Rangitikei District Council

Land Development and Subdivision Infrastructure

Addendum to NZS 4404:2010

March 2017
## Document Control

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<tr>
<th>No.</th>
<th>Organisation</th>
<th>Person</th>
<th>Version Number</th>
<th>Date Supplied</th>
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<tr>
<td>No.2</td>
<td>RDC</td>
<td>Glenn Young Utilities Manager</td>
<td>No.2</td>
<td>March 2017</td>
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## Revision Schedule

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<th>Date</th>
<th>Description</th>
<th>Prepared By</th>
<th>Reviewed by</th>
<th>Approved by</th>
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Introduction

Rangitikei District Council has adopted New Zealand Standard – Land Development and Subdivision Infrastructure (NZS 4404:2010) as the minimum standard for land development and subdivision. This Addendum outlines the changes to NZS 4404:2010 that are specific to Rangitikei District Council and both documents are designed to be used together.

The Resource Management Act provides for effects-based Regional and District Plans through which the implementation of new and innovative solutions for development can be undertaken. Section 11 of the Act provides for local authorities to control subdivision.

Rangitikei District Council’s District Plan refers to NZS 4404:2010 and this Addendum as the minimum standard for subdivision and development. This reference in the District Plan provides the basis for imposing subdivision conditions based on NZS 4404:2010 compliance. The Standard and Addendum is applicable to Greenfield, Infill and Brownfield development.

Rangitikei District Council wants to promote innovation in new developments, in order to support best environmental practices in both design and provision of infrastructure. Thus alternative methods of compliance with the District Plan may be submitted for consideration by Council staff. Council staff will assess developments of this nature on a case by case basis.

Any alternative methods of development that deviate from the District Plan, NZS 4404:2010 and this Addendum must be based on sound engineering principals and be agreed to by Council staff. The applicant will be notified if a peer review is required. The applicant will be liable for any costs associated with a peer review.

Council prefers that developers, particularly for larger developments and environmentally sensitive sites, pursue a design approach rather than a traditional engineering approach.

Scope

This Addendum must be read in conjunction with NZS 4404:2010.

The Addendum is in the same format as NZS 4404:2010 and all clauses are numbered the same to enable cross-referencing between documents.

Many documents govern the form of subdivision and development. In order, these documents take precedence as follows:

- Resource Consent and associated conditions
- The District Plan
- This Addendum
- NZS 4404:2010

This means that if a subdivision has a specified condition that differs from the addendum or NZS 4404:2010 the specific condition will take precedence. Likewise, requirements in the addendum take precedence over the requirements in NZS 4404:2010.

Where NZS 4404:2010 provides a choice between materials and methods etc, Council’s decision on that choice will take precedence.
Part 1: General Requirements and Procedures

1.8.1 Documents to be submitted for design approval

Council will typically set a condition of the subdivision consent requiring engineering plans to be submitted in accordance with the requirements of NZS 4404:2010.

1.8.2.5 Recording of Infrastructure – As-built information

Council has a standard condition regarding the provision of as-built information.

1.8.5 Notification of contracts and phases of work

Council requires compliance with these requirements.

1.8.7.2 Connecting to existing services

Replace with:

“The developer shall give the network utility operator 5 working days notice of the intention to connect to the existing services. A Council Officer must witness the testing carried out by the developer prior to connection.”

1.8.8 Testing

Replace with:

“Any infrastructure to be tested by the developer must be pre-tested and proved satisfactory before Council is requested to witness the final test”.

Council Officers require one working days notice in order to witness testing.

1.8.9 Maintenance

Replace with:

“The Developer shall maintain the works until they are formally taken over by the Council. Formal takeover is the date when the Council issues the Section 224 certificates, or such other earlier date as may be agreed by the Council.

For uncompleted works covered by a bond the developer shall maintain the works until a date specified in the bond or, if earlier than such date, the works are completed to the satisfaction of the Council.

The Developer shall be responsible for any defects as a direct result of faulty and/or substandard workmanship for a minimum period of 12 months from deposit of the survey plan. By way of a condition of consent the defects liability period can be extended or shortened.”
1.8.10 Completion Documentation and As Built Drawings

With regard to “as built” information, coordinates must be in terms of **New Zealand Transverse Mercator (NZTM:2000)**. The electronic format must be (CAD DXF or DWG). **Vertical Datum levels must be in terms of Moturiki 1953.**

Prior to practical completion, the Developer shall amend all drawings and necessary documents to represent the true ‘As Built’. The amendments shall be made on the standard hard copy A1 sheet as well as on electronic format providing it is compatible with the latest version of AutoCAD and in either a DXF or DWG file.

The ‘As Built’ information required on these drawings is as follows; with all coordinates in terms of Geodetic 2000 Wanganui Circuit Coordinates shall be provided in .xls or .dbf format. See Standard Drawings for details of Councils standards draughting symbols, G.I.S. point codes and line types.

a) The size and type of all wastewater, storm water and water supply pipes.

b) The position, related to a side boundary, and depth, related to ground level at the marker, of all wastewater and storm water laterals.

c) The coordinated position of the centre of the cover of all manholes. Levels to two decimal places, to Council datum, of the invert and centre of cover, of each manhole.

d) The coordinated position of all fire hydrants, swabbing points, valves, tees and bends.

e) The position, related to a side boundary, of all manifolds.

f) The coordinated position of the centre of the kerb behind each sump.

g) The coordinated position of the road centreline after line marking has been completed identifying start/finish and tangent points including centre points of each intersection.

h) The extent of all fill areas.

i) The depths and types of pavement formation.

j) Where appropriate, any restriction limiting building on any part of the lot shall be shown on either the wastewater or stormwater plan.

The Developer is responsible for the accuracy of the information given on the ‘As Built’ plans and for any extra costs which may arise as a result of incorrect information shown.

1.9.1.3 Uncompleted works

The amount of the bond is based on the value of the work to be completed plus a 25% margin for values of work up to $50,000. For works valued at more than $50,000 the bond margin will be 50%. The applicant is also responsible for any fees associated with drawing up the bond documentation.
1.10 Additional Requirements

**Emergency Works**

If during the course of the development, any situation arises associated with the development whereby, in the opinion of the Council, public safety, the security of public or private property, or the operation of any public facility or ecological site is endangered, the developer shall immediately carry out such remedial measures as the Council requires to remove the danger. Any work so required shall be at the expense of the developer.

If such emergency works are not immediately carried out, the Council may arrange for the necessary remedial work to be carried out and charge the developer the cost for carrying out the works.

**Damage to Existing Roads, Services and Property during construction**

All damage to existing roads, road reserve plantings, services or private property, or any disturbance of survey boundary marks due to, or caused by, any new works, shall be the liability of the developer. All damage must be repaired by the developer immediately. If such remedial works are not commenced within twenty-four hours after being notified by the Council, the Council may arrange for the necessary work to be carried out and charged to the developer. This provision includes the removal of mud and debris from existing roads in the vicinity of the development. Removal of such debris will be necessary in the interests of traffic safety.

In any situation where the Council considers that damage to existing roads, services or private property constitutes a risk or potential risk to the safety of road users, pedestrians or other persons, the Developer shall immediately repair the damage or otherwise abate the hazard or potential hazard.
Part 2: Earthworks and Geotechnical Requirements

Council will address resource consent applications that have land stability and earthworks issues in the following manner.

Objective 17 of the Rangitikei District Plan states:

“The adverse effects of natural hazards on people, property, infrastructure and the well-being of communities are avoided or mitigated.”

Council has a duty to consider instability issues pursuant to Section 106 of the RMA.

The District Plan promotes addressing natural hazards at the subdivision stage, as it wants to avoid the situation where people buy land that cannot be built on, as they expect.

The following is Council’s position when geotechnical assessments will be required.

1. If earthworks and or fill are proposed in order to create a building site, access and effluent areas.

2. If potential building sites, access and effluent areas are at risk from stability issues.

   For example, a gully or part of the site deemed not suitable for building that is close to (10-20 metres) the only building site on a proposed Lot needs to be assessed by a geotechnical-professional. This situation would usually apply in a rural residential subdivision where lot sizes are small and building sites are limited.

3. Council Officers (Planners Building Officers and Assets Engineers) will be responsible for determining whether a geotechnical assessment is required. Where Council Officers determine there is likely to be a stable building platform on each Lot the geotechnical assessment can be required as a condition of consent. Other conditions will be required to ensure any limitations identified in the geotechnical assessment are identified on the Land Transfer Plan.

Where building sites are marginal, a geotechnical assessment should be required at the application stage.

The District Plan, in the information requirement section, requires subdivision applications to show proposed areas of excavation and fill. It also requires information on the stability of new lots including fill depths and likelihood of erosion.

When Council receives a subdivision application that involves earthworks or the subject land is potentially unstable, it has three options on how to proceed.

1. Council can request further information from the Applicant about the proposed earthworks and stability. A Geo-professional must provide this information in terms of NZS 4404:2010.

2. Council can set a condition requiring a preliminary site evaluation. Council can take this approach if stability issues are minor and stable building platforms are achievable, however there may be some restrictions.
3. Council does not require a stability assessment. Council can take this approach if allotments are so large that multiple building sites exist. To assess all possible building sites for stability is unnecessary and costly.

The following conditions have been formulated in the standard conditions document.

1. The consent holder, prior to any physical works, shall submit to Council a Preliminary site evaluation in accordance with NZS 4404:2010 (clause 2.3.2). A Geo-professional must provide this evaluation.

   *This condition is suitable where there is questionable stability or ground suitability for development.*

2. All earthworks associated with any areas of fill shall be designed, supervised and constructed in accordance with the requirements of NZS 4404:2010.

3. Prior to approval under section 224 of the Resource Management Act 1991, the proposed earthworks must be constructed in accordance with the recommendations in the evaluation required in the above condition.

4. Prior to requesting approval under section 224 of the Resource Management Act 1991, the consent holder must provide a statement of professional opinion from a Geo-professional (as defined in NZS 4404:2010), that the land is suitable for subdivision and residential development. This statement must be made in accordance with NZS 4404:2010 Schedule 2A and shall include a completion report confirming that:

   - the land is suitable for residential development
   - there is a suitable building site on all Lots
   - all restrictions on the lands suitability for subdivision and/or residential development are identified

   As built plans and compaction tests of any fill must also be provided, detailing location and fill depths.

5. If necessary, a Consent Notice shall be placed on each Lot/s identifying limitations or requirements as highlighted in the completion report.
Part 3: Roads

Design and construction of roading and transportation infrastructure shall be undertaken in accordance with the requirements of Part 3: Roads of NZS 4404:2010, except as amended for the Rangitikei District Council requirements in the clauses following. All clause numbers refer to clauses in NZS 4404:2010.

Alternative specific proposals may be submitted with appropriate engineering information that will enable Council to assess the proposal. An alternative system must provide a standard equivalent to that provided by proposals conforming to NZS 4404:2010 and in the Council adopted amendments included in this document.

3.2.1 Objective

Add to clause:

“Roads and transportation routes are to be established to ensure the movement of vehicles, pedestrians, cyclists and public transport is appropriate, safe and integrated in a manner which supports the surrounding land-use and minimises the impact on the environment.

In addition to being functional and safe, the road design shall enhance and complement the land development through landscaping and street furniture.”

3.2.2 Relevant standards and guideline documents

Add to clause:


3.2.4.2 Link Context

The Rangitikei District Council hierarchy of roads can be found in the Rangitikei District Plan (Table B9.6)

3.2.5 Network connectivity

The Planners will assess this requirement as part of the subdivision process. However unless these requirements are in the District Plan they should not be used as a compliance standard.

3.2.6 Design and Access Statement

The required statement must address each of the components of the Road design standards in Table 1 (Appendix C: Minimum Standards for Roading) and the relevant aspects of Section 3.3 of NZS 4404:2010.

3.2.7 Road Safety Audit

A road safety audit will also be required for private right of ways and Access Lots where the Council deems them necessary.
Table 3.2 Road design Standards

Remove and replace with Table 1: RDC Minimum Standards for Roading
## TABLE 1 Road Design Standards

**RDC – MINIMUM STANDARDS FOR ROADING**

**RURAL RESIDENTIAL AND RURAL SUBDIVISIONS**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Legal Road/ROW Width</th>
<th>Carriageway Width (Seal &amp; Metal)</th>
<th>Seal Width</th>
<th>Traffic Lane/Shoulder Width</th>
<th>Total Berm Width</th>
<th>Max / min grade</th>
<th>Normal Camber</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROW / Access Lot 2 Lots Rural</td>
<td>8m</td>
<td>4m (R1) (R2) (R3)</td>
<td>N/A</td>
<td>4.0m</td>
<td>12.5% 0.4%</td>
<td>3%</td>
<td>Approved stormwater control</td>
<td></td>
</tr>
<tr>
<td>ROW / Access Lot / Rural Residential 2 Lots</td>
<td>8m</td>
<td>4.0m</td>
<td>N/A</td>
<td>6.0m</td>
<td>12.5% 0.4%</td>
<td>3%</td>
<td>Approved stormwater control. Turning head required.</td>
<td></td>
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<tr>
<td>ROW / Access Lot 3 to 4 Lots</td>
<td>10m</td>
<td>4.0m</td>
<td>N/A</td>
<td>6.0m</td>
<td>12.5% 0.4%</td>
<td>3%</td>
<td>Approved stormwater control. Turning head required.</td>
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<tr>
<td>ROW / Access Lot 5 to 7 Lots</td>
<td>12m</td>
<td>7.0m</td>
<td>6m (R3)</td>
<td>N/A</td>
<td>6.0m</td>
<td>12.5% 0.4%</td>
<td>3%</td>
<td>Approved stormwater control. Turning head required.</td>
</tr>
<tr>
<td>Local</td>
<td>20m</td>
<td>9.0m</td>
<td>7.0m (R3)</td>
<td>3.5m/1.0m</td>
<td>11.0m</td>
<td>10% 0.4%</td>
<td>3%</td>
<td>Two-coat chipsealing and turning head required.</td>
</tr>
<tr>
<td>Distributor/Collector</td>
<td>20m</td>
<td>10.0m</td>
<td>8.0m (R3)</td>
<td>3.5m/1.5m</td>
<td>10.0m</td>
<td>10% 0.4%</td>
<td>3%</td>
<td>Two-coat chipsealing and turning head required.</td>
</tr>
<tr>
<td>Arterial</td>
<td>20m</td>
<td>11.0m</td>
<td>9.0m (R3)</td>
<td>3.5m/2.0m</td>
<td>9.0m</td>
<td>10% 0.4%</td>
<td>3%</td>
<td>Two-coat chipsealing and turning head required.</td>
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</table>

**Notes**

All cut and fill batters shall be incorporated within the Legal Road/ROW. Fences may be located inside road reserve subject to Council approval.

R1. If the ROW / Access Lot exceeds 150m in length then 6m wide passing bays shall be placed at intervals not exceeding 150m and also where the minimum safe sight stopping distances cannot be achieved.

R2. Rural- Residential subdivisions shall be two-coat chipsealed.

R3. Road design and construction shall be in accordance with NZS 4404 – Land Subdivision and Development Engineering. The Legal Road/ROW width shall be widened to maintain the standard berm widths at all turning heads.

1 March 2017
## RDC – MINIMUM STANDARDS FOR ROADING URBAN SUBDIVISION

<table>
<thead>
<tr>
<th>Classification</th>
<th>Type</th>
<th>Traffic Volume</th>
<th>Area Served</th>
<th>Legal Road/ROW Width</th>
<th>Carriageway Width</th>
<th>Footpath</th>
<th>Total Berm Width</th>
<th>Max/Min Grade</th>
<th>Normal Camber</th>
<th>Notes</th>
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<tr>
<td>ROW / Access Lot</td>
<td>2-4 Lots 2-4 du</td>
<td>3.5m</td>
<td>3.0m (U1)</td>
<td>N/A</td>
<td>0.5m</td>
<td>12.5% 0.4%</td>
<td>3%</td>
<td>Approved stormwater control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROW / Access Lot</td>
<td>5-7 Lots 5-7 du</td>
<td>7.0m (U3) (U4)</td>
<td>5.0m (U5)</td>
<td>1 @ 1.5m</td>
<td>9.0m</td>
<td>12.5% 0.33%</td>
<td>3%</td>
<td>Min kerb and channel one side. Turning Area required.</td>
<td></td>
<td></td>
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<tr>
<td>Local Roads (Public Roads)</td>
<td>Cul-de-sac</td>
<td>Up to 12 Lots or 12 du Max length 150m</td>
<td>16.0m (U3) (U4)</td>
<td>7.0m (U5)</td>
<td>2 @ 1.5m</td>
<td>9.0m</td>
<td>12.5% 0.33%</td>
<td>3%</td>
<td>Kerb and Channel both sides. Cul-de-sac turning head required.</td>
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<td>Residential</td>
<td>&lt;750 vpd</td>
<td>&gt;50 Lots</td>
<td>17.0m</td>
<td>8.0m (U5)</td>
<td>2 @ 1.5m</td>
<td>9.0m</td>
<td>12.5% 0.33%</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>&gt;750 vpd</td>
<td>&gt;50 Lots</td>
<td>20.0m</td>
<td>11.0m (U5)</td>
<td>2 @ 1.5m</td>
<td>9.0m</td>
<td>10% 0.33%</td>
<td>3%</td>
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<td></td>
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<tr>
<td>Industrial</td>
<td>20.0m</td>
<td>11.0m (U5)</td>
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<td></td>
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<td></td>
<td>Subject to specific design</td>
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<td></td>
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<tr>
<td>Commercial</td>
<td>All roads</td>
<td>20.0m</td>
<td>11.0m (U5)</td>
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<tr>
<td>Distributor/Collector</td>
<td>Residential</td>
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<td>11.0m (U5)</td>
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<td></td>
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<tr>
<td>distributor/Collector</td>
<td>Industrial</td>
<td>22.0m</td>
<td>13.0m (U5)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arterial/Strategic</td>
<td>All roads</td>
<td>22.0m</td>
<td>13.0m (U5)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
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### Notes

- **du = Dwelling Units**

All cut and fill betters, including retaining structures, shall be located clear of the Legal Road / ROW.

- **U1.** Approved carriageway construction, either: chipseal, concrete, asphaltic concrete or paving. Passing Bay where visibility limited or if ROW over 75m long. If 3 or 4 lots a minimum of a 15m passing bay (min 5m wide) at the entrance is required.
- **U2.** Where the ROW / Access Lot exceeds 75m in length a 1.4m wide footpath is required on one side.
- **U3.** Council may require additional “On Street” parking where Lot sizes are less than 500 sq.m. (Typically one car park per two lots).
- **U4.** The Legal Road / ROW width shall be widened to maintain the standard berm widths at all turning heads and cul-de-sacs.
- **U5.** Road design and construction shall be in accordance with NZS 4404:2010 – Land Subdivision and Development Engineering.
3.3.2 CBR Tests

Add the following clause:

“When engineering plans are submitted to Council they need to show the CBR value and Equivalent Design Axles (EDA).”

3.3.7 Intersection and alignment Design

The following clause is superceded by the spacing requirements of the Rangitikei District Plan.

“Intersections between connector/collector roads or intersections of connector/collector roads with arterials shall be a minimum of 150m apart, centreline to centreline.”

3.3.11.1 Footpaths and accessways

Note: Requirement for Pedestrian accessways and connectivity issues will be addressed at the application stage.

3.3.14 Road lighting

Add: Road lighting design to be submitted at the time Engineering plans are submitted for approval.

3.3.16 Private ways, private roads and other private accesses

Add: reducing width accesses will not be permitted

3.3.17 Vehicle Crossings

Note: Each Lot is to have it’s own vehicle crossing installed as a condition of consent being to Council standards and constructed by an approved Council Contractor, which will include a Traffic Management Plan. Apply to Council and application fees payable if required.

3.3.18 Fencing

Note: Council does not have fencing policies and does not require fencing to be provided along road reserve boundaries.

3.3.19.6 Kerbs and Channels

Mountable kerb will not be allowed where it will impinge on pedestrians, utility services or safety. Footpaths may need strengthening if mountable kerb is used.

Kerb and channel in rural developments may be required in the following instances:

- Where longitudinal vertical gradients exceed 1:10, kerb and channel will be required for stormwater control. This requirement also applies to right of ways.
- Where the road or accessway is adjacent to a cutting or embankment.
3.3.19.7 Sumps

Note: Double back entry sumps must be specifically identified on the engineering plans and approved by Council.

3.3.19.7.1 Sump location

Add Note: Sumps must be placed on the entry side of a curve.

3.3.19.7.4 Sump leads

Note: May require minimum size of sump lead to be increased to 300mm.

3.4.5 Subgrade checking

Council requires results of subgrade testing to be submitted to Council before the placing of pavement layers.
Part 4: Stormwater

Under normal circumstances design and construction of stormwater systems shall be undertaken in accordance with the requirements of Part 4, Stormwater of NZS 4404:2010, except as amended by Council requirements in the clauses below.

In appropriate circumstances, alternative specific proposals may be submitted with engineering information that will enable Council to assess the proposal. An alternative system must provide a standard of stormwater system equivalent to that provided by systems conforming to NZS 4404:2010.

Stormwater design must be on the basis of replicating the pre-development hydrological regime. That is, the maximum rate of discharge and peak flood levels within a catchment post-development must be no greater than pre-development. Higher rates of discharge will be acceptable where it is demonstrated that adverse effects are no more than minor.

4.2.1 Objectives

Expected levels of service are contained in Council’s Long Term Plan.

4.2.4 Catchment management planning

Early catchment management planning means pre-application or application stage. (Rather than when engineering plans are submitted).

4.2.7 Catchments and off-site effects – add to clause

Note: Means the upstream zoning needs to be taken into account when considering upstream development.

4.3.3 Future Development

Add clause:

“Where further subdivision, upstream of the one under consideration, is provided for in the district or regional plan, then Council will require stormwater infrastructure to be constructed to the upper limits of the subdivision.

Additionally, Council will require further capacity to be provided in the stormwater system to cater for the existing and any future development upstream.”

Note: Additional costs associated with the above requirements are to be met by the developer.

4.3.7.9 Soakage Devices

In addition Council will refer to the Auckland City Council soakage design manual (2003).

4.3.9.9 Subsoil drains

Subsoil drainage is required in all roads and private right of ways and access lots etc.
4.3.10.2 Manhole materials

Note: Manholes in roads must be concrete and may be pre-haunched.
Part 5: Wastewater

Under normal circumstances design and construction of wastewater systems shall be undertaken in accordance with the requirements of Part 5, Wastewater of NZS 4404:2010, except as amended and extended for Council requirements in the clauses below.

In appropriate circumstances, alternative specific proposals may be submitted with appropriate engineering information that will enable the Council to assess the proposal. An alternative system must provide a standard of wastewater system equivalent to that provided by systems conforming to NZS 4404:2010.

5.3.4.2 Extent of infrastructure

Amend sentence to read:

“Where pipes are to be extended in the future, the ends of pipes shall extend past the far boundary of the development by a distance equivalent to the depth to the invert and be capped off. A manhole must be installed at the upstream end of the pipeline within the developers property.”

5.3.6.9 Marking tape or pipe detection tape

Add:

“The taping requirement also applies to laterals.”

5.3.7.1 Pipe location

Refer Council preferred pipe location (centerline) diagram – General location of services in road reserve (Plan 1.2).

5.3.7.5 Minimum cover

The following table applies.

<table>
<thead>
<tr>
<th>Location</th>
<th>Minimum Cover (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads, berms, accesses and parking areas</td>
<td>900*</td>
</tr>
<tr>
<td>All other areas</td>
<td>750</td>
</tr>
</tbody>
</table>

* During construction, pipe work may require ramped metal protection

5.3.8.2 Location of maintenance structures

Maintenance shafts will not be permitted.

5.3.10.4 Location of connection

Add:

“(f) Be clear from vehicle crossings wherever practicable.”
5.3.13 On-site wastewater treatment and disposal

The Applicant must confirm the design is in accordance with Regional Council requirements.

5.4.2 Information to be provided

Add:

“(g) Any additional information required by Council to process the application/proposal.”

5.5.5 Leakage testing of pressurized sewers

Manholes must be tested as well.
Part 6: Water Supply

Under normal circumstances design and construction of Water supply systems shall be undertaken in accordance with the requirements of Part 6, Water supply of NZS 4404:2010, except as amended and extended for Council requirements in the clauses below.

In appropriate circumstances, alternative specific proposals may be submitted with appropriate engineering information that will enable the Council to assess the proposal. An alternative system must provide a standard of water supply equivalent to that provided by systems conforming to NZS 4404:2010.

6.2.1 Objectives

Council requires compliance with SNZ PAS 4509 (2008) (Fire fighting water supplies)

6.3.6.2 Prevention of backflow

Council requires backflow prevention systems on commercial and industrial sites. (Ref: clauses 17.1 and 17.2 of Council’s Water Related Services Bylaw (2013).

6.3.10.3.2 Minimum Pipe PN

Council has a minimum requirement of PN 12

6.3.10.3.3 Nominated Pipe PN

Council nominate a pipe of PN 12.

6.3.12.10.1 Minimum pipe cover

<table>
<thead>
<tr>
<th>Item</th>
<th>Cover Range (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains and Rider mains under carriageways</td>
<td>900</td>
</tr>
<tr>
<td>Mains under berms and footpaths</td>
<td>750</td>
</tr>
<tr>
<td>Rider mains under berms</td>
<td>750</td>
</tr>
<tr>
<td>Hydrant/valve spindles</td>
<td>75 – 225</td>
</tr>
<tr>
<td>Service pipes under carriageways</td>
<td>900</td>
</tr>
<tr>
<td>Service pipes under berms and footpaths</td>
<td>750</td>
</tr>
<tr>
<td>Service pipes at point of supply</td>
<td>300</td>
</tr>
<tr>
<td>Other areas</td>
<td>600</td>
</tr>
</tbody>
</table>

6.3.12.11.2 Anchor Blocks

Add: Council requires “cast in situ concrete” anchor blocks.
6.3.16.2 Property service connections

Add: Location of water tobies must be as per the by-law.
Part 7: Landscape

Refer to the relevant sections of the District Plan for requirements relating to subdivision activities in Outstanding Natural Landscapes or near sites of historic heritage.
Part 8: Network Utility Services

Refer to the relevant sections of the District Plan for requirements relating to subdivision activities near network utilities.
Appendix A

Design Dimensions – Private Access Crossing to a Road (infrequent use by heavy vehicles)
Standard Rural Vehicle Accessway (infrequent use by heavy vehicles)
Sight Distance Measurements

Figure 9.3 District Plan

Note: Sight distances will be measured to and from a height of 1.15m above the existing road surface level of the side road or access road.

Intersection and property access:
   a) Sight distance is defined in Table B9.1 and Table B9.2 of the District Plan
   b) Edge of Traffic Lane
   c) For accesses: 3.5m from edge of traffic lane
   d) For intersections 5.5m from edge of traffic lanes
Traffic Sight Lines at Road/Rail Level Crossings and Road Intersections

Hatched areas are to be kept clear of buildings or other obstructions which may block sight lines.

Where there are two or more tracks, the 30m sight line applies to the centreline of the nearest track.
### Car Manoeuvring and Parking Space Dimensions

**Figure 9.2  District Plan**

<table>
<thead>
<tr>
<th>Degree of angle of parking</th>
<th>Parking type</th>
<th>Stall width</th>
<th>Stall depth (m)</th>
<th>Aisle width (d)</th>
<th>Total depth (e)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>From wall (b)</td>
<td>From kerb (c)</td>
<td>One row</td>
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<tr>
<td>0°</td>
<td>Parallel</td>
<td>2.4m</td>
<td>See note 1</td>
<td>See note 1</td>
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<td>30°</td>
<td>Nose in</td>
<td>Min 2.4m</td>
<td>4.2m</td>
<td>4.0m</td>
<td>3.5m</td>
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<tr>
<td>45°</td>
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<td>4.5m</td>
<td>3.5m</td>
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<tr>
<td>60°</td>
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<td>2.4m, 2.5m, 2.6m, 2.7m</td>
<td>5.4m</td>
<td>4.9m</td>
<td>4.5m, 4.1m, 3.5m, 3.5m</td>
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<td>5.4m</td>
<td>4.9m</td>
<td>6.6m, 6.3m, 5.2m, 4.6m</td>
</tr>
<tr>
<td>90°</td>
<td>Nose in</td>
<td>2.4m, 2.7m</td>
<td>5.1m</td>
<td>4.6m</td>
<td>8.7m, 7.7m, 7.0m, 6.8m</td>
</tr>
</tbody>
</table>

1. Parallel parking spaces (Parking Angle 0°) must be 6.0m long, except where one end of the space is not obstructed, in which case the length of a space may be reduced to 5.0m.
2. Minimum aisle and accessway widths must be 3.0m for one-way flow, and 5.5m for two-way flow. Recommended aisle and accessway widths are 3.5m for one-way flow and 6.0m for two-way flow.
3. Maximum kerb height = 150mm
4. Stall depth computed to 90 percentile vehicle dimensions. A 200mm separation from walls has been added.
99 Percentile Car Tracking Curve Minimum Radius

Figure 9.3 District Plan
99 Percentile Truck Tracking Curve Minimum Radius
Figure 9.4 District Plan
Acess sight lines are defined in Table B9.1.
# Standard Drawings – Index

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<th>PLAN NO.</th>
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<td>Rural Access To Rear Lots</td>
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<td>Manhole Detail For Large Diameter Pipes</td>
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</tr>
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<td>35</td>
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<td>38</td>
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<td>External Drop Manhole Detail – Wastewater</td>
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<td>40</td>
<td>Typical Inspection Chamber Detail For 100mm Dia. Pipe</td>
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<td>Typical Wastewater Pump Station Detail Monitoring</td>
<td>5.6</td>
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<td>Manhole Detail For Large Dia. Pipes 750 – 1050mm</td>
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<td>43</td>
<td>Typical Layout Of Valves And Fire Hydrants</td>
<td>6.1</td>
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<td>44</td>
<td>Typical Layout Of Watermains In Cul-De-Sac</td>
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<td>45</td>
<td>Ridermain Detail 50mm Main Or ROW Connection</td>
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<td>46</td>
<td>Sluice Valve &amp; Marker Installation</td>
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<td>Hydrant And Marker Installation</td>
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<td>Watermain – Pipe Laying Details</td>
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<td>Watermain – Thrust Block Details For 100mm Dia. Watermain</td>
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<td>Air Valve Box Detail</td>
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<td>51</td>
<td>Typical 20mm Dia. Water Service Connection To Main And Rider Main</td>
<td>6.8</td>
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</tbody>
</table>
STANDARD DRAFTING SYMBOLS

SYMBOLS:

- ○ Proposed Manhole
- ✰ Existing Manhole
- □ Existing Valve
- ★ Existing Fire hydrant
- ✤ Existing Water Toby
- △ Existing Sump
- ▼ Existing Survey Marks
- ☼ Existing Street Lights

LINE TYPES:

- W Proposed Water
- W Proposed Wastewater
- SW Proposed Stormwater
- S Existing Water
- S Existing Wastewater
- SW Existing Stormwater
- LV Existing Power (Low Voltage)
- LV Existing Power (High Voltage)
- V Existing Power Ducts
- T Existing Street Light Wiring
- GAS Existing Telecommunication Providers
- GAS Existing Gas
NOTE
Principal water mains are required on both sides of street on all arterial industrial and dual carriage way roads.

GENERAL LOCATION OF SERVICES IN ROAD RESERVE
100mm wide Emulsion Band or Rubber Crack Sealer/PMB Bandage along line saw cut joints of new asphalt concrete surfacing.

Min. 300mm thick pavement:
- AP65 - 200mm thick
- M4/AP40 - 100mm thick

All compaction on trench back filling in the carriageways, footpaths and vehicle crossings must achieve 7 blows per 50mm with Scala Penetrometer or a Clegg Impact value > 40

100mm layer of NZTA:M/4 AP40 basecourse, Clegg Impact Value > 40 at top of basecourse layer

Min. backfill depth: See Table below

### Minimum Backfill Depth (mm)

<table>
<thead>
<tr>
<th>Service</th>
<th>Road Pavement</th>
<th>Berm</th>
<th>Vehicle Access</th>
<th>Parking Areas</th>
<th>Other</th>
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<td>00</td>
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<td>00</td>
<td>00</td>
<td>50</td>
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</tbody>
</table>

### TRENCH REINSTAMTMENT FOR EXISTING ROADS

Scales: Not to scale

Plan No. 3.0

Sheet of Sheets
Note: All sumps to be located on upstream side of a mobility crossing.

Direction of flow

New Mobility Crossings

New Sump

Sawcut seal

Existing Footpath

New Sump

New Mobility Crossings

Low Spot

New Sumps

Existing Kerb & Channel

New Kerb & Channel

Existing Street

New Road

New Pram Crossings

Existing Kerb & Channel

Note: This detail applies where footpath, kerb and channel is to be removed from the existing street.

INTERSECTION DETAIL

Scales: Not to scale

Plan No. 3.2

Sheet of Sheets
**JUNCTION WITH PRIMARY ROADS**

- 6.0m Seal min.
- 1 in 10 Taper to 2.50m
- 15m Rad.
- Legal boundary
- Street Light
- Sight Rails as per standard drawing No.3.2
- Edge of seal
- Edge of traffic lane.

Note: Existing Pavement to be Upgraded to Similar Standard to New Road Unless it is Already to the Required Standards.

**JUNCTION WITH SECONDARY ROADS**

- 6.0m Seal min.
- 1 in 10 Taper to 2.50m
- 5m Rad.
- Legal boundary
- Street Light
- Sight Rails as per standard drawing No.3.4
- Edge of seal
- Edge of traffic lane.

Note: Existing Pavement to be Upgraded to Similar Standard to New Road Unless it is Already to the Required Standards.

**JUNCTION WITH PRIMARY ROADS**

- Seal widening and access sealing
- Road marking to NZTA's MOTSAM Standard

**RURAL / RURAL RESIDENTIAL ROAD INTERSECTION (0-500 VPD)**
1. Refer also to standard Drawing No. 3.2.2 & 3.2.3

2. Timber posts to be treated to H5 specification.

3. Timber rails to be treated.

NOTES:

Standard headwall if drain exceeds 0.0m depth. Refer Standard Dwg 6.6.
Approved NZTA culvert slope ends. If drain is less than 0.0m depth refer Standard Dwg 3.4.1.
1. Only concrete pipes are to be used in the construction of water table culverts. Minimum diameter 300mm.

2. There are various standards currently available for the construction and completion of water table culverts. In order to standardise procedures, all culverts up to a diameter of 250mm shall be constructed as follows:

3. The exposed end of the pipe is to be encased in hand formed reasonably dry concrete to form a 50mm thick by 200mm wide "collar" to retain any backfill and to reduce the amount of grass overhanging the end of the pipe. This collar may be omitted where it would normally be placed on the pipe collar.

4. Where the length of the cut face is greater than the length of the pipe excluding the collar, suitable precast inlet and outlet structures are to be used.

5. Concrete filled bags culvert headwalls may be used with the approval of Council's Roading Manager.

RURAL ROAD/ACCESSWAY ENTRANCE EDGE PROTECTION FOR DRAIN DEPTH < 1.0m
DISCH ED CÆ ANNEL

20 MPa Concrete

Basecourse

Subgrade

Approved Drainage Material

110mmØ flexible PVC perforated pipe with filter cloth. Connect to sump outlets

SUBGRADE DRAINAGE DETAIL AT CÆ ERB

DISCHED CÆ ANNEL AND SUBGRADE DRAINAGE
Note:
Industrial Cul de Sac min. radius 15m. Islands are not permitted

Note:
Carriageway width vary

Footpath and boundary need not be concentric with kerb.
All radii shown are minimum radii.

MINIMUM CUL-DE-SAC EAD DESIGN
Where the gradient of the open drain is steeper than 1 in 15 or where soil type has the potential to erode use "Enkamat W" or similar.

NOTE:
"Enkamat W" or similar to be installed to manufacturers instructions.
TYPICAL CROSS SECTION

NOTES:
(i) Pavement depth to be designed
(ii) Adopt which ever provides the greater depth:
   a) 300mm below the seal edge or
   b) 50mm below the pavement subbase and subgrade interface
(iii) For batter slopes steeper than 1.5:1 engineering design will be required.

DESired Service Location (for both sides)

RURAL ROAD (VPD 0-500) TYPICAL CROSS SECTION
20 MPa Concrete

STANDARD 50mm ERB & CHANNEL DETAILS
STANDARD MOUNTABLE KERB FOR TRAFFIC ISLAND, ROUNDABOUTS & RAISED MEDIANs

20 MPa Concrete
Sawcuts
20 MPA Concrete footpath
100mm thick.

Asphalt footpath
Plaster kerb with
3 Sand : 1 Cement
mixed with either
40% Araplex : 60%
Water or Febfix.

20 MPA Concrete footpath
00mm thick.

Asphalt footpath
30mm thk.
Mix 5 or 0
with Emulsion Tack Coat.

PVC Novadrain 0 kerb outlet or similar

Sawcuts
200mm trench width

Backfill trench with approved crushed basecourse

Plaster kerb with
3 Sand : 1 Cement
mixed with either
0% Araplex : 60%
Water or Febfix.

Turf or topsoil
5mm sow with Coated Grass Seed.

Boundary

KERB OUTLET
Concrete or Asphalt footpath.

110mmØ PVC pipe complying to NZS/AS 1260
with an SN value not less than than 0

110mmØ PVC pipe complying to NZS/AS 1260

3.11

PROPERTY STORMWATER DISCHARGE TO ERB DETAILS

Scales: Not to scale
Plan No.
Sheet of Sheets

3.3
 DETAIL OF CONCRETE FOOTPATH
（Excluding Vehicle Crossings）

All footpaths must be constructed on a layer of 100mm minimum compacted NZTA M/4 basecourse on sound foundation (95% Standard Compaction).

20 MPa concrete
Ready Mix Concrete Only

SECTION OF LOW LEVEL FOOTPATH
（Excluding Vehicle Crossings）

CONCRETE FOOTPATH DETAILS
NOTE:
1. A, B, C, D & E refer to the gradients expressed either as a percentage or in degrees.
2. Low slung cars with ground effect features may not meet the criteria assumed in this design guide.
3. LTSA document "Light Vehicle Sizes and Dimensions: Street Survey Results and Parking Space Requirements - Road and Traffic Standards Information No. 35 (June 1994)" contains more information about the 90th and 99th percentile vehicles.
4. Buses are permitted to have lower clearance value of (A+B) of 6% or 3.4°.
**STANDARD CONCRETE RESIDENTIAL VEHICLE CROSSING**

**Notes:**
1. All concrete used for the construction of the 50mm thick residential vehicle crossing must have a minimum compressive strength of 25 MPa after 28 days.
2. All new concrete surface to have a broom finish.
3. If asphalt concrete (AC) reinstatement is required, all excavated areas must be completely coated with an application of bitumen prior to paving with Mix 15 AC.
4. At the channel face, install 250mm long D12 deformed starter bars at 400mm centres, drill 100mm (min.) deep and grout with Sika 212 or approved equivalent.
5. Height from channel invert to string line from road centreline must not exceed 300mm.
6. The existing footpath is to be sawcut. The minimum distance from the new vehicle crossing is 0.5m or to the nearest expansion joint. The reinstated footpath next to the vehicle crossing is for pedestrians which must be built to match the crossfall of the adjacent footpath but the finished crossfall is not to exceed 1:12.5 (8%). If this cannot be achieved, the adjacent footpath must be reconstructed at a grade no steeper than 1:25 (8%) to tie in with the new crossing. This design will require the approval of the Manager.
7. New residential vehicle crossing wider than 3.0m will require a consent from the Manager.

---

**Plan No.**

**Sheet of Sheets**

**Scales:** Not to scale
1. All concrete used for the construction of the 200mm thick commercial/industrial vehicle crossing must have a minimum compressive strength of 30 MPa after 28 days.
2. All new concrete surface to have a broom finish.
3. If asphalt concrete (AC) reinstatement is required, all excavated areas must be completely coated with an application of bitumen prior to paving with Mix 5 AC.
4. Height from channel invert to string line from road centreline must not exceed 300mm.
5. The new footpath next to the vehicle crossing is for pedestrians which must be built to match the crossfall of the adjacent footpath but the finished crossfall is not to exceed 2%. If this cannot be achieved, the adjacent footpath will be reconstructed at a grade no steeper than 1:12 (8%) to tie in with the new crossing. This design will require the approval of the Manager.

6. New commercial or industrial vehicle crossing wider than 4.0m will require a consent from the Manager.

Note:

COMMERCIAL / INDUSTRIAL VEHICLE CROSSING
H.R.C. 665 mesh reinforcement. Overlap all reinforcement 150mm centres.

Undercut to road pavement sub-base depth.

Compacted metal to achieve sound foundation.

Note:
All steel to have 50mm min. cover

SECTION 'A'-"A'

Note:
Residential  25MPa, X=150mm thick certified concrete only.
Commercial  30MPa, X=200mm thick certified concrete only.
Industrial  30MPa, X=200mm thick certified concrete only.
STANDARD CONCRETE VEHICLE CROSSING

Concrete ramp reinforced with HRC 665 mesh, 50mm from bottom of crossing.

Crossing sub-base to be compacted metal to achieve a sound foundation.

LO\(\ell\) LEVEL CONCRETE VEHICLE CROSSING

Concrete ramp reinforced with HRC 665 mesh, 50mm from base of crossing. Refer Dwg 3.13 for breakover angles.

Note:
1. Residential  25MPa, 150mm thick certified concrete only.
2. Commercial  30MPa, 200mm thick certified concrete only.
3. Industrial  30MPa, 200mm thick certified concrete only.

DISH VEHICLE CROSSING - CROSS SECTIONS
Crossing sub-base to be compacted to achieve a sound foundation.

- Berm & Channel to be removed and replaced with 300mm channel as per standard Drawing No. 3.19
- Galvanized Mesh Plates - Residential only.
- Cast Iron Solid Plates - Commercial and Industrial only.

665 Reinforcement to be placed 50mm from base of crossing.

Light broom finish to surface.

This Section of the crossing is for pedestrians and shall match the crossfall of the adjacent footpath and not exceed 2%.

If maintaining the required crossfall through the pedestrian section of the vehicle crossing is unattainable, specific design will be required that includes the adjacent footpath being ramped up/down to tie in at no greater than 1:12 (8%). This design will require the approval of the Council's Roading Manager.

Crossings greater than 3.0m may require separate resource consent.

Note:
1. Residential 25MPa 50mm thick certified concrete only.
2. Commercial 30MPa 200mm thick certified concrete only.
3. Industrial 30MPa 200mm thick certified concrete only.

Scales: Not to scale
Plan No. 3.8
Sheet of Sheets
a. All plates to be 760mm long x 410mm wide x 30mm thick.
b. Plates to be plastered into place with epoxy at 10mm below concrete surface.
c. Provide 50mm (Min.) cover to reinforcing steel.
d. Residential - Use Heavy Duty galvanised mesh plate.
e. Commercial / Industrial - Use Heavy Duty Cast Iron solid plate

**Note:**
1. Residential 25MPa, 150mm thick certified concrete only.
2. Commercial 30MPa, 200mm thick certified concrete only.
3. Industrial 30MPa, 200mm thick certified concrete only.

---

**PLATE VEHICLE CROSSING - CHANNEL DETAIL**
HEAVY DUTY CONCRETE RESIDENTIAL VEHICLE CROSSING (2 OR MORE PROPERTIES)

Note:

1. All concrete used for the construction of the 50mm thick residential vehicle crossing must have a minimum compressive strength of 25 MPa after 28 days.
2. All new concrete surface to have a broom finish.
3. If asphalt concrete (AC) reinstatement is required, all excavated areas must be completely coated with an application of bitumen prior to paving with Mix 5 AC.
4. At the channel face, install 250mm long D: 2 deformed starter bars at 100mm centres; drill 100mm (min.) deep and grouted with Sika 2:2 or approved equivalent.
5. Height from channel invert to string line from road centreline must not exceed 300mm.
6. The new footpath next to the vehicle crossing is for pedestrians which must be built to match the crossfall of the adjacent footpath but the finished crossfall is not to exceed 2%. If this cannot be achieved, the adjacent footpath will be re-constructed at a grade no steeper than 1:12 (8%) to tie in with the new crossing. This design will require the approval of the Manager.
7. New residential vehicle crossing wider than 3.0m will require a consent from the Manager.
REPAIR OF VEHICLE CROSSING - GENERAL POSITION

Note:
1. Residential 15MPa, 150mm thick certified concrete only.
2. Commercial 30MPa, 200mm thick certified concrete only.
3. Industrial 30MPa, 200mm thick certified concrete only.
Notes:
1. Pavement thickness to be designed and constructed in accordance with NZTA specifications.
2. If required, retain edges of pavement surface.
3. Wastewater, Stormwater and Water services may be laid in a common trench provided the required clearances between services are maintained.

BUSINESS, INDUSTRIAL AND ACCESS TO REAR LOT-TYPICAL CROSS SECTION
BUS BAY DESIGN
1. Pavement formation depths to be designed.
2. Surfacing - 2 coat chipseal, sizes 3 & 5 or 30mm of Mix 10 asphaltic concrete
3. Wastewater, stormwater and water services must be appropriately sized. All services may be laid in a common trench provided the required clearances between services are maintained.

Note:
Concrete ROW’s may be drained to the centre.
2 LOTS

6.5m Min.(8m Legal Road width)

0.5m

1.0m

4.0m

1.0m

10-12m Min. Legal Road Width.

3-4 Lots - 4.0m

Power, Telephone

1 in 30

6:1

6:1

1 in 30

2.5:1 or Flatter

Power, Telephone

Subgrade

Basecourse 200mm AP65 min.

2 Coat Chip Seal Grade 2 and for Rural. Pavement thickness to be designed

The minimum width of 6.0m must be increased to include cut and fill batters and roadside drainage.

3 Lots RURAL

0.2m Min. Legal Road Width

0.5m

0.0m

0.0m

0.0m

6:1

6:1

1 in 30

1 in 30

2.5:1 or Flatter

Power, Telephone

Subbase 200mm AP65 min.

2 Coat Chip Seal Grade 2 and for Rural. Pavement thickness to be designed

The minimum width of 6.0m must be increased to include cut and fill batters and roadside drainage.

Notes:
1. For batter slopes steeper than 2.5:1 Engineering design report will be required.
2. Drainage details as for rural road requirements. Refer to Drawing No.3.

2 Coat Chip Seal Grade 2 and for Rural. Pavement thickness to be designed.

The minimum width of 0.0m must be increased to include cut and fill batters and roadside drainage.
For standard P category installations, LED luminaires to be chosen from the NZTA Approved M30 list details at [https://www.nzta.govt.nz/assets/resources/specifications-and-guidelines-for-road-lighting-design/docs/m30-accepted-luminaires.pdf](https://www.nzta.govt.nz/assets/resources/specifications-and-guidelines-for-road-lighting-design/docs/m30-accepted-luminaires.pdf), proposed luminaire to be approved by RDC.

For decorative installation proposed luminaires and poles to be approved by RDC.

**Structural Notes:**
- Minimum allowable pressure shall be 100 kPa
- Client to provide location and orientation
- Contractor to check location of all services before commencing work.
- Only approved light fittings may be used, no additional attachments can be placed on pole without Spunlite's approval.
  - (maximum light size=0.2m² with a cd=1.0, maximum light weight=15kg)
- Backfill fill hole with cement stabilised AP40 fill well compacted 200mm layer of concrete.

**Notes:** Foundation design information is supplied as a guide only. Other solutions may be more appropriate for specific situations. Due to variations in site conditions and installation procedures Spunlite does not accept legal liability for the use of this information.

If requested Spunlite will design specific foundations for each project. Alternatively Spunlite recommends the engagement of a registered consulting engineer where upon Spunlite supply all loadings.

A site evaluation by a qualified Structural/Geotechnical Engineer is advisable.

**Backfill with 10% cement stabilised AP40 fill well compacted in 200mm layers or 20 MPa concrete**

**Notes:**
- Complete in ground installation to be coated with manufacturer’s corrosion inhibiting system

**Pole and Luminaire details for new Category P3 and P4 Residential Lighting**

**TYPICAL STEEL LIGHTING COLUMNS FOR STREETS**
Plan No. 4.1

FOR USE WITH PIPES OF 1050mmØ & OVER INTERNAL DIA. NO JUNCTION IS REQUIRED.

NOTE:
- Bends may be installed adjacent to a manhole using splay cut epoxy jointed specials.
- The jointing of the off-take riser to pipe bend special work must be carried out by the Pipe Manufacturer.

NOTE:
- Epoxy joint
- Up to 30° per joint
- Heavy Duty Cast Iron cover and frame flush with surface
- Standard manhole riser
- Approved rubber/bitumen sealing strip.
Precast Sump Base
Hynds SUMPPB-LHCC
or approved equivalent.

Precast Sump Top with frame &
Grate. Hynds SUMPTFG-WDC or
approved equivalent.

Precast Sump Base
Hynds SUMPPB-LHCC or
approved equivalent.

Epar epoxy pipe into
precast sump base.

300mm Ø Stormwater
pipe min.

Precast Sump Top with frame &
Grate. Hynds SUMPTFG-WDC or
approved equivalent.

300mm Ø Stormwater
pipe min.

Precast Sump Base
Hynds SUMPPB-LHCC or
approved equivalent.

300mm Ø Stormwater
pipe min.

300mm Ø Stormwater
pipe min.

PLAN
Not To Scale

ISOMETRIC VIEW
Not To Scale

STREET SUMP
Not to Scale

STREET SUMP DETAILS
Note
Where grates are replaced on frames with no centre supports the grate should have deeper sections, i.e. greater than 45mm to distribute loading.

PLAN VIEW OF FRAME

STANDARD SUMP GRATE DETAILS
FOOTPATH & YARD SUMP DETAILS

FOOTPATH & YARD SUMP DETAILS

Note:
Nominal grate size shown. 
To conform with manufacturer's dimensions.
DN100mmØ SN10 PVC-U pipe complying to AS/NZS 1260: PVC-U pipes and fittings for drain waste and vent applications.

Grate

Vehicle Crossing.

DN100mmØ SN10 PVC-U pipe complying to AS/NZS 1260: PVC-U pipes and fittings for drain waste and vent applications.

'ELL-UP ORGE' ell-up sump grate

Boundary

VEHICLE CROSSING (HEAVY DUTY & STANDARD) ELL-UP - SUMP
### STANDARD EADWALL DETAILS

1. REINFORCE FLOOR & WALLS WITH:
   - 150 - 375 665 Mesh
   - 450 - 600 663 Mesh
   - 675 - 900 12Ø Rods @ 250 CRS
   - 1050 - 1350 12Ø Rods @ 150 CRS

2. ALL REINFORCEMENT S/ALL BE PLACED CENTRALLY IN WALLS AND FLOOR AND S/ALL BE CONTINUOUS BETWEEN WALLS AND FLOOR.

3. LAPS IN STRUCTURAL GRADE BARS TO BE 300mm MIN.


5. CONCRETE IS TO BE ORDINARY GRADE (0.5MPa) IN ACCORDANCE WITH N.S. 3:01.

6. BAFFLES ARE TO BE CONSTRUCTED AS S/ OWN W/ EN OUTLET VELOCITIES AND SOIL CONDITIONS DICTATE. IN T/E TREMEO CASES SPECIFIC DESIGN MA: BE RE: URED BY T/E ENGINEER.

7. INLET STRUCTURES S/ ALL AVE REVERSE APRON FALL AND NO BAFFLES.

8. DIMENSIONS b/c & d MA/ BE VARIED TO SUIT SITE CONDITIONS.

9. DEBRIS GRILL TO BE SPECIFICALLY DESIGNED.

---

**PRINCIPAL DIMENSIONS (mm.)**

<table>
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<th>ø of PIPE</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
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</table>
Other Non-Traffic areas:
Ordinary Fill □ Compaction to 5% N:\ Standard (N:\ S • 02)

Other Non-Traffic areas:
Ordinary Fill □ Compaction to 5% N:\ Standard (N:\ S • 02)

Excavated Material □ Appropriately compacted, maximum particle size 20mm Ø

Bedding Material for pipe diameter for pipe diameter ≤ 450mmØ
use 5-20mmØ clean granular mix or pipe diameter > 50mm
use 5-40mmØ clean granular mix

Pipe cover to the manufacturers requirements under carriageway but no less than values stipulated in the engineering standards.

Carriageways & Parking Areas
Road pavement basecourse and subbase aggregate. See Plan No. 3.0. for details

Other areas:
Ordinary Fill □ Compaction to 5% N:\ Standard (N:\ S • 02)

Bedding material 5-20mmØ granular mix

300mm Min. Width

100mm min under barrel

CONCRETE & CERAMIC PIPES

PIPE TRENCHING DETAILS  WASTEWATER & STORMWATER
Bedding material with cement added to give a strength of not less than 7 MPa.

Dotted line indicates block dimensions for gradients steeper than 30°.

20MPa Concrete

Block for 20° - 30° grades.

Note:
Spacing of anti-scour blocks is subject to Engineer’s design.
STORMWATER DETAIL

Continuous sand coated PVC pipe where in contact with concrete.

Single Flexible joints

Pour 20MPa concrete corbel up to flexible joint.

Approved Rubber/Bitumen Sealing Strip.

WASTEWATER DETAIL

Channels to be constructed using half rounds uPVC or ceramic.

Detail for concrete & PVC-U pipelines from manhole.

Haunching 1 in 3 minimum width 190mm

Seal with epoxy mortar or flexible sealant.

STORMWATER DETAIL

Continuous sand coated PVC pipe where in contact with concrete.

Single Flexible joints

Pour 20MPa concrete corbel up to flexible joint.

Approved Rubber/Bitumen Sealing Strip.

WASTEWATER DETAIL

Channels to be constructed using half rounds uPVC or ceramic.

Detail for concrete & PVC-U pipelines from manhole.

Topsoil or Hotmix Concrete Hauching

Heavy Duty Lid

Heavy Duty Cast Iron cover & frame flush with surface

Stepped at 300mm crs. Seal bolt holes with epoxy mortar

See joint detail

Standard precast 1050Ø manhole section with fitted base.

750 Max.

25

25

WASTEWATER DETAIL

Channels to be constructed using half rounds uPVC or ceramic.

Detail for concrete & PVC-U pipelines from manhole.

Topsoil or Hotmix

Concrete Hauching

Heavy Duty Lid

Heavy Duty Cast Iron cover & frame flush with surface

Stepped at 300mm crs. Seal bolt holes with epoxy mortar

See joint detail

Standard precast 1050Ø manhole section with fitted base.

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25

25

STORMWATER DETAIL

Continuous sand coated PVC pipe where in contact with concrete.

Single Flexible joints

Pour 20MPa concrete corbel up to flexible joint.

Approved Rubber/Bitumen Sealing Strip.

WASTEWATER DETAIL

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Detail for concrete & PVC-U pipelines from manhole.

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25

25

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Stepped at 300mm crs. Seal bolt holes with epoxy mortar

See joint detail

Standard precast 1050Ø manhole section with fitted base.

750 Max.

25

25

STORMWATER DETAIL

Continuous sand coated PVC pipe where in contact with concrete.

Single Flexible joints

Pour 20MPa concrete corbel up to flexible joint.

Approved Rubber/Bitumen Sealing Strip.
EXTERNAL DROP MANHOLE - WASTEWATER

- **Details:**
  - **Riser-Lid Detail (Full height riser):**
  - **Riser-Lid Detail (Riser shortened):**
  - **Joint Details:**
  - **Sealing Strip:**
    - Approved sealing strip
    - Dry pack mortar
  - **Topsoil or Hotmix:**
  - **Concrete Hauching:**
    - Pour 20MPa concrete corbel up to flexible joint.
  - **Seal to Manhole:**
    - Bond to Manhole by scabbling or with epoxy bonding agent.
  - **Double Flexible Joints:**
  - **Riser shortened:**
  - **Standard precast manhole section with fitted base:**
  - **Sealed with Epoxy mortar or flexible sealant:**
  - **Pour 20MPa concrete corbel up to flexible joint:**
  - **Seal bolt holes with epoxy mortar:**
  - **Pour 20MPa concrete corbel up to flexible joint:**
  - **Provide screw cap:**
  - **Seal with Epoxy mortar or flexible sealant:**
  - **Pour 10 MPa site concrete (Min 5mm thickness):**
  - **Seal bolt holes with epoxy mortar:**
  - **Standard precast manhole section with fitted base:**
  - **Pour 20MPa concrete corbel up to flexible joint:**
  - **Provide screw cap:**
  - **Seal with Epoxy mortar or flexible sealant:**
  - **Pour 10 MPa site concrete (Min 5mm thickness):**
  - **Seal bolt holes with epoxy mortar:**
  - **Standard precast manhole section with fitted base:**
  - **Pour 20MPa concrete corbel up to flexible joint:**
  - **Provide screw cap:**
  - **Seal with Epoxy mortar or flexible sealant:**
  - **Pour 10 MPa site concrete (Min 5mm thickness):**
  - **Seal bolt holes with epoxy mortar:**
  - **Standard precast manhole section with fitted base:**

- **Plan No.:**

**Scales:** Not to scale

**Sheet of Sheets:**
Heavy Duty Cast Iron Cover & Frame fits into 600mm Ø pipe

For lid see Plan No. 5.3 & 5.4

Pipe must be completely bonded to concrete base. An acceptable method for PVC-U pipes is either a manhole connector or a glued coating of sand to the outside of the pipe

Corbel to extend 150mm each side of pipe

Double Flexible joint at corbel to be provided within 500mm of the inspection chamber

Where this pipe stub has a downstream facing socket, it shall be encased as shown opposite

Single Flexible Joint to be provided within 500mm of the inspection chamber

Cut flush with wall of chamber

STORMWATER

WASTEWATER

SECTION A-A

SECTION B-B

TYPICAL INSPECTION CHAMBER FOR 100mm Ø PIPE
Manhole Riser
Incoming Sewer
High Level Alarm
Pump 2 Start
Both Pumps Stop

100mm Ø Rising main
Discharge
Non Return Valve
Isolating Valve

Guide Rail
Lifting Chain

Four hours
Storage Required
at 2 x DWF
above High Level Alarm

Discharge Bend
2 Pumps of type
removable from
chamber by raising
from discharge bend.

Isolating Valve
Pump 2 Start
Pump Starting
Range to give no
more than 10 starts
per hour

Both Pumps Stop

50mm Opening Heavy Duty

TYPICAL WASTEWATER PUMP STATION LEVEL MONITORING
Precast manhole cover

Precast manhole liners

Concrete fillet

Manhole liners embedded on mass concrete base 25mm above barrel of pipe. Alternatively precast base may be used. Haunching common to both

NOTES:
1) Precast manhole liners 1200, 1500 or 1800 internal diameter
2) The chosen size of liners may need to be offset from the centreline of the pipe to accommodate bends or junctions.

Flexible joint

Concrete fillet

ELEVATION B-B

PLAN A-A

MANHOLE FOR LARGE DIA. PIPES - 750 to 1050mm
50mm Rider Mains
Fed one end: max. 6 dwelling units
max. length 90m
Fed both ends: max. 20 dwelling units
max. length 200m.

25mm, or 32mm. Service to rear lots can be taken off rider main. Refer Engineering Standards for land development for set criteria.

Valve Spacing: Not exceeding 350m
Fire hydrant Spacing
Not exceeding 35m Residential Streets
Not exceeding 60m Business and Industrial Streets
SI = Swab Inlet

LAYOUT OF VALVES AND FIRE HYDRANTS
Principal Main is to be connected with principal main in adjacent street.

63mm OD Rider Main to be connected to Principal Main at both ends.

Walkway/cycleway or easement.

LAYOUT OF WATERMAINS IN CUL DE SAC
PLAN

Cast iron surface box to N/S 5638
Precast concrete surface box surround.

Precast concrete under blocks
520 x 6/5 x [0]
(2/0 x [0 opening])

Valve box -
Heavy Duty (road) Light Duty (berm)

SECTIONAL ELEVATION

Valve box -
Heavy Duty (road) Light Duty (berm)

Precast concrete surface box surround.

PLAN

DN50mm Rider Main

10mm Ø Reinforcing

Cast iron lid

DN50mm Rider Main

R.S valve Resilient Seated

225mm:
150mm:

See note

SV

300

300

50

90° bend required.

Cast iron surface box to N/S 5638
Precast concrete surface box surround.

Principle Main connections: 100mm:
As Shown

Use Gibault joint with 50mm take off placed vertical. 90° bend required.

NOTE:

Principle Main connections: 100mm:
As Shown

50mm:
225mm:

DN50mm RIDER MAIN OR R.O.W. SERVICE CONNECTION

Scales: Not to scale
Plan No.

6.3

Sheet of Sheets
NOTE:
All in ground nuts and bolts are to be twice wrapped in Densotape or approved equivalent.
In footpaths or berms, surface boxes shall be light pattern surface box surrounded by a 600 x 600 x 150 concrete surround.

Resilient Seated Sluice Valve to AS/NZS 2638.2
Flanged joint (Z joint alternative)

Precast concrete under blocks 520 x 65 x 60
(2:0 x 2:0 opening)

Concrete pad. Concrete to be poured clear of joints

Timber marker post painted white

6mm bolt

Ground Level

SLUICE VALVE INSTALLATION
FOR CARRIAGEWAYS

VALVE MARKER INSTALLATION

SLUICE VALVE AND MARKER INSTALLATION
HYDRANT INSTALLATION

Cast iron surface box
Precast concrete surface box surround
Spindle cap
Precast concrete under block
520 x 65 x 110
(2 x 0 x 0 opening)
Approved concrete base plate

10mm Ø reinforcing
Approved fire hydrant

Under blocks installed to the same level of bottom flange
Hydrant riser(s) as necessary
Concrete under block

Cast iron lid

NOTES:

Under blocks installed to the same level of bottom flange
Hydrant riser(s) as necessary

"Scotchlite" strip on face at end of Cul De Sac.
Timber marker post painted yellow (Colour No. 356, B.S. 381 C)

6mm bolt

NOTE:

Hydrant must also be marked on road with yellow triangle and blue coloured R.R.P.M.
Metallic Detector Tape (when required)

Ground Level

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains under carriageways</td>
<td>≥ 00mm (Min.)</td>
</tr>
<tr>
<td>Mains under berms and footpaths</td>
<td>≥ 50mm (Min.)</td>
</tr>
<tr>
<td>Rider mains under carriageways and berms</td>
<td>≥ 50mm (Min.)</td>
</tr>
<tr>
<td>Hydrant spindle</td>
<td>≥ 5mm (Min.) and 225mm (Max.)</td>
</tr>
<tr>
<td>Valve spindle</td>
<td>≥ 5mm (Min.) and 00mm (Max.)</td>
</tr>
<tr>
<td>Service pipes under carriageways</td>
<td>≥ 00mm (Min.)</td>
</tr>
<tr>
<td>Service pipes under berms and footpath</td>
<td>≥ 50mm (Min.)</td>
</tr>
<tr>
<td>Service pipes at road boundary</td>
<td>300mm (Max.)</td>
</tr>
</tbody>
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STANDARD WATER MAINS LAYING DETAILS

Trench Width, B

Nominal Pipe Diameter + 300mm

Tracer Wire (when required)

Bedding Material sand/crushed grit or TNZ AP20

Carriageway and Parking Areas
Min. 300mm thick pavement:
- AP65 ≥200mm thick
- M1/AP: 0.00mm thick
All compaction on trench back filling in the carriageways, footpaths and vehicle crossings must achieve 4 blows per 50mm with Scala Penetrometer or a Clegg Impact value ≥ 0
Thickness of Layers for compaction ≤ 50mm
- 00mm layer of NZTA:M0, AP0
basecourse: Clegg Impact Value ≥ 0 at top of basecourse layer

Other Areas
Ordinary Fill: 5 compacted to 95% Standard Compaction (NZS 4402)

WATERMAIN - PIPE LAYING DETAILS

Scales: Not to scale
Plan No. 6.6
Sheet of 10 Sheets
STANDARD THRUST BLOCKS

OR 100mm Ø WATERMAIN

WATER MAIN - THRUST BLOCK DETAILS
Outlet of Air Valve must be min. 300mm above Ground Level.

35mm gap

50mm gap

Ø x M10 threaded studs welded to flanged top of box.

Ø x M12 Stainless Steel bolts with tubular spacers.

35mm gap

50mm gap

0.6mm thick Stainless Steel coloured Dark Green plus Reflector Strip.

Reflector Strip

Concrete Footing

AIR VALVES BOX BLOCK DETAILS
300mm Max.
235mm Min.
if no base in
meter box

250mm

Lower/raise existing service to meet min./max depth requirements

'MACFLO' CM 2000 manifold centrally located in meter box

Notes:
- Service to be tapped onto top of main
- Service to be laid at right angles to the frontage.
- 20mm NB (25mm OD) service to all lots or dwelling units (or larger in special cases)

MDPE80 Metric (Blue) pipe
Approved Self Tapping Ferrule
Service Pipe

Gunmetal Tapping Band
PE adaptor
Supply Pipe

Meter Box with blue lid marked "WATER" installed on polyethylene base plate

355mm Max.
235mm Min. if meter box is installed with base

Boundary

Plan No. 6.8

Scales: Not to scale