

2. Subdivision and Land Development Bylaw – technical issues

(Report from Keith Hovell, Planning Consultant)

Two submissions have been received on technical issues associated with the proposed Subdivision and Land Development Bylaw and these are considered below.

A separate report has been prepared in relation to the sustainable management of storm water, in particular, the mandatory provision of rainwater tanks, use of green technology and requirements to dispose of storm water on-site where this is practical.

Submissions from Hamish Weir (LandPro)

<p>1 Bylaw provision and Issue</p> <p>1.8.2.5 Recording of infrastructure (e) Digital tables</p> <p>Mean sea level is an ambiguous term. True mean sea level varies considerably around the coast line of New Zealand and does not provide a fixed datum of reference. Furthermore, climate change is causing mean sea level to rise adding further ambiguity.</p>	<p>Requested Change</p> <p>I propose that the bylaw replace all references to ‘mean sea level’ with the wording ‘Dunedin to Bluff Vertical Datum 1960.’</p> <p>Reason</p> <p>Dunedin Vertical Datum 1960 is a fixed point of reference and is an official vertical datum of New Zealand as administered by Land Information New Zealand (https://www.linz.govt.nz/data/geodeticsystem/datums-projections-and-heights/verticaldatums/local-mean-sea-level-datums)</p> <p>The majority of levels referred to by documentation/as built data in the Gore district, are not in fact in terms of ‘mean sea level’. This term has been mistakenly used to refer to levels in terms of Dunedin Vertical Datum.</p> <p>Land Information New Zealand maintains a database of bench marks with levels in terms of this datum located throughout the Gore district.</p> <p>Landpro recently had Environment Southland accept our submission on the Land and Water Plan to specify all levels in terms of New Zealand Vertical Datum 2016. There is a mathematical relationship between this datum and Dunedin Vertical Datum 1960 allowing transformation between the datums.</p>
<p>Provision Subject to Submission</p> <p>1.8.2.5 Recording of infrastructure - As-built information</p> <p>(e) <i>Digital Tables</i></p> <p><i>Conventions to be followed in populating the tables with information are:</i></p> <ul style="list-style-type: none"> ➤ <i>The feature number may be any unique whole number allocated by the licensed cadastral surveyor, but the numbers used are to be sequential.</i> ➤ <i>The feature type is to be the commonly used name such as sump, valve, and manhole with the naming being consistent over the project.</i> ➤ <i>Co-ordinate positions shall be accurate to within +/-100 mm.</i> ➤ <i>Levels shall be accurate to within +/-20 mm and expressed in terms of mean sea level.</i> 	
<p>Response</p> <p>The reasoning set out in this submission is accepted. It is recommended reference to “mean sea level” in this provision be amended to NZ Vertical Datum 2016.</p>	

<p>2 Bylaw provision and Issue</p> <p>1.8.10 (b)</p> <p>NZTM projection coordinates cause considerable distortion at this end of the South island due to the origin of</p>	<p>Requested Change</p> <p>The use of local projections, Geodetic Datum 2000 North Taieri or Bluff Circuits is proposed in addition to NZTM.</p> <p>Reason</p> <p>All modern Geographical Information Systems (GIS) used by councils now have the ability (whether users understand or not)</p>
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<p>this projection. The difference between projection distances calculated between projection coordinates is not equivalent to true ground distances.</p> <p>Projections are necessary to account for earth curvature but are generally poorly understood by those outside of the Surveying or Spatial professions. This often leads to the user's assumption that ground distances are the same as projection distances which is not the case. In Gore's central business area an NZTM projection distance of 100m is actually 100.081m on the ground</p>	<p>to accept data in terms of all of New Zealand's local projections. There is no need for the sole use of NZTM, which is a projection designed for datasets that cover the entire country such as the topographical map 50 and 250 series. There is a direct mathematical relationship between NZTM and local circuits North Taieri and Bluff as all three are based on the same reference ellipsoid. The difference is that the local circuits have origins that are in close proximity to the Gore district and are not significantly affected by the influence of projection scale factors. As a comparison to NZTM;</p> <ul style="list-style-type: none"> • A 100m Bluff circuit projection distance is equivalent to 100.003m on the ground • A 100m north Taieri circuit projection distance is equivalent to 100.009m on the ground <p>The use of local projections allows general users to assume that projection distances are the same as ground distances. This solves the issue caused by the use of NZTM projection coordinates.</p>
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Provision Subject to Submission

1.8.10 Completion documentation

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

- (a) *The geotechnical reports and as-built plans required by Section 2.6 of this Bylaw.*
- (b) *As-built plans of all infrastructure showing the information set out in Schedule 1D. As-built plans will be required in hard copy and in an electronic format (as per Section 1.8.2.5,) the electronic data is to use the New Zealand Transverse Mercator (NZTM) co-ordinate system.*

If electronic data does not meet the Council's format requirements or is deemed to be of inadequate quality, the Council reserves the right to return to the developer for correction.

Response

While the changes sought are convenient for land professionals, they are not of benefit to the Council for asset management purposes and it is the request of the 3Waters Department that the current provisions be retained. Additionally it should be noted Land Information NZ regularly provides adjusted property boundary data and this is in NZTM format. No change to the provision is recommended.

<p>3 Bylaw provision and Issue</p> <p>Table 3.1</p> <p>Under urban residential, private ROWs are no longer able to have reserves of less than 5m in width or carriageways of less than 3.5m. This will make infill subdivision within the district townships very difficult if not impossible to achieve.</p> <p>Under rural/rural lifestyle, private ROWs are no longer able to have reserves of less than 6m. This is unnecessarily restrictive.</p>	<p>Requested Change</p> <p>I propose that urban residential private ROW section of Table 3.1 is broken down into subcategories as per table 6.1 of the current Subdivision and Land Development Bylaw. The note allowing single household unit access to be 3m is also requested to remain. The proposed changes are intended to replace 'up to 6' breaking it down into the original 4 categories with the addition of the note as follows;</p> <table border="0"> <thead> <tr> <th><i>Max lots served</i></th> <th><i>Min reserve width (m)</i></th> </tr> </thead> <tbody> <tr> <td>1 – 3 lots</td> <td>3.5*</td> </tr> <tr> <td>4 lots</td> <td>4.0</td> </tr> <tr> <td>5 lots</td> <td>4.5</td> </tr> <tr> <td>6 lots</td> <td>5.0</td> </tr> </tbody> </table> <p>Note * The width of an access serving a single household unit may be reduced to 3 metres if the driveway has unrestricted visibility and the length does not exceed 30 metres.</p> <p>I propose that rural/rural lifestyle private ROW section of Table 3.1 is broken down into subcategories as follows;</p> <table border="0"> <thead> <tr> <th><i>Max lots served</i></th> <th><i>Min reserve width (m)</i></th> </tr> </thead> <tbody> <tr> <td>4 lots</td> <td>4.0</td> </tr> </tbody> </table>	<i>Max lots served</i>	<i>Min reserve width (m)</i>	1 – 3 lots	3.5*	4 lots	4.0	5 lots	4.5	6 lots	5.0	<i>Max lots served</i>	<i>Min reserve width (m)</i>	4 lots	4.0
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	<p>5 lots 4.5</p> <p>6 lots 5.0</p> <p>I also propose that short cul-de-sac is increased from <5 to <6 units served.</p>
<p>Provision Subject to Submission</p> <p>Table 3.1 attached at the end of this report. The relevant provisions are highlighted in yellow and those of specific concern have a red font.</p>	
<p>Response</p> <p>This submission requests that the provisions of the current Bylaw be retained. The proposed Bylaw provides a single standard for access width, whereas the current bylaw enables different sized accesses depending on the number of lots. The Roading Department has assessed this submission and supports all of the changes sought. It is recommended that all changes sought be adopted.</p>	

<p>4 Bylaw provision and Issue</p> <p>3.3.3, 3.3.16.3 & 3.4.5</p> <p>Pavement design criteria could be better defined.</p>	<p>Requested Change</p> <p>Nelson City (NCC) & Tasman District Council's (TDC) engineering standards have some very useful design charts for pavement thickness design based on Scala Penetrometer, laboratory and Benkleman Beam testing. We would urge council request permission from NCC or TDC to include these in the bylaw</p> <p>Reason</p> <p>These charts provide robust pavement design and are a solid benchmark for determining compliance. I have worked in both the Nelson/Tasman region and have used these standards for pavement design. I have also encountered references to these design charts in specifications by engineers working in Christchurch on various projects.</p>
<p>Provision Subject to Submission</p> <p>3.3.3 <i>Pavement structural design</i> <i>Generally, pavements shall be flexible designs. Other types of pavements shall be subject to the approval of the Council. Pavements shall be designed in accordance with the Austroads guides with a design life of 30 years.</i></p> <p>3.3.3.1 <i>California bearing ratio design method for rigid and flexible pavements</i> <i>Soaked California bearing ratio (CBR) values of the pavement subgrade shall be used and the pavement designed for the estimated number of equivalent standard axle (ESA) loadings over a 30-year design life.</i></p> <p>3.3.16.3 <i>Pavement design</i> <i>Private pavements shall be designed as for public roads but no residential or rural pavement shall have a minimum formation thickness of less than 150 mm for flexible pavements or 100 mm for concrete pavements.</i> <i>All public roads pavement shall be provided with adequate supporting design to ensure that it will have a life of 30 years.</i> <i>Acceptable surfacing for accesses includes asphaltic concrete (25 mm minimum thickness), chipseals, in situ concrete or concrete pavers.</i></p> <p>3.4.5 <i>Subgrade checking</i> <i>Where the extent of cut or fill for the project is too great to make subgrade CBR testing feasible at the design stage, it should be done on completion of earthworks when subgrade levels have been exposed. Even in cases where the subgrade has been tested as part of the design its condition shall be reviewed on exposure during construction and pavement thicknesses adjusted accordingly.</i> <i>The results of such testing or review along with any consequent adjustments to pavement layer thicknesses shall be advised to the Council before placing of pavement layers commences.</i></p>	

Any identified wet spots in the subgrade shall be drained to the under-channel drainage system. Where the wet area is below the level of the under-channel drain, it shall be drained using approved filter drainpipes connected to the nearest stormwater system. Between the date the subgrade is completed and the application of the first metal-course aggregate, the subgrade shall be maintained true to grade and cross section. Should potholes, soft spots or ravelling develop in the subgrade, the area so affected shall be scarified and clean material added and recompacted.

Response

Council staff consider there is no benefit in making the changes sought. While several Councils have used an alternate approach to pavement design criteria, they are in the minority. Council staff and contractors are familiar with the current approach. No change is recommended.

5 Bylaw provision and Issue

3.3.16.1 (b)
Requiring minimum road/access grades of 1 in 250 is unnecessarily restrictive.

Requested Change

The current bylaw allows for kerb grades of 1 in 300. We would promote that this is retained in the new bylaw and this clause amended accordingly.

Reason

Kerbing grades of 1 in 500 are permissible by Christchurch City and Selwyn District Councils. The flatter parts of the district could struggle to achieve 1 in 250 grades and the 1 in 300 proposed is not as flat as that permitted in Canterbury.

Provision Subject to Submission

3.3.16 *Private ways, private roads, and other private accesses*
3.3.16.1 *Plan and gradient design*
Centre line grades should:
(a) *Not be steeper than 1 in 5 although gradients of 1 in 4.5 may be used on straight lengths of access over distances of up to 20 m. The first 5 m of any access shall be not steeper than 1 in 8. A greater length of transition shall be provided where necessary on non-residential accesses.*
(b) *Not be less than 1 in 250.*

Response

As a standard, a minimum road grade of 1:250 is considered appropriate. This is consistent with the requirements of the Southland District. No change is recommended.

6 Bylaw provision and Issue

3.3.20.7.4 & 4.3.9.3
3.3.20.7.4 specifies 200mm pipe and conflicts with 4.3.9.3 which specifies 225mm pipe.

Requested Change

One diameter needs to be set as the minimum requirement
Reason
A correction needs to be made to one of the figures to remove ambiguity.

Provision Subject to Submission

3.3.20.7.4 *Sump leads*
Leads shall be designed to be of sufficient size to convey all the design capacity of the sump to the system. The minimum size of the lead for all types of sumps shall be 200 mm diameter, but 300 mm diameter is desirable to minimise inlet losses and blockage risk. For double sumps and other high capacity sumps the minimum size of lead required is 300 mm diameter.

4.3.9.3 *Minimum pipe sizes*

Minimum pipe sizes for public mains and sump leads unless otherwise specified shall be:
Single sump outlets - 225 mm internal diameter
Public mains - 150 mm internal diameter where only taking house leads

Response

This submission highlights an inconsistency in the Bylaw and it is appropriate for the 225mm figure to be used in all cases.

<p>7 Bylaw provision and Issue 3.4.3.1 (a) The standard appears to require minimum 40mm thick asphalt on all road surfaces which is excessive and unnecessary. Depths of 40mm or greater should be restricted to turning areas or intersections.</p>	<p>Requested Change This item needs to be reworded to clarify that 25mm depth is acceptable on road surfaces outside turning areas Reason There is currently some ambiguity as to when 40mm depth asphalt is required.</p>
<p>Provision Subject to Submission 3.4.3.1 <i>Acceptable surfacing materials</i> <i>All movement lanes shall be provided with a permanent, hard wearing surfacing layer, which shall be either impermeable or formed over an impermeable base. The surfacing shall be capable of carrying all stresses expected during its lifetime.</i> <i>Acceptable surfacing options may include:</i> <i>(a) Hot laid asphaltic concrete of minimum compacted thickness 40 mm, laid over a waterproofing sealcoat;</i> <i>Asphaltic concrete of at least 25 mm, but subject to specific design, may be used as an alternative to chip sealing.</i> <i>The asphaltic concrete shall comply with TNZ Specifications M10 and P9.</i></p>	
<p>Response The introductory text in 3.4.3.1 states “The surfacing shall be capable of carrying all stresses expected during its lifetime” and some examples are then given. They are not mandatory, with case by case assessment being undertaken. The Roading Department has advised asphaltic concrete of 25mm thickness is unlikely to be allowed in the Gore setting. The figure should be amended to 30mm. No other change is supported. It is recommended the following wording be adopted: <i>Asphaltic concrete of at least 25 30mm, but subject to specific design, may be used as an alternative to chip sealing.</i></p>	

<p>8 Bylaw provision and Issue 3.4.4.5 & 3.4.14.1 The specification of 30 MPa concrete is excessive and not what is usually produced from the plants in town.</p>	<p>Requested Change I would suggest that a 25 MPa specification is satisfactory. Reason According to Allied’s testing the 25 MPa specification will usually lead to concrete achieving a 30 MPa strength at 28 days. This should be more than suitable for use in trafficable areas. Specifying 30 MPa will result in unnecessary additional construction expense. All concrete from certified plants exceeds the specified strength rating to ensure compliance. Allied Concrete in Gore have advised that the usual mix requested for works in Gore township is 20 to 25MPa. The testing on these mixes usually comes back at 24.5 MPa for the 20 and 30.5MPa for the 25. The current bylaw only requires 17.5 MPa, to jump to 30 is excessive.</p>
<p>Provision Subject to Submission 3.4.4.5 <i>Concrete</i> <i>All concrete for roads shall come from a special grade plant as defined in NZS 3109. Concrete of not</i></p>	

*less than 30 MP at 28-day strength shall be used for any road or crossing slabs.
Concrete for kerbs and channel shall be of not less than 20 MPa, 28-day strength.*

3.4.14 Footpaths and cycle paths

3.4.14.1 Concrete

Concrete used in footpaths shall be of at least 20 MPa, 28-day strength. Concrete for crossings shall be 30 MPa, 28-day strength as detailed in 3.4.4.5.

Response

A valid issue is raised here, for the reasons given by the submitter. It is recommended that reference to 30 MPa be amended to 25 MPa as required.

9 Bylaw provision and Issue

5.3.7.4

The minimum 1.0m offset to boundaries will not be practical on infill subdivision in the townships

Requested Change

Another exception should be made for 100mm laterals serving only one property to be a minimum of 500mm.

Reason

Infill subdivisions often only have space for a 1m wide easement along the boundary perpendicular to the road. If the pipe must be a minimum of 1m metre the easement would encroach on to necessary building platforms.

Provision Subject to Submission

5.3.7.4 Pipes in private property

Where pipes are designed to traverse any vacant or occupied public or private properties, the design shall as far as practicable allow for possible future building plans, preclude maintenance structures and specify physical protection of the pipe within or adjacent to the normal building areas and all engineering features (existing or likely) on the site, such as retaining walls.

The design shall allow access for all equipment required for construction and future maintenance. Except where obstructions or topography dictate otherwise, pipes shall run parallel to boundaries at minimum offsets of 1.0 metre.

Response

Reducing the width of the easement is not supported. If an in-fill subdivision cannot meet the current 1 metre easement width, then further subdivision may not be appropriate. The one metre required is considered appropriate. However, if there are extenuating circumstances justifying a reduction in the width of an easement, that can be considered by way of a request for a dispensation from the Bylaw provisions. No change to the provision is recommended.

10 Bylaw provision and Issue

5.3.7.5

No allowance for concrete pipe protection has been made.

Requested Change

Allowance for concrete encasement or protective overlay should be included.

Reason

Concrete pipe encasing is a satisfactory alternative means of achieving the purpose of specifying minimum pipe cover. This provides flexibility for design solutions where pipe depth is problematic.

Provision Subject to Submission

5.3.7.5 Minimum cover

Minimum cover shall be determined by the property connections which require a minimum depth at the property boundary of at least 1.0 metre. Where there are no property connections to govern the cover over the main the minimum cover shall be 600 mm in private property and 900 mm in the road reserve.

Response

If pipe depth is problematic then any deviation from the required standard should be assessed by

way of a request for a dispensation from the Bylaw provisions. If a lesser standard is provided in the Bylaw it will become the norm and that is not appropriate. No change to the provision is recommended.

<p>11 Bylaw provision and Issue 7.3.3 Requirements for qualified person (assumed to be an arborist) are not clear.</p>	<p>Requested Change Paragraph two should be altered to clarify that a qualified person is only required if the vegetation is a protected tree specified in the District Plan Reason Currently the requirement insinuates that all vegetation to be retained needs an assessment by a qualified person. I assume this person is intended to be an arborist which is an excessive requirement in all circumstances not involving protected trees.</p>
<p>Provision Subject to Submission 7.3.3 <i>Existing vegetation and trees</i> <i>All existing vegetation and trees to be retained shall be cordoned off to protect the root zone and vegetation, prior to the commencement of construction and the cordon shall remain in place until completion of construction.</i> <i>Existing trees to be retained are to be protected by temporary fencing in a circle with a radius equal to the maximum crown extension (drip line). A qualified person shall be used to determine the protected area and supervise construction.</i> <i>At no time shall anything be deposited in the root zones of protected vegetation and trees. If installation is required under existing vegetation trenchless technology should be considered, if this is not practicable advice from a suitably qualified person should be sought to minimise damage to the vegetation.</i> <i>A tree or vegetation plan and construction methodology shall be supplied to the Council including:</i> <i>(a) Position and design of temporary protective fencing or other methods of protection.</i> <i>(b) Arboricultural maintenance required.</i> <i>(c) Methods of protection of the tree and root zone where construction is to occur near the root zone and tree canopy.</i> <i>(d) Maintenance required for long term health and stability of the tree or vegetation.</i></p>	
<p>Response The term arborist is not protected in New Zealand, which means anyone can call themselves an arborist. While in many cases, a qualified arborist is the appropriate person to provide advice and assistance, there are other ecological skill sets that would also be suitable. No change is recommended to these provisions arising from the submission. It is noted however, there is a minor grammatical error in the provision and this should be amended into a new paragraph as follows: <i>If installation is required under existing vegetation trenchless technology should be considered. If this is not practicable, advice from a suitably qualified person should shall be sought to minimise damage to the vegetation.</i></p>	

<p>12 Bylaw provision and Issue D17-1 Standard house connection detail shows raised PVC rodding eyes which will be vulnerable to damage.</p>	<p>Requested Change The detail should be altered to show a flush plastic box and lid similar to a water meter box. Reason Raised plastic pipes will be vulnerable to damage allowing surface water, soil and other undesirable material to enter the sewer. The plastic boxes would protect the rodding eye access and provide for ease of location.</p>
<p>Provision Subject to Submission</p>	

Diagram 17-1 attached at the end of this report

Response

A valid issue is raised and it is recommended that the diagram be amended to show a flush plastic box and lid similar to a water meter.

13 Bylaw provision and Issue

R10

The image is blurry and difficult to read.

Requested Change

Provide a better-quality image.

Provision Subject to Submission

Diagram D10 attached at the end of this report

Response

A number of diagrams in the proposed Bylaw are copied from the existing Bylaw and other sources. These all require replacement with better quality images and that will be done as part of the final document.

Submission from Murray Fortune (Clark Fortune McDonald and Associates)

14 Bylaw provision and Issue

Tables 3.3A (p66) and Tables 3.3B & 4.3C (p67) refer to *Standard Drawings R13 and R14* – these drawings don't appear in Appendix B

Requested Change and Reasons

Provision Subject to Submission

Diagrams R13 and R14 attached at the end of this report

Response

The omission is noted and it is recommended that Standard Drawings R13 and R14 be included in the final Bylaw document.

Table 3.1 - Road design standards

Street Type	Units Served	AADT	Parking Lanes (m)	Traffic Lanes (m)	Carriageway Width (m)+	Formed Shoulder Width (m)	Footpaths No. x m	Minimum Reserve Width (m)
Sealed Roads								
Commercial/Industrial								
Arterial		500+	2 x 2.5	2 x 3.5	12		2 x 1.4	20
Collector		100-499	1 x 2.5	2 x 3.5	9.5		2 x 1.4	20
Local		0-99	2 x 2.5	1 x 3	8		2 x 1.4	17
Urban Residential								
Arterial	> 100	500+	2 x 2.5	2 x 3.5	12		2 x 1.4	20
Collector	21 - 100	100-499	2 x 2.5	2 x 3	11		2 x 1.4	20
Local	50 max	0-99	2 x 2.5	1 x 3	8		2 x 1.4	20
Cul-de-sac / ROW	20 max		1 x 2.5	1 x 3.5	6*		1 x 1.4	15
Private ROW	7 to 12			1 x 5	5		1 x 1.4	7
Private ROW	up to 6			1 x 3.5	3.5		Nil	5
Rural/Rural Lifestyle								
Arterial		500+		2 x 3.5	7.5			
Collector		100-499		2 x 3.0	7.0			
Local	<100	0-99			6.5	1	1 x 1.4 ***	20
Long cul-de-sac	10-20 max				5.5*	1	1 x 0.9 ***	15

Street Type	Units Served	AADT	Parking Lanes (m)	Traffic Lanes (m)	Carriageway Width (m)+	Formed Shoulder Width (m)	Footpaths No. x m	Minimum Reserve Width (m)
Short cul-de-sac	<5				5	0.75	Nil	12
Private ROW	up to 5			3	4	0.5	Nil	6
Unsealed Roads								
Collector		100+			6.5 m+		Nil	
Local		0-99			4.5-6.5 m		Nil	
Track					Site Specific	Nil		

* **Note** - Passing bays (6 m carriageway width) are required at 100 m spacings (nominal).

** **Note** - Kerb and channel may be required for scour protection. See Clause 6.13.

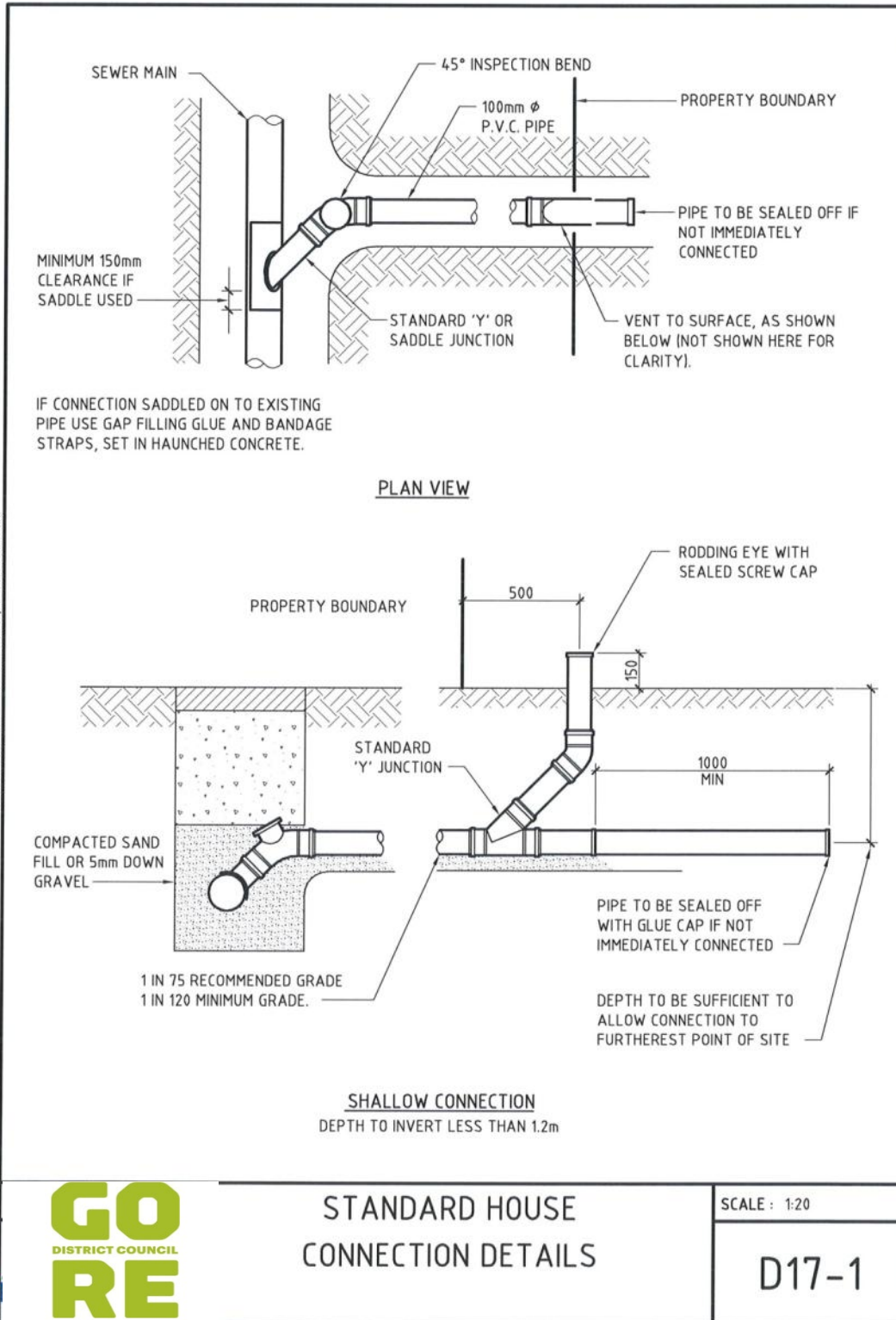
*** **Note** - Footpaths may not be required in rural and rural /residential situations.

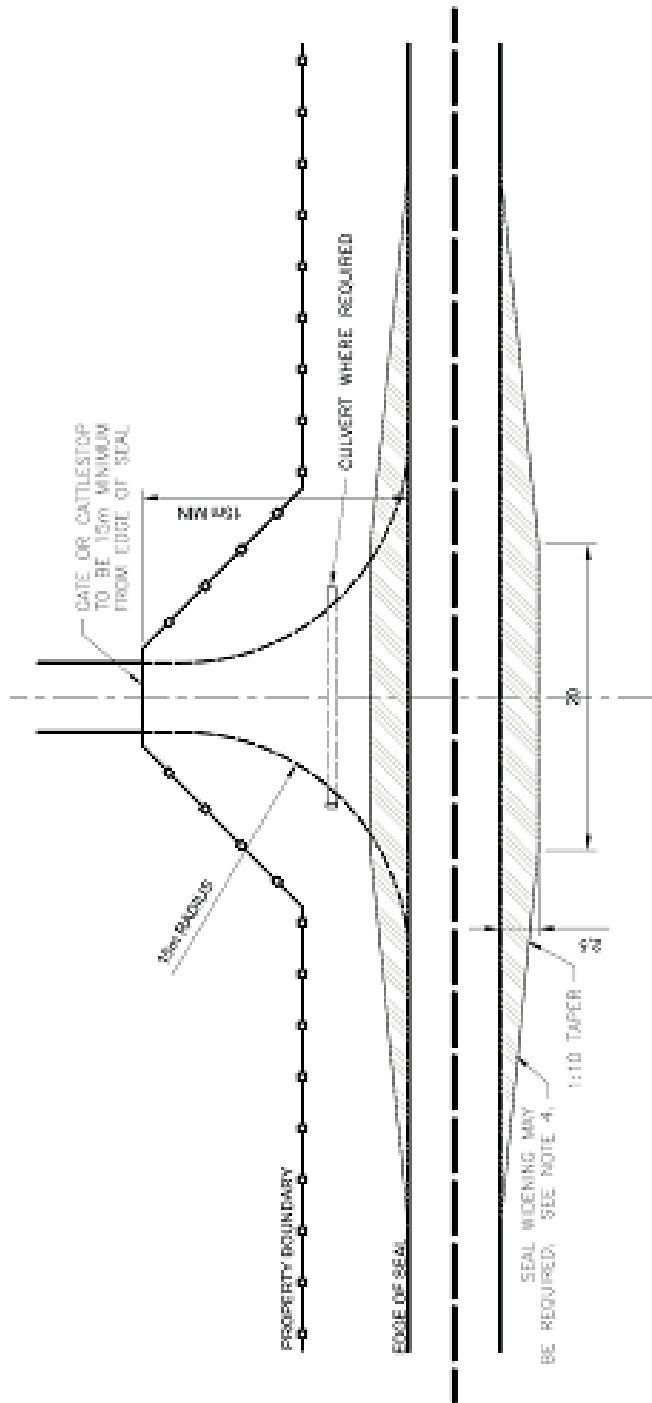
+ **Note** - Carriageway width is defined as kerb face to kerb face in urban situations.

This table is to be used as a guide only and will be subject to particular requirements of the engineer for each situation.

NB. Urban/Rural definition is based on speed limit, i.e., urban roads are those with a speed limit of 70 kph or less, rural > 70 kph

Figure B18 - D17-1 Standard House Connection Details





PRIMARY COMMERCIAL ACCESS

(Collector and Local Roads)

NOTES

1. CROSSING TO BE 4.5m MINIMUM WIDE AT ENTRANCEWAY AND INCORPORATE 15m MINIMUM EDGE RADIUS.
2. CONSTRUCTION TO BE OF CRUSHED GRAVEL MEETING THE REQUIREMENTS OF TRZ M/4 AT LEAST 250mm DEEP.
3. WHERE THE CROSSING INTERCEPTS EXISTING SIDE DRAINAGE A 200mm DIAMETER CULVERT IS TO BE INSTALLED. PIPE TO BE HEAVY WALL PVC OR CONCRETE.
4. SEAL WIDENING REQUIRED IN HATCHED AREA WHERE ACCESS IS ONTO AN EXISTING SEALED ROAD.
5. A PRIMARY COMMERCIAL ACCESS SHALL BE PROVIDED WHERE AN ACCESS ON AN UN-KERBED ROAD

Source: Gore District Council



Primary Commercial Access - Collector and Local Roads

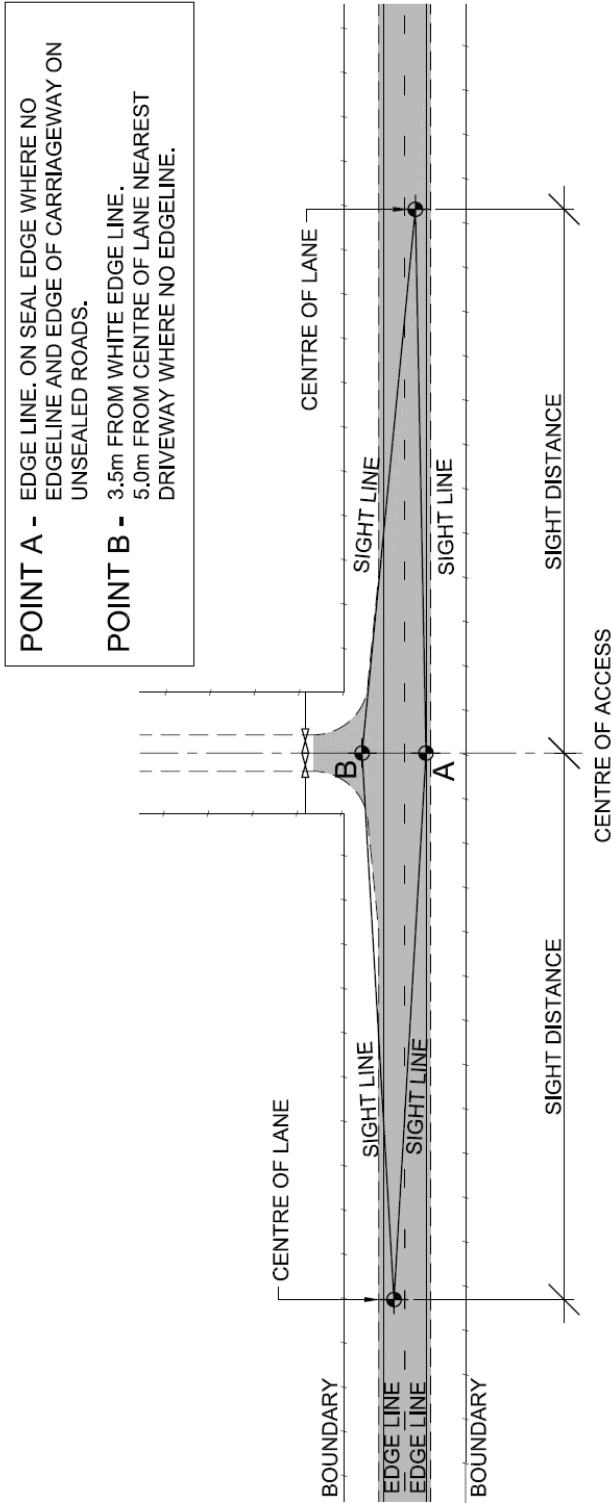
Refer to Section 6.21

Not To Scale
Original Size A4

Sheet **R10**

September 2011

3. FOR REQUIRED SIGHT DISTANCES REFER TO TABLES 6.1 AND 6.2 IN SECTION 6.20.



ACCESS SIGHT LINES

NOTES

1. SIGHT DISTANCES SHALL BE MEASURED FROM A POINT 1.15 m (MOTORISTS EYE LEVEL) ABOVE THE FINISHED SURFACE OF THE ACCESS CROSSING PLACE AND 1.15m ABOVE THE ROAD SURFACE.
2. THERE SHALL BE NO OBSTRUCTIONS TO VISIBILITY INSIDE THE AREA BOUNDED BY THE SIGHT LINES.
3. FOR REQUIRED SIGHT DISTANCES REFER TO TABLE 5.1 FOR STATE HIGHWAY AND OTHER ARTERIAL ROADS AND TABLE 5.2 FOR COLLECTOR AND LOCAL ROADS.

Source:
Transit NZ



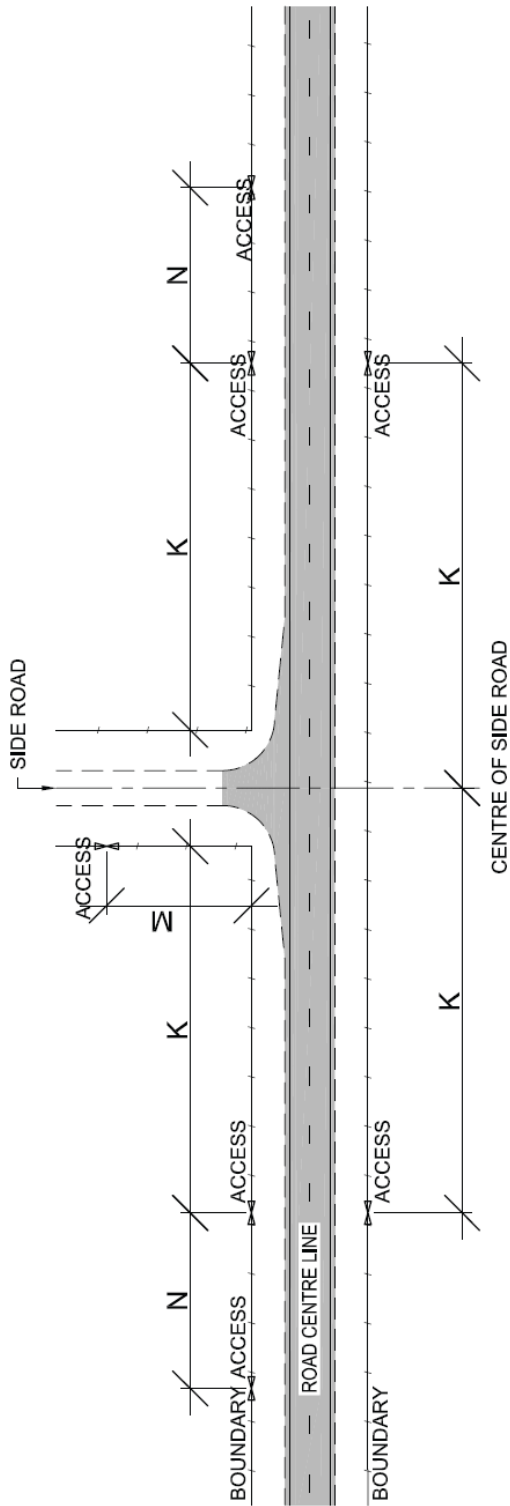
Access Sight Lines

Refer to Sections 6.20 and 6.21

Not To Scale
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Sheet **R13**

September 2011



ACCESS SEPARATION FROM INTERSECTIONS AND OTHER ACCESSES

NOTES

1. FOR REQUIRED SIGHT DISTANCES REFER TO TABLE 5.1 FOR STATE HIGHWAY AND OTHER ARTERIAL ROADS AND TABLE 5.2 FOR COLLECTOR AND LOCAL ROADS.

Source:
Transit NZ



Access Separation Diagram

Refer to Sections 6.20 and 6.21

**Not To Scale
Original Size A4**

Sheet R14

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