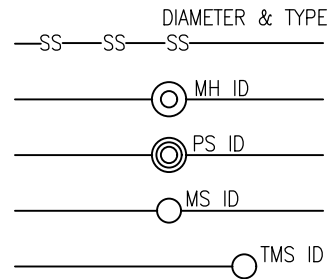


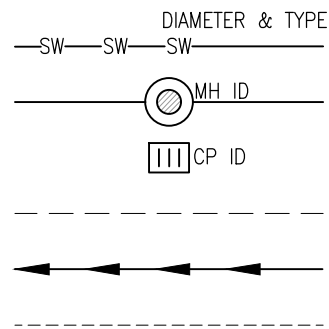
Sewer Reticulation

- Sewer Lines
- Sewer Manholes
- Pump Station
- Maintenance Shaft
- Terminal Maintenance Shaft



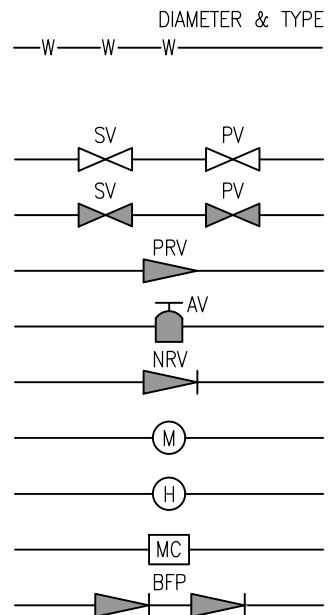
Stormwater Reticulation

- Stormwater Lines
- Stormwater Manholes
- Cesspit/Sump
- Subsoil Drain
- Watercourse
- Limit of Catchment Area



Water Reticulation

- Water Lines
- Sluice & Peet Valve
 - Normally open
 - Normally closed
- Pressure Reducing Valve
- Air Valve
- Non Return Valve
- Bulk Meter
- Hydrant
- Multi Chamber
- Back Flow

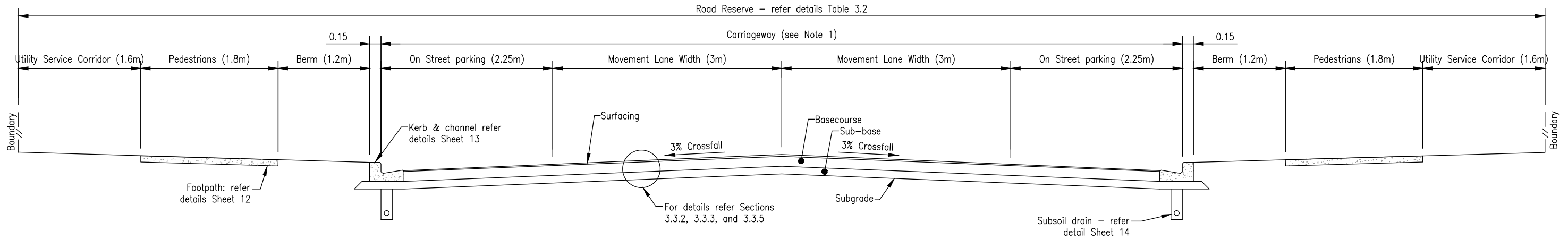


STANDARD SYMBOLS

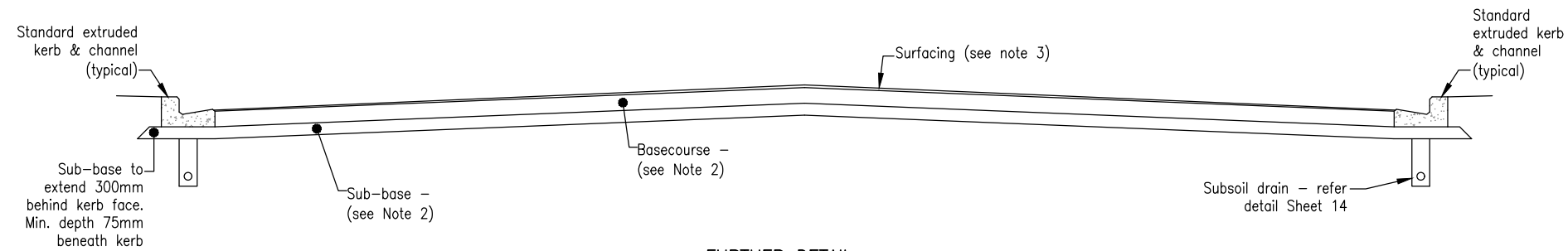


FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

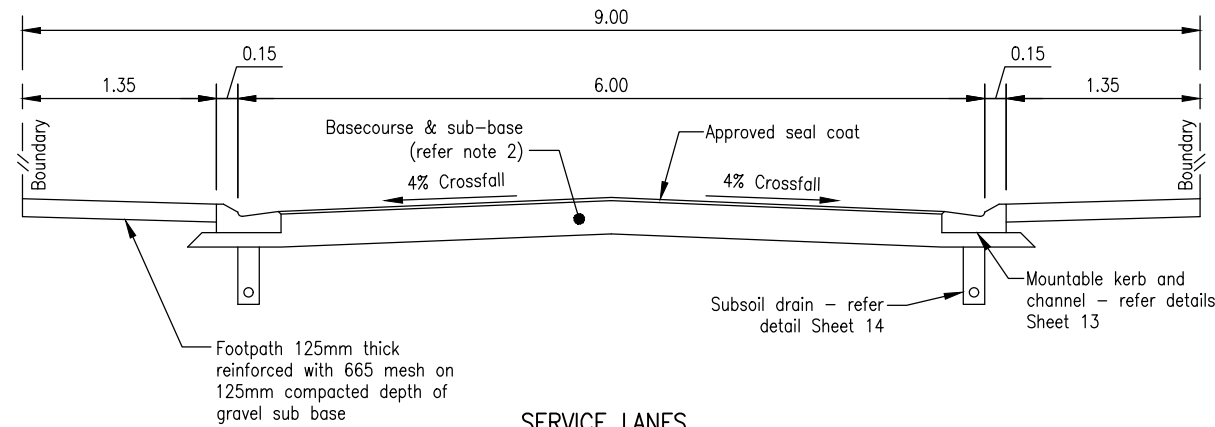
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| Date: | FEB 2021 |
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| SHEET No. | 1 |



TYPICAL ACCESS ROAD CROSS SECTION
NTS



FURTHER DETAIL
NTS



SERVICE LANES
1:50 (A4)

NOTES:

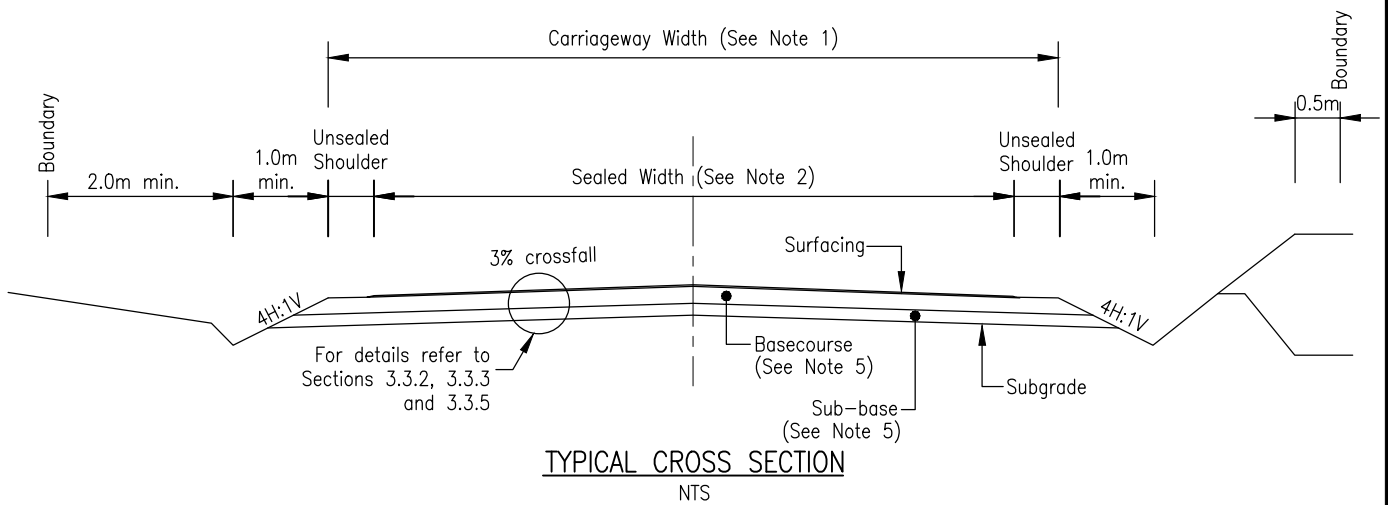
1. Refer to Table 3.2 for carriageway details.
2. Pavement thickness to be determined by the designer in accordance with Section 3.2.12.
3. Refer to Section 3.2.13 for details.
4. Privateways in industrial developments shall be formed to service lane standards.

URBAN ROAD & SERVICE LANE DETAILS



FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

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NOTES:

1. Refer to Table 3.3 and Table 3.4 for carriageway details.
2. Sealed width = movement lane width + sealed shoulder width (table 3.3 and table 3.4)
3. The road reserve shall be located 0.5 metres outside the top and/or bottom of batter slopes unless the slope of the earthworks is 1V:5H (20%) or less in which case it can be located at the minimum distance from the centreline.
4. Footpaths shall be provided in accordance with Section 3.2.21
5. Pavement thickness to be determined by the designer in accordance with Section 3.2.12
6. All rural roads shall be sealed except where specifically exempted by the District Council.

RURAL ROAD DETAILS



FAR NORTH DISTRICT COUNCIL
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| SHEET No. | 3 |

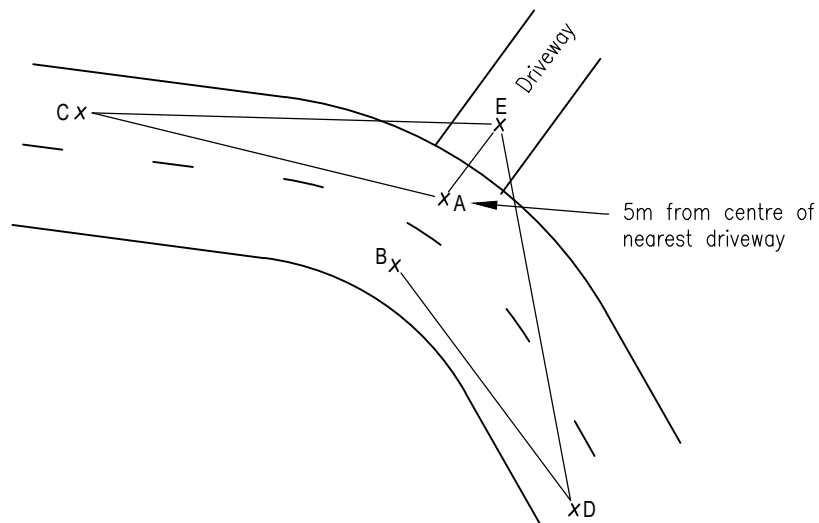
MINIMUM SIGHT DISTANCE FROM VEHICLE ENTRANCES (m)

| Posted Speed Limit (km/hr) | Frontage Transport Corridor Classification | | |
|----------------------------|--|-------------------------------|---------------------|
| | Access (incl. Low Volume) | Primary & Secondary Collector | Arterial & Regional |
| 40 | 45 | 50 | 90 |
| 50 | 60 | 70 | 120 |
| 60 | 85 | 90 | 150 |
| 70 | 105 | 120 | 185 |
| 80 | 135 | 145 | 220 |
| 90 | 160 | 175 | 265 |
| 100 | 195 | 210 | 305 |

Notes:

1. The sight distances are based on Austroads Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections (Equation 1 and 2).
2. Where there is an accepted speed survey, the operating speed and relevant equation may be used to calculate the minimum sight distance.
3. Access transport corridor sight distances are calculated based upon Approach Sight Distance (ASD) with Reaction (Rt) time of 1.5 seconds.
4. Collector transport corridor sight distances are calculated based upon ASD with Rt of 2 seconds.
5. Arterial and Regional transport corridor sight distances are calculated based upon Safe Intersection Sight Distance (SISD) with Rt of 2 seconds.
6. Grade is based on 0%. Austroads provides adjustment factors for grades.

SIGHT DISTANCE MEASUREMENT



Note:

1. Derived from the New Zealand Transport Agency, "Road and Transport Standards: Guidelines for Visibility at Driveways."

| | |
|---|--|
| There should be lines of clear sight from the driver's eye height (1.15m above ground level) along the lines detailed below. | |
| Lines AC and BD | All vehicle crossings on all transport corridors |
| Lines EC and ED (no permanent obstructions, exclude parked vehicles which might obstruct these sight lines occasionally). | All vehicle crossings on arterial, collector and access transport corridors. |
| Lines EC and ED (no obstructions, parked vehicles not excluded). | All vehicle crossings on regional transport corridors. |
| Points C and D are established by measuring the sight distance from the above Table along the centre of the appropriate lane from points A and B. For practical purposes A and B can be taken as opposite the centre of the driveway. | |

TRAFFIC SIGHT LINES FOR VEHICLE ENTRANCES

Date: JAN 2021

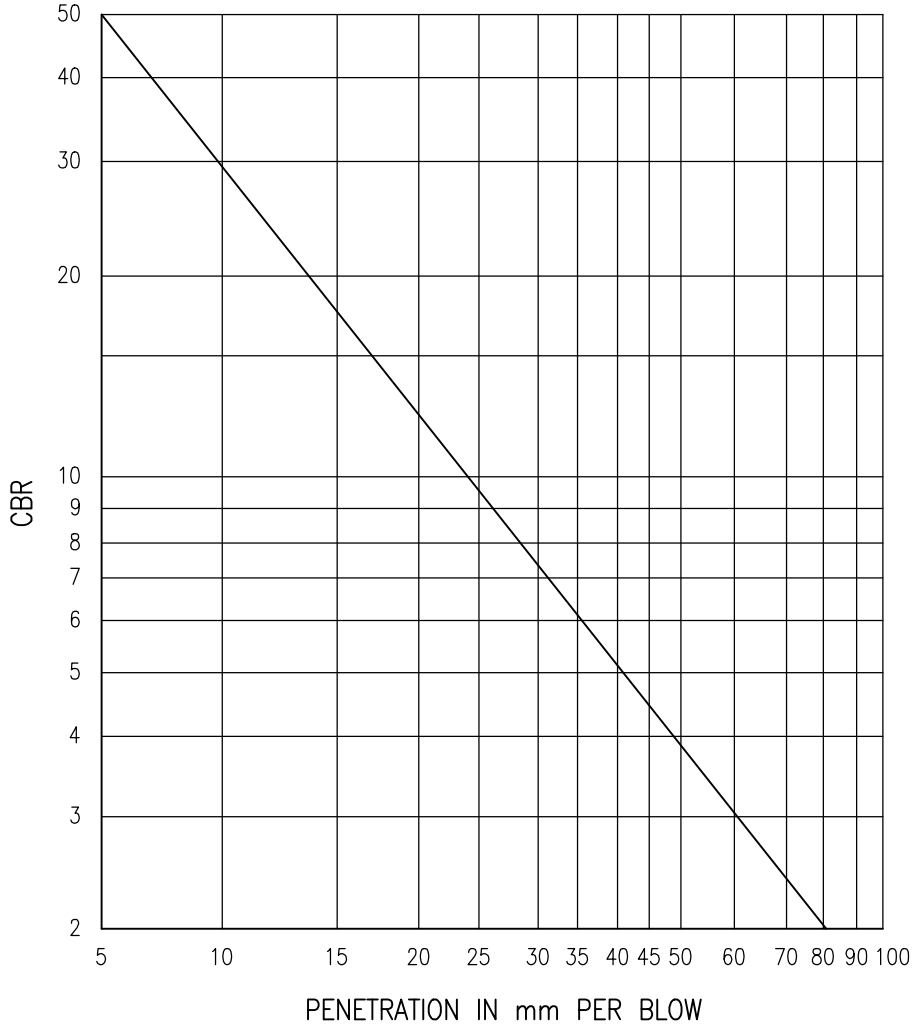
Revision: 0.1

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SHEET No. 4



FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS



SCALA PENETROMETER CHART FOR C.B.R. VALUES (Subgrade)

SCALA PENETROMETER CHART
(FOR ALL ENVIRONMENTS)



FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

Date: JAN 2021

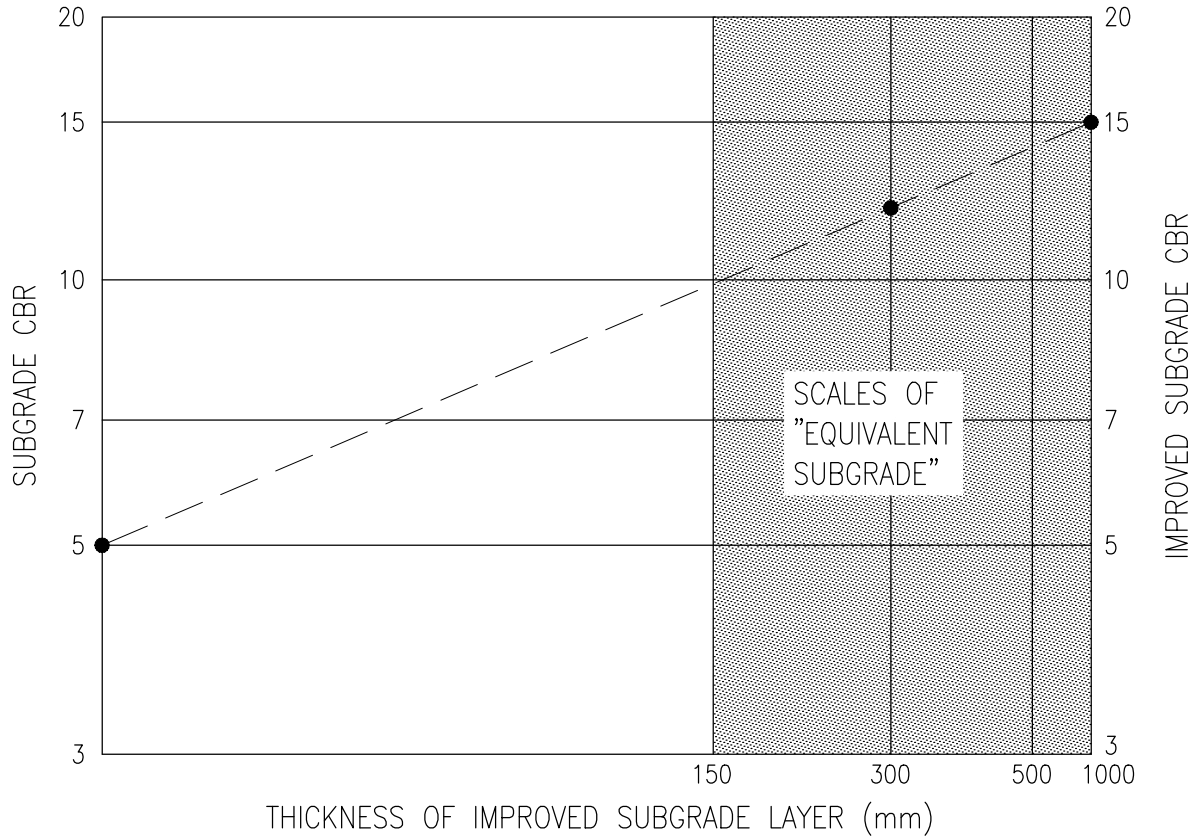
Revision: 0.1

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SHEET No. **5**

Example:

Subgrade of CBR 5 will be overlaid by 300mm layer of CBR 15 material. Using the methodology below, the equivalent CBR used to represent the two subgrade layers for the design of the pavement is a CBR of 12.



NOMOGRAPH FOR DETERMINING THE EFFECT OF SUBGRADE IMPROVEMENT LAYERS.
(GRANULAR OR STABILISED SUBGRADE IMPROVEMENT)

Methodology

To use this nomograph:

1. Plot the improved subgrade on the right hand side axis and the underlying design subgrade on the left hand side axis.
2. Join these two points for an inclined line.
3. Rule a vertical line for the desired thickness of the improved subgrade layer from the base axis.
4. Where the two lines intersect is the equivalent subgrade strength.

Note:

Also applicable where weak layers are encountered under an upper layer of stronger material within 1.0m below the design subgrade level.

EQUIVALENT SUBGRADE CBR DESIGN CHART
(FOR ALL ENVIRONMENTS)



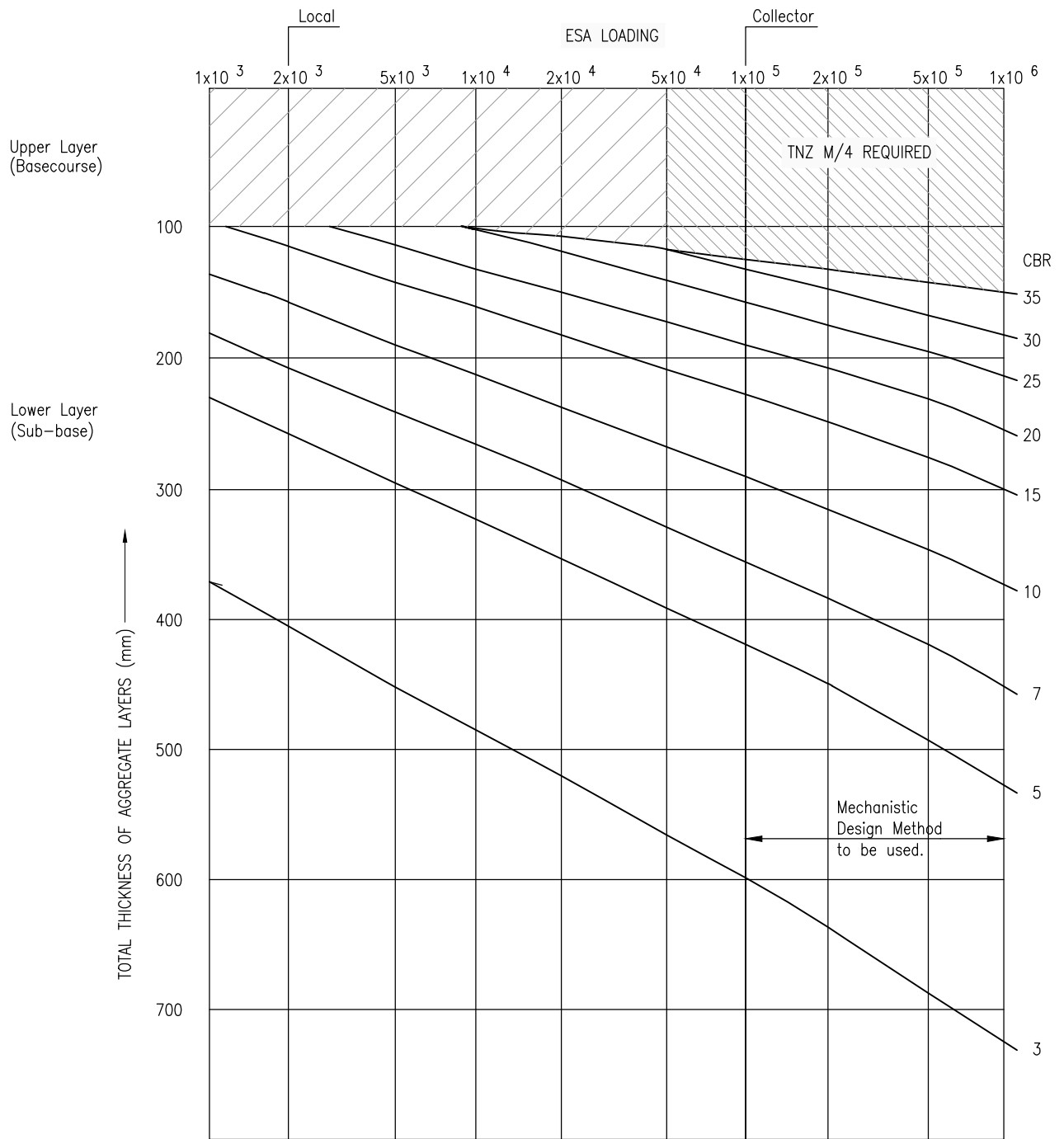
FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

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Scale: AS SHOWN

SHEET No. **5A**



NOTES:

1. Collector, arterial and industrial streets shall be the subject of specific design based on an estimate of their E.S.A. (Equivalent Standard Axle) loading, using a mechanistic design method.
2. The curves give minimum aggregate thickness above the subgrade and greater depths of higher quality materials may be necessary.
3. The minimum aggregate thickness for roads shall be 200mm.
4. CBR testing is required to confirm designed aggregate depths.
5. Refer to Sections 3.4.5 and 3.5.1 for design and construction details.

DESIGN CHART FOR FLEXIBLE PAVEMENTS
FOR ALL ENVIRONMENTS



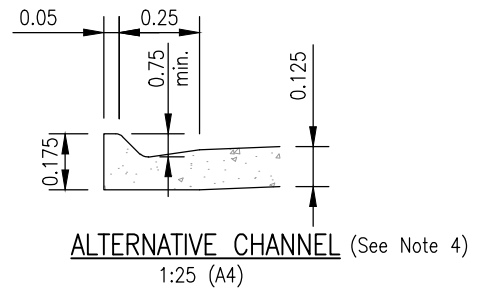
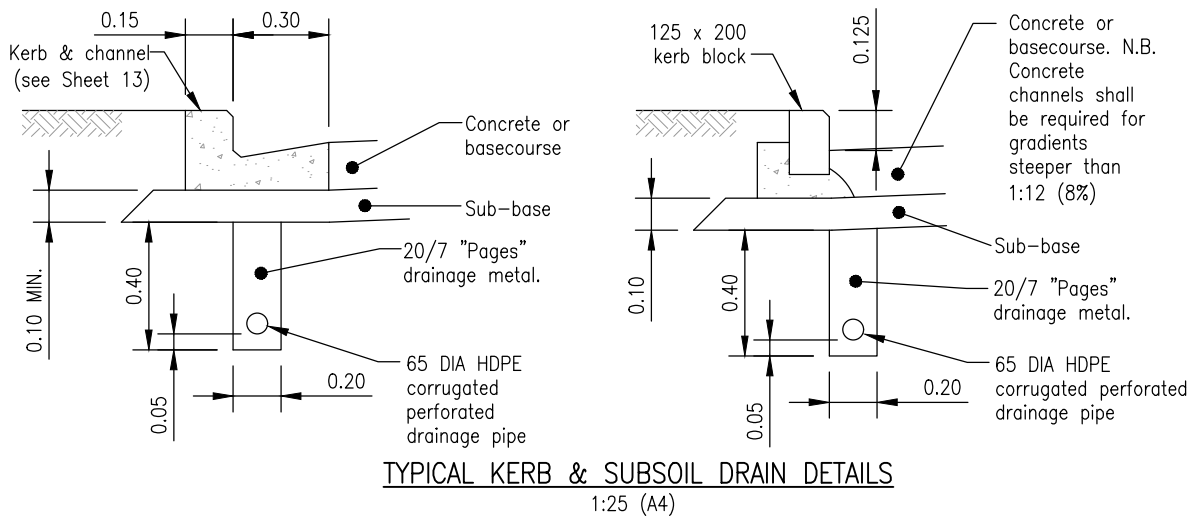
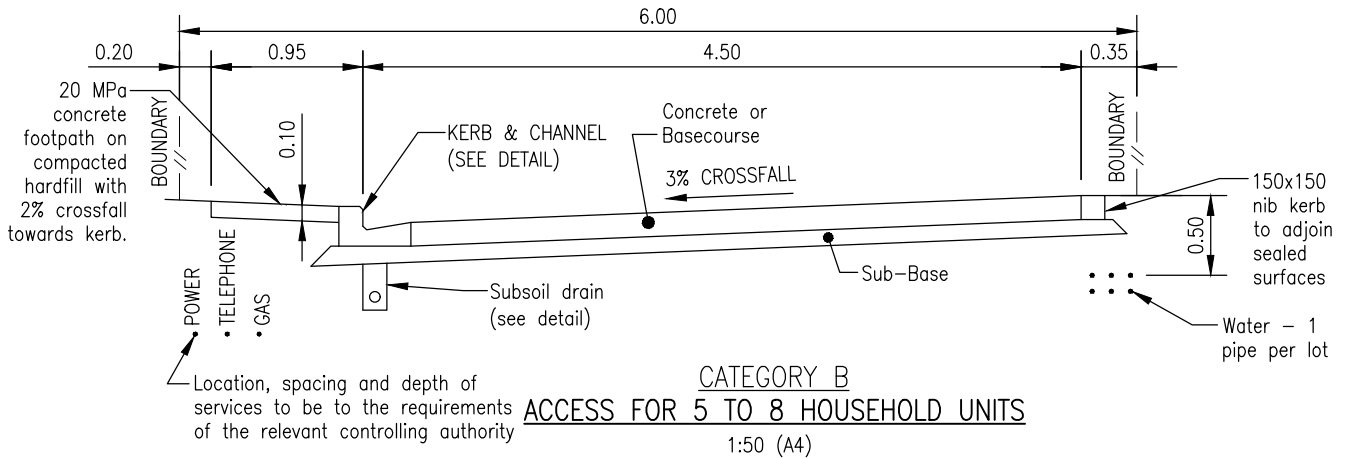
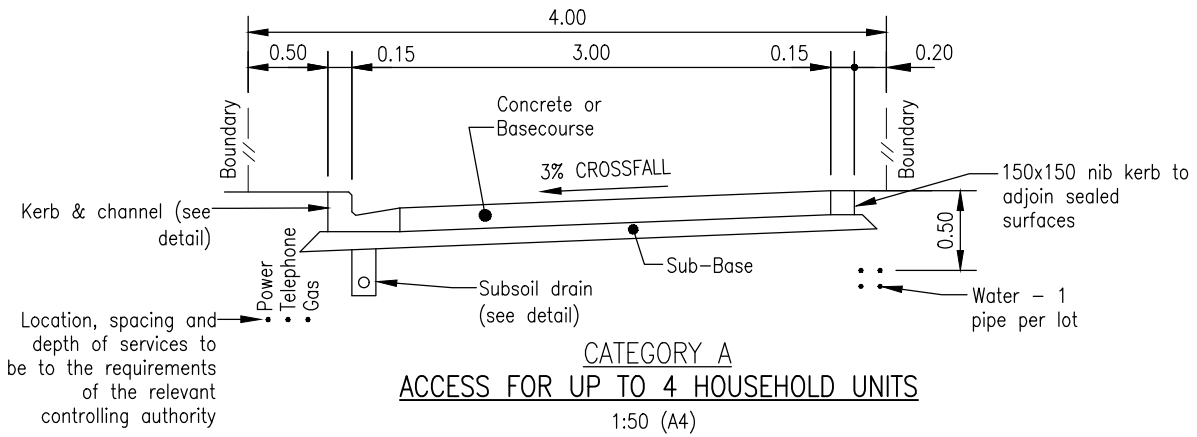
FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

Date: JAN 2021

Revision: 0.1

Scale: AS SHOWN

SHEET No. **6**



NOTES:

1. If more than one environment contiguous to the site, then the more stringent standard applies.
2. Note that privateways in industrial developments shall be formed to the service lane standard of Sheet 2.
3. Refer also to Table 3.13 and Section 1.2.28..
4. For further notes refer to Sheet 8.

URBAN PRIVATEWAY DETAILS



FAR NORTH DISTRICT COUNCIL
 ENGINEERING STANDARDS

| | |
|-----------|----------|
| Date: | JAN 2021 |
| Revision: | 0.1 |
| Scale: | AS SHOWN |
| SHEET No. | 7 |

NOTES:

The standards are minimum and may need to be increased to cope with services, topographical and drainage problems, or similar.

1. Access longitudinal gradients shall not be steeper than 1:4.5 (22.2%) unless specifically approved. the first 5m within the property shall not exceed 1:8 (12.5%).
2. Pavements shall be 30 MPa concrete 125mm thick with 665 mesh (or as approved) with construction joints @ 3.5m centres on 100mm compacted basecourse.

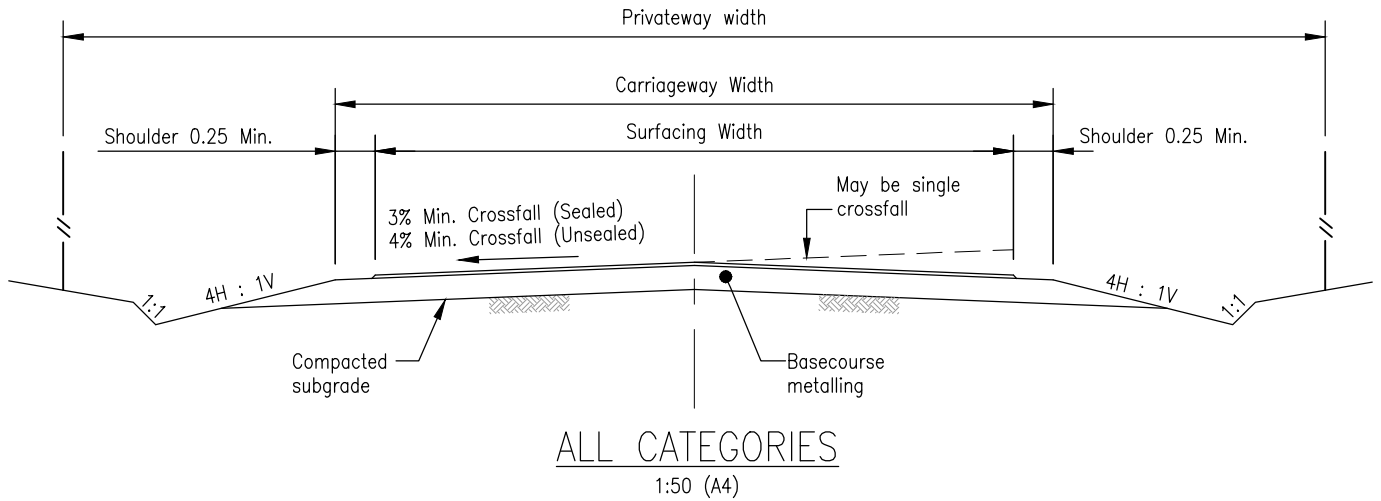
OR, Where the subgrade CBR is not less than 7 the sub-base shall be 150mm of GAP 65 with 100mm of selected blue GAP 40 basecourse with either a chip seal, or a minimum of 30mm of asphaltic concrete over a waterproofing seal coat.

OR, specifically designed by a council approved SQEP, and in particular where the subgrade CBR is less than 7.
3. If kerb blocks are used, concrete channels shall also be provided for gradients steeper than 1:12.5 (8%).
4. The alternative channel may only be used with specific approval and must be slipformed. It shall not be used in business environments.
5. Privateways with a carriageway less the 4.5m shall have passing bays at no more than 50m spacing, subject to adequate visibility, or as approved.
6. Gated privateways shall ensure that vehicles are not required to park on the road affecting through traffic.
7. Sealed surfaces may be grade 4 chip with a grade 6 dry locking coat chip rolled in within 5 hours of the application of the grade 4 chip, OR, as approved.
8. The Clegg Impact Value prior to sealing shall be not less than 40 tested at 10m intervals.
9. Concrete vehicle crossings shall comply with Sheet 19 or as approved including drainage provisions as required.
10. Privateways containing public watermains, sewers, or cables, must be of adequate width for separation of services to comply with Table 4.10, or as approved.
11. Stormwater pipes and associated installation are to comply with relevant NZ standards and the manufacturer,s requirements, be suitable for the catchment, and not less than 200mm diameter.
12. Sump grates shall be not less than 300mm x 300mm, be suitable for catchment, and vehicle loading.
13. Where an access falls towards a road, a sump is to be installed at the property boundary discharging to an approved outfall. Runoff is not to be concentrated so as to pond, flood, or cause erosion on any adjacent property, or affect pedestrian use of footpaths.
14. Cut and fill batters are to be contained within the legal access, unless otherwise approved.
15. Adequate turning & parking areas for fire appliances and service vehicles shall be provided in the vicinity of fire hydrant and sewer pump stations located within or adjacent to a privateway.

URBAN PRIVATEWAY DETAILS

FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

| | |
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| Scale: | AS SHOWN |
| SHEET No. | 8 |



NOTES:

1. If there is more than one environment contiguous to the site, then the more stringent standard applies.
2. Refer to Table 3.13 and Section 1.2.28.
3. For further notes refer to Sheet 10.

RURAL PRIVATEWAY DETAILS



FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

| | |
|-----------|----------|
| Date: | JAN 2021 |
| Revision: | 0.1 |
| Scale: | AS SHOWN |
| SHEET No. | 9 |

NOTES:

The standards are minimum and may need to be increased to cope with services, topographical and drainage problems, or similar.

1. Access longitudinal gradients shall not be steeper than 1:4.5 (22.2%) unless specifically approved. the first 5m within the property shall not exceed 1:8 (12.5%).
2. Pavements may be 30 MPa concrete 125mm thick with 665 mesh (or as approved) with construction joints @ 3.5m centres on 100mm compacted basecourse.

OR, Where the subgrade CBR is not less than 7 the sub-base may be 150mm of GAP 65 with 100mm of selected blue GAP 40 basecourse with either a chip seal, or a minimum of 30mm of asphaltic concrete over a waterproofing seal coat.

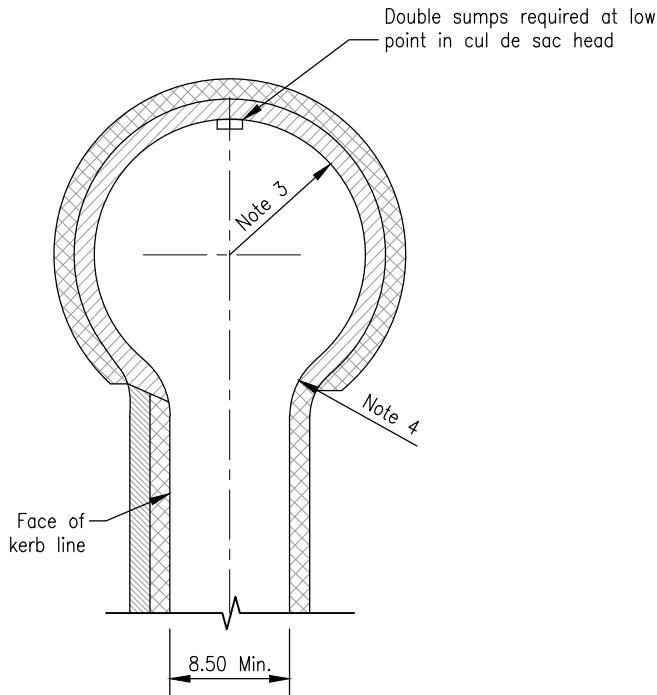
OR, specifically designed by a council approved SQEP, and in particular where the subgrade CBR is less than 7.
3. All accessways in the Living 3 environment shall be sealed. In other rural environments all accessways serving 6 lots/dwelling units or more shall be sealed and/or where the gradient exceeds 1:8 (12.5%).
4. Privateways with a carriageway less the 4.5m shall have passing bays at no more than 100m spacing, subject to adequate visibility, or as approved.
5. Gated privateways shall ensure that vehicles are not required to park on the road affecting through traffic.
6. Sealed surfaces may be grade 4 chip with a grade 6 dry locking coat chip rolled in within 5 hours of the application of the grade 4 chip, OR, as approved.
7. The Clegg Impact Value prior to sealing shall not be less than 40 tested at 20m intervals.
8. Piped vehicle crossings onto a road shall comply with Sheet 21.
9. Privateways containing public water mains, sewers, or cables, must be of adequate width for separation of services to comply with Table 4.10 or as approved.
10. Stormwater pipes and associated installation are to comply with relevant NZ standards and the manufacturer's requirements, be suitable for the catchment, and not less than 200mm diameter.
11. Any sump grates shall be not less than 300mm x 300mm, be suitable for catchment, and vehicle loading.
12. Where an access falls towards a publicly maintained road, controlled stormwater disposal is required that prevents erosion or flooding within the road boundaries from the access.
13. Approved concrete dished channels, kerb and channelling, concrete or stonework headwalls and aprons, wooden flume outfalls, or similar, are to be installed for discharges into controlled and stable outfalls.
14. Cut and fill batters are to be contained within the legal access, unless otherwise approved.




RURAL PRIVATEWAY DETAILS



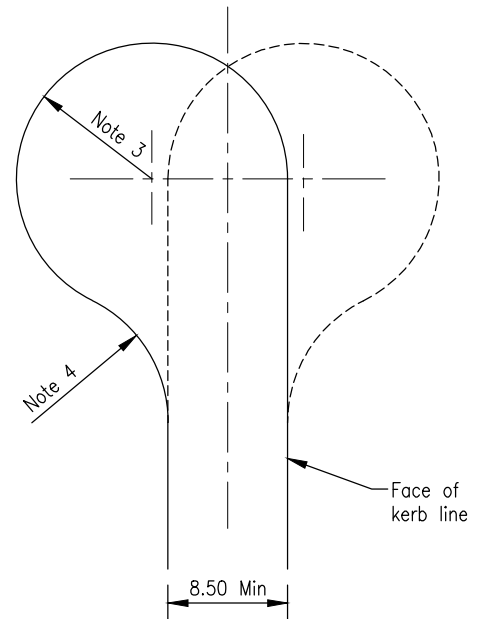
FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

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| SHEET No. | 10 |



-  Berm
-  Reinforced Footpath to Commercial Crossing Standard – See Notes.
-  Ordinary Footpath

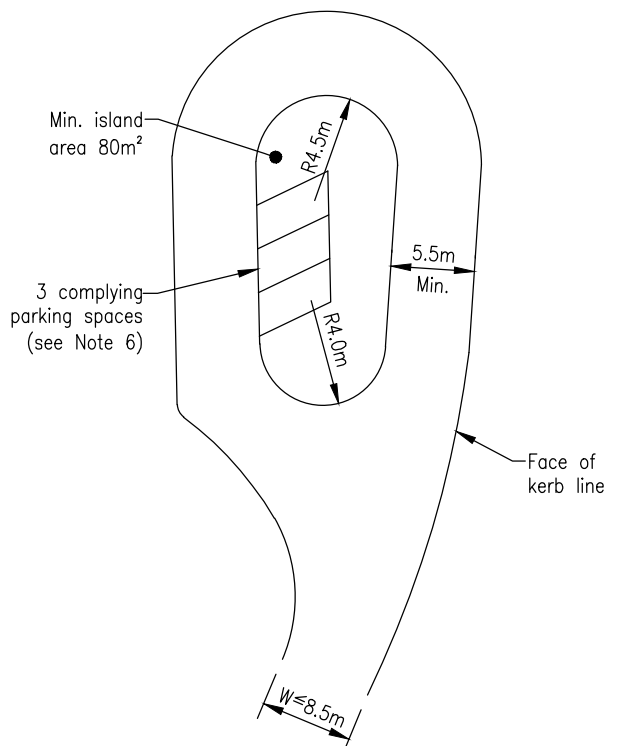
TYPE A



TYPE B

NOTES:

1. Types A and B for all Environments.
2. Type C for Living 1 and Living 2 Environments only.
3. Minimum turning radius 9.5 metres for all Living and Countryside Environments, 15.0 metres for Business Environments.
4. Shoulder radius 8.0 metres for non-offset heads, 9.5 metres for offset heads.
5. Reinforced footpath to be 150mm thick concrete with 665 mesh. Concrete strength to be 30 MPa at 28 days.
6. A central area may be provided for parking or planting (Type C). Where this is proposed, the layout shall be checked for access by a 11.5m medium rigid truck – widening may be required.
7. The minimum kerb gradient shall be 0.5%.
8. Hammerhead or "T" cul-de-sacs may be considered where a standard circular head is unsuitable. The layout is subject to specific design and approval. Compliance with Figure 3.4 in NZS 4404:2010 is an acceptable solution in residential areas.



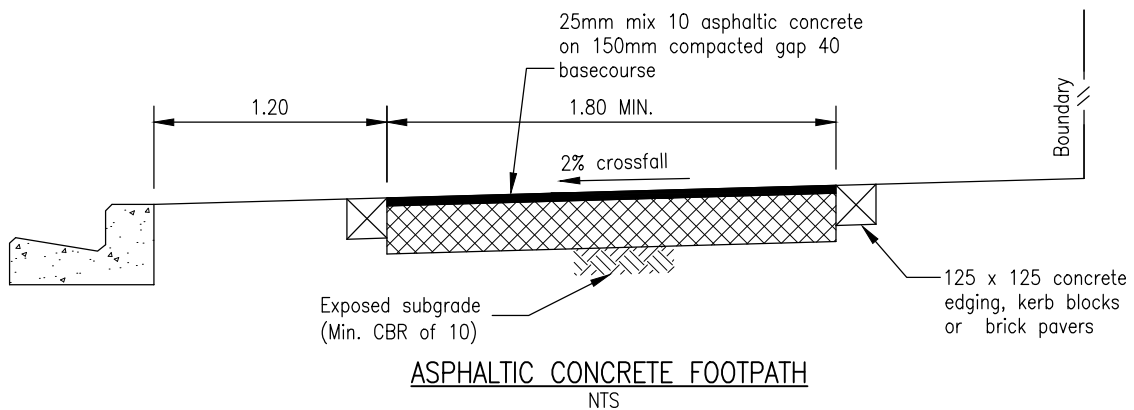
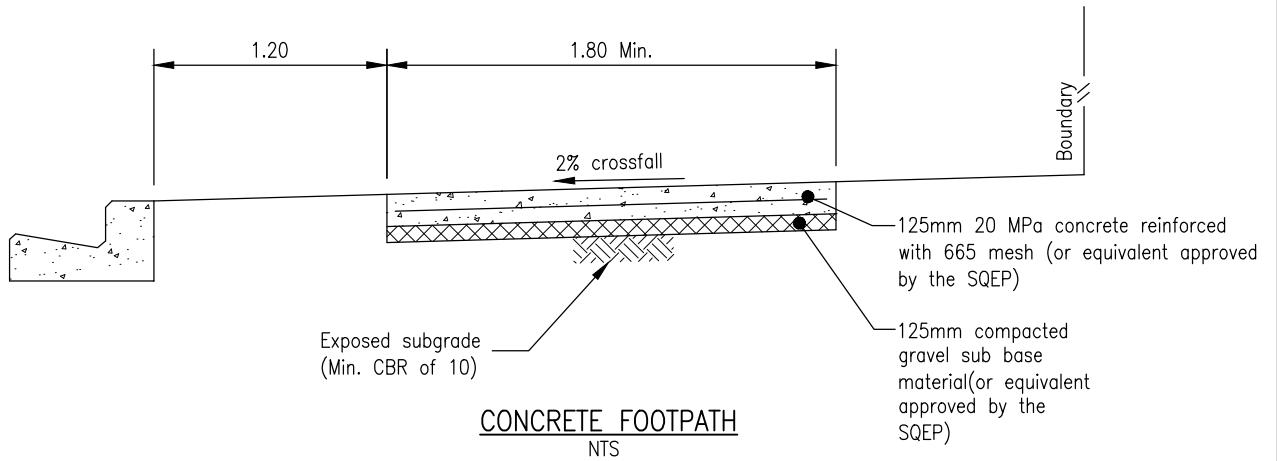
TYPE C

CUL DE SAC DETAILS



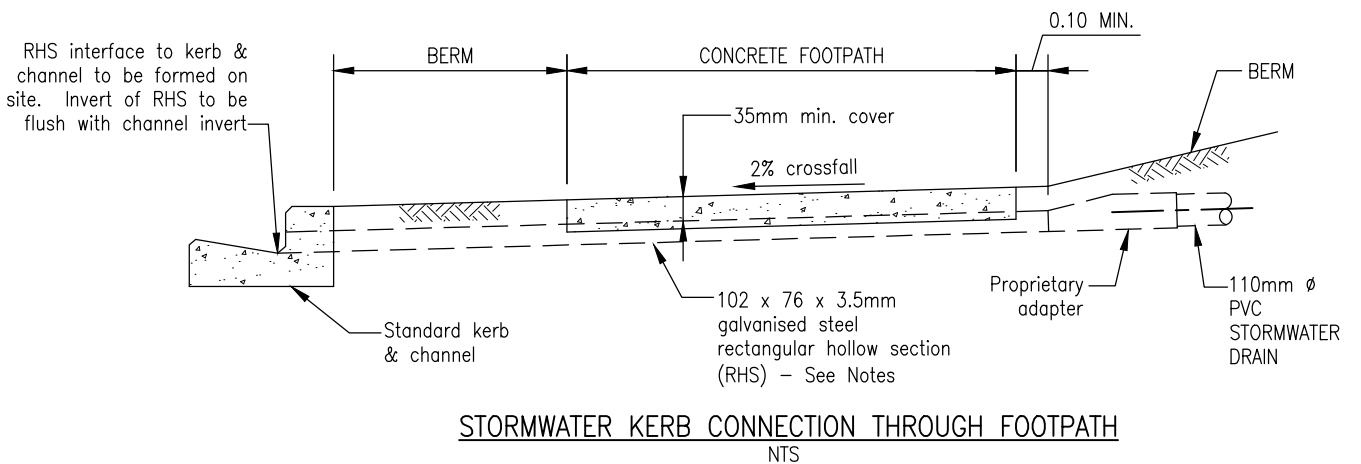
FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

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| Date: | JAN 2021 |
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| SHEET No. | 11 |



NOTES:

1. All service lids to be raised or lowered to be flush with footpath levels.
2. For footpaths in areas of high pedestrian use, local widening may be required.
3. Increased concrete & basecourse depths may be required in commercial areas and shall be required for service lanes (see Sheet 2)



NOTES:

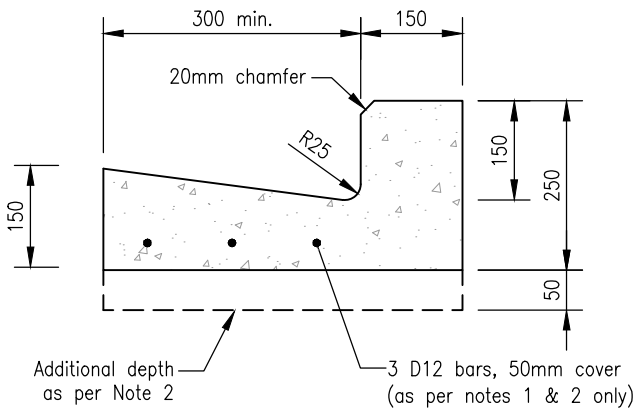
1. Kerb connection may not be installed without specific approval.
2. Kerb connections not permitted for any kerb profile other than standard (see Sheet 13).
3. Existing kerb to be cut out and reinstated using epoxy mortar.

FOOTPATH & STORMWATER KERB CONNECTION DETAILS

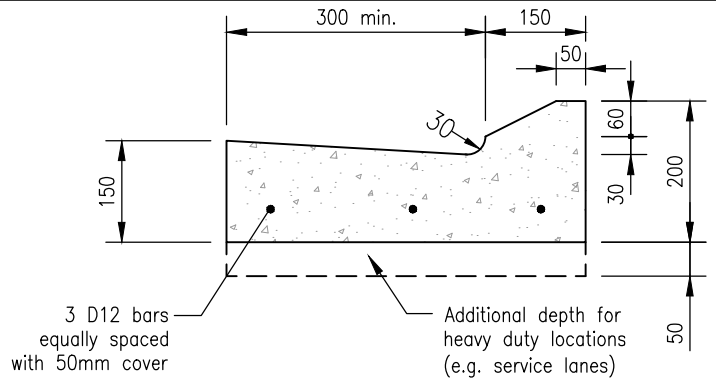


FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

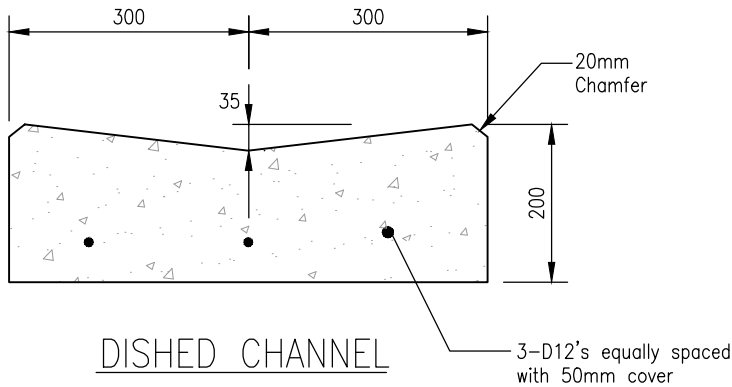
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| SHEET No. | 12 |



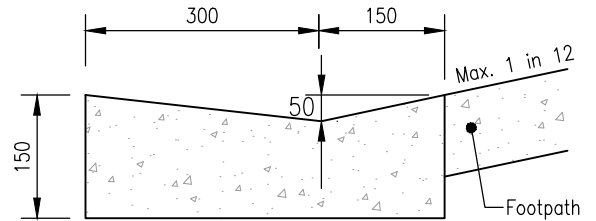
STANDARD KERB AND CHANNEL



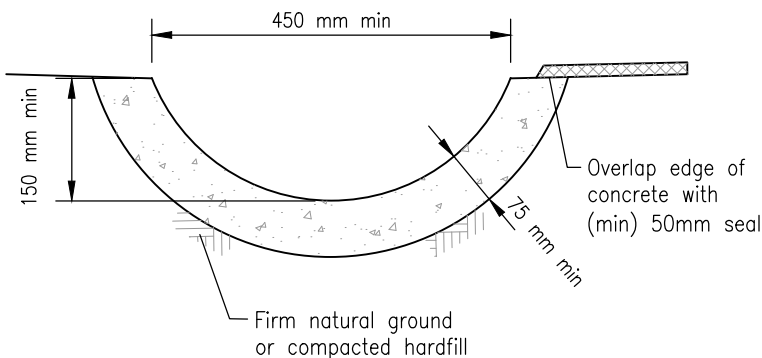
MOUNTABLE KERB AND CHANNEL



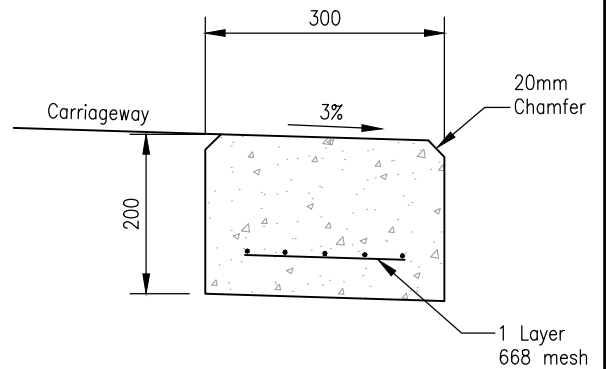
DISHED CHANNEL



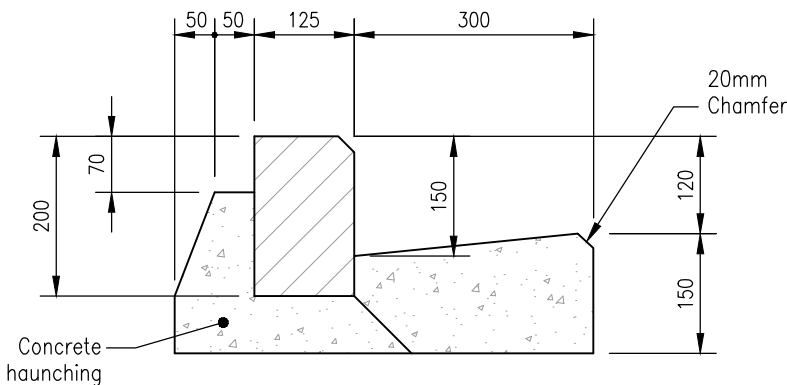
PRAM CROSSING



CONCRETE LINED CHANNEL - RURAL



FLUSH EDGE BEAM



KERB BLOCK

NOTES:

1. 3/D12 reinforcing bars to be placed around all curves, and intersections between tangent points in Business environments.
2. Commercial and industrial crossings to be additional 50mm in depth as well as having 3-D12's equally spaced in the channel.
3. Concrete for Standard Kerb and Channel shall be 20MPa at 28 days.
4. Concrete for Dished Channel, Flush Edge Beam and Mountable Kerb and Channel shall be 30MPa at 28 days.
5. Concrete for Concrete Lined Channel - Rural shall be 25MPa at 28 days.
6. Crack control joints to be formed at maximum of 3.5 metre intervals. To be a minimum depth of 30mm.
7. Profiles may be modified slightly to suit kerbing machine.
8. Mountable kerbs may only to be used for service lanes and traffic islands.
9. Use of kerb blocks subject to specific approval. Haunching to be 20 MPa at 28 days.

KERB & CHANNEL DETAILS
FOR ALL ENVIRONMENTS



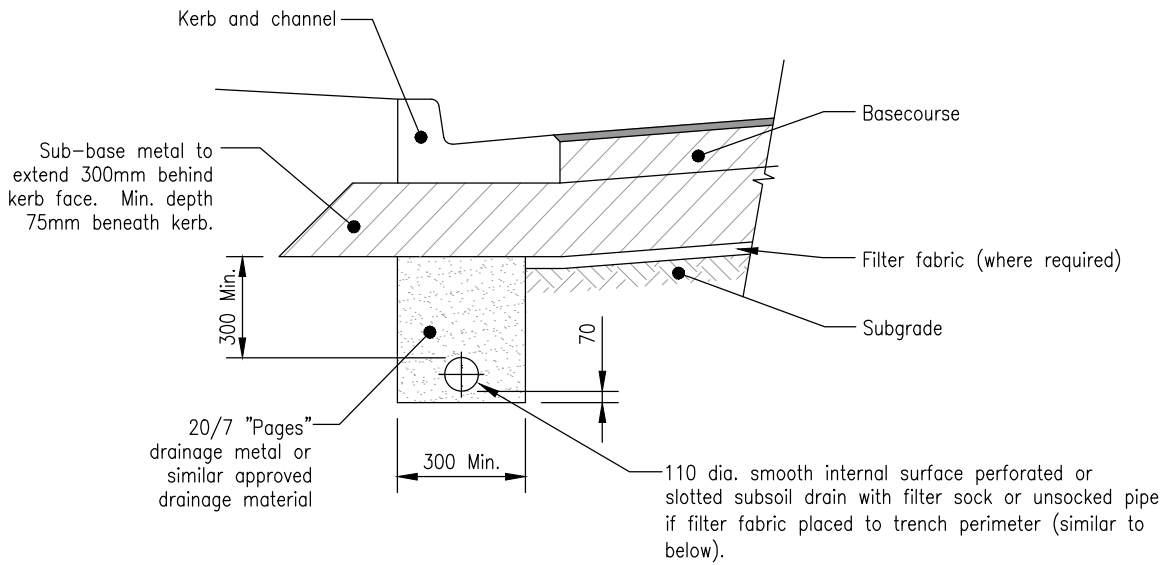
FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

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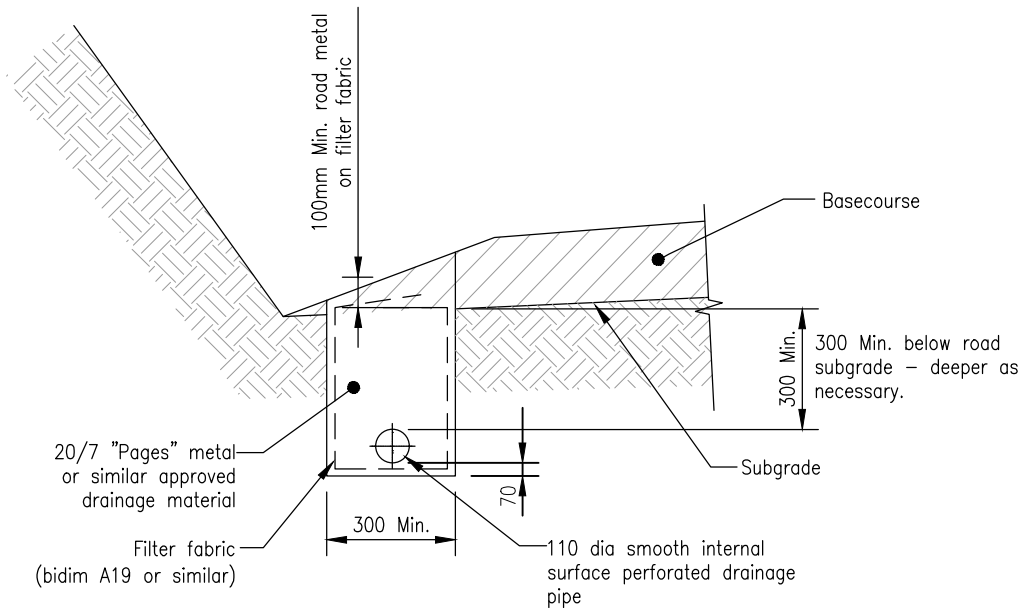
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SHEET No. **13**



UNDER KERB DRAINAGE



RURAL SUBSOIL DRAINAGE

NOTES:

1. Construct subsoil drain after stabilisation of subgrade.
2. Subsoil drain is to connect to the downstream sump (urban) above the soffit level of the outlet pipe. Subsoil drain depth to be adjusted to meet this criteria.
3. For scour protection refer Section 1.2.14.3
4. Subsoil drains in clays to be PAP 7 or BMF (blue metal fines)

TYPICAL SUBSOIL DRAINAGE DETAILS



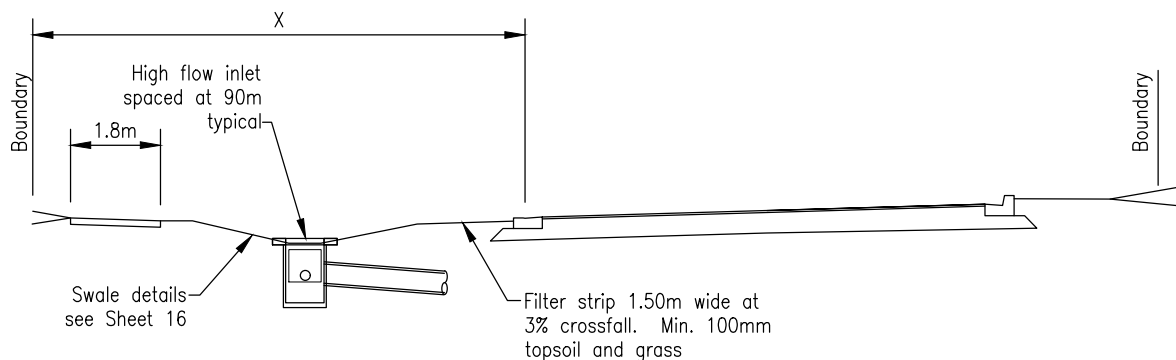
FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

Date: JAN 2021

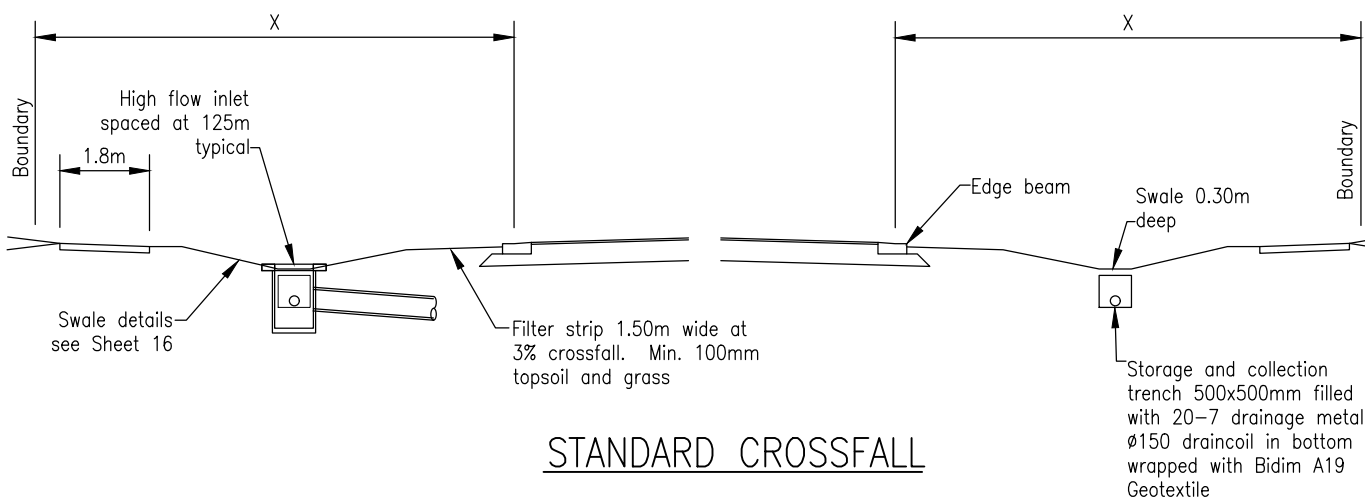
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SHEET No. **14**



UNIFORM CROSSFALL



STANDARD CROSSFALL

NOTES:

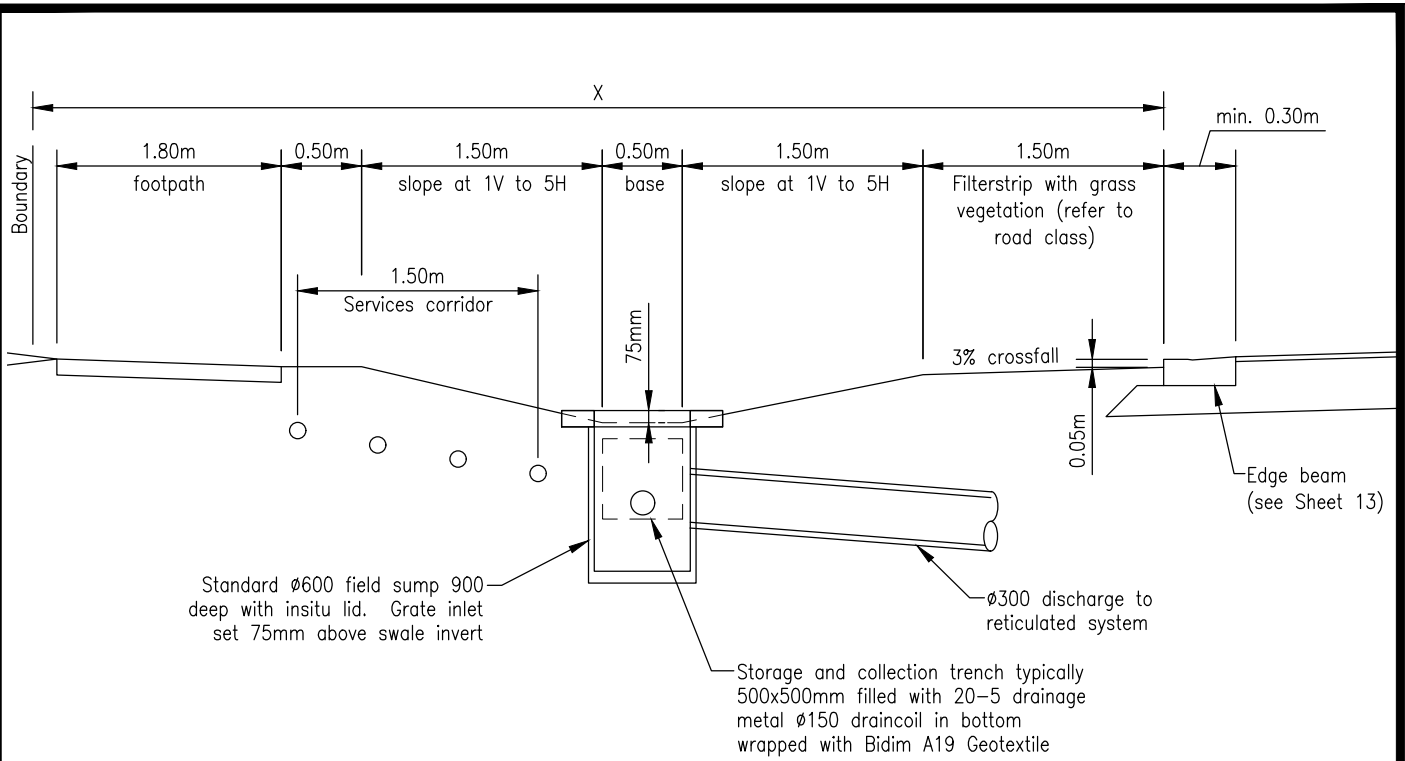
1. Dimension X (and swale depth) to be sized for conveyance of 10% AEP event.
2. Transport corridor widths to be increased beyond the legal minimum to accommodate swale.
3. Storage and collection trenches subject to specific design and approval.
4. Refer to Sheet 16 for further detail.

STANDARD ROAD SWALE DETAILS

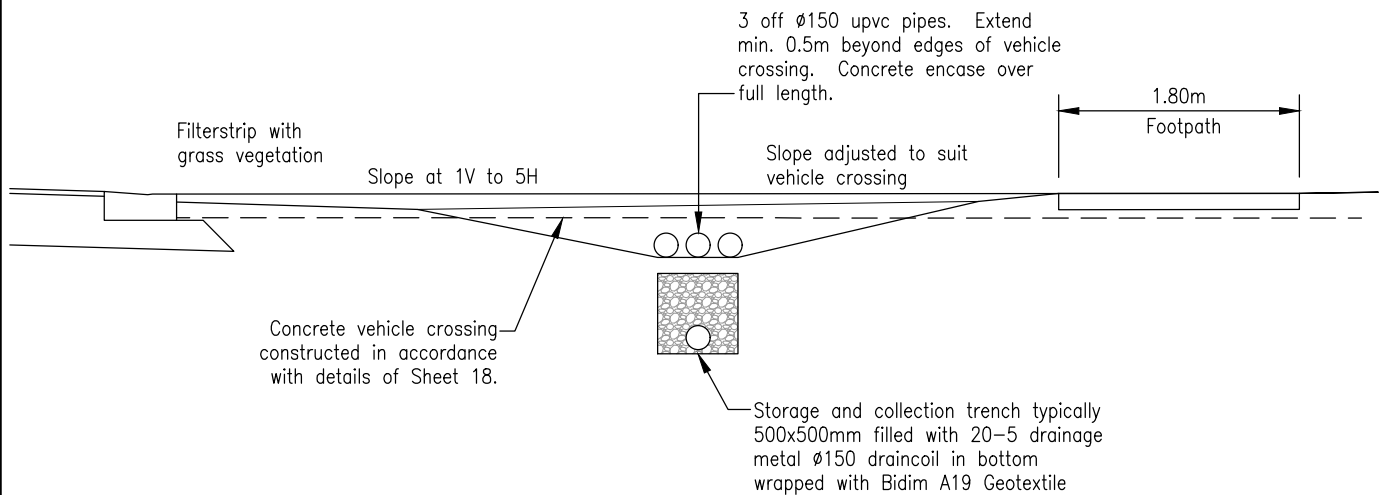


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ENGINEERING STANDARDS

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SWALE DRAINAGE OUTLET DETAIL



SWALE VEHICLE CROSSING DETAIL

NOTE:

1. Refer to Sheet 15 for further detail.
2. Dimension X typically not less than 7.25m. See Note 1 on Sheet 15.

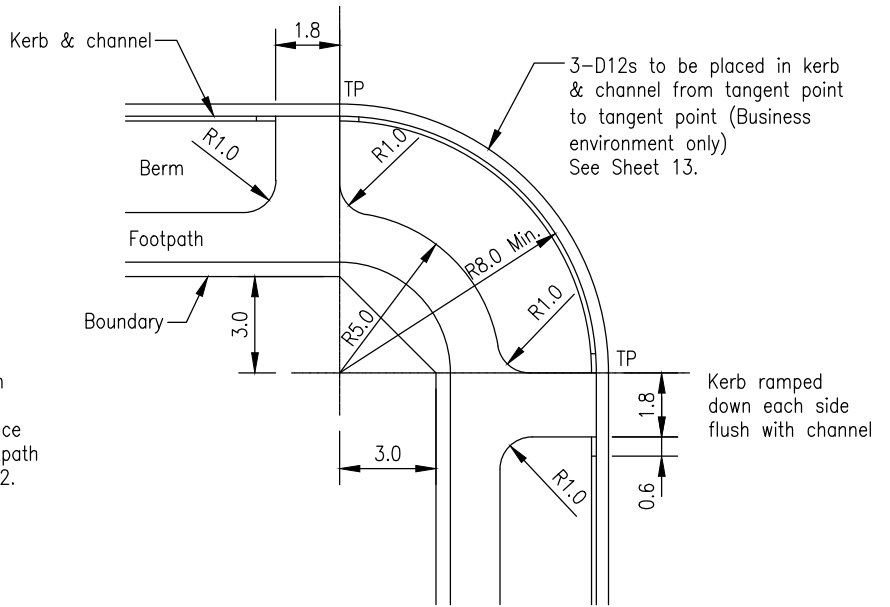
STANDARD ROAD SWALE DETAILS

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ENGINEERING STANDARDS

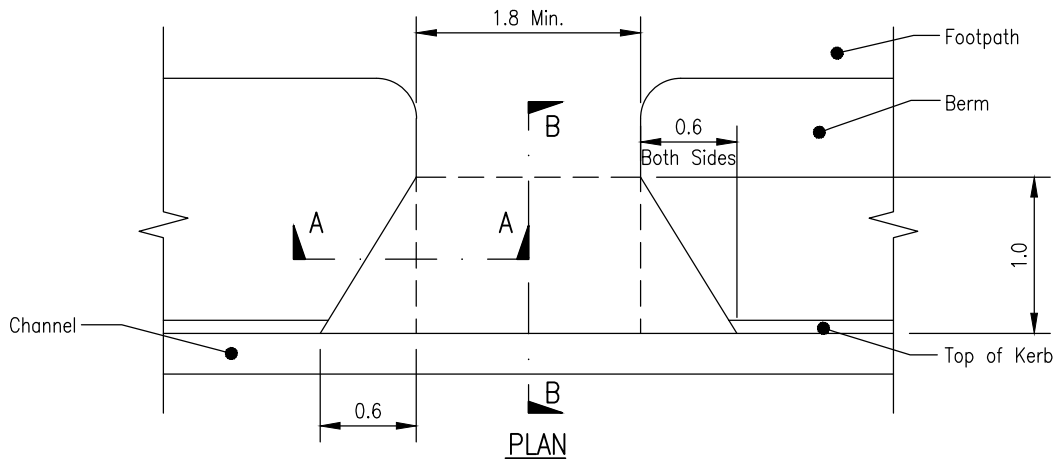
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| Date: | FEB 2022 |
| Revision: | 0.2 |
| Scale: | NTS |
| SHEET No. | 16 |

NOTES:

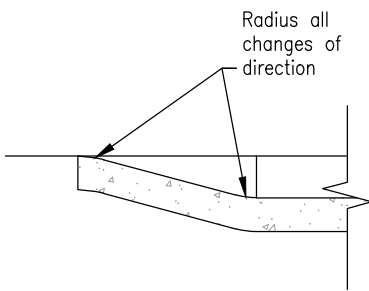
1. Maximum grade is 1 in 12 (8.3%).
2. Edge of crossing to be finished flush with existing channel.
3. Crossing shall be constructed in accordance with the requirements for a concrete footpath unless otherwise approved – see Sheet 12.



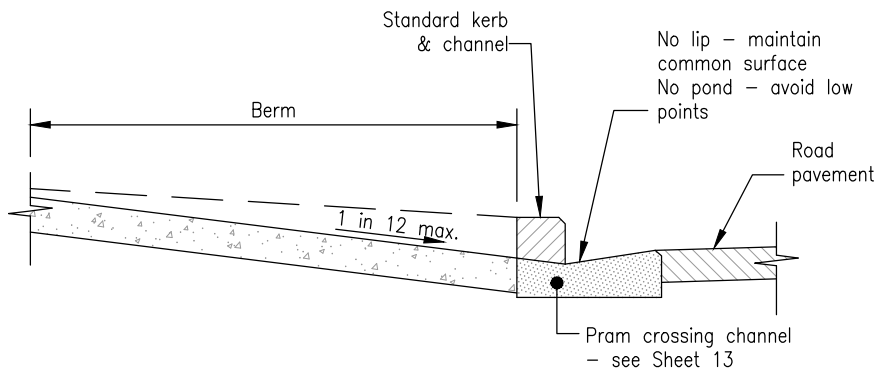
CROSS ROADS OR TEE INTERSECTION
NTS



PLAN



HALF SECTION A-A



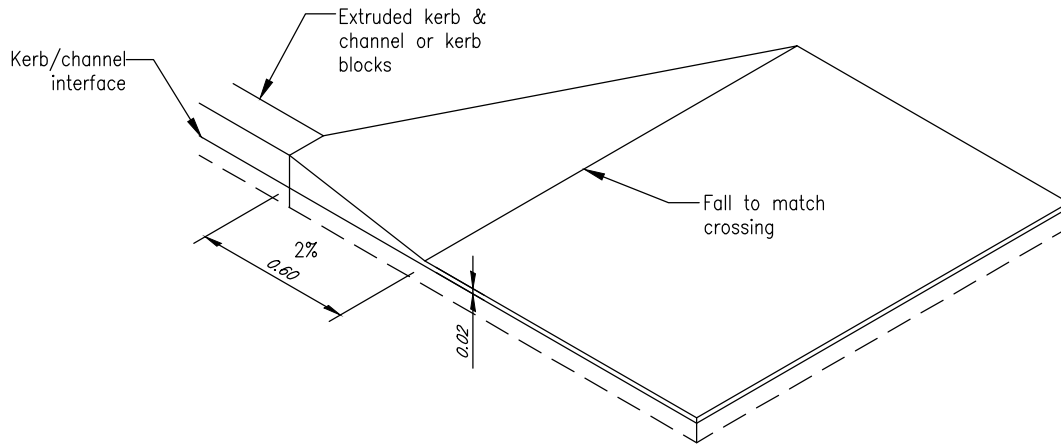
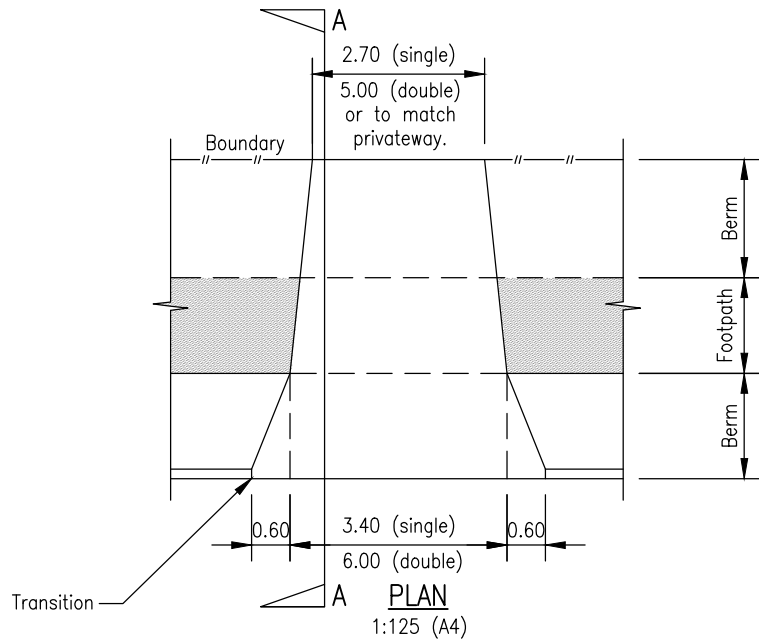
SECTION B-B
1:25 (A4)

ACCESSIBLE CROSSING DETAILS



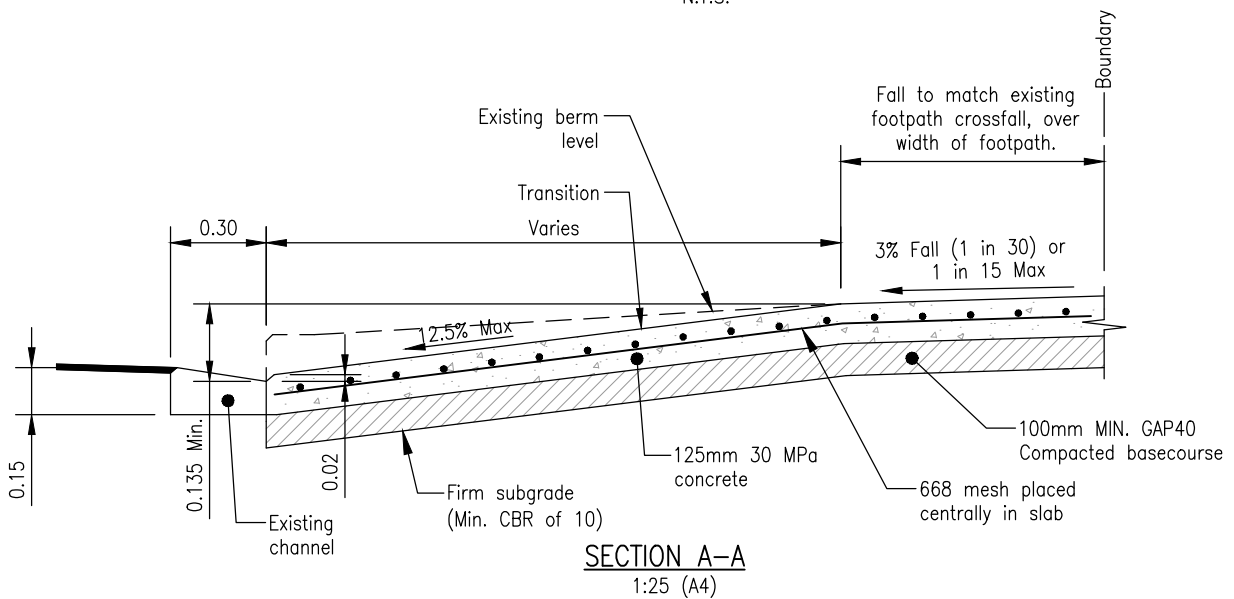
FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

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| Date: | FEB 2022 |
| Revision: | 0.2 |
| Scale: | AS SHOWN |
| SHEET No. | 17 |



DETAIL OF KERB TRANSITION AT CROSSING

N.T.S.



For further notes refer to Sheet 22

VEHICLE CROSSING – RESIDENTIAL



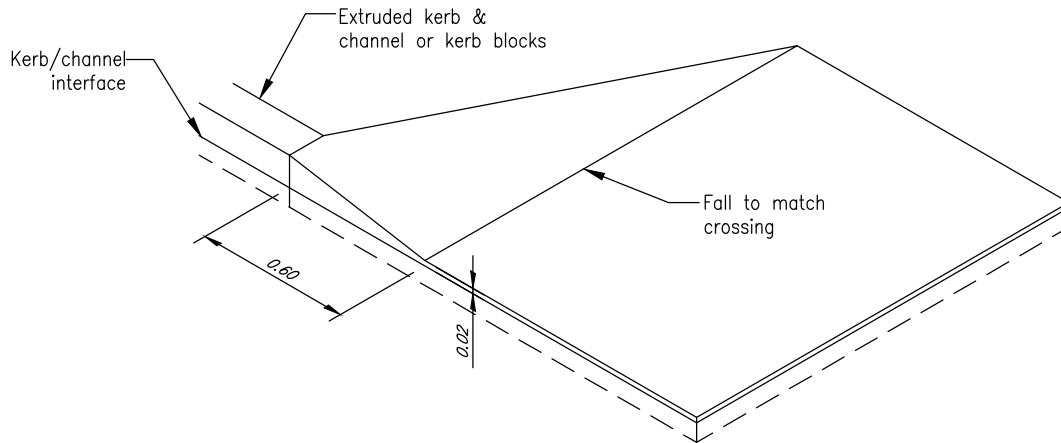
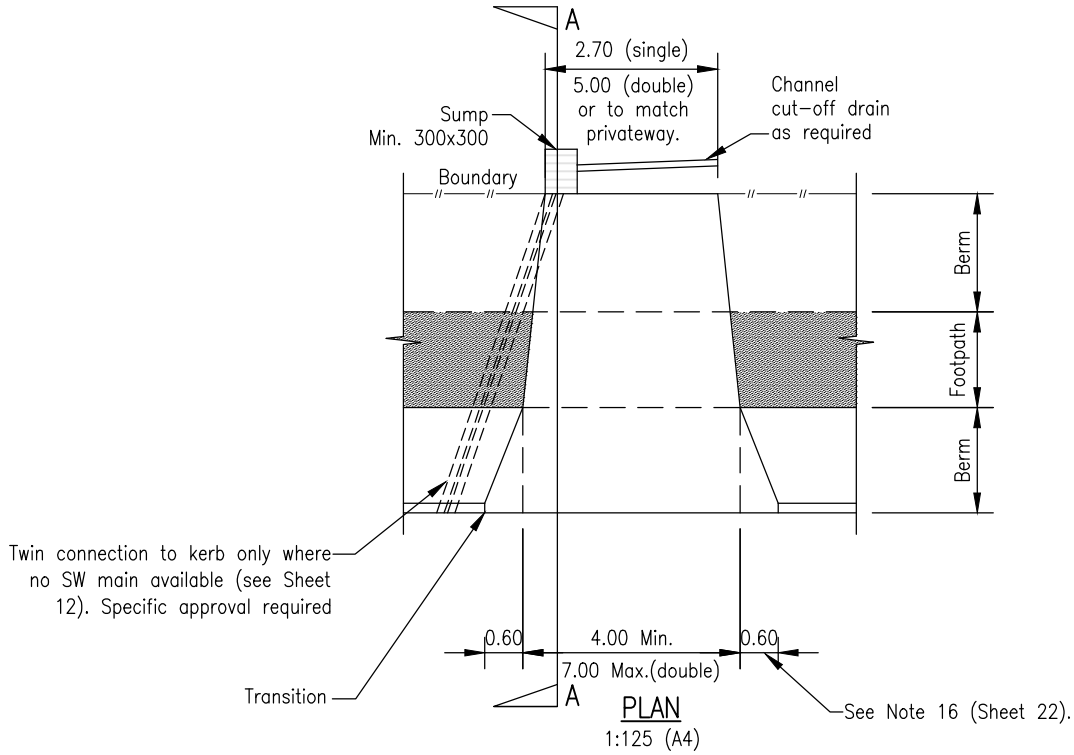
FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

Date: JAN 2021

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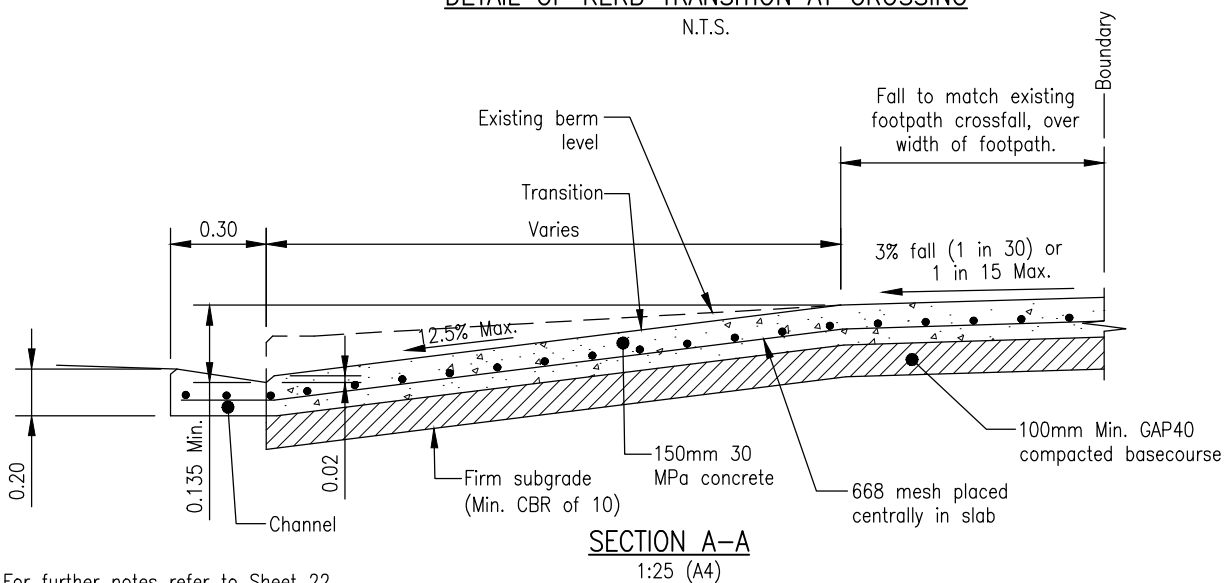
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SHEET No. 18



DETAIL OF KERB TRANSITION AT CROSSING

N.T.S.



For further notes refer to Sheet 22

VEHICLE CROSSING - COMMERCIAL/ INDUSTRIAL



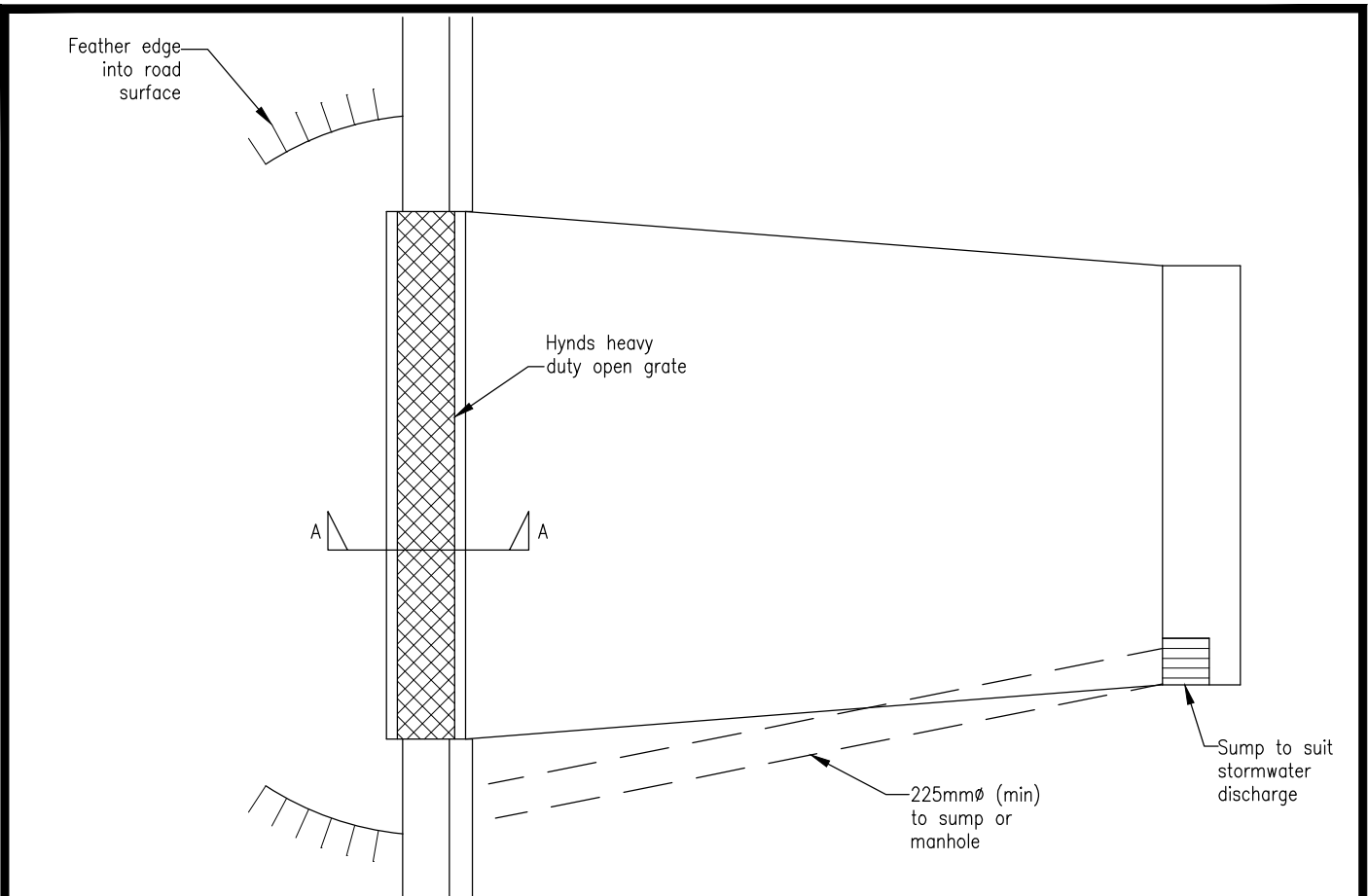
FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

Date: JAN 2021

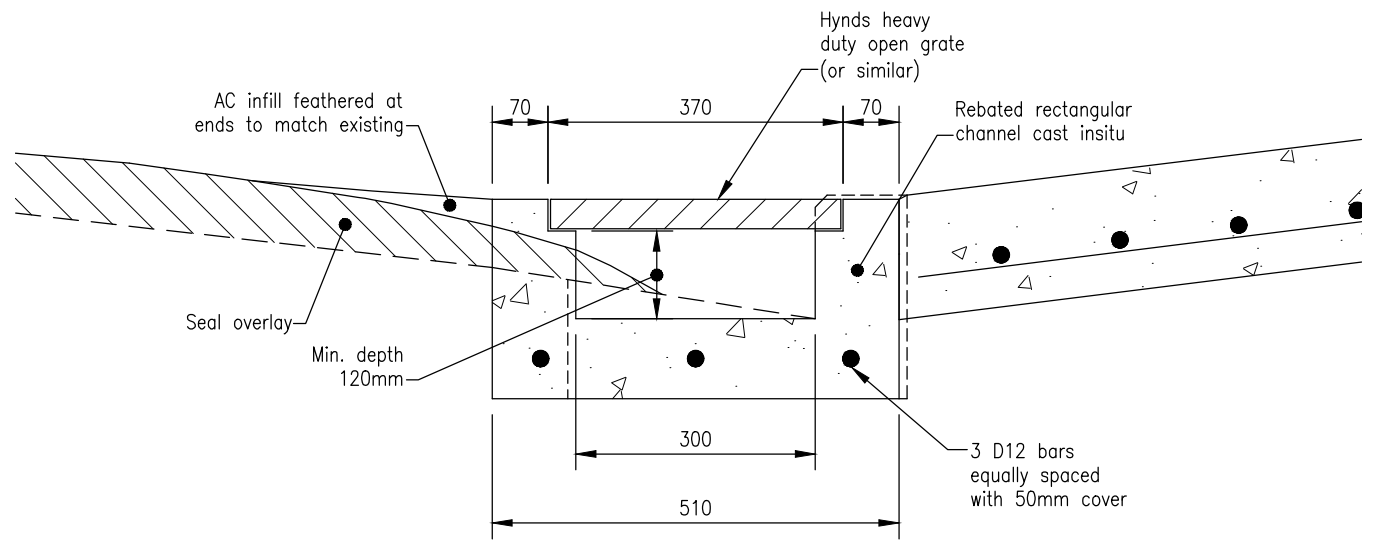
Revision: 0.1

Scale: AS SHOWN

SHEET No. 19



PLAN
NTS

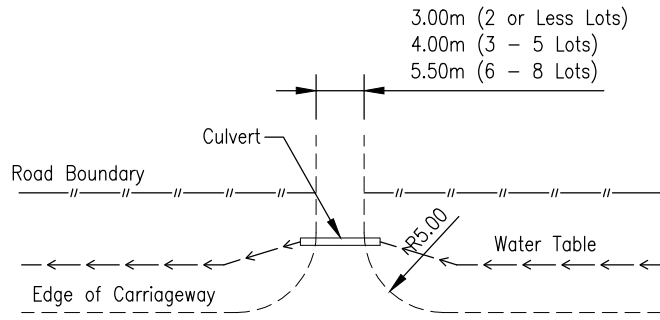


SECTION A-A
1:10

ALTERNATIVE CHANNEL CROSSING
(See Note 3 on Sheet 22)

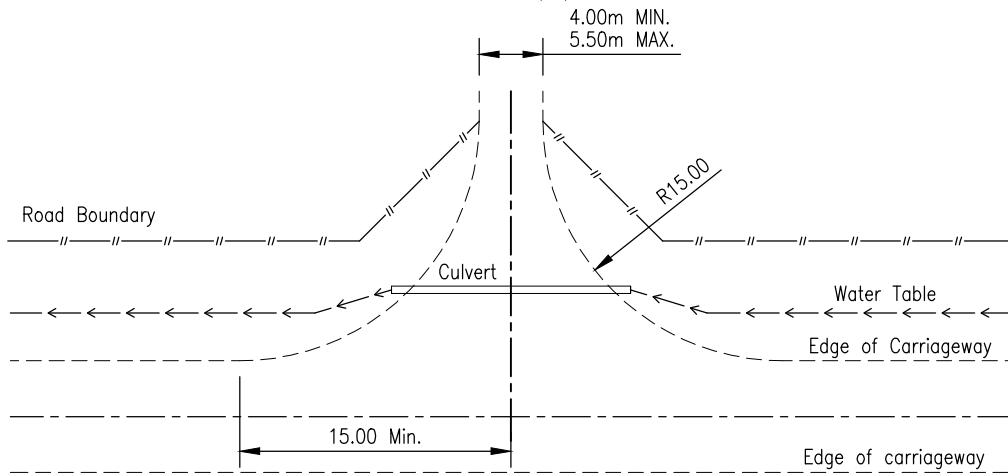
| | | |
|--|-----------|-----------|
| ALTERNATIVE VEHICLE CROSSING | Date: | JAN 2021 |
| | Revision: | 0.1 |
|  FAR NORTH DISTRICT COUNCIL ENGINEERING STANDARDS | Scale: | AS SHOWN |
| | SHEET No. | 20 |

Note this crossing may only be installed with specific written approval from FNDC



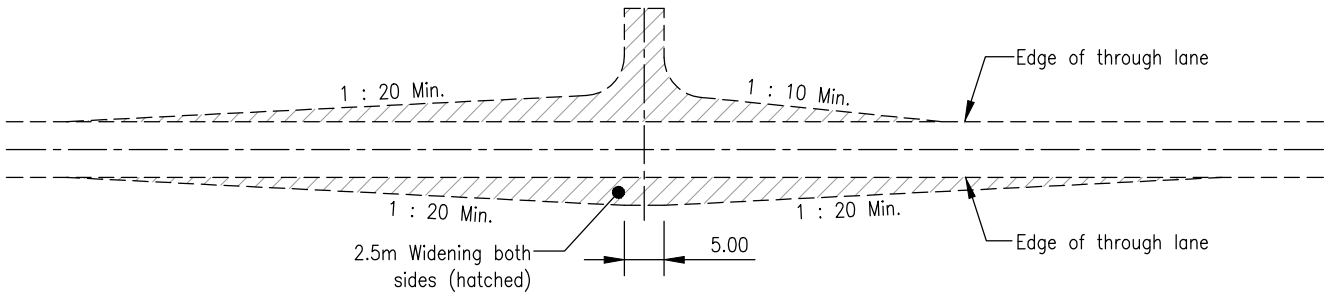
TYPE 1A – LIGHT VEHICLES

1:500 (A4)



TYPE 1B – HEAVY VEHICLE

1:500 (A4)



TYPE 2 – CROSSING WITH LOCAL WIDENING

1:1000 (A4)

NOTES:

1. Refer to Sheet 22 and Section 1.2.27.4.
2. For Types 3 and 4 refer to Section 1.2.27.4

VEHICLE CROSSING – RURAL



FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

Date: JAN 2021

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Scale: AS SHOWN

SHEET No. **21**

RESIDENTIAL, COMMERCIAL AND INDUSTRIAL CROSSINGS

1. All concrete to be 30 MPa strength at 28 days.
2. Crossings to be constructed to match existing footpath and channel levels and be graded to give sufficient clearance to the underside of all vehicles.
3. The alternative channel crossing detailed on Sheet 20 may only be used with specific approval. It is for use only where thick overlay of existing seal precludes the standard option.
4. If no footpath, allowance shall be made for such with a 3% crossfall to the kerb.
5. Kerb transitions to be constructed of similar materials to the adjacent kerb or cast insitu concrete. See Sheet 12 for details.
6. Where the footpath or adjacent property level is below the channel level, ramp the crossing up from the channel to control surface water while maintaining vehicle clearance. A freeboard of 200mm above the channel is required to contain stormwater within the road.
7. Gradient of crossing not to exceed 12.5% (1 in 8)
8. Crossings for all private accessways shall be commercial grade to Sheet 19.
9. Edges of footpath and back of channel to be saw cut.
10. All crossings require council inspection prior to pouring concrete.
11. If the edge of the crossing is within 1m of a crack or joint in an existing footpath then that section of footpath shall be replaced.
12. Commercial and industrial channels to be reinforced with an extension of the 668 mesh.
13. Where a street sump is located within the proposed crossing, the sump shall be relocated to the side of the crossing and reconnected to the council storm water system.
14. Refer to Sheet 16 for vehicle crossing over a drainage swale.
15. Stormwater kerb connections generally not permitted. (See Section 4.3.17.2).
16. Splay width may need to be increased in some circumstances to accommodate an 11.5m rigid truck.

RURAL CROSSINGS

1. Pipes are to be RCRRJ Class "4".
2. Pipes are to be adequate for the upstream catchment, but not less than 300mm dia or the downstream culvert and shall be constructed to the correct line and level to maintain drainage paths.
3. Provide traversable culvert safety ends. See Section 1.2.27.4
4. Gateways shall be located to allow vehicle parking clear of the road shoulder.
5. Minimum sight distance requirements for entrance crossings are to comply with Sheet 4.
6. All crossings adjoining sealed public roads are to be sealed or concrete, to the property boundary or 10m (whichever is greater).
7. Concrete crossings shall start at least 0.5m outside of the existing edge of seal or 0.5m outside of the carriageway width required by the standard whichever is the further.
8. Concrete entrance crossings are to be 125mm of 30MPa concrete for light vehicle access. Heavy vehicle crossings shall be 150mm thick of 30MPa concrete reinforced with 665 mesh unless specifically designed.
9. Unsealed crossings shall comprise not less than 125mm GAP 65 and 75mm GAP40 or 200mm GAP 40 (compacted depths).
10. For application of Type 2 crossing refer to Section 1.2.27.4.
11. Where local widening is required (Types 2 and 3) the tapers shall be sealed.

VEHICLE CROSSING NOTES
(FOR RESIDENTIAL, COMMERCIAL, INDUSTRIAL AND RURAL USE)



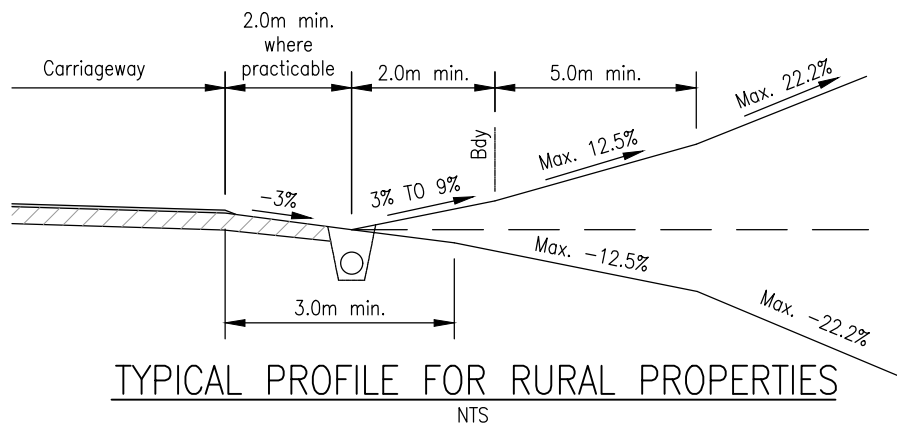
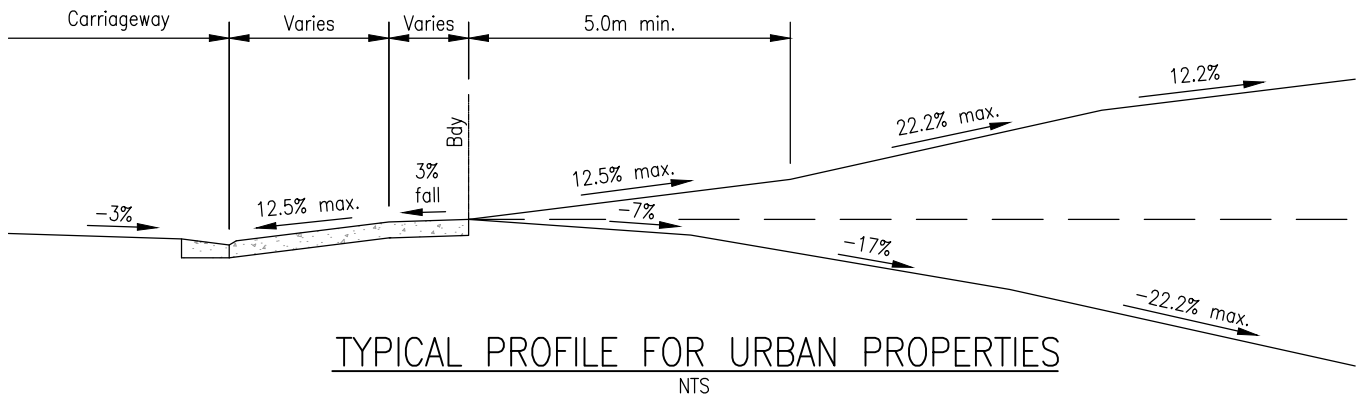
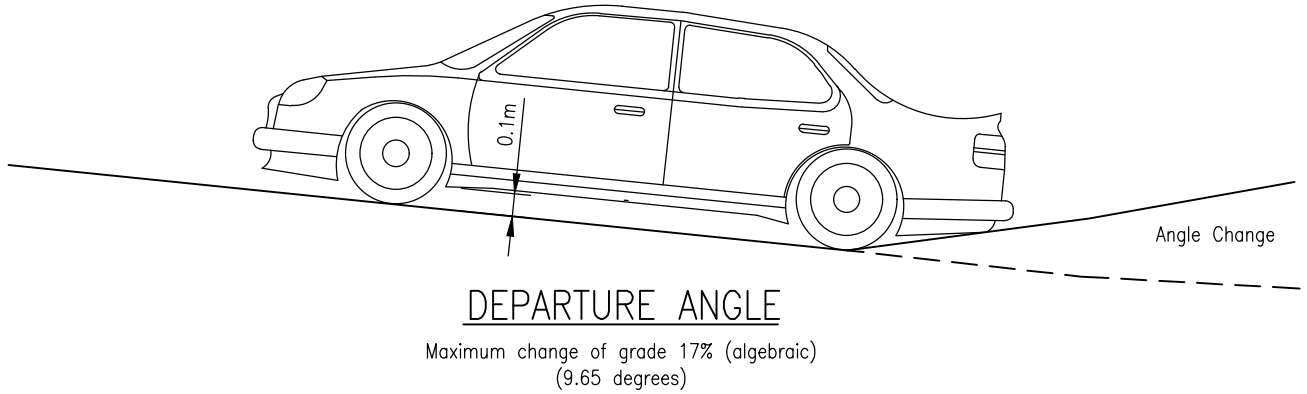
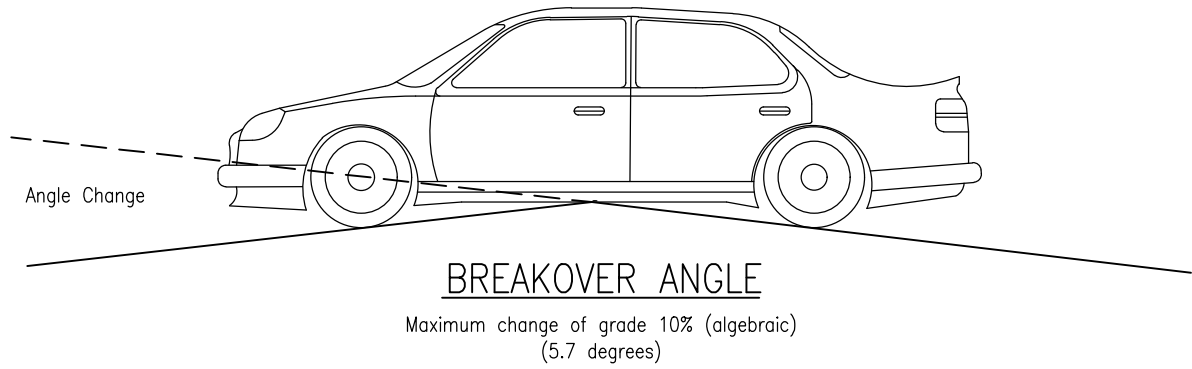
FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

Date: JAN 2021

Revision: 0.1

Scale: AS SHOWN

SHEET No. **22**



NOTES:

1. Maximum grade changes to occur at not less than 2.0m intervals.
2. Based on 90 percentile car as at 1990 with minimum ground clearance of 100mm.

VEHICLE CROSSING –
MAXIMUM GRADED PROFILES FOR URBAN/ RURAL PROPERTIES

Date: JAN 2021

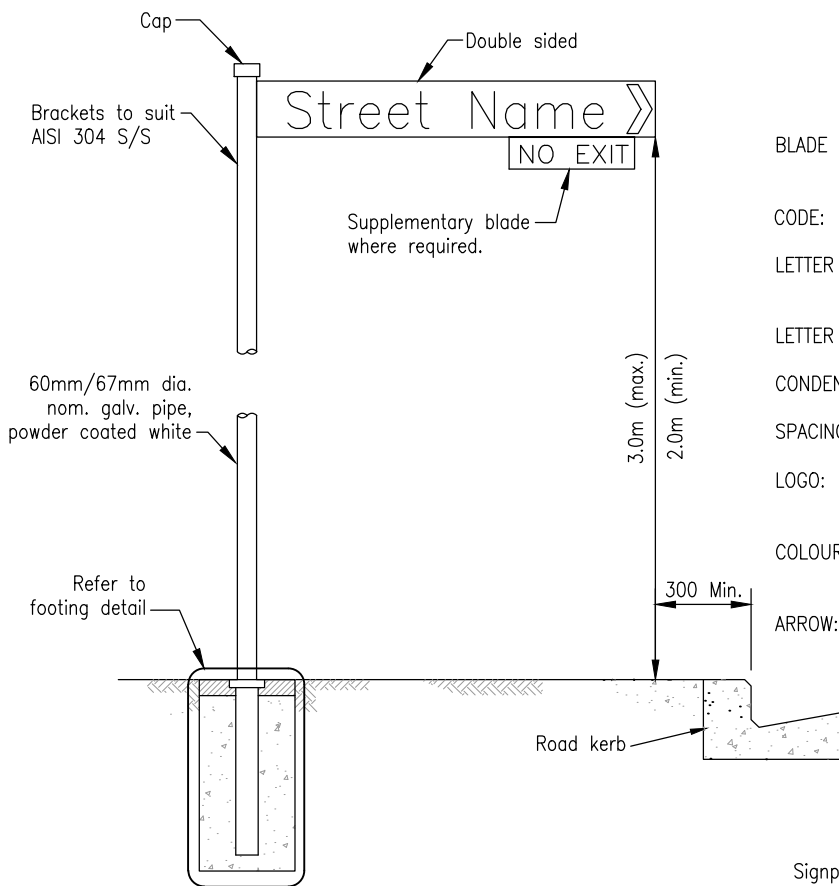
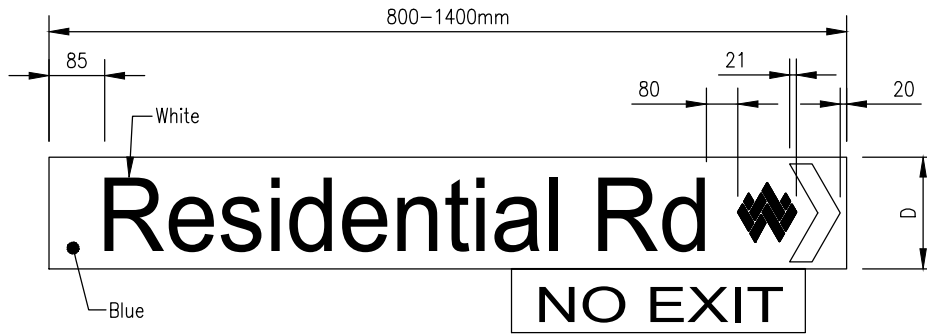
Revision: 0.1

Scale: NTS

SHEET No. **23**



FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

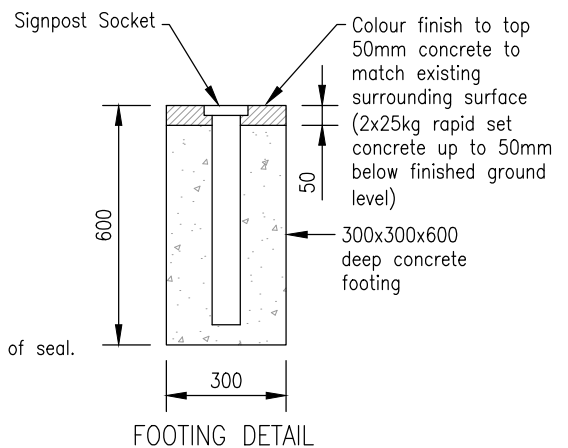


- BLADE SIZE: D: 150mm/200mm/250mm (See Note 1)
- BLADE LENGTH: a) Single Sided shall not be less than 800mm nor greater than 1400mm. If greater than 1100mm, blade shall be mid-mounted.
b) Double Sided shall not be less than 800mm nor greater than 1100 and shall be end mounted
- BLADE TYPE: "I" Section Aluminium Extrusion
- CODE: SNB 150mm/200mm/250mm
- LETTER STYLE: Transport-Upper & lower case
- LETTER HEIGHT: 100mm/150mm/200mm
- CONDENSED: To Suit
- SPACING: To Suit
- LOGO: Whangarei District Council Logo
- COLOUR: High Intensity White Letters on Blue background
- ARROW: 120°
150mm blade -40mm wide
200mm blade -45mm wide
250mm blade -50mm wide

NOTES:

1. Blade Sizing:
State Highways:- 250mm
Arterial roads:- 200mm
All other roads:- 150mm.

Refer to Section 1.2.26.
2. Flush socket -detail to be used in urban areas unless otherwise approved.
3. End of name blade to be set back 300mm from kerb face or shoulder/edge of seal.
4. Wooden posts will be considered for rural environments.
5. All signs to be installed with anti rotation device



STREET SIGN FOR PUBLIC ROADS
(FOR ALL ENVIRONMENTS)



FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

| | |
|-----------|-----------|
| Date: | JAN 2021 |
| Revision: | 0.1 |
| Scale: | AS SHOWN |
| SHEET No. | 24 |



BLADE SIZE: D: 150mm/200mm/250mm (See Note 1)

BLADE LENGTH: a) Single Sided shall not be less than 800mm nor greater than 1400mm. If greater than 1100mm, blade shall be mid-mounted.
 b) Double Sided shall not be less than 800mm nor greater than 1100 and shall be end mounted

BLADE TYPE: "I" Section Aluminium Extrusion

CODE: SNB 150mm/200mm

LETTER STYLE: Transport-Upper & lower case

LETTER HEIGHT: 100mm/150mm/200mm

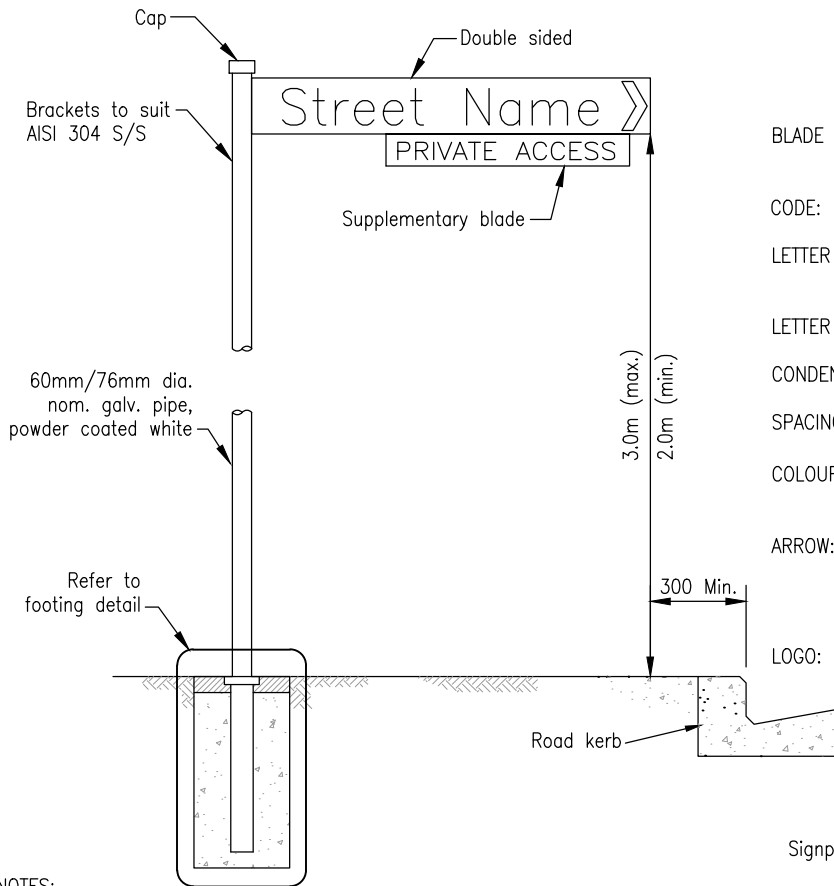
CONDENSED: To Suit

SPACING: To Suit

COLOUR: High Intensity Blue Letters on White background

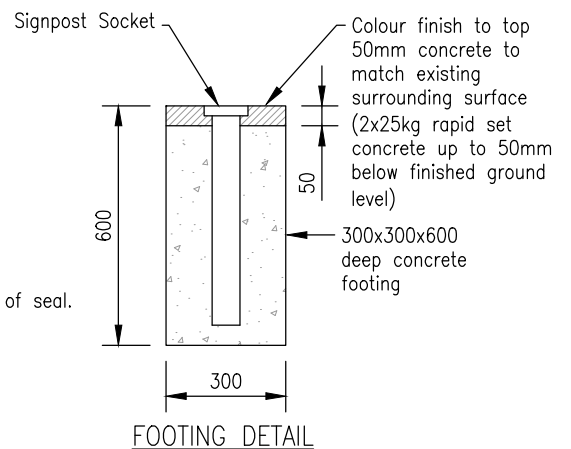
ARROW: 120°
 150mm blade -40mm wide
 200mm blade -45mm wide
 250mm blade -50mm wide

LOGO: No Logo



NOTES:

- Blade Sizing:
 50kph:- 150mm
 Over 50kph:- 200mm
 Refer to Section 1.2.26.
- Flush socket -detail to be used in urban areas unless otherwise approved.
- End of name blade to be set back 300mm from kerb face or shoulder/edge of seal.
- Wooden posts will be considered for rural environments.
- All signs to be installed with anti rotation device.



STREET SIGN FOR PRIVATE ROADS
 (FOR ALL ENVIRONMENTS)



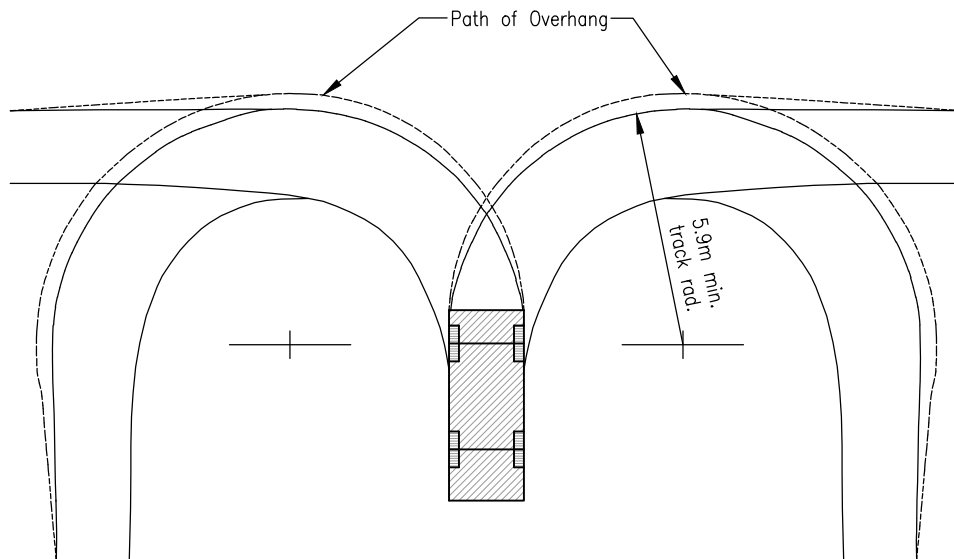
FAR NORTH DISTRICT COUNCIL
 ENGINEERING STANDARDS

Date: JAN 2021

Revision: 0.1

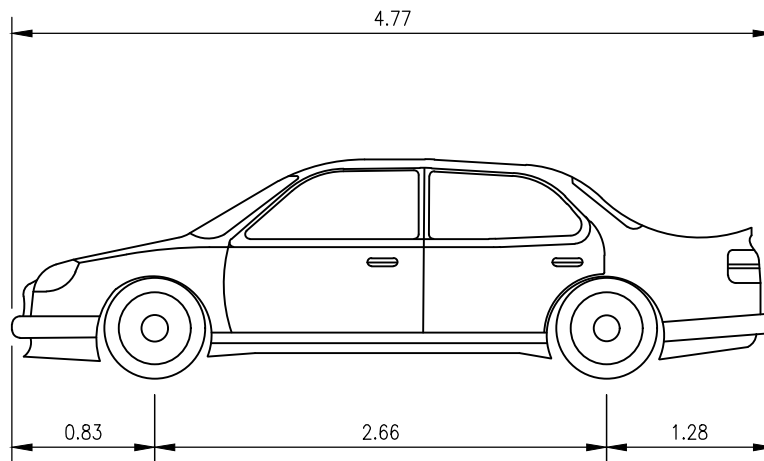
Scale: AS SHOWN

SHEET No. 25



TRACKING CURVES

Scale 1:200



DESIGN VEHICLE DIMENSIONS (NTS)

(Vehicle Width 1.88m)

Note:

1. The curve has been derived from the 90% car shown in the District Plan.
2. Turning radius shown is the minimum and not appropriate for speeds > 10km/hr.

VEHICLE TRACKING CURVES
STANDARD CAR



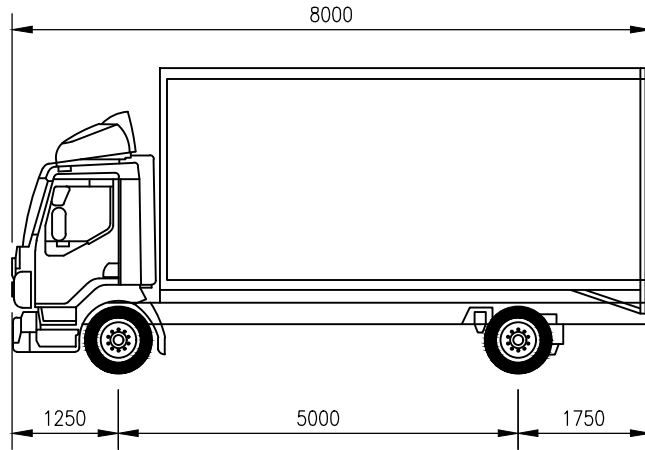
FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

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Revision: 0.1

Scale: AS SHOWN

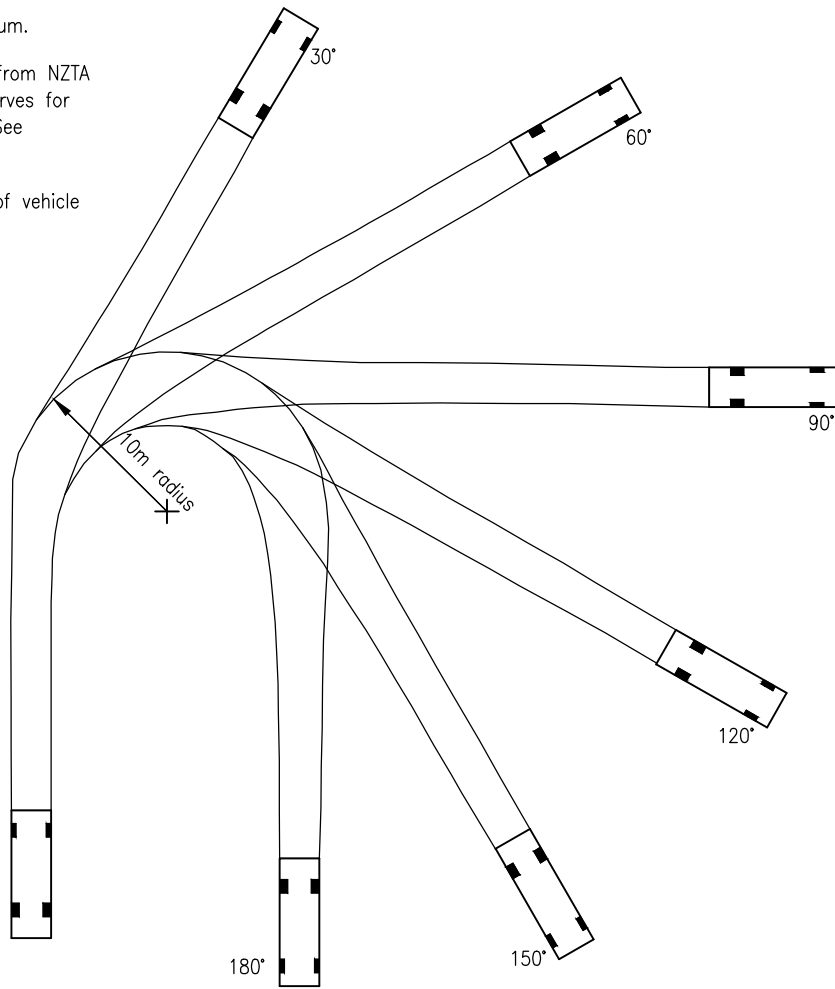
SHEET No. **26**



DESIGN VEHICLE DIMENSIONS
(Vehicle Width - 2500)

NOTES:

1. Curves are not to scale.
2. Turning radius is minimum.
3. Curves are reproduced from NZTA "NZ Onroad Tracking Curves for Heavy Vehicles 2007" (See Section 1.2.7.3)
4. Curves show extremity of vehicle body.



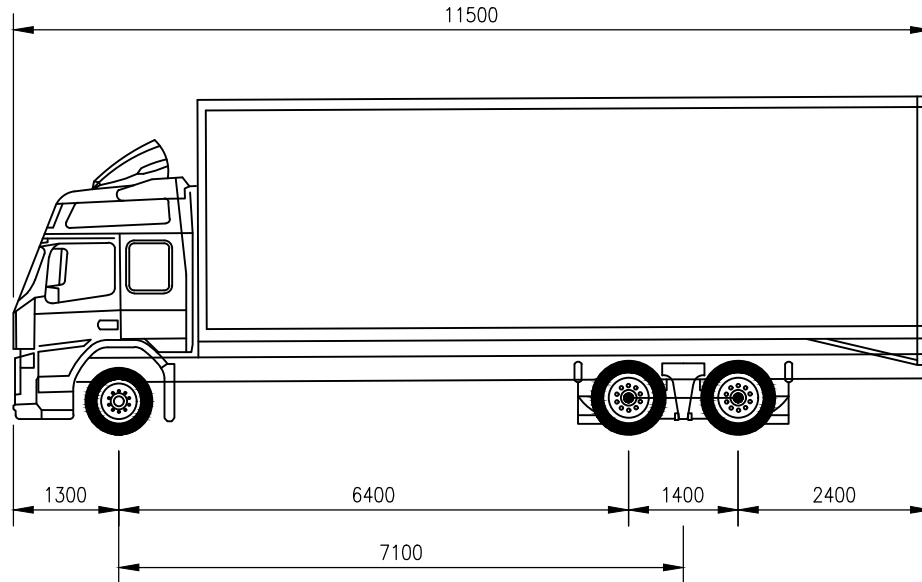
TRACKING CURVES - 8.0m RIGID TRUCK

HEAVY GOODS VEHICLE TRACKING CURVES
MEDIUM RIGID TRUCK



FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

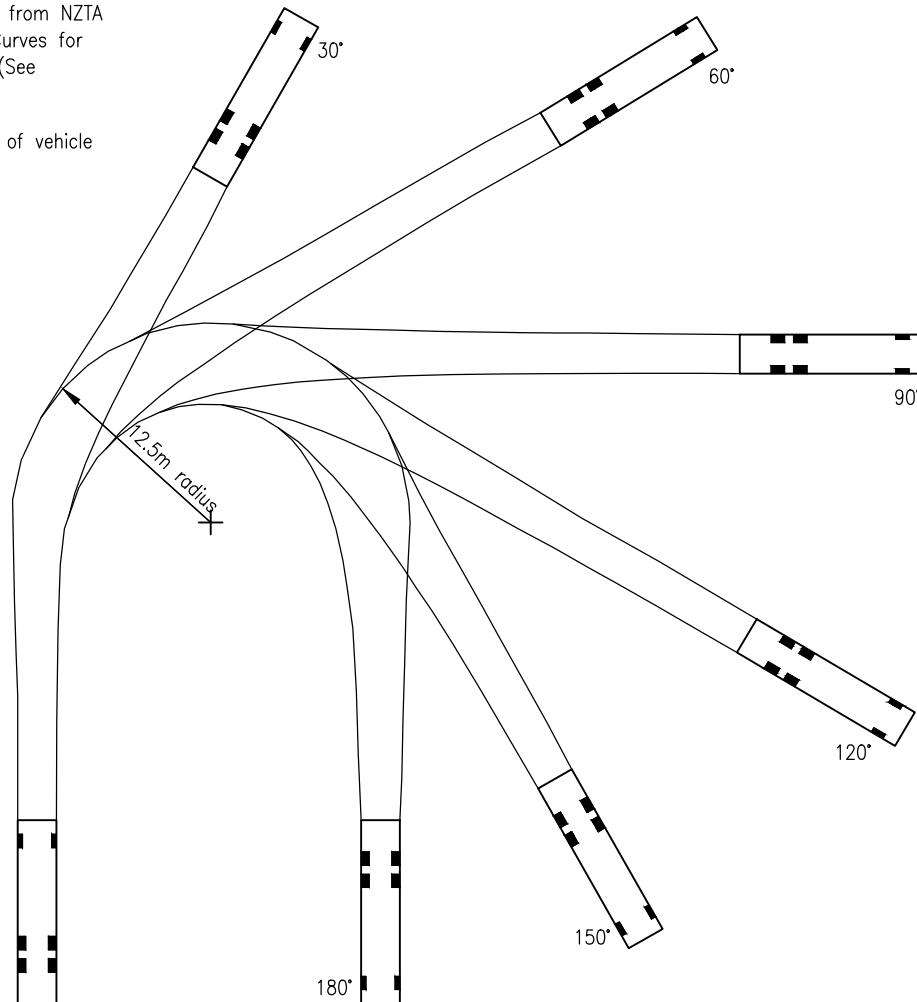
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| Date: | JAN 2021 |
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| Scale: | NTS |
| SHEET No. | 27 |



DESIGN VEHICLE DIMENSIONS
(Vehicle Width – 2500)

NOTES:

1. Curves are not to scale.
2. Turning radius is minimum.
3. Curves are reproduced from NZTA "NZ Onroad Tracking Curves for Heavy Vehicles 2007" (See Section 1.2.7.3)
4. Curves show extremity of vehicle body.



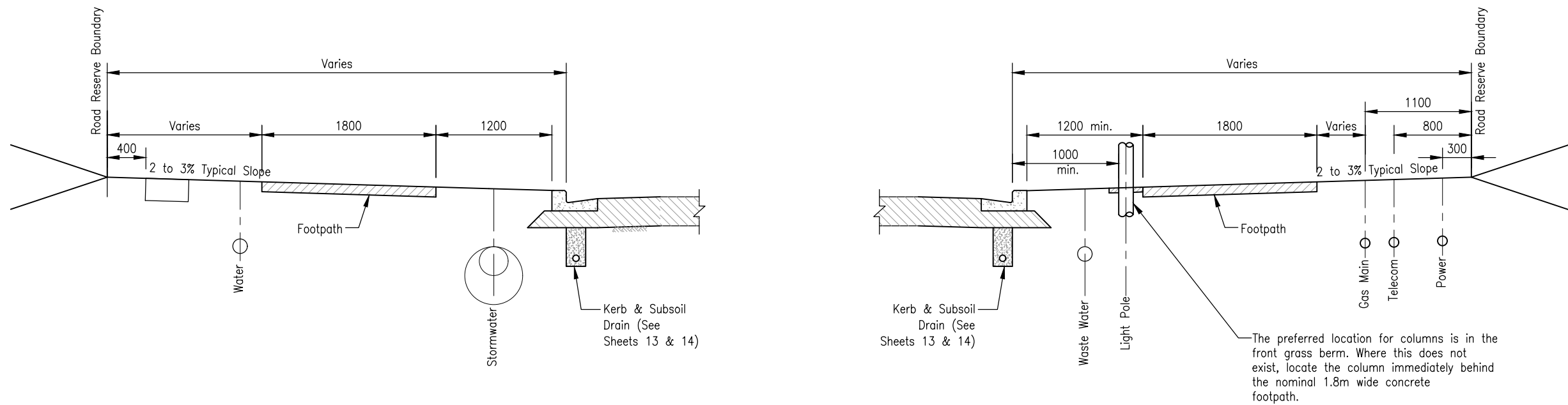
TRACKING CURVES – 11.5m RIGID TRUCK

HEAVY GOODS VEHICLE TRACKING CURVES
LARGE RIGID TRUCK



FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

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| SHEET No. | 28 |



URBAN ROADS – ALL CLASSIFICATIONS

LAYOUT OF SERVICES : URBAN ROADS

FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

Date: FEB 2022

Revision: 0.2

SHEET No. **29**

MINIMUM CLEARANCE BETWEEN SERVICES

The minimum clear distance between services shall be the greater of the required clearances between the relevant services as follows:

| | |
|---------------|---|
| Stormwater: | 300 H, 150 V |
| Wastewater: | 300 H 150 V (except watermains as follows) 1000 H, 500 V or 600 H, 750 V to watermains. |
| Electricity: | 500 H, 225 V (except watermains > 200mm ID as follows) 1000 H, 225 V to watermains > 200mm ID. |
| Telecom & Gas | 300 H, 150 V (except watermains > 200mm ID as follows): 600 H, 150 V to watermains > 200mm ID. |
| Watermains: | Clearance to other services as above. Clearance to other watermains as follows: 600 H, 500 V where new pipeline is > 375mm ID 300 H, 150 V where new pipeline is ≤ 200mm ID and where existing pipeline is ≤ 375mm ID 600 H, 150 V where new pipeline is > 200mm ID and where existing pipeline is < 375 mm ID. |

Notes:

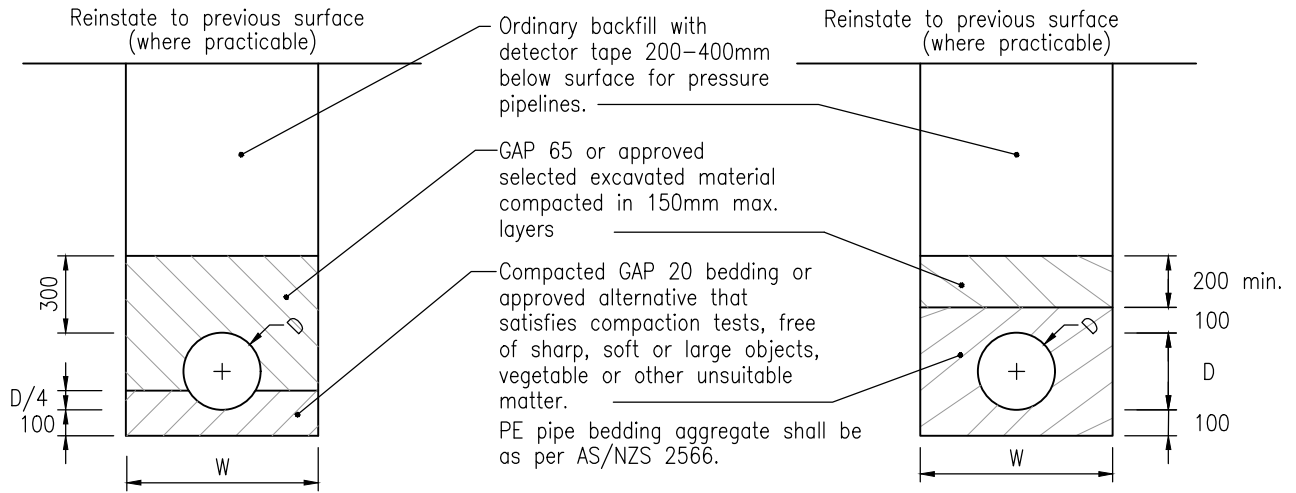
1. All distances in mm.
2. All services shall have min. cover under footpaths and berms as per relevant section in ES.
3. Refer to Table 4.9, 5.6, and 6.1.
4. Vertical clearances apply where services cross, except that watermains shall always maintain a clearance above a parallel wastewater pipeline.

MINIMUM CLEARANCES BETWEEN SERVICES FOR ALL ENVIRONMENTS



FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

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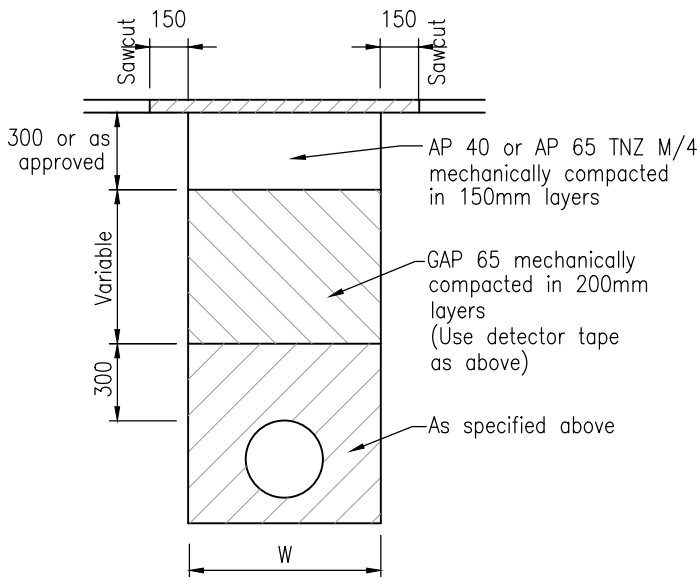
**CONCRETE, DUCTILE IRON,
STEEL OR VITRIFIED CLAY PIPE**

(Where specifically approved)

PVC, PE & PP PIPE
(PVC & PP not approved for water supply)

NOTES

- Concrete pipes to be RCRRJ to AS/ NZS 4058 installed to manufacturers requirements.
- Ordinary backfill shall be free from stones or rocks greater than 150mm nominal diameter compacted in 300mm layers.
- Replace topsoil to original depth as necessary.
- Existing sealed roadway excavations are to be resurfaced with 50mm of asphaltic concrete.
- Clegg Hammer test:
0-300mm depth range Clegg reading not less than 45.
300mm-1.5m depth range Clegg reading not less than 30.
1.5m-top of pipe bedding material Clegg reading not less than 25.
- PRIVATEWAY base course metalling within pipe trenches may be in accordance with the Privateway Standards.
- Trench width shall not exceed W at the pipe crown level.
- Unsatisfactory trench material is to be undercut and replaced with compacted hardfill.
In poor soils such as swamp, peat, and in rock the minimum depth of granular bedding material below the invert is to be 200mm or specific design as necessary.
- Pipelines at 1:8 gradient or steeper shall have cement stabilised bedding and/or surrounds.
- Pipelines at 1:3 gradient or steeper shall have weak mix concrete bedding (10MPa) in accordance with Sheet 32. Large pipes will require specific pier design.
- Concrete bedding shall be allowed to cure for 48 hours prior to backfilling.
- Backfilling - carriageways may be with 'flowable fill' (low strength fly-ash concrete).
- Granular bedding is to satisfy N.Z.S. 7643 Appendix B.
- Minimum cover over pipes (unless specifically designed or protected in accordance with sheet 32).
A. 600mm if not subjected to traffic loading
B. 900mm under carriageways and trafficed areas.
- Sand is not permitted as PE Pipe Bedding



**ADDITIONAL BACKFILL REQUIREMENTS
UNDER CARRIAGEWAYS**

(All types of pipe)

| W | TYPE OF PIPE |
|---------|----------------|
| D + 600 | Steel, DI |
| D + 450 | Concrete |
| D + 450 | Vitrified clay |
| D + 400 | uPVC, PE & PP |

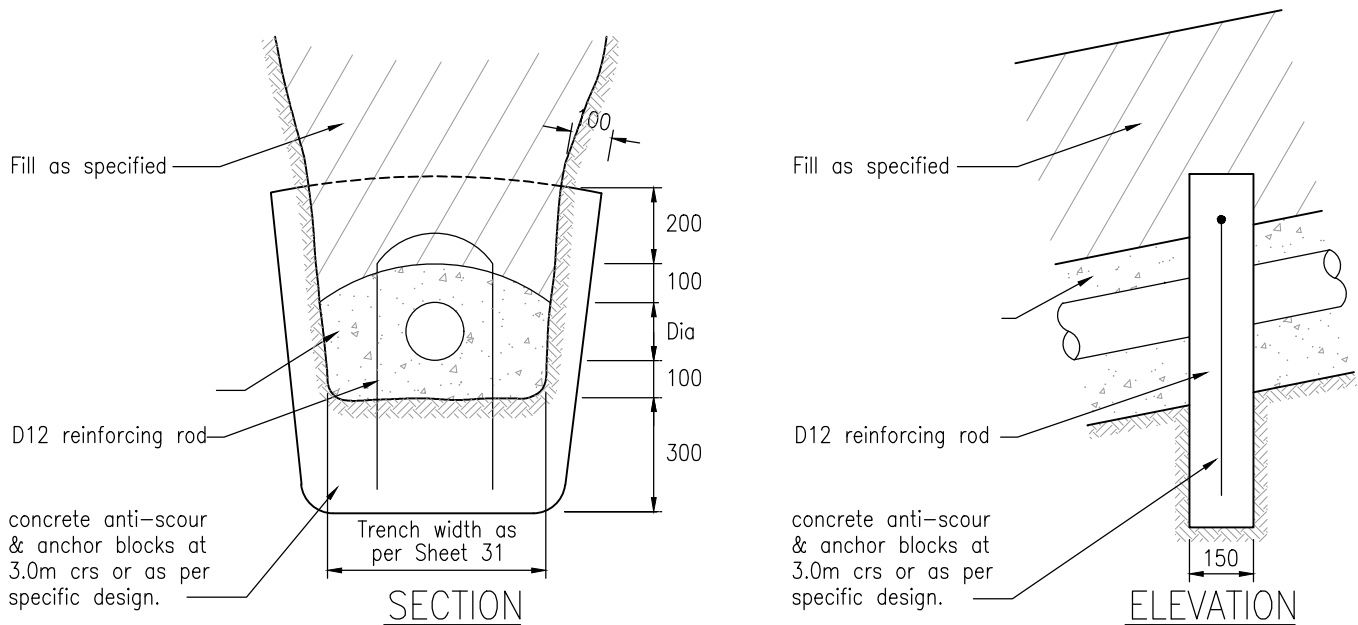
Variations in W require additional design compensation.

PIPE BEDDING & BACKFILL
(FOR ALL ENVIRONMENTS)



FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

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| SHEET No. | 31 |

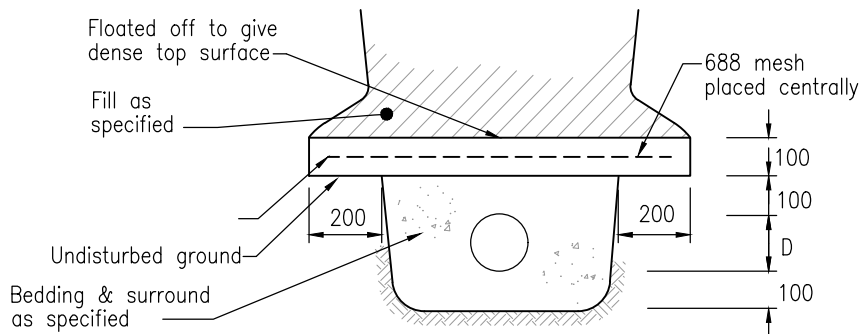


STEEP PIPE DETAILS

(For pipeline gradients 1:3 or steeper and diameter ≤ 450mm)

NOTES:

- 1) Some variation is possible using aluminium plate cut off walls bolted to larger diameter pipes.
- 2) Larger diameter pipes will require specific pier design to counter the downward component of water and pipe weight.

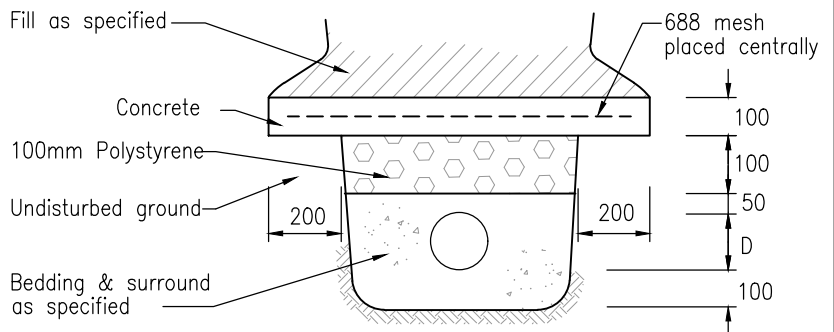


REINFORCED CONCRETE SLAB PROTECTION FOR STORMWATER AND WASTEWATER

(Where additional loading or other requirements necessitate)

GENERAL:

- A. All concrete to be 20MPa at 28 days as per NZS 3104:2021
- B. Cement stabilised bedding and back fill: 1 part cement to 20 parts aggregate.
- C. Allow 48 hours curing prior to back filling any concrete or stabilised material.
- . Slab protection to be laid in lengths no greater than 2.0M



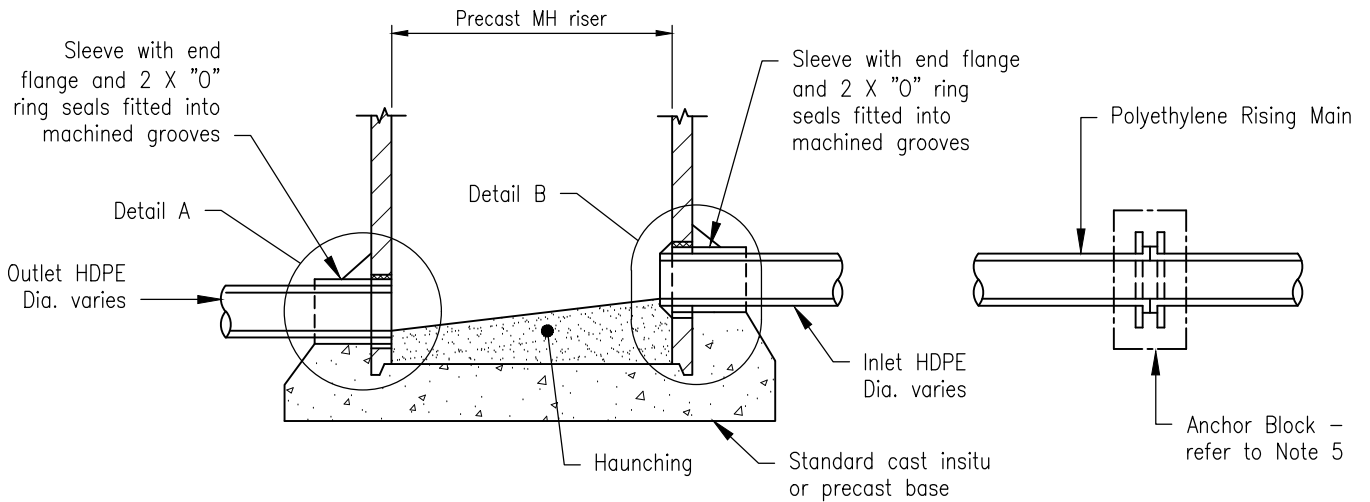
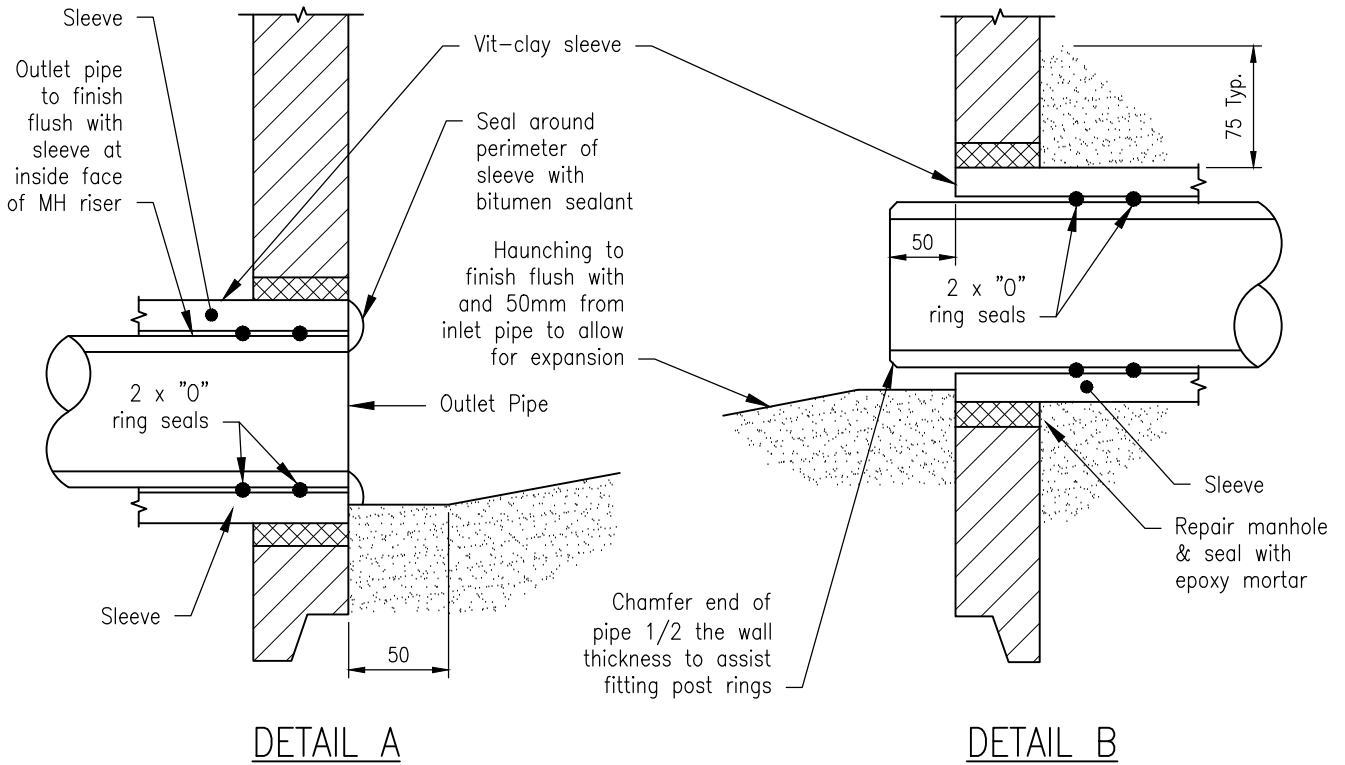
REINFORCED CONCRETE SLAB PROTECTION FOR WATER PIPELINES

PIPE PROTECTION AND BULKHEAD DETAILS
(FOR ALL ENVIRONMENTS)



FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

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| SHEET No. | 32 |



NOTES:

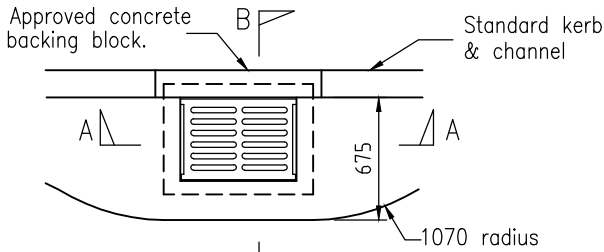
1. Haunching shall be formed to enable pipe to expand and contract.
2. Sliding joint Vit-Clay sleeve to be factory fabricated to match O.D. of pipe.
3. Anchor blocks required on rising mains.
4. All concrete to be 20MPa at 28 days as per NZS 3104:2021.
5. Anchor blocks to be on rising main inlet and will be cast against firm ground. For thrust block details refer to Sheet 49 & 50.
6. For standard manhole refer to Sheets 39.
7. For private rising main connections refer to Sheet 38

STANDARD MANHOLE HDPE SLIDING JOINT

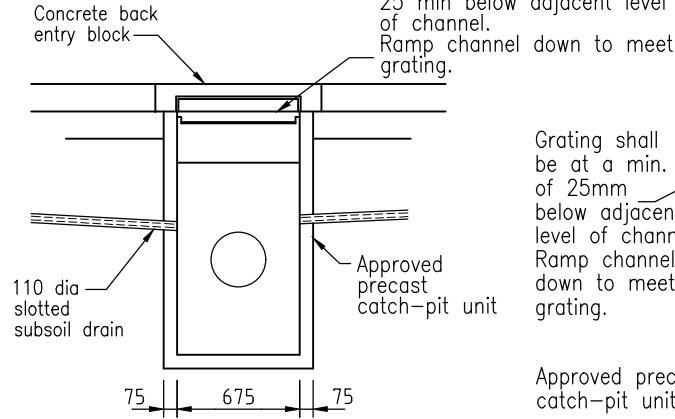


FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

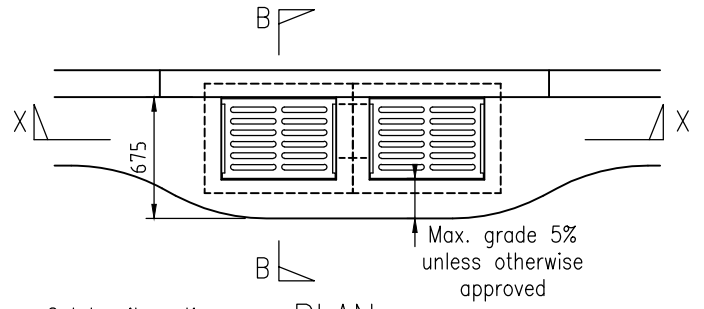
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| Revision: | 0.2 |
| Scale: | AS SHOWN |
| SHEET No. | 33 |



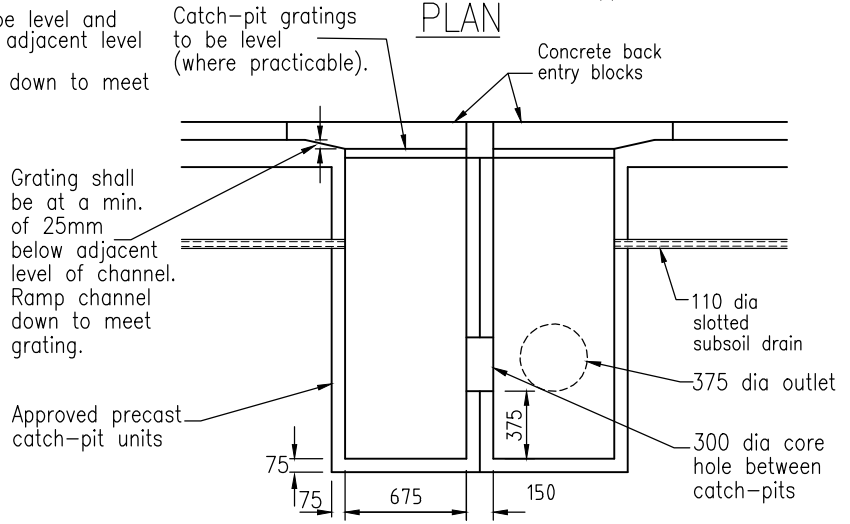
PLAN



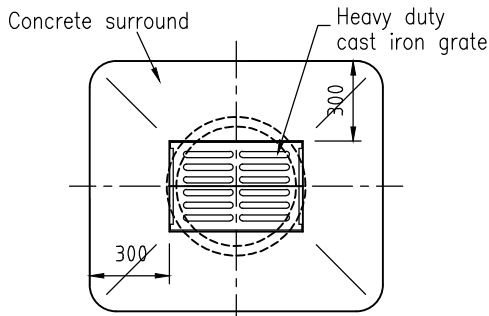
SECTION A-A
SINGLE CATCH-PIT



PLAN

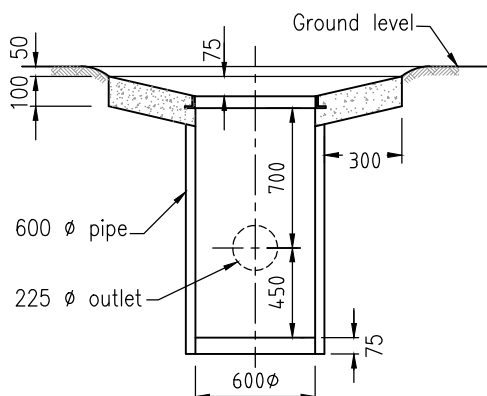


SECTION X-X
DOUBLE CATCH-PIT

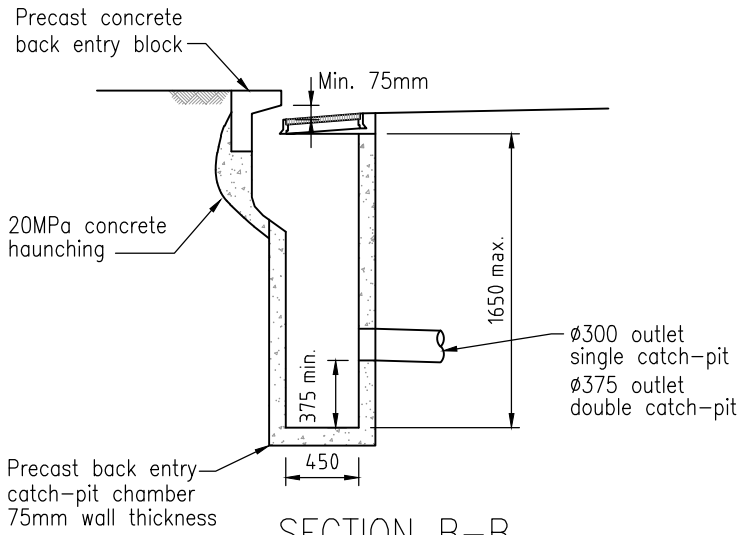


PLAN

ALTERNATIVE CAST IRON GRATE CONFIGURATION
(perpendicular slots) for cycle routes



SECTION
FIELD CATCH-PIT DETAIL



SECTION B-B

NOTES:

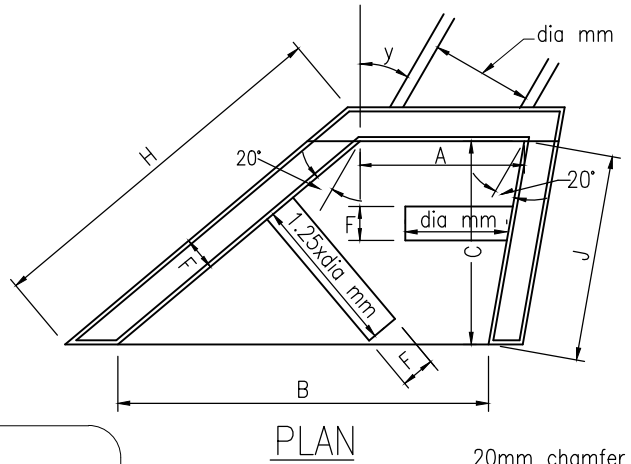
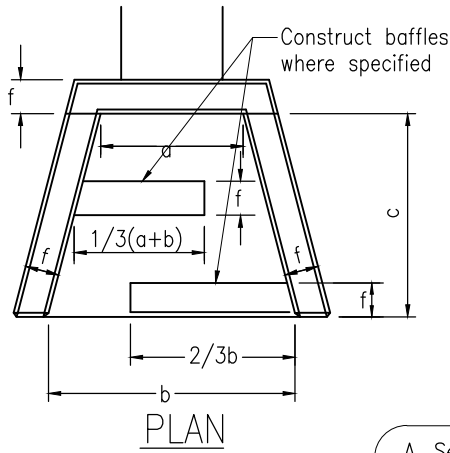
1. Concrete to be ordinary grade (20MPa) in accordance with NZS 3104:2021
2. Catch-pit outlet pipes to be 1:100 min gradient.
3. Mega catch-pits require specific design and approval.
4. Grates to be cycle friendly. Refer Section 3.2.14.6.

CATCH-PIT DETAILS
FOR ENVIRONMENTS LIVING 1 AND 2, AND BUSINESS 1-5

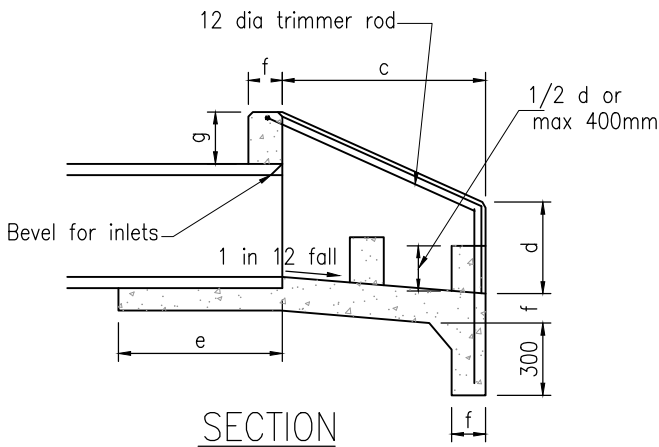
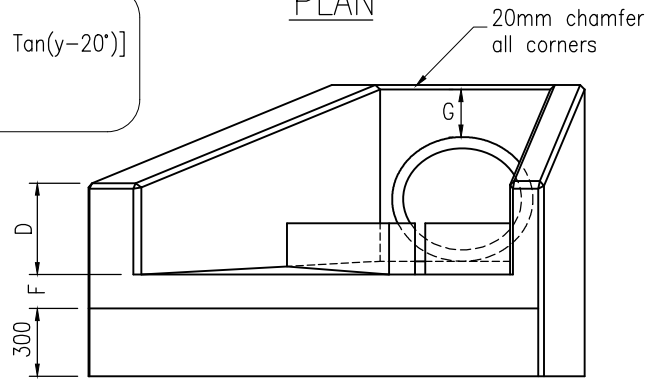
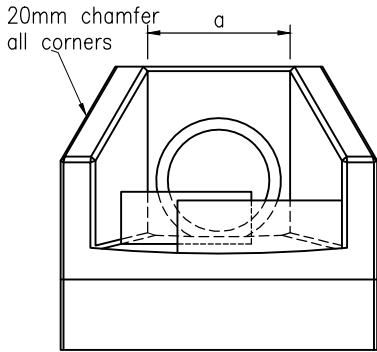


FAR NORTH DISTRICT COUNCIL
ENGINEERING STANDARDS

| | |
|-----------|----------|
| Date: | FEB 2022 |
| Revision: | 0.2 |
| Scale: | AS SHOWN |
| SHEET No. | 34 |



A. $\text{Sec } y \times (a)$
 B. $C \tan (y+20^\circ) + [A-C \tan(y-20^\circ)]$
 H. $C \times \text{Sec } (y + 20^\circ)$
 J. $C \times \text{Sec } (y - 20^\circ)$



| PRINCIPAL DIMENSIONS (mm) | | | | | | | |
|---------------------------|------|------|--------|--------|--------|--------|--------|
| DIA OF PIPE | a | b | c C | d D | e E | f F | g G |
| 150 | 300 | 450 | 600 | 200 | 325 | 100 | 150 |
| 230 | 380 | 600 | 700 | 250 | 425 | 100 | 150 |
| 300 | 450 | 750 | 750 | 300 | 525 | 100 | 150 |
| 375 | 550 | 900 | 850 | 350 | 625 | 100 | 150 |
| 450 | 630 | 1100 | 900 | 400 | 725 | 150 | 230 |
| 525 | 700 | 1200 | 1000 | 450 | 825 | 150 | 230 |
| 600 | 800 | 1400 | 1100 | 550 | 900 | 150 | 230 |
| 750 | 1000 | 1700 | 1200 | 600 | 1050 | 150 | 300 |
| 900 | 1170 | 2000 | 1450 | 650 | 1225 | 150 | 300 |
| 1050 | 1380 | 2300 | 1700 | 750 | 1375 | 150 | 300 |
| 1200 | 1520 | 2600 | 2100 | 750 | 1550 | 150 | 450 |
| 1350 | 1680 | 2800 | 2400 | 750 | 1725 | 150 | 450 |

- NOTE:**
- Reinforce floors & walls with:
 150 – 375 665 mesh
 450 – 600 633 mesh or D10 rods at 250 crs.
 675 – 900 D12 rods at 250 crs.
 1050 – 1350 D12 rods at 150 crs.
 - All reinforcement shall be placed centrally in walls and floor, and shall be continuous between walls and floor.
 - Laps in structural grade bars to be 300 min.
 - There shall be at least 2 bars – whether mesh or M.S. over the top of the pipe.

- Concrete is to be 20MPa at 28 days as per NZS 3104:2021.
- Baffles are to be constructed as shown when outlet velocities and soil conditions dictate, in extreme cases specific design may be required by the Council.
- Inlet structures shall have reverse apron fall and no baffles.

INLET AND OUTFALL STRUCTURES

