is based on just NZS4404:2004. NZS 4404:2004 is the 'default Code'. For any given subject, where Council is satisfied that the provision in NZS 4404:2004 is perfectly adequate, no further requirement is made, and NZS 4404:2004 is not reproduced in this Code.

However, where Council feels that a departure from NZS 4404:2004 is required to address an issue specific to Porirua City, a new provision is set out in the "Special Provisions" section, together with a cross reference to the corresponding provision in NZS 4404:2004. Thus, the third section of this Code, 'Special Provisions', comprises a list of variations from NZS 4404:2004 specific to Porirua City.

The Special Provisions amend and add to NZS 4404:2004. The paragraph and clause numbers refer to those in NZS 4404:2004. Where there is conflict between these Special Provisions and NZS 4404:2004, then the Special Provisions shall have precedence.

Innovative, creative alternative solutions; Performance-based Code

Although most developers are prepared to use the standard "acceptable solutions" as the means of meeting the performance goals, there are some who desire more flexibility. To meet these wishes this Code enables developers to propose innovative and creative alternative solutions; they just need to be able to demonstrate that their solution (a) meets the Level 2 Performance Criteria; and (b) is equivalent to the Level 3 Acceptable Solutions (that is, it would provide the same level of service for both customers and Council).

This Code is intended to be "performance-based", rather than "prescriptive". That is, it enables people to use alternative means of meeting the same requirements. For example, a prescriptive Code may say, for earthworks, no fill batter slope shall be steeper than 1 in 2, or 26 degrees. A performance-based code enables a developer to construct a steeper batter slope, provided they use properly designed engineering technology (which might be appropriately anchored and reinforced geotextile fabric, for instance) to hold the fill in place.

There may be instances where an objective can be best achieved by a means not anticipated by this Code. In this situation, departure from the Code is justifiable provided it can be demonstrated that the proposed design solution is in accordance with the 'Goals' and 'Performance Criteria' and delivers an outcome equivalent to recognised 'Acceptable Solutions'.

General Requirements and Procedures

Performance Goals

While at all times avoiding, remedying or mitigating any adverse effects on the environment;

To ensure that subdivisional work and the construction of public infrastructure is carried out competently, and that completion documentation is provided to certain minimum standards.

Performance Criteria

To achieve the Performance Goal, development proposals shall demonstrate that they have considered and addressed the following criteria:

Performance Criterion

General - to cover any construction works and outline relevant Council standards

All subdivisional works shall be carried out in accordance with:

- the approved services plan;
- the conditions of resource consent; and
- this Code.

Special Provisions:

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004
1.2.2.1	New Clause	<p><i>Requirements of authorities other than Council</i></p> <p>In addition to the Council, bodies or persons that may require to be consulted in respect of any proposed subdivision of land include:</p> <ul style="list-style-type: none"> • The Greater Wellington Regional Council; • The electricity supply utility operators; • The gas supply utility operators; • The telecommunications utility operators; • The New Zealand Historic Places Trust; • The national highways operator; and • Ngati Toa.
1.2.3	Add Terms	<p><i>Definitions</i></p> <p>ACCEPTABLE SOLUTIONS – means NZS4404:2004 plus PCC Special Provisions;</p> <p>CODE OF PRACTICE – means this Code plus NZS4404:2004;</p> <p>DISTRICT PLAN – means the Porirua City District Plan</p> <p>SPECIAL PROVISIONS – means the list of variations to NZS4404:2004, specific to Porirua City Council, set out in this Code.</p>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004
1.2.4		<i>Abbreviations</i>
	Add	S.224(c) RMA – Section 224(c) of the Resource Management Act 1991 PCC Code (or "the Code" or "this Code") – The PCC Code of Land Development and Subdivision Engineering 2010; PCC – Porirua City Council; RMA - Resource Management Act 1991
1.5.1.1	Add Paragraph	Under (c) For any subdivision of 50 lots or more, or of 20 lots or more in hilly terrain or where the subdivision is part of a larger overall development, the following survey requirements shall be met: <ul style="list-style-type: none"> (i) a level benchmark is to be established within the subdivision; (ii) the benchmark is to be a brass or stainless steel pin set in a substantial block of concrete and accurately levelled to urban standards in terms of Wellington Mean Sea Level; (iii) A drawing showing the location in terms of Wellington GD 2000 and level, with a note of the existing benchmarks used to determine the level of the new benchmark, shall be supplied.
		<i>Contents of drawings</i>
1.5.2.4	Add Paragraphs	Under (e) Details and location on stormwater reticulation plans of catchment area limits and actual areas, showing existing ground levels, both on the land to be subdivided and on adjoining properties, to indicate how the land drains prior to the subdivision and the location of any secondary overland flow paths. Under (h) Underground reticulation of all utility services except in any particular subdivision or part thereof where Resource Consent has been obtained for an alternative. New (j) Details of proposed relocation of any existing services.
		<i>Completion documentation</i>
1.5.10	Replace paragraph	(b) As-built plans of all infrastructures showing the information set out in Schedule 1D and complying with Council's "As Built Requirements" shall be submitted in an electronic format compatible with Council's GIS system and Hansen asset data-base for all infrastructures to be vested in Council. Electronic as-built plans (including a schedule of easements) showing surveyed co-ordinates in Wellington Circuit 2000 and levels in terms of MSL for all services within the development shall be submitted to Council once construction is complete. No assumed datum shall be submitted. The Council shall supply the electronic format that is to be used. The information to be given in as-built plans shall include but shall not be limited to: (a) Stormwater and wastewater reticulation – including the co-ordinated positions of manholes, manhole inverts, inverts of pipes and lid levels, invert level of any incoming pipe at a different level from the outgoing pipe, measurements to house connections, and laterals and their length and position. Positions of connections and laterals shall be referenced to adjacent manhole lids and boundary pegs. The

NZN 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004
		<p>diameter of manholes and the shape and configuration of catchpits should be shown. Use of any proprietary treatment or filtration device should be shown and full details provided. A record of the completion CCTV inspection (where required) of all newly constructed public mains shall be supplied in DVD format.</p>
1.7.1	New Clause	<p><i>Insurance</i></p> <p>Where the developer's contractors carry out work in a public place, the developer shall ensure that the contractor has a current Public Liability Insurance Policy as specified in Schedule 1A indemnifying the Council in respect of any one claim or series of claims arising out of the same occurrence. Such insurance shall be comparable with and no more onerous than that required from others working in a public place.</p> <p>Engineers providing Certification of works shall be covered by Professional Indemnity Insurance to a sum commensurate with the current amounts recommended by IPENZ, ACENZ, TNZ and INGENIUM.</p> <p>The developer may be required to produce to Council's representative the policy of insurance and the receipt for payment of the current premium.</p>
1.8.1	New Clause	<p><i>Final Acceptance</i></p> <p>In addition to any other work which may be required by the Council prior to final acceptance and issue of section 224(c), the developer shall have the following works carried out:</p> <ul style="list-style-type: none"> (a) berm grass to be mown and showing a 95% strike rate; (b) carriageways and footpaths swept; (c) channels, sumps and silt structures cleaned out; and (d) contractor's site office and all other temporary buildings removed, and working area cleared and left in a tidy condition. <p>Provision for a bond to be paid in lieu of completion of works required for final acceptance shall be included in the conditions of the resource consent at the discretion of Council and approval in principle obtained prior to lodging the resource consent.</p>

Land Stability, Foundations and Earthworks

Performance Goal

While at all times avoiding, remedying or mitigating any adverse effects on the environment.

To manage the alteration of land forms to provide for the development and use of land.

Performance Criteria

To achieve the Earthworks Performance Goal, development proposals shall demonstrate that they have considered and addressed the following criteria:

Performance Criterion

Stability

Ensure safety and stability of all batters and platforms created by earthworks, under all anticipated loadings as judged by a suitably qualified and experienced professional engineer with reference to the relevant codes.

Enhance the stability of the existing land form, where appropriate and necessary.

Strength

Ensure earthfills are constructed of suitable materials, and to a standard of compaction which is adequate to provide for reasonable expectations of the proposed use, and future use and development.

Visual Amenity

Ensure that any adverse visual effects caused by modifications to topography by earthworks are adequately avoided, remedied or mitigated.

Functionality

To undertake earthworks in a way so that alterations to the natural topography do not:

- adversely affect the ability of existing utilities to serve the modified site, or surrounding area;
- divert stormwater from its natural catchment; and
- create an increased flood risk or other hazards.

There shall be no interruption of natural drainage ways or overland flow paths without prior written consent from PCC and the Greater Wellington Regional Council.

Cultural and Heritage Sites

Ensure that earthworks do not adversely impact on cultural, historical and archaeological sites.

Performance Criterion

Outstanding Natural Features, Ecological and Coastal Sites

Ensure that earthworks do not adversely impact on ecological and coastal sites, including riparian margins, and that areas of significant indigenous vegetation, significant habitats of indigenous fauna, notable trees and outstanding natural features are preserved.

Documentation

Maintain a record of the works carried out, and the testing of the works, by way of Certification. The developer shall provide the Council with a certificate from a suitably qualified and experienced professional engineer, who has been engaged by the developer to supervise the works, verifying that the works that require certification have been completed to the required standard.

Environmental Quality

Ensure that environmental quality is taken into account in design and construction of earthworks. Earthworks should be designed and constructed in a way that:

- avoids or remedies adverse effects from earthworks on freshwater ecosystems, streams and watercourses, Porirua Harbour, the Pauatahanui Inlet and the coastal marine area;
- provides for on-site silt and sediment management and erosion control; and
- provides for dust control.

Special Provisions: Land Stability, Foundations and Earthworks

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004								
2.1	Add	<i>(e) house lots are shown over areas of fill.</i>								
2.4.1	Add	There shall be no interruption of natural drainage ways or overland flow paths without prior written consent from PCC and the Greater Wellington Regional Council.								
2.4.2	New Clause	<p><i>Resource Consent Application</i></p> <p>A suitably qualified chartered professional engineer experienced in geotechnical matters shall be required to design, supervise and certify where earthworks exceed:</p> <p>(a) in the urban zone: 1.5m in depth of cut to an extent of 30m³ or more, or 0.3m in height of fill to an extent of 30m³ or more, or a slope exceeding 25° from the horizontal; and</p> <p>(b) in the rural zone: 1.5m in depth of cut to an extent of 100m³ or more, or 0.3m in height of fill to an extent of 100m³ or more, or a slope exceeding 25° from the horizontal.</p>								
2.5		Stability criteria								
	Add Paragraph	Where the District Planning Maps identify areas of stability concerns, or Council otherwise considers that the stability of the land requires special investigation, the developer shall supply a report from a suitably qualified chartered professional engineer experienced in soil mechanics and geotechnical matters. The report shall set out the facts relating to the investigations together with the test results and such other data as his recommendations for development may depend on.								
C2.6.1	New Clause	<p><i>Weathered Greywacke</i></p> <p>Cut batters in weathered greywacke should be no steeper than the following:</p> <p>For cut batters less than 6 metres in height:</p> <table border="0"> <tr> <td>(a) Grade I to Grade II</td> <td>¼ horizontal to 1 vertical</td> </tr> <tr> <td>(b) Grade II to Grade III</td> <td>½ horizontal to 1 vertical</td> </tr> <tr> <td>(c) Grade III to Grade IV</td> <td>¾ horizontal to 1 vertical</td> </tr> <tr> <td>(d) Grade IV to Grade V</td> <td>1 horizontal to 1 vertical</td> </tr> </table> <p>For cut batters over 6 metres, but not higher than 10 metres, in typical moderate to highly weathered greywacke, 1 horizontal to 1 vertical, exclusive of bench width.</p> <p>For cut batters over 10 metres in typical moderate to highly weathered greywacke, 1.5 horizontal to 1 vertical exclusive of bench width.</p> <p>Unless qualified by a report prepared by a suitably qualified chartered professional engineer experienced in soil mechanics and geotechnical matters, the soil overburden on rock cut batters should be cut back to be not steeper than 1.5 horizontal to 1 vertical.</p> <p>Unless qualified by a report prepared by a suitably qualified chartered professional engineer experienced in soil mechanics and geotechnical matters, benches should be cut in all cut batters over 6 metres in height, at</p>	(a) Grade I to Grade II	¼ horizontal to 1 vertical	(b) Grade II to Grade III	½ horizontal to 1 vertical	(c) Grade III to Grade IV	¾ horizontal to 1 vertical	(d) Grade IV to Grade V	1 horizontal to 1 vertical
(a) Grade I to Grade II	¼ horizontal to 1 vertical									
(b) Grade II to Grade III	½ horizontal to 1 vertical									
(c) Grade III to Grade IV	¾ horizontal to 1 vertical									
(d) Grade IV to Grade V	1 horizontal to 1 vertical									

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004
		<p>intervals of not less than 6 metres. Benches should be not less than 1.2 metres in width, and grade back to the batter face at 1 in 10. The benches should have longitudinal grades of not less than 1 in 100, and provision to collect and discharge the stormwater run-off in an acceptable manner. The engineer's Methodology Statement should include a programme for clearing the benches of minor slips until long term stability can be regarded with confidence.</p> <p>The above general standards should not be applied where jointing in the rock fabric, or loading to the top of the batter, will influence the stability of the batter. In these cases a suitably qualified chartered professional engineer experienced in geotechnical matters will decide.</p> <p>(Refer to the Table 2.1 Weathering Classification for further information).</p>
Table 2.1	New Table	Weathering Classification
C2.6.2	New Clause	<p><i>Other materials</i> Where cuttings are proposed in materials other than weathered greywacke, cut batters should be designed according to accepted soil mechanics procedures. The designs should be supported with testing and calculations.</p>
C2.6.3	New Clause	<p><i>Clearances from Cut Batters</i> For cuttings in weathered greywacke rock, the top of the batter, or the base of the batter should be at least 2 metres from any buildings, unless stability is provided by a retaining wall. The base of the batter should be no less than 1 metre behind the back edges of a footpath or driveway or the back of a kerb where there is no footpath.</p> <p>The top edge of the batter or the toe of the batter should be at least 1m from any property boundary.</p> <p>Any buildings on top of the batter should lie beyond a line extended at 45 degrees from the base of the batter. Buildings at the base of a batter should lie outside a line extended at 45 degrees from the top of the batter.</p> <p>In materials other than weathered greywacke rock, the clearances of buildings should be subject to normal soil mechanics calculation.</p>
2.8		Erosion, sediment and dust control
2.8.1	Add Paragraphs	<p><i>Minimization of effects</i> The developer shall apply for and obtain all necessary consents from all relevant authorities prior to commencing works.</p>
2.8.2	Add Paragraphs	<p><i>Protection measures</i> The developer shall prepare and implement an Erosion and Sediment Control Management Plan.</p> <p>The developer shall comply with the current version of:</p> <p>(a) the PCC General Bylaw 1991 Part 24 Silt and Sediment Control; and (b) Greater Wellington Regional Council "Erosion and Sediment Control Guidelines for the Wellington Region".</p>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004
C2.8.2		<i>Protection measures</i>
	Add Paragraphs	<p>(m) Areas opened up for earthworks at any one time should be the minimum size necessary to permit orderly progression of the works.</p> <p>(n) The individual areas of cut and fill should be completed progressively in stages and the completed areas top-soiled and sown with grass, or hydro-seeded, as soon as practically possible, and maintained until a full strike is obtained.</p> <p>(o) No new area of earthworks should be opened up until the previously worked-on area has been substantially completed, top-soiled and grass sown.</p>
2.9		Seismic considerations
	Add Paragraph	Reference shall be made to the District Plan Seismic Hazard Maps, and all other relevant references to seismic fault-lines or hazards to ensure the proposed works are not at risk from seismic activity.
2.11.1		<i>Geotechnical completion report</i>
	Add Paragraph	<p>The report shall specify the time stipulated by a suitably qualified chartered professional engineer experienced in geotechnical matters where compacted fills shall be left to permit consolidation prior to the commencement of any building work.</p> <p>The report shall either certify that a building site is available on each allotment which is suitable for conventional foundations in accordance with the current version of NZS 3604, or:</p> <p>(a) shall supply the Council and prospective purchasers of each allotment with specific recommendations for foundation design (where a developer proposes house sites unsuitable for conventional foundations); and</p> <p>(b) contain a recommendation for a Consent Notice pursuant to s.221 RMA, to the effect that: " ... any building construction or earthworks shall be designed by a chartered professional engineer experienced in soil mechanics and geotechnical matters; who shall provide specific design for foundations of buildings and earthworks, which takes into account the development limitations of the lots".</p>
C2.12		Fill batters
C2.12.1	New Clause	<p><i>Maximum slope of Fill Batters</i></p> <p>The maximum slope of fill batters should not be steeper than 1 vertical to 2 horizontal unless specifically designed by a suitably qualified chartered professional engineer experienced in geotechnical matters.</p>
C2.12.2	New Clause	<p><i>Clearances from Fill Batters</i></p> <p>The top or the toe of a batter should be at least 3 metres from any existing building, or proposed building location, and at least 1m from any property boundaries unless specifically designed by a suitably qualified chartered professional engineer experienced in geotechnical matters.</p> <p>Beside roading the top edge of the batter, or the base of the batter, should be at least 1 metre behind the rear edge of the footpath, or the back of the kerb where there is no footpath. The clearance of the batter toe or top should also make allowance for the installation of utility servicing.</p>

Table 2.1 Weathering Classifications

Term	Grade	Colour	Appearance of Weathered Material	Sampling
Residual Soil (Rw)	VI	Various	Rock discoloured and completely changed to soil. Original fabric of rock has completely disappeared.	Readily sampled with triple tube core barrier. Core recovery in excess of 90% possible with careful drilling with well maintained equipment.
Completely Weathered (Cw)	V	Generally light yellow - brown	Completely crushable to silt under finger pressure. Sandy texture of original rock fabric clearly visible in undisturbed material. Very closely spaced joints in original rock clearly marked with black stains in undisturbed material. There does not seem to be any characteristic joint orientation evident.	As above
Highly Weathered (Hw)	IV	Generally light yellow - brown	Most of the material can be crushed to silt and sand sizes under finger pressure but occasional lumps of harder material remain, typically smaller than 20mm sandy texture of original rock clearly visible in undisturbed material.	Can be sampled with triple tube core barrel. Core recovery generally in excess of 75% with careful drilling and well maintained equipment.
Moderately Weathered (Mw)	III	Brown to rusty brown	Undisturbed material is very tight, sometimes with a small amount of fines on the joint surfaces. On disturbing can be separated into individual pieces which are hard, angular and apart from slight crumbling at edges cannot be crushed under hand pressure. Pieces easily broken with a light hammer blow and trimmed with a knife. Brown colour due to weathering extends through pieces. Joint surfaces are clearly marked but not so stained as grades IV or V. As above no characteristic joint orientation evident.	Can be sampled with triple tube core barrel but with some difficulty. Runs tend to be short usually less than 450mm. Core recovery may be down to 50%.
Slightly Weathered (Sw)	II	Brown to rusty brown	Hard very closely jointed rock. Separate pieces angular and require moderate hammer blow to break. Brown colour penetrates only a short distance into material, interior has colour and texture of unweathered greywacke.	Cannot be sampled with triple tube core barrier used on above grades; requires diamond drilling.
Fresh Rock (Fr)	I	Light grey	Unweathered greywacke, shows no discolouration, loss of strength or any other effects due to weathering.	Cannot be sampled with triple tube core barrel, requires diamond drilling.

Roading and Access

Performance Goals

While at all times avoiding, remedying or mitigating any adverse effects on the environment.

To ensure that the passage of vehicles and pedestrians on roads and onto property enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety.

To ensure land development supports communities and neighbourhoods that are liveable, sustainable, well connected and safe.

Performance Criteria

To achieve the Roding Performance Goal, development proposals shall demonstrate that they have considered and addressed the requirements of Part H of the District Plan, and the following criteria:

Performance Criterion

Passage

Ensure road, private way, service lane, and access way widths are adequate to cater for all anticipated requirements including:

- vehicle movements, including public transport;
- cycle and pedestrian traffic, which may include mobility scooters and perambulators;
- safety and amenity for pedestrians and cyclists;
- vehicle parking;
- utility services; and
- landscape development.

Road design shall encourage desirable vehicle speeds, taking into account:

- the anticipated type and level of activity in the area; and
- an appropriate level of environmental quality.

Design options may include (but not be limited to):

- road alignment and width;
- through-road versus cul-de-sac design;
- surface materials;
- interface between vehicle, pedestrian and cycle routes; and
- specific traffic-calming features.

Safety

Ensure road and intersection design allows for the interaction of all road users and road usages while maximising safety. The specific needs of pedestrians, cyclists, the disabled, and users of public transport systems shall be considered.

Design of public spaces should use the “National Guidelines for Crime Prevention through Environmental Design in New Zealand” (CPTED) to provide an environment that enhances personal safety and perceptions of personal safety.

Designs shall incorporate a system of artificial lighting that is appropriate to the location and adequate to maintain safety during darkness.

Access

Ensure roading networks provide:

- vehicular access onto all residential properties;
- goods and services access to all commercial properties; and
- an appropriate level of heavy transport access to all industrial properties.

Emergency services access shall be provided to all properties.

Connectivity shall be provided within and between communities for vehicles, pedestrians and cyclists.

The layout of new subdivisions and developments should give consideration to maximising the number of residential units to support existing and potential public transport links and services. For example, higher residential density may be considered appropriate in a location 400-500m (i.e. 5-10 minutes walking) from existing or potential new public transport services.

There shall be convenient access to local facilities and shopping centres. The needs of all modes, including lay-bys/stops for bus services, direct pedestrian crossings, cycle parking facilities, etc, at these locations shall be considered. Cycling facilities, such as cycle lanes, cyclist shortcuts, and cycle end facilities where appropriate, shall be constructed in accordance with recognised best practice guidelines to ensure safe connectivity for cyclists.

Provision should be made for pedestrian and cycle access ways that link the heads of cul-de-sacs.

Connectivity shall be provided to adjacent blocks of land.

Separate pedestrian footpaths shall generally be provided, including provision for pedestrian and disabled vehicle access onto and across the carriageway in accordance with best practice guidance and principles in the current version of the New Zealand Transport Agency’s *‘Pedestrian Planning and Design Guide’*.

Roading networks shall provide efficient routes for public transport.

Any bus stops/shelters/seating should be installed in accordance with the guidelines for public transport infrastructure developed by Greater Wellington Regional Council in conjunction with territorial authorities.

Performance Criterion

Parking

Ensure roading proposals provide parking, both off and (as appropriate) on the carriageway, that is adequate to cater for residential, commercial and visitor parking needs, including parking for disabled persons, as a consequence of the subdivision and development of the immediate area.

Needs for future access to adjacent and nearby land areas which are being, or might reasonably be expected to be, developed should also be taken into account.

Function

Ensure road design is appropriate for its intended function within the overall roading network. The function of roads should be visually clear and unambiguous.

Landscape Development

Ensure that road design aesthetically enhances and complements land development. Where appropriate, the following should be considered:

- landscaped berms, islands and other refuges;
- planting of trees, shrubs and grasses;
- provision of street furniture;
- treatment of road run-off; and
- other opportunities for visual enhancement.

Roads should follow the natural contours of the land as far as is practicable, as a means of managing adverse effects on visual amenity caused by significant cuts and batters.

Drainage

Ensure that all areas used by traffic and pedestrians, including parking areas, are kept free of surface water, and maintain a safe operating surface.

Utility Servicing

Ensure adequate provision in roading design for separate utility services and potential future services, and that all properties can be connected to these services in a way in which damage to completed roads at a later date will be minimised.

Services shall comply, as far as is practicable, with the City's standard "Typical Disposition of Services in Berm" (Figure 9) with respect to:

- depths of services;
- offsets from boundaries and kerbs; and
- reserve areas for future services.

Performance Criterion

Economic Life-Cycle Costs

To ensure that the overall life-cycle cost of roading is minimised, all roading proposals shall be designed for a minimum of 25 years life-cycle or as that set out in NZS 4404:2004, whichever is the greater.

Environmental Quality

Ensure that environmental quality is taken into account in the location and design of roads.

In considering environmental quality the following should be taken into account:

- the need to avoid adverse effects on cultural and heritage sites;
- the need to preserve or protect areas of ecological significance, areas of significant habitat for indigenous flora and fauna, and outstanding natural features;
- the need to avoid, remedy or mitigate adverse effects on freshwater systems, streams and watercourses, Porirua Harbour, and the coastal marine area;
- the need to avoid, remedy or mitigate adverse effects on visual amenity; and
- the need to provide for on-site silt and sediment management, erosion control and dust control during both the bulk earthworks phase and section development phase.

In general, roading design and access should be commensurate with:

- the intended character of the area;
- its environmental context; and
- the function of the road.

Special Provisions: Roading and Access

Attention is drawn to Part H of the Porirua City District Plan (“Car Parking, Vehicle Movements and Roads”).

Except where otherwise stated, the following standards apply equally to both urban and rural roading.

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004
3.2.6.7	New Clause	<i>Private Way</i> Includes private drives serving more than one property, delivery lanes, rights of way and formed access ways, which remain in private ownership after completion of a development.
3.2.7.5	New Clause	<i>Private Way</i> Includes private drives serving more than one property, rights of way and formed access ways, which remain in private ownership after completion of a development.
3.3.1		<i>Minimum requirements</i>
	Add Paragraph	Where street furniture is provided, it shall be incorporated into the legal road in all cases, with extensions to the road reserve as necessary.
3.3.2.1		<i>Design Parameters</i>
	Add Paragraphs	Berm widths shall not be reduced in cul-de-sac turning heads to less than the width on the main section of the street. <i>Longitudinal Grades</i> In areas of particularly difficult terrain, where the 1 in 10 grade standard cannot be reasonably met, gradients of up to 1 in 8 (12.5%) will be permitted on short straight sections provided the distance between vertical grade intersection points does not exceed 75 metres. This dispensation shall not apply to public transport routes or roads carrying significant heavy traffic. In particularly exceptional circumstances steeper grades may be considered where supported by a report from a suitably qualified and experienced road safety engineer confirming the circumstances are exceptional and the design incorporates sufficient mitigation measures to be safe for all road users. <i>Horizontal Curves</i> The minimum centreline radius should be 40 metres. <i>On-Road Turning Curves</i> Road designs will be consistent with the minimum vehicle movements indicated by the NZTA’s On-Road Vehicle Turning Curves.
3.3.2.2		<i>Sight distance</i>
	Add Paragraph	Sight distances for non-signalised intersections and driveways shall meet the minimum distances in Figure 3.3, derived from LTNZ RTS: 6 Guidelines for Visibility at Driveways.
Table 3.1	Replace Table	<i>Road design standards – Urban (speed limit ≤ 70 km/hr)</i>
Table 3.2	Replace Table	<i>Road design standards – Rural (speed limit up to 100 km/hr)</i>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004
3.3.6		<i>Parking</i>
	Add Paragraphs	<p>Acceptable car park dimensions shall be taken from Figure 3.2 and shall be consistent with Figure B3 AS/NZS 2890.1:2004: "Parking facilities: Part 1: Off-street car parking".</p> <p>Dimensions in Figure 3.2 have been derived from the NZ Building Code and Austroads Guide to Traffic Engineering Practice Part 11: Parking.</p> <p>Except in the Rural Zone, each car park, including aisles, shall be formed and surfaced with permanent material, before use of the site or building (as appropriate) commences.</p>
3.3.6.3	New Clause	<p><i>Disabled Parking</i></p> <p>Parking lots for buildings and facilities shall be consistent with the requirements of the current version of NZS 4121: Design for Access and Mobility - Buildings and Associated Facilities</p>
Figure 3.3	Replace Figure	Minimum traffic sight-lines at non-signalised intersections
3.3.12.1		<i>Urban Pathways</i>
	Amendment	Footpaths shall be the minimum widths shown in Table 3.1.
	Add Paragraphs	<p>In shopping areas, footpaths shall be at least 3.5 metres wide.</p> <p>Footpaths shall have crossfalls of a minimum of 2% in the direction from the property boundaries to the street kerb, depending on the surface. For concrete footpaths the crossfall shall be 2%. For asphalted concrete and concrete pavers the minimum crossfall shall be no less than 3%.</p>
3.3.12.5	New Clause	<p><i>Pedestrian Crossings</i></p> <p>In determining the requirements for pedestrian crossings, the recommendations of the Road Research Unit's Technical Recommendation TR 11 "Recommended Practice for Pedestrian Crossings" 1988 shall take precedence over the Traffic Regulations.</p>
3.3.17	<u>Delete</u> Clause	<i>Non public accesses (urban and rural)</i>
C3.3.17	New Clause	<p>Private ways are allowed under the District Plan, but are not encouraged. It is preferable that all shared access ways and the services within them are in public ownership. Where private ways are proposed the developer should show that it is possible to form drive-on access to each lot that can be safely traversed by normal road-going vehicles.</p> <p>Minimum formed and legal widths and other relevant standards should be as detailed in Tables 3.1 and 3.2.</p> <p>Changes in alignment should utilise corner splays along both inner and outer boundaries, and circular curves.</p> <p>Private ways proposed to serve more than a single lot should be formed at the time of subdivision.</p> <p>All private ways should be shaped with either crown or crossfall of not less than 2%.</p>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004
		<p>Private ways sloping up from the road should drain to sumps (urban) or side drains (rural) on the private side of the public road. The sumps should discharge via a single appropriately sized connection to a stormwater main where available. Where a main is unavailable, acceptable disposal options should be agreed in writing with Council, including provisions for onsite disposal of runoff if deemed appropriate.</p> <p>Private ways required to slope down from the road should be designed to ensure that road stormwater is not able to pass down the access. Side drainage such as kerbs or side ditches (rural) should be provided to stop the concentration and discharge of stormwater and debris onto adjacent properties or to any land which could be at risk of instability or erosion.</p> <p>To avoid pedestrian-vehicle conflict there should be no doors opening directly onto a private way or access way adjacent to a dwelling and any windows on the side of the dwelling abutting the access way should be fitted with stays so that they can be opened outwards no further than a maximum of 0.4m.</p> <p>At rear sections, provision for vehicle manoeuvring space to provide for vehicles to exit the site in a forward direction is encouraged.</p>
3.3.17.1	New Clause	<p><i>Suburban Private Ways</i></p> <p>(a) Maximum gradient of 1 in 5 (20%) on straight private ways with no entrance along the length of the way. Maximum gradient of 1 in 8 (12.5%) where curves limit visibility or where there are entrances to the private way along its length.</p> <p>(b) The full length of the private way shall be surfaced with permanent material.</p> <p>(c) All private ways serving more than 3 dwellings shall have a turning head or bay which enables vehicles to manoeuvre in accordance with the vehicle turning template shown in Figure B3, AS/NZS 2890.1:2004: "Parking facilities: Part 1: Off-street car parking", or an equivalent.</p> <p>(d) For private ways serving fewer than 4 dwellings, 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.</p> <p>(e) To allow cars to pass, suburban private ways longer than 50m and with a carriageway less than 4.5m wide shall have passing bays at not more than 50m spacings. Passing bays shall have a minimum width of 4.5m, length of 5m and start and end tapers of 4m.</p> <p>(f) All shared private ways (serving more than 1 dwelling) shall have their edges defined by concrete edging capable of collecting and directing stormwater to suitably designed stormwater collection and disposal systems. For private ways being shared by no more than three dwellings, suitably robust and treated timber edging may be acceptable on one edge where it is not required to serve a stormwater control purpose.</p> <p>(g) Water supply in Private Ways shall be provided by means of either: (i) a public main laid in the berm protected by a 3.0 m (minimum) wide easement in gross; or (ii) individual private service leads each terminating at the boundary</p>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004
		between the public road and the private way.
3.3.17.2	New Clause	<p><i>Non-Suburban Zoned Urban Private Ways</i> Maximum gradient of 1 in 8 (12.5%).</p> <p>The full length of the private way shall be surfaced with permanent material.</p> <p>A turning head in the common area shall be provided at the end of all accesses where adequate turning area is not available within each lot or private area. All shared private ways (serving more than 1 lot) shall have their edges defined by concrete edging capable of collecting and directing stormwater to suitably designed stormwater collection and disposal systems.</p>
3.3.17.3	New Clause	<p><i>Rural Private Ways</i> Maximum gradient of 1 in 5 (20%) on straight private ways with no entrance along the length of the way. Maximum gradient of 1 in 8 (12.5%) where curves limit visibility or where there are entrances to the private way along its length.</p> <p>Rural private ways shall be surfaced with permanent surfacing for at least the first 5m from the road carriageway or up to the road boundary, whichever is less, to prevent debris being carried onto roads. Reference may be made to PCC Drawing Number 2/-/333 Rural Vehicular Crossing.</p> <p>A turning head in the common area shall be provided at the end of all accesses where an adequate turning area is not available within each lot or private area.</p> <p>Private ways shall have a formation width wider than the sealed widths with safe side drains along, but adequately clear of, each side of the private way.</p> <p>Rural side drains may discharge directly to the road side drain or, where private ways pass over storm ditches, they should be provided with a culvert of appropriate size for the design flow, but not less than 300mm diameter.</p>
3.3.18	Amend Clause	<p><i>Multi-unit non public accesses (urban and rural)</i></p>
		(d)(i) Maximum gradient of 1 in 5 (20%) on straight private ways with no entrance along the length of the way. Maximum gradient of 1 in 8 (12.5%) where curves limit visibility or where there are entrances to the private way along its length.
3.3.19.1	Add Paragraphs	<p>Heavy duty vehicle crossings shall be provided at industrial and commercial sites, and at any site where heavy commercial vehicles are likely to require access. Refer to Council's specification for installation of residential vehicle crossings.</p> <p>If excavations for a crossing would reduce the cover over a public main to less than 750 mm to the crown, the driveway concrete paving shall be 150 mm thick, for 750 mm either side of the centreline of the public main, to protect the pipes from damage.</p> <p>Footpaths may be reconstructed to enable the construction of steep driveways, provided they are reconstructed in accordance with Council specifications, and provided that the maximum longitudinal slope of a footpath is 1 in 10 and maximum lateral slope is 1 in 25.</p>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004
3.3.21.4		Kerbing and channelling shall be constructed to the "Standard Kerb & Channel" profile; refer to PCC Drawing No 2/-/312. (See Species.14).
C3.3.21.5	Add Paragraphs	<p>Where a double sump is required, a high capacity inlet constructed in accordance with PCC Drawing Numbers 2/-/265 and 2/-/271 may be used. Double sumps may be replaced with single sumps at reduced spacing.</p> <p>Where small sumps are to be used on footpaths and pedestrian access ways, they should conform to Figure 3.14 NZS4404:2004.</p> <p>For all stormwater sumps, a metal plaque with symbol of fish, and the words "Drains to Natural Water" or "Drains to streams" should be fixed onto the kerb or footpath immediately adjacent to the sump.</p>
3.3.22	Add Clause	<p>Wherever practicable, public water supply, sanitary sewer and stormwater mains shall be laid within a service corridor, rather than under the line of the road, kerb and channel or footpath.</p> <p>Wherever practicable, underground power, telephone, gas and water services and ducting for telecommunications shall be located under the berm. Disposition of services is to be as shown in Figure 9.1 "Typical Disposition of Services".</p>
3.4.11	Replace Table 3.8	<i>Deflection testing prior to surfacing</i>
3.4.14.1	Add Paragraph	<p>Concrete shall be the preferred surface material for footpaths. Footpaths shall be 100 mm thick, supported on a minimum of 75 mm compacted base-course.</p> <p>Where concrete footpaths are damaged as a result of subdivisional work, the section to be reinstated shall be the full width and length between previous shrinkage cracks.</p>
3.4.14.3	Add Paragraphs	<p>Interlocking concrete and ceramic paving blocks are not approved surfacing materials, but may be considered in specific locations subject to approval by the Council.</p> <p>Interlocking block pavements shall comply with NZS 3116, and the manufacturer's recommendations. Blocks installed in traffic lanes shall a minimum of 80mm thick, and be subject to specific pavement design. Blocks installed in pedestrian areas shall be a minimum of 50mm thick.</p> <p>All completed blockwork shall be cleaned, sand-filled and without gaps prior to handing over.</p>
3.4.15	Add Paragraphs	<p>Kerbing and channelling shall be laid as a single monolithic unit by slip forming or similar approved method. Proposals to use boxed or precast kerbing should be made only in difficult circumstances and shall be submitted to the Council for prior approval. Slip-formed kerb and channel shall have movement joints every 3 metres \pm 10%.</p> <p>Residential stormwater laterals shall be directly connected to the stormwater main wherever practicable. Where no suitable stormwater main exists, the lateral shall be connected to the kerb and channelling.</p>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004
		<p>A residential drainage connection to kerb and channelling shall not be made at vehicle crossings; the lateral shall be directed to one side or the other of the vehicle crossing.</p> <p>Where it is not possible to achieve a direct connection to the stormwater drainage system, or drainage grades from the property to the kerb and channel, an alternative solution shall be submitted to Council for prior approval.</p> <p>Wherever the adjacent land is above the kerb line, and it is feasible to drain residential roofing stormwater to the channel, proprietary galvanised steel rectangular kerb drainage outlet holes shall be cast into the kerb. The outlets shall be joined to 100mm outlet pipes installed with their invert at the level of the channel invert, and grading up to the property boundary at no less than a grade of 1 in 100. The pipe shall be galvanised iron between the back of the kerb, and the property boundary.</p>

Table 3.1 Road design standards– Urban (speed limit \leq 70 km/hr) (refer to District Plan for required standards)

Class	Zone	Type	Area Served ¹	Traffic volumes (vpd) ¹	Design Speed (km/h)	Length along Road (m)	Legal Road width (m)	Minimum carriageway width (m)				Foot path (m)	Berm (m)	Max super-elevat ⁿ	Notes
								Parking	Traffic	Cycles ²	Total				
Local Road	Suburban	Private Way ³	1-3 du	-	-		3.5	-	1 x 2.75	-	2.75	-	0.75	NA	Not directly connected to collector or arterial roads.
		Private Way ³	1-3 du	-	-	First 6m	6.0	-	1 x 5.0	-	5.0	-	1.0	NA	Directly connected to collector or arterial roads. Taper between the 6m and 10m distances.
						After first 6m	3.5	-	1 x 2.75	-	2.75	-	0.75		
		Private Way ³	4-6 du	-	-		6.0	-	1 x 5.0	-	5.0	-	1.0	NA	
		Cul de Sac	\leq 20 du	-	-		12	1 x 2.5	1 x 3.5	-	6.0	1.5	4.5	6%	No stopping on one side
		Minor Access		< 750	30		20.0	2 x 2.5	2 x 3.0	-	11.0	2 x 1.5	6.0 ⁵	6%	Note 8
	Local Distributor		< 1000	40		21.0	2 x 2.5	2 x 3.5	-	12.0	2 x 1.5	6.0 ⁵	8%	Note 8	
	Industrial/Commercial	Private Way or Public Service Lane	\leq 50 m	< 300			8.0	-	2 x 3.5	-	7.0	-	1.0	NA	No parking both sides; private utility ⁶
		Cul de Sac	\leq 150 m	< 300			11.0	-	2 x 3.5	-	7.0	1.5	2.5 ⁵	NA	No parking both sides; public utility; note 7
		Minor Access		< 300	30		15.5	1 x 2.5	2 x 3.5	-	9.5	2 x 1.5	3.0	6%	Note 7
Local Distributor			300 - 1000	40		18.0	2 x 2.5	2 x 3.5	-	12.0	2 x 1.5	3.0	6%	Note 7	
Collector				1000 - 3000	50		24.0	2 x 2.5	2 x 3.5	2 x 1.5	15.0	2 x 1.5	6.0 ⁵	6%	
Secondary (District) Arterial				3000 - 7000	50		24.0	2 x 2.5	2 x 3.5	2 x 1.5	15.0	2 x 1.5	6.0 ⁵	8%	
Primary (Regional) Arterial				> 7000	70		27.0	2 x 3.0	2 x 3.5 1 x 2.0	2 x 1.5	18.0	2 x 1.5	6.0 ⁵	8%	Painted median occupies 2m traffic lane

Notes to table

- (1) du = dwelling units; vpd = vehicles per day
- (2) Where PCC gives approval to remove cycle lanes each traffic lane shall be increased to 4.0m
- (3) For variations specific to Medium Density Policy Areas reference must be made to the District Plan.
- (4) Passing bays shall have a minimum width of 4.5m, length of 5m and start and end tapers of 4m
- (5) Minimum berm width shall be 1.5m
- (6) Private utility leads (connections) only running along private way
- (7) Footpath width shall be minimum of 3.5m adjacent to retail premises
- (8) Parking requirement may not be practicable where steep batters are on either side of the road. Equivalent provision for car-parking shall be made in the near vicinity.
- (9) One-way streets are discouraged.

Table 3.2 Road design standards– Rural (speed limit up to 100 km/hr) (refer to District Plan for required standards)

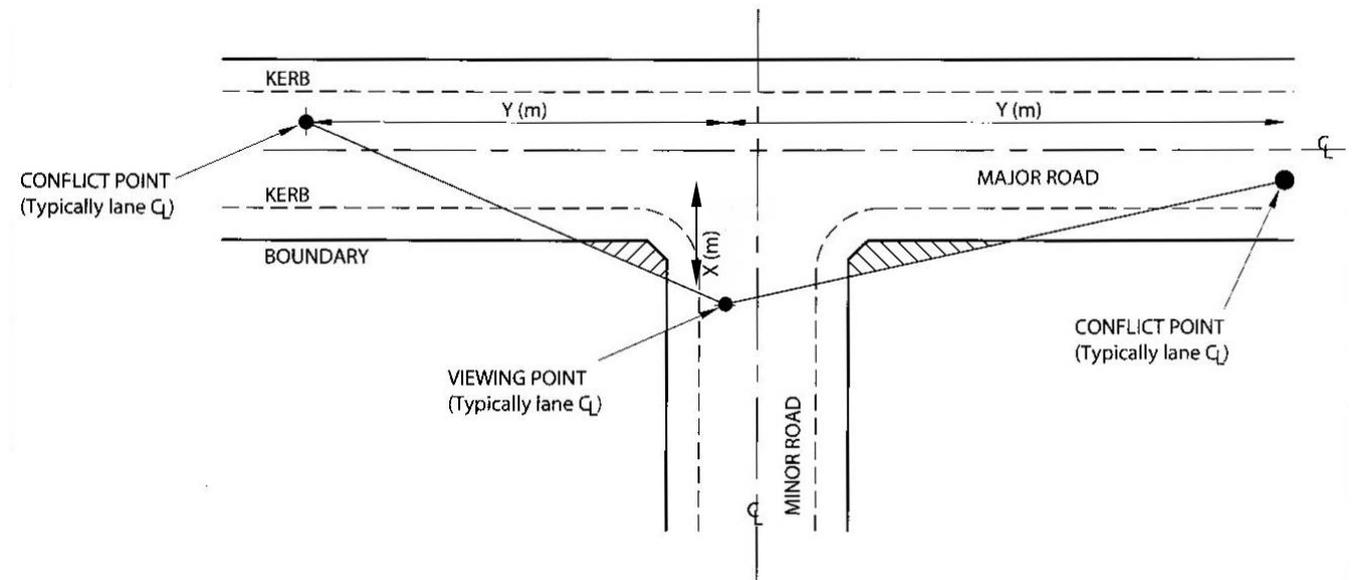
(a) Road Standards - Rural

Class	Type	Area Served ⁽⁵⁾	Traffic volumes (vpd) ⁽⁵⁾	Design Speed (km/h) Flat or rolling / Hilly ⁽³⁾	Minimum Legal Road width (m)	Lane width (m) A ⁽¹⁾	Shoulder width (m) ⁽²⁾		Minimum total seal width	Notes
							Total width B	Sealed Part		
Local Road	Private Way	1-3 du	< 30		5.5	1 x 3.0	2 x 1.25	2 x 0.75	4.5	Metalled Passing bays as required, maximum 100m distance between bays ⁽⁶⁾
	Private Way	4 -6 du	30 - 100		6.0	1 x 3.5	2 x 1.25	2 x 0.75	5.0	Sealed Passing bays as required, maximum 100m distance between bays ⁽⁶⁾
	Minor Access		< 250	50	15.0	2 x 2.75	2 x 0.75	2 x 0.25	6.0	
	Local Distributor		300 - 1000	70 / 50	15.0	2 x 3.0	2 x 1.25	2 x 0.75	7.5	
	Collector		1000 - 3000	100 / 70	20.0	2 x 3.5	2 x 1.25	2 x 0.75	8.5	
	Primary & Secondary Arterial ⁽⁴⁾		> 3000	100 / 70	20.0	2 x 3.5	2 x 2.5	2 x 2.0	11.0	Includes two, 2m wide cycle lanes

Notes to table

- (1) Lane widths: Curve widening on rural roads should be as outlined in Table 3.2 (b)
- (2) Shoulder width: The shoulder width needs to be assessed for each project based on the speed environment of the area and the terrain. For high speed environments or where high cycle use is expected, shoulder widths may need to be increased to optimize overall road safety
- (3) Design speed: The design speed indicated generally assumes a “Rural/residential” level of frontage onto the road. Where frontage access is minimal and terrain reasonable, higher design speeds may be appropriate. This may also impact on shoulder widths (Refer to Note (2))
- (4) Arterial: The TNZ State Highway Geometric Design Manual may be used as an acceptable solution for any rural road design provided road reserve widths are of adequate width to serve the purposes required by NZS 4404
- (5) du = dwelling units, vpd = vehicles per day
- (6) Passing bays shall have a minimum width of 4.5m, length of 5m and start and end tapers of 4m

Figure 3.3 Minimum traffic sight lines at non-signalized intersections



Minimum sight distance Y (metres)

Operating speed (km/h) (3)	Low volume driveways and minor roads ⁽¹⁾			High volume driveways and minor roads ⁽²⁾		
	Major road classification			Major road classification		
	Local	Collector	Arterial	Local	Collector	Arterial
40	30	35	70	30	70	70
50	40	45	90	40	90	90
60	55	65	115	55	115	115
70	85	85	140	85	140	140
80	105	105	175	105	175	175
90	130	130	210	130	210	210
100	160	160	250	160	250	250
110	190	190	290	190	290	290
120	230	230	330	230	330	330

- (1) Up to 200 vehicle manoeuvres per day
- (2) More than 200 vehicle manoeuvres per day
- (3) Operating speed = 85th percentile speed on frontage road. This can be taken as the speed limit plus 15% if survey data are not available
- (4) Distances are taken from NZTA's RTS 6 Guidelines for visibility at driveways; based on the Approach Sight Distance and Safe Intersection Sight Distance tables in NAASRA, Intersections at Grade assuming reaction times of 1.5 seconds on local roads with operating speeds up to 60 km/h and 2.0 seconds for all other speeds and all collectors and arterial roads.

Distance X (metres)

Measured from the centre of the major road lane, closest to the minor road.

	Major road classification		
	Local	Collector	Arterial
X (metres)	5	7	7

Table 3.8: Benkelman beam standards

		Road Classification	Deflections
Urban	Suburban	Private Way & Drive Way	2.0 mm
		Cul de Sac	1.3 mm
		Minor Access	1.3 mm
		Local Distributor	1.0 mm
	Non-Suburban	Service Lane & Drive Way	1.0 mm
		Minor Access	1.0 mm
		Local Distributor	1.0 mm
Urban	Collector	0.8 mm	
	Secondary Arterial	0.8 mm	
	Primary Arterial	0.8 mm	
Rural	Arterial	1.0 mm	
	Other	1.3 mm	

Stormwater Drainage

Performance Goal

While at all times avoiding, remedying or mitigating any adverse effects on the environment.

To manage stormwater and provide for its disposal.

Performance Criteria

To achieve the Performance Goal, development proposals shall demonstrate that they have considered and addressed the following criteria:

Performance Criterion

Level of Protection

All new stormwater systems, or existing systems modified to accommodate new works, shall be designed to the Minimum Level of Protection specified in Table 4.1 of this Code.

(The minimum level of protection is also called the Design Flood).

Protection of Property

The stormwater system (including overland flow paths) shall be designed and constructed so as to avoid damage or risk of damage to property due to inundation, scour or the dynamics of stormwater flow.

Control of Flow paths

Stormwater shall be conveyed in suitable pipes, formed channels or defined water courses to approved discharge points within, as far as is practicable, the catchment as it exists at the time of development.

Overland or Secondary Flow Paths

New development and redevelopment projects shall be planned, designed and constructed so as to provide adequately for secondary overland flow paths.

There shall be no interruption of natural drainage ways or overland flow paths without prior written consent from the Council and the Greater Wellington Regional Council.

Secondary overland flow paths shall generally be clearly defined as no-building zones

Performance Criterion

Health and Safety

Stormwater systems shall be designed and constructed so that the requirements of the Health and Safety in Employment Act are met both during construction and during the life of the systems.

Covers, barricades, fences and sign-posting shall be provided as appropriate to provide for public safety and prevent public access to hazardous areas.

Ponding of water in open stormwater drains is to be minimised, to reduce the health risks associated with insects breeding in ponded water.

Development Potential

The design and location of stormwater systems shall not unnecessarily restrict the development potential of land within the subdivision, nor restrict development of land elsewhere in the catchment.

Other Demand

Stormwater systems shall be sized and located to allow for all reasonably predictable development within the upstream catchment designed to the level of development allowed within the relevant District Plan.

Preventing Contamination

Wastewater or other contaminated water shall not be directed into the stormwater system nor shall stormwater be directed into the wastewater system.

Stormwater systems shall be designed to minimise the risk of contamination, and to prevent inflow and infiltration into the wastewater system. Consideration must be given to the prevention of the potential adverse effects by pre-treatment of stormwater to be discharged to sensitive areas including the Porirua Harbour and Pauatahanui Inlet.

Economic Life-Cycle Costs

Stormwater systems are to be designed in a way that minimises the overall life-cycle costs, inclusive of capital, maintenance and rehabilitation costs. For the purposes of this criterion, the life-cycle shall be taken as no less than 50 years.

Compatibility and Durability

The stormwater system shall use durable materials and be constructed to withstand anticipated pressures and loads.

Materials used in the stormwater system shall be compatible with Council's existing systems and approved materials.

Performance Criterion

Maintenance

Stormwater systems shall be located and designed to provide reasonable access for maintenance, without significant damage or disruption to other network utility services, land use activities, and landscape values. Drainage easements may be necessary to enable Council maintenance staff to gain access to carry out maintenance required to provide for the free flow of floodwaters, including removal of materials, such as tree branches, that could result in blockages further downstream.

Impact on Existing Systems

Stormwater systems shall be designed to ensure that they do not create any adverse effects on downstream properties or the drainage system or potential adverse effects from climate change on existing stormwater systems due to the potential increase in the intensity/frequency of extreme rainfall events.

Where an alternative stormwater system is proposed it shall be designed to mitigate the potential adverse effects resulting from the use of the alternative system.

Detention ponds and/or other measures to reduce peak flows may be considered where the downstream system cannot accommodate peak flows or controls are necessary to protect the receiving environment from the potential adverse effects of unrestricted and untreated discharge.

Detention storage (where required) shall be designed to retain onsite the design peak discharge from the properties (post construction) to not greater than the design peak discharge from that which already exists exiting into the public network, for a design storm event.

Erosion Protection

The risk of debris or gravel blockage, outlet scour and land instability resulting from stormwater concentration, shall be minimised.

Environmental Quality

Ensure that environmental quality is taken into account in the location and design of stormwater systems. Sustainable stormwater techniques should be incorporated into the design of the stormwater system to minimise the potential adverse effects of development. Options such as, but not limited to, bio-retention, retention of streams and natural landform, porous paving, rain gardens, rainwater tanks, green road reserves and detention storage should be considered.

In considering environmental quality the following shall be taken into account:

- the need to avoid adverse effects on cultural and heritage sites;
- the need to preserve or protect areas of ecological significance, areas of significant habitat for indigenous flora and fauna and outstanding natural features;
- the need to avoid, remedy or mitigate adverse effects on freshwater ecosystems,

streams and watercourses, esplanade strips, Porirua Harbour and the coastal marine area;

- the need to avoid, remedy or mitigate adverse effects on visual amenity; and
- the need to provide for on-site silt and sediment management, erosion control and dust control during construction.

In general, stormwater design and construction should be commensurate with:

- the intended character of the area; and
- the environmental context.

Stormwater must not be discharged to the ground in a manner that may cause or contribute to ground instability.

Special Provisions: Stormwater Drainage

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
4.2.2.1	New Clause	<p><i>Relevant Standards and Guideline Documents</i></p> <p>The design of stormwater disposal and flood protection systems shall be in accordance with the accepted engineering standards and relevant published guidelines current at the time, including, but not limited to :</p> <ul style="list-style-type: none"> - HIRDS – computer rainfall statistics – NIWA 2004; - “A Guideline & Procedure for Hydrological Design of Urban Stormwater Systems” – NZIE; - NZS/AS 3725:1989 “Loads on Buried Concrete Pipes” and Supplement/Commentary to NZS AS 3725; - ASCE Manual of Engineering Practice No 37 (WPCF Manual of Practice No 9) “Design and Construction of Sanitary and Storm Sewers”; - Concrete Pipe Association of Australia “Concrete Pipe Selection and Installation”; - Preparing for Climate Change – A guide for local government in New Zealand; - MfE:2008 Coastal Hazards and Climate Change: A Guidance Manual for Local Government in New Zealand, 2nd Edition, July 2008; - Auckland Regional Council “Low Impact Design Manual” – TP124; and - Acceptable Solution AS E1 to the Building Regulations.
4.2.3	Add Paragraph	It should be standard practice to place all services to be vested to Council within designated service corridors within public road or access ways, rather than in private property. Refer to Table 9.1.
4.2.9.1		<i>Stormwater Pumping</i>
	Add Paragraphs	<p>Where pumping is unavoidable and acceptable to Council, pumping systems shall be specifically designed using a multi-pump system to best balance the need for regular pump operation against the relative infrequency of major storm events.</p> <p>The peak storm frequency designed for shall be set to match the upstream and downstream stormwater system, but shall be not less than:</p> <ul style="list-style-type: none"> - the return period specified in Performance Criterion 2.3.1 when an overland flow path can be identified that will ensure that the minimum

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
		<p>level of protection is not exceeded; or</p> <ul style="list-style-type: none"> - 100 year return period when no overland flow path is available. <p>All pumps in a station shall be of the same size and the number used shall be such that at peak flows one pump remains unused as a standby.</p> <p>Valves shall isolate all pumps and incorporate an easily dismantled pipe joint near the pump, which enables easy removal of the pump. Pumps shall be designed for not more than 8 starts per hour, but shall use starters capable of 15 starts per hour. For pumps of over 2 kW, soft start systems shall be provided.</p> <p>On all pump stations the control switchboard shall be provided with a plug and wiring capable of allowing an emergency generator of size suitable for coping with the wet weather flow, to be used to drive the pumps.</p> <p>A metered water supply and tap outlet shall be provided to the immediate vicinity of the station. The supply shall be fitted with an approved reduced pressure backflow preventer.</p> <p>Chamber lids shall provide access openings centrally over each pump and shall be designed to withstand HNHO loadings when in roads (including paths and berms).</p> <p>Access openings shall be provided with protective screens to prevent persons from falling into the chamber while maintenance is being done.</p> <p>Stormwater pump stations shall incorporate valving control, monitoring, alarm and telemetry systems to Council standards at the time of the design.</p>
4.3.2.1		<i>The designer</i>
	Add Paragraph	<p>The design submitted shall incorporate suitable measures such as attenuation ponds and detention tanks, designed to retain onsite the design peak discharge from the properties (post construction) to not greater than the design peak discharge from that which already exists exiting into the public network for a 1 in 10 year, 20 minute duration storm event.</p> <p>The maximum allowable rate of runoff of stormwater from the site to the storm water system, post development, shall be no more than would occur from the pre-existing development following a 1 in 10 year return period, 20 minute duration storm.</p> <p>Such measures are particularly appropriate in cases where the capacity of the existing stormwater system may be unable to cope with the increased stormwater arising from proposed new development (e.g. infill development).</p>
Table 4.1	Replace Table	<i>Minimum AEP for design storms</i>
4.3.2.5.3		<i>Tidal areas</i>
	Add Paragraphs	<p>Protection standards shall take into account the potential impact of climate change.</p> <p>Where a drain's capacity is affected by the sea-level it shall be designed assuming sea-level is at 0.6 metres, plus an appropriate allowance for forecast sea level rise over 100 years (including climate change), above Mean Sea Level(about mean high Water Spring Tide Level within Porirua Harbour and the</p>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
		<p>Pauatahanui Inlet).</p> <p>The allowance for sea level rise shall be obtained from information published by the Ministry for the Environment. This includes MfE (2008): Coastal Hazards and Climate Change: A Guidance Manual for Local Government in New Zealand, 2nd Edition, July 2008.</p>
4.3.3.1		<i>Location and alignment of stormwater mains</i>
	Add Paragraphs	<p>Due account shall be taken of the location of other services, when defining stormwater pipeline alignments.</p> <p>Wherever practicable, drains shall be laid where access from the ground surface is possible at all times at reasonable cost and least possible disruption to the public.</p> <p>Pipelines on private land shall be sited to minimise reduction of the building area available. Drains shall be laid at least 1.5m clear of existing buildings. No building footprint or retaining wall shall impose extra load on the drain and shall be placed outside the 45 degree surcharge line from the centre of the drain unless by a special design solution to the satisfaction of Council.</p>
4.3.3.2		<i>Pipe Materials</i>
	Add Paragraphs	<p>For public mains (including sump leads) acceptable materials include:</p> <ul style="list-style-type: none"> - On normal grades: RCRRJ Class X, Y or, Z (depending on the depth) or Boss pipe SN8; - On steep sections: HDPE PE100 SDR17, if approved by Council. <p>Minimum stormwater pipe size for public mains shall be 300mm ID.</p> <p>For private laterals the acceptable pipe material is Boss pipe SN8.</p> <p>All pipes shall comply with the minimum sizes and specifications given in this Code.</p>
4.3.3.3	Add Paragraphs	<p>Council will not approve any permanent building or other structure (such as retaining walls) over any public drains, drainage easements, or underground service easements.</p>
4.3.3.6	Add Paragraphs	<p>AS/NZS 2566 is not acceptable. Minimum cover to crown shall be 600mm in the berm and 750mm in carriage way or as recommended by the manufacturer, whichever is the greater, unless by a special design solution to the satisfaction of Council.</p>
4.3.3.10	Add Paragraphs	<p>Provision shall be made so that no water can bypass the inlet structure and flow into compacted fill or areas where damage may occur.</p> <p>Provision shall be made for flows greater than the design capacity of the intake and pipe to overflow to an overland flow path that meets the minimum AEP in Table 4.1.</p> <p>There shall be no interruption of natural drainage ways or overland flow paths without prior written consent from Council and the Greater Wellington Regional Council.</p> <p>Secondary flow paths shall be designed and constructed so that when flooding occurs (in events equal to or greater than the 100 year design flood,</p>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
		<p>stormwater ponding cannot exceed such a depth that would impede normal traffic flow or 150 mm above the road crown before being released overland.</p> <p>A minimum pipe size to be contained in road reserve or vested to Council shall be 300mm ID (excluding sump leads 225mm ID).</p>
4.3.4.4	Add Paragraph	Where depth to invert does not exceed 900mm, shallow type manholes may be used, except that they shall not be used under carriageways.
4.3.7.1	Add Paragraphs	<p>All lots shall be provided with a connection, within the body of the lot, to a public stormwater drain, or to a suitable stormwater drainage system where no public stormwater is feasible.</p> <p>(e)(i) The maximum length of a 100mm diameter connection between rodding eyes shall be 40 metres.</p> <p>(k) When acceptable to Council, where drainage to kerb and channel is used, connections may be provided for each lot by means of a 100mm diameter pipe. Stormwater shall be discharged into the channel through a galvanised iron pipe between the kerb and the property boundary. When entering the kerb any pipe shall be angled at a 45° angle in the direction of the existing flow.</p>
4.3.8.1	Delete	(a) A suitable outfall and dissipating structure shall be constructed at the outlet to ensure no erosion occurs in the immediate vicinity of the waterway;
	Replace with	<p>(a) (i) Any design submitted shall show the applicant disposing of storm-water runoff in an effective and responsible way which shall avoid creating adverse or negative effects on the environment such as erosion or scouring or a nuisance to surrounding properties or areas;</p> <p>(ii) Outlets require wing wall outlet structures with downstream lip, below which is an additional concrete apron with rip-rap embedded in concrete, to dissipate the flow over a wider area, and to further reduce velocity;</p> <p>(iii) Preferably stormwater outfalls should discharge directly to existing natural streams, rather than onto land sloping down towards a stream. In certain circumstances, discharge to land may be considered, provided the flows are shown to be controlled so as to have no significant impact, the owners of the adjacent land are in agreement and the scale of development proposed is limited to that where flows can be accommodated. Stormwater outfalls should not be located on steeply sloping land where scour is likely to result.</p>
4.3.9		<i>Drainage easements and underground service easements</i>
	Add Paragraphs	<p>The drainage easement along a public main shall be created extending a minimum of distance of 1.5 m either side of the centreline of the pipe, provided that the overall easement width is not less than 3.0m.</p> <p>Where more than one public main is laid in an easement, the easement shall extend 1.5m beyond the outside public main.</p> <p>Where a pipe is laid deeper than 1.5 m, a Building Line Restriction, defined by a 45 degree angle up from the centre of the pipe, shall be created, accompanied with a Consent Notice requiring specific engineered design by a chartered professional engineer of the foundations of any buildings to be constructed within the building line restriction area, so that no additional surcharge load is</p>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
		<p>imposed on the pipe and an excavation could be made to maintain or replace the pipe without undermining the foundations of any building.</p> <p>Where the pipe is to be laid close to a side boundary, so that the boundary falls within 1.5 m of the pipe, provided the centreline of the pipe is greater than 1.0 m from the boundary, there is no necessity to create an additional narrow (less than 0.5 m wide) easement on the neighbouring property to make up the 1.5 m minimum from the centreline.</p> <p>With pipes of a diameter larger than 300 mm, the easement shall extend a minimum distance of 1.35 m plus half the diameter of the pipe either side of the centreline of the pipe ($1.35 + D/2$ where D is the pipe diameter).</p> <p>The cross section of the drainage easement shall, wherever possible, be designed and constructed as an access for maintenance (including mowing if appropriate) and as a dish drain that can act as an overland flow path.</p> <p>Council will at all times retain a 24 hour access right to all services contained within the easement without impediment and without prior notice to the property owner. Under no circumstances shall any building be constructed or obstruction placed in a drainage easement or underground service easement.</p> <p>A drainage easement in favour of Council shall be provided along any open watercourse of capacity equivalent to that for which a 600mm diameter (or greater) pipe would be required to carry the 10-year design stormwater flow. A drainage easement shall include the bed and banks of the open watercourse as determined by the Mean Annual Flood (MAF) plus a minimum 3.0m wide access strip on at least one side of the watercourse.</p>
4.3.12.2.2	New Table 4.6	Rainfall depths in Central Porirua
	New Map 401.3.2A	Rainfall Zone Factors
4.3.12.7	Replace Clause	<p><i>Stormwater quality control</i></p> <p>Stormwater treatment devices shall be selected based on the best practicable option for the location and catchment and be acceptable to Council.</p> <p>The Water Quality Volume (WQV), which is used to size stormwater treatment devices, shall be calculated using the SCS Unit Hydrograph method and the two year ARI storm event for Porirua City.</p> <p>Stormwater treatment devices shall be designed in accordance with best practice and in conjunction with the Porirua City Council.</p>

Table 4.1: Minimum Annual Exceedance Probability for design storms (Levels of Protection)

Land or Asset Type	AEP (%)	Return period ARI (years)	Notes
Primary protection – satisfied by an appropriate size pipe or waterway network. Open space Rural and rural residential areas Residential areas Commercial and industrial areas Minor roads Property yards	10	10	
Gully traps	5	20	
Major non-arterial roads	5	20	
Floors of Habitable and Communal Non-Residential Buildings	2	50	Allow appropriate freeboard.
Floors of Commercial & Industrial & Public Buildings			In accordance with usage. Specified on Building Consent
Key Services: Arterial roads Bridges Pump stations Water storage Electrical supply	1	100	
Areas where no secondary flow path is available	1	100	
Secondary protection	1	100	

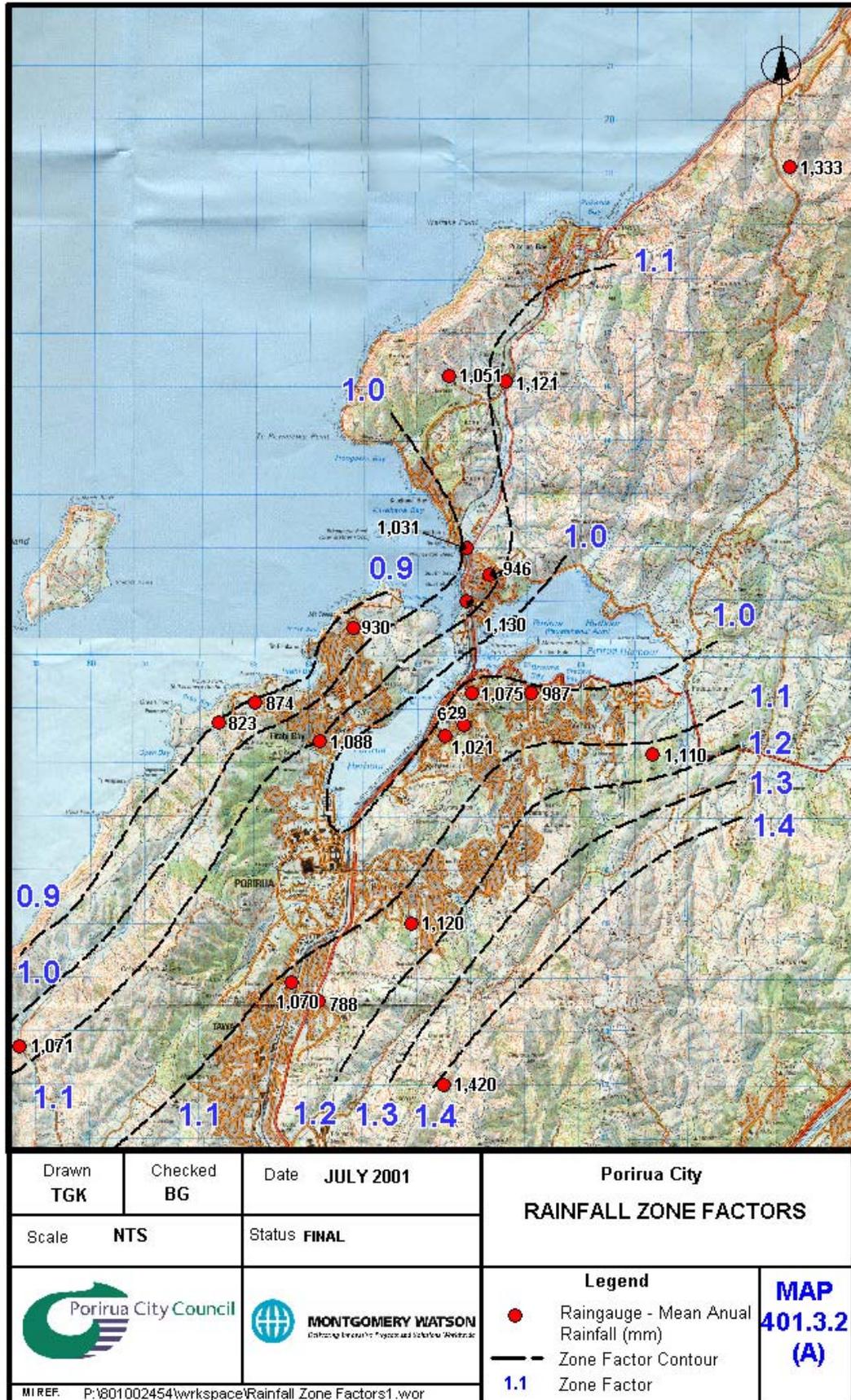
Table 4.6 Rainfall Depth in Central Porirua

ARI	Duration									
Years	10min	20min	30min	60min	2hr	6h	12h	24h	48h	72h
2	7	10.1	12.4	17.9	24.2	39	52.8	71.4	87.2	98.1
10	10	14.1	17.3	24.5	33.3	54	73.3	99.4	120.3	134.5
20	11.6	16.3	19.9	28.1	38.2	62.1	84.4	114.7	138.2	154.2
30	12.7	17.8	21.7	30.5	41.5	67.6	91.9	125	150.3	167.4
40	13.6	19	23.2	32.4	44.1	71.9	97.8	133.2	159.8	177.8
50	14.4	20	24.3	34	46.2	75.5	102.8	140	167.8	186.5
60	15	20.9	25.4	35.3	48.1	78.6	107.1	145.9	174.7	194.1
70	15.6	21.7	26.3	36.5	49.8	81.4	110.9	151.2	180.8	200.8
80	16.1	22.4	27.1	37.6	51.3	83.9	114.4	156	186.4	206.9
100	17.1	23.6	28.6	39.6	54	88.4	120.6	164.5	196.3	217.6
125	18.1	25	30.2	41.7	56.9	93.2	127.2	173.7	206.9	229.1
150	19	26.1	31.6	43.5	59.4	97.4	133	181.7	216.1	239.2

(source: HIRDS Version 2.0, High Intensity Rainfall Design System, Table of rainfall depths.

Location: Porirua 41 08S 174 51E. (Rainfall depths in mm).

- Rainfall depth is in millimetres for the specified duration
- ARI = Average Recurrence Interval, normally the Minimum Level of Protection as defined in Section 2.3.1
- The Ministry for the Environment publication “Preparing for Climate Change” forecasts an increase of mean temperatures of 2 degrees Celsius by 2080. An allowance of 16% shall be added to the figures in the above chart to take account of the increase in precipitation that would follow from this temperature increase.
- Reference should be made to Map 401.3.2A for Rainfall Zone Factors
- For all urban lots a co-efficient of run-off of 0.65 shall be used.



Wastewater

Performance Goal

While at all times avoiding, remedying or mitigating any adverse effects on the environment.

To provide a system for the safe treatment and disposal of wastewater that safeguards people and communities from injury or illness caused by infection or contamination resulting from exposure to wastewater.

Performance Criteria

To achieve the Performance Goal, development proposals shall demonstrate that they have considered and addressed the following criteria:

Performance Criterion

Capacity

The wastewater system shall be capable of carrying peak flows anticipated during the lifetime of the system, with due allowance for ground and surface water inflow and infiltration. In designing the wastewater system, population density shall be based on proposed use, but with a minimum of 50 persons per hectare for the urban areas.

Design peak wet weather flows shall be not less than 0.6 litres per second per hectare, unless specific information relating to long-term development can demonstrate a lower requirement.

Discharge

Buried pipe reticulation shall convey wastewater to an approved connection point to the existing wastewater system, or to a treatment facility, in a way that maintains public health and avoids, remedies or mitigates effects on the receiving environment, particularly the Porirua Harbour and Pauatahanui Inlet.

Wastewater shall be released to the environment only at locations where the discharge can be treated and dispersed so that adverse effects are avoided or mitigated. Potential adverse effects may include effects on the spiritual and cultural values of Tangata Whenua.

Wastewater must not be discharged to the ground in a manner that may cause, or contribute to, ground instability.

Self Cleansing

All wastewater systems shall be designed so that they are self-cleansing at current or expected peak dry weather flows, so that blockages and restrictions to the capacity of the systems caused by the accumulation of solids deposited in pipes or other structures are avoided.

Performance Criterion

Treatment

No wastewater shall be discharged to the environment unless it has first been treated to avoid any likelihood of contamination of soils, groundwater and waterways, except as permitted under the Resource Management Act 1991, and relevant Wellington Regional Plan Rules.

Connection to Public Collection Network

Subject to the conditions of Council's trade waste bylaws, wastewater sources may be connected to the public wastewater network.

Connection to Private Collection Network

Private wastewater systems, including septic tanks and privately owned and operated treatment plants, shall not be used where discharge to the public wastewater network is available. They shall be permitted only where:

- it can be demonstrated that there will be no more than minor adverse effects, including adverse cumulative effects on the environment; and
- it can be demonstrated that sustainable management systems are in place for their long-term operation, maintenance, replacement, upgrading and funding.

Catchment Development

Wastewater system design shall demonstrate that the immediate requirements of use and development, as well as future development and upstream development, have been considered and that, where appropriate, the system:

- is adequate to meet existing and expected future demand to allow for all reasonably predictable development within the upstream catchment designed to the level of development allowed within the relevant District Plan; and
- provides suitable points of connection for other sources.

Restriction on Discharge

Stormwater drains must not be connected to the wastewater system. Wastewater systems shall be designed and constructed to minimise the risk and extent of stormwater inflow and infiltration.

The level of a gully trap for any new connection to the wastewater system must conform to the requirements of the Building Act, and in addition must be:

- at least 150 mm above the nearest opening in the wastewater network; and
- above the surface level of stormwater with a 100 year or greater return period.

Performance Criterion

Economic Life-Cycle Costs

Ensure wastewater systems are designed in a way that minimises the overall life-cycle costs.

The life-cycle shall be no less than 50 years.

Compatibility and Durability

Ensure wastewater system design and construction:

- uses durable materials;
- minimises any likelihood of leakage and infiltration; and
- withstands anticipated pressures and applied loads.

Materials used in the wastewater drainage system shall be compatible with Council's existing systems and approved materials.

Maintenance

Wastewater systems shall be located and designed to provide reasonable access for maintenance without significant damage or disruption to other network utility services, land use activities, and landscape values. Covers, barricades, fences and sign-posting shall be provided as appropriate to provide for public safety and prevent public access to hazardous areas.

Security

The wastewater system shall have adequate alarms, standby pump capacity, storage, access points or other emergency provisions to minimise the risk and extent of loss of service due to failure or maintenance requirements.

For pump stations either at least 6 hours dry weather flow storage shall be provided in the event of system failure or alternative equivalent protection shall be provided as a minimum requirement.

On Site Disposal

On site disposal systems shall be specifically designed to a standard that:

- ensures the effects of disposal remain entirely within the area to be served;
- ensures environmental effects are no more than minor;
- minimises adverse public health effects;
- ensures maintenance requirements are minimised; and
- complies with Greater Wellington Regional Council Permitted Activity requirements for discharge to land; or
- is in accordance with a Resource Consent for Discharge to Land approved by Wellington Regional Council.

Performance Criterion

Design shall be based on field testing and any other site investigations necessary to demonstrate that these requirements can be met.

Reference may be made to the GWRC “Guidelines for on-site sewage systems in the Wellington Region”.

Environmental Quality

Ensure that environmental quality is taken into account in the location, design and construction of all components of wastewater systems.

In considering environmental quality, the following should be taken into account:

- the need to avoid adverse effects on cultural and heritage sites and to respect cultural values, particularly the cultural values of Tangata Whenua relating to wastewater treatment and disposal;
- the need to preserve or protect areas of ecological significance, areas of significant habitat for indigenous flora and fauna and outstanding natural features;
- the need to avoid, remedy or mitigate adverse effects on freshwater ecosystems, watercourse margins, esplanade strips, Porirua Harbour and the coastal marine area;
- the need to avoid, remedy or mitigate adverse effects on visual amenity; and
- the need to provide for on-site silt and sediment management, erosion control and dust control during construction.

Special Provisions: Wastewater

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
5.3	New Clause	<p><i>General</i></p> <p>Within rural areas, if it is not possible to connect, or where there is no immediate likelihood of connection, to the public sewerage system, on-site treatment and disposal of sewage will be considered.</p> <p>Land development or subdivision in such areas must comply with the Regional Plan for Discharges to Land.</p> <p>The design of an on-site wastewater treatment system shall be carried out by an experienced wastewater professional, based on a specific assessment of site conditions.</p> <p>On-site systems will remain the maintenance responsibility of, and in the ownership of, the property owner.</p>
5.3.2.1	Add Clause	(g) Ensure that all wastewater gully traps are 150 mm above the nearest opening in the wastewater network and 100 mm above 100 year Design Flood level or finished ground level, whichever is higher.
5.3.2.2	Add Clause	<p>Scheme layout</p> <p>Refer to 4.2.3.</p>
5.3.2.3	Add Clause	<p><i>Pipes in road and drainage reserves and public open space</i></p> <p>Refer to Table 9.1.</p> <p>Refer also section 4.3.9 "Drainage easements and underground service easements"</p>
5.3.2.4	Add clause	<p>Pipes in private property</p> <p>Refer also section 4.3.9 "Drainage easements and underground service easements"</p>
5.3.2.9	New Clause	<p><i>Building Consents</i></p> <p>Where required all necessary building consents (e.g. for pump stations) must be obtained prior to commencement of construction.</p>
5.3.5.1	Add Paragraphs	<p><i>Design flow</i></p> <p>Design flows for existing domestic areas and all commercial/industrial areas shall be discussed with Council before detailed design is carried out. Where possible, for systems serving existing areas or major industrial projects, flows shall be measured over a period of time or based on knowledge of the industrial process, as applicable. In all cases due allowance for infiltration shall be made.</p> <p>Allowance shall be made for any future development which could flow into the proposed system. For this purpose, the designer must check with Porirua City Council.</p>
	Replace Paragraph	<p>a) Residential flows:</p> <p>i) Average dry weather flow of 270 litres per person per day.</p> <p>ii) Dry weather diurnal PF of 2.</p> <p>iii) Dilution infiltration factor of 2 for wet weather.</p> <p>iv) Number of persons per dwelling 3.5.</p>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
5.3.5.7.1	New Clause	All pipes and associated structures within the road reserve and all other areas likely to receive traffic shall be designed to HN-HO-72 loading as set out in the current version of the NZTA "Highway Bridge Design Brief".
5.3.6.4.1	New Clause	(d) A pipe invert and self-haunching through manholes that is rounded and given a form and finish which facilitates smooth flow, non-entrapment of debris, and easy access with cleaning rods. Generally, haunching shall be from invert of pipe to top of pipe, sloped backwards and up to the outer inside of the MH at an angle of not less than 30°, but not more than 45°, to ensure non-entrapment. All haunching shall be to the satisfaction of Council.
C5.3.6.4.1	New Clause	Haunching can also be achieved by a complete insert, such as by the "Sheriff Bencher". This is a complete polyethylene bencher insert, with a range of channels already moulded in, that fits inside the MH as one part and all that is required is the cutting out of the desired hole for the pipe. If inserts are used, these shall be installed to the manufacturer's directions and specification.
5.3.6.4.9	New Clause	<i>Shallow Manholes</i> Where depth to invert does not exceed 900mm, shallow type manholes may be used, except under carriageways.
5.3.8.1		<i>Pipe Materials</i>
	Add paragraphs	For public mains acceptable pipe materials include: <ul style="list-style-type: none"> - On normal grades: uPVC SN16. - On steep sections: HDPE PE100 SDR17. For private laterals the pipe material shall be: SN16. All pipes shall comply with the minimum sizes and specifications given in this Code.
5.3.9.2	Add Paragraph	Plans and sections submitted to Council shall show: <ul style="list-style-type: none"> - proposed means of connection to the public system, and the invert and lid levels of any existing manholes involved, in terms of Wellington MSL; - pipe diameters (min 100 mm residential lateral); and - pipe materials.
5.3.9.3		<i>Number of connections</i>
	Add Paragraph	Sewers to service 2 or more lots must be constructed to the standard required for public drains.
5.3.9.4		<i>Location of connection</i>
	Add Paragraphs	(e) Be contained within the body of the lot. The point of discharge from a private connection at the property boundary to the public sewer marks the boundary of responsibility between the Council and property owner. For laterals more than 10 m long and not directly connected to a manhole, access shall be provided at this point by sealed rodding eye brought to the surface contained within an approved toby box with a white coloured lid with the words 'SS' or 'sewer' on it. (Refer also to PCC Wastewater Bylaw Part 25).

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
		<i>Connection depth</i>
5.3.9.5	Add Paragraph	(i) Connections or parts of connections remaining the property of private owners shall satisfy the Building Code with respect to cover.
5.3.9.5.2	New Clause	<i>Connections to deep lines</i> Connections shall not be made to a sewer that is more than 3.5m deep to the crown. A new, shallower branch sewer shall be laid from a manhole on the deep sewer and connections made to the branch sewer for the lots to be served.
5.3.10		<i>Sewage Pumping</i>
	Add Paragraphs	<p>Sewage pumping will only be approved where gravity conveyance is not feasible. Pump stations and associated pumping mains serving less than 2 urban lots or equivalent multiple units will not be taken over by Council. Pumping stations that will come into the ownership of Council shall be designed to cope with not less than 100% of the peak wet weather flow using a pump system incorporating pumps of equal capacity. Design shall be to the highest accepted current standards and as a minimum shall incorporate the following:</p> <p>A) Sewage Pumping Stations: Vested (Public) Assets:</p> <p>Minimum Requirements:</p> <ol style="list-style-type: none"> a. Sewage pumping will only be approved where gravity conveyance is not feasible. b. Pumping stations that service 3 or more Lots and will or may come under the ownership or jurisdiction of PCC shall be designed as follows: c. Pumps shall be as specified in the design and acceptable to PCC for servicing 3 or more residential Lots (Pumps shall be compatible with those already installed in the PCC network). d. The pump outlet to rising main installation shall be as per Council accepted design; e. Pumps shall be capable of coping with peak wet weather inflows; f. Chains of high tensile quality steel for lifting are to be provided for the maintenance and servicing of all pumps; g. Sewage pumps shall have non-clogging impellers capable of handling minimum solid size of 75mm discharging into 100mm diameter or larger rising mains. h. Smaller diameter rising mains may be approved subject to specific design calculations submitted to Council; i. The effects of water hammer pressures shall be addressed and measured to limit their impact shall be designed as necessary; j. Rising mains shall be rated appropriate to the maximum total head but not less than Class C (90 metres), generally a HDPE SDR 11 rating and with all duty pumps operating shall deliver not less than 1.5 times the flow from 1 pump; k. Pumps and chambers shall be designed for a maximum of 12 starts per hour; l. A system curve shall be developed for the pump station and rising main. Pumps shall be selected to operate efficiently at the design flow rate on the system curve; m. Pumps shall be fitted in pairs so that while one pump is acting as duty pump, the other is on automatic standby; i.e., all pumping installations shall have 100% standby capacity. Each pump

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
		<p>operating separately shall be capable of delivering the design wet weather flow. The duty sequence shall be automatically interchangeable, with a manual override;</p> <p>n. Pumps shall be able to be isolated for maintenance purposes by gate valves housed in an accessible chamber. A station valve shall be incorporated to enable the whole pump station to be isolated. Valving of pumps shall be such that maintenance can be undertaken on the standby pump as well as the check valve without interfering with the operation of the duty pump and vice versa;</p> <p>o. All iron and steel shall be internally and externally protected against corrosion. Flanged or welded fittings shall be provided throughout, with a proprietary dismantling joint or similar in the system to facilitate dismantling;</p> <p>p. Pump chambers shall be of adequate size to provide flow storage i.e., six hours minimum of design flow, at least part of the required emergency storage and be safely entered for work and repairs. Adequate provision shall be made for overflow or standby functionality; e.g. generators, etc;</p> <p>q. Chambers shall be designed against flotation when empty;</p> <p>r. The discharge pipe within the Pump chamber shall be of ABS or Stainless Steel construction;</p> <p>s. All electrical switchgear is to be flame resistant, located above ground level and above the 100-year flood level (1-% probability of exceedance) in a stainless steel weatherproof cabinet;</p> <p>t. Pump stations shall incorporate all necessary control, monitoring, alarm and telemetry systems to Council standards at the time of design. Radio linkage shall be provided to every new pumping station;</p> <p>u. All electrical equipment and cabling shall be safety rated for its particular location and use;</p> <p>v. A 3 phase power connection is to be provided to enable emergency power to be supplied to the pump station together with a single 3 pin, 3 phase plug for portable lighting and equipment;</p> <p>w. Cables shall be sealed to protect from sewer gas entering the switch gear;</p> <p>x. A water supply with back flow prevention to the approval of PCC shall be provided to the immediate vicinity of the station;</p> <p>y. Pumping stations shall be located on a separate lot within the development/ subdivision. A sealed access way of not less than 3.5 metres width shall be provided to the nearest public street. The immediate area around the station shall be fenced and provided with a locked gate. Refer to: WSA 04: Pump Stations and Rising Mains;</p> <p>z. A Resource Consent from GWRC may be required prior to the design acceptance of any pumping station; and</p> <p>aa. Odour control shall be addressed in the design.</p> <p>(B) Required Standards for Private On-site Sewer Pump Stations</p> <p>a. To service single Lots but no more than 2 Lots per single pump station;</p> <p>b. Site assessment carried out by a suitably qualified person;</p> <p>c. The design and installation of the on-site treatment system undertaken by a suitable professional;</p>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
		<ul style="list-style-type: none"> d. Pumps and chambers designed for a maximum of 12 starts per hour; e. Sewage pumps to have non-clogging impellers; f. The effects of water hammer pressures addressed and measures to limit their impact designed as necessary; g. Chambers designed against flotation when empty and impervious to fluid infiltration; h. A water supply with back flow prevention if connected in to Council underground service network provided to the immediate vicinity of the station; i. All necessary control and monitoring alarms; j. A pump with an immersed open multi-channelled impeller with a grinder on the intake; k. A float or level sensor; l. Pipe discharge size of a minimum 32mm internal diameter; m. All power sources and cables protected by appropriate cover; n. Performance limits of a maximum of 8mm free passing; o. Built-in thermal over-load protection; p. A liquid temperature rating of 40 degrees C; q. Normal power supply in single phase 230 v – 50 Hz; r. Pump casing made of cast iron or similar; s. All electrical switchgear located above ground level and above the 100-year flood level; t. The holding-chamber designed to contain the back-wash of the raising main. A back flow prevention device (non-return valve and isolating valve) shall be installed just prior to the connection to the Porirua City Council main, so any effluent not discharged into Council's main can drain back to the chamber, thus preventing aerobic effluent turning anaerobic in the pipe before discharging to the public system; u. Manufactured to AS/ NZ standards 1546; v. Minimum 24-hour emergency capacity; w. Audible and visual alarm system; x. Groundwater entry prevention lids; y. Flush Valves (to clean lines); z. 24-hour call or message service; aa. An on-going service contract; bb. Routine servicing; cc. The private pump chamber must be large enough to cope with the back flow or drainage from the line when the pump is shut off. Pump chambers shall be of an adequate size to provide flow storage i.e., 24 hours minimum of design flow and still give safe access for work and repairs. The system in the event of power failure shall have either a gravity or siphon emergency over-flow line away from the tank to a specified effluent field of not less than 100m² with an irrigation filter installed prior to discharge, or additional built-in safety holding capacity; dd. The developer takes the responsibility to alert any future purchasers of a Lot serviced by a private pump station; ee. It shall be stated that any private pump station shall be and remain the full responsibility of the property owner or users to maintain to the appropriate standard along with all on-going costs and upkeep associated with the pump; ff. All pump stations shall be kept to a standard acceptable to Council and that does not cause a nuisance to other property owners, adverse effects to the surrounding environment, or discharge material that may damage or cause negative effects to

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
		Council's sewer network and the environment
5.5		On Site Disposal
5.5.1	New Clause	<p><i>Proposal/Applications</i> For any subdivision for which on-site disposal is proposed, proof of the ability to provide a suitable system for each lot shall be submitted with the resource consent application.</p> <p>The preliminary design and supporting report shall be based on field testing carried out on each lot.</p> <p>5.5.1.1 Any design shall comply with Council's Wastewater Bylaw, but shall provide for, but not be limited to, the following points:</p> <ol style="list-style-type: none"> a. Site assessment carried out by a suitably qualified person; b. Design and installation undertaken by a suitable professional; c. Tank to have secondary treatment; d. A test on the system is carried out by the installer or manufacturer within a 4-month period of its installation to demonstrate its compliance with AS/NZ 1547. A copy of the compliance results shall be sent to Porirua City Council; e. On-site system capacity designed to occupancy based on the number of bedrooms in the dwelling – as per Table 4.3A1 AS/NZS 1547, but shall be not less than 4500 litres; f. An outlet filter to a standard prescribed in AS/NZS 1547; g. Even distribution of effluent to the entire disposal field by either pump or dosing siphon; and h. A minimum 3-year service/maintenance contract with the supplier or its agent post-installation. <p>5.5.1.2 The minimum features of any design shall include:</p> <ol style="list-style-type: none"> a. Manufactured to New Zealand standards; b. Minimum 24-hour emergency capacity; c. Audible and visual alarm; d. Full-height primary wall (to prevent solids washing through to the high performance chambers during surge flows); e. Groundwater entry prevention lids; f. Irrigation filter (regular blockage would indicate tank is not performing well); g. Flush valves (to clean lines); h. 24-hour call or message service; i. Service contract; and j. Routine servicing. <p>5.5.1.3 Effluent disposal fields shall comply with the following location requirements:</p> <ol style="list-style-type: none"> a. Have at least 20m separation distance between neighbouring disposal fields; Located not closer than 50m from valley floors, ephemeral streams, storm drains, any type of open waterbody, or down-slope land boundaries, and 20m down-gradient (i.e. with respect to groundwater flow) from drinking water bores; b. Located in an area where the ground surface is free of inundation in a 20-year flood event; c. Have the underside of the disposal bed be not less than 600mm above the highest water table; d. Have

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
		<p>e. Located no closer than 1.5m from any boundary; f. disposal into the top soil, preferably; and g. Located in a designated area free from slopes over 18 degrees (3 horizontal : 1 vertical).</p> <p>5.5.1.4 Effluent disposal fields shall comply with the following site requirements:</p> <p>a. A primary effluent disposal field of not less than 250m² (average 3 bedroom home); b. A 'reserve area' of equivalent size to the designed effluent disposal area shall be set aside on the same lot for future expansion or replacement of disposal area; c. Maximum discharge to land not to exceed 1500 litres/day per primary disposal field; d. With suitable soils and groundwater conditions, for lot sizes under 4,999m², the aerial effluent-loading rate shall not exceed 3.5 litres/m²/day; e. With suitable soils and groundwater conditions, for lot sizes over 5,000m² the aerial effluent-loading rate shall not exceed 5 litres/m²/day.</p> <p>5.5.1.5 Other requirements for effluent disposal fields include:</p> <p>a. Suitable plants and shrubs shall be planted and maintained in the disposal field; and b. Fencing of the disposal field from children and animals as a protection for public health.</p> <p>If at sub-division stage an existing effluent disposal system on any Lot within the proposed development is found to be more than 10 years old, it must then be proven to comply with the current minimum requirements for on-site effluent disposal.</p>
5.5.2	New Clause	<p>In situations of high permeability soils and/or high water table, where potential for environmental contamination is high, further treatment by filtration and/or disinfection will be required.</p> <p>In special circumstances the use of other than water-based sewage systems may be proposed. Such systems shall be designed according to current guidelines and supported by relevant design data. In such cases grey water shall be disposed of to land and adequate soil testing and design shall be provided to support the proposal for grey water disposal. Council will consider grey water disposal to land where adequate soakage can be shown from soil testing and any potential adverse public health effects/nuisance conditions can be minimised.</p>
5.5.3	New Clause	<p><i>Design</i> Design inputs shall include:</p> <p>a. Testing of site soils; b. Obtaining winter groundwater surface levels; and c. Topographical survey of the relevant part of the lot to enable the system to be accurately located in terms of ground contours and features.</p>

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
5.5.3.1	New Clause	<i>References</i>
		Current versions of standards: a. NZS 1546.1 On-site Domestic Wastewater Treatment Units Part 1: Septic Tanks; b. NZS 1547 Disposal Systems for Effluent from Domestic Premises.
5.6	New Clause	<i>Testing</i> All sewers will be pressure tested upon completion of construction at the applicant's expense prior to issue of S.224c. Council's engineer or representative will be present during the test, and will sign the appropriate documentation provided by Council to verify test. A minimum of 24 hours notice is required to be given to Council prior to the test being carried out. The contractor shall provide all fittings and materials to carry out the test. Water test to be in compliance with Appendix B NZS 4404. Water lines to be disinfected in compliance with Appendix C NZS 4404.
C5.6	New Clause	<i>Advisory Note</i> Requirements prior to pipe testing and Council arriving on site: a. Trenched and pipes laid; b. Bedding material, top and bottom shall have been laid over the pipe. Minimum 100mm top and bottom of pipe; c. All joints areas exposed including laterals and inspection eyes; d. Lines flushed and all residual debris cleaned out; e. All fitting and connection to have been installed prior to pressure test; and f. Lines to have been pressurized over night to the required pressure prior to the test commencing.

Water Supply

Performance Goal

While at all times avoiding, remedying or mitigating any adverse effects on the environment.

To achieve a water supply system for the purposes of meeting residential, commercial and industrial potable water requirements and for fire fighting purposes. The system shall promote community health and wellbeing.

Performance Criteria

To achieve the Water Supply Performance Goal, in all cases the water supply shall be consistent with the service levels required for the specific land use and development proposals shall demonstrate that they have considered and addressed the following criteria:

Performance Criterion

Quantity

Where a reticulated water supply is in place, or is proposed, the new or extended infrastructure shall have the capacity to service the anticipated demand at adequate flow and pressure. Servicing the anticipated demand shall include consideration of reticulation capability, pumping capacity, and storage.

For a reticulated urban supply the following shall be achieved:

Maximum working pressure	90 m
Minimum working pressure at peak daily demand (at 6m above ground at house site)	20m
Minimum working pressure under fire fighting flows	10 m
Minimum available flow at point of supply	15 litres/minute

A reticulated system shall provide both:

- flows equivalent to the NZS PAS 4509:2008 "New Zealand Fire Service Firefighting Water Supplies Code of Practice" flow requirements, plus two thirds of the peak daily consumption flow; and
- peak daily demand at 0.60 litres/second/hectare.

The supply for residential use in the urban area shall be based on 50 persons per hectare.

Industrial and commercial demands shall be specifically analysed for known or potential usage. Note that Porirua industrial areas have been planned on the basis of an overall water demand of 0.6 litres/second/hectare and may not be appropriate for industries with intensive water demands.

Note that as Council looks at developing rural residential areas through its District Plan appropriate standards will be developed.

Performance Criterion

Fire Fighting

The water supply shall satisfy the requirements of NZS PAS 4509:2008 "New Zealand Fire Service Firefighting Water Supplies Code of Practice" and amendments, and permit access for fire fighting.

Quality

Where connection is made to the urban water network, the water supply shall be capable of providing potable water to a quality grading of Aa, complying with the requirements of New Zealand Drinking Water Standards and the asset management plan for the public water supply.

Residential, commercial and industrial premises in areas which are not able to be connected to the urban water network, shall develop a supply capable of providing potable water which meets the requirements of the New Zealand Drinking Water Standards.

Storage

Where served by a fully reticulated supply, a reticulated water supply system shall have adequate storage capacity to allow for fire fighting purposes, and to provide reserve supply for the calculated requirements of users. Storage for domestic demand shall not be less than 450 litres per head per day, for a minimum consumption period of 24 hours.

Where not served by a fully reticulated supply, a storage facility shall be provided for each dwelling unit not served by a fully reticulated supply, adequate to provide for both domestic and fire-fighting requirements as per section 2.5.1 above.

Economic Life Cycle Costs

Water supply systems shall be designed in a way that minimises the overall life-cycle costs inclusive of capital, operating, maintenance and rehabilitation costs. For the purposes of these criteria, the life-cycle shall be taken as no less than 100 years.

Compatibility and Durability

The water supply system shall use durable materials and be constructed to minimise leakage and potable water contamination, and to withstand anticipated pressures and applied loads.

Materials used in the water supply system shall be compatible with Council's existing systems and approved materials.

Maintenance

Water supply systems shall be positioned and designed so as to:

- be easily located; and
- provide for reasonable access for maintenance, outside of carriageways.

In providing for maintenance access the following shall be avoided or minimised:

- damage or disruption to landscape and planting;
- disruption to access to properties; and
- adverse effects on land uses.

Covers, barricades, fences and sign-posting shall be provided as appropriate to provide for public safety and prevent public access to hazardous areas.

Private Water Supplies when Connection to Urban Network is not Feasible

Private water supplies shall be considered on a case-by-case basis, and shall generally be provided only where supply from public reticulation is not economically feasible.

Environmental Quality

Environmental quality shall be considered in the location, design and construction of water supply systems.

In considering environmental quality, the following should be taken into account:

- the need to avoid, remedy or mitigate adverse visual effects, particularly of reservoirs
- the need to avoid adverse effects on cultural and heritage sites
- the need to preserve or protect areas of ecological significance, areas of significant habitat for indigenous flora or fauna, and outstanding natural features
- the need to avoid, remedy or mitigate adverse effects on stream and watercourse margins and the coastal marine area.

In general, a well-planned and well-designed water supply system should have little or no adverse effects on environmental quality.

Special Provisions: Water Supply

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
6.2.1		<i>Objectives</i>
	Add Paragraph	(a) The provision of water mains shall apply to developments where a water supply is available, or, in the opinion of the Council, will be available within five years from the date of scheme plan approval.
C6.3.6.2	Add paragraph	Prior to submitting any application for subdivision, it is recommended that there be pre-application discussion with Council Water and Drainage Engineer, over details. This is particularly relevant (a) in areas difficult to service, and (b) prior to preparing detailed construction plans.
6.3.7.3		<i>Pipe materials</i>
	Add paragraphs	For public mains acceptable pipe materials include: <ul style="list-style-type: none"> - For 63 mm OD or smaller pipes: MDPE - PN12; - For 100mm and larger pipes: oPVC PN12, or as approved by Council; and - For service leads: MDPE – PN12. <p>Any pipes of diameter equal to or over 300 mm shall be specifically designed and approved by Council.</p>
6.3.9.1		<i>Level of Service</i>
	Add Paragraphs	(d) Mains 100mm diameter and over shall be designed either for peak daily demand or for fire flow plus two-thirds of the peak daily demand, whichever requires the larger size. <p>Mains under 100mm diameter shall be designed for peak daily demand.</p>
6.3.9.11	New Clause	<i>Height Limits of Supply Relative to Reservoirs Supply</i> In assessing requirements, it is assumed that the highest fitting to be supplied will be six metres above the ground level of the house site on the lot. If the gardening area of the lot is higher, it will not necessarily be supplied at the specified minimum pressure. The highest ground level on the lot should not normally be above the level to which water supply is available to fittings.
6.3.10.1	Add Clause	Refer to 4.2.3 and Table 9.1.
	Add paragraph	For accessibility and ease of maintenance, all new water supply mains other than trunk mains; i.e. those mains that provide individual service connections, shall be laid under the berm rather than under a footpath.
6.3.10.2		<i>Mains layout</i>
	Add Paragraph	(f) Wherever practicable, water mains laid in long cul-de-sacs shall be carried through the adjoining section, or sections, by way of easements and shall be connected to another street main. The minimum size of such through-mains shall be 100mm diameter.
6.3.10.3		<i>Water supply in Private Ways, and Easements</i>
	Add paragraph	Water supply in Private Ways shall be provided by means of either: <ul style="list-style-type: none"> (a) a public main laid in the berm protected by a 3.0 m (minimum) wide easement in gross; or

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
		(b) individual 20 mm private service leads each terminating at the boundary between the public road and the private way, and protected by private easements.
6.3.11.7.1		<i>Pipe cover</i>
	Add Paragraph	Minimum cover over pipes shall be as follows: <ul style="list-style-type: none"> - Mains 100mm diameter and greater: 750mm to the crown; - Rider Mains – under grass berms and footpaths : 600mm to the crown; - Rider Mains – under carriageway: 750mm to the crown; and - Service Pipes : 450mm.
6.3.12		<i>Reservoirs and pumping stations</i>
	Add Paragraph	The setting up of a new reservoir or a pumped separate pressure zone to supply less than fifty lots will not normally be considered.
6.4		Valves
6.4.1		<i>General</i>
	Add Paragraphs	(e) Sluice valves shall be resilient seated, cast iron, anti-clockwise closing, heavy pattern, with a non-rising spindle. Valves shall be flanged.
		(f) Valved bypasses shall be installed around all valves 300mm and over. The size of the bypass shall be 100mm or larger as required by the Council.
6.4.2.1		<i>Gate Valves</i>
	Add Paragraph	Resilient seated gate valves shall be used with pipes of 50mm diameter and less and shall be manufactured of ductile iron, clockwise closing, single gate, non-rising spindle type, tested to 2.07 MPa. The gate valves shall be fitted with a ductile-iron hand wheel which will enable a valve key to be used for opening and closing of the valve.
6.5		Hydrants
6.5.1		<i>General</i>
	Add Paragraph	Tall hydrants shall be used.
6.5.7	New Clause	<i>Hydrant Location</i> Hydrants for scouring only and for special fire risks are required on mains 375mm and over, where these mains are without service connections and there are adequate hydrants on parallel mains. Hydrants shall be provided for scouring mains at dips and upstream from valves. Hydrants at peaks are an advantage, but are not essential. Hydrants are needed especially at intersections and near special fire risks (but in a safe position). Services and small mains shall be connected upstream of the terminal hydrant. Hydrant risers shall be used, or the water main laid deeper, where necessary. Ensure that the top of the spindle shall be no less than 100mm below surface, and screw no deeper than 300mm below surface.

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
6.6.2 (b)		<i>Property service connections</i>
	Add Paragraphs	(i) <i>Sections having separate road frontage</i> A connection to the main or rider main shall be made at the appropriate location and the domestic service lateral shall be at right angles to the main or rider main and extend to the toby. The Council approved toby box, with base plate and blue lid with the word "water" on it, shall be located at a point on the street boundary in the berm.
		(ii) <i>Diameter of Service Connections</i> Each Lot or dwelling within the Lot shall be serviced by a 20mm ID lateral unless otherwise directed in writing.
		(iii) <i>Service connection materials</i> Galvanised steel pipes and fittings are not permitted. All service laterals shall be of the material type MDPE PN12.
		(iv) <i>Toby boxes</i> Plastic toby boxes shall be approx 260mm x 230mm x 300mm deep, with base plate to locate the manifold valve, and shall be blue with the word "Water" on the lid.
		(v) <i>Commercial and Industrial Sites</i> All industrial and commercial sites being developed having water requirements over the normal 20mm ID, shall include the installation of backflow prevention devices to the satisfaction of Council.
6.10.4	Add Paragraphs	A minimum of 24 hours notice is required to be given to Council prior to the test being carried out. The contractor shall provide all fittings and materials to carry out the test. Refer to 5.6 for requirements prior to pipe testing.
6.10.3.5	New Clause	All PVC/Hobas/Blue Brute manufacturing codes and class markings shall be installed facing upwards. All spigot end witness marks shall be showing just clear of the following pipe collar. Rating 'PN12' or higher shall be used.
6.11.3		<i>Allowable operating pressures (heads)</i>
	New Paragraph	The maximum working pressure shall not exceed 900 kPa (90m head of water) at any point in a reticulated system without Council approval. The minimum working pressure shall not be less than 350 kPa (35 m head of water) at 6 metres above ground level of the building platform.
6.11.5		<i>Minimum water demand</i>
	Replace Paragraph	(a) Peak daily demand for design shall be 0.6 litres/second/hectare. Average demand on the peak day shall be based on 50 persons per hectare and demand of 450 litres per head per day. These are gross areas including streets, but excluding reserves.
6.12.1	New Clause	<i>Pumping</i> In cases where pumping is required, such work shall be carried out to the approval of the Council , at the expense of the developer and according to the following principles: (a) Design to deliver the total maximum day water requirement without using a standby unit in 15 hours for stations under 50 litres per second and 18 hours for larger stations. The minimum capacity of any one

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
		<p>pump shall be 4 litres per second;</p> <p>(b) Pumps normally to be equal in size and of the same make. Standby capacity 100% for station under 50 litres per second. Standby at least 50% for larger stations; e.g. total number of pumps = 2 : capacity each 100%;</p> <p>(c) Stations less than 50 litres per second shall be designed so that both pumps can be run simultaneously if so required;</p> <p>(d) The station shall be designed for automatic control and fitted with protective devices to prevent damage to the pumps and control systems. These protection devices may include (but not be limited to) check valves, no-flow cut-outs, motor overload cut-out, and alarms;</p> <p>(e) Equipment shall be arranged and installed to limit noise in air and water. Permanent buildings are required; and</p> <p>(f) The design of the pumping installation shall be subject to the acceptance of Council, including layout and electrical circuit design.</p>
6.12.2	New Clause	<p><i>Storage</i></p> <p>In cases where storage is required, it shall be provided to the acceptance of the Council at the expense of the developer generally according to the following principles:</p> <p>(a) 450 litres per head with fire storage not necessarily additional but considered in terms of the Fire Services Code of Practice.</p> <p>(b) Reservoirs not normally more than 6 metres deep. In special cases up to 7.5 metres.</p> <p>(c) It is desirable that alternative means of feeding the area be available in the event of the reservoir or outlet main being out of service.</p> <p>(d) Depth monitoring and pump control equipment shall be fitted.</p> <p>(e) All-weather vehicular access shall be provided. The access road shall be surfaced with permanent material unless the Council agrees that the installation is temporary.</p> <p>(f) The reservoir structure shall be constructed in prestressed or reinforced concrete, or suitable materials having equivalent or better long term durability and performance.</p> <p>(The Council reserves the right to provide the storage and charge the subdivider.)</p>
6.13	New Clause	<p><i>Water Supply in Non-Reticulated Areas</i></p> <p>Specific design by a person experienced in design of small water supply and treatment is required where a reticulated water source is not available. The design shall demonstrate that the proposed system will meet the New Zealand Drinking Water Standards. This shall include testing of the supply source (except in the case of roof supplies) by an approved Telac Lab to ensure compliance with NZ Drinking water standards prior to acceptance for consumption.</p> <p>Requirements for ongoing testing shall also be specified in the design. As a minimum this shall provide for annual testing of the water quality at the point of usage. Contingency measures in the event of future failure to meet the New Zealand Drinking Water Standards shall be considered.</p> <p>Where roof supplies are proposed, the roof area and storage shall be sufficient to provide an average daily household supply of 800 litres per day assuming 60 days without rain.</p>

Landscape Design and Practice

Part 7 of NZS4404:2004 has not been adopted by PCC. Users of the code are urged to discuss these matters with the Councils Leisure Assets Services Staff.

Reserves

Part 8 of NZS4404:2004 has not been adopted by PCC. Users of the code are urged to discuss these matters with the Councils Leisure Assets Services Staff.

Power, Telecommunications, Gas

Performance Goal

While at all times avoiding, remedying or mitigating any adverse effects on the environment.

To ensure that all new allotments, where practicable, are able to connect to electricity supply, gas supply, and telecommunications.

Performance Criteria

To achieve the Performance Goal, development proposals shall demonstrate that they have considered and addressed the following criteria as relevant:

Performance Criterion

Location of Services

Services shall be laid underground except where otherwise permitted by the District Plan. In rural areas with existing overhead cables, the use of overhead cables may be accepted where it complies with the District Plan.

Design and Construction of Services

Design and construction of gas, telecommunications and electricity services shall be to the requirements and approval of the respective network utility operators.

Design and construction shall allow for the operating access and service requirements of adjacent utilities in the ground.

Wherever practicable the design shall cater for the full anticipated development of the catchment served allowed within the District Plan.

Services shall be laid out in accordance with Council's standard alignments. Refer to Figure 9.1

Covers, barricades, fences and sign-posting shall be provided as appropriate to provide for public safety and prevent public access to hazardous areas.

Electricity Supply

Electricity supply shall be provided to each allotment. The supply shall be adequate for the requirements of the anticipated use and development of each allotment.

Performance Criterion

Gas and Telecommunications Connection

The design of roads and other services shall enable the provision of gas, telephone and ducting for telecommunications services in urban areas and, where practicable, in rural areas.

Compliance Certificate

A compliance certificate shall be provided from the relevant network utility operator, stating that the design and construction of gas, electricity, telephone and ducting for telecommunication services is satisfactory in standard and level of service, and that the network utility operator has accepted an undertaking for operation and maintenance of the facilities at no cost to Council.

Environmental Quality

Ensure that environmental quality is taken into account in the design, location and construction of all utilities.

In considering environment quality, the following should be taken into account:

- the need to avoid adverse effects on cultural and heritage sites;
- the need to preserve or protect areas of ecological significance, areas of significant habitat for indigenous flora and fauna and outstanding natural features;
- the need to avoid, remedy or mitigate adverse effects on freshwater ecosystems, streams and watercourses, esplanade strips, Porirua Harbour and the coastal marine area;
- the need to avoid, remedy or mitigate adverse effects on visual amenity; and
- the need to provide for on-site silt and sediment management, erosion control and dust control during construction.

Special Provisions: Power, Telecommunications, Gas

NZS 4404 Clause #	Nature of change	PCC Special Provisions that amend and add to NZS 4404:2004.
9.3.1.1		<i>Plans</i>
	Add Paragraph	(e) Interaction of existing and proposed street trees with services.
9.3.2		<i>Above Ground Utilities</i>
	Replace clause	Above-ground utilities shall be sited on land outside of the legal road reserve, and set back outside of the normal street line. A separate lot or easement shall be created in favour of the utility company.
9.4.5.1		<i>Position in the street</i>
	Add Paragraph	Location of services is to be as shown in Figure 9.1 Typical Disposition of Services wherever practicable.
Figure 9.1	New Figure	Typical Disposition of Services.

Figure 9.1 Typical Disposition of Services in Berm

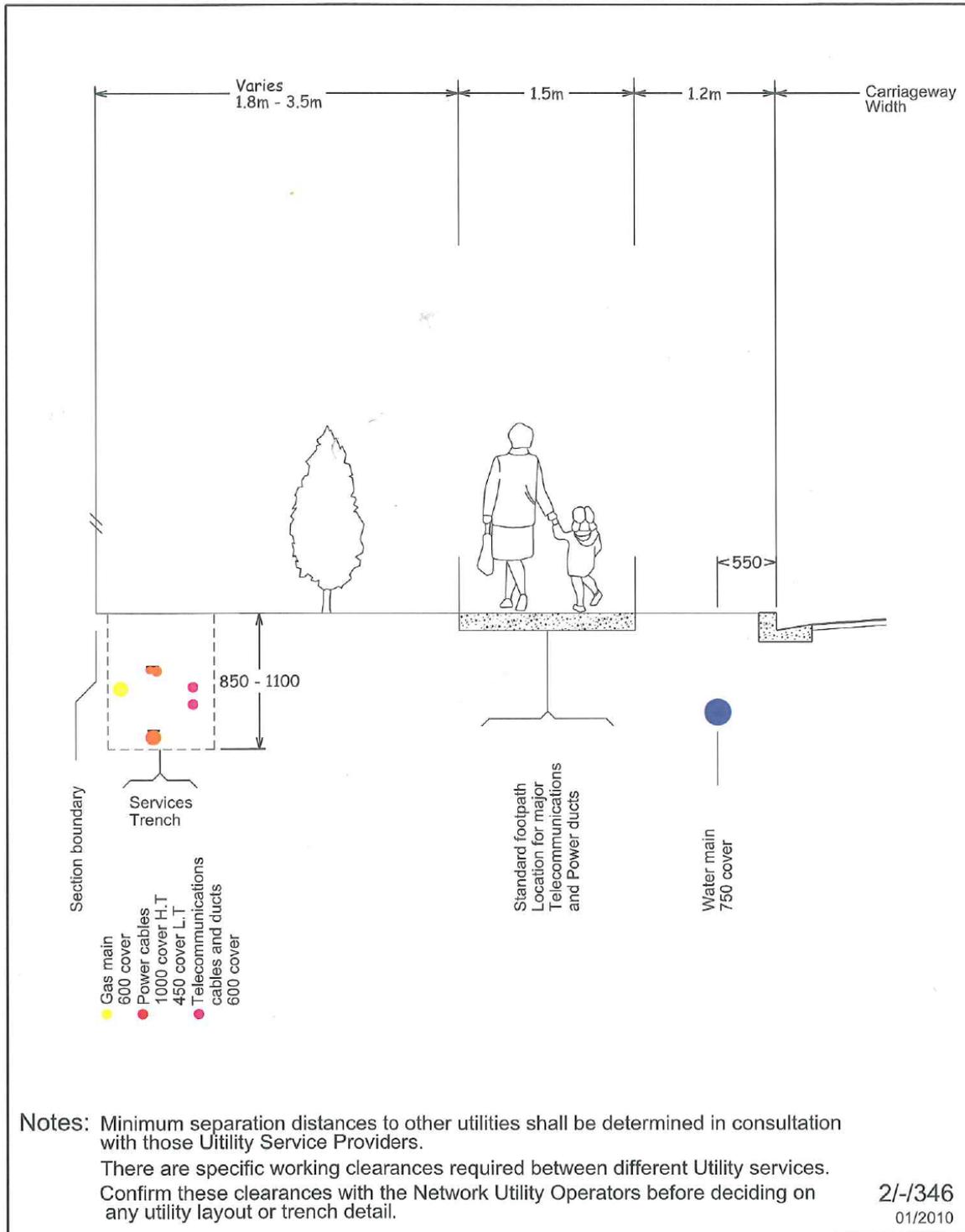


Fig 9.1

TYPICAL SERVICES LAYOUT IN BERM

Appendix: Council Specifications

PCC Engineering Specifications

(SPECINEW)

ROADING/SEALING	FILE NO.
General specification for Asphaltic Concrete Paving	Species.1
Specification for Berms	Species.3
Specification for Concrete Footpaths	Species.5
Control of Traffic While Working on Public Streets	Species.6
Specification for Crushed Basecourse Aggregate	Species.7
Specification for First Coat Chip Sealing Soft Residue Asphaltic Cutback	Species.10
Specification for Insitu Lime Stabilisation	Species.11
Specification for Installation of Residential Vehicular Crossing	Species.12
Specification for Installation of Heavy Duty Vehicular Crossing	Species.13
Specification for Timber Footpath	Species.123
Specification for Kerb and Channelling	Species.14
Repair of Trench Excavations on State Highways	Species.19
Specification for (Machine Laid) Asphaltic Concrete	Species.24
Specification for Construction of Private Ways and Parking Areas	Species.41
Specification for Timber Kerbs	Species.49
Specification for Lime Treated Aggregate Supplied Mixed to Site	Species.54
Specification for Sub Basecourse Construction	Species.74
Specification for the Reinstatement of Trench Excavations	Species.76
Specification for Shape Correction and Minor Surface Levelling	Species.78
Specification for the Repair of Edge Break	Species.79
Specification for Digout Repairs in Flexible Pavements	Species.80
Specification for Surface Preparation for Future Reseal	Species.82
Specification for Concrete Paving	Species.94
Specification for Slurry Sealing	Species.140
Maintenance Specification	Species.64
WATERWORKS	
Specification for Laying of Watermains	Species.15
Specification for Materials and Construction for Water Supply Reticulation	Species.18
Specification for Water Reticulation Disinfection	Species.21
Specification for Hydrant and Sluice Valve Installation	Species.36
Specification for Laying and Joining Mains	Species.37
Specification for Ridermains	Species.38
Specification for Services	Species.39
DRAINAGE	
Specification for Laying of Pipe Drains	Species.16
Specification for Working with Asbestos Cement Pipes	Species.22
Pipes	Species.60

Porirua City Council

Code of Land Development and Subdivision Engineering: Appendix: Council Specifications

Specification for Plumber and Drainlayer	Species.68
Specification for Replacing of Sump Grate and Frame	Species.72
Specification for Subsoil Drainage	Species.81

CONCRETE

Specification for Concrete Construction	Species.4
Specification for Concreter	Species.45
Specification for Reinforcing Steel	Species.47

GENERAL CONTRACT

Specification for Earthworks	Species.8/8a
Specification for Eight Wire Fence	Species.9
Specification for Lighting and Electrical	Species.116
General Specification	Species.23
Specification for Vegetation Control by Spraying	Species.26
Specification for Timber handrails	Species.27
General Requirements for Demolition	Species.35
Specification for Excavation and Siteworks	Species.42
Specification for Miscellaneous Small Contract Work	Species.43
Specification for Excavation for Bridge Abutments	Species.44
Specification for Double Core Units for Bridge	Species.46
Specification for Steelwork	Species.48
Specification for Construction of Gabion Baskets for Bridges	Species.50
Specification for the Construction of Pile Foundations	Species.52
Specification for Concrete Block Work	Species.61
Specification for Painting	Species.69
Specification for Painting (A)	Species.69a
Preliminary and General	Species.71
Specification for Interlocking Concrete Block Paving	Species.73
Specification for Riprap	Species.77
Specification for Traffic Signal Maintenance	Species.83
Specification for Laying 'BG' Slabs	Species.84
Specification for Rubbish Bins	Species.95

PROFESSIONAL SERVICES

TNZ General Conditions	Tnz cond.doc
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PCC ENGINEERING DRAWINGS LIST

2/-/312 Kerbing & Channelling;
2/-/326 - 1/3 Standard Vehicle Crossing - case 1: Grass Berm adjacent to kerb;
2/-/326 - 2/3 Standard Vehicle Crossing - case 2: Footpath adjacent to kerb;
2/-/326 -3/3 Standard Vehicle Crossing - case 3: Heavy Duty;
2/-/333 Rural Vehicle Crossing;
2/-/265 Sump – High Capacity Inlet;
2/-/ 271 Sump – High Capacity Inlet;