Rangitikei District Council

Land Development and Subdivision Infrastructure

Addendum to NZS 4404:2010

March 2017

Document Control

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Contents

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:

"Work undertaken on Council Roads shall be undertaken in accordance with Standards New Zealand Handbook SNZ HB 2002:2003 Code of Practice for Working in the Road. "

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

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

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.

RDC – MINIMUM STANDARDS FOR ROADING
URBAN SUBDIVISION

Classification	Type	Traffic Volume	Area Served	Legal Road/ROW Width	Carriageway Width	Footpath	Total Berm Width	Max/Min Grade	Normal Camber	Notes
ROW / Access Lot			2-4 Lots 2-4 du	3.5m	3.0m (U1)	N/A	0.5m	12.5% 0.4%	3%	Approved stormwater control
ROW / Access Lot			5-7 Lots 5-7 du	7.0m (U3) (U4)	5.0m (U5)	(U2)	2.0m	12.5% 0.4%	3%	Min kerb and channel one side. Turning Area required.
Local Roads (Public Roads)	Cul-de-sac		Up to 12 Lots or 12 du Max length 150m	16.0m (U3) (U4)	7.0m (U5)	1 @ 1.5m	9.0m	12.5% 0.33%	3%	Kerb and Channel both sides. Cul-de-sac turning head required.
	Residential	<750 vpd	>50 Lots	17.0m	8.0m (U5)	2 @ 1.5m	9.0m	12.5% 0.33%	3%	
	Residential	>750 vpd	>50 Lots	20.0m	11.0m (U5)	2 @ 1.5m	9.0m	10% 0.33%	3%	
	Industrial			20.0m	11.0m (U5)	Subject to specific design				
Commercial	All roads			20.0m	11.0m (U5)					
Distributor/ Collector	Residential			20.0m	11.0m (U5)					
	Industrial			22.0m	13.0m (U5)					
Arterial/ Strategic	All roads			22.0m	13.0m (U5)					

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.

3.3.3.2 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 connecter/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.

Location	Minimum Cover (mm)
Roads, berms, accesses and parking areas	900*
All other areas	750

* 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 blackflow 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

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

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

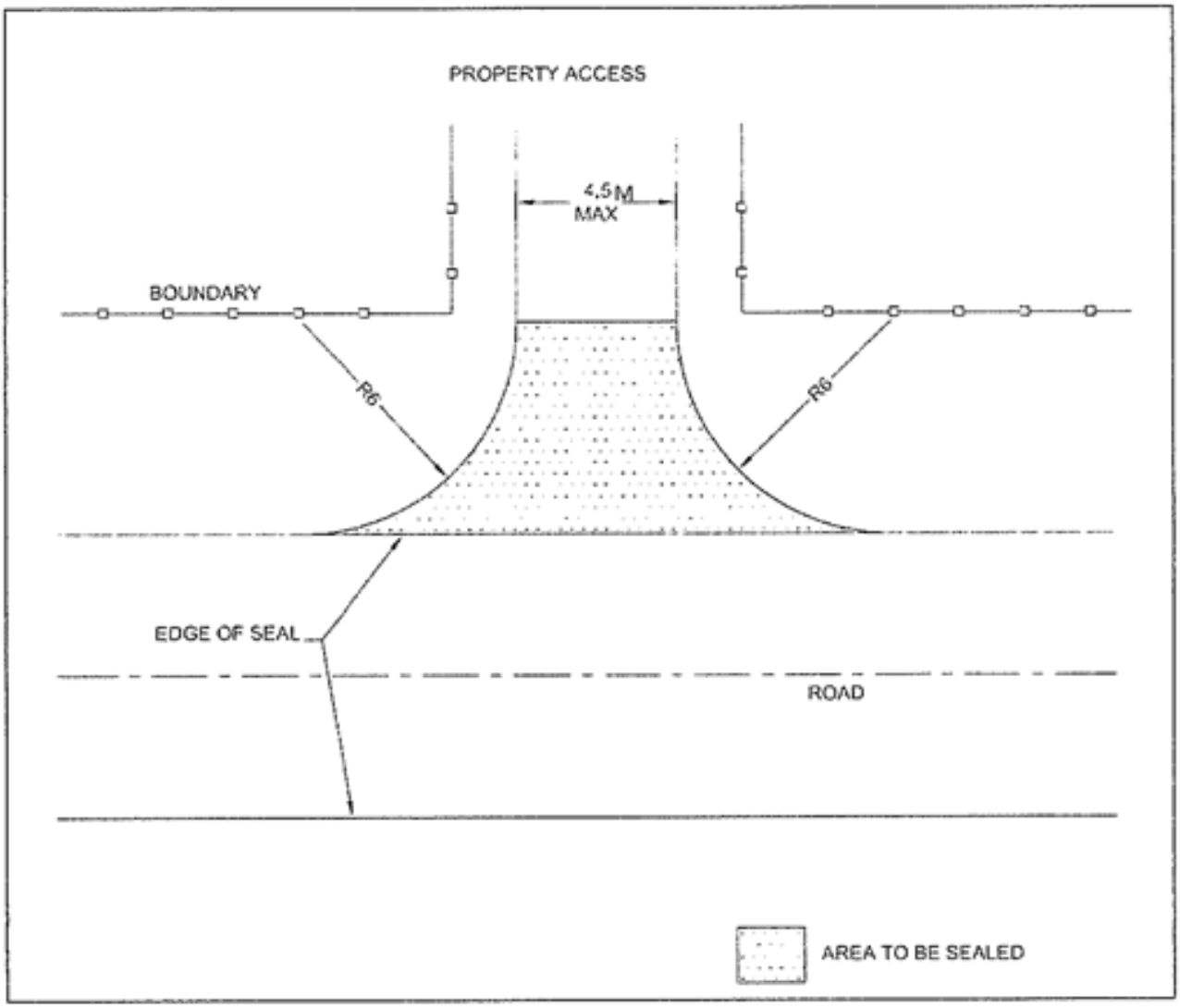
Refer to the relevant sections of the District Plan for requirements relating to subdivision activities in Outstanding Natural Landscapes or near sites of historic heritage.

Part 8: Network Utility Services

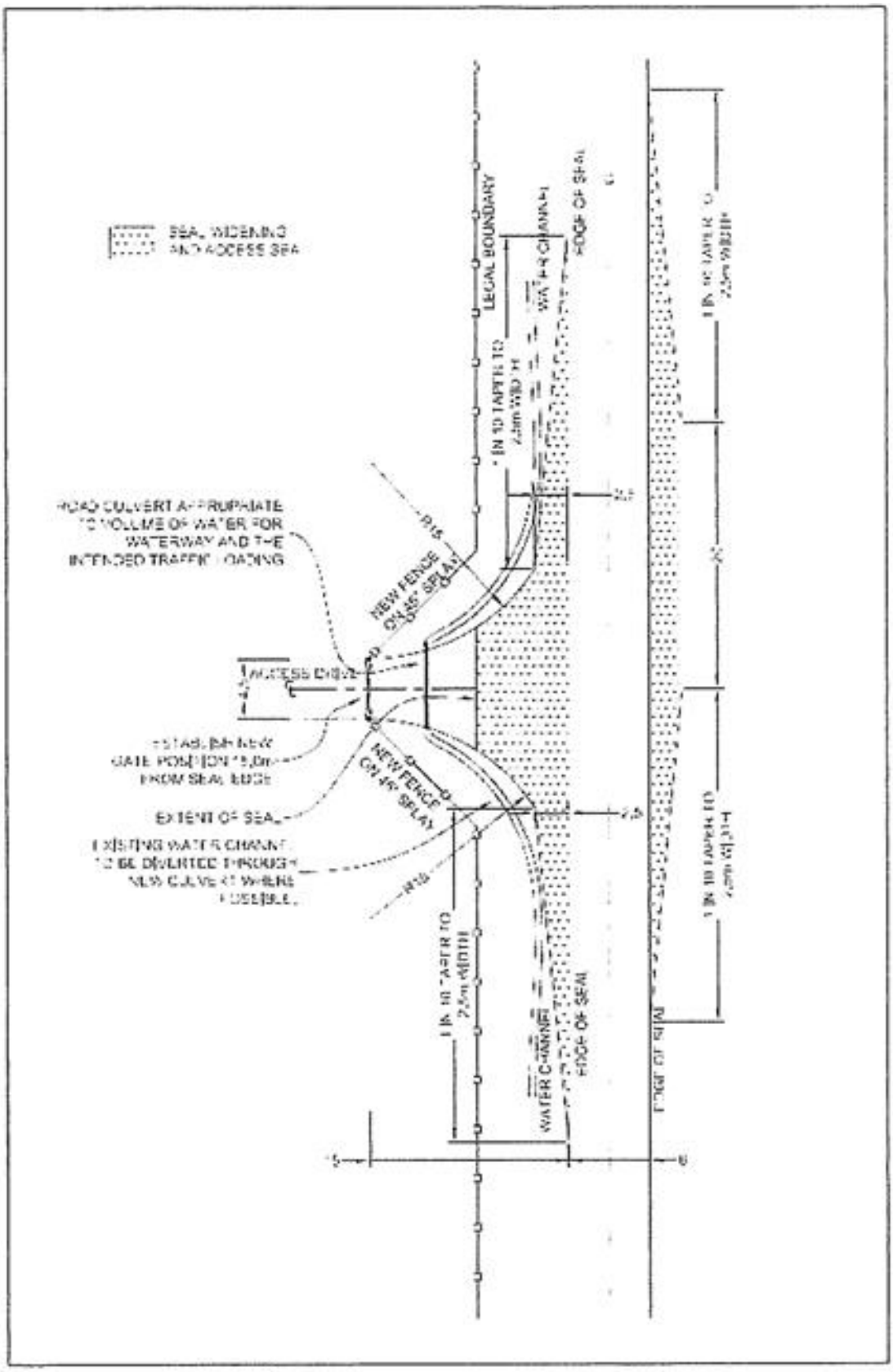
Refer to the relevant sections of the District Plan for requirements relating to subdivision activities near network utilities.

Appendix A

Design Dimensions – Private Access Crossing to a Road (infrequent use by heavy vehicles)

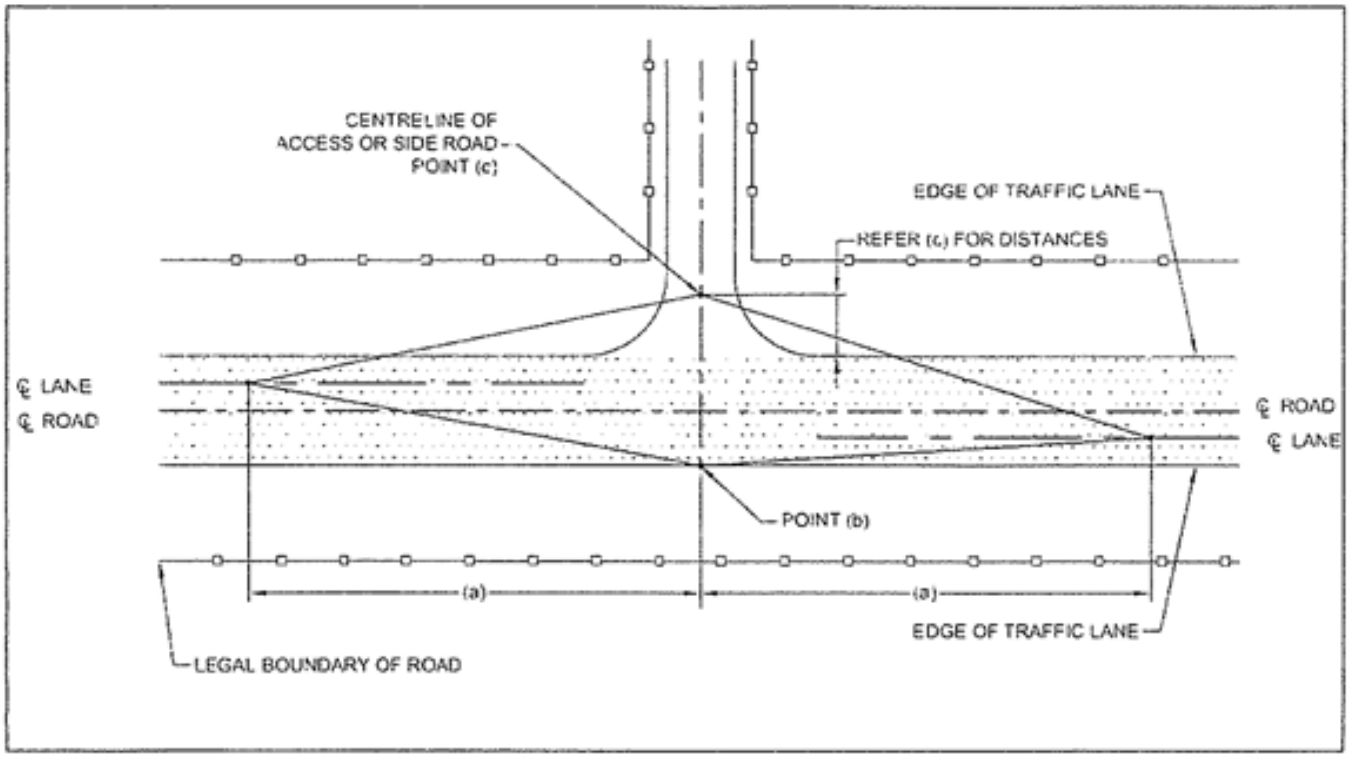


Standard Rural Vehicle Accessway (infrequent use by heavy vehicles)



Sight Distance Measurements

Figure 9.3 District Plan

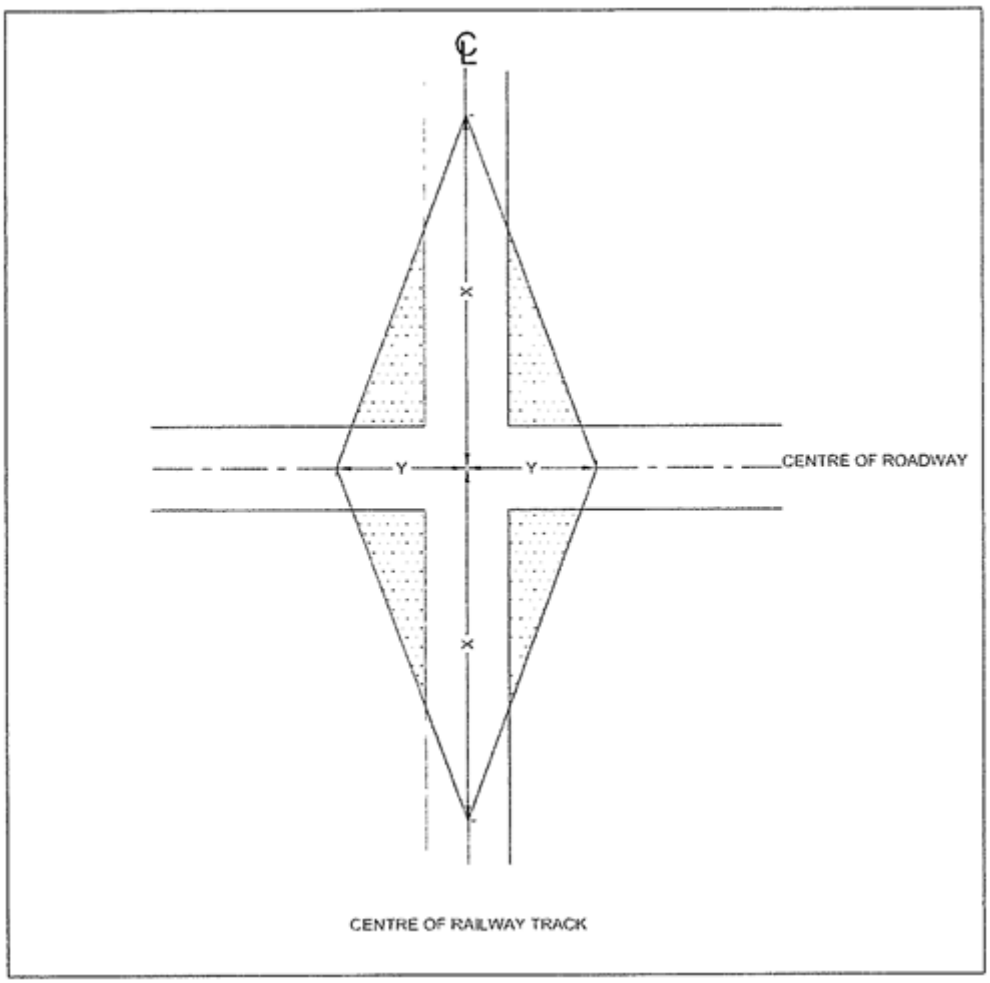


Note: Sight distances will be measured to and from a height of 1.15m above the existing road surface level of the side road or access road.

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



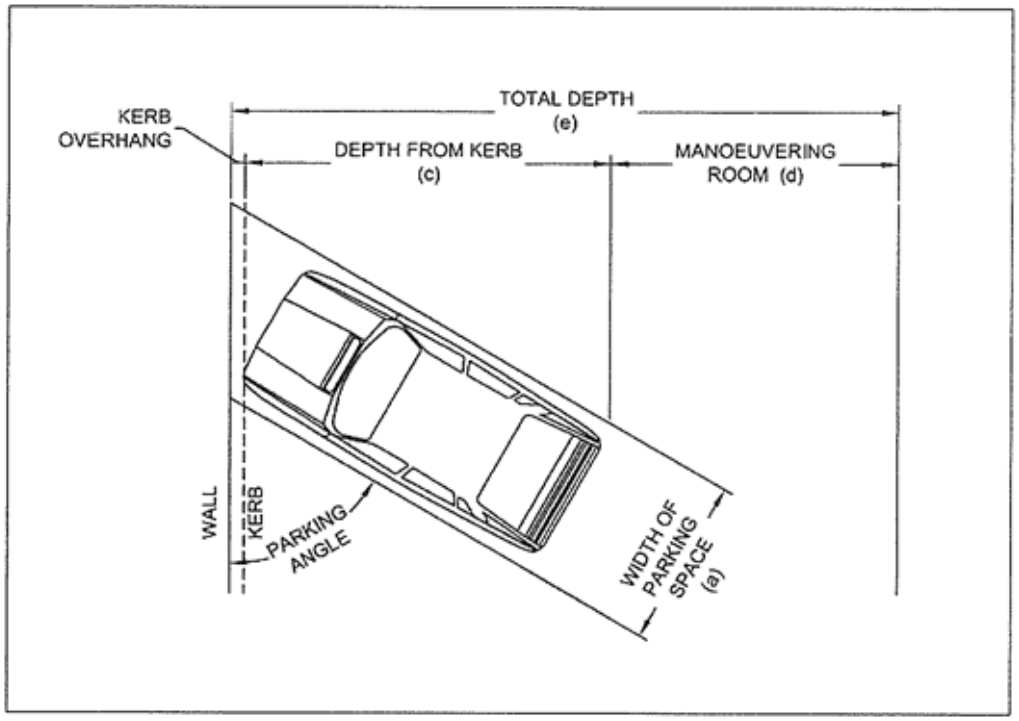
Road/Rail	X	Y
Road/Rail	140m	30m
Rural Roads	140m	30m
Urban Roads	50m	14m

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 Manoeuvering and Parking Space Dimensions

Figure 9.2 District Plan

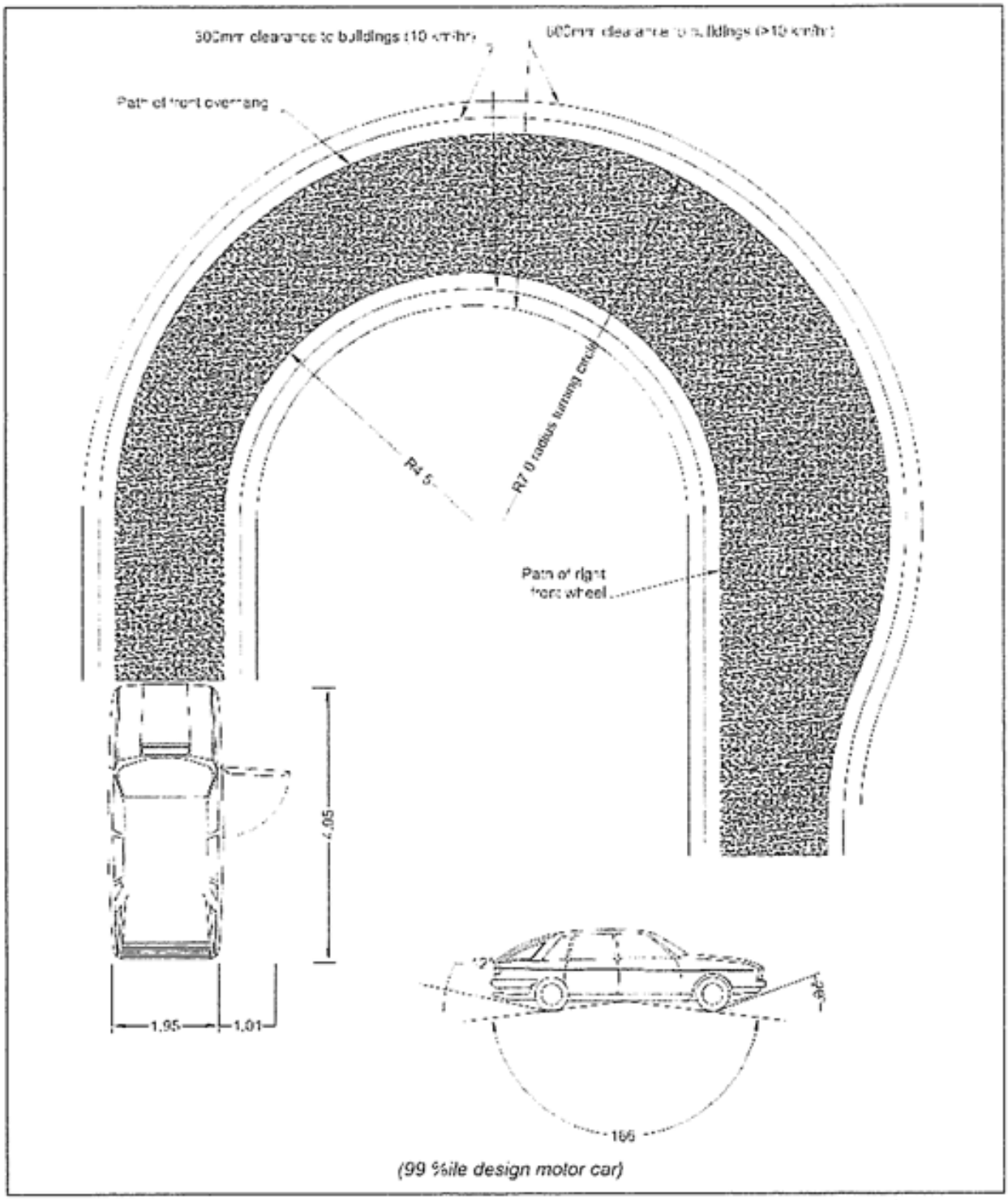


Degree of angle of parking	Parking type	Stall width	Stall depth		Aisle width (d)	Total depth (e)	
			From wall (b)	From kerb (c)		One row	Two rows
0°	Parallel	2.4m	See note 1	See note 1	3.5m	5.9m	8.3m
30°	Nose in	Min 2.4m	4.2m	4.0m	3.5m	7.7m	11.9m
45°	Nose in	Min 2.4m	4.9m	4.5m	3.5m	8.4m	13.3m
60°	Nose in	2.4m 2.5m 2.6m 2.7m	5.4m	4.9m	4.5m 4.1m 3.5m 3.5m	9.9m 9.5m 8.9m 8.9m	15.3m 14.9m 14.3m 14.3m
75°	Nose in	2.4m 2.5m 2.6m 2.7m	5.4m	4.9m	6.6m 6.3m 5.2m 4.6m	12.0m 11.7m 10.6m 10.0m	14.4m 17.1m 16.0m 15.4m
90°	Nose in	2.4m 2.7m	5.1m	4.6m	8.7m 7.7m 7.0m 6.8m	13.8m 12.8m 12.1m 11.9m	18.9m 17.9m 17.2m 17.0m

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.

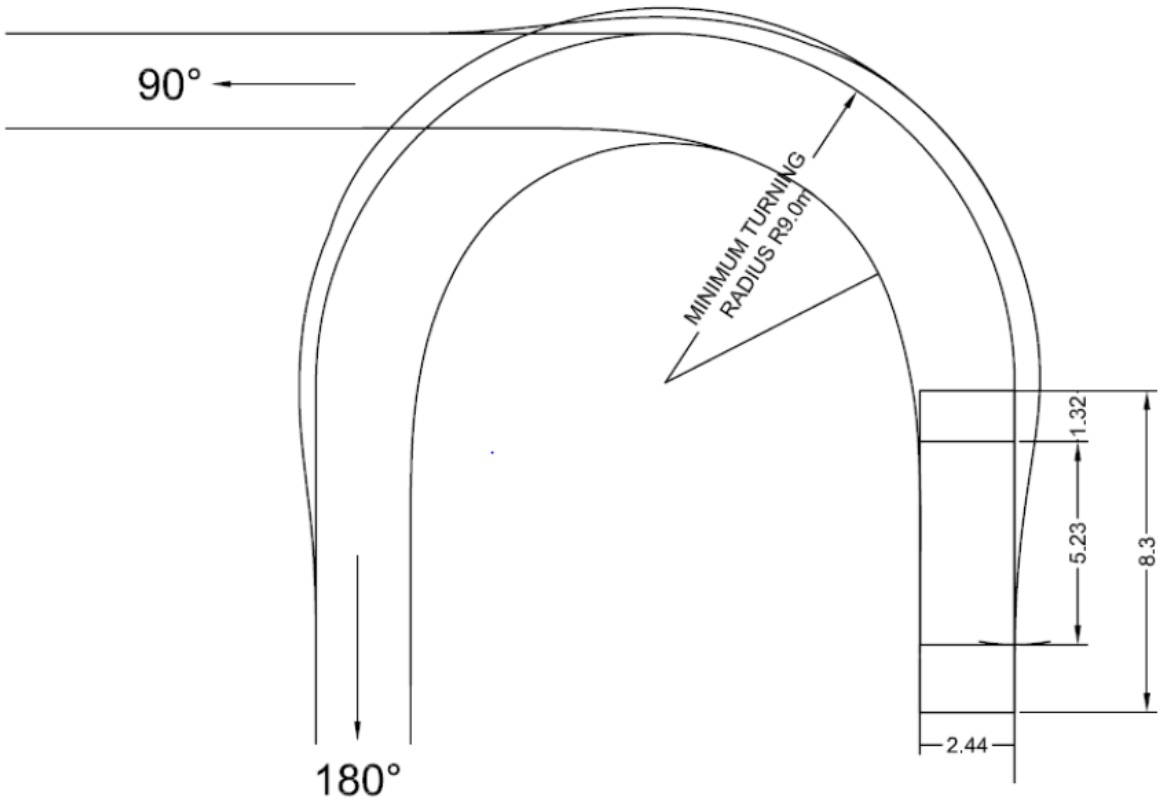
99 Percentile Car Tracking Curve Minimum Radius

Figure 9.3 District Plan



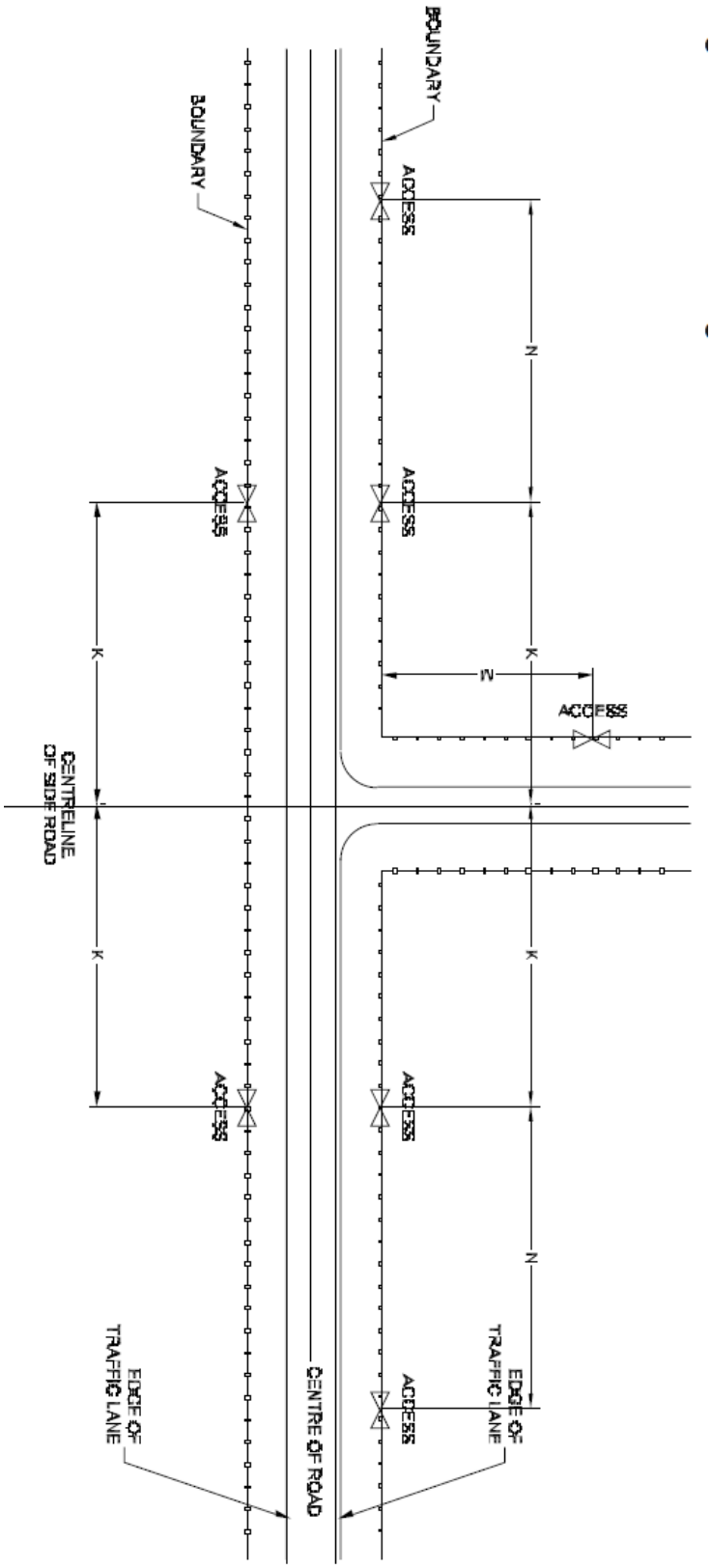
99 Percentile Truck Tracking Curve Minimum Radius

Figure 9.4 District Plan



Access Sight Lines

Figure 9.5 District Plan



Acess sight lines are defined in Table B9.1.

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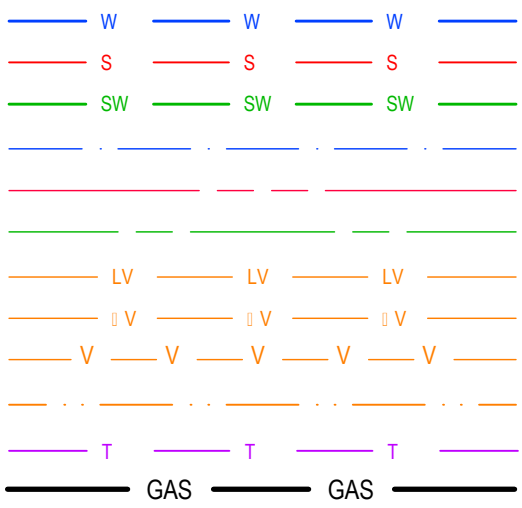
51	Typical 20mm Dia. Water Service Connection To Main And Rider Main	6.8

STANDARD DRAFTING S MBOLS

S MBOLS:

- Proposed Manhole
- Existing Manhole
- Existing Valve
- Existing Fire ydrant
- Existing Water Toby
- Existing Sump
- Existing Survey Marks
- Existing Street Lights

LINE T PES:



- Proposed Water
- Proposed Wastewater
- Proposed Stormwater
- Existing Water
- Existing Wastewater
- Existing Stormwater
- Existing Power (Low Voltage)
- Existing Power (igh Voltage)
- Existing Power Ducts
- Existing Street Light Wiring
- Existing Telecommunication Providers
- Existing Gas

STANDARD S MBOLS

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Scales: Not to scale

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NOTE
Principal watermains are required on both sides of street on all arterial□ industrial and dual carridgeway roads.

T□ PICAL CROSS SECTION

GENERAL LOCATION OF SERVICES IN ROAD RESERVE

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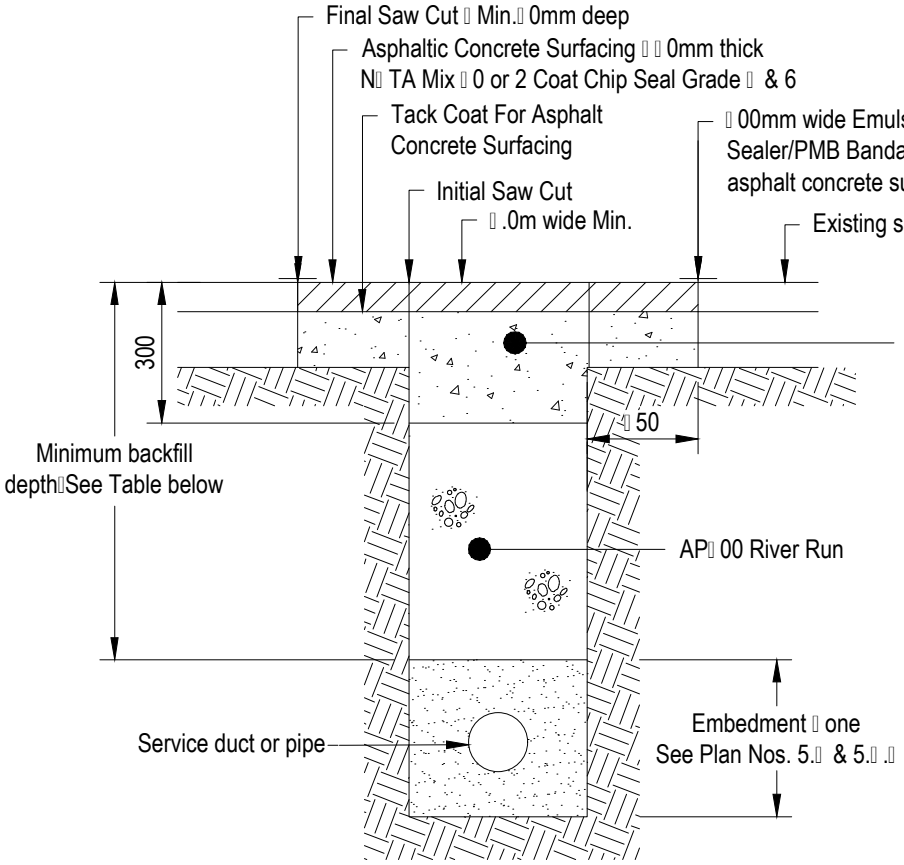

Minimum Backfill Depth (mm)					
Service	Road Pavement	Berm	Vehicle Access	Parking Areas	Other
Wastewater					
Mains	00	50	00	00	50
Service	00	50	00	00	50
Water Supply					
Mains	00	50	00	00	50
Service	00	50	00	00	50
Stormwater					
Mains	00	50	00	00	50
Service	00	50	00	00	50
Other Utilities	00	50	00	00	50

TRENCH REINSTATEMENT FOR EXISTING ROADS

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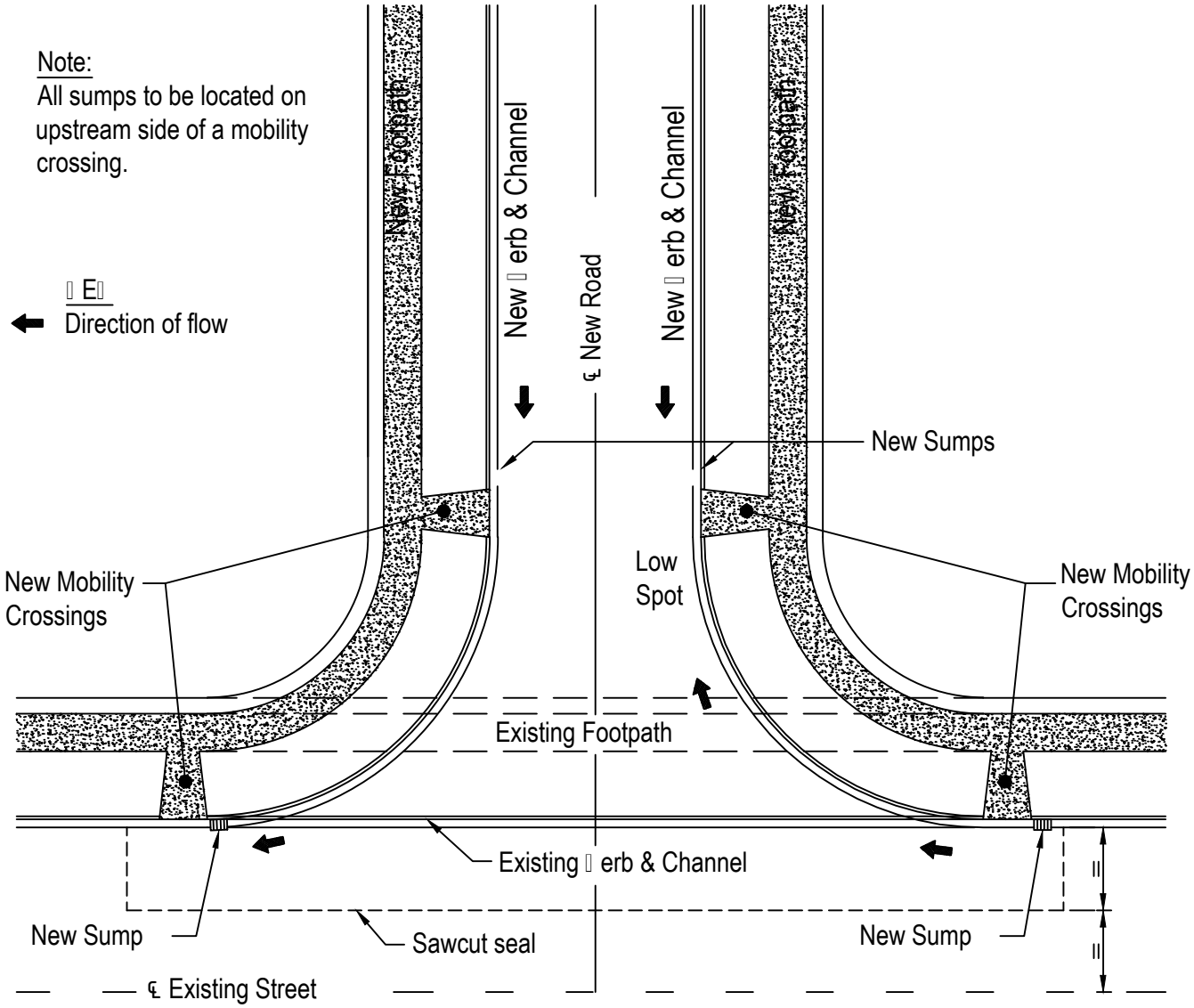
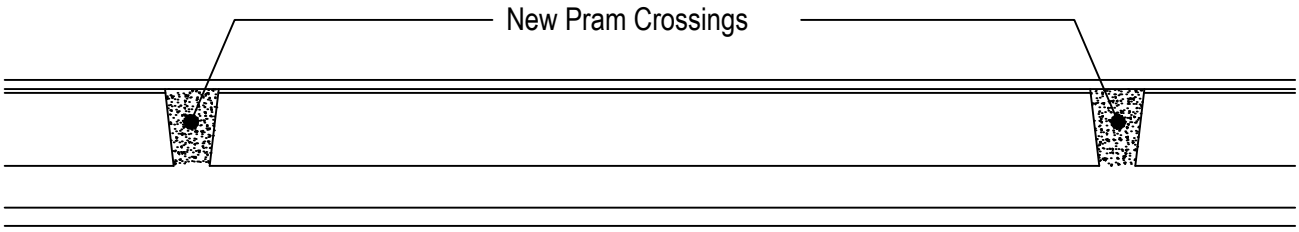
Note:
All sumps to be located on upstream side of a mobility crossing.

E
Direction of flow





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

INTERSECTION DETAIL

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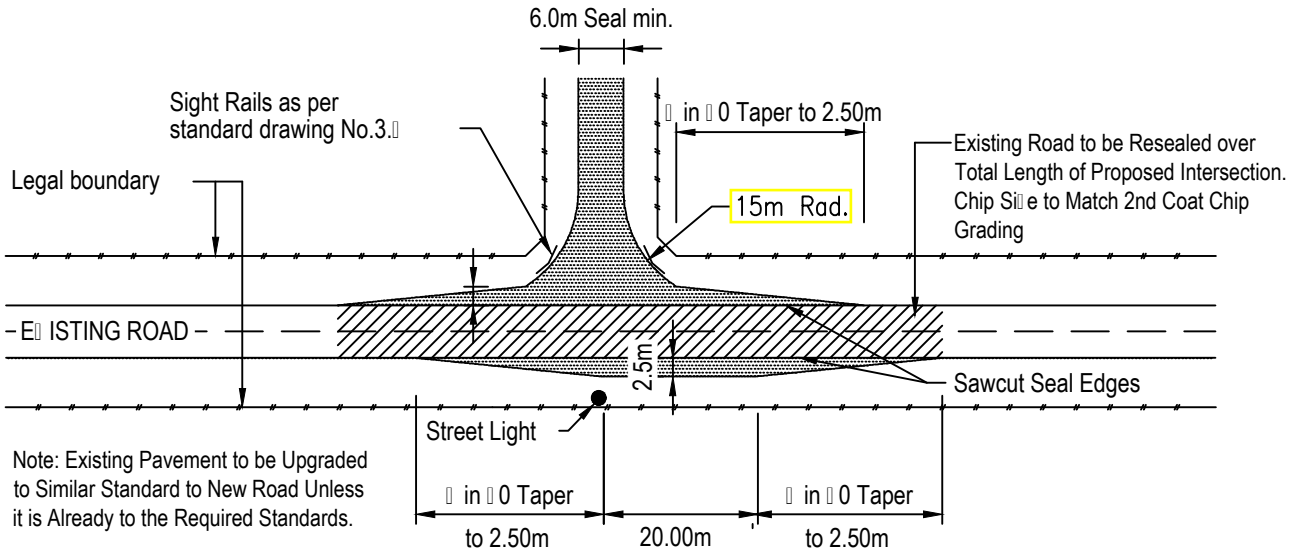
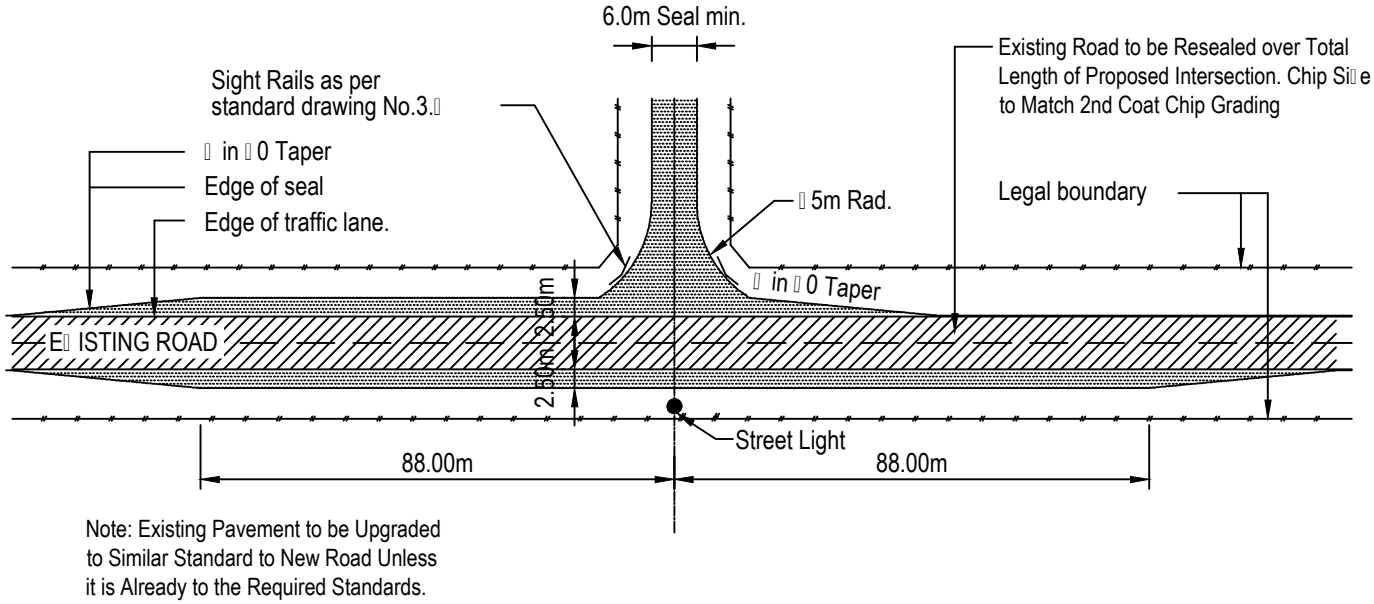


JUNCTION WITH SECONDARY ROADS



JUNCTION WITH PRIMARY ROADS

Seal widening and access sealing

Road marking to NZTA's MOTSAM Standard

RURAL / RURAL RESIDENTIAL ROAD INTERSECTION (0–500 VPD)

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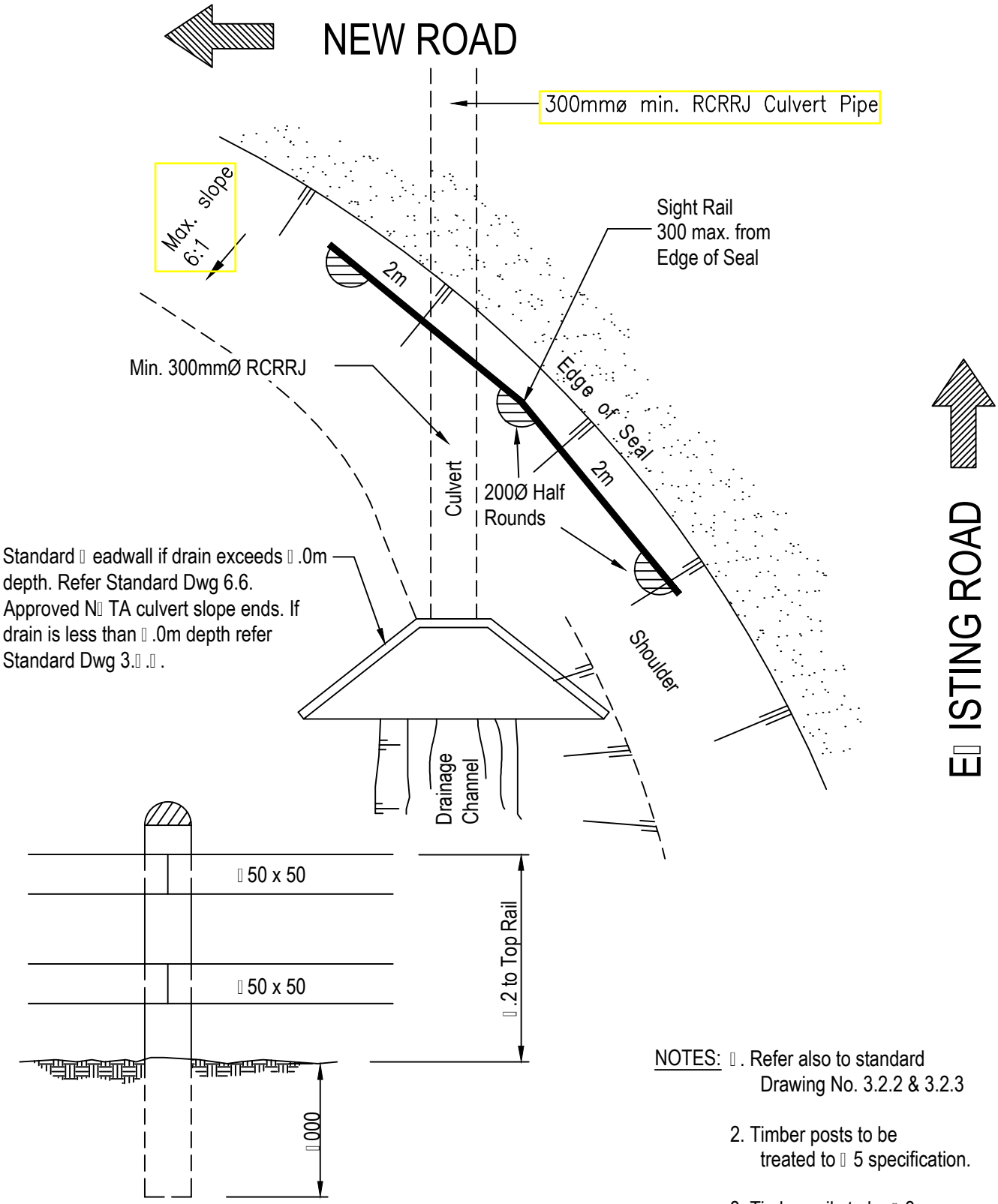

SIG T RAIL DETAIL

NOTES: . Refer also to standard Drawing No. 3.2.2 & 3.2.3

2. Timber posts to be treated to 5 specification.

3. Timber rails to be 3 treated.

RURAL ROAD/ACCESSWA ENTRANCE EDGE PROTECTION DRAIN DEPT .0m

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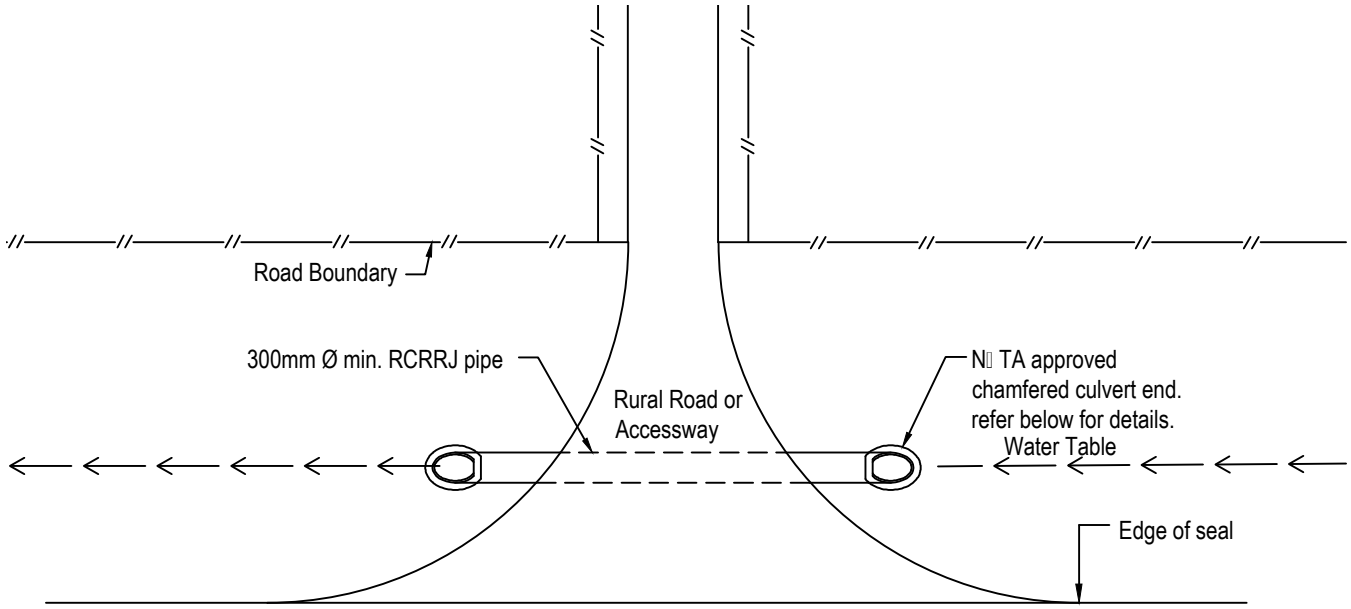
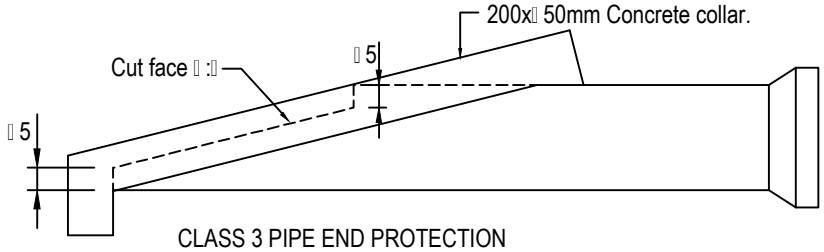


Rural Road

. 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 25mm shall be constructed as follows:



CLASS 3 PIPE END PROTECTION

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.

. 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/ACCESSWA ENTRANCE EDGE PROTECTION FOR DRAIN DEPT .0m

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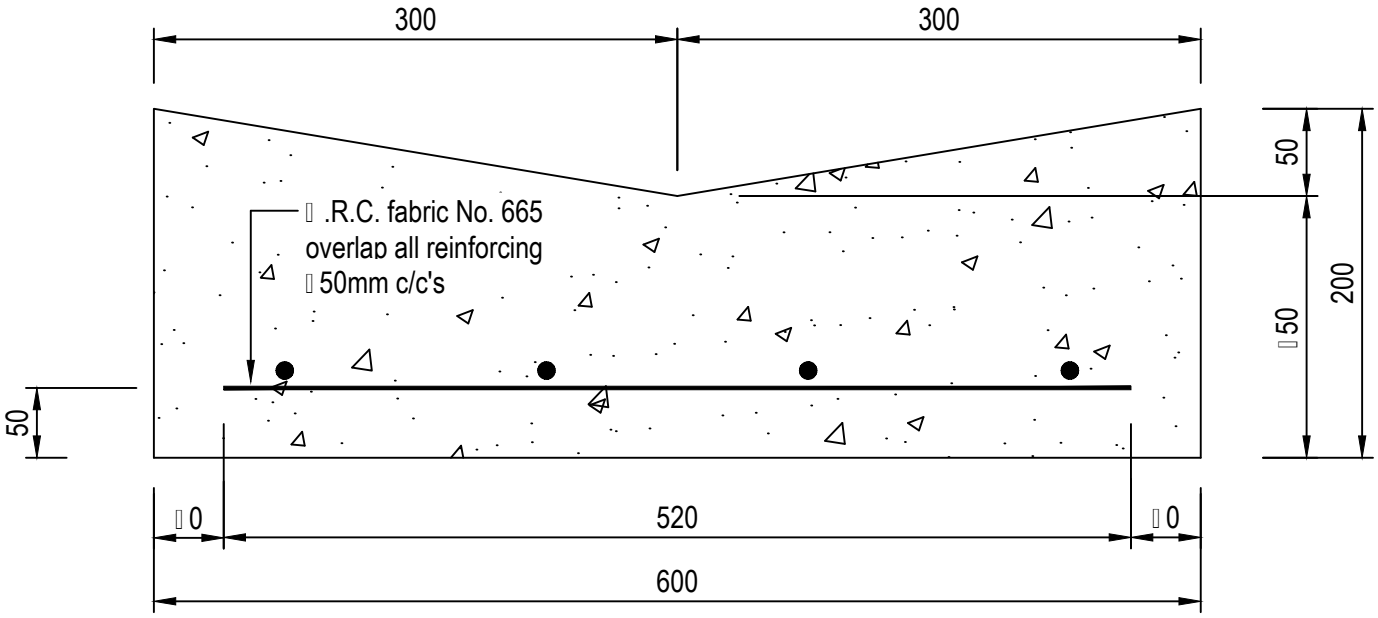
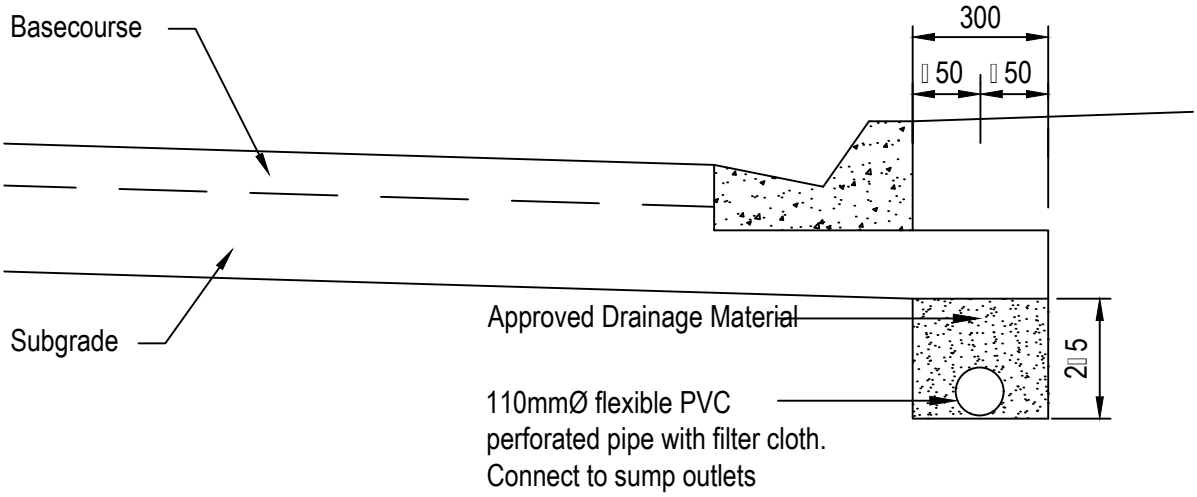


DIS ED C ANNEL

20 MPa Concrete



SUBGRADE DRAINAGE DETAIL AT ERB

DIS C ANNEL AND SUBGRADE DRAINAGE

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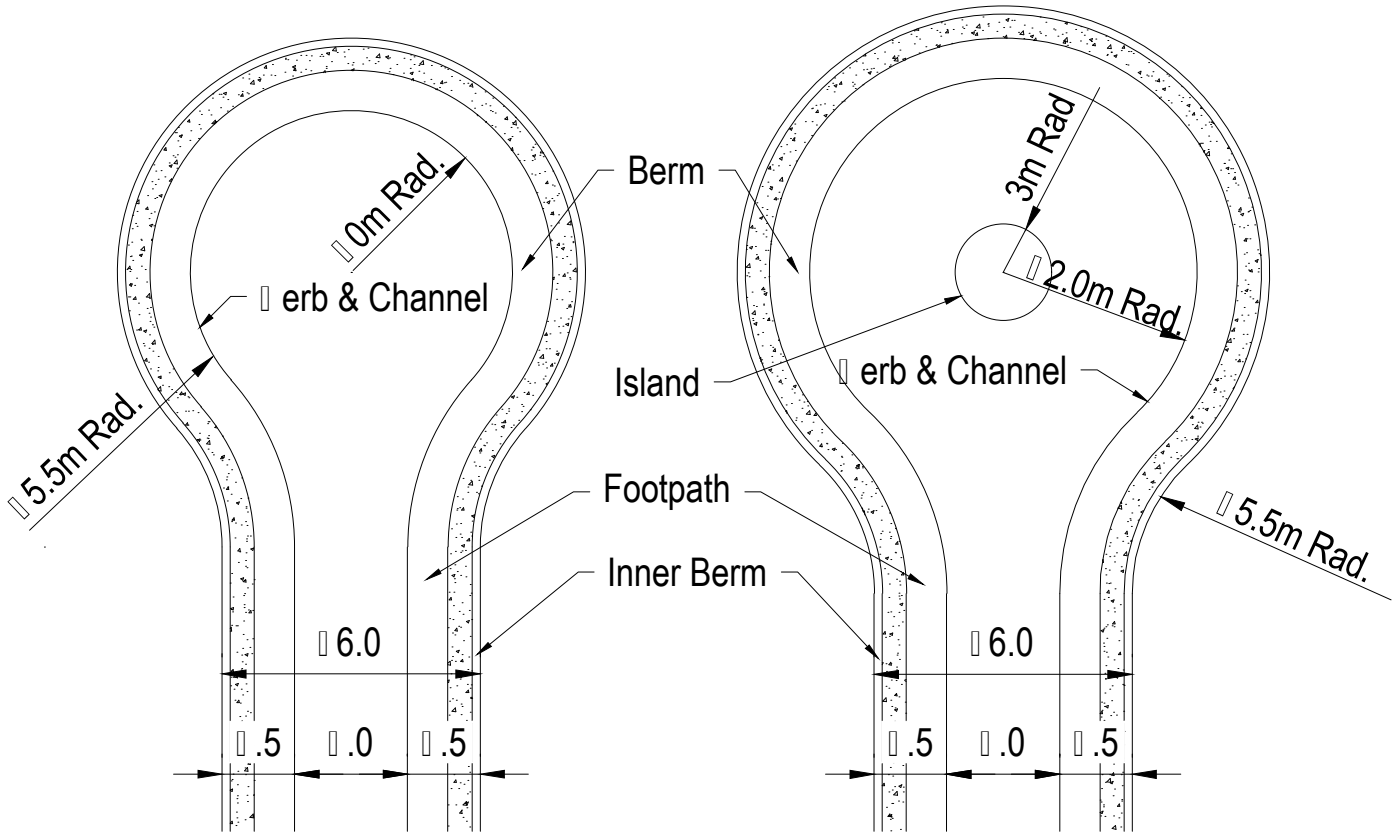

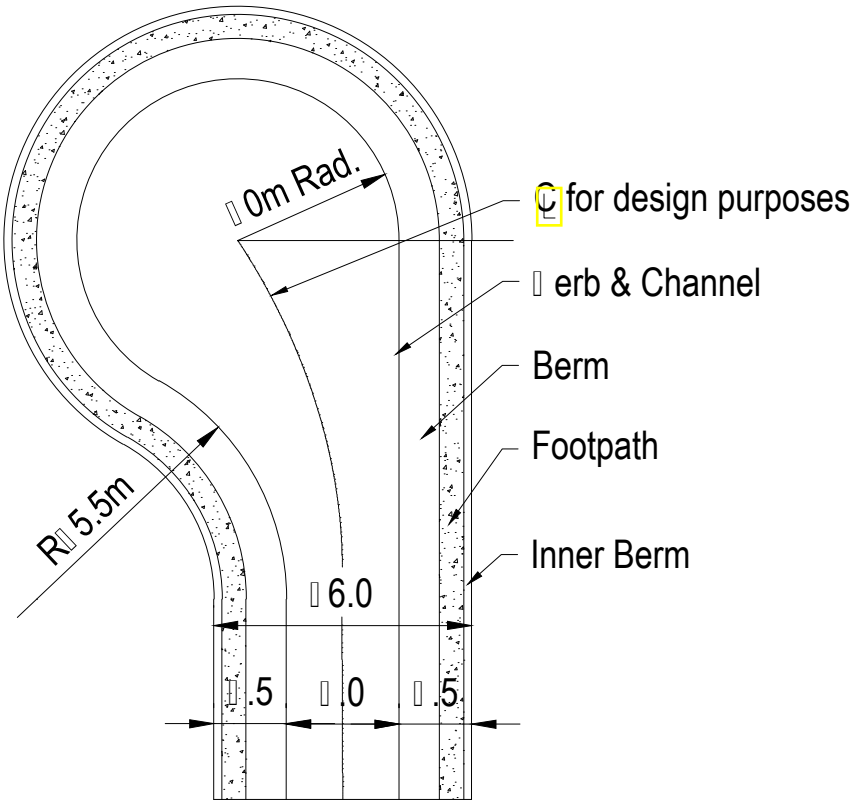

Note:
Industrial Cul de Sac min. radius 5m.
Islands are not permitted

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

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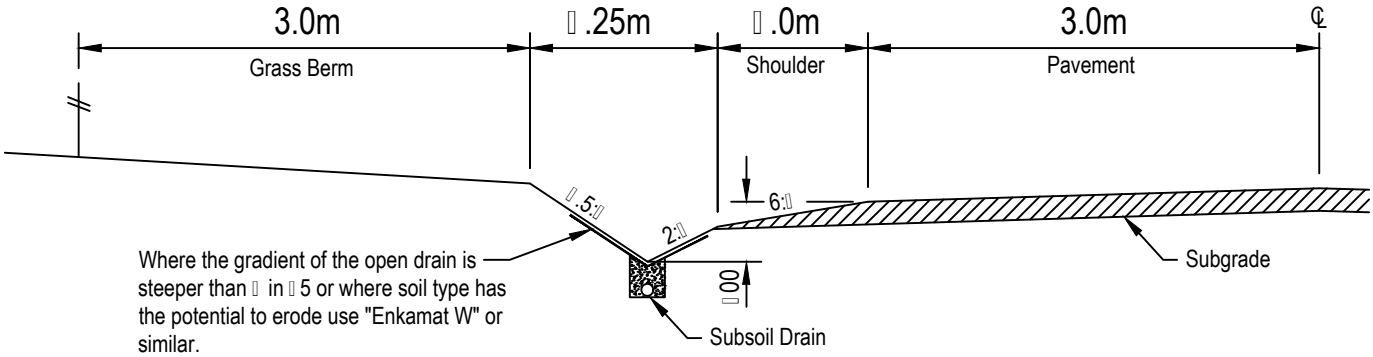

NOTE:
"Enkamat W" or similar to be installed to manufacturers instructions.

RURAL ROAD OPEN DRAIN T PICAL DETAILS

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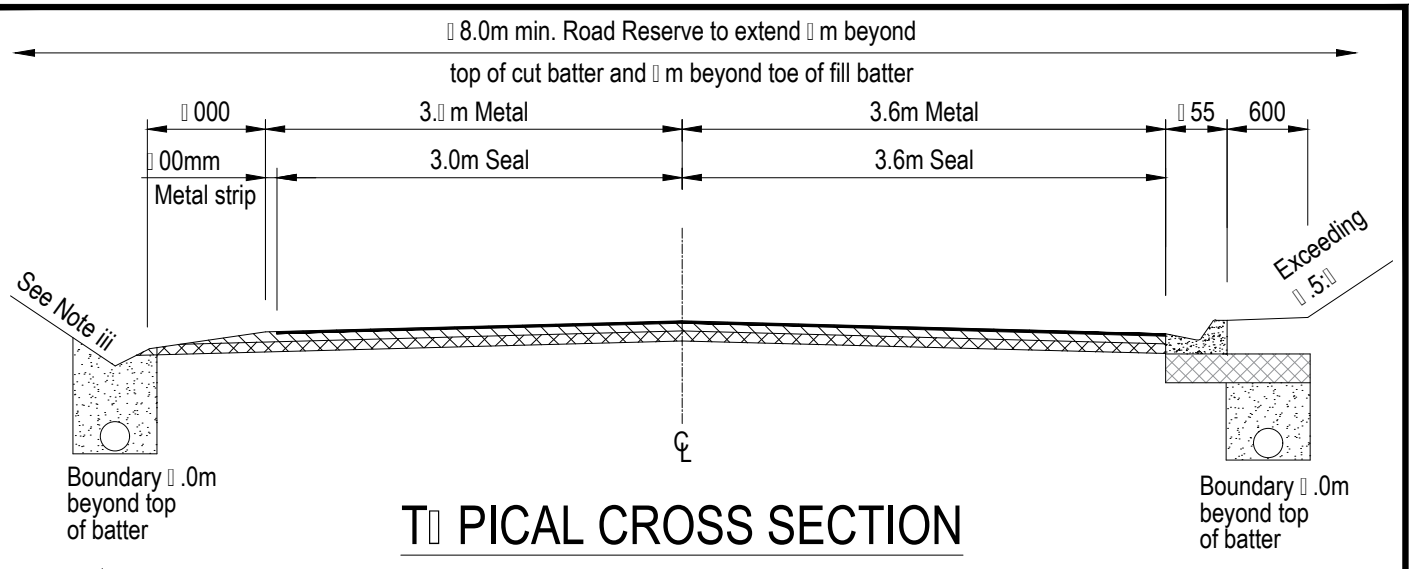
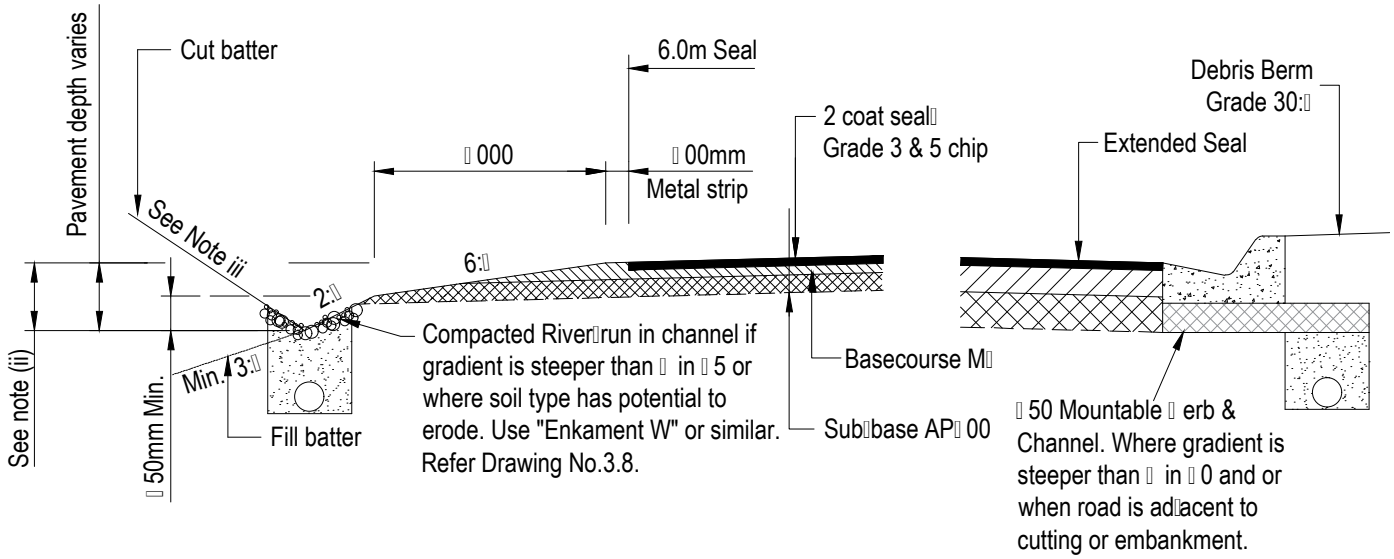
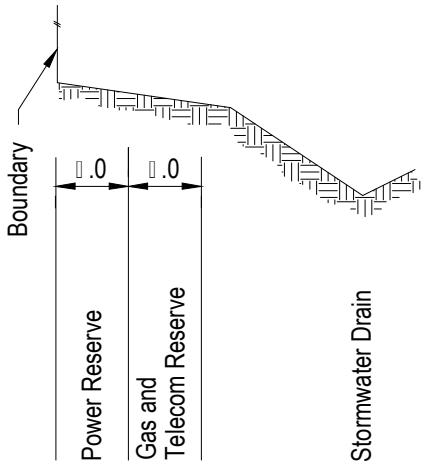


T PICAL CROSS SECTION



SIDE SLOPE DETAIL



NOTES:

(i) Pavement depth to be designed

(ii) Adopt which ever provides the greater depth:
a) 00mm below the seal edge or
b) 50mm below the pavement subbase and subgrade interface

(iii) For batter slopes steeper than .5: engineering design will be required.

DESIRED SERVICE LOCATION (for both sides)

RURAL ROAD (VPD 0500) T PICAL CROSS SECTION

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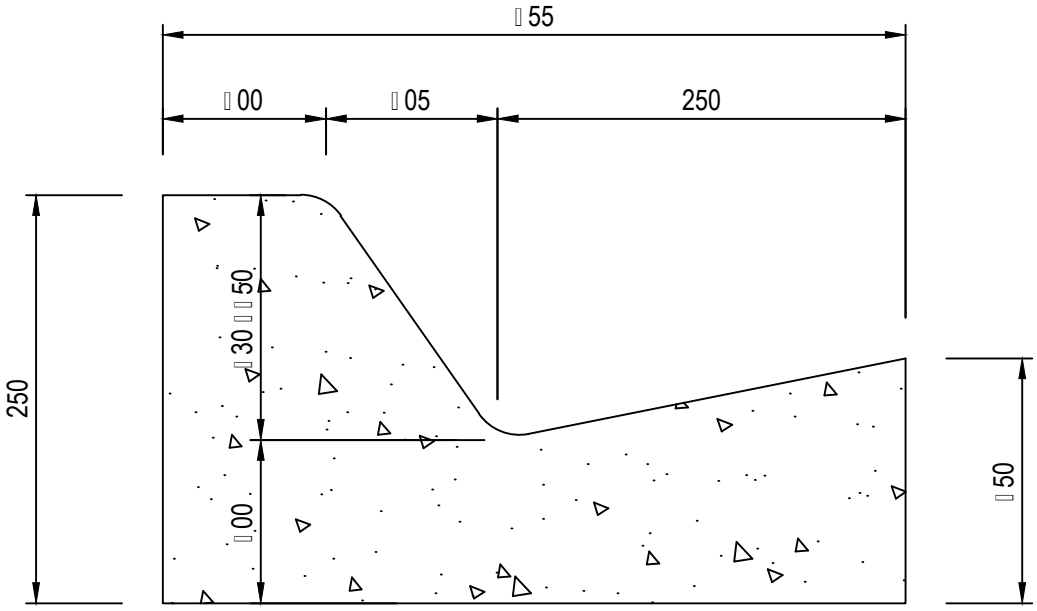
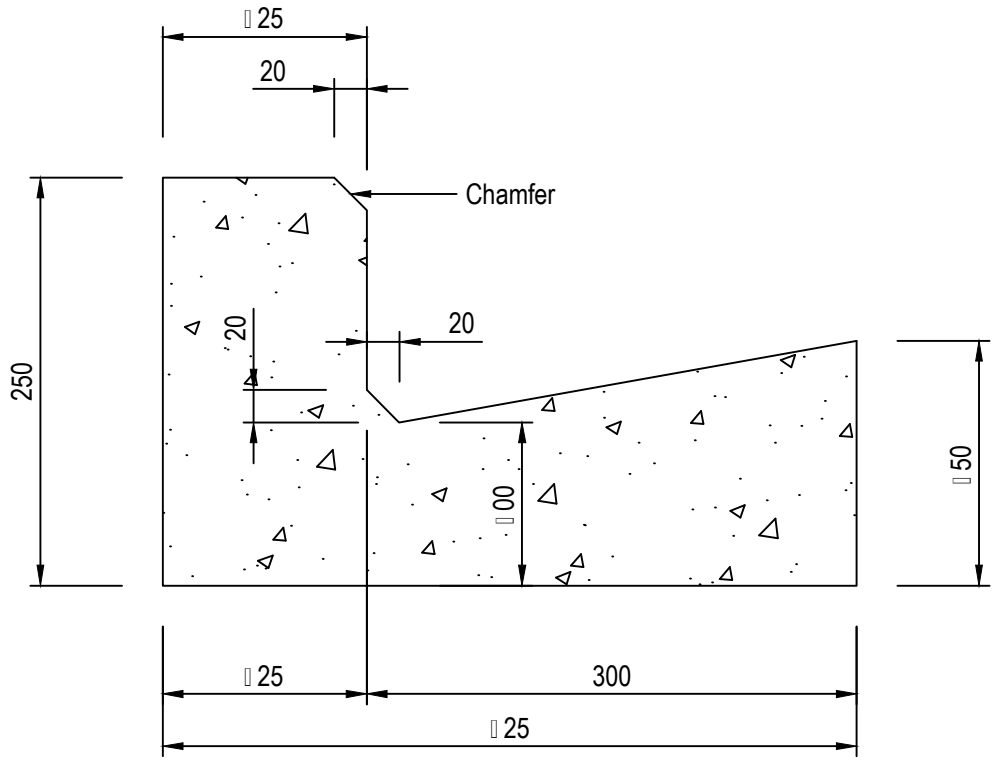


DETAIL OF STANDARD ERB & CANNEL



DETAIL OF ALTERNATIVE ERB & CANNEL

20 MPa Concrete

STANDARD 50mm ERB & CANNEL DETAILS

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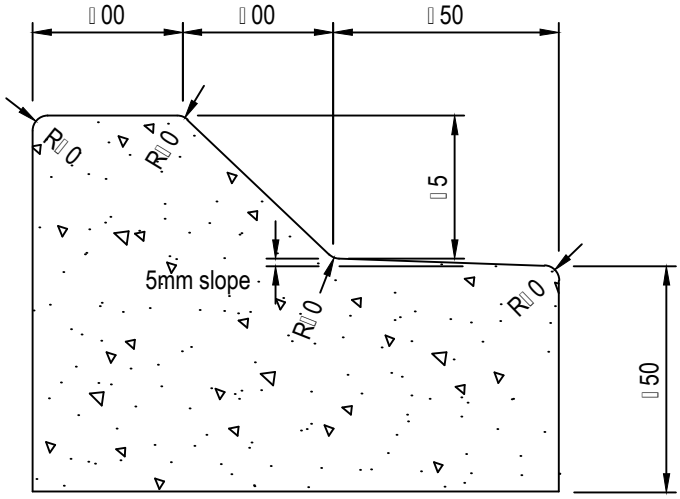
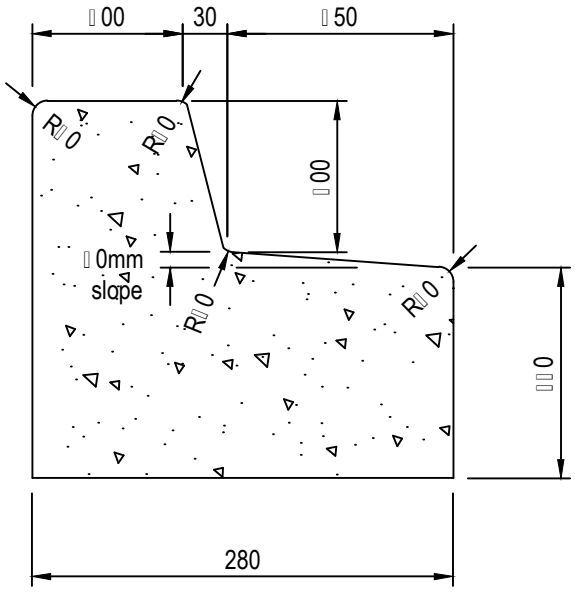


STANDARD MOUNTABLE ERB



20 MPa Concrete

KERB FOR TRAFFIC ISLAND, ROUNDABOUTS & RAISED MEDIANS

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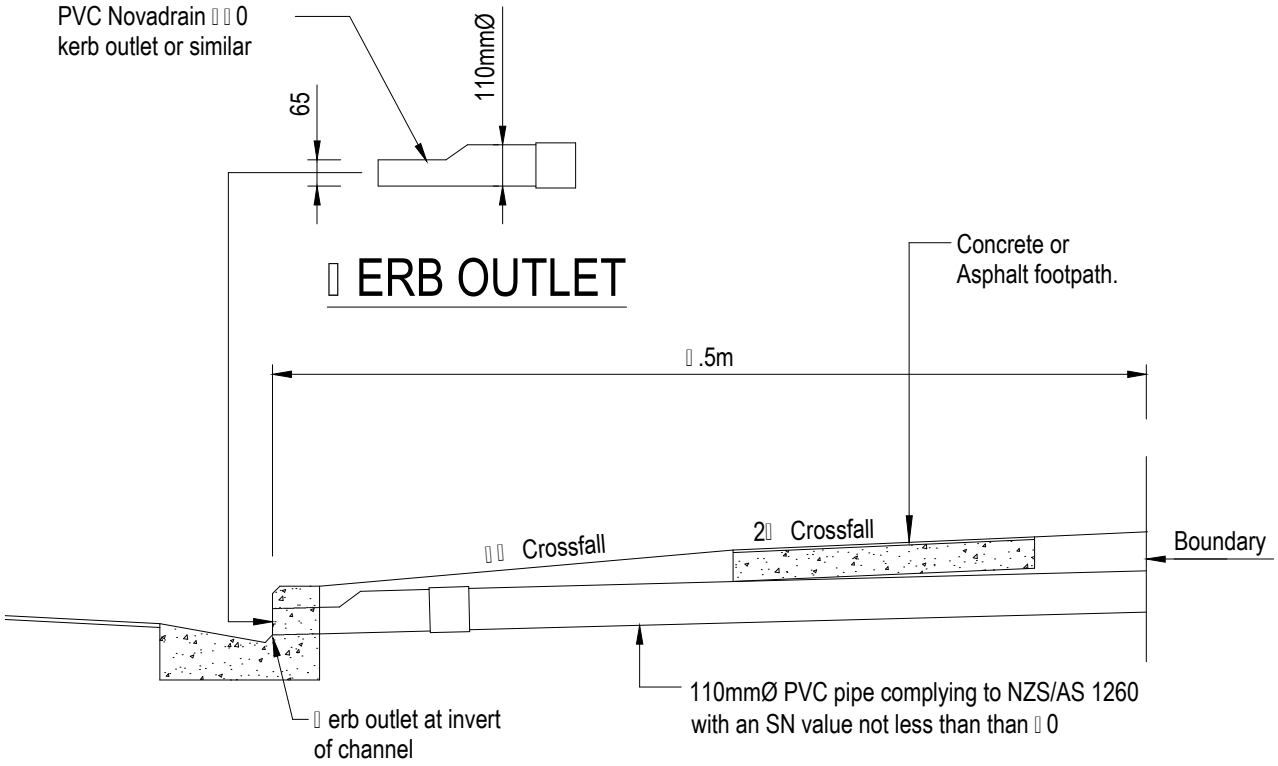

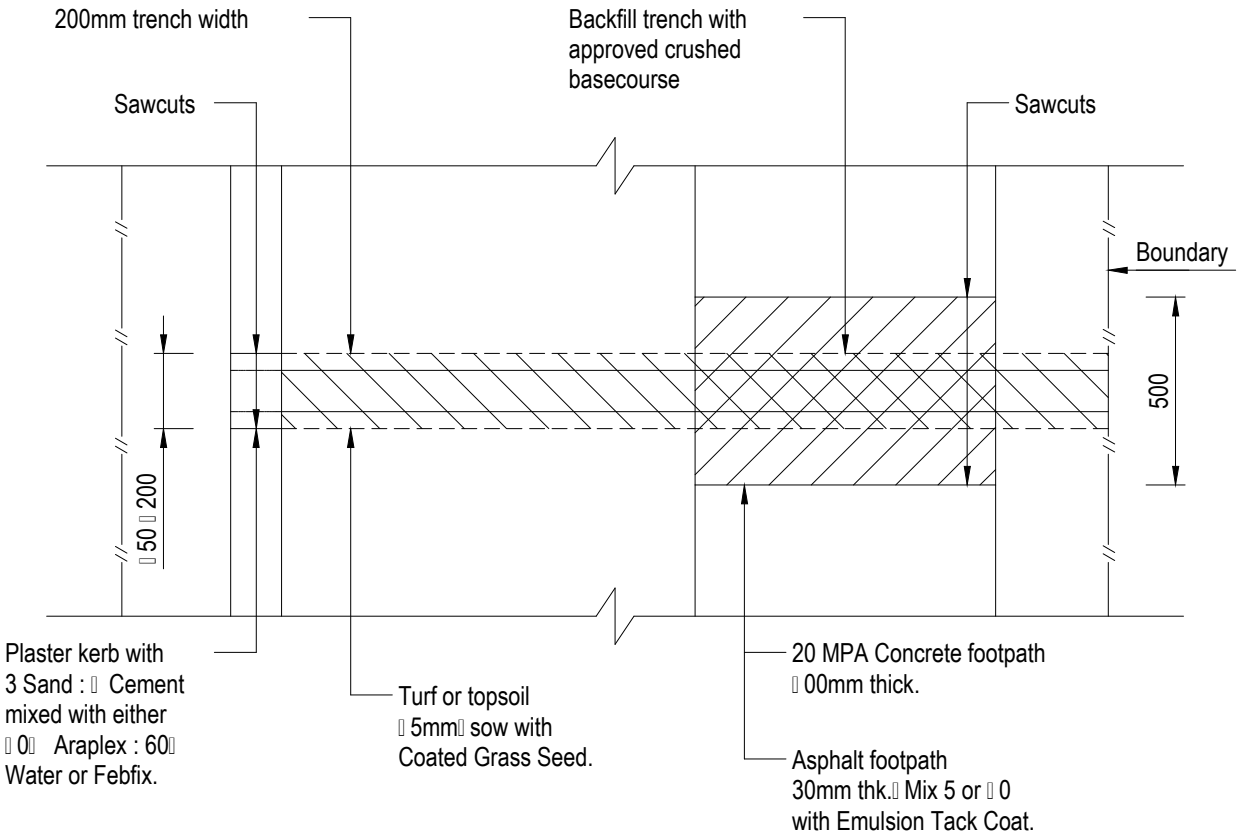

PROPERT STORMWATER DISC ARGE TO ERB DETAILS

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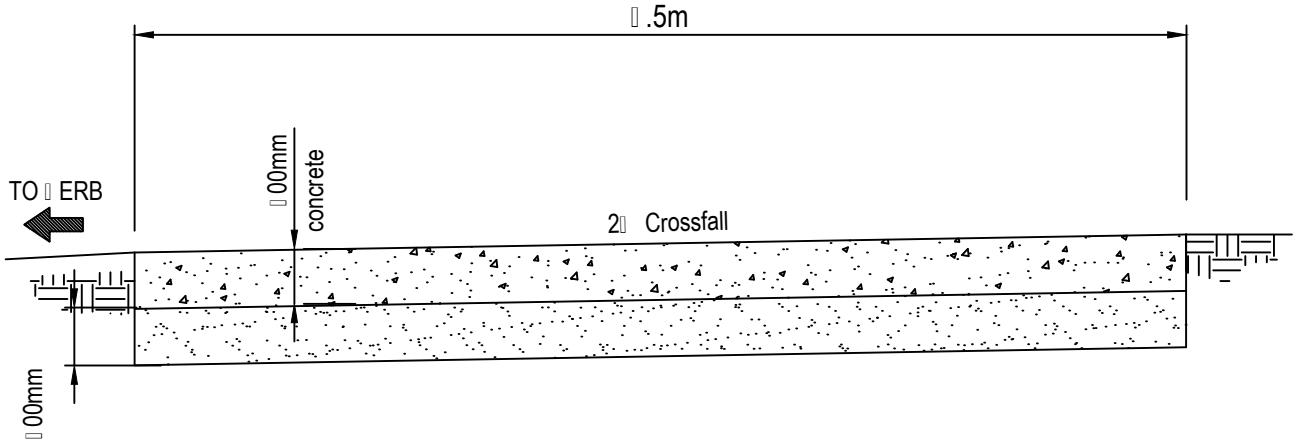
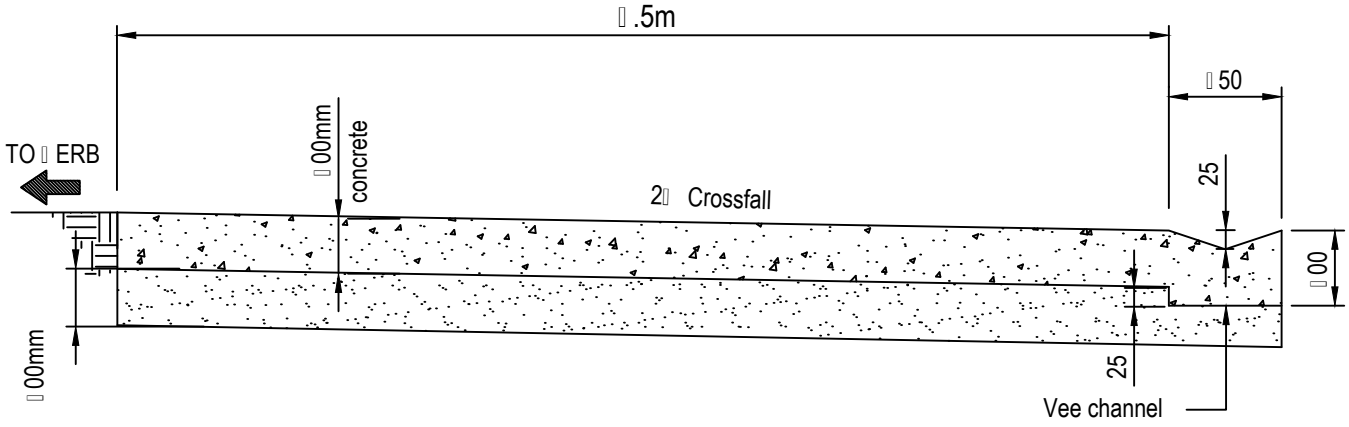


DETAIL OF CONCRETE FOOTPAT

(Excluding Vehicle Crossings)

All footpaths must be constructed on a layer of 00mm minimum compacted N TA M/ basecourse on sound foundation (5 Standard Compaction).

20 MPa concrete
Ready Mix Concrete Only



SECTION OF LOW LEVEL FOOTPAT

(Excluding Vehicle Crossings)

CONCRETE FOOTPATH DETAILS

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UNSPOILT...

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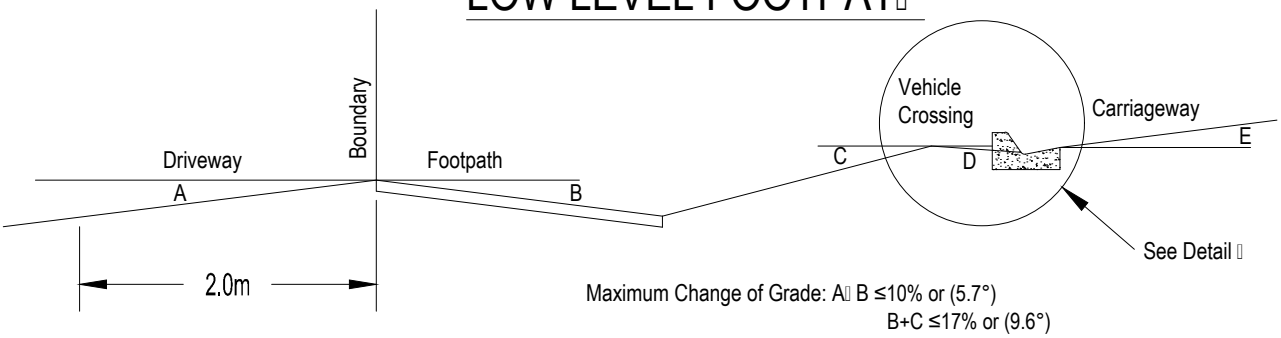
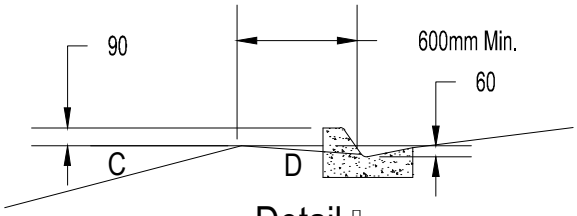
LOW LEVEL FOOTPAT



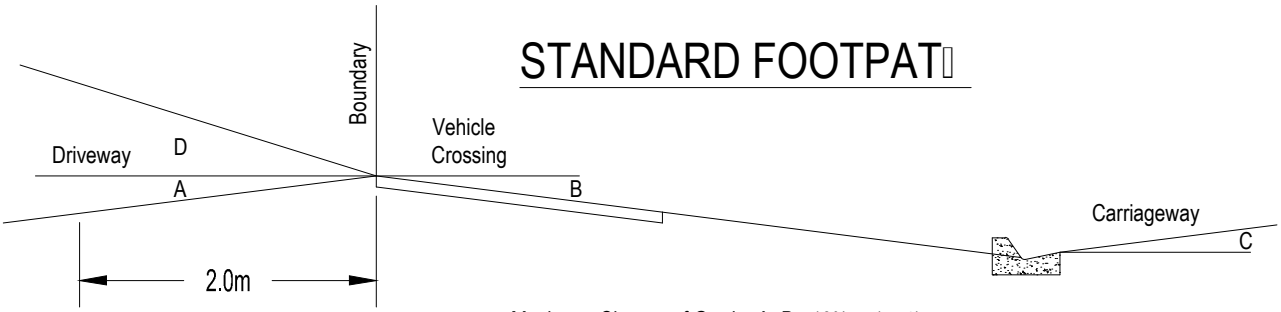
Maximum Change of Grade: A B ≤10% or (5.7°)
B+C ≤17% or (9.6°)
C+D ≤10% or (5.7°)
C-E ≤10% or (5.7°)

(Ref. Dwg 3.)



Detail

STANDARD FOOTPAT



Maximum Change of Grade: A B ≤10% or (5.7°)
D-B ≤17% or (9.6°)
B+C ≤17% or (9.6°)

(Ref. Dwg 3.)

NOTE:

. 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 Si es and Dimensions: Street Survey Results and Parking Space Requirements Road and Traffic Standards Information No. 35 (une)" contains more information about the 0th and th percentile vehicles.

Buses are permitted to have lower clearance value of (A B) of 6% or 3.4°.

MA IMUM BREA OVER ANGLES FOR VE ICULAR ACCESS TO PROPERT

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Scales: Not to scale

Plan No.

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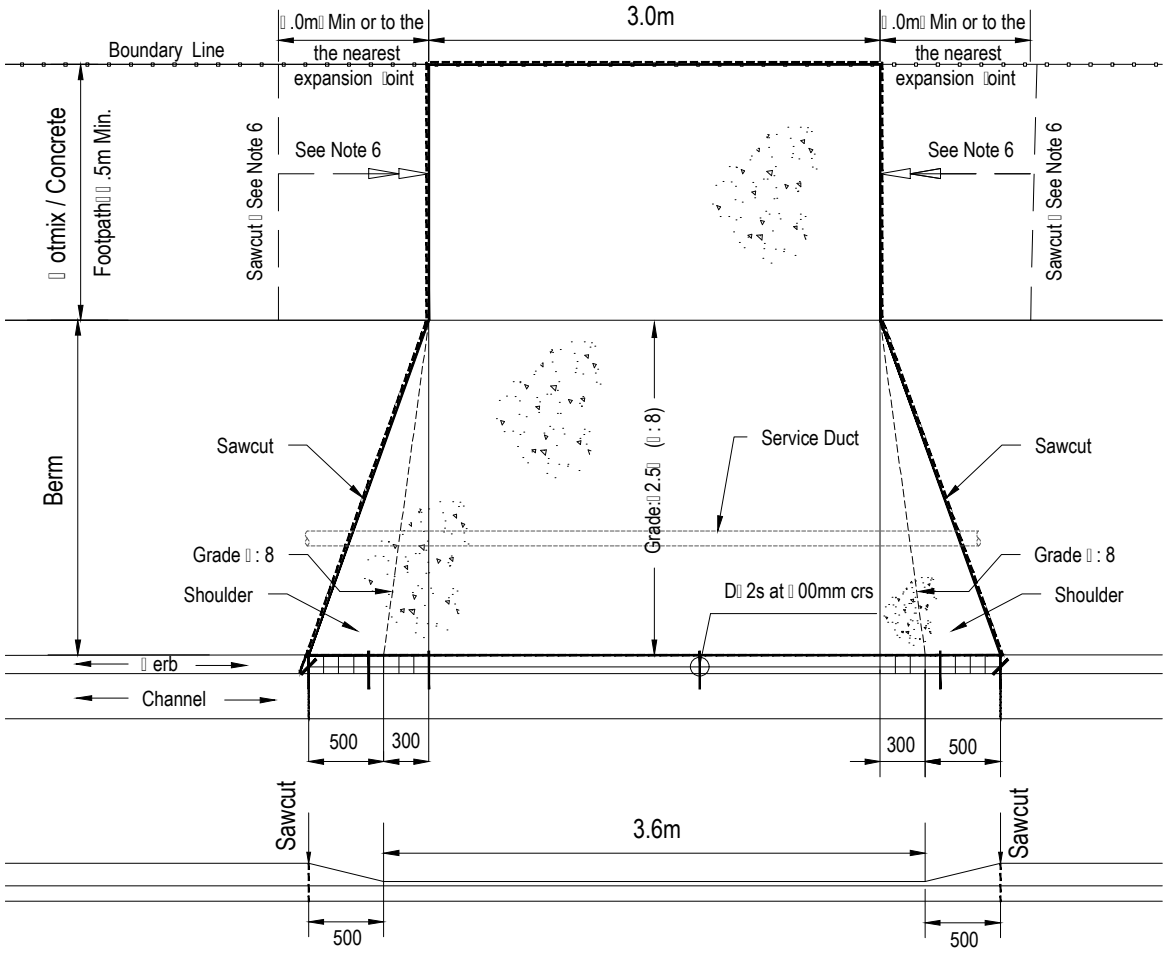

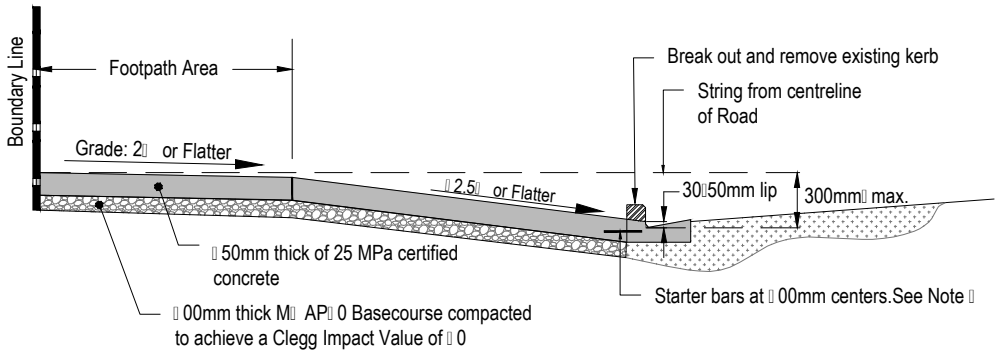

Note:

. 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.

. At the channel face install 250mm long D 2 deformed starter bars at 00mm centres drill 00mm (min.) deep and grout with Sika 2 2 or approved equivalent.

5. eight 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 .0m or to the nearest expansion oint. The reinstated footpath next to the vehicle crossing is for pedestrians which must be built to match the crossfall of the adacent footpath but the finished crossfall is not to exceed 2 . If this cannot be achieved the adacent footpath must be reconstructed at a grade no steeper than : 2.5 (8) to tie in with the new crossing. This design will require the approval of the Manager.

. New residential vehicle crossing wider than 3.0m will require a consent from the Manager.

STANDARD CONCRETE RESIDENTIAL VEHICLE CROSSING

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Scales: Not to scale

Plan No. 3.

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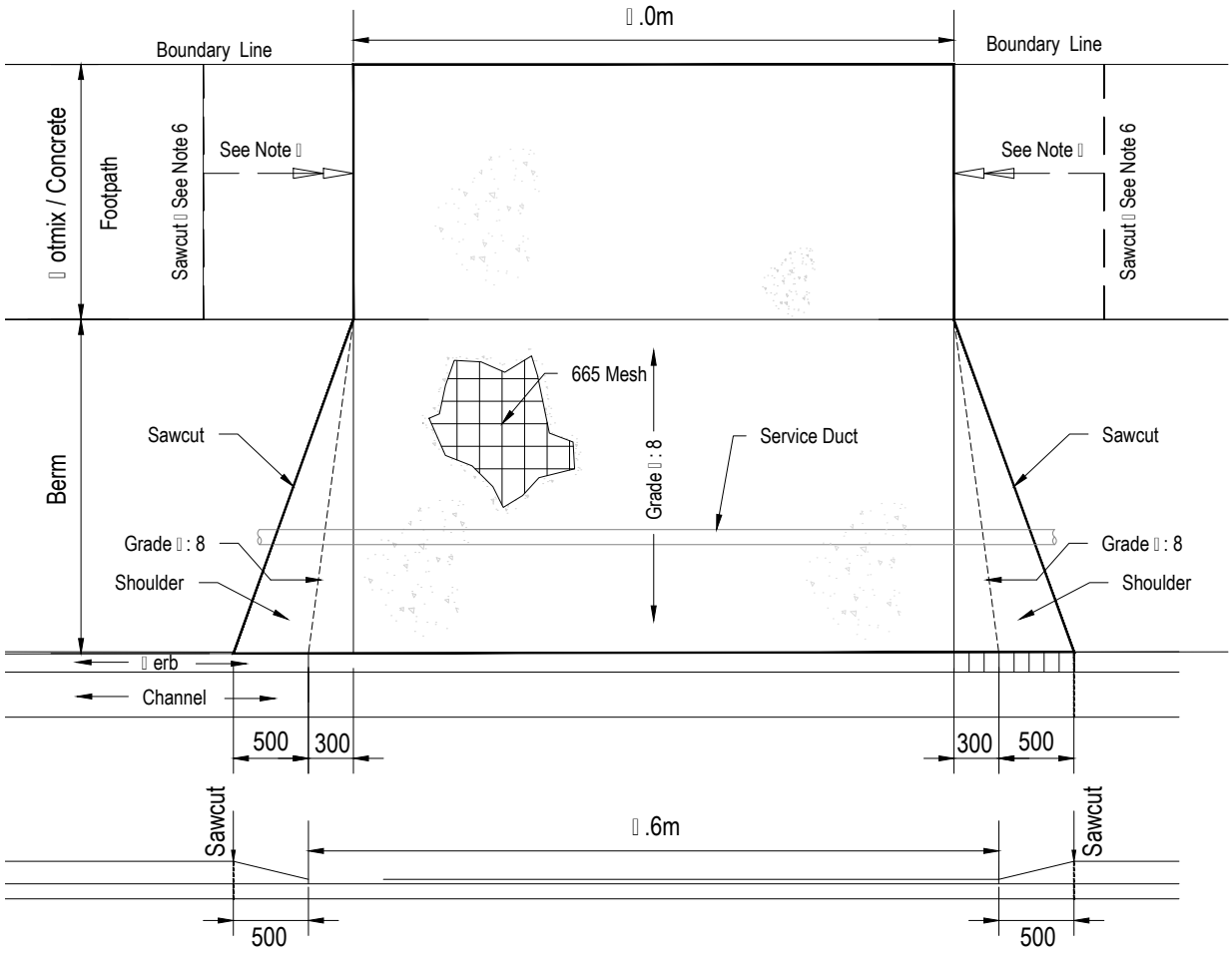

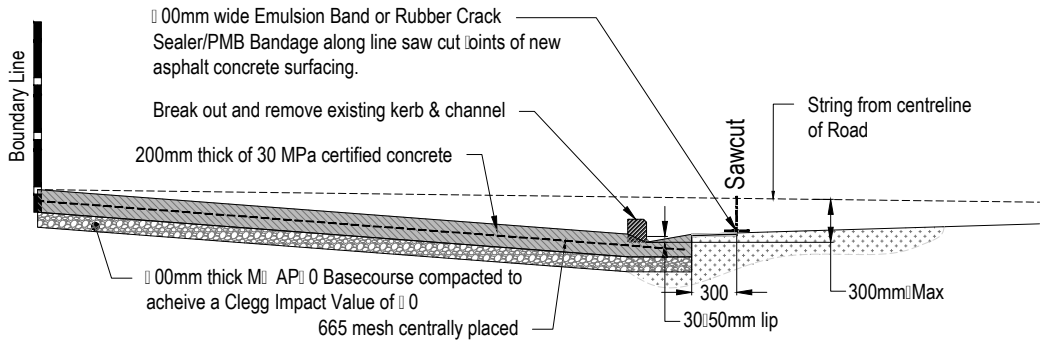

Note:

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. eight 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 adacent footpath but the finished crossfall is not to exceed 2 . If this cannot be achieved the adacent footpath will be reconstructed at a grade no steeper than : 2 (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 .0m will require a consent from the Manager.

COMMERCIAL / INDUSTRIAL VEHICLE CROSSING

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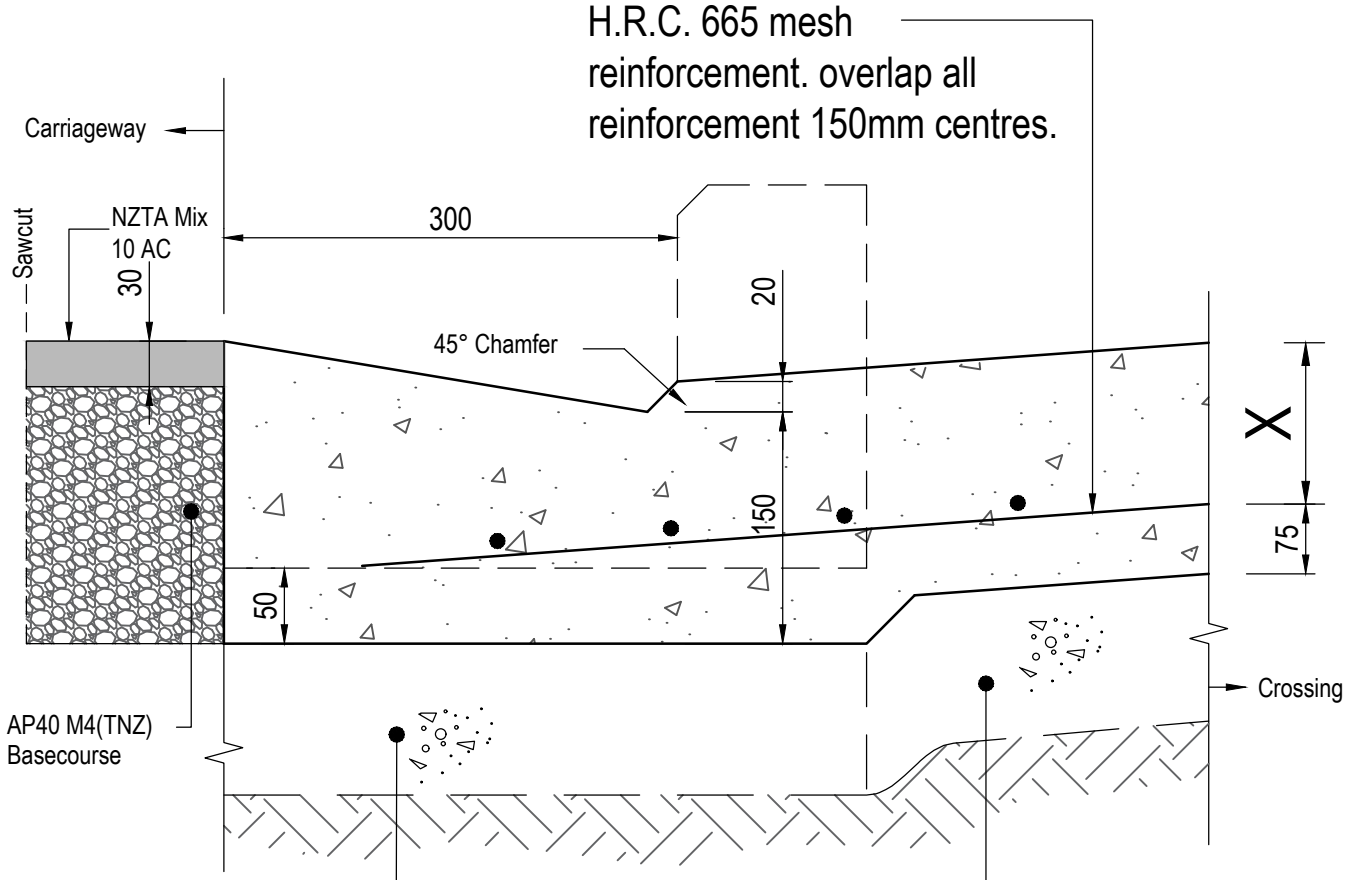
UNSPOILT...

Scales: Not to scale

Plan No.

3. 5

Sheet of Sheets



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.

DISH VEHICLE CROSSING - CHANNEL DETAIL

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UNSPOILT...

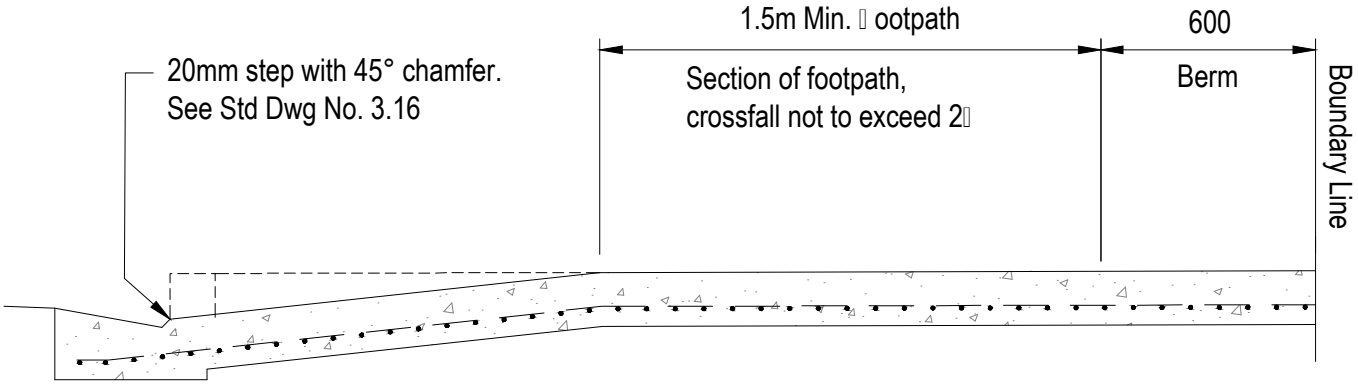
Scales: Not to scale

Plan No.

3.16

Sheet of Sheets

STANDARD CONCRETE VEHICLE CROSSING



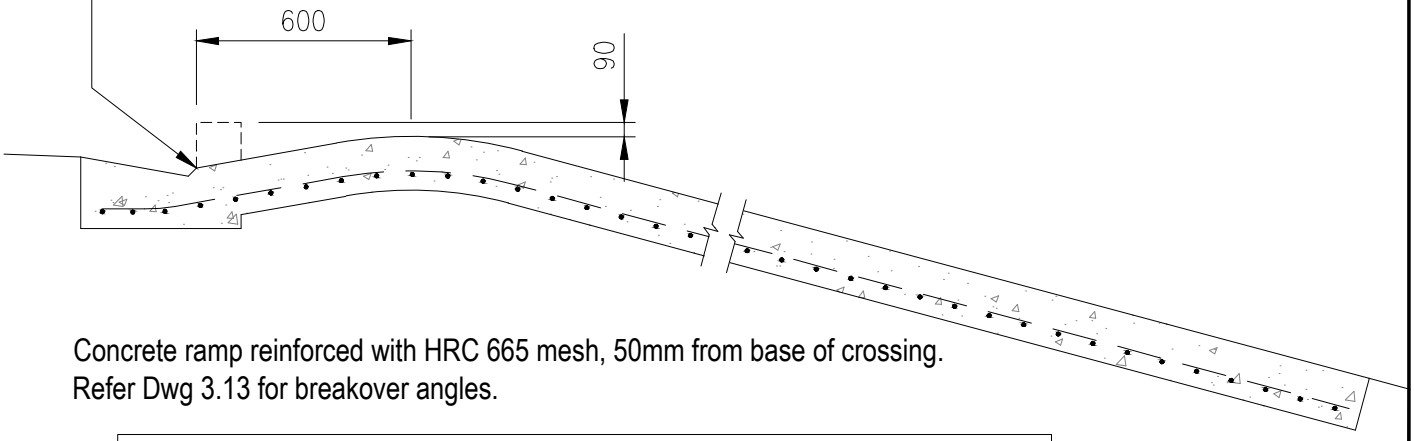
Concrete ramp reinforced with HRC 665 mesh,
50mm from bottom of crossing.

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

LO LEVEL CONCRETE VEHICLE CROSSING

20mm step with 45° chamfer.
See Std Dwg No. 3.16

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



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

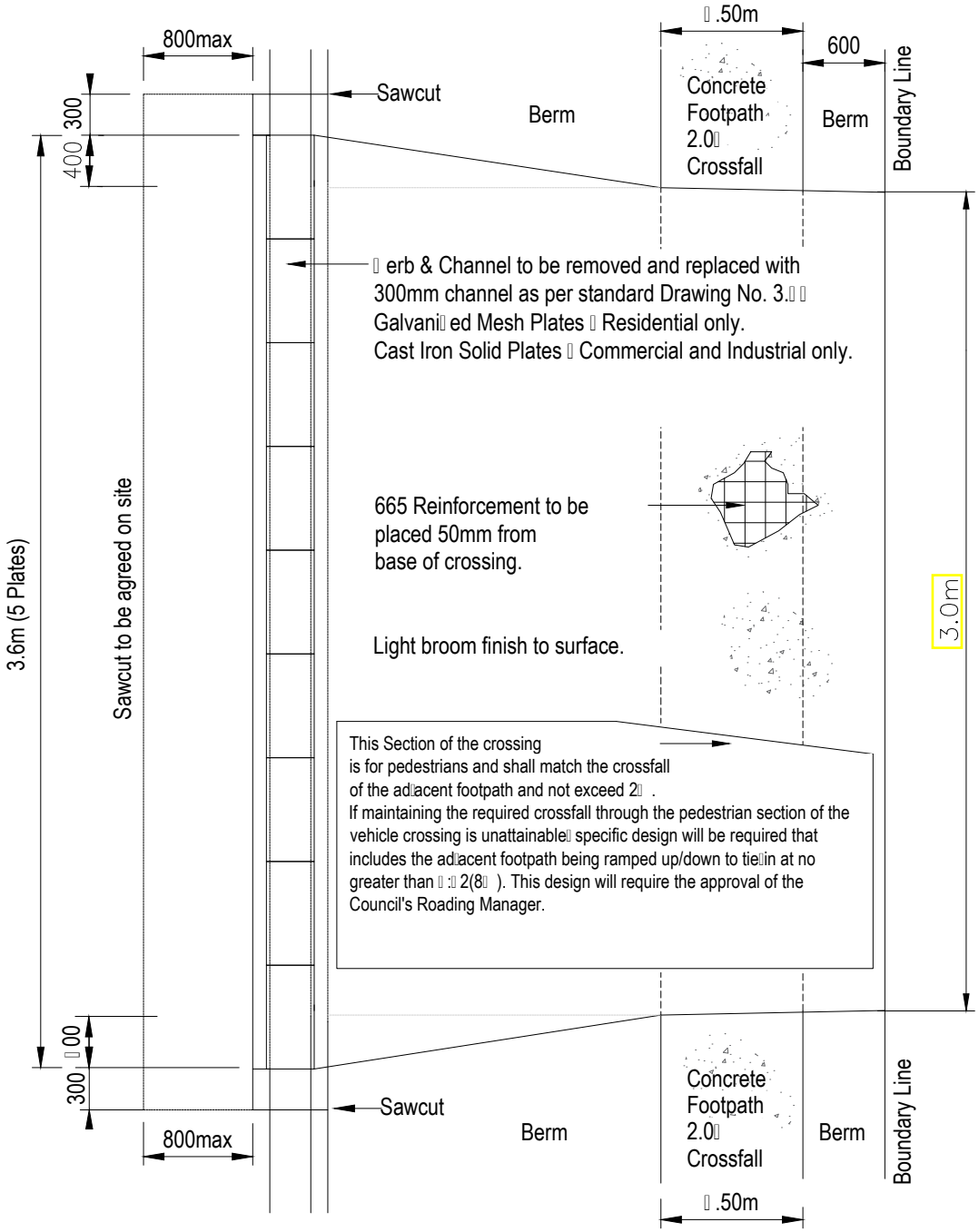
Rangitikei

Scales: Not to scale

Plan No.

3.17

Sheet of Sheets



Crossing sub base to be compacted
to achieve a sound foundation

Note:

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

Crossings greater than 3.0m
may require separate resource consent

PLATE VE ICLE CROSSING

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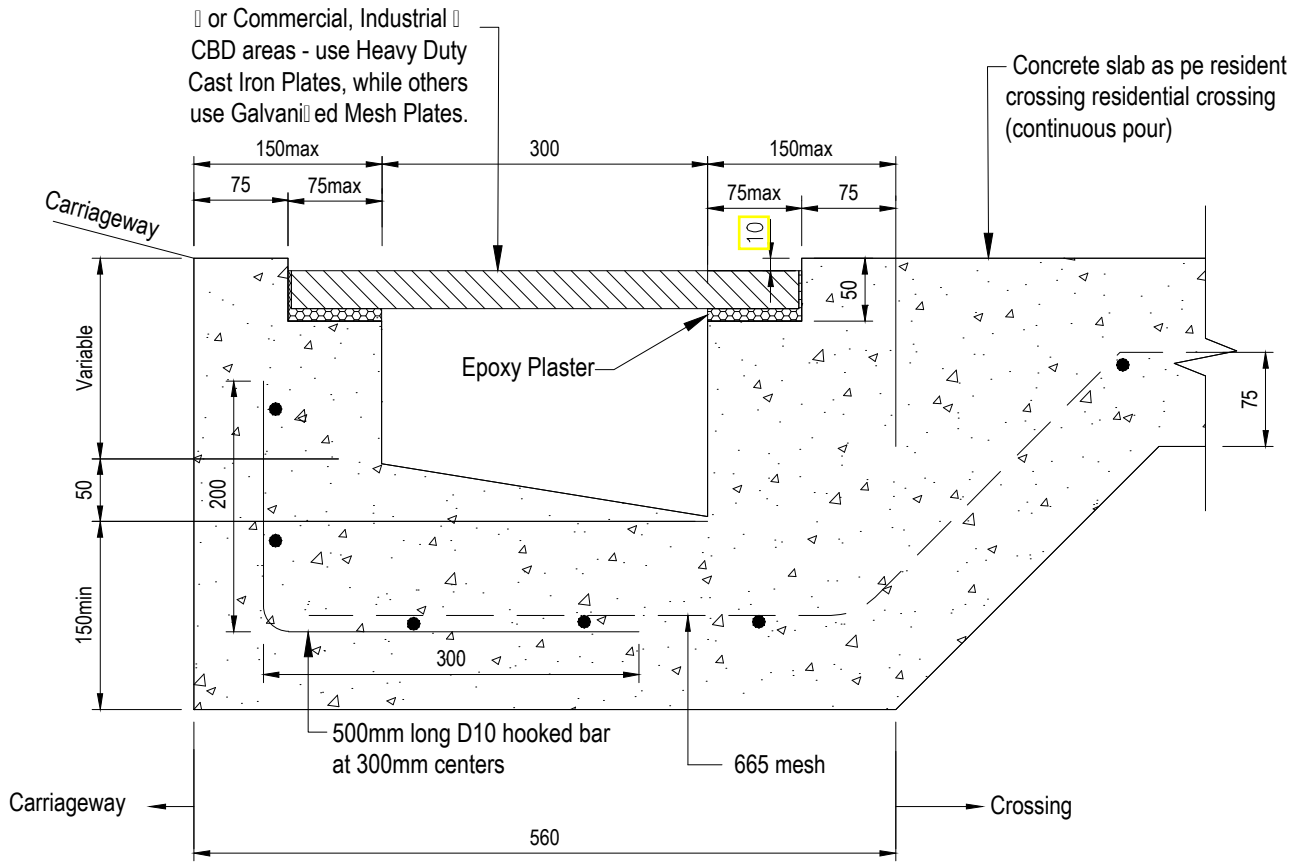
Unsp ilt...

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.

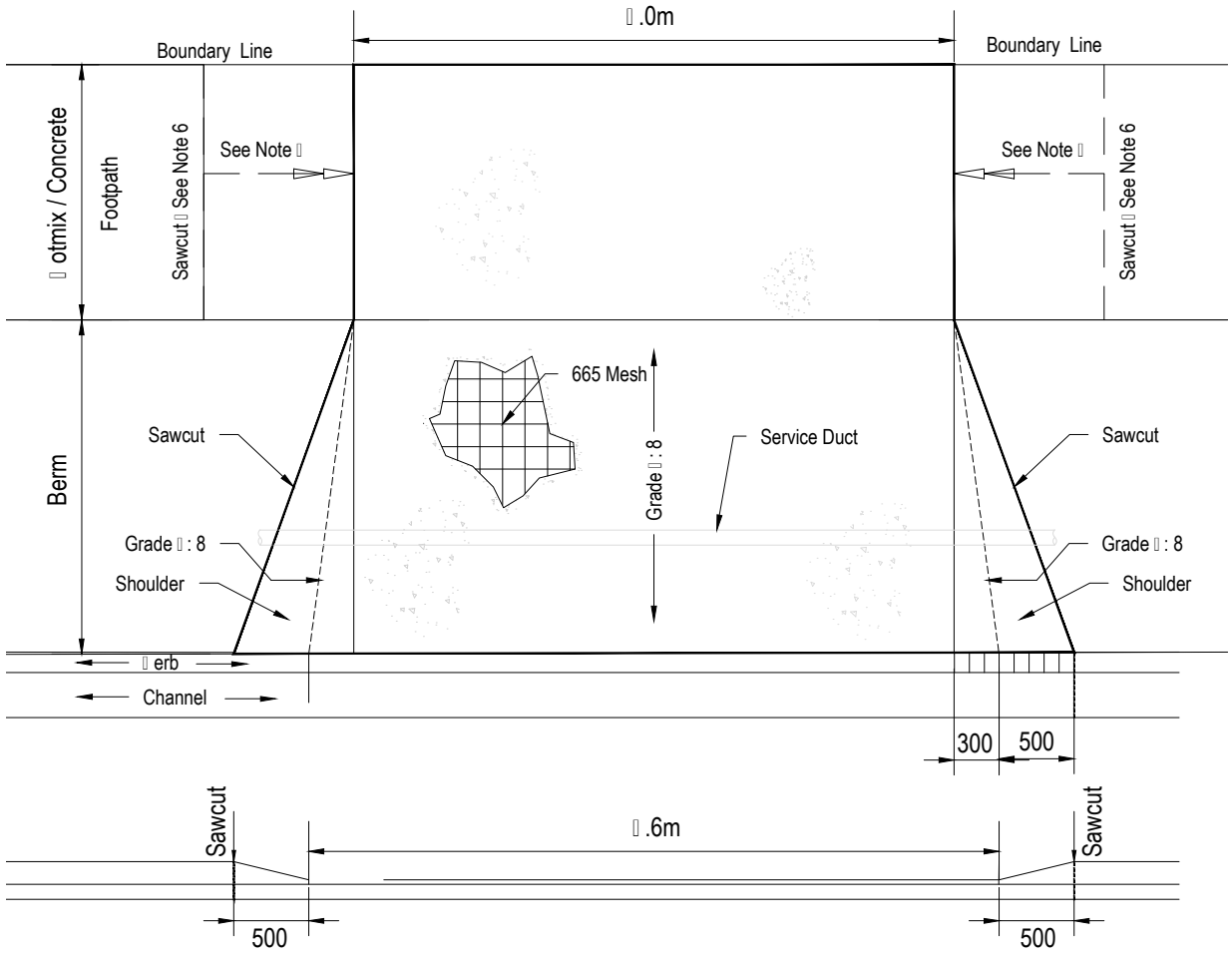
PLATE VEHICLE CROSSING - CHANNEL DETAIL

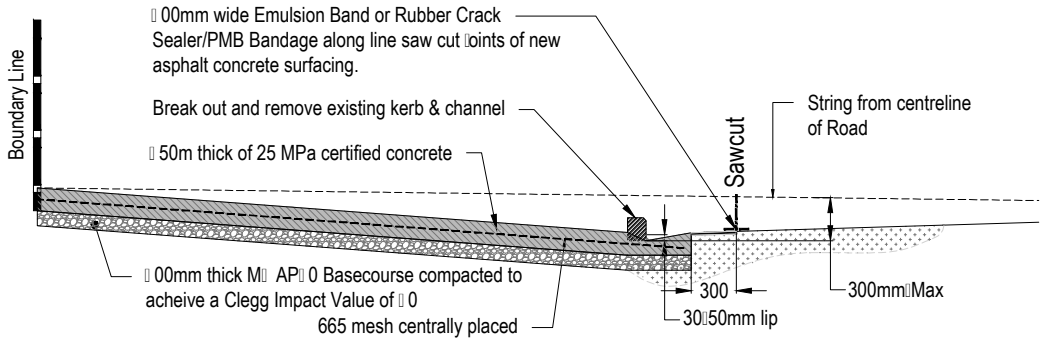
Rangitikei

Scales: Not to scale

Plan No. 3.1

Sheet of Sheets





Note:

. 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.

. At the channel face install 250mm long D 2 deformed starter bars at 00mm centres drill 00mm (min.) deep and grouted with Sika 2 2 or approved equivalent.

5. eight 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 adacent footpath but the finished crossfall is not to exceed 2 . If this cannot be achieved the adacent footpath will be reconstructed at a grade no steeper than : 2 (8) to tie in with the new crossing. This design will require the approval of the Manager

. New residential vehicle crossing wider than 3.0m will require a consent from the Manager.

HEAVY DUTY CONCRETE RESIDENTIAL VEHICLE CROSSING(2 OR MORE PROPERTIES)

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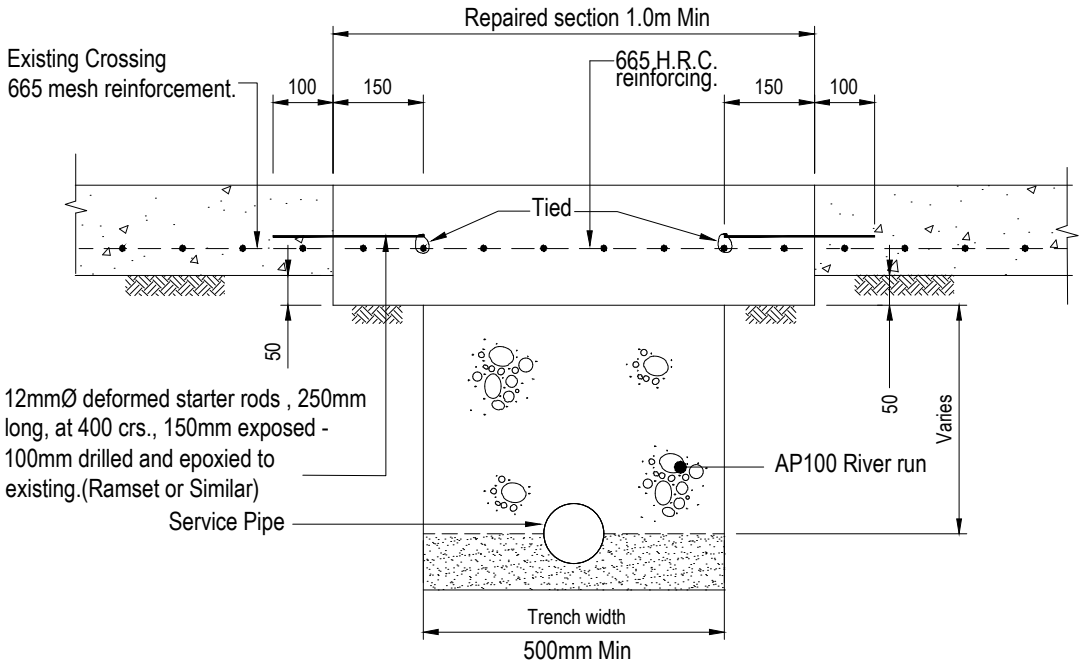
Scales: Not to scale

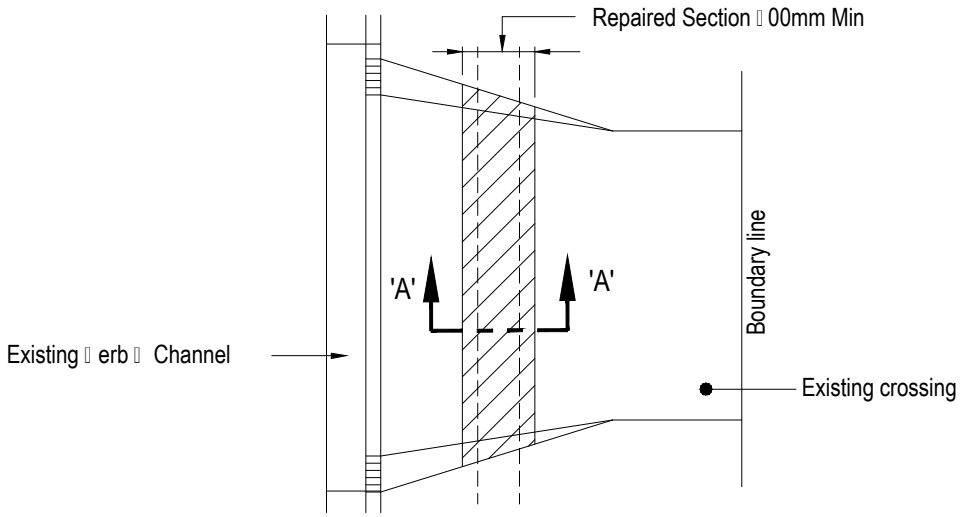
Plan No.

3.20

Sheet of Sheets

SECTION A-A





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.

REPAIR O VEHICLE CROSSING - GENERAL POSITION

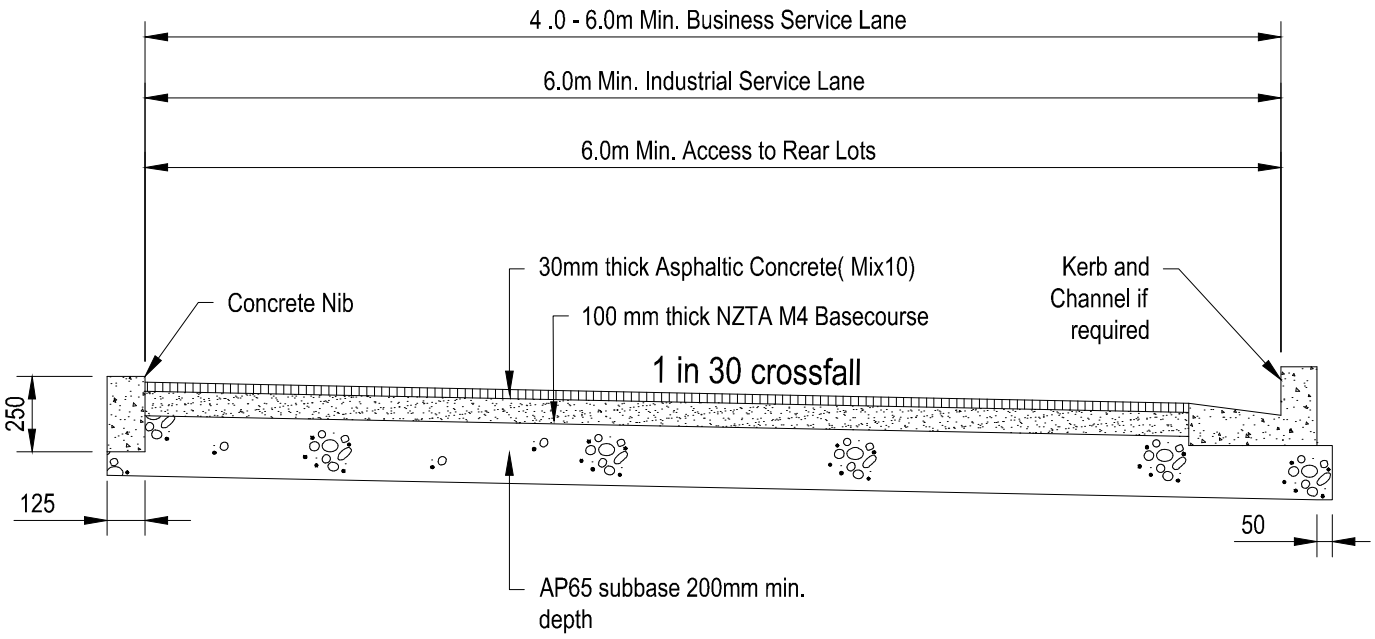
Rangitikei

Scales: Not to scale

Plan No.

3.21

Sheet * of * Sheets



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.

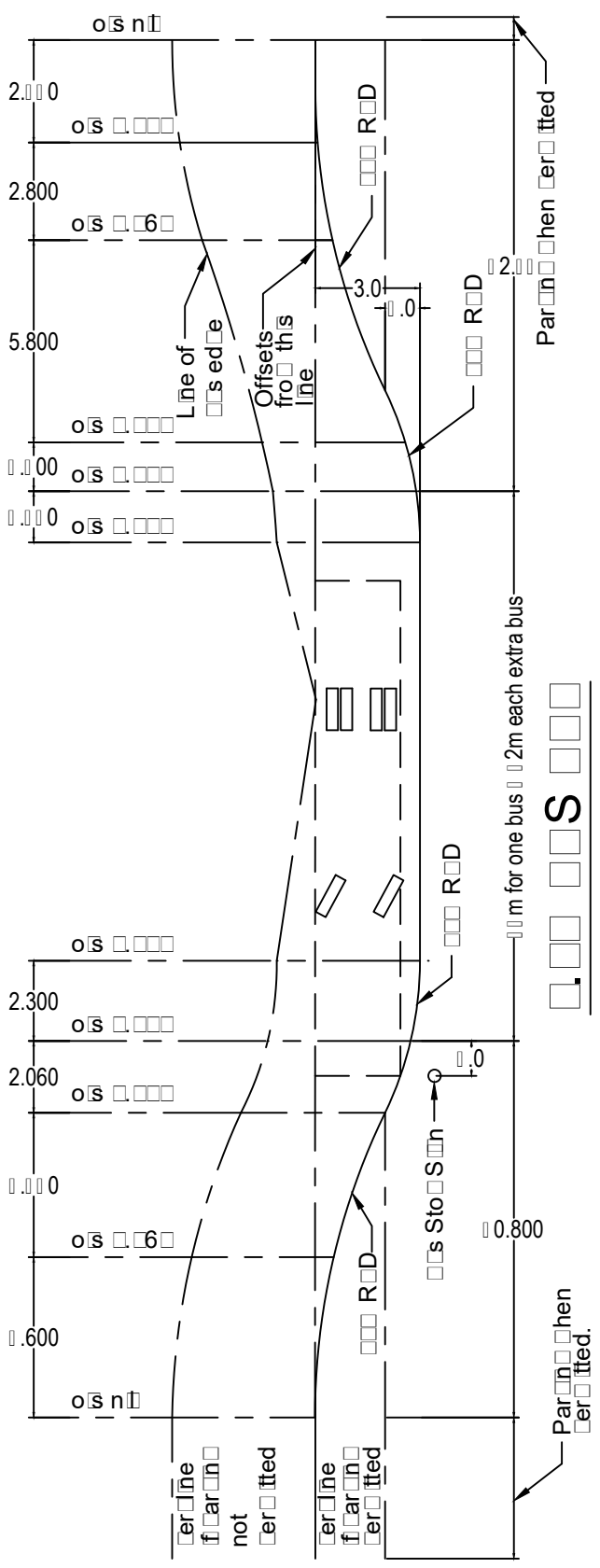
BUSINESS, INDUSTRIAL AND ACCESS TO REAR LOT-TYPICAL CROSS SECTION

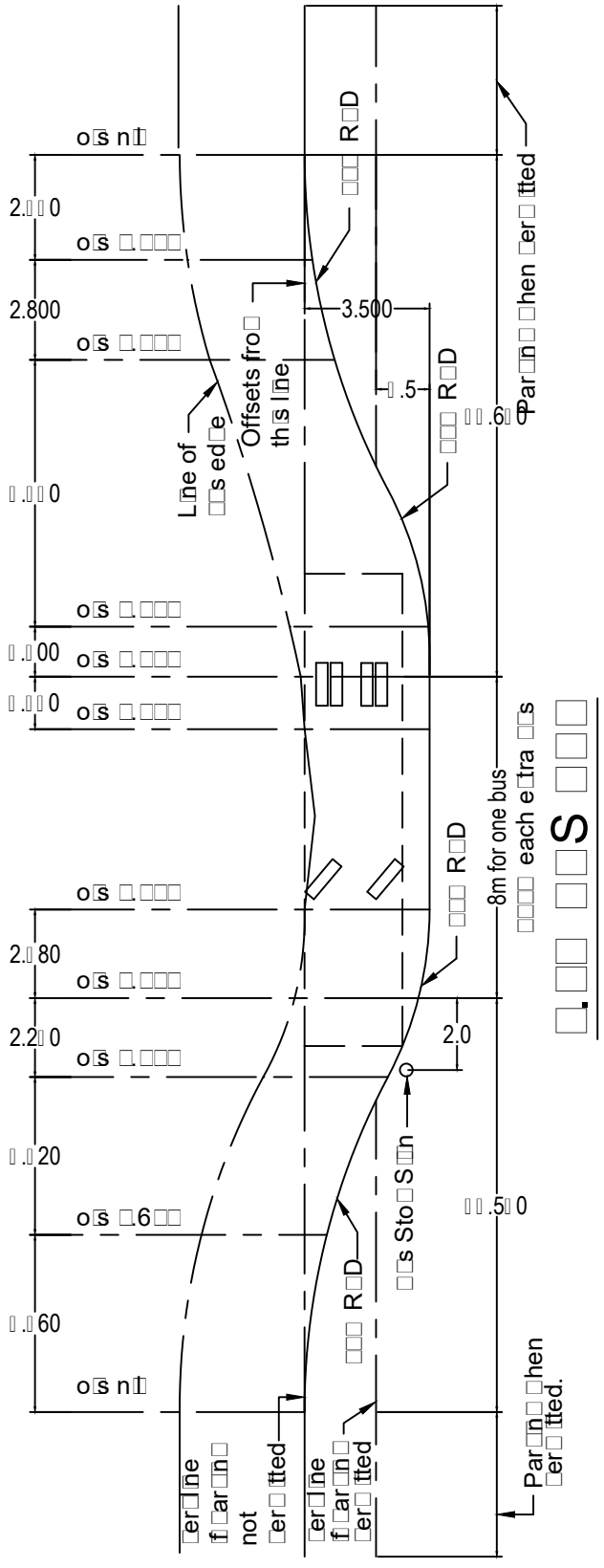
Rangitikei

Scales: Not to scale

Plan No. □.□□

Sheet of Sheets





BUS BAY DESIGN

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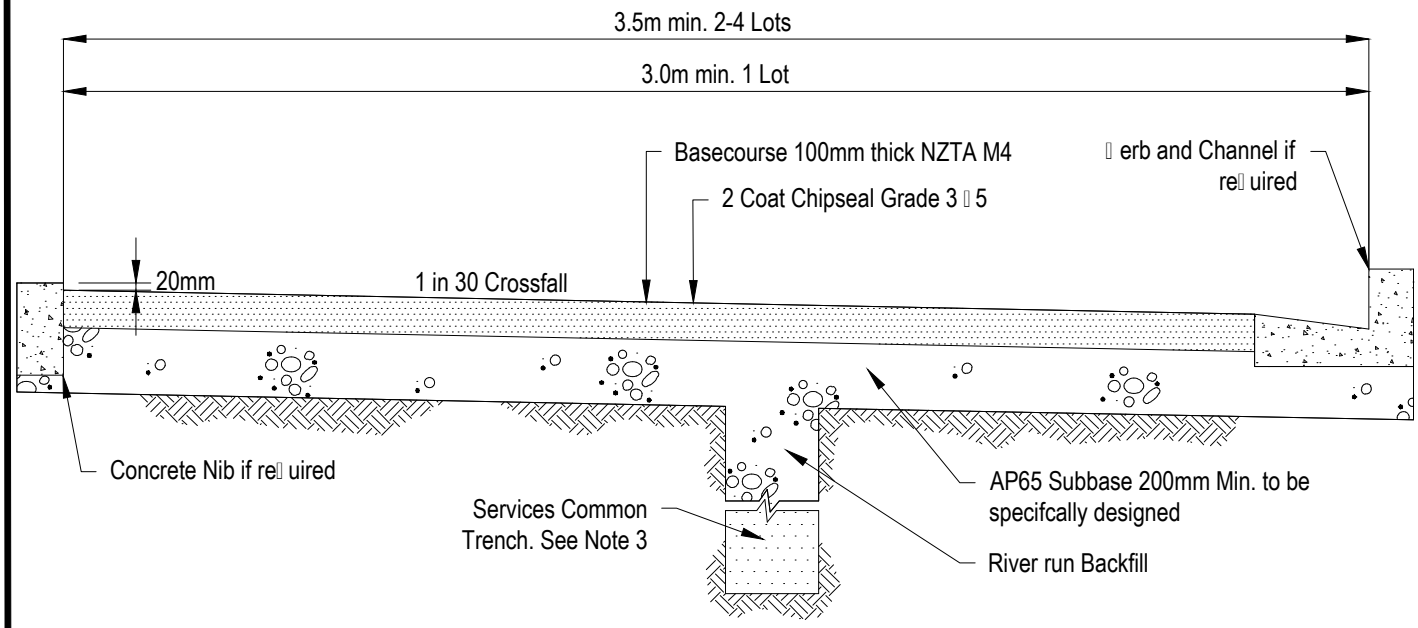
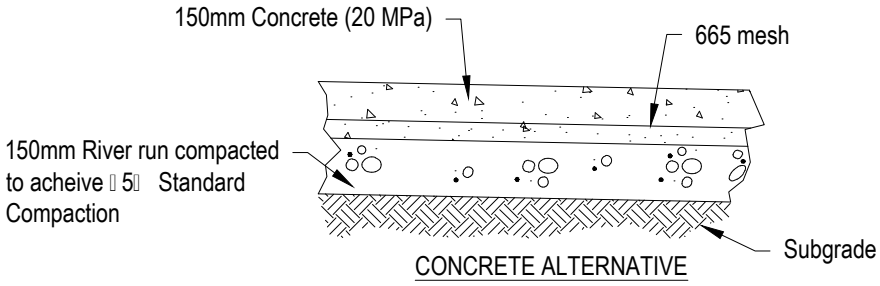
Plan No.

6

Sheet of Sheets





CONCRETE ALTERNATIVE

Note:
Concrete RO 's may be drained to the centre.

Note

1. Pavement formation depths to be designed.
2. Surfacing - 2 coat chipseal, si es 3 5 or
   30mm of Mix 10 asphaltic concrete
3. astewater, stormwater and water services must be appropriately si ed. All services may be laid in a common trench provided the re uired clearances between services are maintained

RESIDENTIAL ACCESS TO REAR LOTS - 1 TO 4 LOTS

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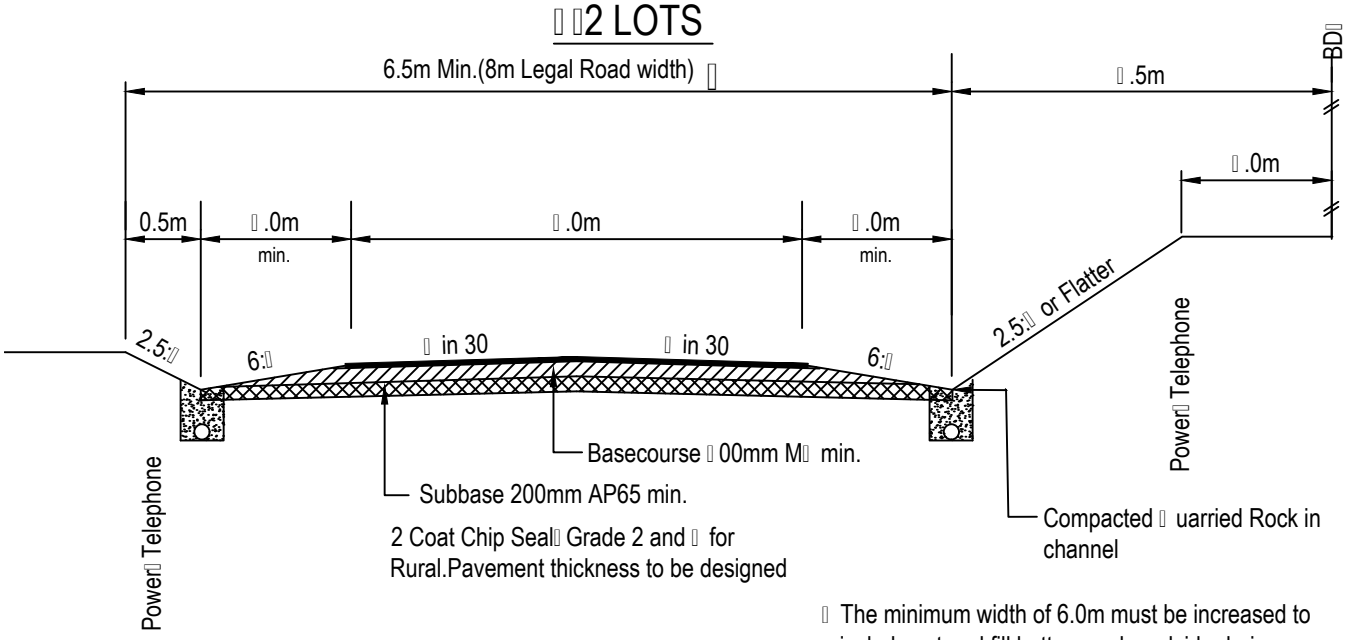
Scales: Not to scale

Plan No.

3.27

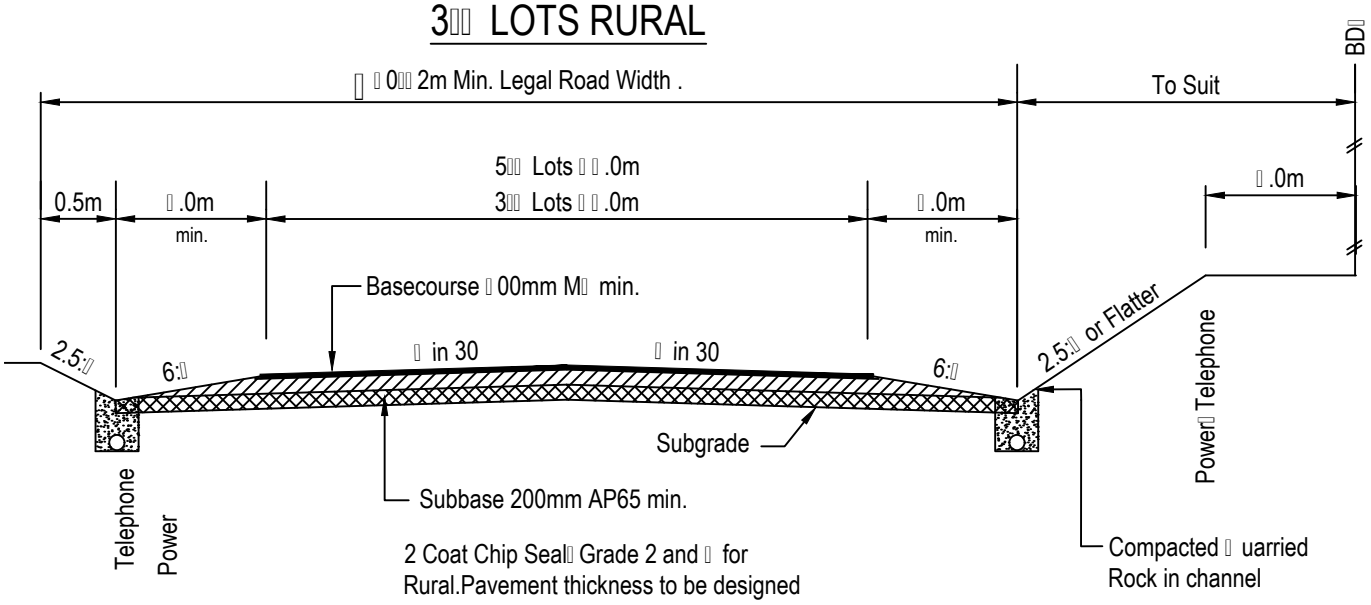
Sheet of Sheets

□□2 LOTS



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

3□□ LOTS RURAL



□ The minimum width of □.0m must be increased to include cut and fill batters and roadside drainage.

Notes:

□. For batter slopes steeper than 2.5:□ □ Engineering design report will be required.

2. Drainage details as for rural road requirements. Refer to Drawing No.3.□

T□ PICAL CROSS SECTION □ RURAL □ ACCESS TO REAR LOT

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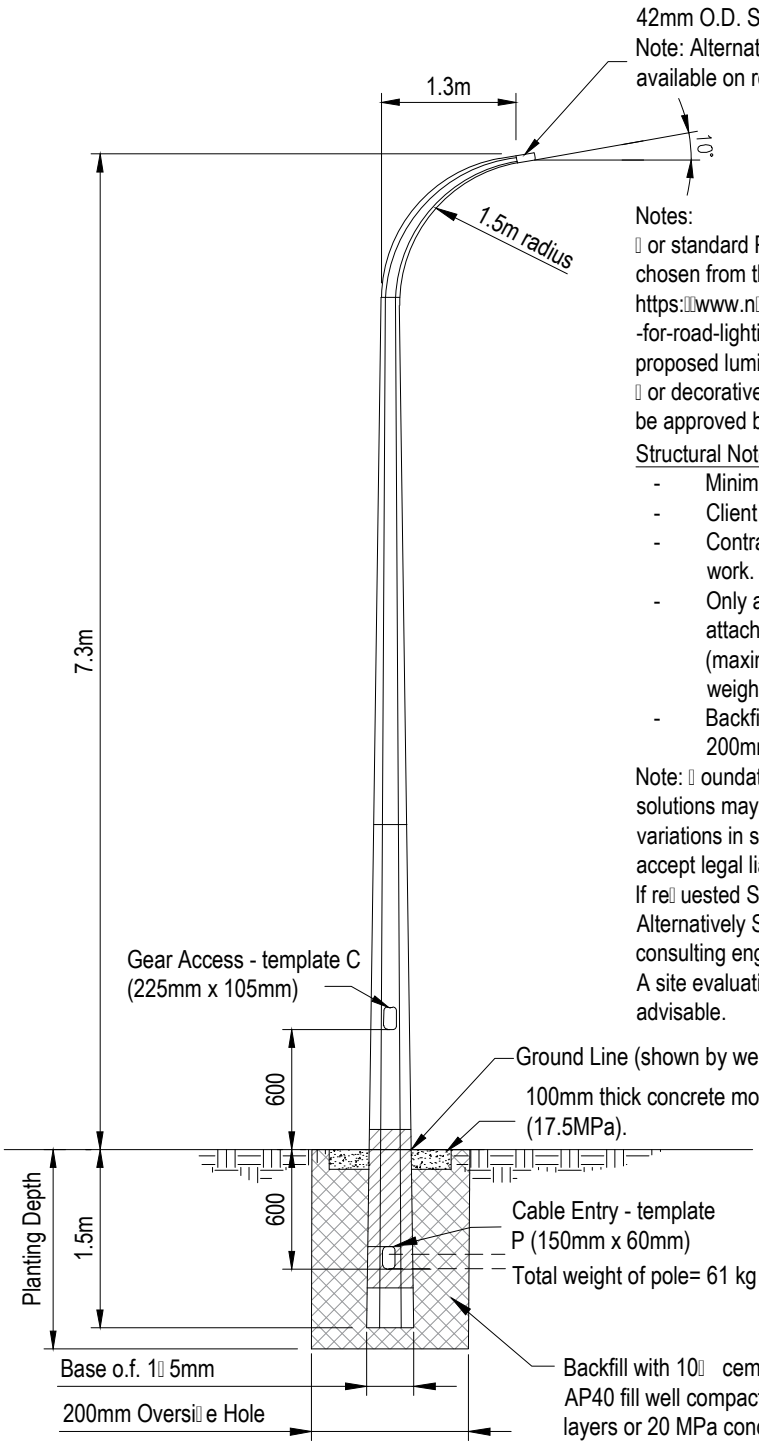
UNSPOILT...

Scales: Not to scale

Plan No.

3.2□

Sheet of Sheets



Notes:
or standard P category installations, LED luminaires to be chosen from the NZTA Approved M30 list details at https: www.n ta.govt.n assets resources specifications-and-guidelines -for-road-lighting-design docs m30-accepted-luminaires.pdf, proposed luminaire to be approved by RDC.
or 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 sued , no additional attachments can be placed on pole without Spunlite's approval. (maximum light si e=0.2m^{2}with a cd=1.0, maximum light weight=15kg
- Backfill fill hole with cement stabilised AP40 fill well compacted 200mm layer of concrete.

Note: oundation 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 re uested Spunlite will design specific foundations for each pro ect . Alternatively Spunlite recommends the engagement of a registered consulting engineer where upon Spunlite supply all loadings.
A site evaluation by a ualified Structural Geotechnical Engineer is advisable.

Notes:
Complete in ground installation to be coated with manufacturers's corrosion inhibiting system
or full installation details see https :www.spun ite.co.n uploads Install 20Guide.pdf
Pole and Luminaire details for new Category P3 and P4 Residential Lighting

TYPICAL STEEL LIGHTING COLUMNS FOR STREETS

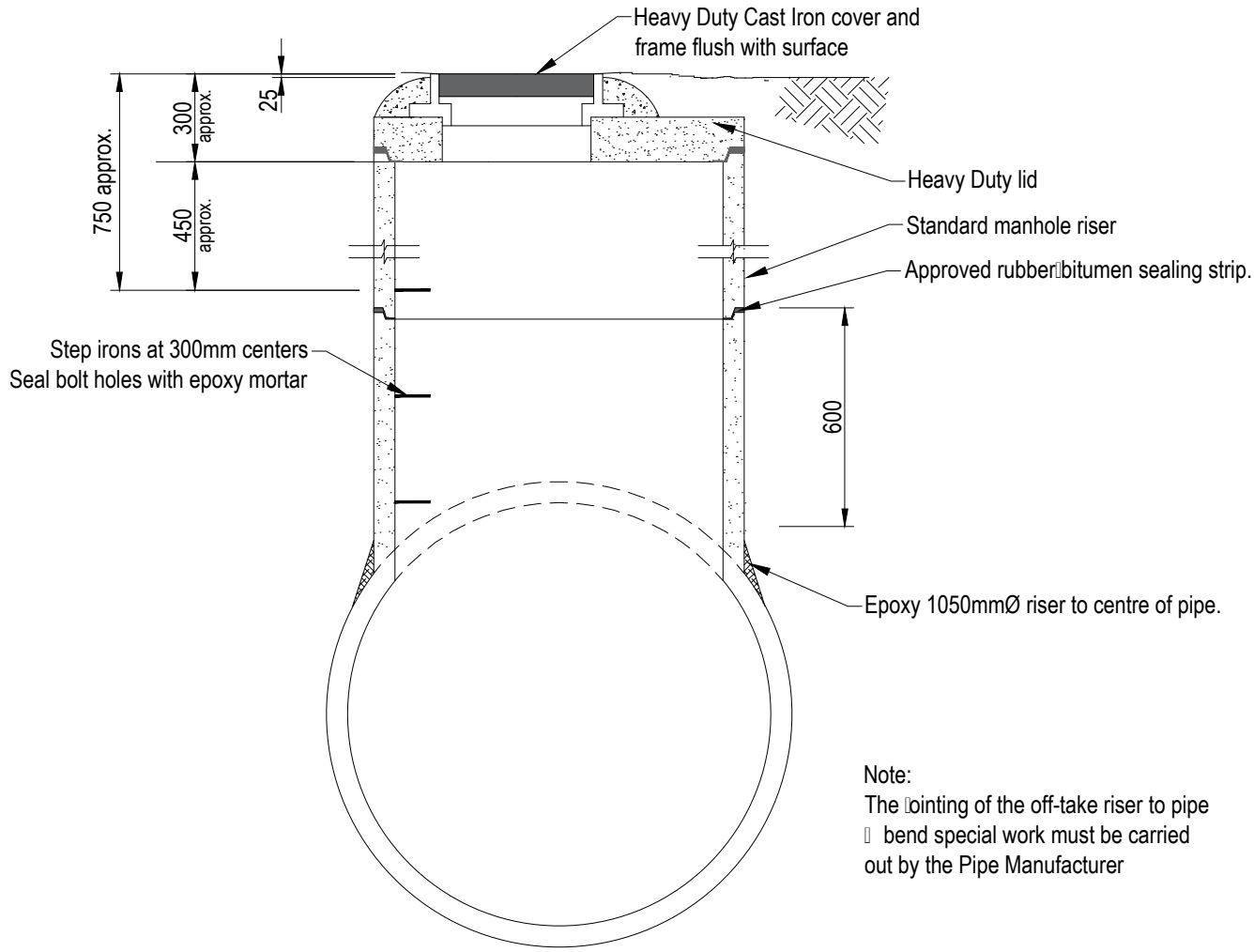
Rangitikei

Scales: Not to scale

Plan No.

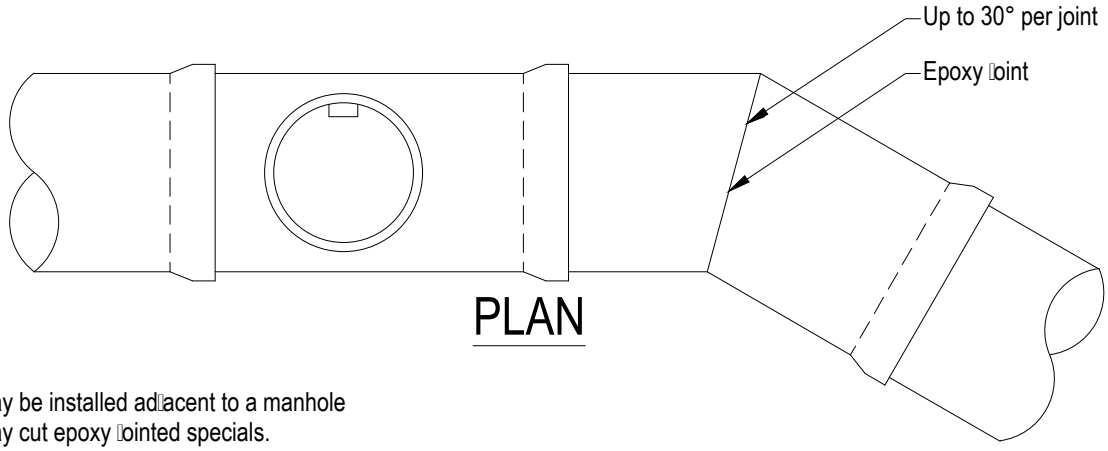
3.30

Sheet of Sheets



SECTION

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



PLAN

NOTE:
Bends may be installed adjacent to a manhole using splay cut epoxy jointed specials.

MANHOLE FOR LARGE DIAMETER CONCRETE PIPES - 1050mm DIA. PLUS

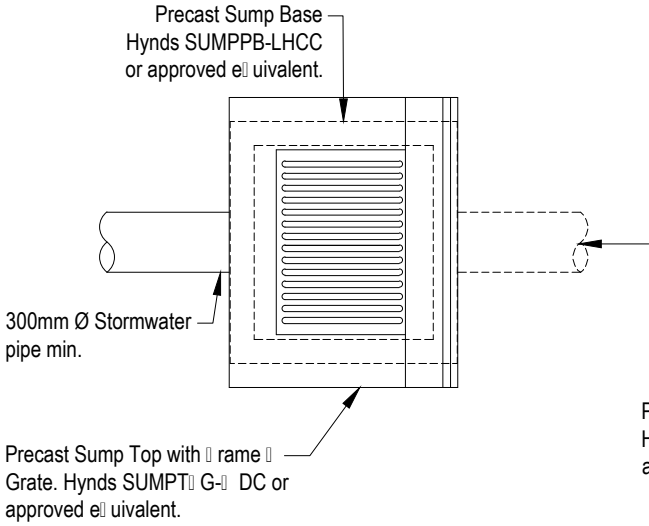
Rangitikei

Scales: Not to scale

Plan No.

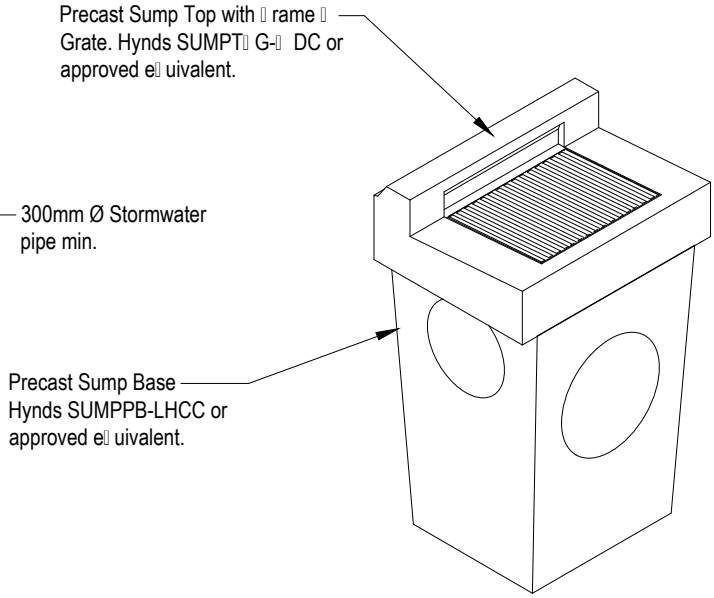
4.1

Sheet of Sheets



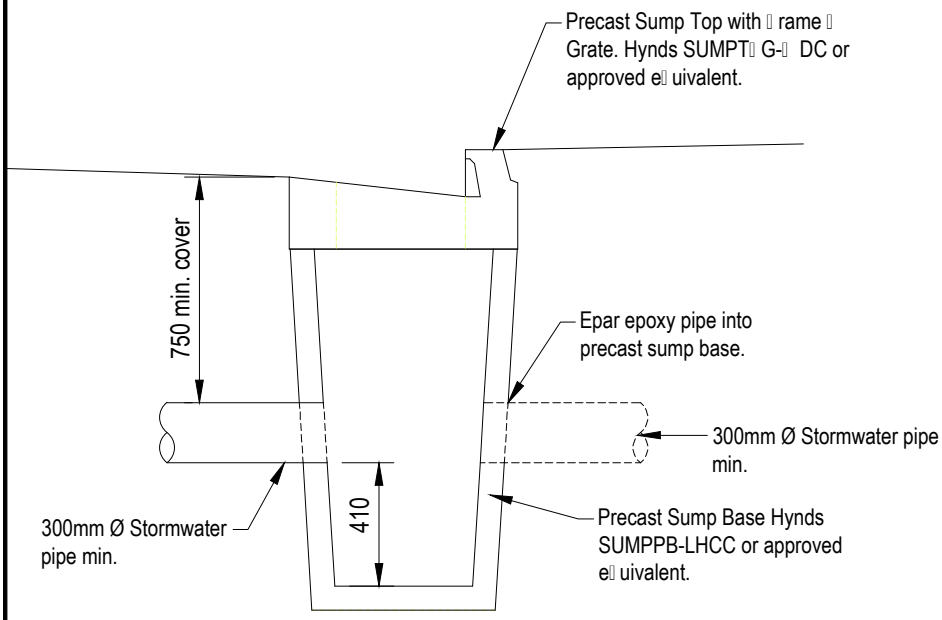
PLAN

Not To Scale



ISOMETRIC VIE

Not To Scale



STREET SUMP

Not to Scale

STREET SUMP DETAILS

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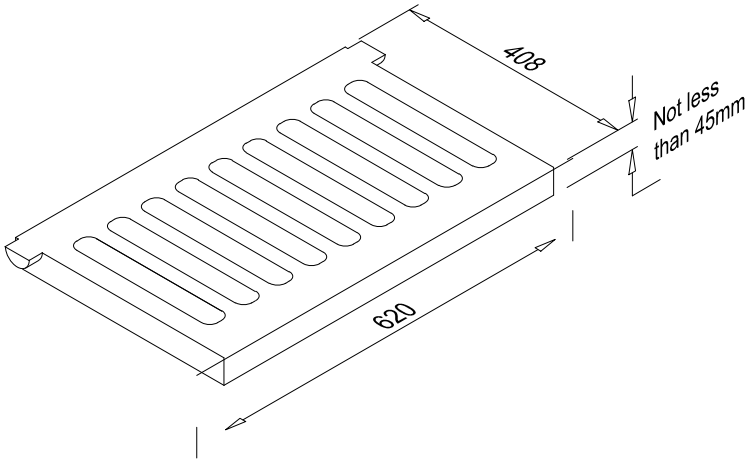
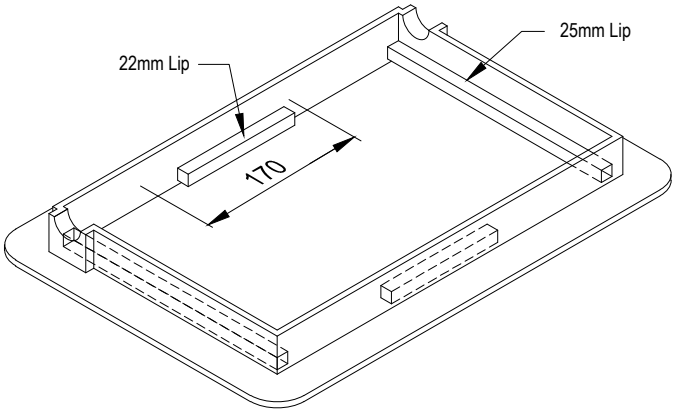
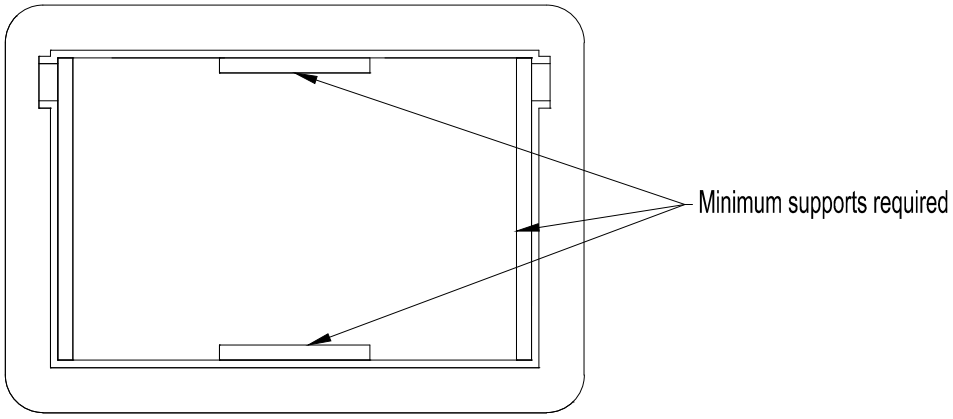
Plan No.	4.2
Sheet	of Sheets





Note
Where grates are replaced on frames with no centre supports the grate should have deeper sections ie greater than 5mm to distribute loading.



PLAN VIEW OF FRAME

STANDARD SUMP GRATE DETAILS

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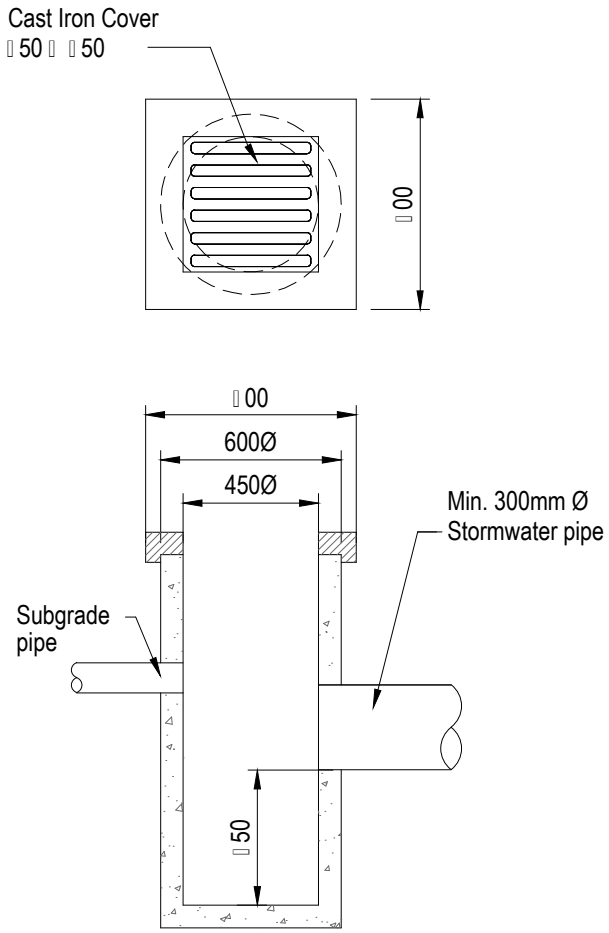
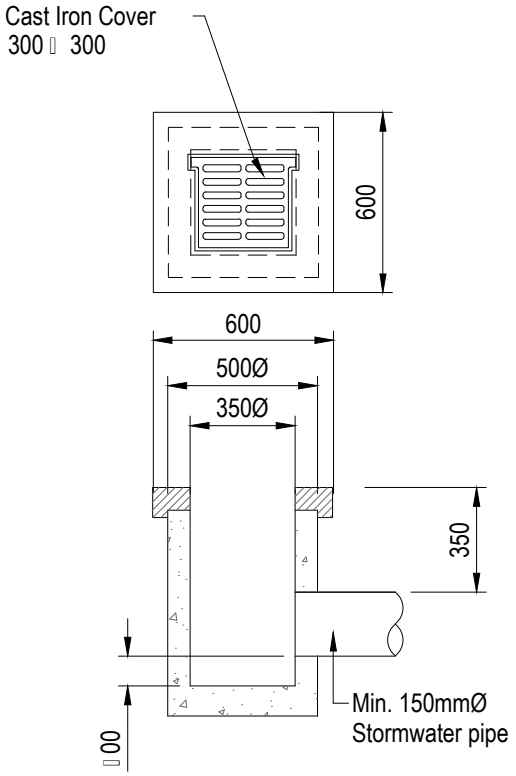
UNSPOILT...

Scales: Not to scale

Plan No.
.3

Sheet of Sheets





□ ARD SUMP

FOOTPAT□ /SMALL SUMP

Note:
Nominal grate si□e shown.
To conform with manufacturer's dimensions.

FOOTPAT□ & □ ARD SUMP DETAILS

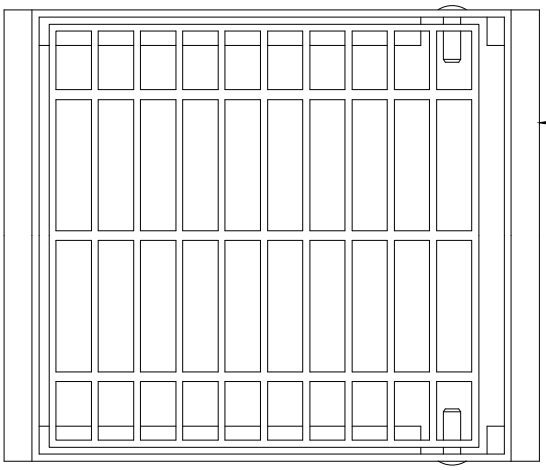
Rangitikei
UNSPOILT...

Scales: Not to scale

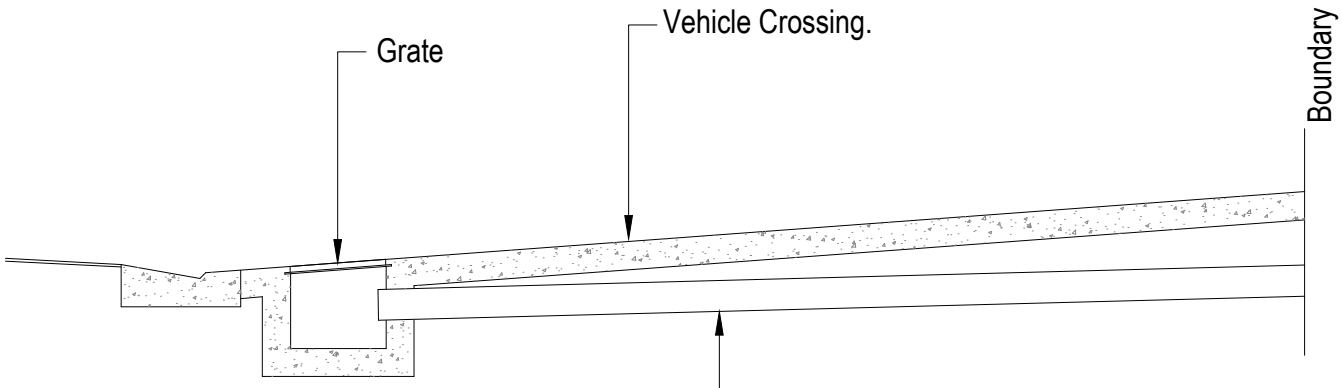
Plan No.

□ .3.□

Sheet of Sheets



' EB ORGE'
  ell-up sump grate



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

VEHICLE CROSSING (HEAV DUT   STANDARD) ELL-UP - SUMP

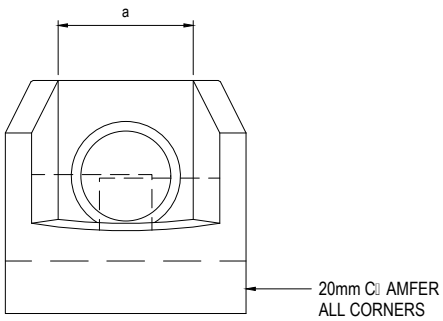
Rangitikei

Scales: Not to scale

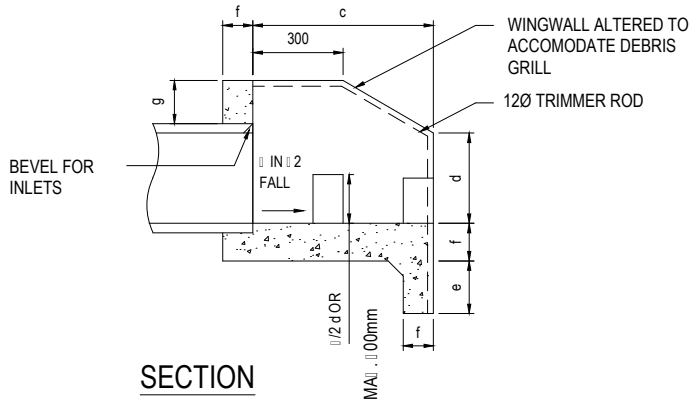
Plan No.

4.4

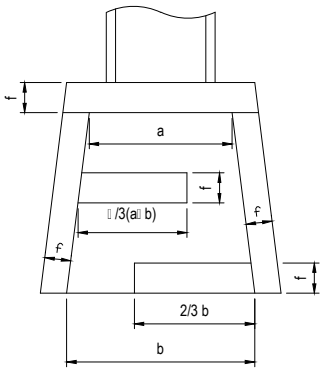
Sheet of Sheets



END ELEVATION

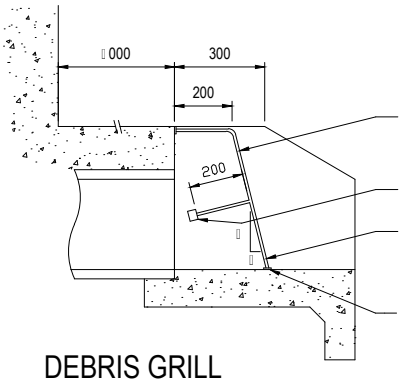


SECTION



PLAN

PRINCIPAL DIMENSIONS (mm.)							
Ø of PIPE	a	b	c	d	e	f	g
50	300	50	600	200	50	00	50
230	380	600	00	250	200	00	50
300	50	50	50	300	200	00	50
3 5	550	00	850	00	200	00	50
50	630	00	00	50	230	50	230
525	00	200	000	550	230	50	230
600	800	00	00	600	230	50	230
50	000	00	200	650	300	50	300
00	0	2000	50	50	300	50	300
050	380	2300	00	50	50	50	300
200	520	2600	2 00	50	50	50	50
350	680	2800	2 00	50	50	50	50



DEBRIS GRILL

. REINFORCE FLOOR & WALLS WIT :
50 3 5 665 MES
450 - 600 663 MESH OR 10Ø RODS @ 250 CRS
675 - 900 12Ø RODS @ 250 CRS
1050 - 1350 12Ø RODS @ 150 CRS
2. ALL REINFORCEMENT S ALL BE PLACED CENTRALL IN WALLS AND FLOOR AND S ALL BE CONTINUOUS BETWEEN WALLS AND FLOOR.
3. LAPS IN STRUCTURAL GRADE BARS TO BE 300mm MIN.
. T ERE S ALL BE AT LEAST TWO BARS W ET ER MES OR M.S. OVER T E TOP OF T E PIPE.
5. CONCRETE IS TO BE ORDINAR GRADE (.5MPa) IN ACCORDANCE WIT N S 3 0 .
6. BAFFLES ARE TO BE CONSTRUCTED AS S OWN W EN OUTLET VELOCITIES AND SOIL CONDITIONS DICTATE. IN E TREME CASES SPECIFIC DESIGN MA BE RE UIRED B T E ENGINEER.
. INLET STRUCTURES S ALL AVE REVERSE APRON FALL AND NO BAFFLES.
8. DIMENSIONS b c & d MA BE VARIED TO SUIT SITE CONDITIONS.
. DEBRIS GRILL TO BE SPECIFICALL DESIGNED.

STANDARD EADWALL DETAILS

Rangitikei
UNSPOILT...

Scales: Not to scale

Plan No.

.5

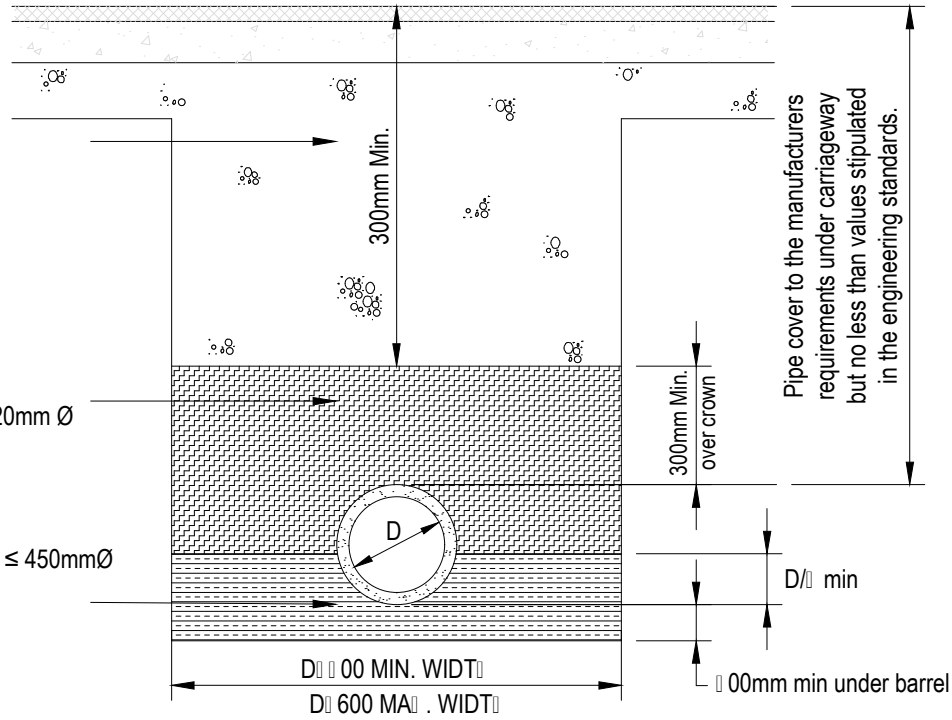
Sheet of Sheets

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

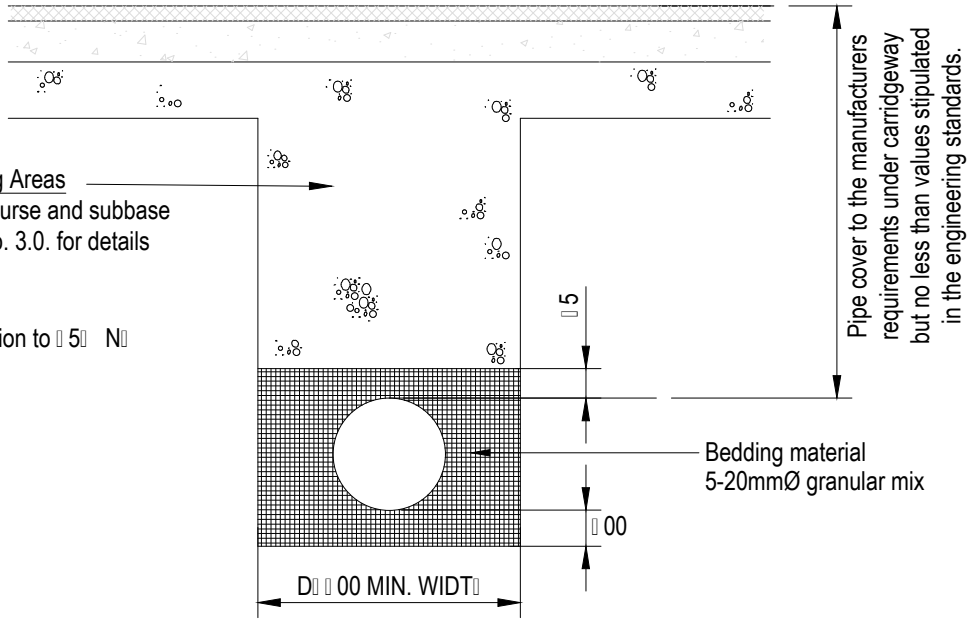
□Bedding Material
for pipe diameter for pipe diameter ≤ 450mmØ
use 5-20mmØ clean granular mix
or pipe diameter □ □ 50mm
use 5-40mmØ clean granular mix



CONCRETE & CERAMIC PIPES

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)



PIPE TRENC□ ING DETAILS □ WASTEWATER & STORMWATER

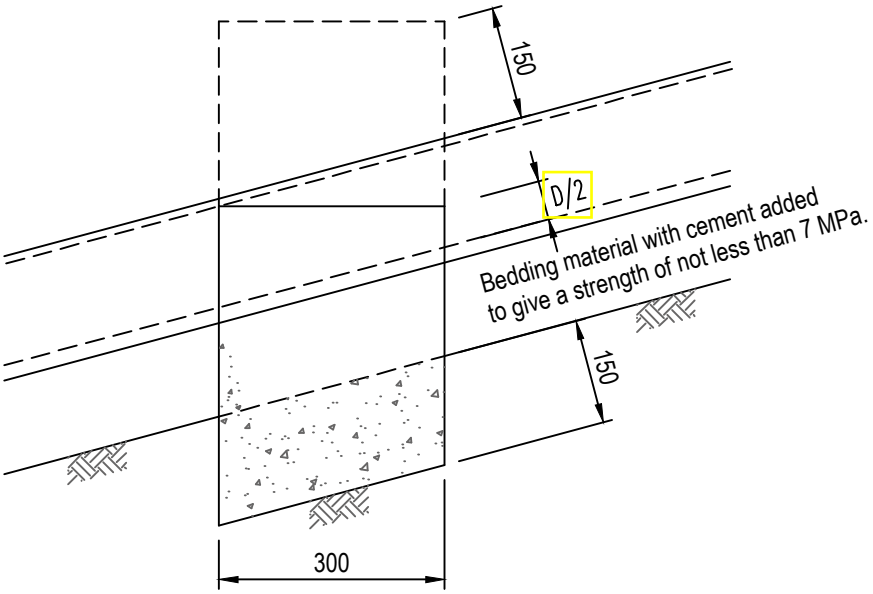
Rangitikei

Scales: Not to scale

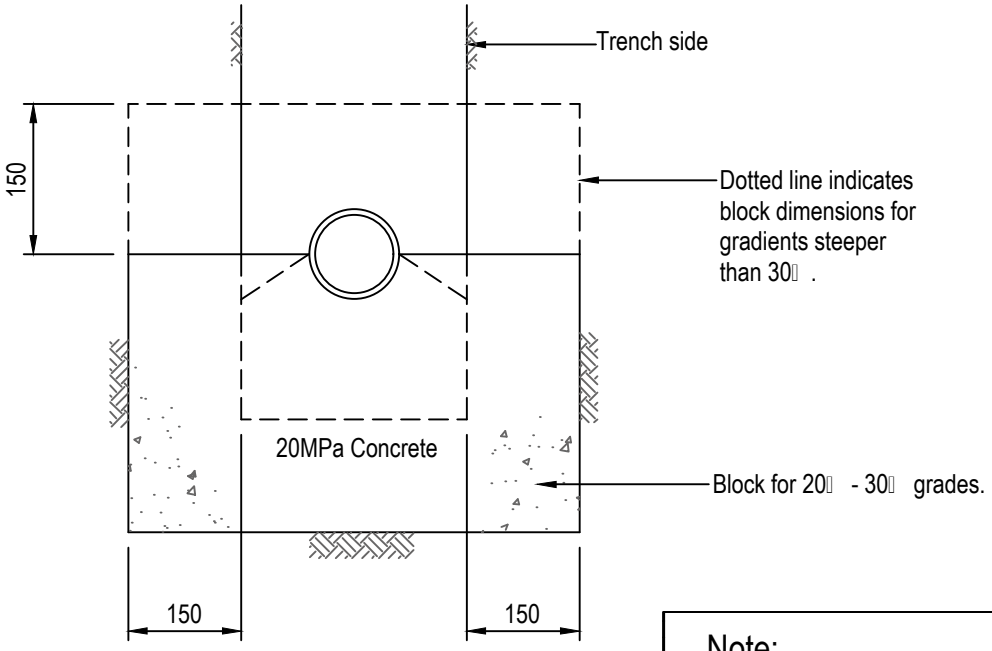
Plan No.

5.□

Sheet of Sheets



LONGITUDINAL SECTION



CROSS SECTION

Note:
Spacing of anti-scour blocks is subject to Engineer's design.

ANTI-SCOUR BLOCKS FOR STEEP PIPELINES

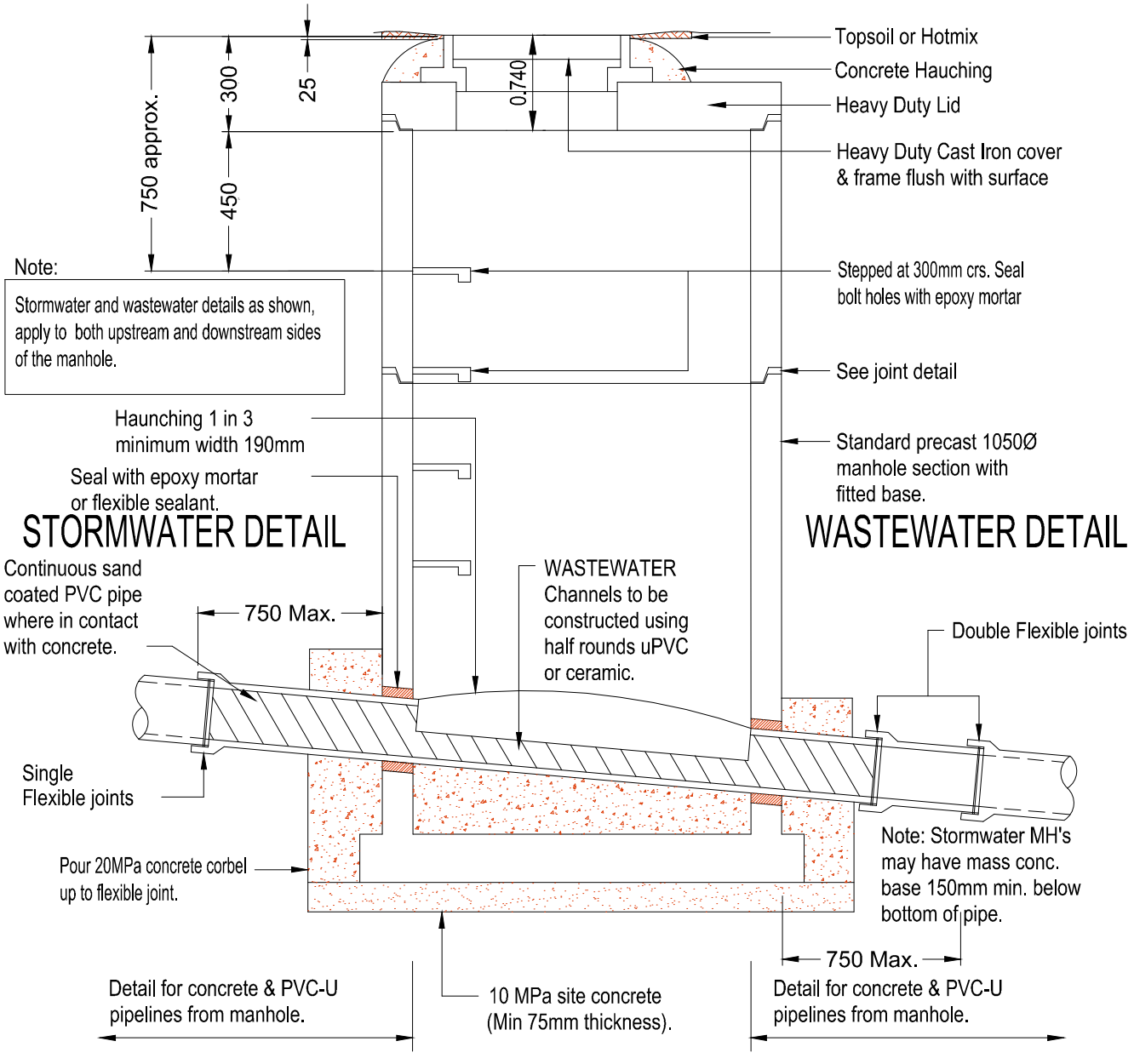
Rangitikei

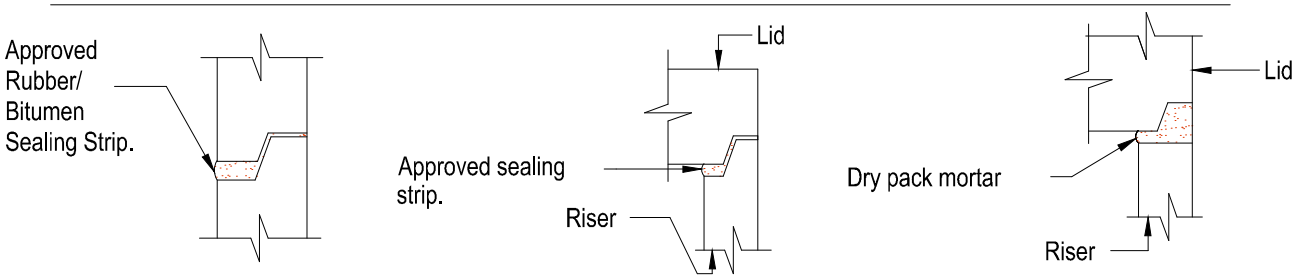
Scales: Not to scale

Plan No.

5.2

Sheet of Sheets





JOINT DETAIL

RISER-LID DETAIL
(Full height riser)

RISER-LID DETAIL
(Riser shortened)

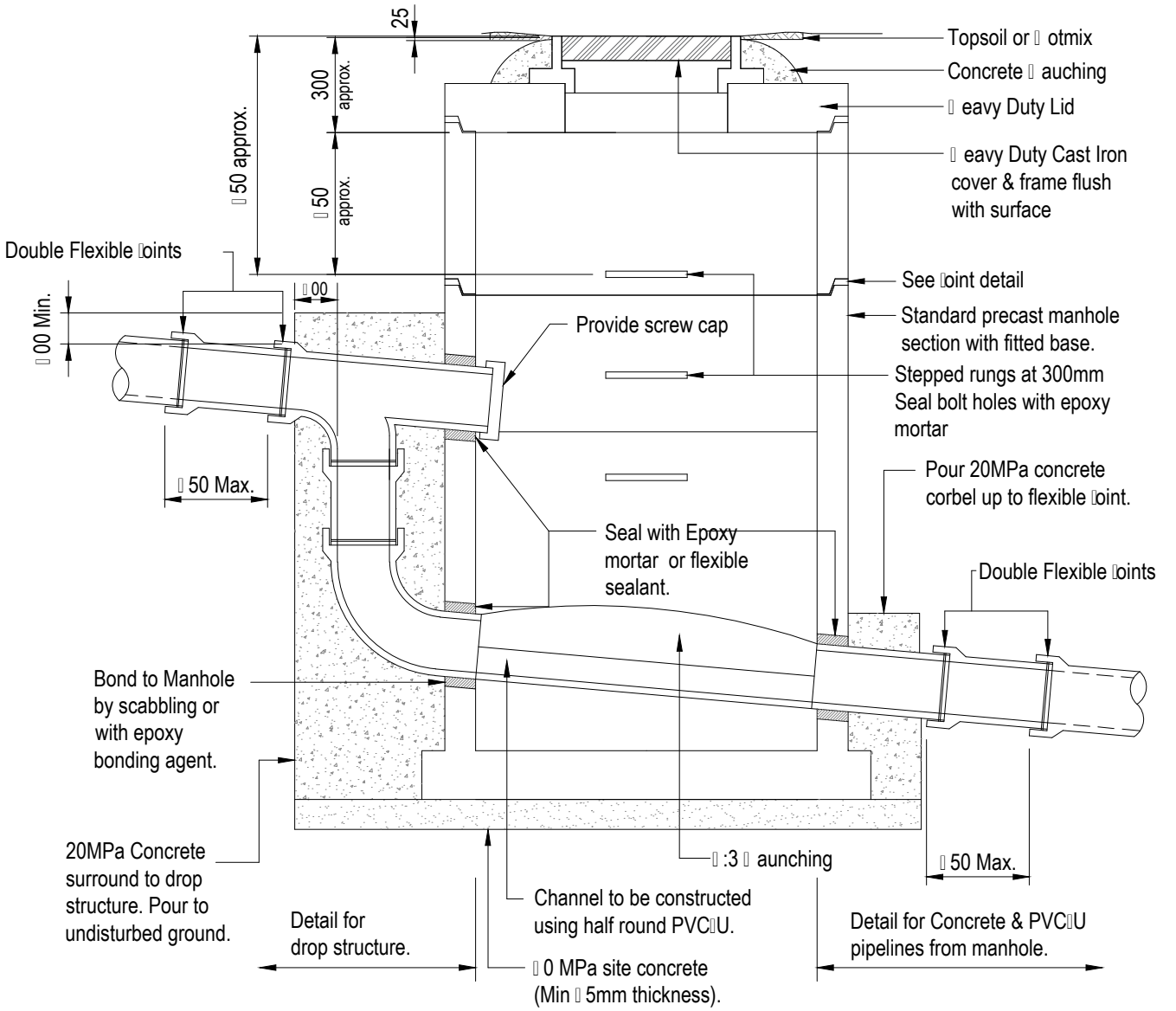
MANHOLE - WASTEWATER & STORMWATER

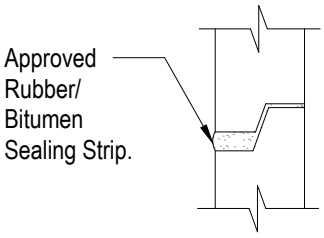
Rangitikei

Scales: Not to scale

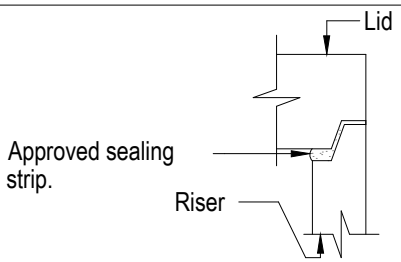
Plan No.

Sheet of Sheets

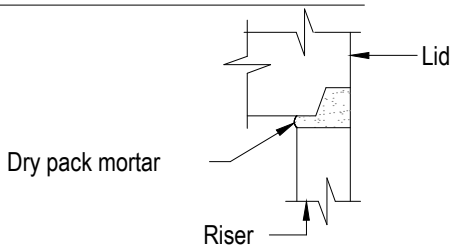




OINT DETAIL



RISERLID DETAIL
(Full height riser)



RISERLID DETAIL
(Riser shortened)

E TERNAL DROP MAN OLE WASTEWATER

Rangitikei
UNSPOILT...

Scales: Not to scale

Plan No.

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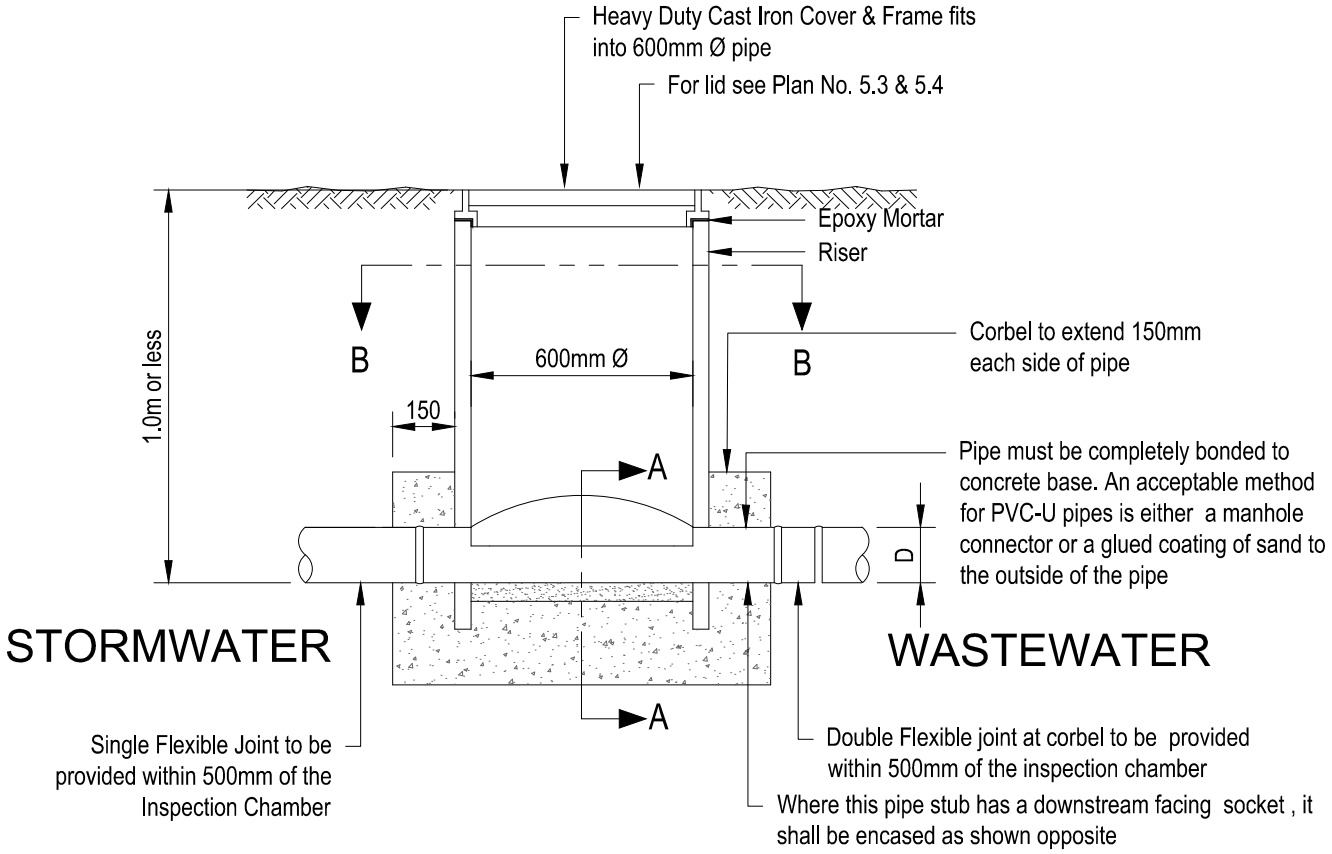
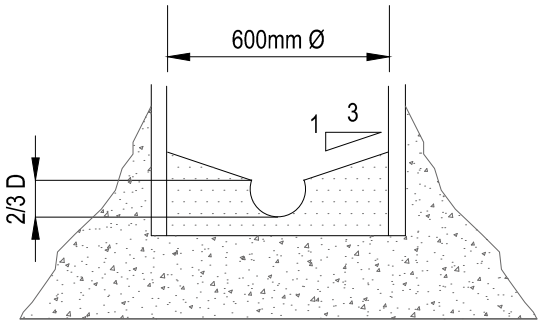
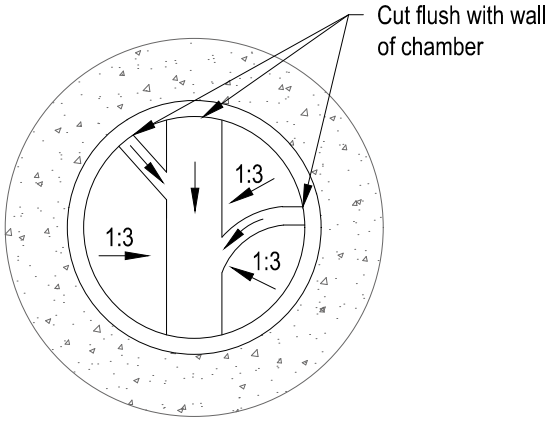
Sheet of Sheets





SECTION A-A



SECTION B-B

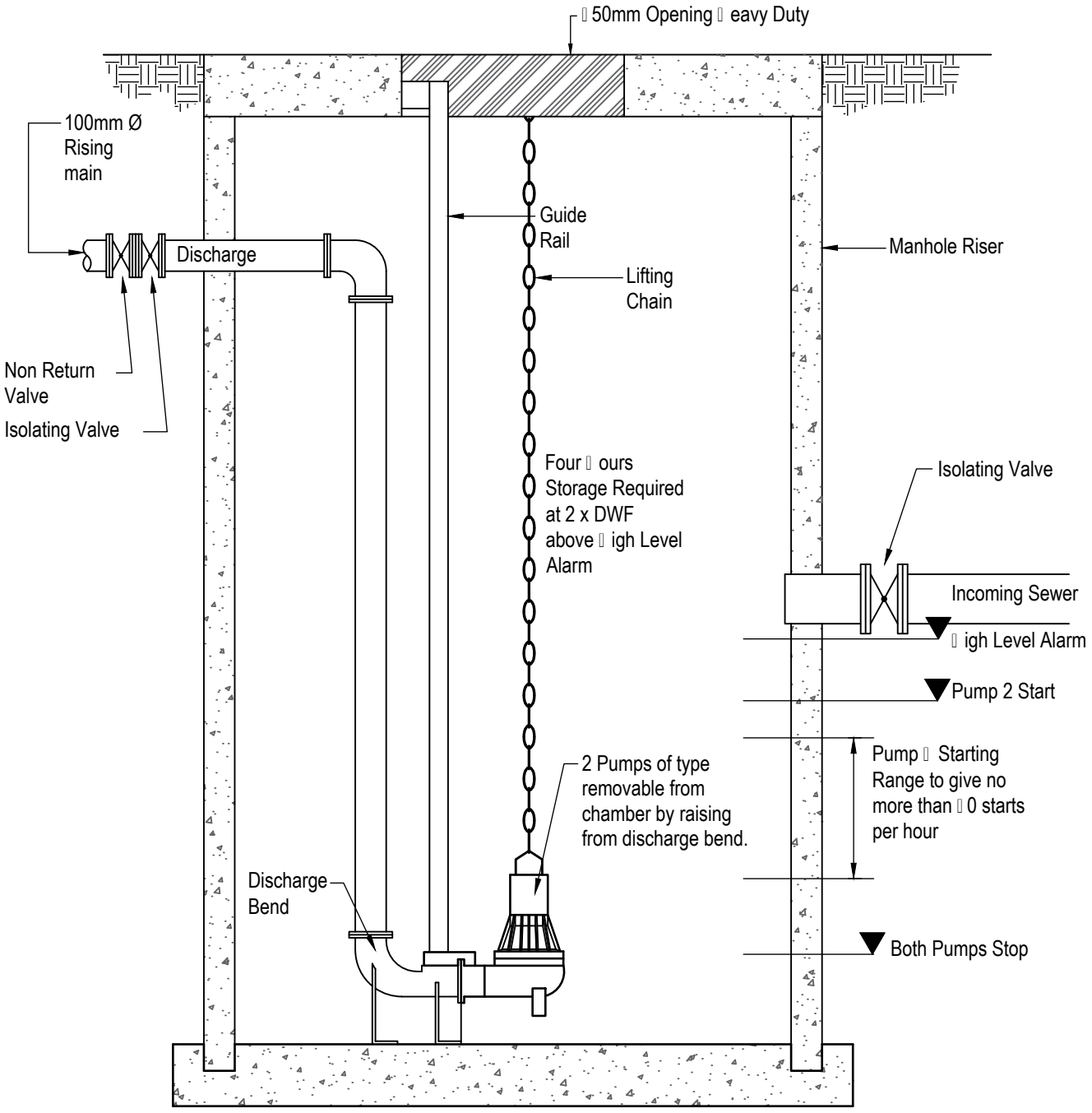
TYPICAL INSPECTION CHAMBER FOR 100mm Ø PIPE

Rangitikei

Scales: Not to scale

Plan No.

Sheet of Sheets



TPICAL WASTEWATER PUMP STATIONLEVEL MONITORING

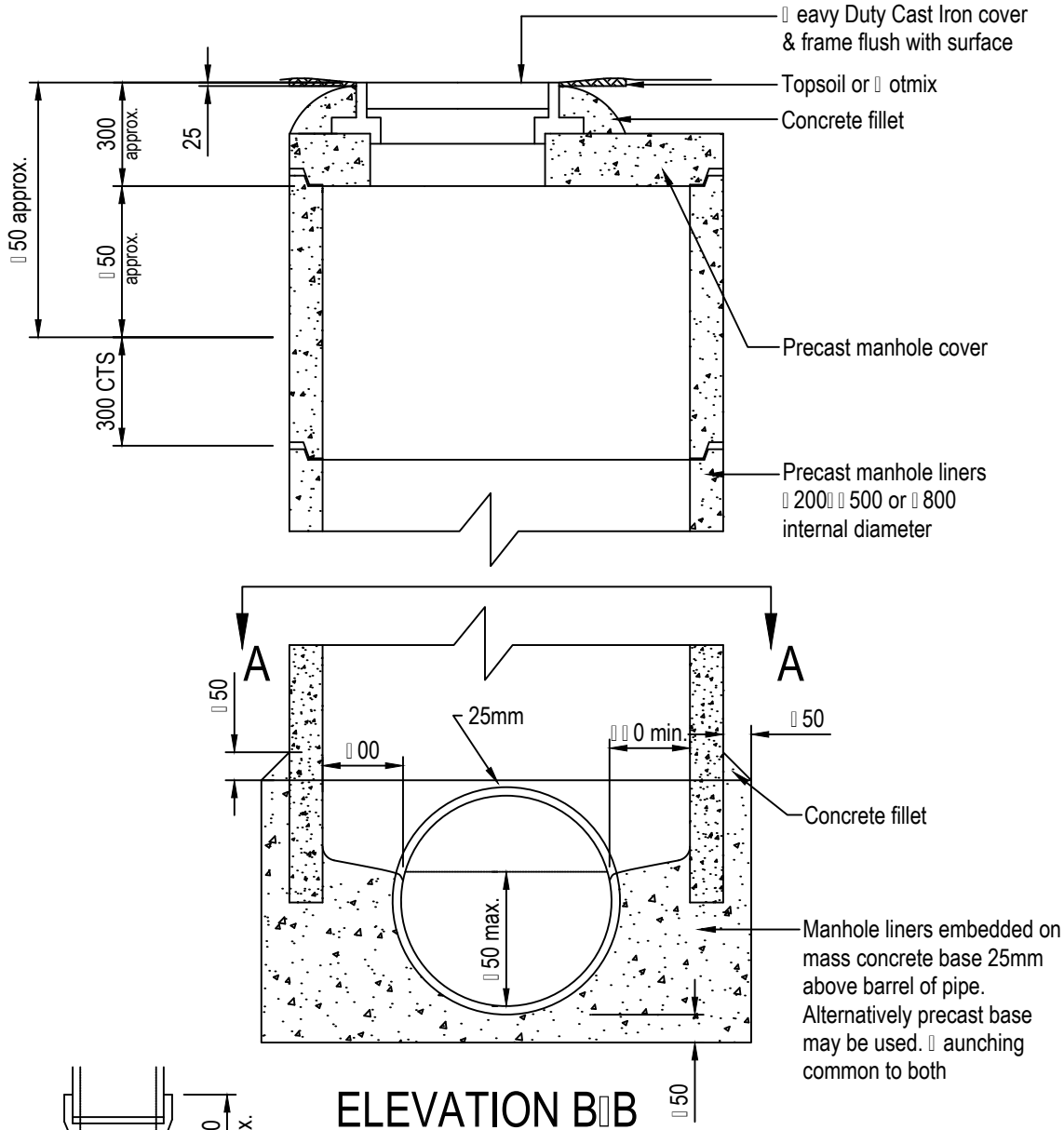
Rangitikei

Scales: Not to scale

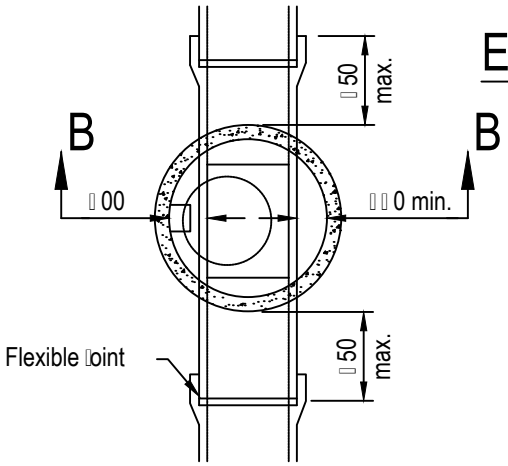
Plan No.

5.6

Sheet of Sheets



ELEVATION B B



PLAN A A

NOTES:

1) 200 500 OR 800 dia. liners should be selected having regard to the configuration of bends and unctions within the manhole.

2) The chosen si e of liners may need to be offset from the centreline of the pipe to accommodate bends or unctions.

MANHOLE FOR LARGE DIA. PIPES - 750 to 1050mm

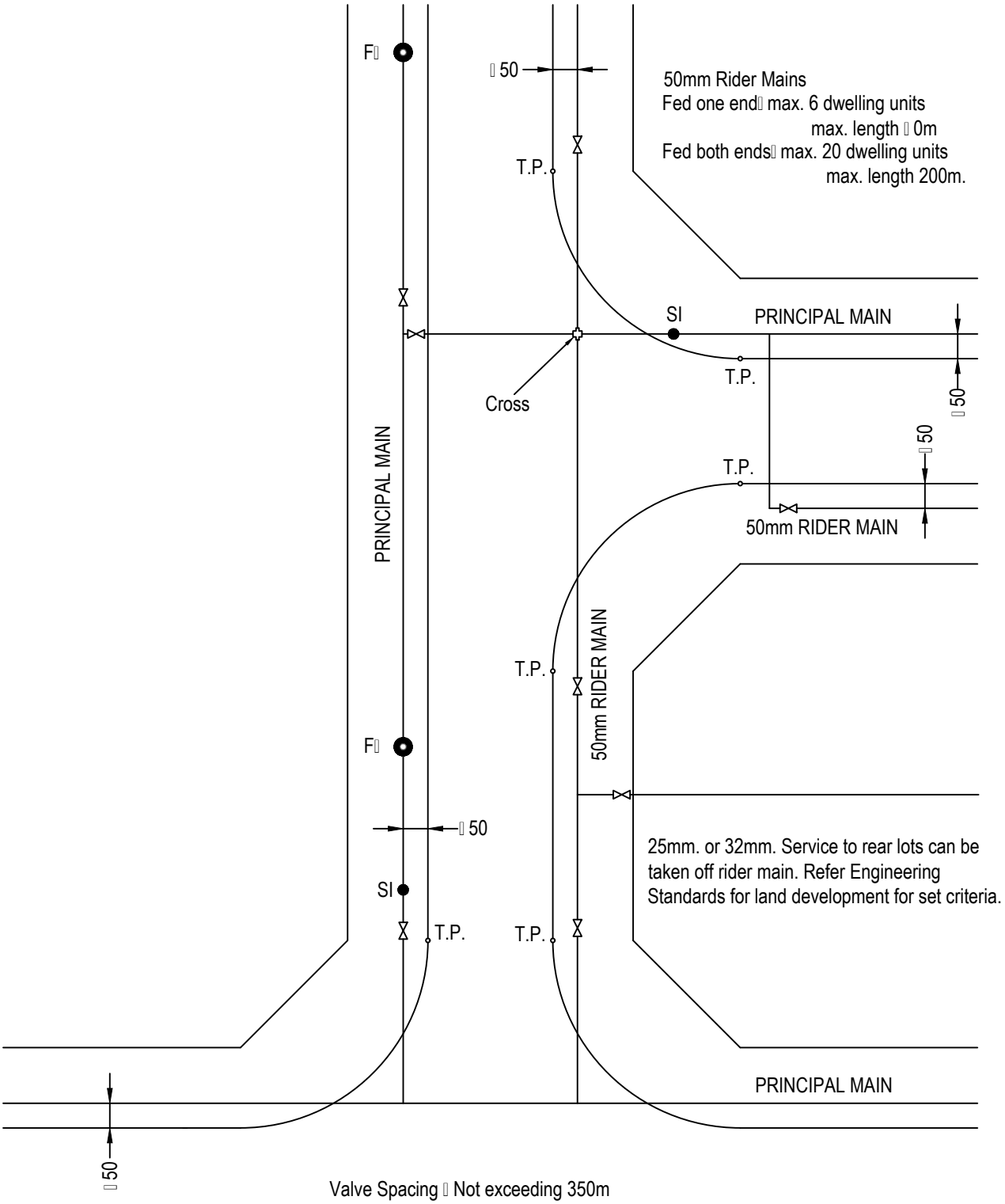
Rangitikei
UNSPOILT...

Scales: Not to scale

Plan No.

5.

Sheet of Sheets



Valve Spacing Not exceeding 350m
Fire ydrant Spacing
Not exceeding 35m Residential Streets
Not exceeding 0m Business and Industrial Street
SI Swab Inlet

LA OUT OF VALVES AND FIRE DRANTS

Rangitikei
UNIQUELY...

Scales: Not to scale

Plan No.

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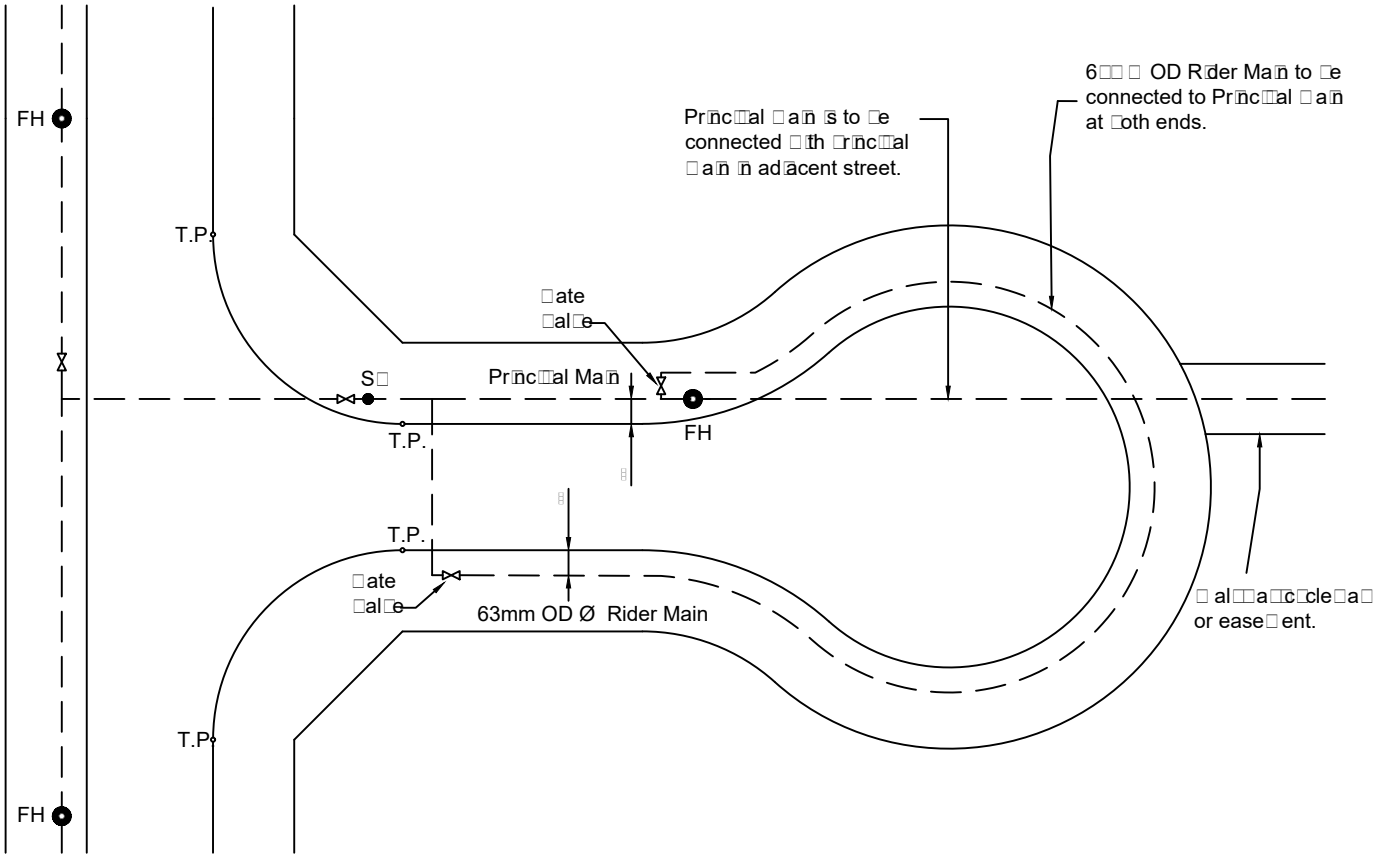
Sheet of Sheets



LAYOUT OF WATERMAINS IN CUL DE SAC

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UNSPOILT...

Scales: Not to scale

Plan No.

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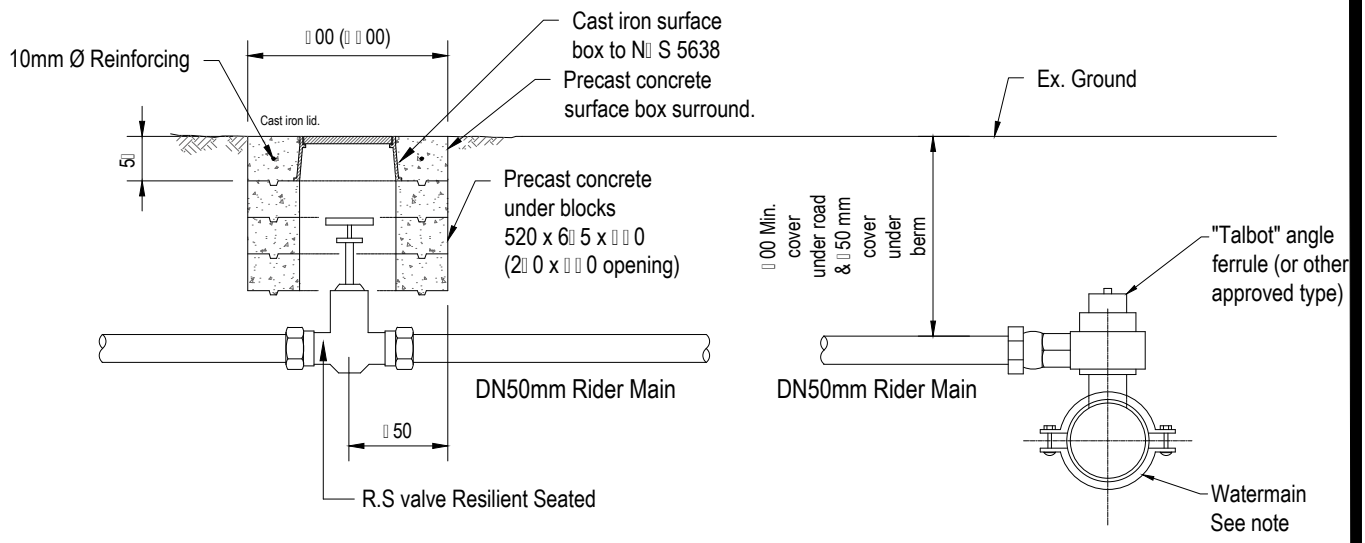
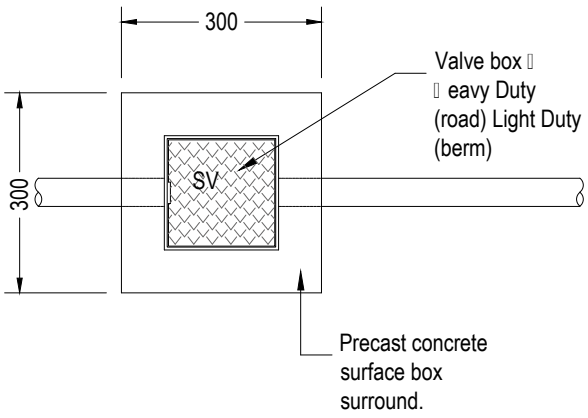
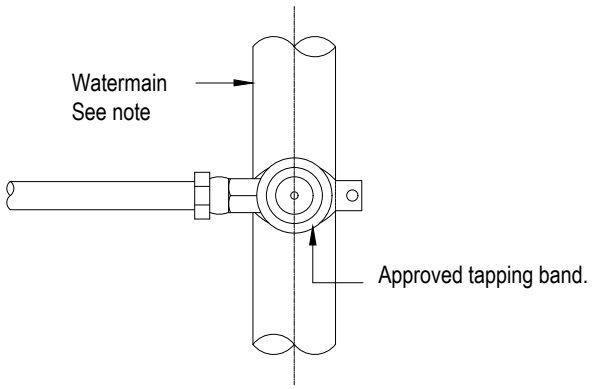
Sheet of Sheets



SECTIONAL ELEVATION





PLAN

NOTE:

Principle Main connections: 00mm: As Shown

50mm: 225mm: Use Gibault oint with 50mm take off placed vertical. 90° bend required.

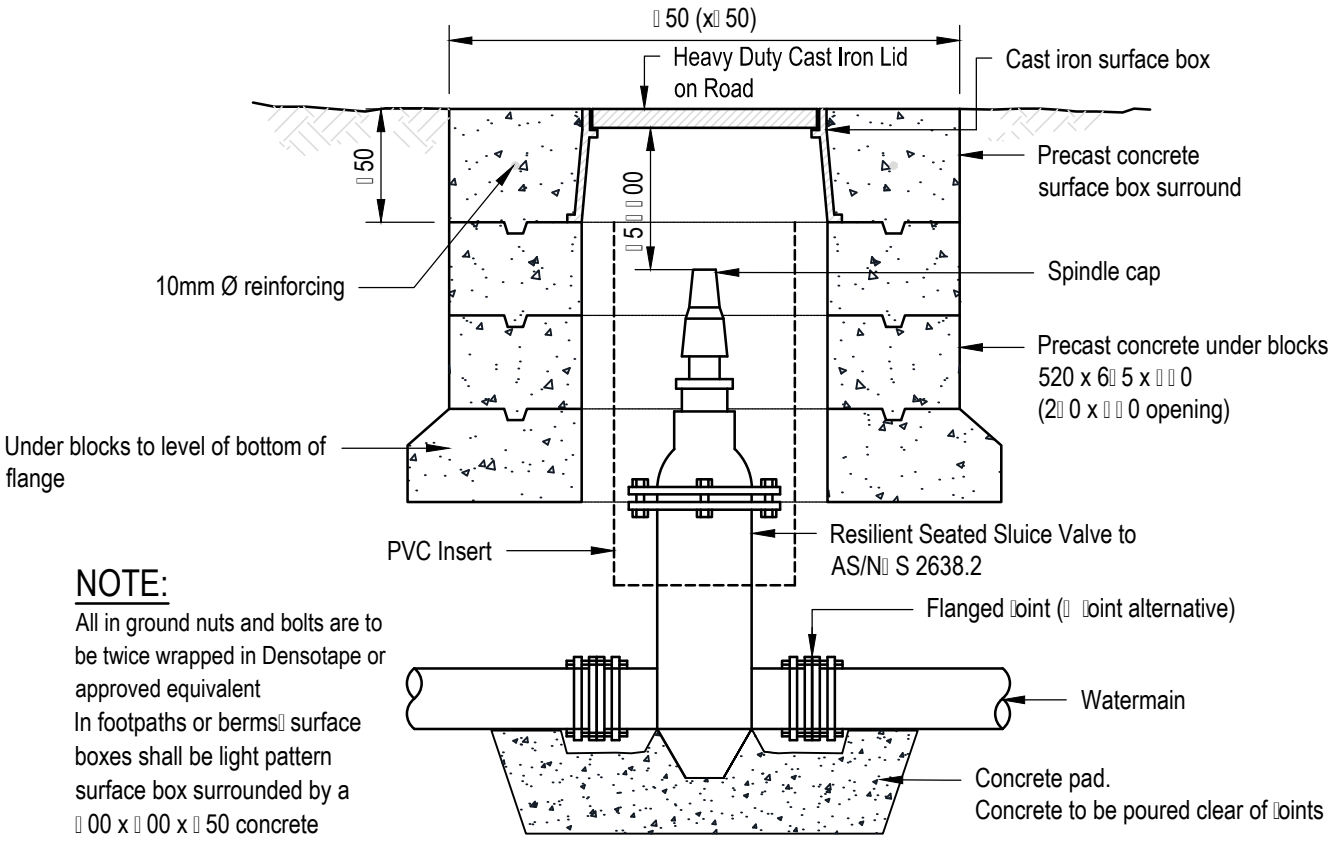
DN50mm RIDER MAIN OR R.O.W. SERVICE CONNECTION

Rangitikei

Scales: Not to scale

Plan No. 6.3

Sheet of Sheets

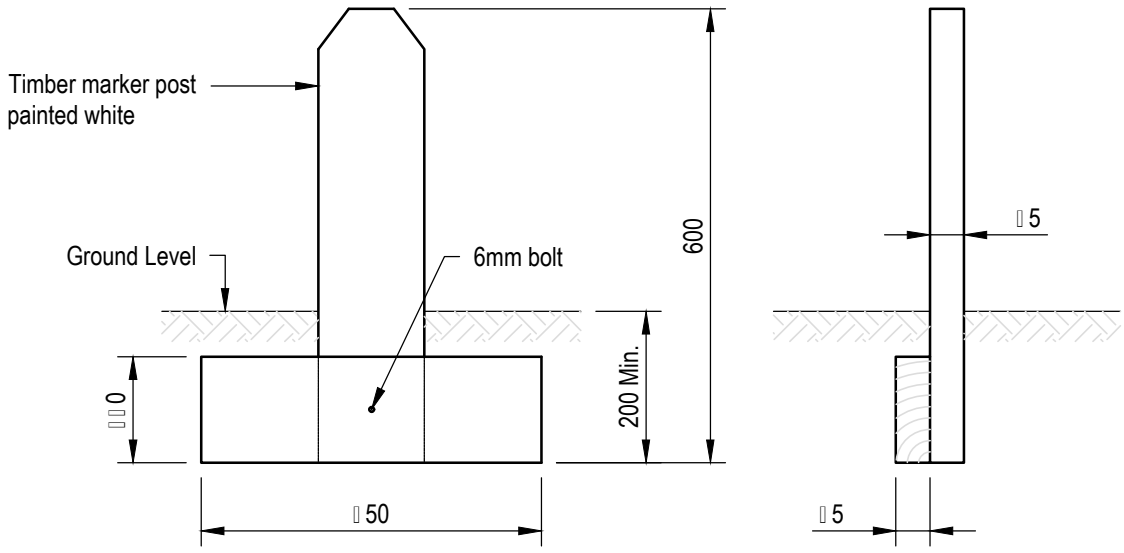


NOTE:

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 00 x 00 x 50 concrete surround.

SLUICE VALVE INSTALLATION FOR CARRIAGEWA S



VALVE MAR ER INSTALLATION

SLUICE VALVE AND MARKER INSTALLATION

Rangitikei

Scales: Not to scale

Plan No.

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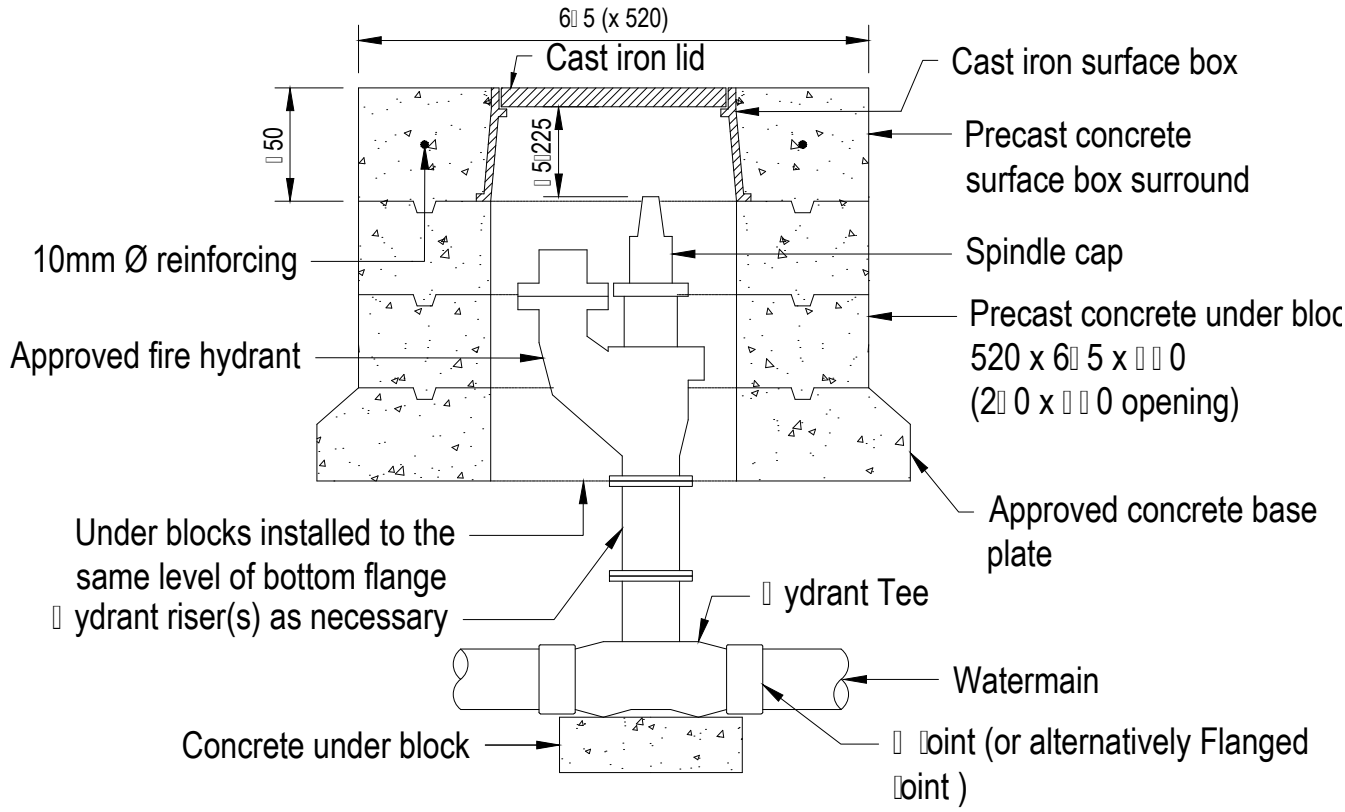
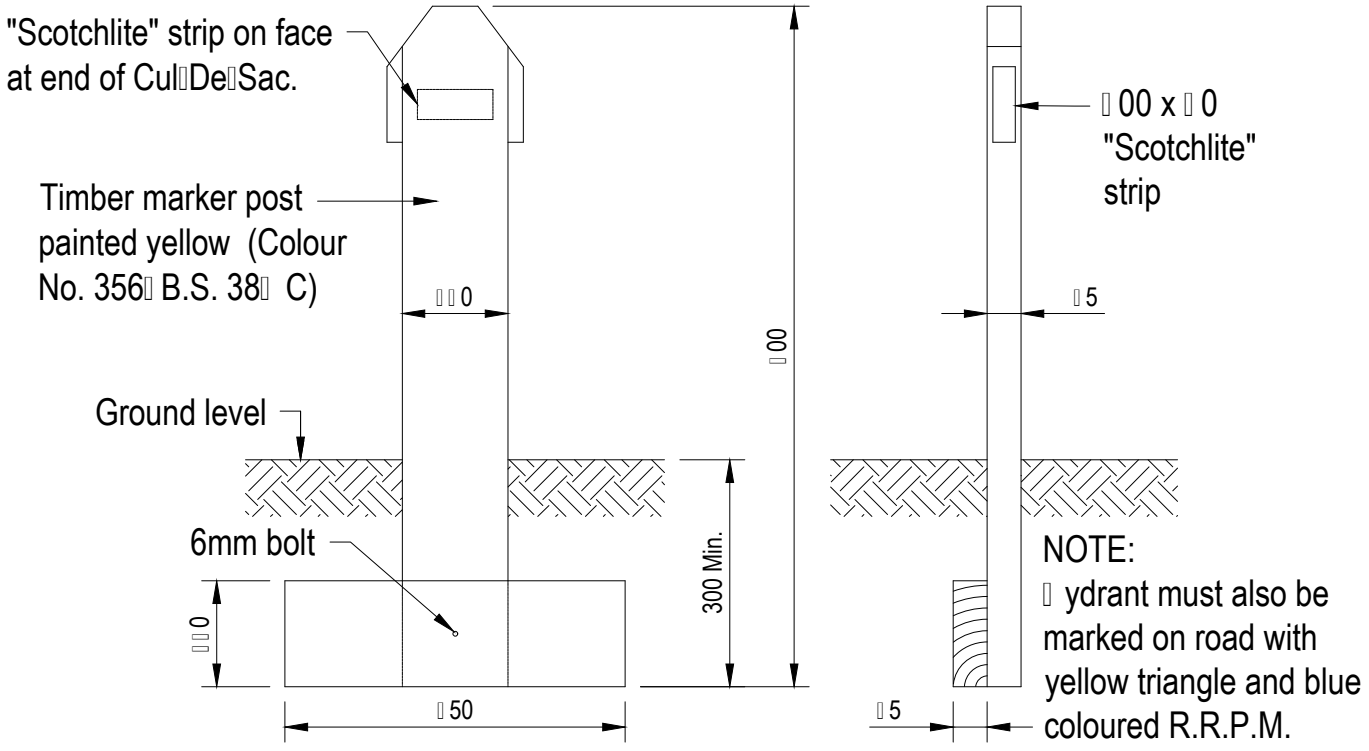
Sheet of Sheets



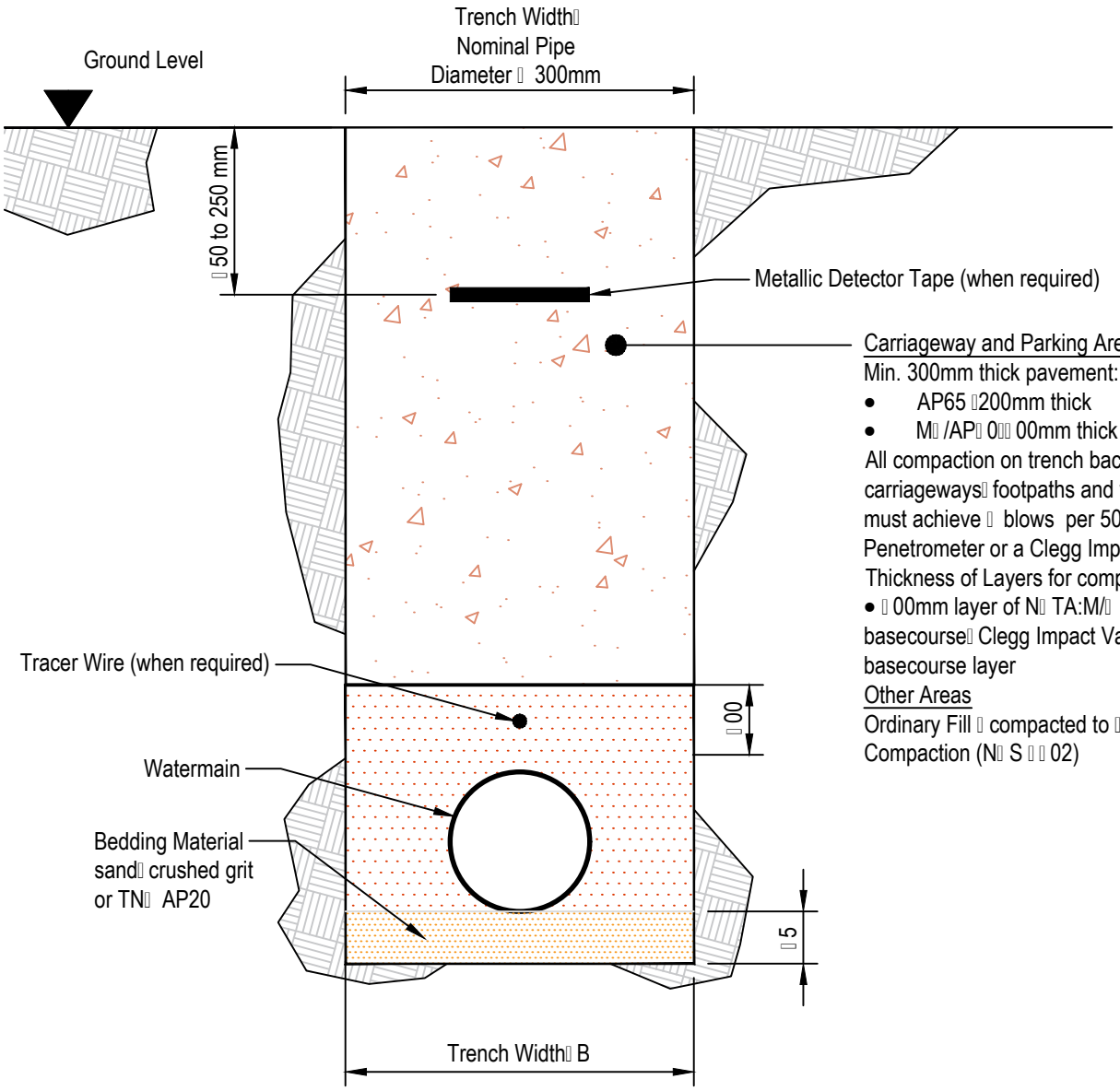
□ □ DRANT INSTALLATION



□ □ DRANT MAR□ ER INSTALLATION

HYDRANT AND MARKER INSTALLATION

Rangitikei UNSPOILT...		Scales: Not to scale Plan No. 6.5 Sheet of Sheets



Carriageway and Parking Areas

Min. 300mm thick pavement:

- AP65 200mm thick
- M /AP 0 00mm thick

All compaction on trench back filling in the carriageways footpaths and vehicle crossings must achieve blows per 50mm with Scala Penetrometer or a Clegg Impact value 0

Thickness of Layers for compaction 50mm

- 00mm layer of N TA:M/ AP 0 basecourse Clegg Impact Value 0 at top of basecourse layer

Other Areas

Ordinary Fill compacted to 5 Standard Compaction (N S 02)

STANDARD WATER MAINS LA ING DETAILS

ITEM	COVER
Mains under carriageways	00mm (Min.)
Mains under berms and footpaths	50mm (Min.)
Rider mains under carriageways and berms	50mm (Min.)
ydrant spindle	5mm (Min.) and 225mm (Max.)
Valve spindle	5mm (Min.) and 00mm (Max.)
Service pipes under carriageways	00mm (Min.)
Service pipes under berms and footpath	50mm (Min.)
Service pipes at road boundary	300mm (Max.)

WATERMAIN - PIPE LAYING DETAILS

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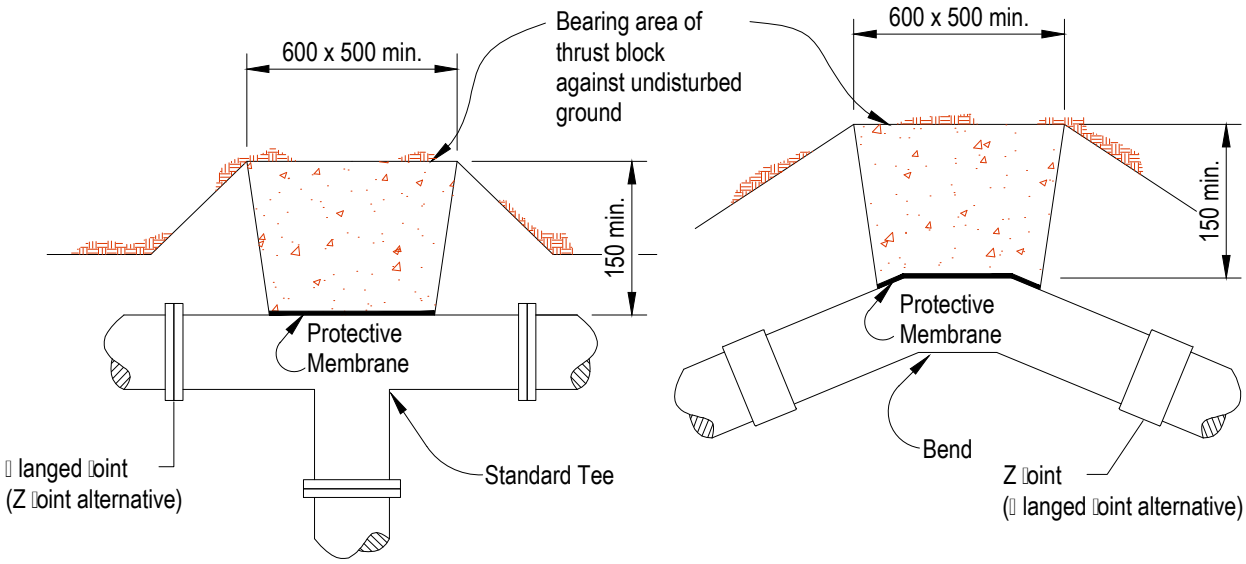
Scales: Not to scale

Plan No.

6.6

Sheet of Sheets



STANDARD THRUST BLOC S
OR 100mm Ø ATERMAIN

WATER MAIN - THRUST BLOCK DETAILS

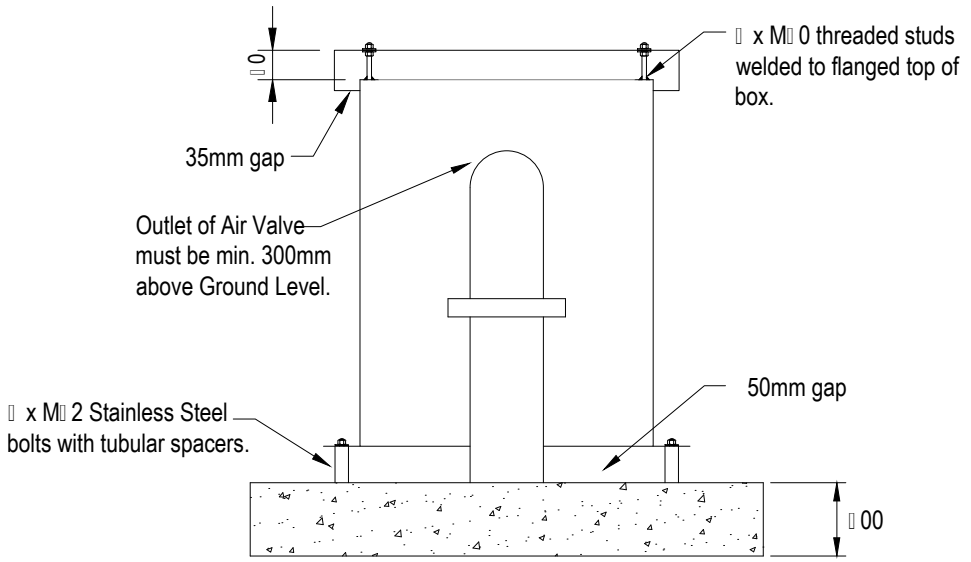
Rangitikei

Scales: Not to scale

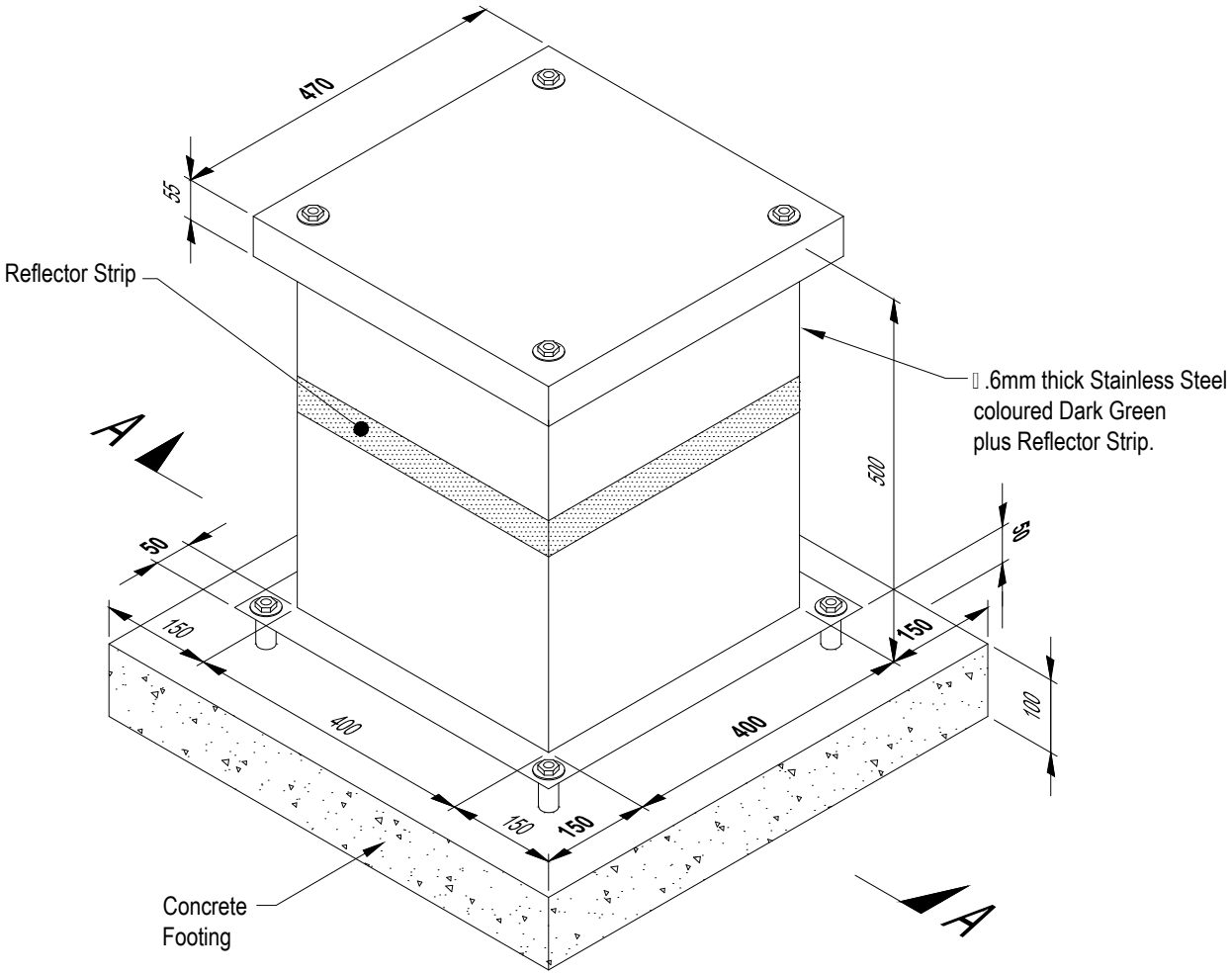
Plan No.

6.6.

Sheet of Sheets



SECTION A□A



AIR VALVES BOX BLOCK DETAILS

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UNIQUELY...

Scales: Not to scale

Plan No.

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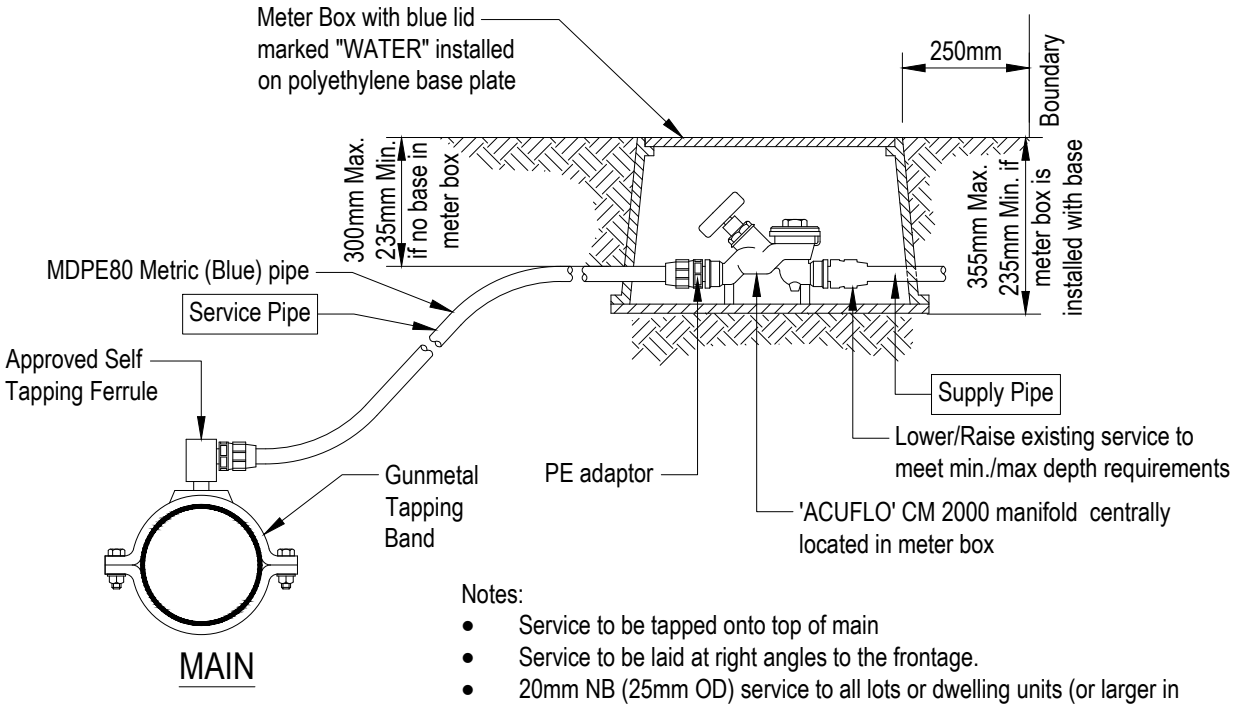
Sheet of Sheets



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)

SERVICE CONNECTION DETAILS TO MAIN & RIDERMAIN

Rangitikei
UNSPOILT...

Scales: Not to scale

Plan No.

6.8

Sheet of Sheets