Whangarei District Council

Engineering Standards

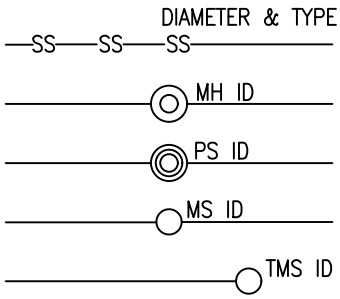
Drawing sheets

Issue 0.4 – Revised 2022

Whangarei District Council | Te Kaunihera a rohe o Whangārei

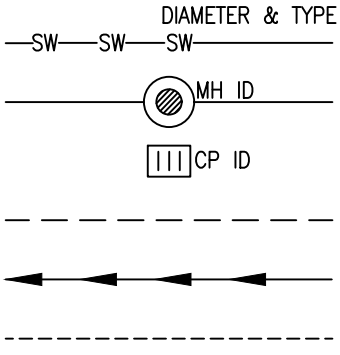
Sewer Reticulation

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



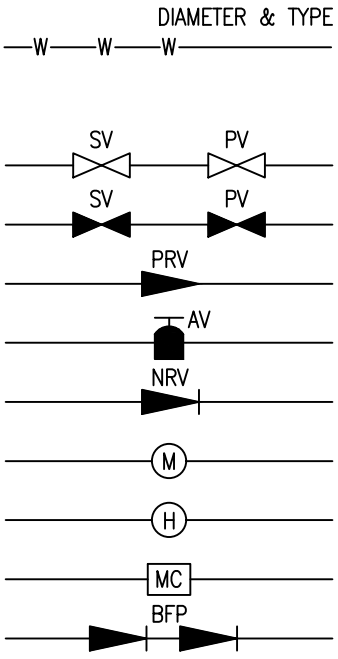
Stormwater Reticulation

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

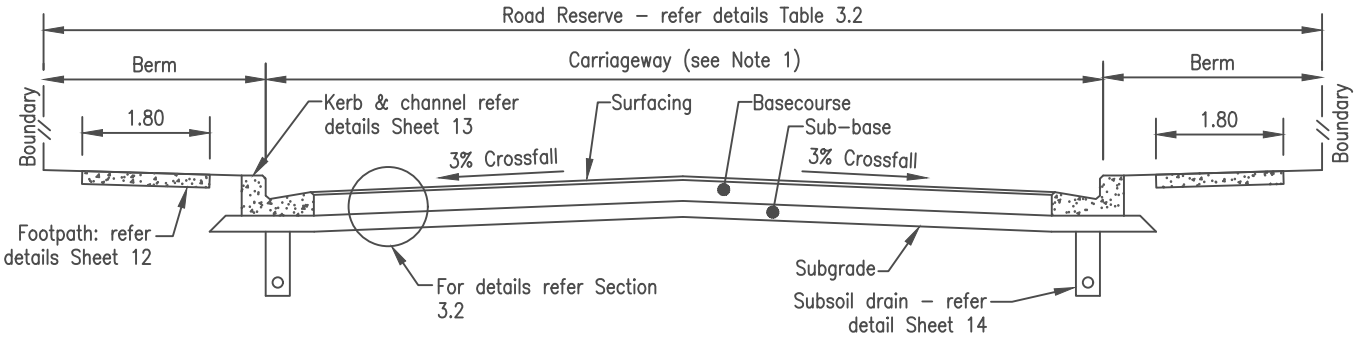


Water Reticulation

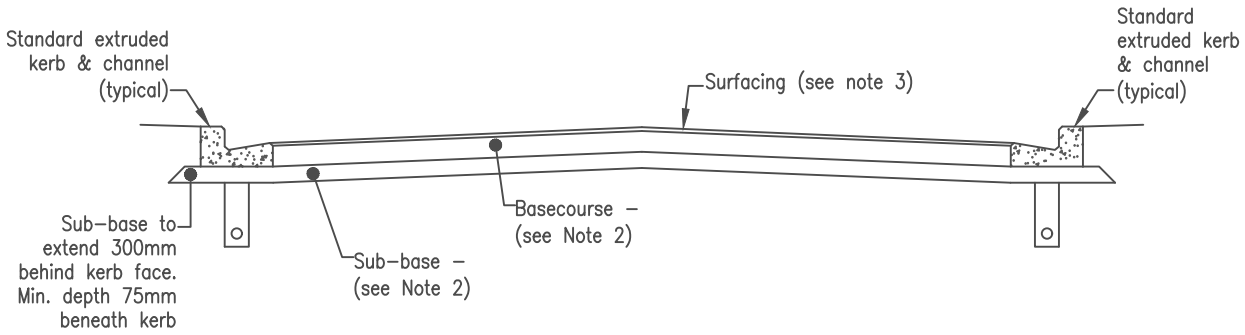
- Water Lines
- Sluice & Peet Valve
  - Normally open
  - Normally closed
- Pressure Reducing Valve
- Air Valve
- Non Return Valve
- Bulk Meter
- Hydrant
- Multi Chamber
- Back Flow



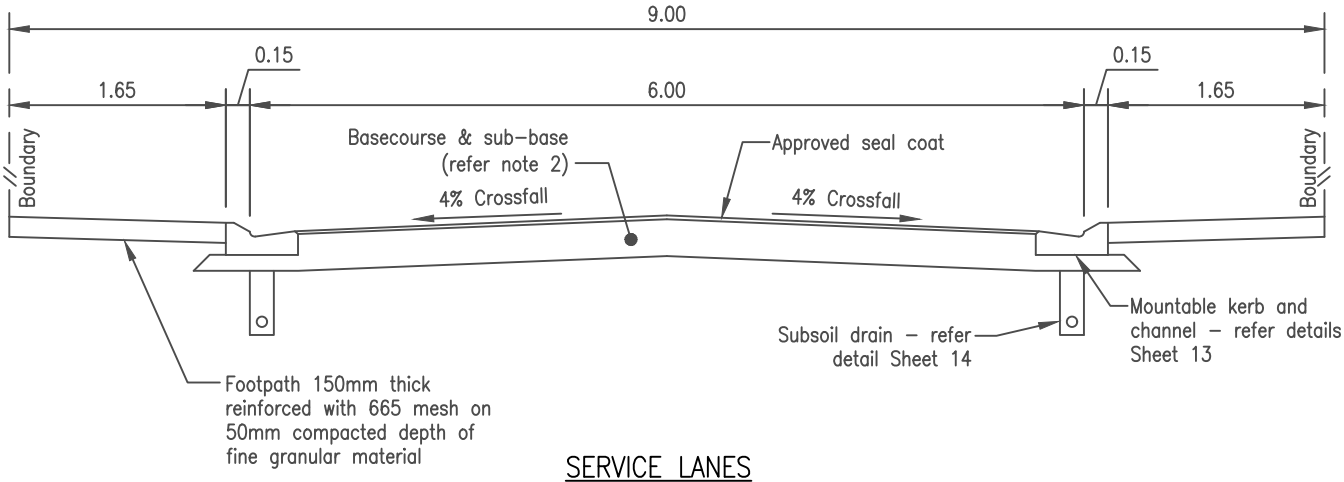
STANDARD SYMBOLS	Date: DEC 2021
	Revision: R2
	Scale:
Whangarei District Council | Engineering Standards	SHEET No. 1



TYPICAL CROSS SECTION
NTS



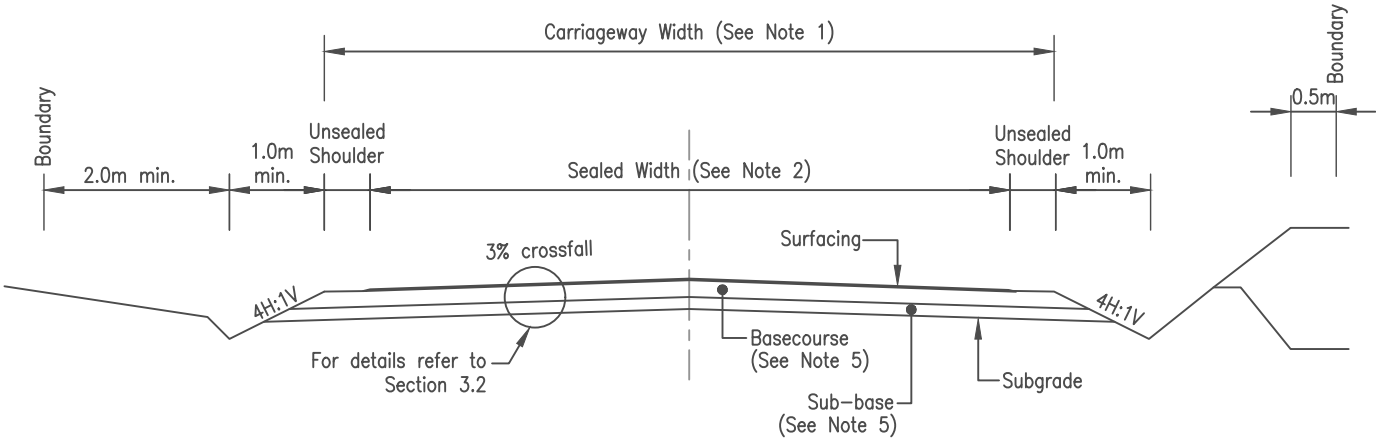
FURTHER DETAIL
NTS



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 3.2.11
3. Privateways in industrial developments shall be formed to service lane standards.

URBAN ROAD & SERVICE LANE DETAILS	Date: DEC 2021
	Revision: R2
Whangarei District Council | Engineering Standards	Scale: AS SHOWN
	SHEET No. 2



TYPICAL CROSS SECTION
NTS

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 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 3.2.20
5. Pavement thickness to be determined by the designer in accordance with Section 3.2.11
6. All rural roads shall be sealed except where specifically exempted by the WDC

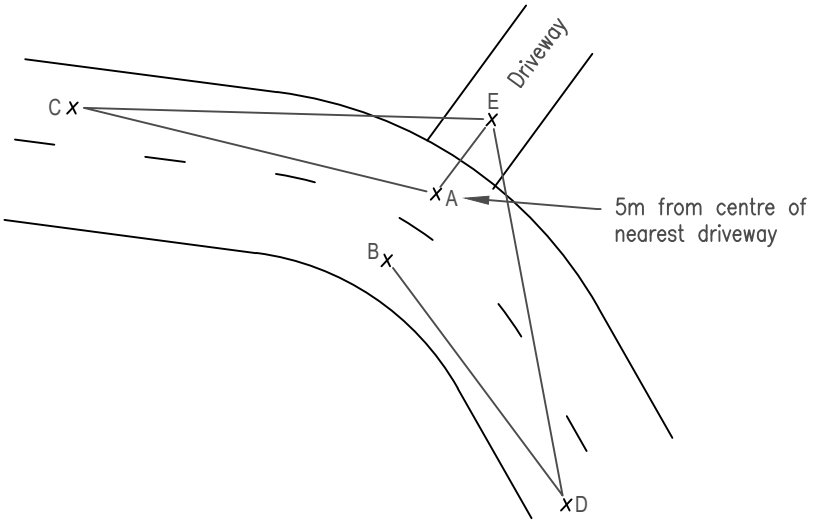
RURAL ROAD DETAILS	Date: DEC 2021
	Revision: R2
Whangarei District Council | Engineering Standards	Scale: AS SHOWN
	SHEET No. 3

MINIMUM SIGHT DISTANCE FROM VEHICLE ENTRANCES (m)

	Frontage Transport Corridor Classification		
Posted Speed Limit (km/hr)	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 (R_T) time of 1.5 seconds.
4. Collector transport corridor sight distances are calculated based upon ASD with R_T of 2 seconds.
5. Arterial and Regional transport corridor sight distances are calculated based upon Safe Intersection Sight Distance (SISD) with R_T of 2 seconds.
6. Grade is based on 0%. Austroads provides adjustment factors for grades.

SIGHT DISTANCE MEASUREMENT



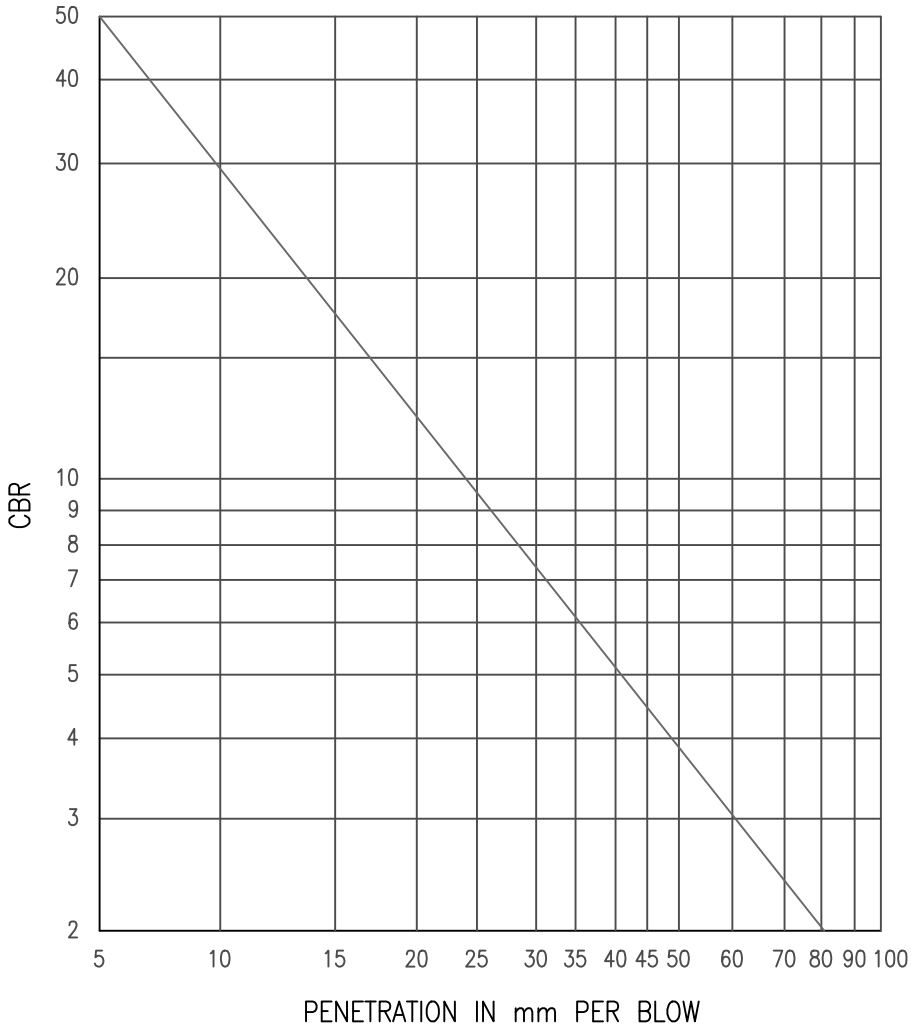
Note:
1. Derived from the New Zealand Transport Agency, "Road and Transport Standards: Guidlines for Visibility at Driveways."

There should 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:	MARCH 2018
Revision:	R1
Scale:	AS SHOWN
SHEET No.	4

Whangarei District Council | Engineering Standards



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

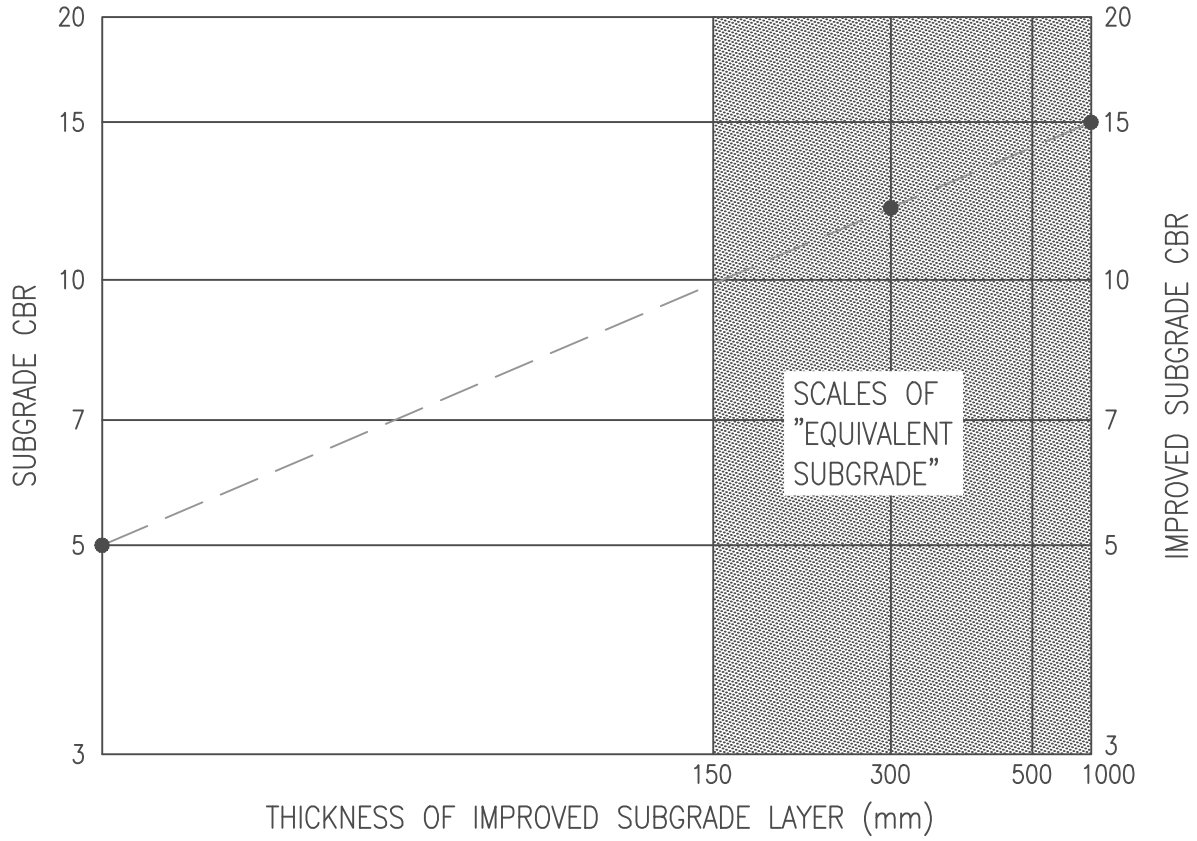
SCALA PENETROMETER CHART
(FOR ALL ENVIRONMENTS)

Whangarei District Council

Engineering Standards

Date:	APRIL 2010
Revision:	R0
Scale:	AS SHOWN
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 OF STABILISED SUBGRADE IMPROVEMENT)

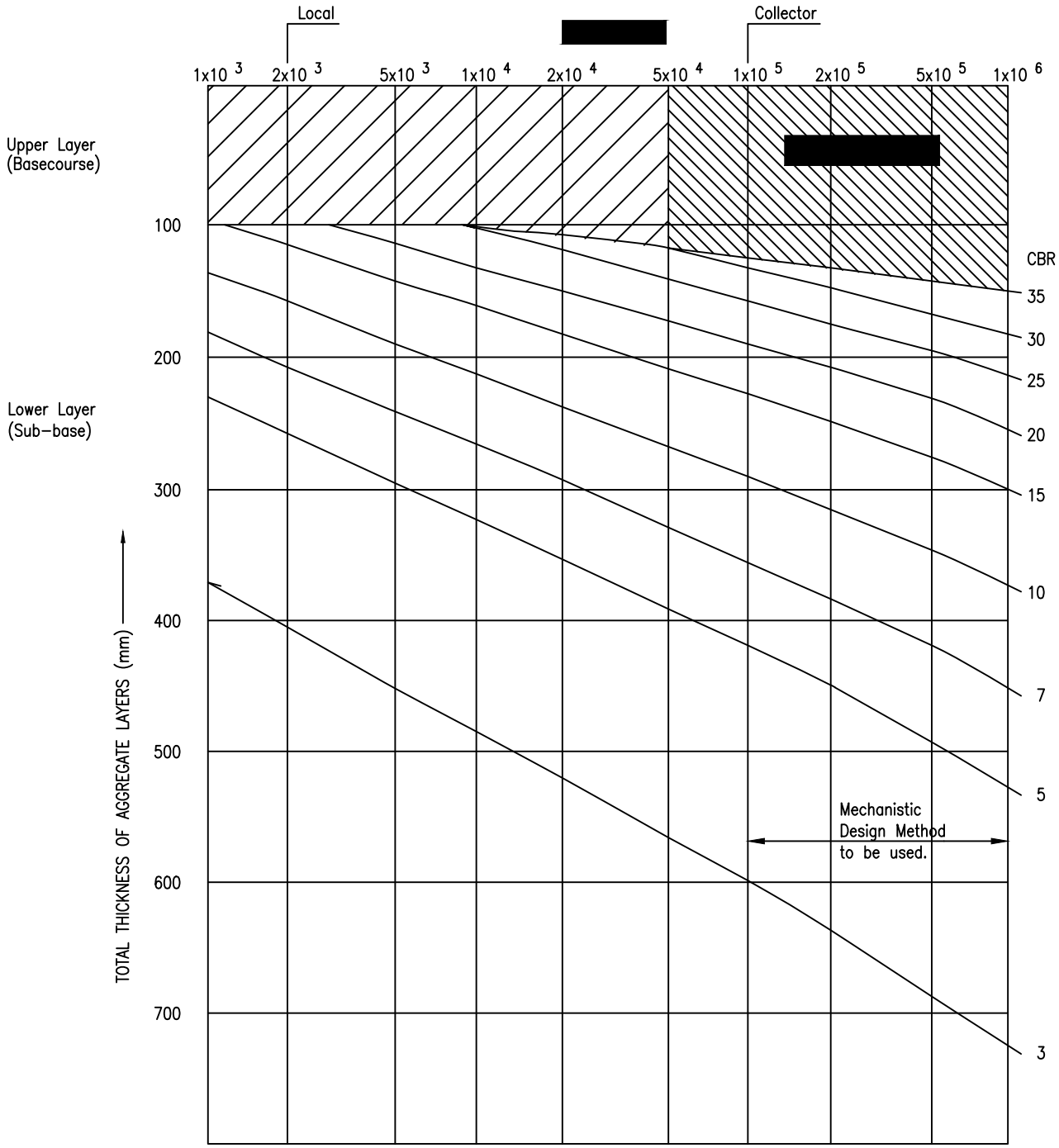
Methodology

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 FNVIRONMFNTS)	Date: MARCH 2018
	Revision: R0
Whangarei District Council | Engineering Standards	Scale: AS SHOWN
	SHEET No. 5A

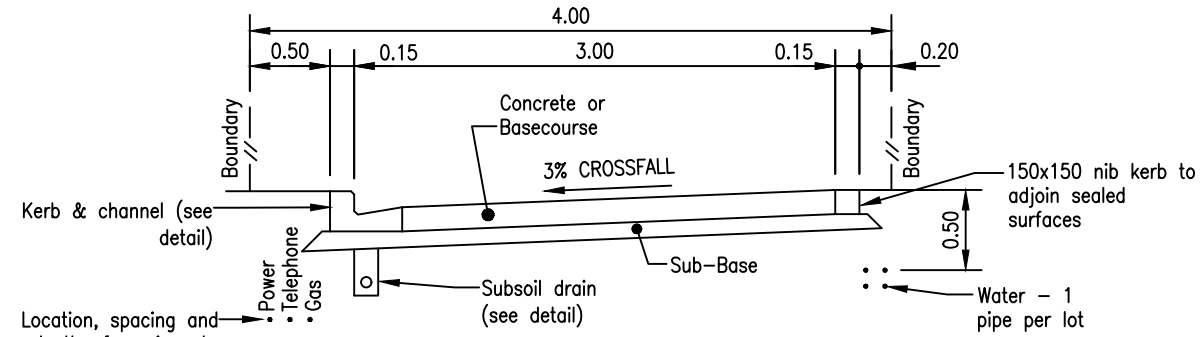


NOTES:

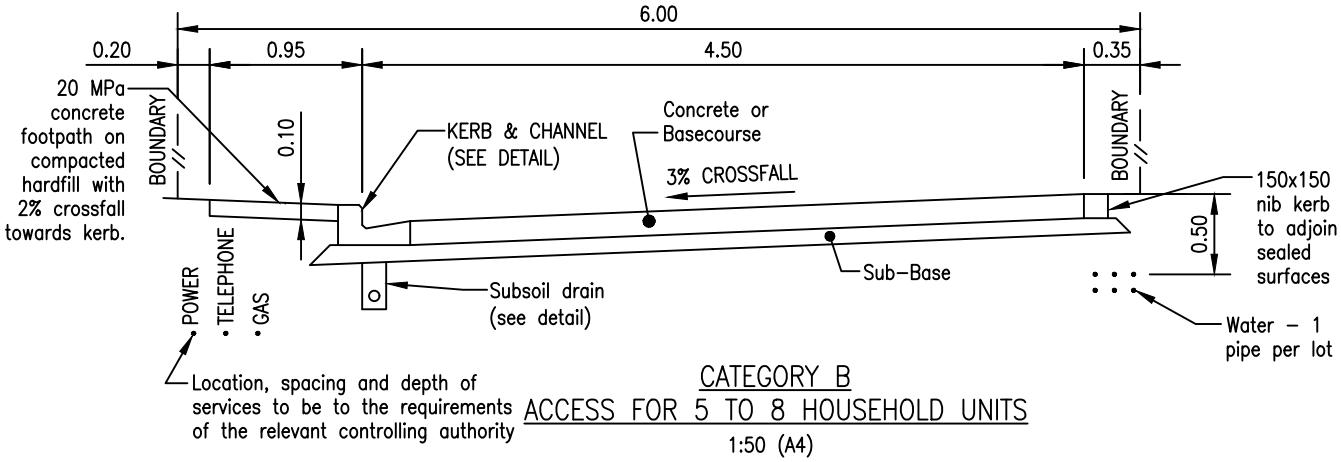
1. Collector, arterial and industrial streets shall be the subject of specific design based on an estimate of their E.S.A. (Equivalent Standard Axle) loading, using a mechanistic design method.
2. The curves give minimum aggregate thickness above the subgrade and greater depths of higher quality materials 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 3.2.11 and 3.3.2 for design and construction details.

DESIGN CHART FOR FLEXIBLE PAVEMENTS FOR ALL ENVIRONMENTS	Date: DEC 2021 Revision: R2 Scale: AS SHOWN SHEET No. 6

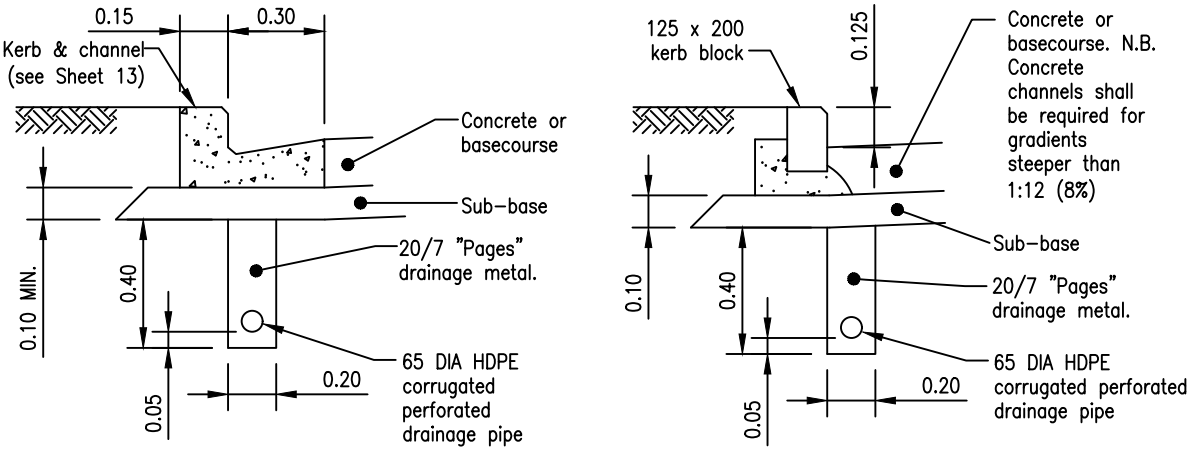
Whangarei District Council | Engineering Standards



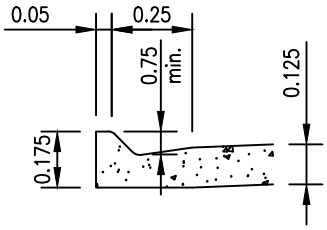
CATEGORY A
ACCESS FOR UP TO 4 HOUSEHOLD UNITS
1:50 (A4)



CATEGORY B
ACCESS FOR 5 TO 8 HOUSEHOLD UNITS
1:50 (A4)



TYPICAL KERB & SUBSOIL DRAIN DETAILS
1:25 (A4)



ALTERNATIVE CHANNEL (See Note 4)
1:25 (A4)

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 3.16 and Section 3.2.27..
4. For further notes refer to Sheet 8.

URBAN PRIVATEWAY DETAILS

Whangarei District Council | Engineering Standards

Date:	MARCH 2018
Revision:	R1
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 WDC 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 Sheet 30, or as approved.

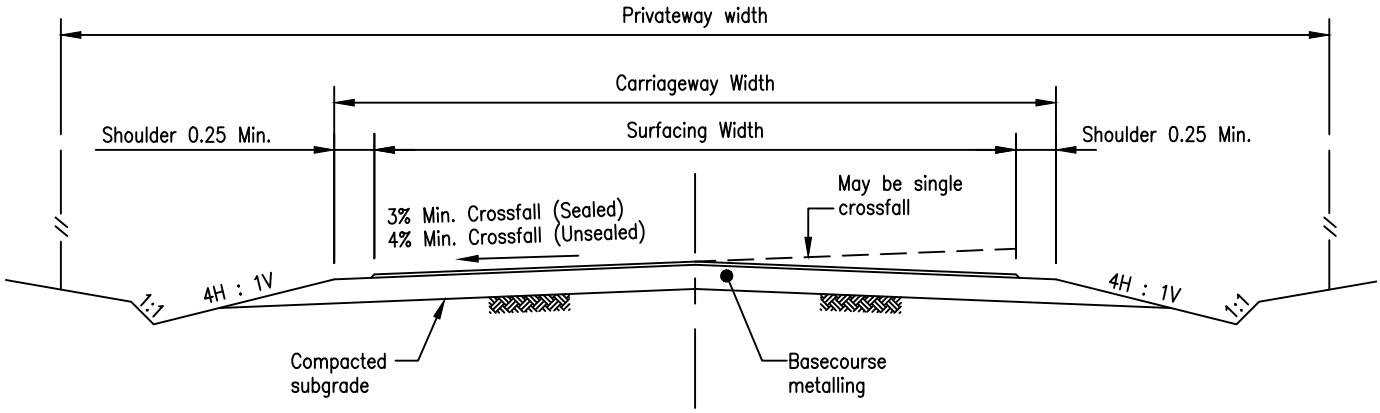
11. Stormwater pipes and associated installation are to comply with relevant NZ standards and the manufacturer,s requirements, be suitable for the catchment, and not less than 200mm diameter.

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.



ALL CATEGORIES

1:50 (A4)

NOTES:

1. If there is more than one environment contiguous to the site, then the more stringent standard applies.
2. Refer to Table 3.16 and Section 3.2.27.
3. For further notes refer to Sheet 10.

RURAL PRIVATEWAY DETAILS

Whangarei District Council | Engineering Standards

Date:	DEC 2021
Revision:	R2
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 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 watermains, sewers, or cables, must be of adequate width for separation of services to comply with Sheet 30 or as approved.

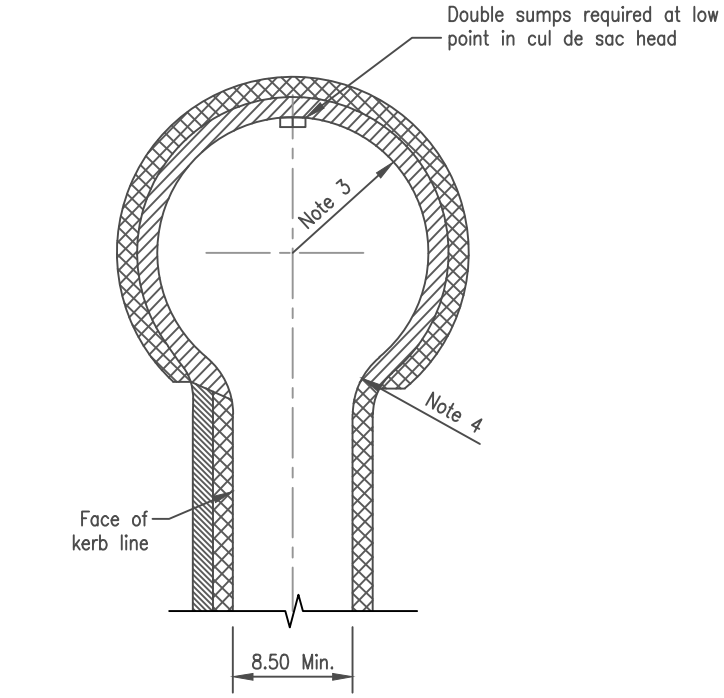
10. Stormwater pipes and associated installation are to comply with relevant NZ standards and the manufacturer,s requirements, be suitable for the catchment, and not less than 200mm diameter.

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.

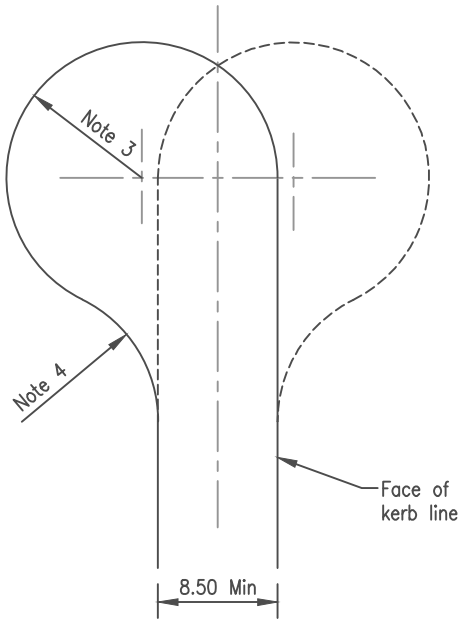


Berm

Reinforced Footpath to Commercial Crossing Standard – See Notes.

Ordinary Footpath

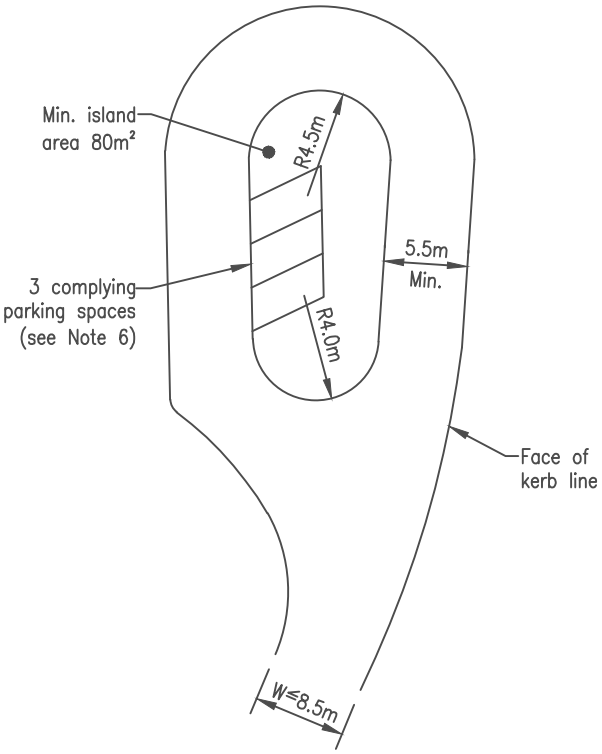
TYPE A



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.

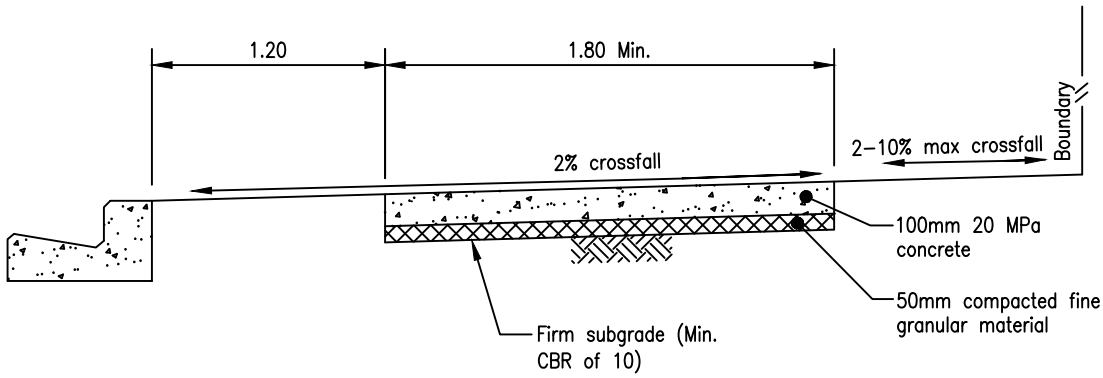


TYPE C

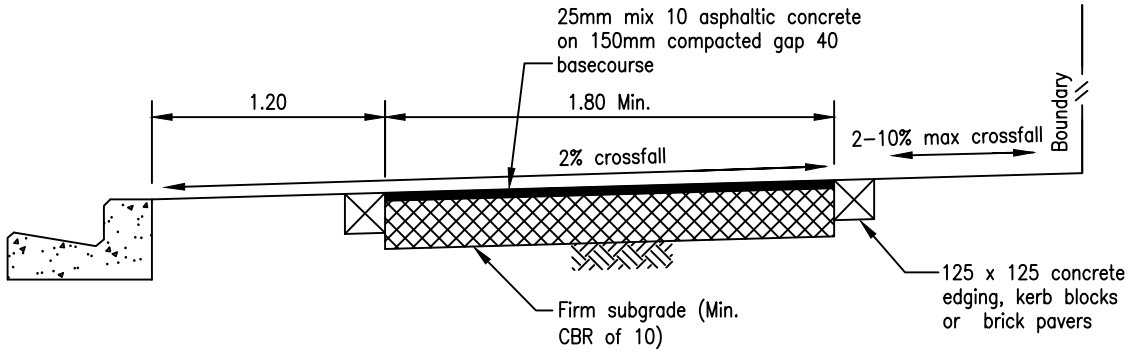
CUL DE SAC DETAILS

Date:	FEB 2015
Revision:	R0
Scale:	NTS
SHEET No.	11

Whangarei District Council | Engineering Standards

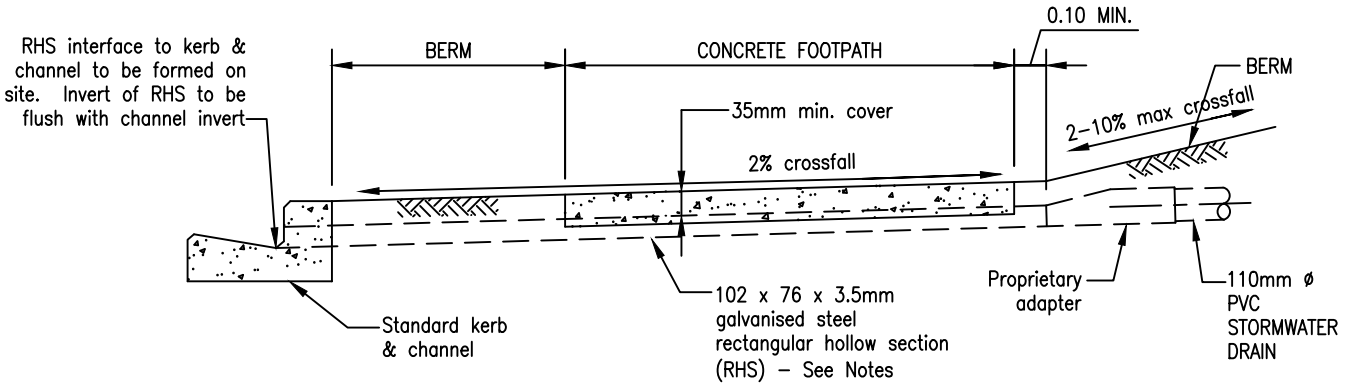


CONCRETE FOOTPATH
1:25 (A4)



ASPHALTIC CONCRETE FOOTPATH
1:25 (A4)

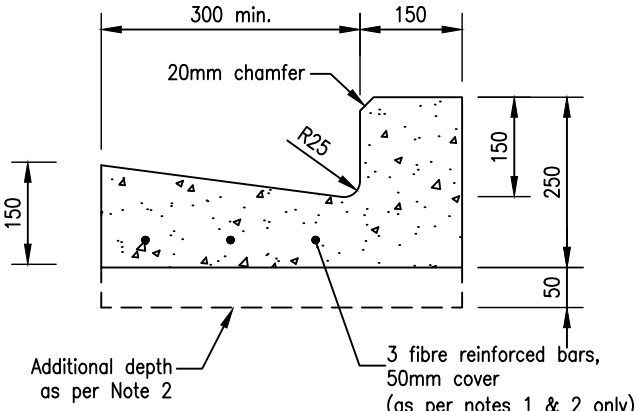
NOTES:
1. All service lids to be raised or lowered to be flush with footpath levels.
2. For footpaths in areas of high pedestrian use, refer to NZTA Pedestrian Network Guidance
3. Increased concrete & basecourse depths may be required in commercial areas and shall be required for service lanes (see Sheet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



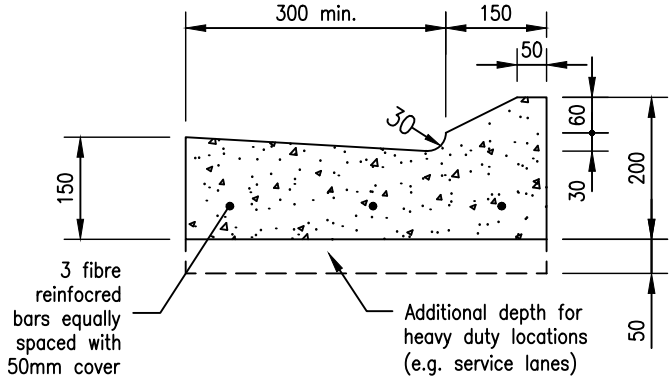
STORMWATER KERB CONNECTION THROUGH FOOTPATH
1:25 (A4)

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.

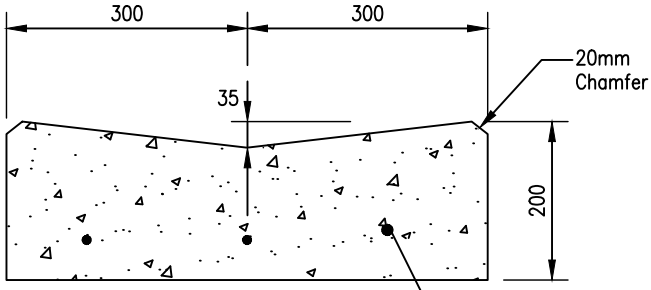
FOOTPATH & STORMWATER KERB CONNECTION DETAILS	Date: DEC 2021
	Revision: R2
Whangarei District Council | Engineering Standards	Scale: AS SHOWN
	SHEET No. 12



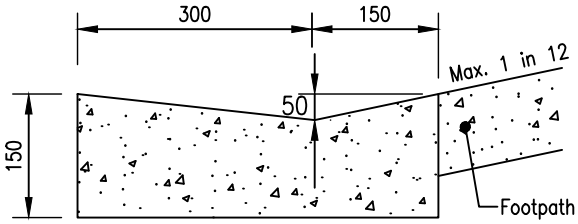
STANDARD KERB AND CHANNEL



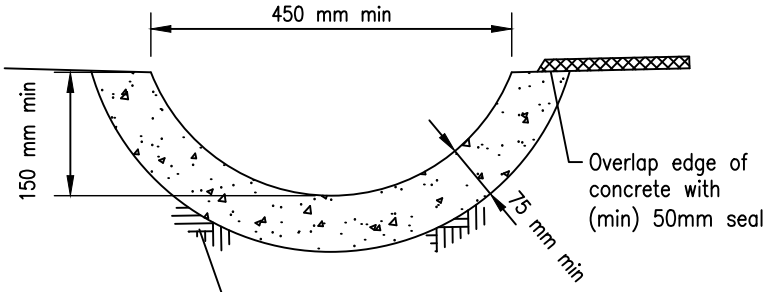
MOUNTABLE KERB AND CHANNEL



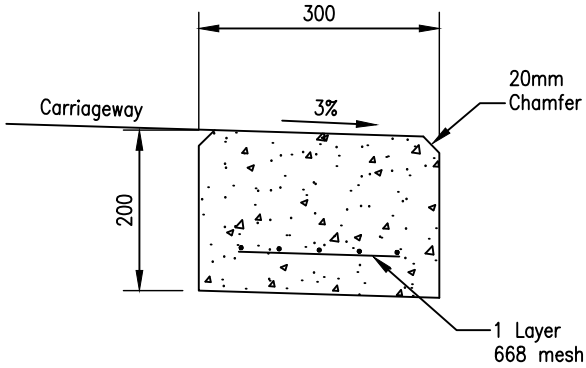
DISHED CHANNEL



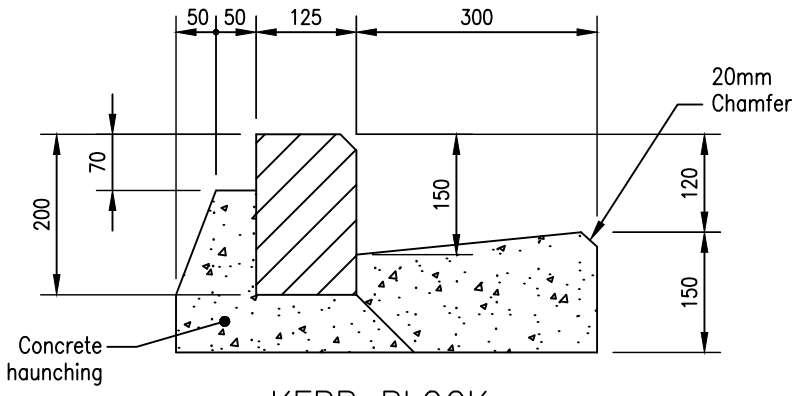
PRAM CROSSING



CONCRETE LINED CHANNEL – RURAL



FLUSH EDGE BEAM



KERB BLOCK

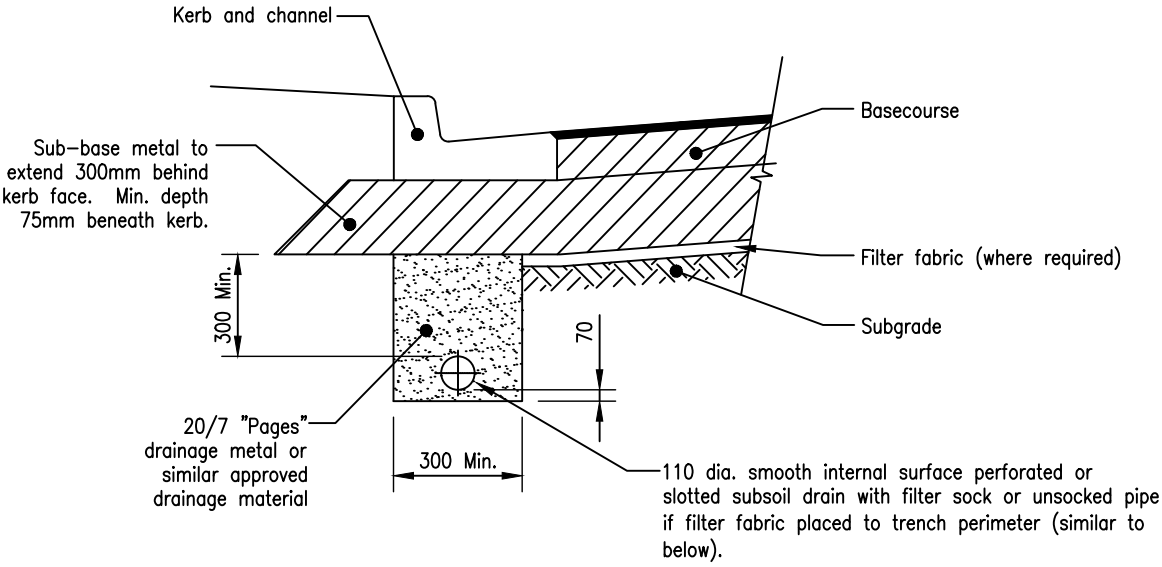
NOTES:

1. 3/fibre 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–fibre reinforced bars 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.

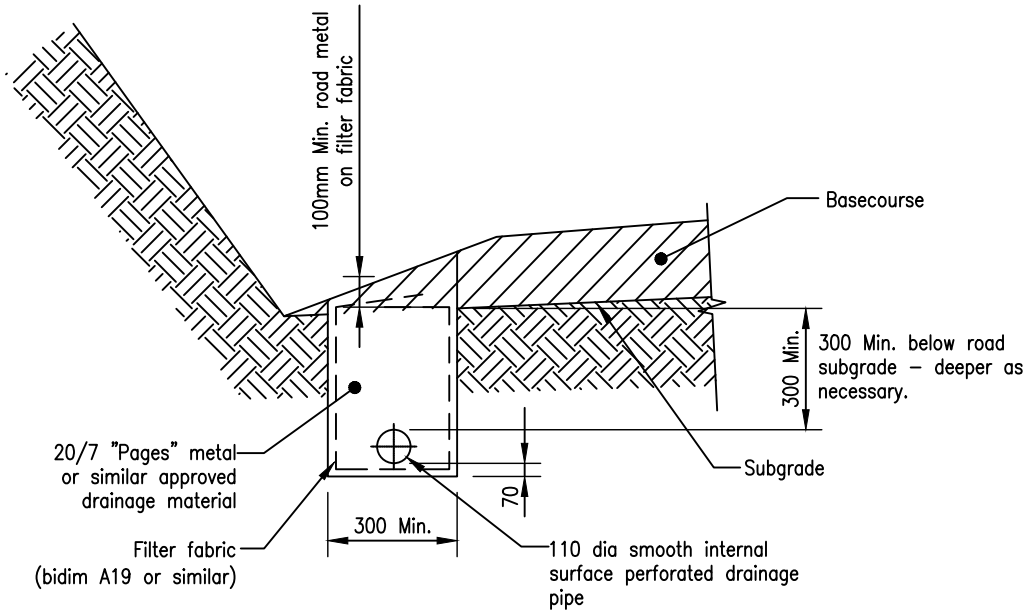
KERB & CHANNEL DETAILS
FOR ALL ENVIRONMENTS

Date:	DEC 2021
Revision:	R1
Scale:	NTS
SHEET No.	13

Whangarei District Council | Engineering Standards



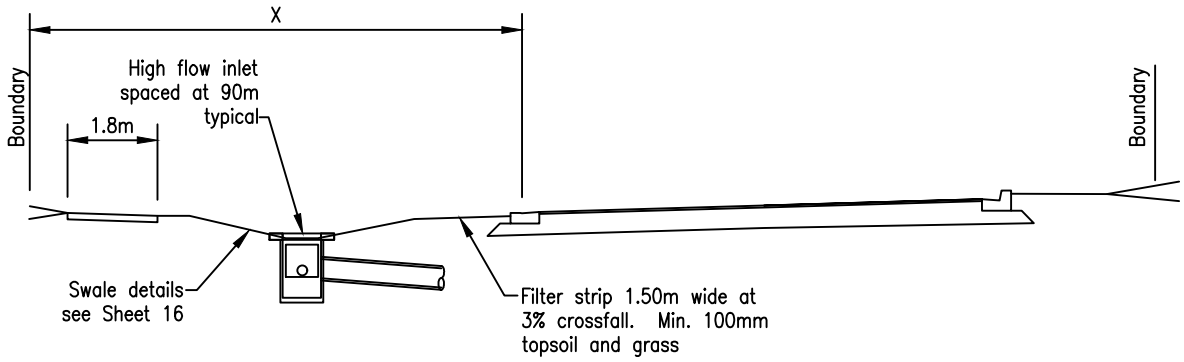
UNDER KERB DRAINAGE



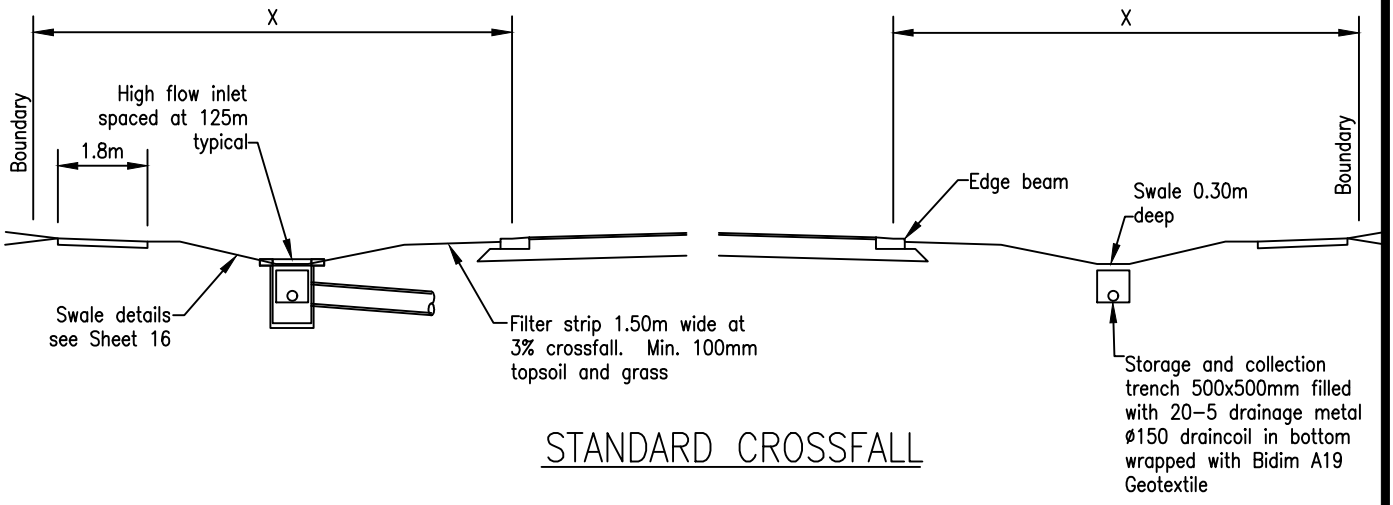
RURAL SUBSOIL DRAINAGE

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 3.2.13
4. Subsoil drains in clays to be PAP 7 or BMF (blue metal fines)

TYPICAL SUBSOIL DRAINAGE DETAILS	Date: FEB 2022
	Revision: R1
Whangarei District Council | Engineering Standards	Scale: AS SHOWN
	SHEET No. 14



UNIFORM CROSSFALL



STANDARD CROSSFALL

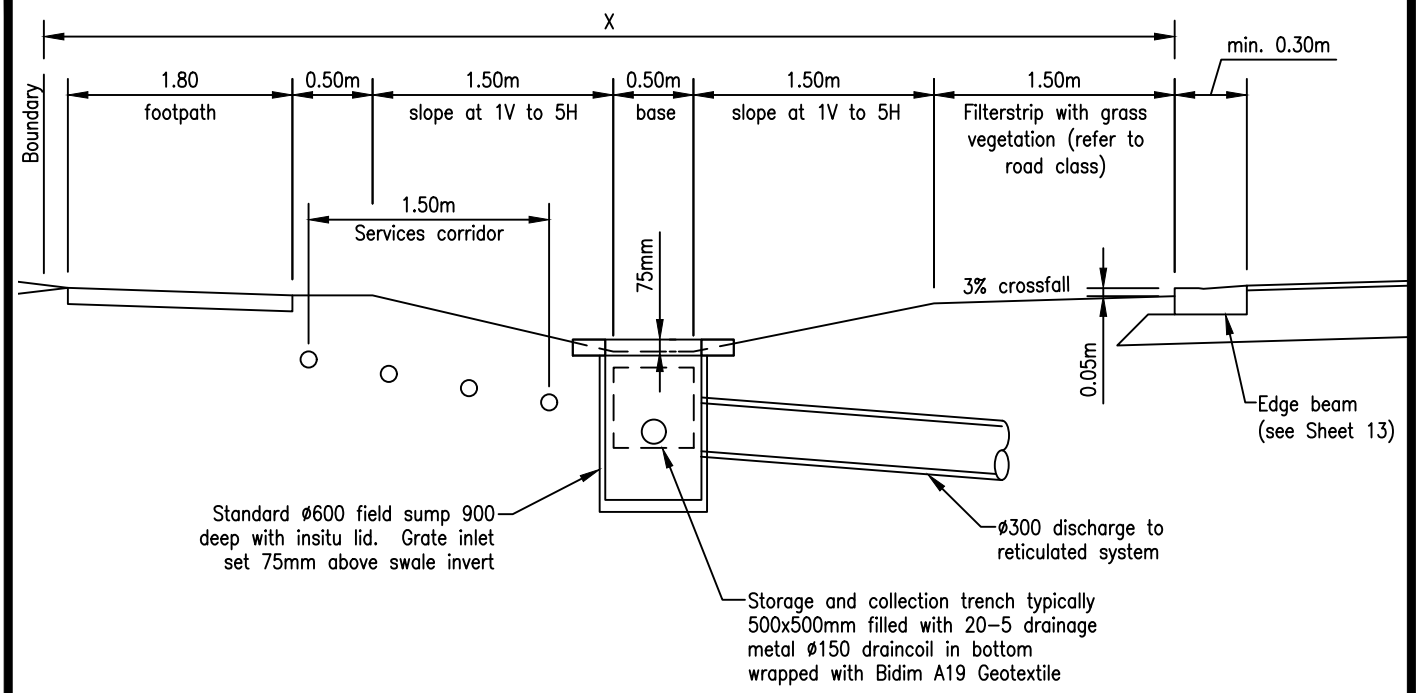
NOTES:

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.

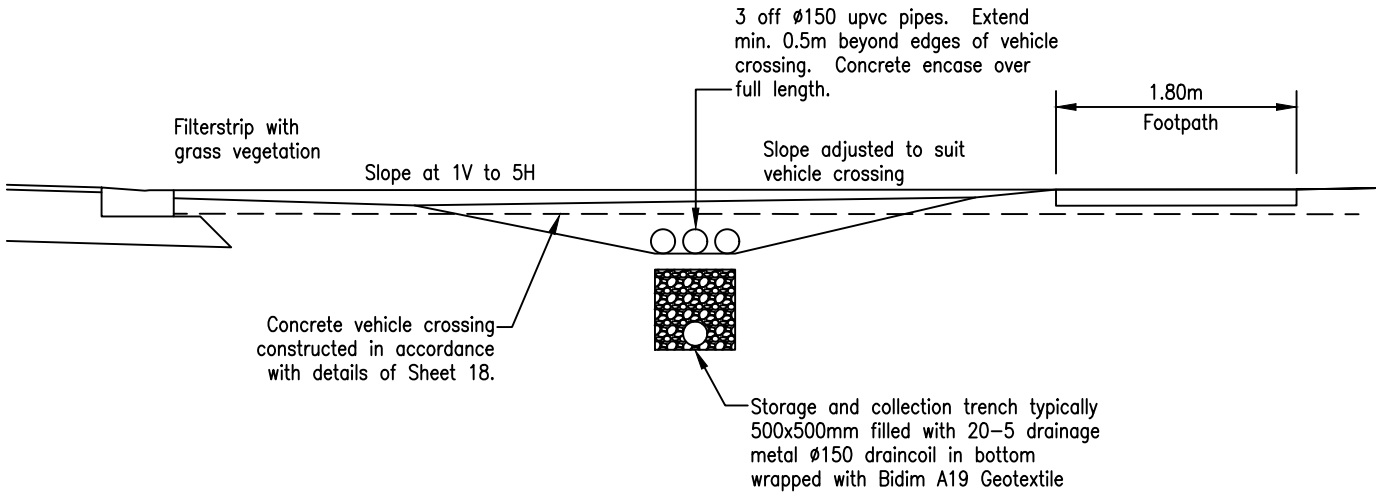
STANDARD ROAD SWALE DETAILS

Date:	DEC 2021
Revision:	R2
Scale:	NTS
SHEET No.	15

Whangarei District Council | Engineering Standards



SWALE DRAINAGE OUTLET DETAIL



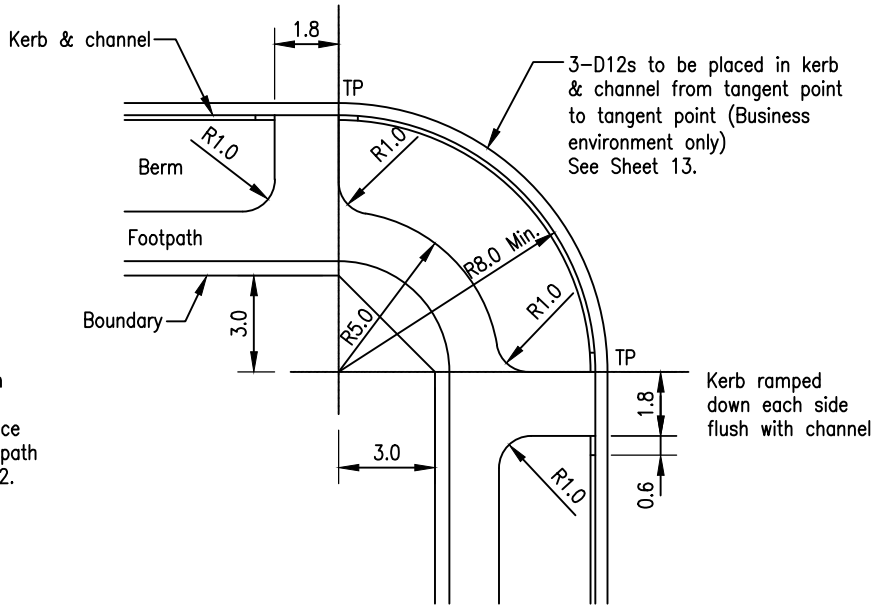
SWALE VEHICLE CROSSING DETAIL

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

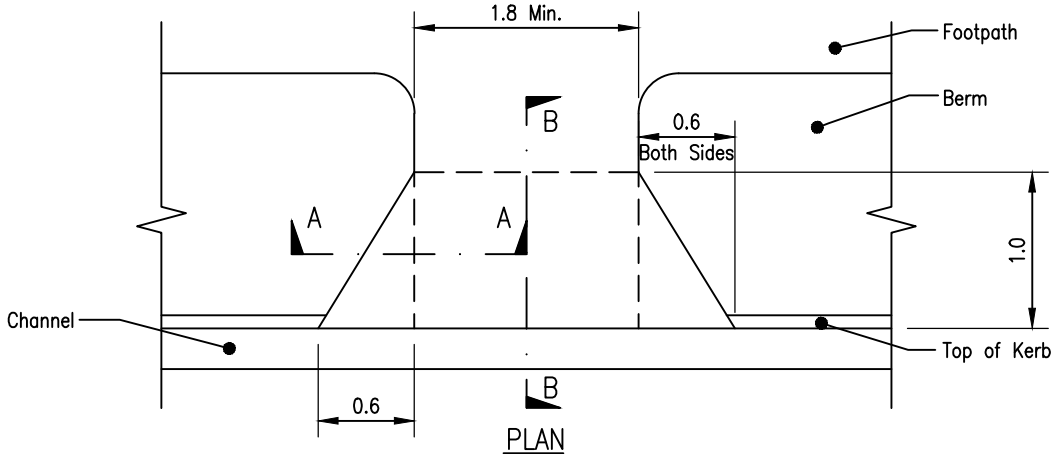
STANDARD ROAD SWALE DETAILS	Date: DEC 2021
	Revision: R2
Whangarei District Council — Engineering Standards	Scale: NTS
	SHEET No. 16

NOTES:

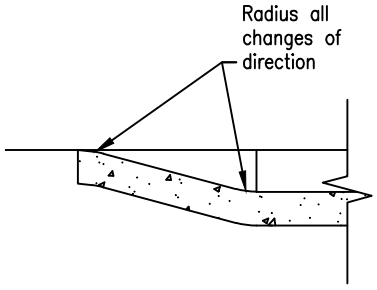
1. Maximum grade is 1 in 12 (8.3%).
2. Edge of crossing to be finished flush with existing channel.
3. Crossing shall be constructed in accordance with the requirements for a concrete footpath unless otherwise approved – see Sheet 12.



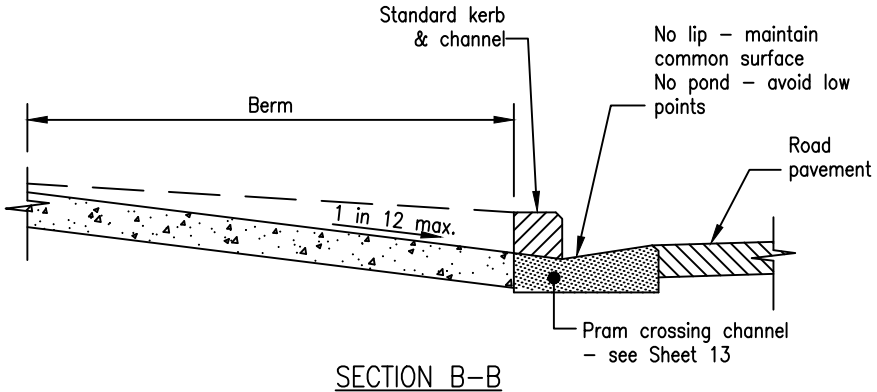
CROSS ROADS OR TEE INTERSECTION
NTS



PLAN



HALF SECTION A–A

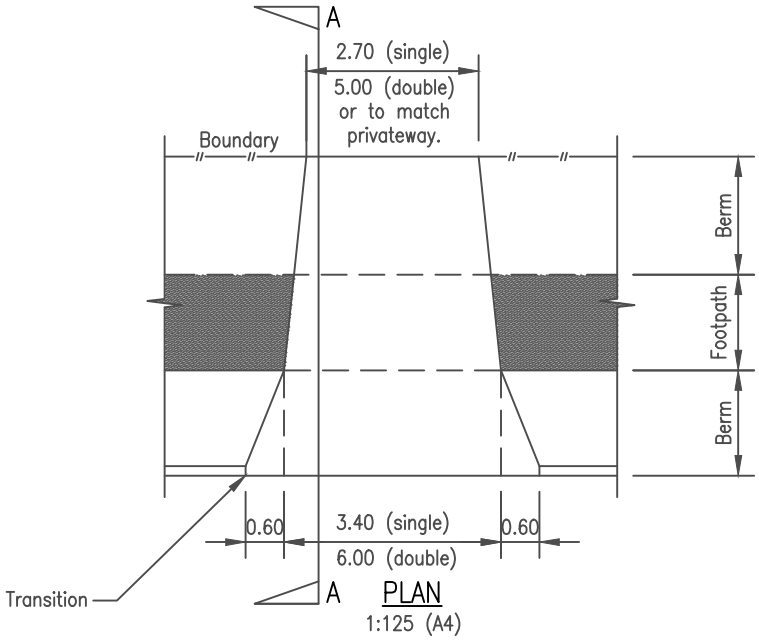


SECTION B–B
1:25 (A4)

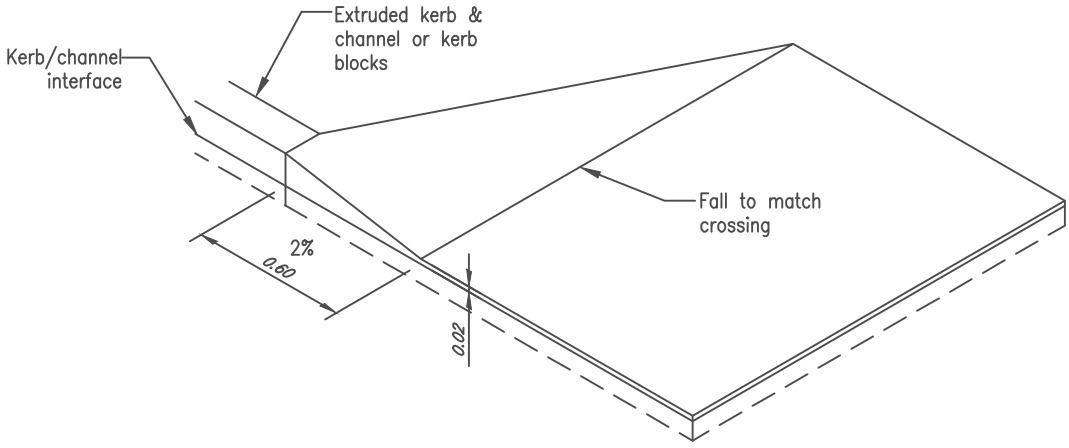
ACCESSIBLE CROSSING DETAILS

Date:	DEC 2021
Revision:	R1
Scale:	AS SHOWN
SHEET No.	17

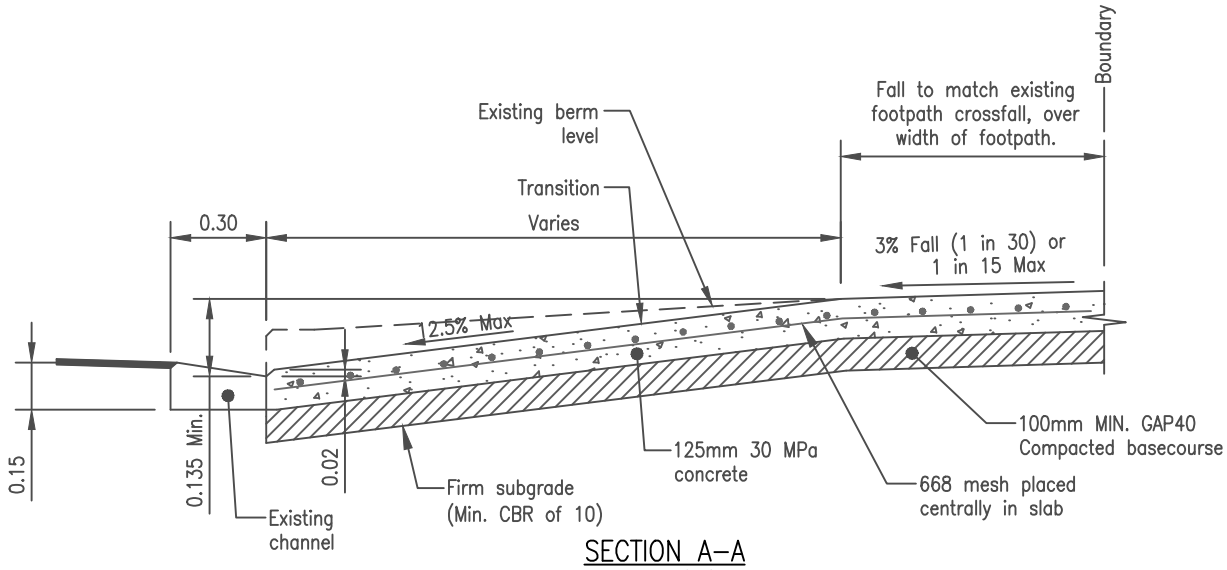
Whangarei District Council | Engineering Standards



PLAN
1:125 (A4)



DETAIL OF KERB TRANSITION AT CROSSING
N.T.S.



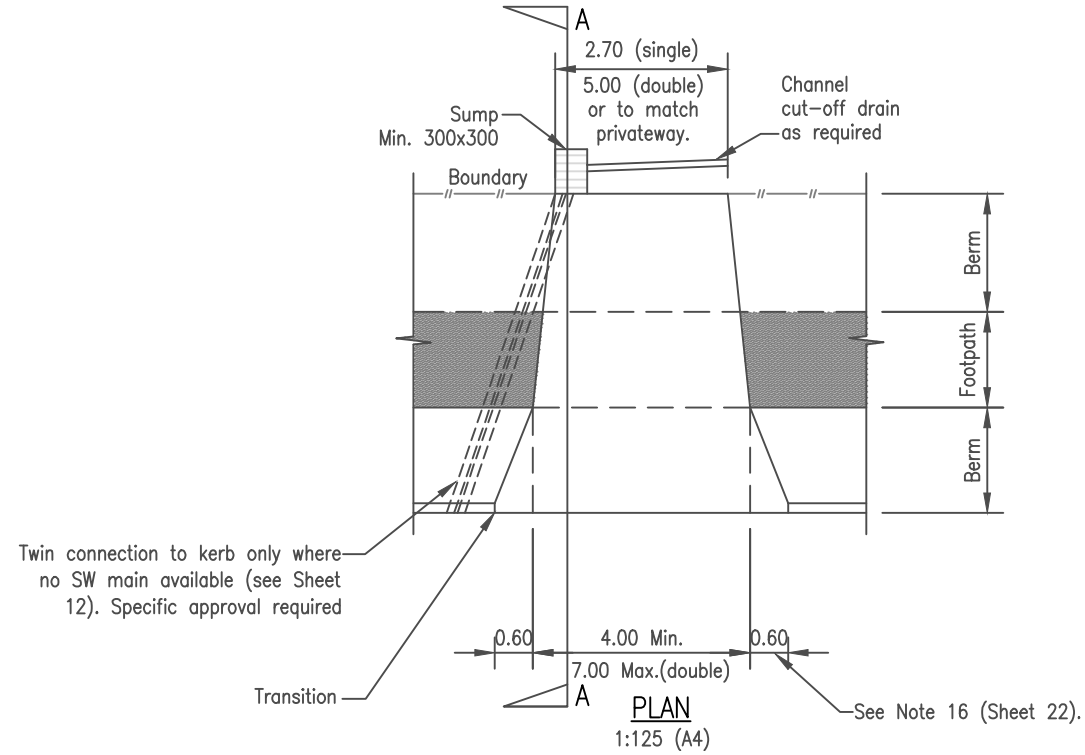
SECTION A–A
1:25 (A4)

For further notes refer to Sheet 22

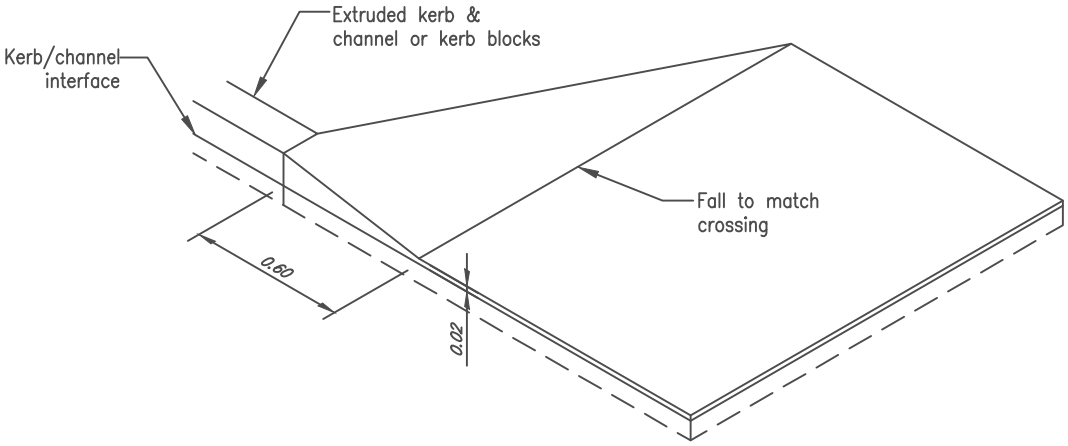
VEHICLE CROSSING – RESIDENTIAL

Date:	MARCH 2018
Revision:	R1
Scale:	AS SHOWN
SHEET No.	18

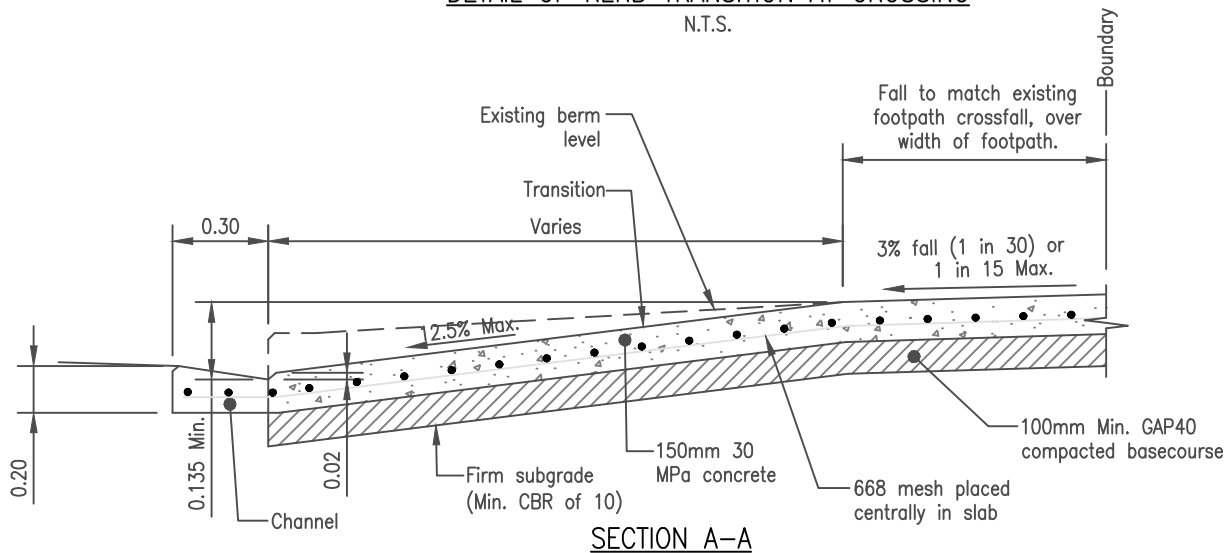
Whangarei District Council | Engineering Standards



PLAN
1:125 (A4)



DETAIL OF KERB TRANSITION AT CROSSING
N.T.S.



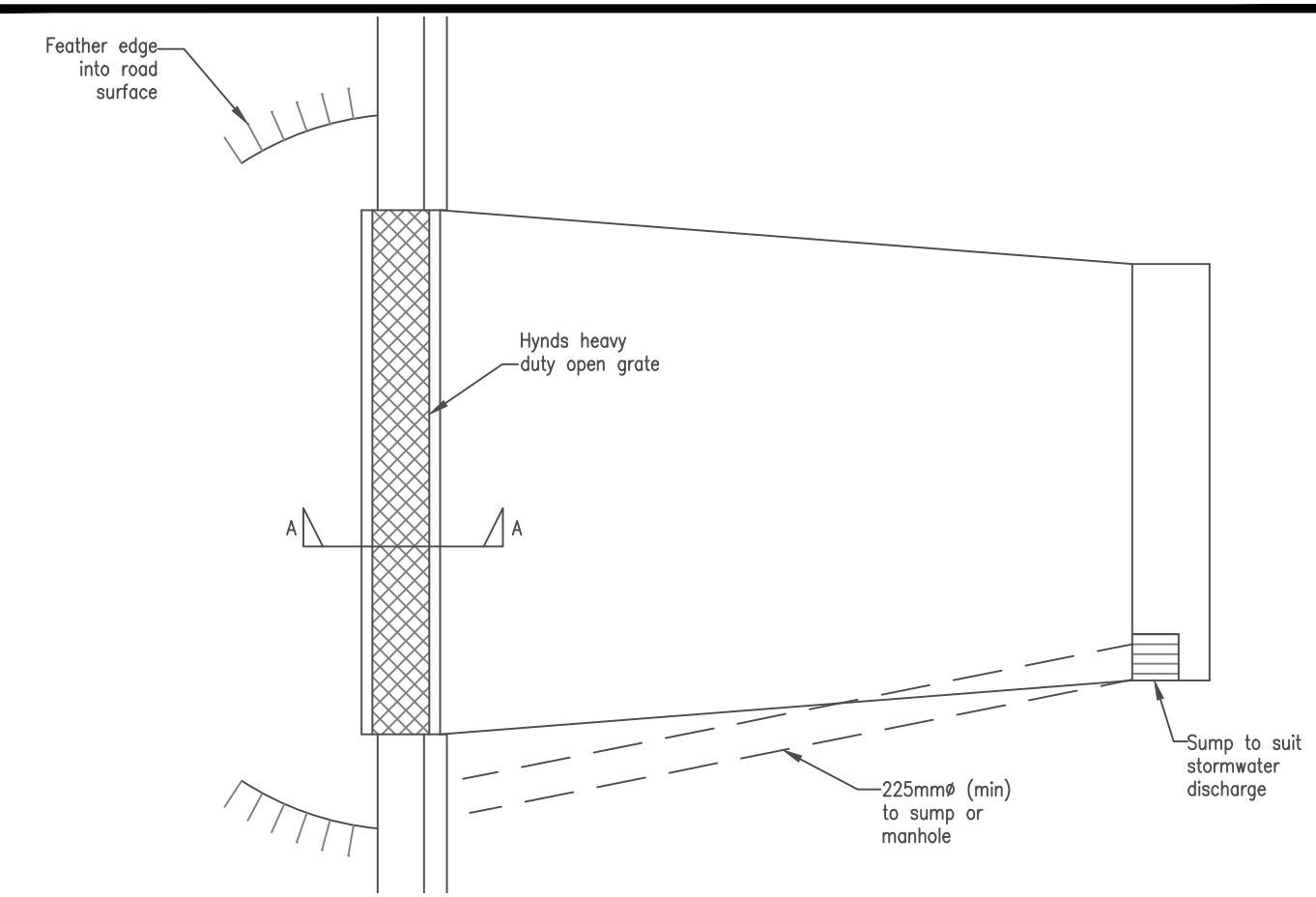
SECTION A–A
1:25 (A4)

For further notes refer to Sheet 22

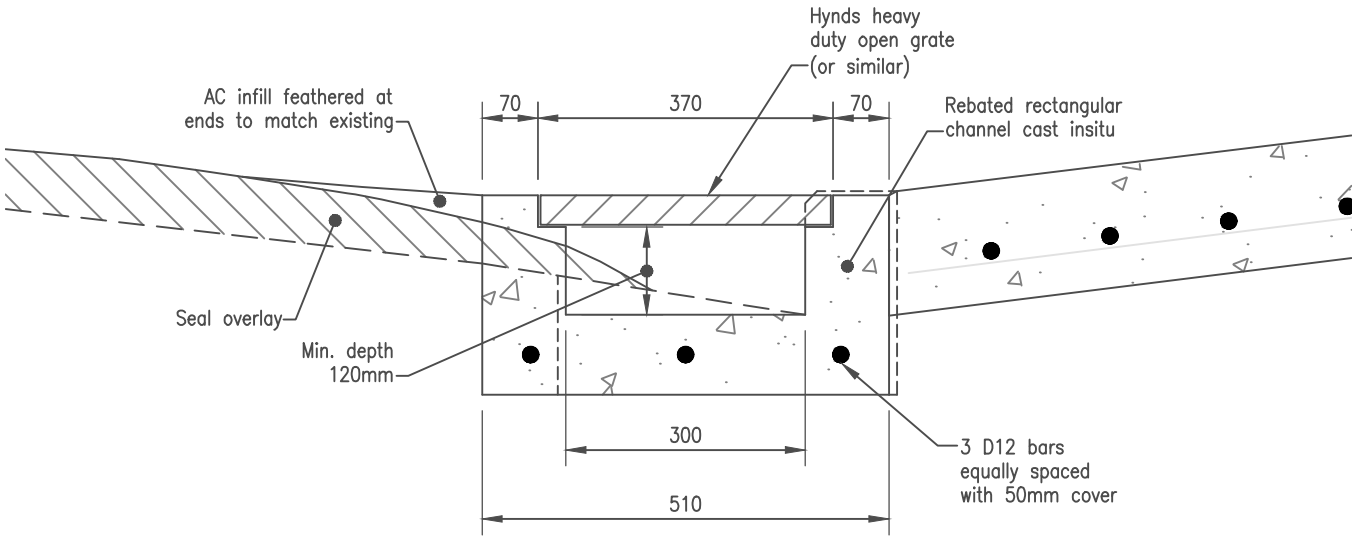
VEHICLE CROSSING – COMMERCIAL/ INDUSTRIAL

Whangarei District Council | Engineering Standards

Date:	MARCH 2018
Revision:	R1
Scale:	AS SHOWN
SHEET No.	19



PLAN
NTS



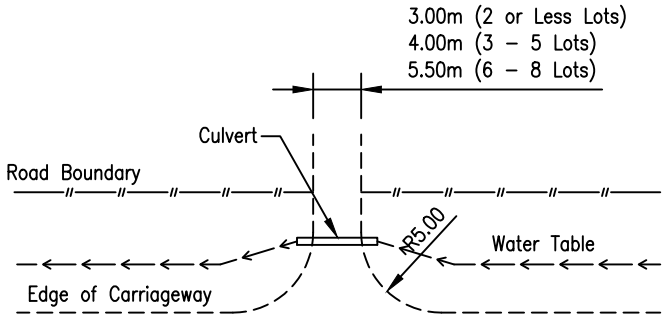
SECTION A–A
1:10

ALTERNATIVE CHANNEL CROSSING

(See Note 3 on Sheet 22)

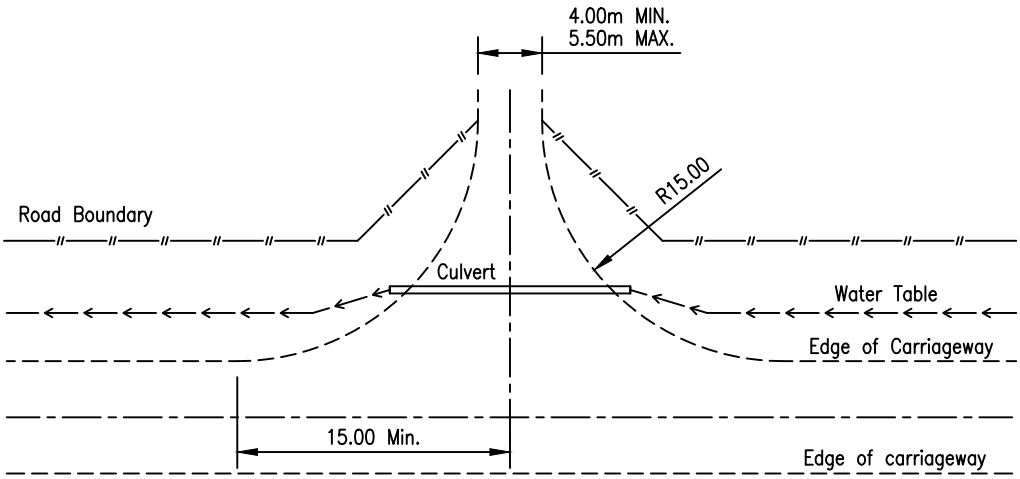
Note this crossing may only be installed with specific written approval from WDC

ALTERNATIVE VEHICLE CROSSING	**Date:** MARCH 2018
	Revision: R1
Whangarei District Council | Engineering Standards	**Scale:** AS SHOWN
	SHEET No. 20



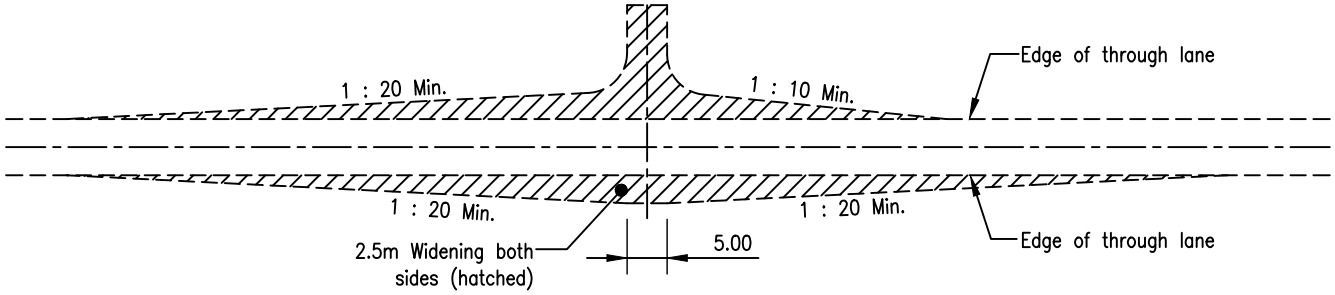
TYPE 1A – LIGHT VEHICLES

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 3.2.26
2. For Types 3 and 4 refer to Section 3.2.26

VEHICLE CROSSING – RURAL

Whangarei District Council | Engineering Standards

Date:	DEC 2021
Revision:	R2
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).
16. Splay width may need to be increased in some circumstances to accommodate an 11.5m rigid truck.
17. Clegg impact values to be in accordance with Table 3.21.

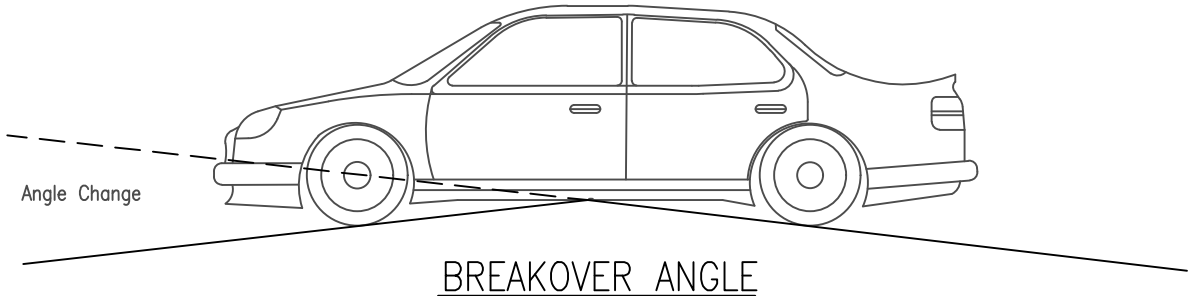
RURAL CROSSINGS

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 3.2.26.4.
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 3.2.26.
11. Where local widening is required (Types 2 and 3) the tapers shall be sealed.
12. Clegg impact values to be in accordance with Table 3.21

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

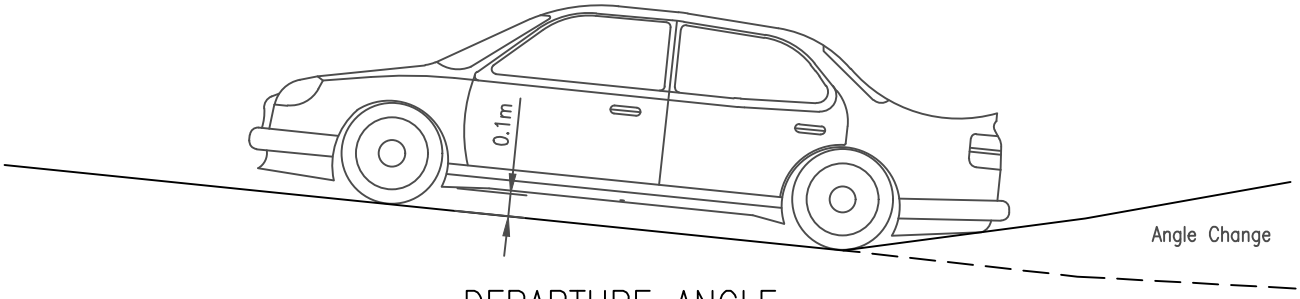
Whangarei District Council | Engineering Standards

Date:	DEC 2021
Revision:	R2
Scale:	AS SHOWN
SHEET No.	22



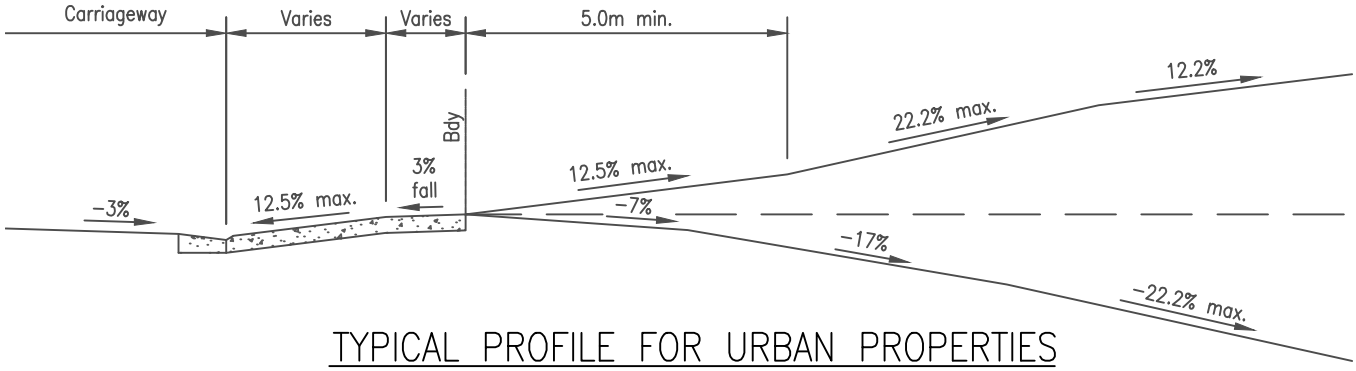
BREAKOVER ANGLE

Maximum change of grade 10% (algebraic)
(5.7 degrees)



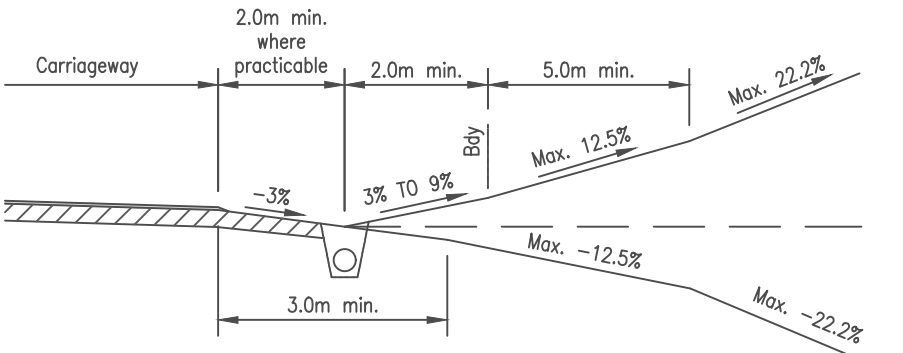
DEPARTURE ANGLE

Maximum change of grade 17% (algebraic)
(9.65 degrees)



TYPICAL PROFILE FOR URBAN PROPERTIES

NTS



TYPICAL PROFILE FOR RURAL PROPERTIES

NTS

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: FEB 2015
	Revision: R1
Whangarei District Council | Engineering Standards	Scale: NTS
	SHEET No. 23

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

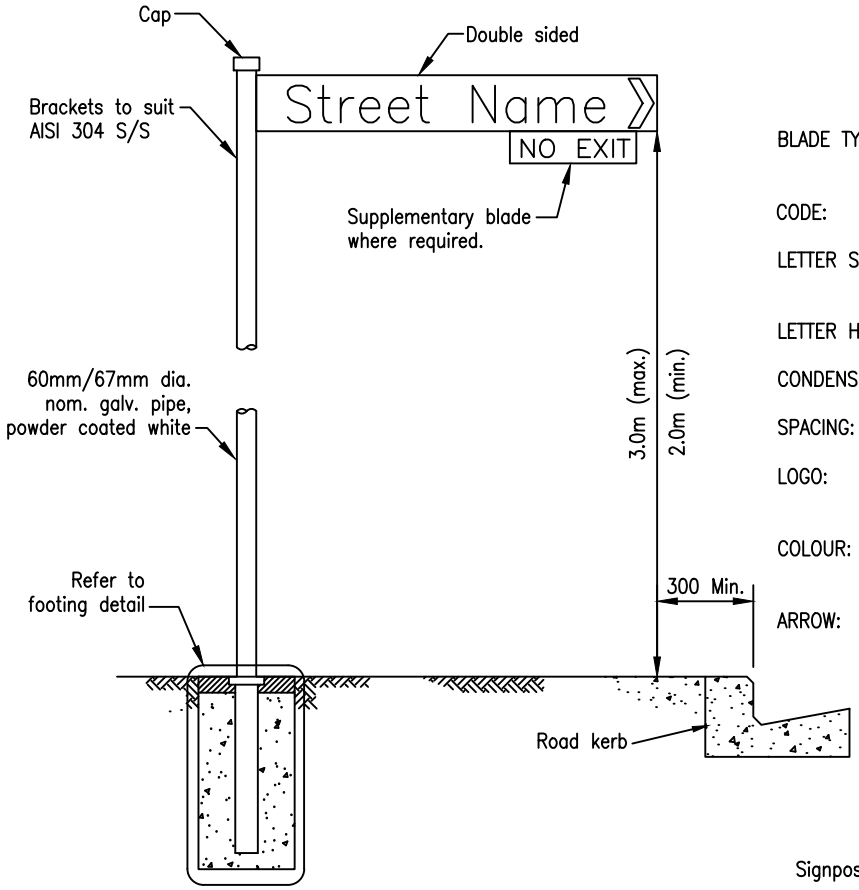
CONDENSED: To Suit

SPACING: To Suit

LOGO: Whangarei District Council Logo

COLOUR: High Intensity White Letters on Blue background

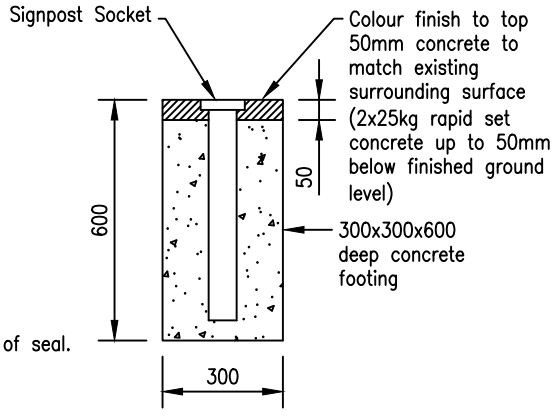
ARROW: 120°
150mm blade –40mm wide
200mm blade –45mm wide
250mm blade –50mm wide



NOTES:

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

   Refer to Section 3.2.25.
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

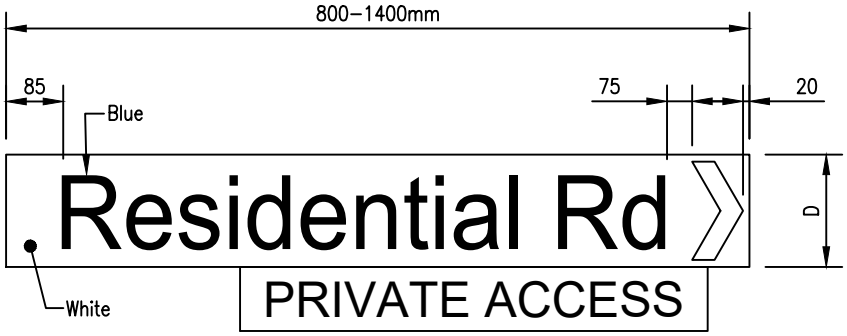


FOOTING DETAIL

STREET SIGN FOR PUBLIC ROADS
(FOR ALL ENVIRONMENTS)

Whangarei District Council | Engineering Standards

Date:	MARCH 2018
Revision:	R1
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

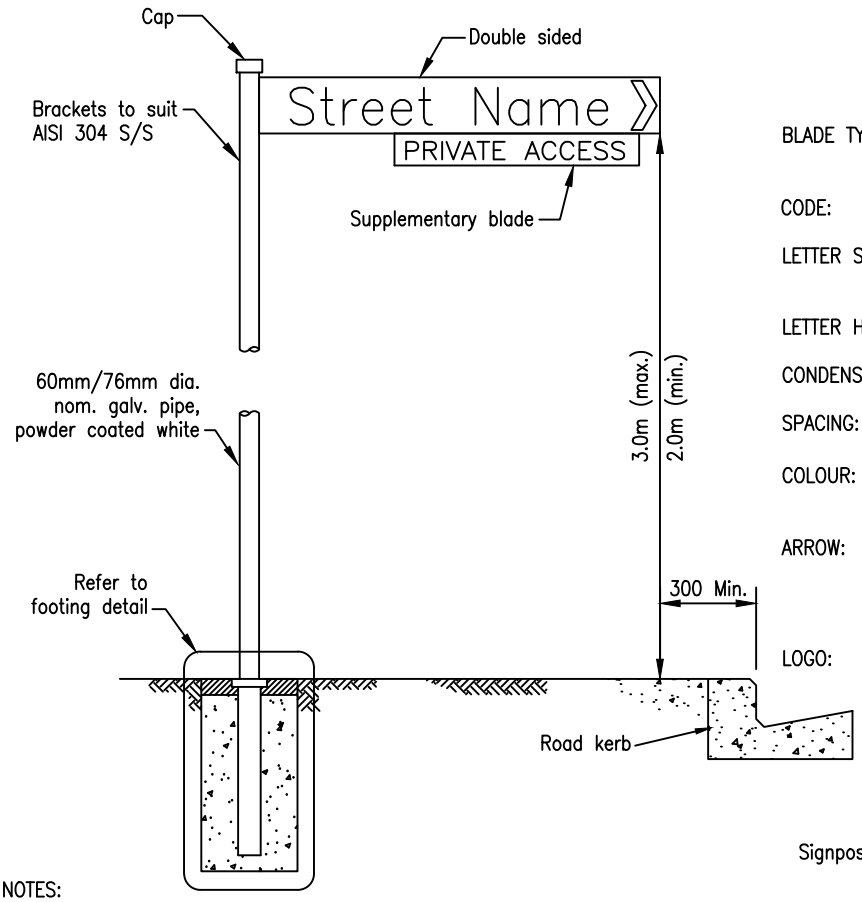
CONDENSED: To Suit

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:

1. Blade Sizing:
   50kph:– 150mm
   Over 50kph:– 200mm

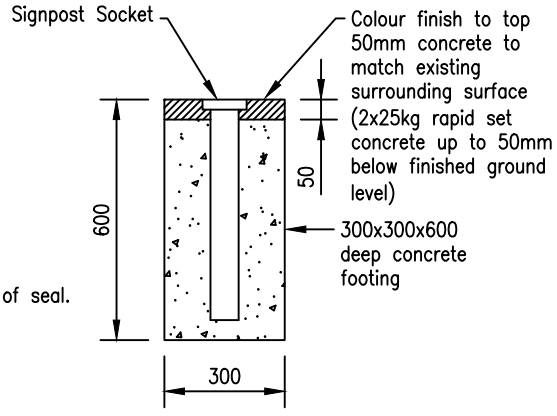
   Refer to Section 3.2.25

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.

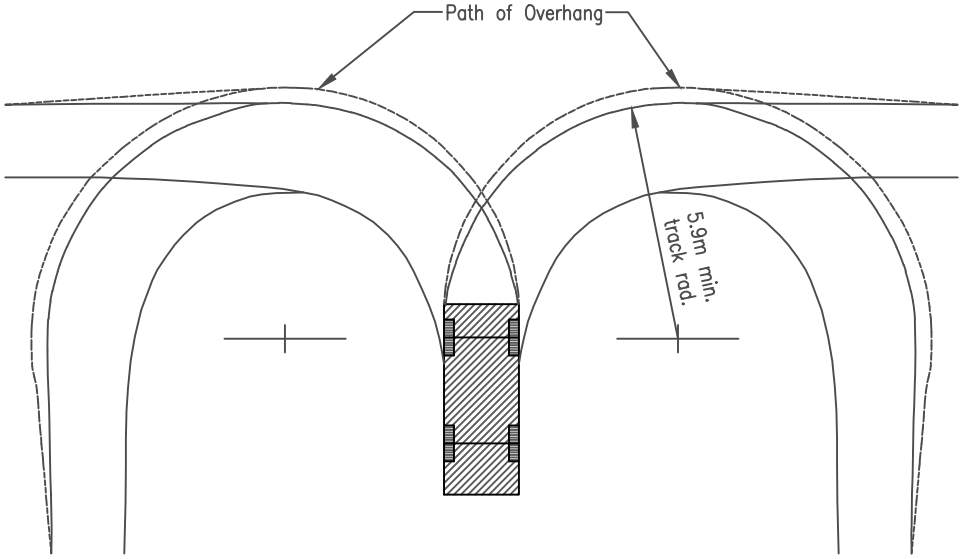


FOOTING DETAIL

STREET SIGN FOR PRIVATE ROADS
(FOR ALL ENVIRONMENTS)

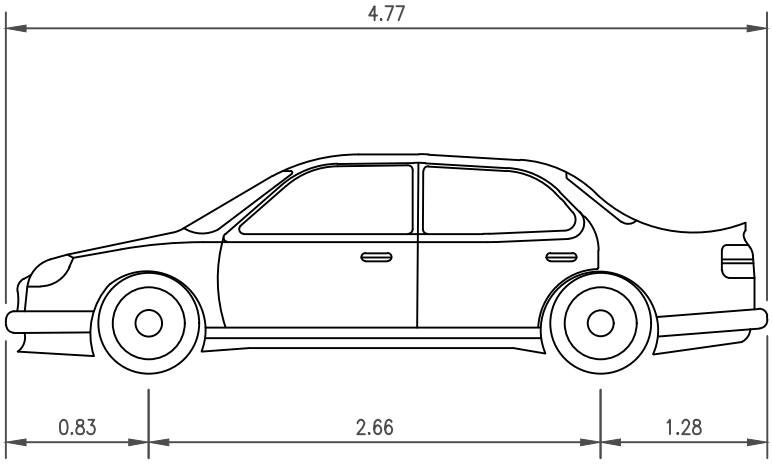
Date: MARCH 2018
Revision: R1
Scale: AS SHOWN
SHEET No. 25

Whangarei District Council | Engineering Standards



TRACKING CURVES

Scale 1:200



DESIGN VEHICLE DIMENSIONS (NTS)

(Vehicle Width 1.88m)

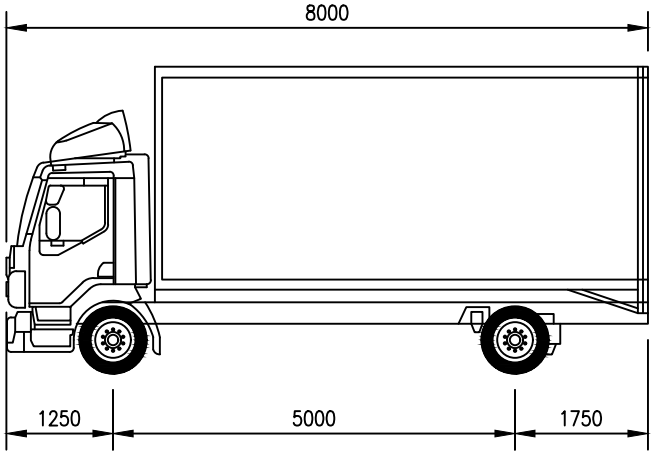
Note:
1. The curve has been derived from the 90% car shown in the District Plan.
2. Turning radius shown is the minimum and not appropriate for speeds > 10km/hr.

VEHICLE TRACKING CURVES

STANDARD CAR

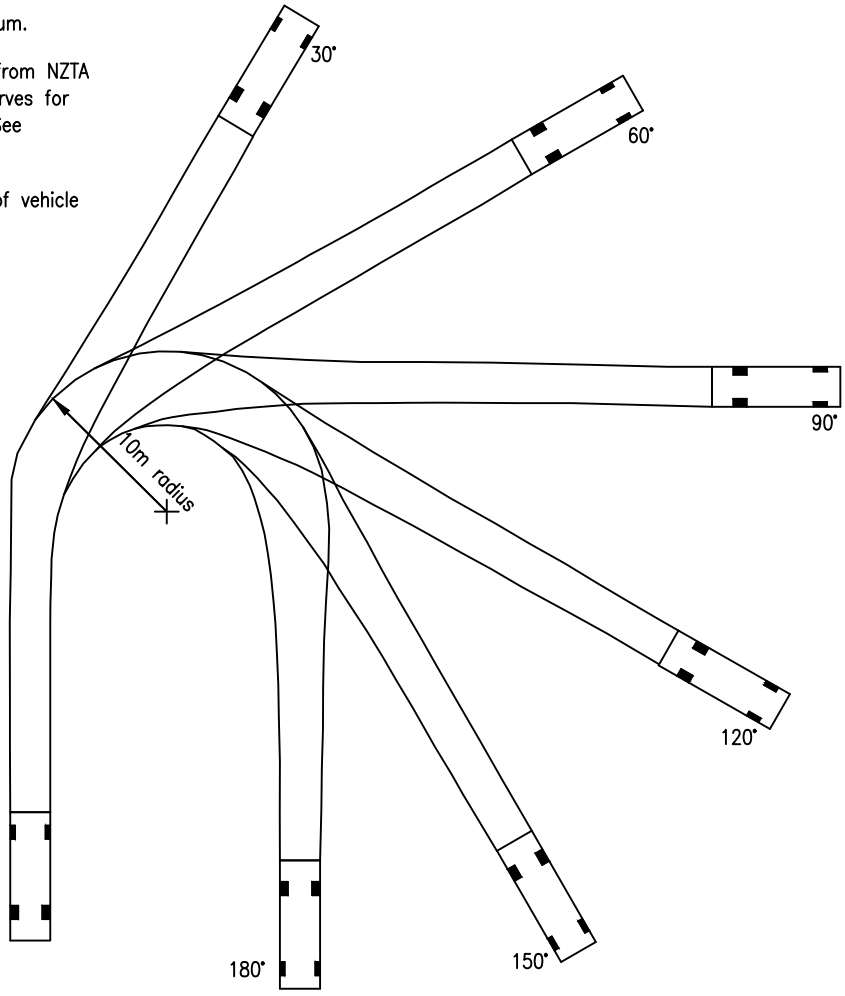
Date:	FEB 2015
Revision:	R1
Scale:	AS SHOWN
SHEET No.	26

Whangarei District Council | Engineering Standards



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 3.2.6.3)
4. Curves show extremity of vehicle body.



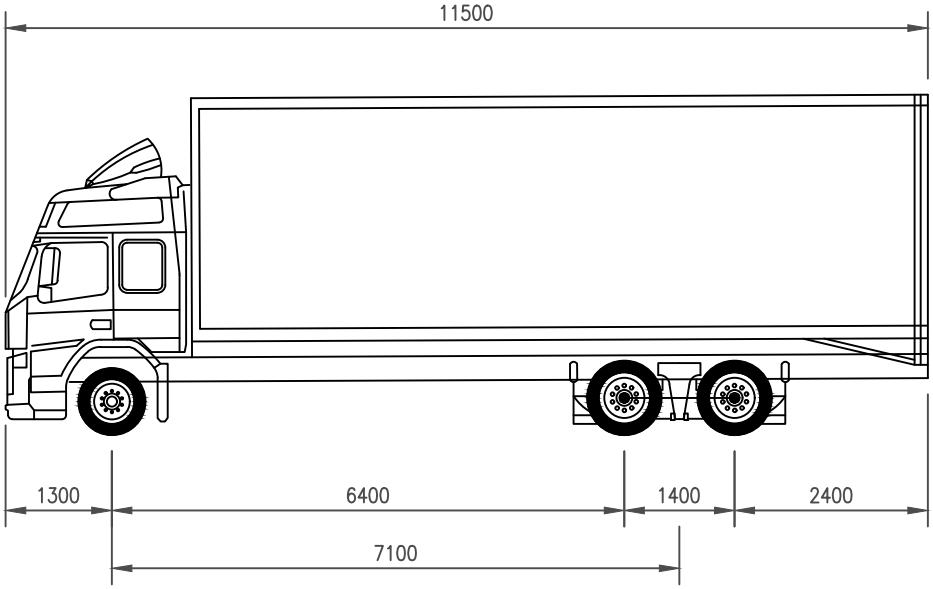
TRACKING CURVES – 8.0m RIGID TRUCK

HEAVY GOODS VEHICLE TRACKING CURVES

MEDIUM RIGID TRUCK

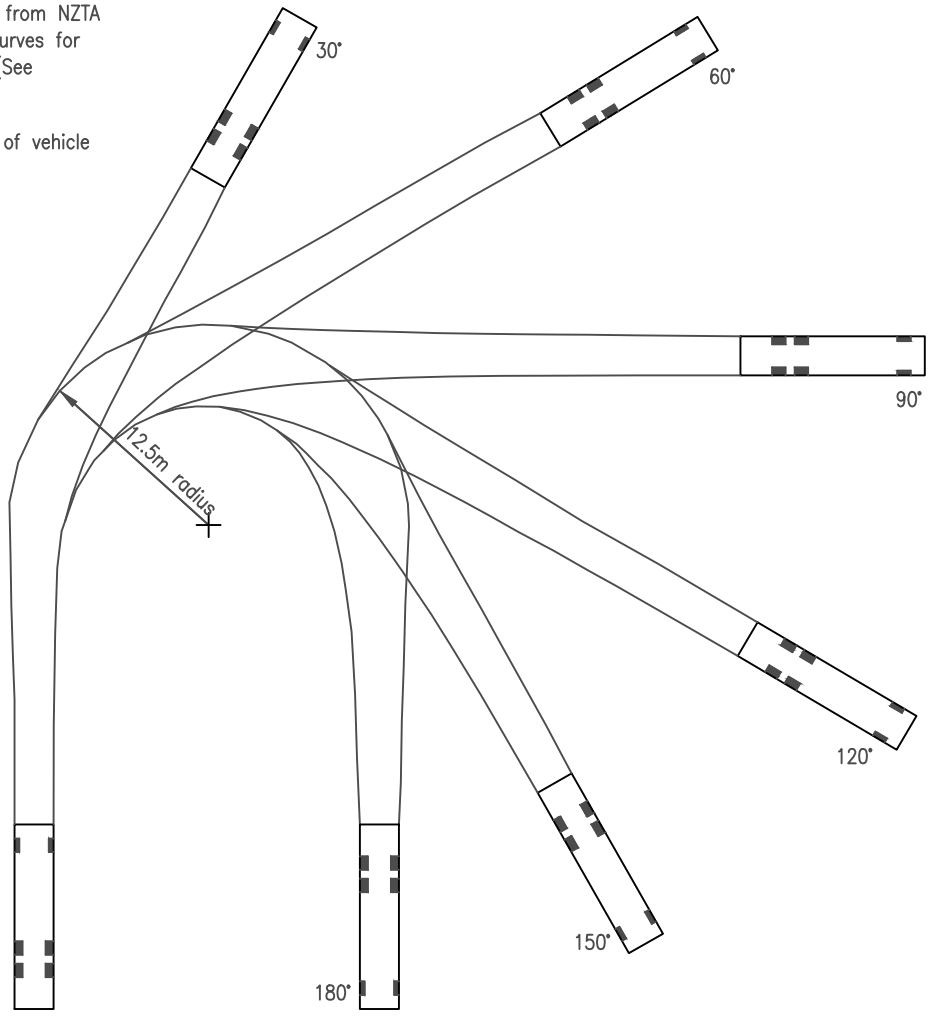
Whangarei District Council | Engineering Standards

Date:	FEB 2015
Revision:	R1
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 3.2.6.3)
4. Curves show extremity of vehicle body.



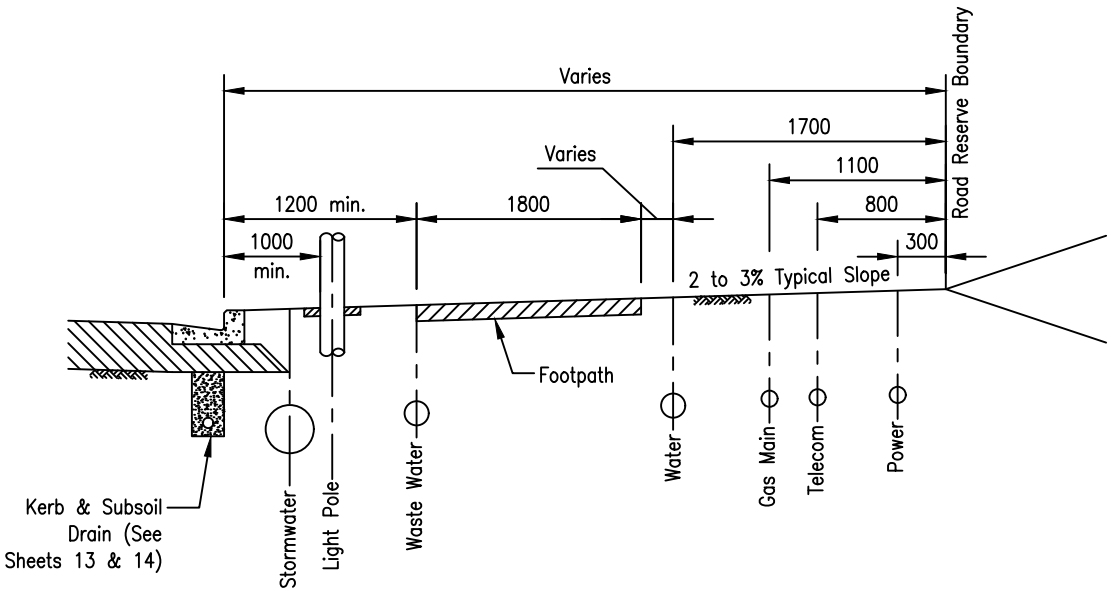
TRACKING CURVES – 11.5m RIGID TRUCK

HEAVY GOODS VEHICLE TRACKING CURVES

LARGE RIGID TRUCK

Whangarei District Council | Engineering Standards

Date:	FEB 2015
Revision:	R1
Scale:	NTS
SHEET No.	28



URBAN ROADS – ALL CLASSIFICATIONS

Notes:
1. This sheet only shows the indicative horizontal order of services, the layout and clearance of services must also meet the requirements of Sheet 30 and the ES.
2. This sheet applies to urban roads of all classifications.

HORIZONTAL ORDER OF SERVICES: URBAN ROADS	Date: FEB 2022
	Revision: R2
Whangarei District Council | Engineering Standards	Scale: NTS
	SHEET No. 29

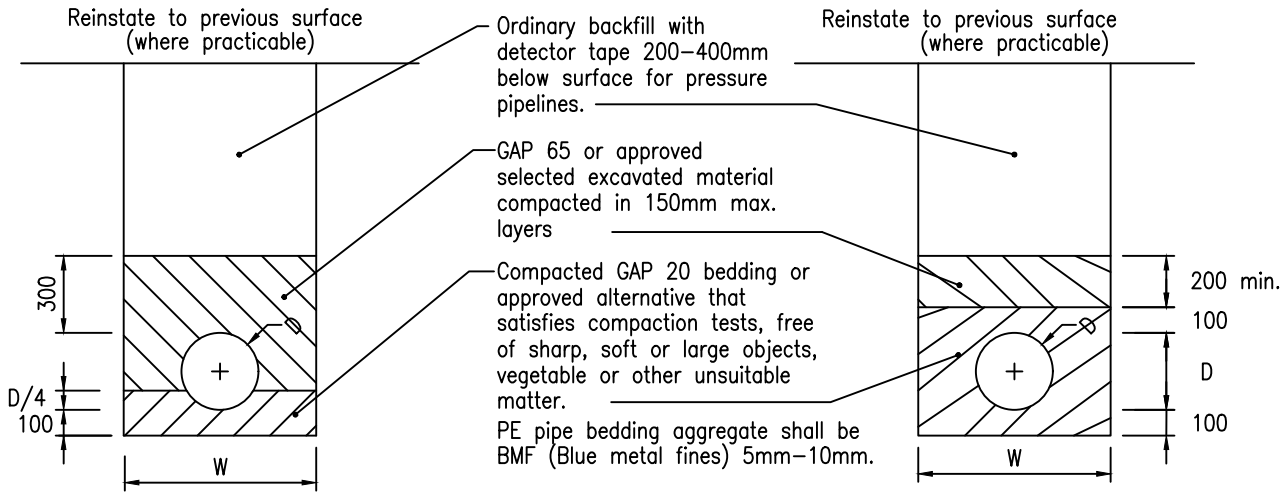
MINIMUM CLEARANCE BETWEEN SERVICES

The minimum clearance between underground services shall be measured from the outside of each pipe or duct and shall be the greater of the required clearances between the relevant services as follows:

Utility	Clearance to other Utilities Other than Watermains (mm)	Clearance to Watermains (mm)
Stormwater	300 H, 150 V	
Wastewater	300 H, 150 V	1000 H, 500 V or 600 H, 750 V
Electricity	500 H, 225 V	500 H, 225 V when watermains < or = 200 mm ID 1000 H, 225 V when watermains > 200 mm ID
Telecom and Gas	300 H, 150 V	300 H, 150 V when watermains < or = 200 mm ID 600 H, 150 V when watermains > 200 mm ID
Watermains	As above	600 H, 500 V when new pipeline > 375 mm ID 300 H, 150 V when new pipeline < 200 mm ID and existing is < 375 mm ID 600H, 150 V when new pipeline > 200 mm ID and existing is < 375 mm ID

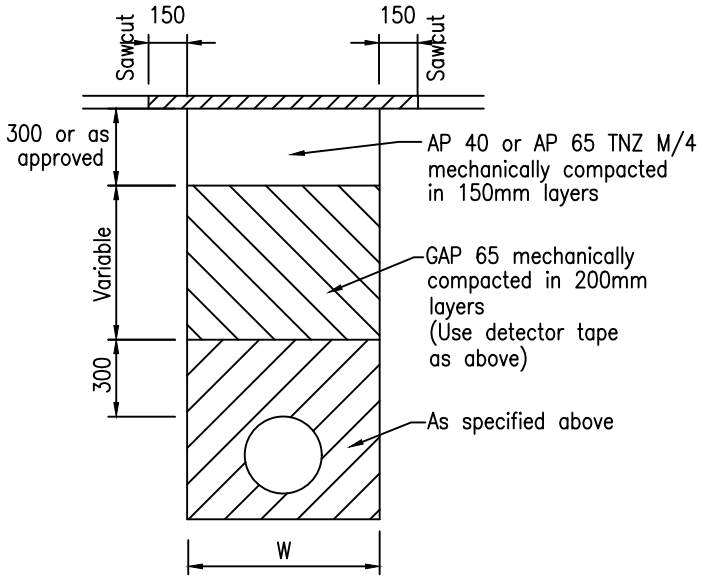
Notes:

1. Vertical clearances apply where services cross, except in the case of watermains when a vertical clearance shall always be maintained, even when the water and wastewater pipes are parallel. The watermain should always be located above the wastewater pipe to minimize the possibility of backflow contamination in the event of a main break.
2. Clearance can be reduced further to 150 mm for distances of up to 2 m when passing installations such as poles, pits and small structures, providing the structure is not destabilized in the process.
3. When a wastewater pipe is at the minimum vertical clearance below the water main (500 mm), a minimum horizontal clearance of 1000 mm shall be maintained. This minimum horizontal clearance can be progressively reduced to 600 mm as the vertical clearance is increased to 750 mm.
4. Where a water main crosses other services, it shall cross at an angle as near as practicable to 90 degrees.
5. Clearance shall be measured from the outside of each pipe or duct.
6. Watermains shall always cross over wastewater and stormwater drains.
7. Alternative clearances require the WDC's specific approval and written agreement from the affected service owners.
8. All services shall have minimum cover under footpaths and berms as per relevant section in the ES.



CONCRETE, DUCTILE IRON, STEEL OR VITRIFIED CLAY PIPE

(Where specifically approved)



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.

PVC, PE & PP PIPE

(PVC & PP not approved for water supply)

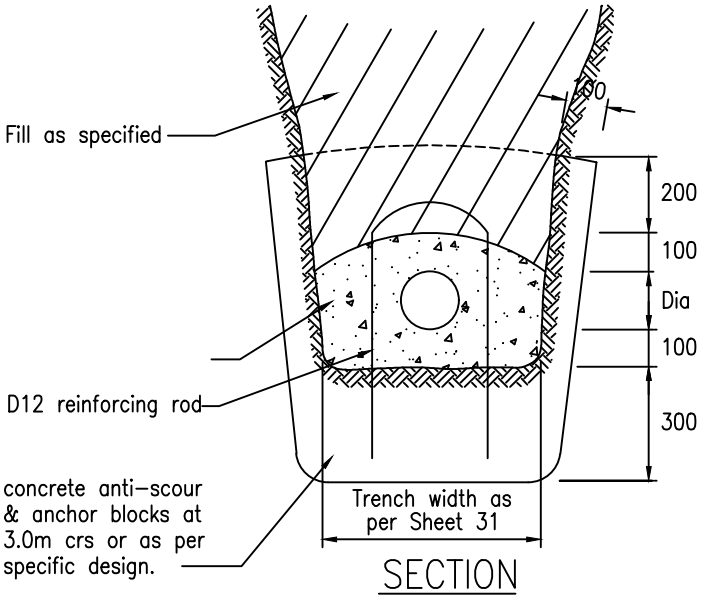
NOTES

1. Concrete pipes to be RCRRJ to AS/ NZS 4058 installed to manufacturers requirements.
2. Ordinary backfill shall be free from stones or rocks greater than 150mm nominal diameter compacted in 300mm layers.
3. Replace topsoil to original depth as necessary.
4. Existing sealed roadway excavations are to be resurfaced with 50mm of asphaltic concrete.
5. 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.
6. PRIVATEWAY base course metalling within pipe trenches may be in accordance with the Privateway Standards.
7. Trench width shall not exceed W at the pipe crown level.
8. 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.
9. Pipelines at 1:8 gradient or steeper shall have cement stabilised bedding and/or surrounds.
10. 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.
11. Concrete bedding shall be allowed to cure for 48 hours prior to backfilling.
12. Backfilling – carriageways may be with 'flowable fill' (low strength fly–ash concrete).
13. Granular bedding is to satisfy N.Z.S. 7643 Appendix B.
14. 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.
15. Sand is not permitted as PE pipe bedding.

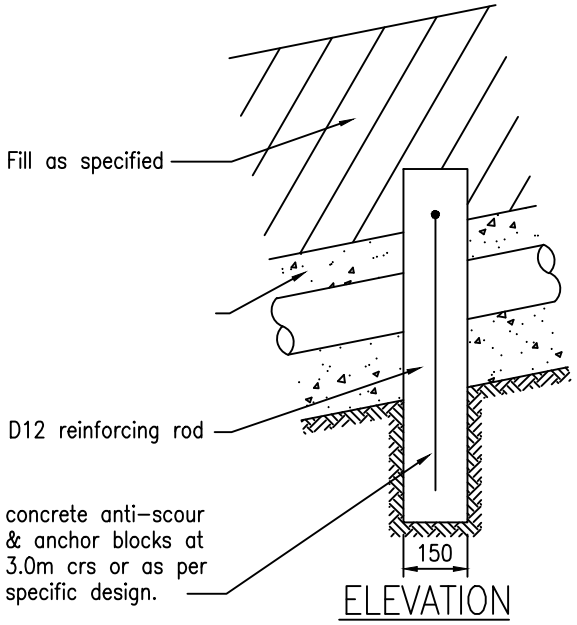
PIPE BEDDING & BACKFILL
(FOR ALL ENVIRONMENTS)

Date:	DEC 2021
Revision:	R2
Scale:	AS SHOWN
SHEET No.	31

Whangarei District Council | Engineering Standards



SECTION



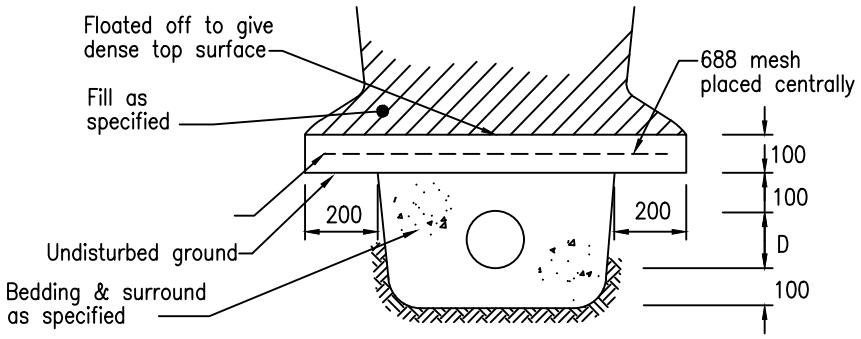
ELEVATION

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.

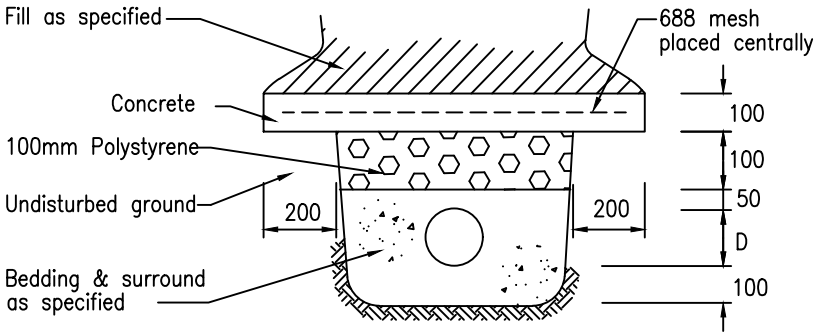


REINFORCED CONCRETE SLAB PROTECTION FOR STORMWATER AND WASTEWATER

(Where additional loading or other requirements necessitate)

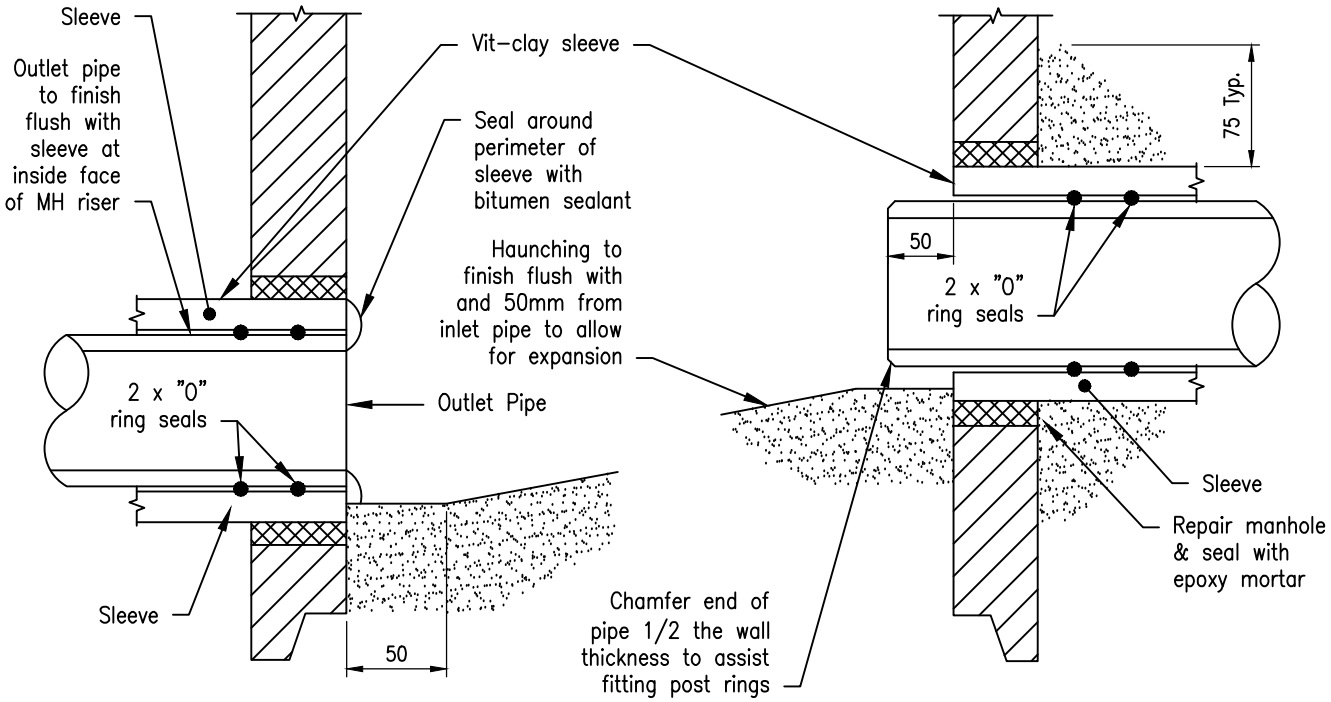
GENERAL:

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

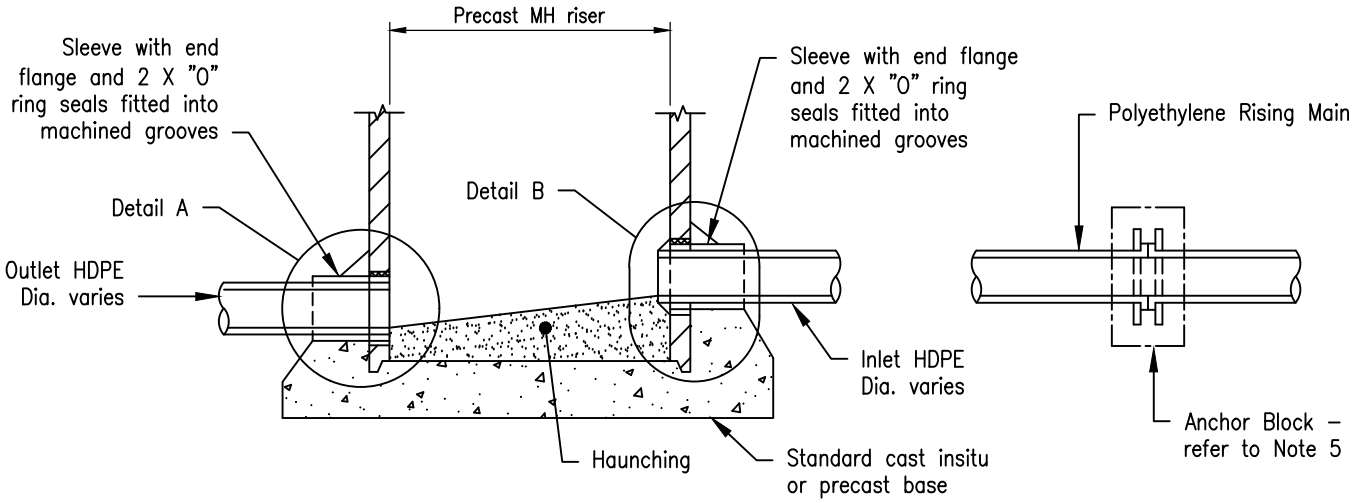


REINFORCED CONCRETE SLAB PROTECTION FOR WATER PIPELINES

PIPE PROTECTION AND BULKHEAD DETAILS (FOR ALL ENVIRONMENTS)	Date:	DEC 2021
	Revision:	R2
	Scale:	AS SHOWN
Whangarei District Council | Engineering Standards	SHEET No.	32



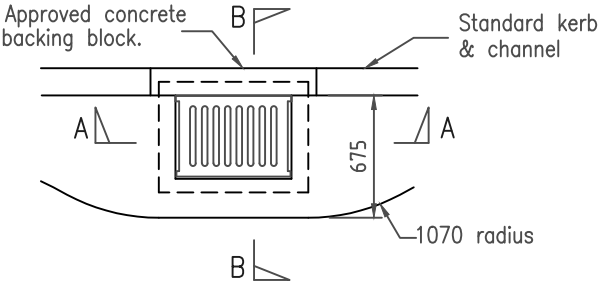
DETAIL A DETAIL B



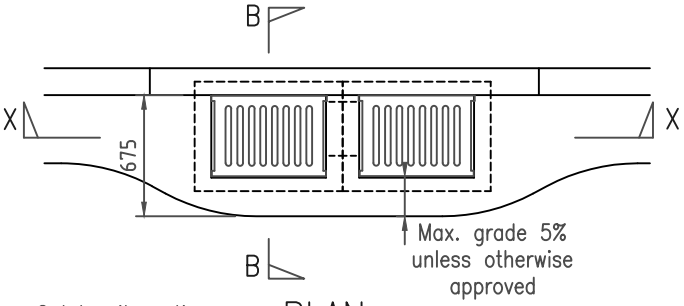
NOTES:

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

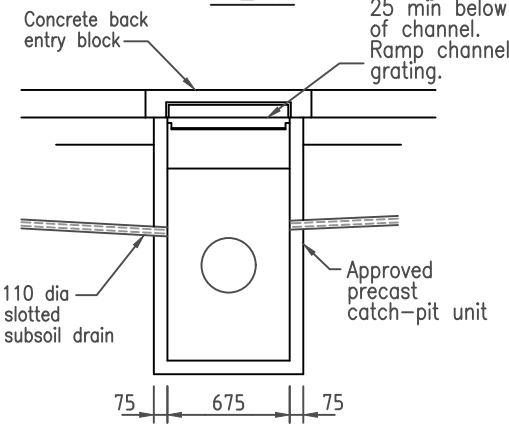
STANDARD MANHOLE HDPE SLIDING JOINT	Date: DEC 2021
	Revision: R2
Whangarei District Council — Engineering Standards	Scale: AS SHOWN
	SHEET No. 33



PLAN

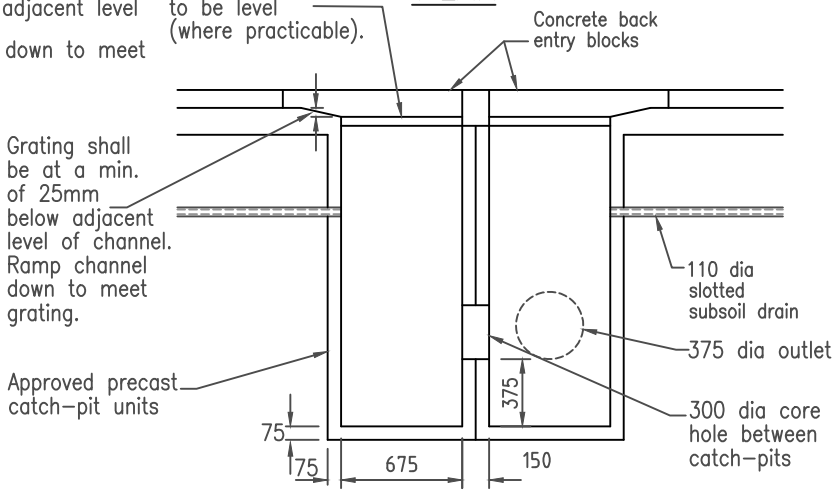


PLAN

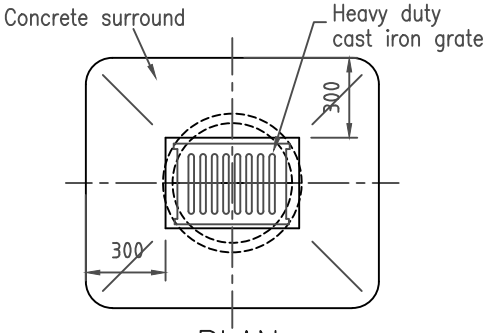


SECTION A–A
SINGLE CATCH-PIT

PLAN



SECTION X–X
DOUBLE CATCH-PIT



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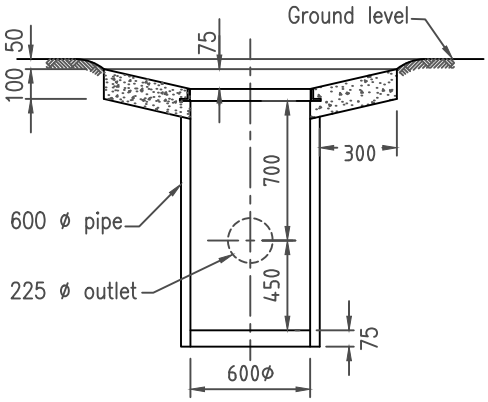
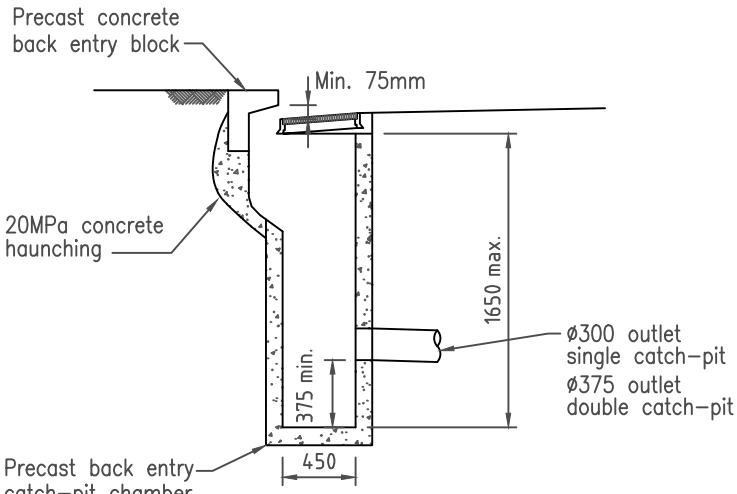


SECTION
FIELD CATCH-PIT DETAIL



SECTION B–B

NOTES:

1. Concrete to be ordinary grade (20MPa) in accordance with NZS 3104:2013
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 and to be placed outside kerb ramp/pram crossing. Refer to Section 3.2.13.6

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

Date:	DEC 2021
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Scale:	AS SHOWN
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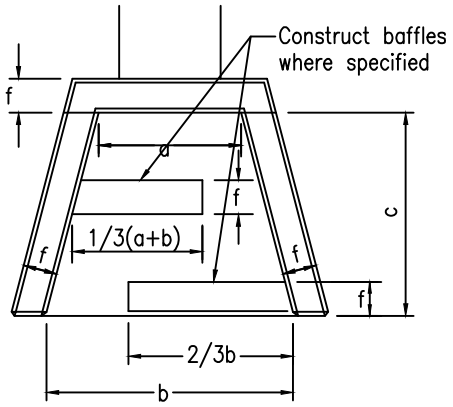
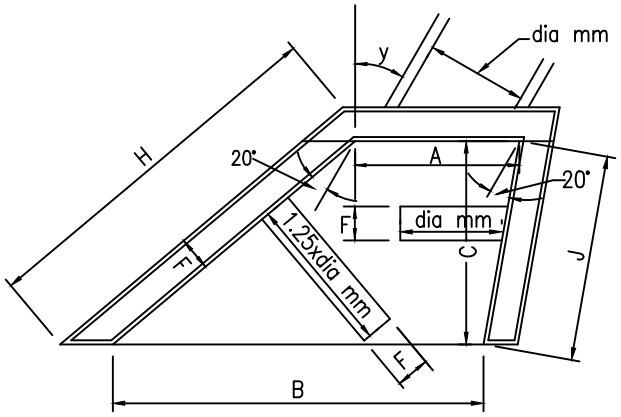
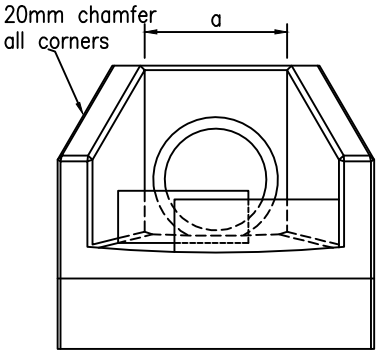


PLAN

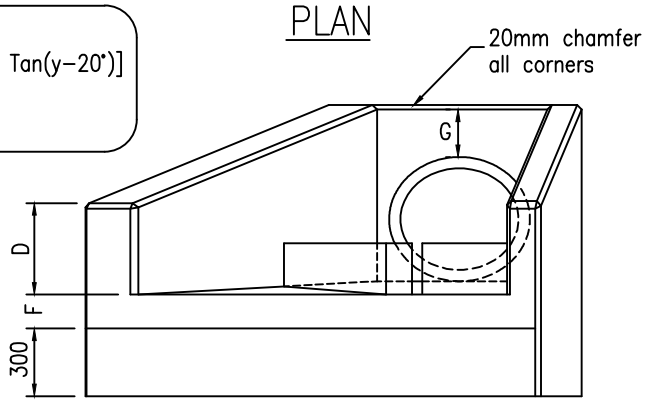


PLAN

A. Sec y x (a)
B. C Tan (y+20°) + [A−C Tan(y−20°)]
H. C x Sec (y + 20°)
J. C x Sec (y − 20°)



END ELEVATION



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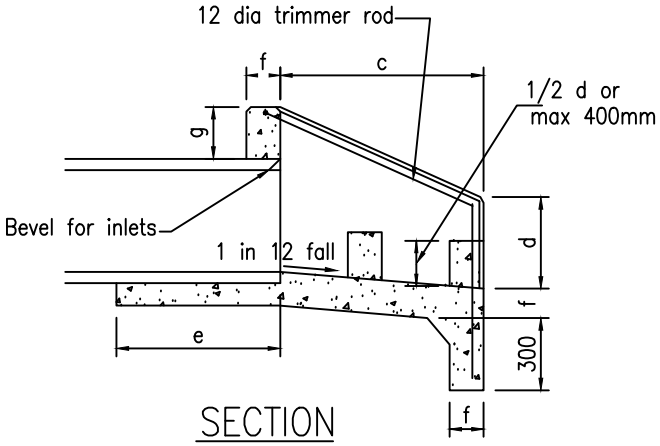


SECTION

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

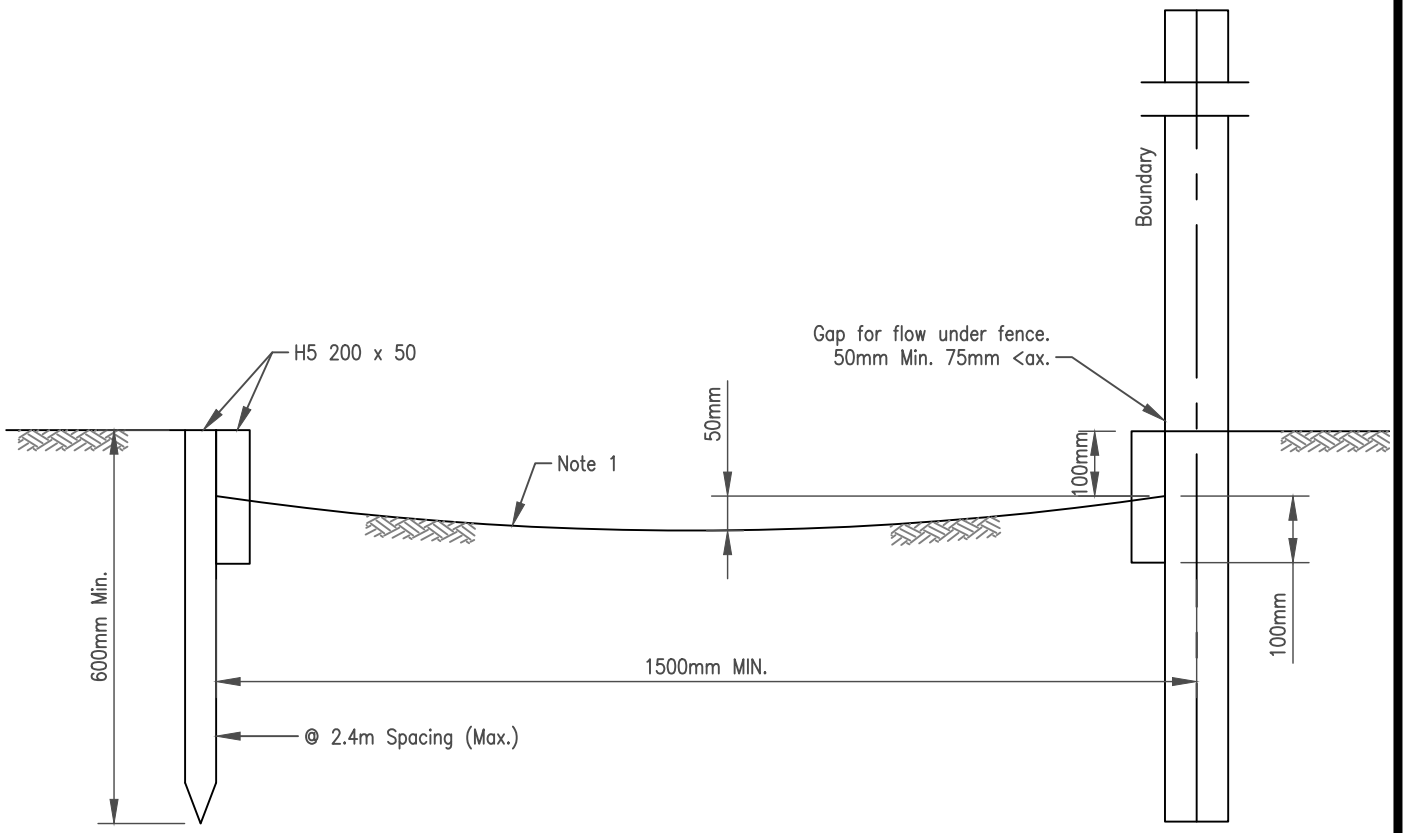
NOTE:

1. 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.
2. All reinforcement shall be placed centrally in walls and floor, and shall be continuous between walls and floor.
3. Laps in structural grade bars to be 300 min.
4. There shall be at least 2 bars – whether mesh or M.S. over the top of the pipe.
5. Concrete is to be 20MPa at 28 days as per NZS 3104:2021.
6. 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.
7. Inlet structures shall have reverse apron fall and no baffles.

INLET AND OUTFALL STRUCTURES

Whangarei District Council | Engineering Standards

Date:	DEC 2021
Revision:	R2
Scale:	AS SHOWN
SHEET No.	35



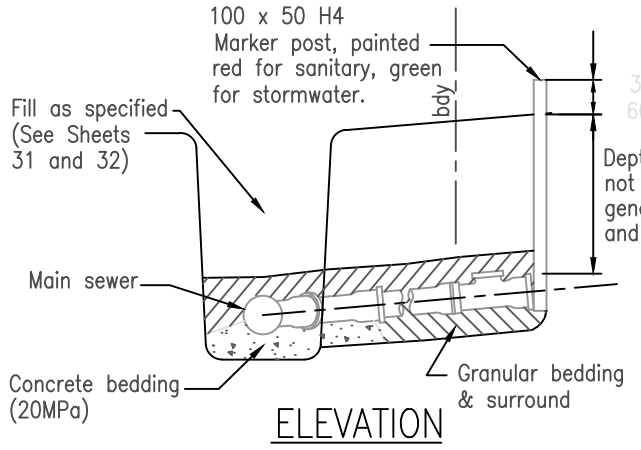
NOTE:

1. For 10 % AEP flow velocities :<1.0m/s grass cover is sufficient.
:1.0 – 1.5m/s reinforcing is required.
:>1.5m/s Hardening is required.

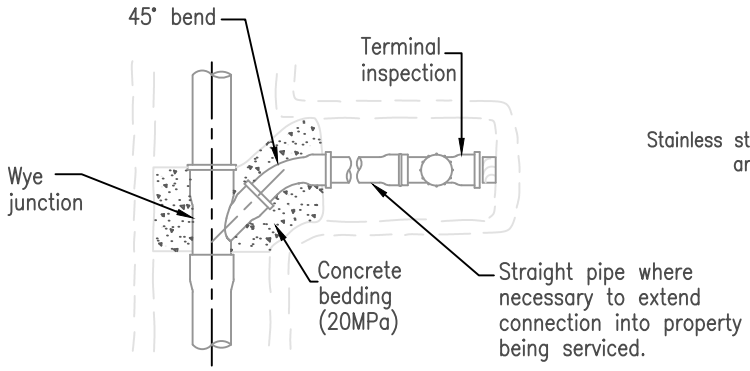
STORMWATER SECONDARY FLOW PATH TREATMENT – PRIVATE PROPERTY

Date:	FEB 2022
Revision:	R1
Scale:	AS SHOWN
SHEET No.	36

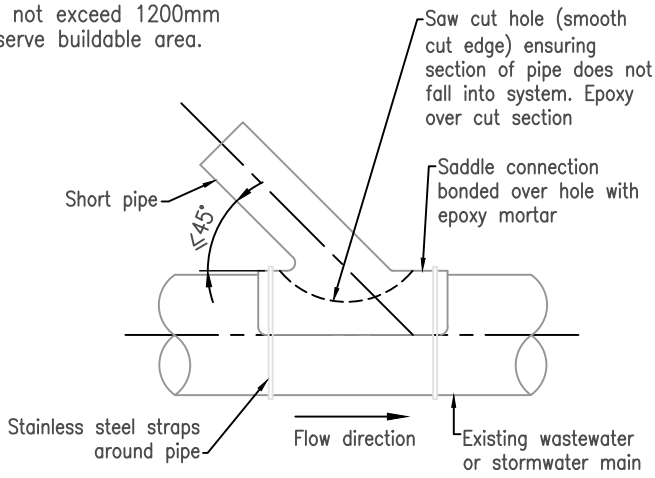
Whangarei District Council | Engineering Standards



ELEVATION



PLAN STANDARD CONNECTION

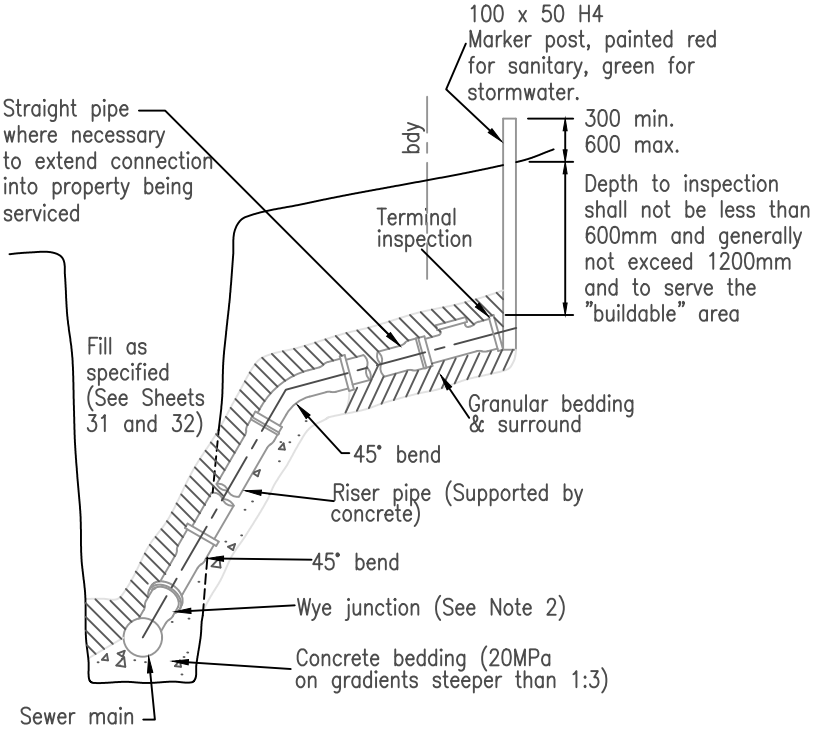


SADDLE CONNECTION

If main > 225mm

NOTES:

1. The terminal inspection shall be located not less than 300mm inside the property being serviced and be free of obstructions
2. For stormwater connections, junctions to be: (in order of preference)
   a. Prefabricated standard wye junctions,
   b. Prefabricated factory special connection, epoxy mortared saddled flange connection with appropriate insert adapter > DN 225.
3. Terminal blank end required for stormwater connections.
4. Pipes and fittings are to be sewer grade uPVC, or concrete to relevant NZ Standard
5. Pipelines that are likely to carry commercial or industrial waste are to satisfy the manufacturers requirements.
6. Specific design may be required in potentially unstable areas.
7. Joint flexibility is to be maintained where pipelines are in contact with concrete. Pipes shall be separated from concrete using DPC.
8. AS–BUILT plans are required for all connections.

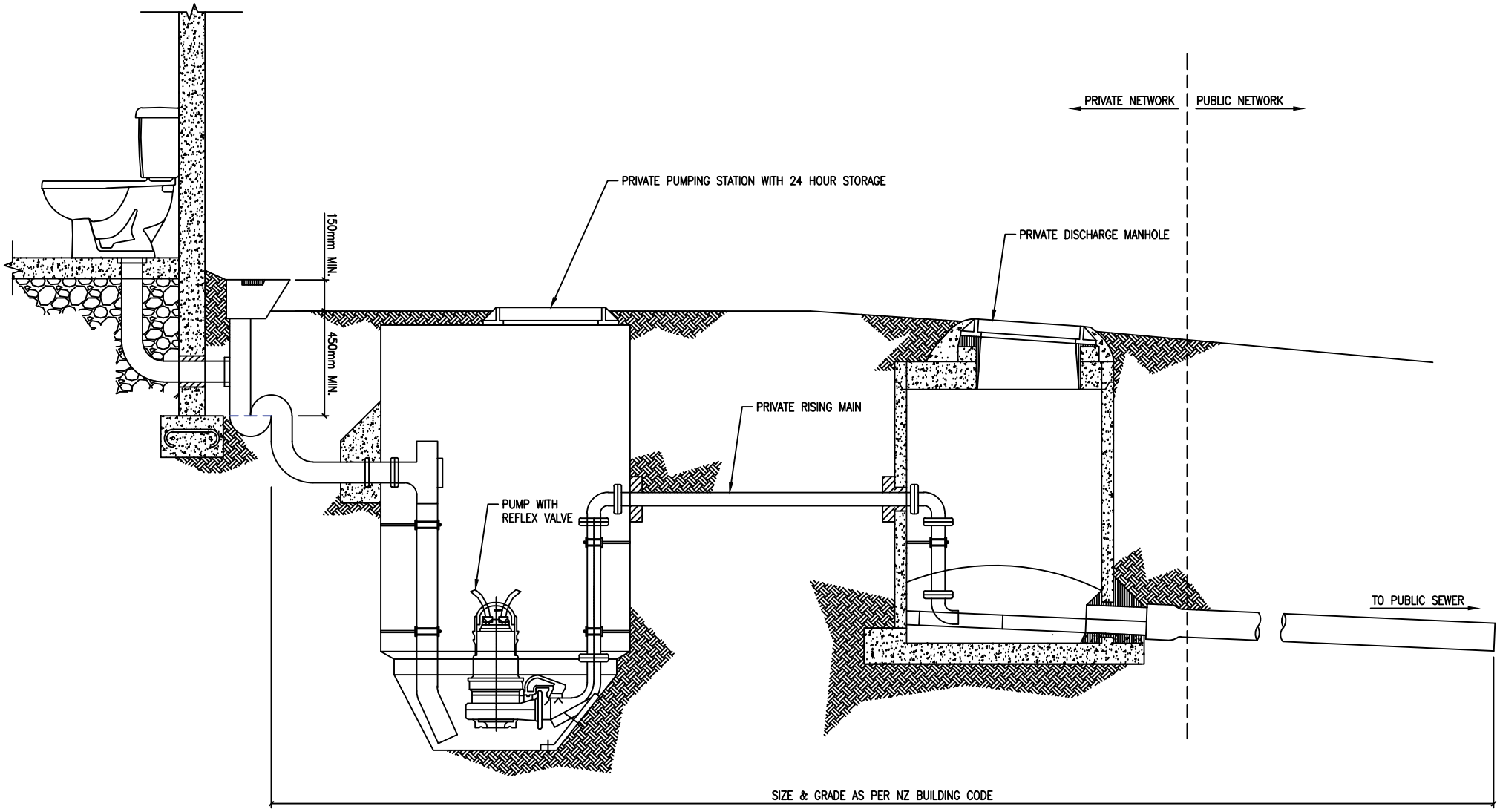


RAMPED RISER CONNECTION

STORMWATER AND WASTEWATER CONNECTIONS
FOR ALL ENVIRONMENTS

Whangarei District Council | Engineering Standards

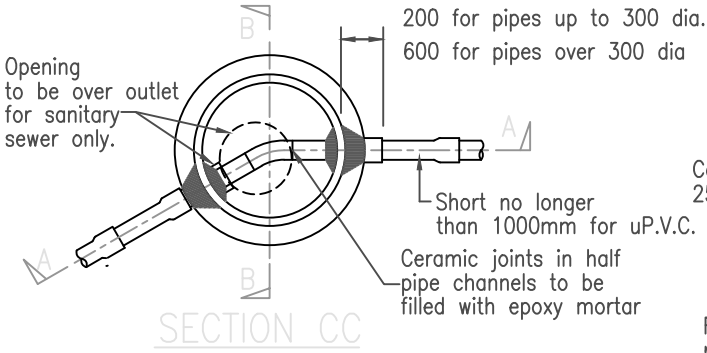
Date:	MARCH 2018
Revision:	R1
Scale:	AS SHOWN
SHEET No.	37



PRIVATE WASTEWATER PUMPING STATION CONNECTION TO PUBLIC GRAVITY NETWORK

Whangarei District Council | Engineering Standards

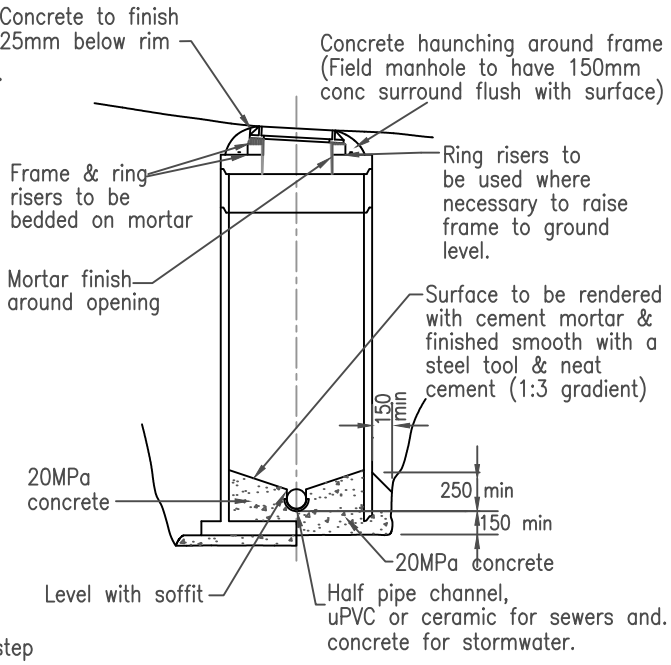
Date:	DEC 2021
Revision:	R1
SHEET No.	38



SECTION CC

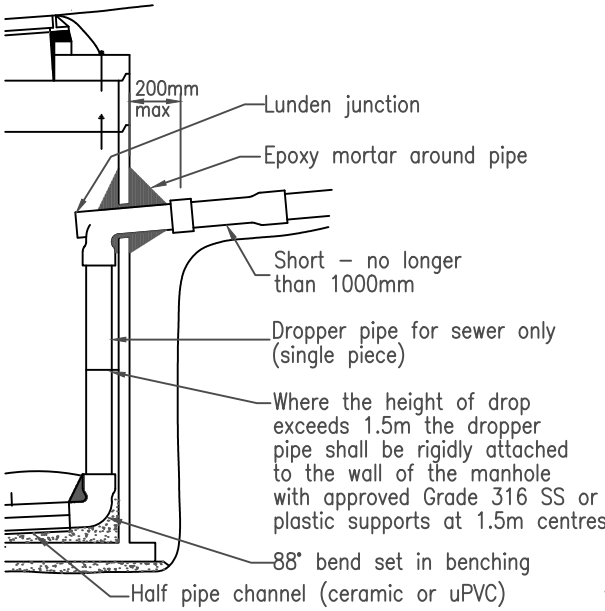
NOTES:

1. This detail is applicable for pipe diameters up to 600mm & for manhole depths up to 4.0m.
2. 150mm thick reinforced concrete lids with heavy duty ductile iron frames & covers to be used in driveways, carriageways & berms. 100mm thick concrete lids with light duty cast iron frames & covers may be used elsewhere.
3. Precast manhole bases shall be used in all instances with minimum sized holes cut for pipe entry.
4. No additional thin plastering of benching or benching of inverts is permitted.
5. All concrete to be 20MPa.
6. All manholes >1,2m in depth shall be provided with manhole step rungs, as per Sheet 40.
7. Where non-concrete pipe connections are made to concrete manholes, then a gritted starter pipe shall be installed to allow bond between manhole and pipe material. A flexible joint should also be specified as part of grited starter pipe (as standard).

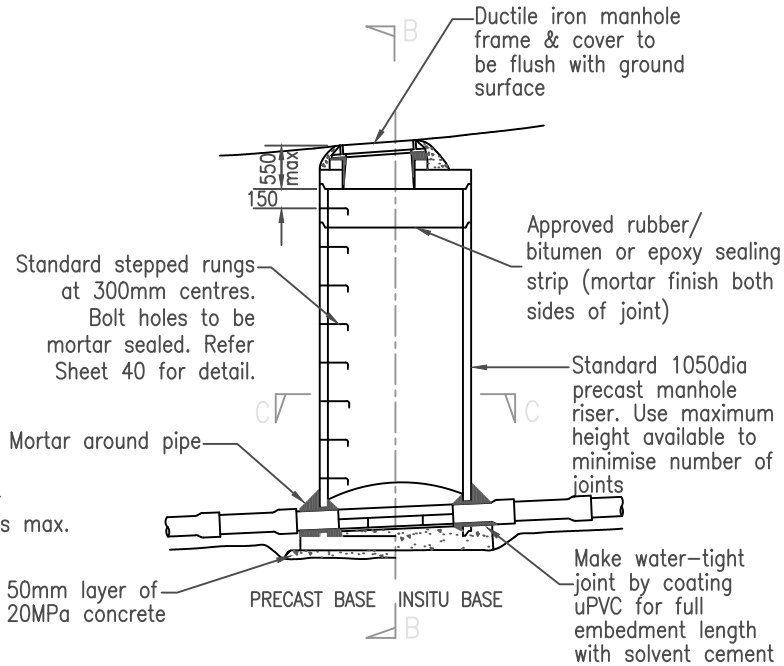


PRECAST BASE INSITU BASE (only permitted for pipes larger than 600mm)

SECTION BB



SECTION A–A INTERNAL DROP



SECTION AA

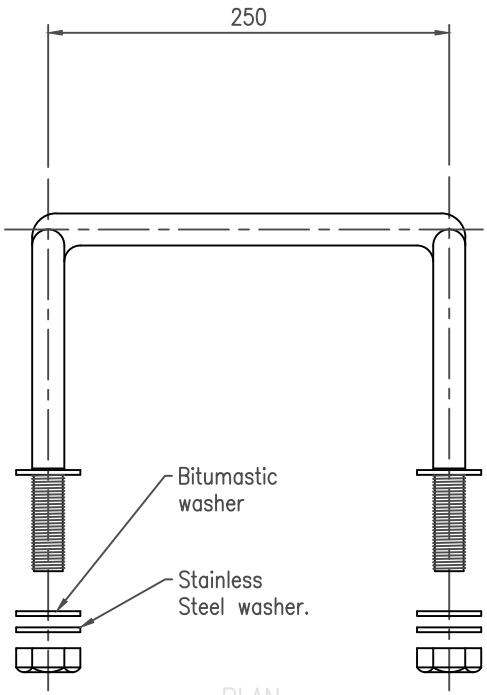
Note:

1. This detail is applicable for pipe diameters up to 250mm & for manhole depth up to 4.0m & for manhole diameters ⩾ 1200mm.
2. External drops shall not be used

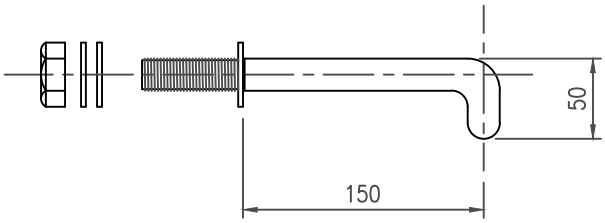
STANDARD PRECAST MANHOLE WASTEWATER AND STORMWATER FOR ALL ENVIRONMENTS

Whangarei District Council | Engineering Standards

Date:	DEC 2021
Revision:	R2
Scale:	AS SHOWN
SHEET No.	39



PLAN

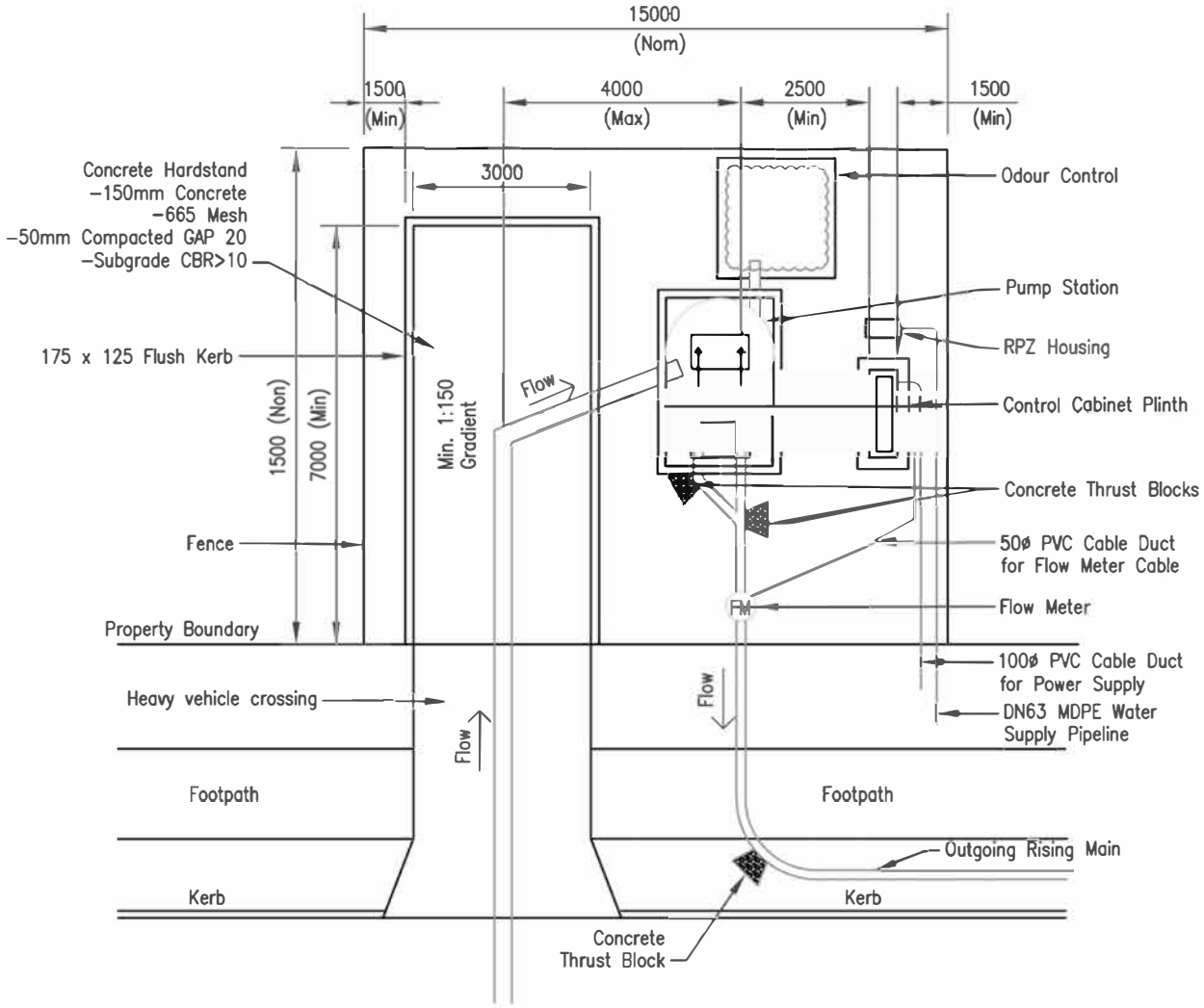


ELEVATION
STEPPED RUNG DETAIL

NOTE:

1. Step rungs shall be stainless–steel
2. Encapsulated rungs with galvanized steel or a stainless–steel core shall be fully coated with an industrial grade PE or an approved alternative.

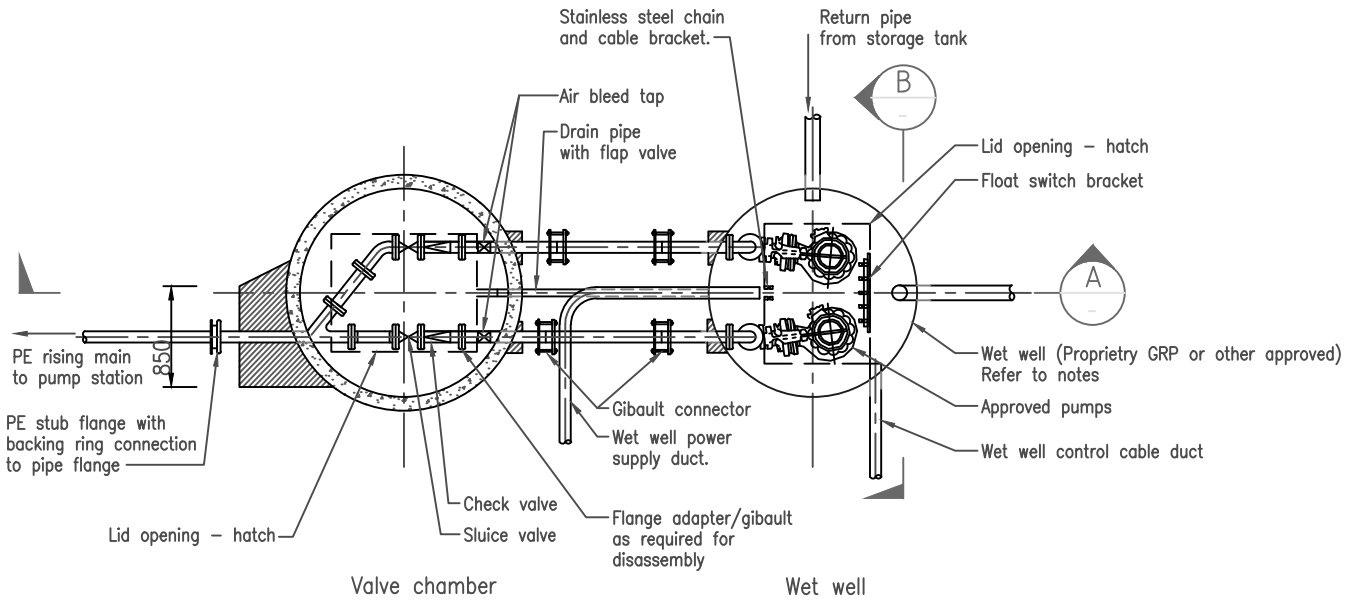
STANDARD PRECAST MANHOLE – STEP RUNG WASTEWATER & STORMWATER – FOR ALL ENVIRONMENTS	Date: DEC 2021
	Revision: R1
Whangarei District Council | Engineering Standards	Scale: NOT TO SCALE
	SHEET No. 40



NOTES::

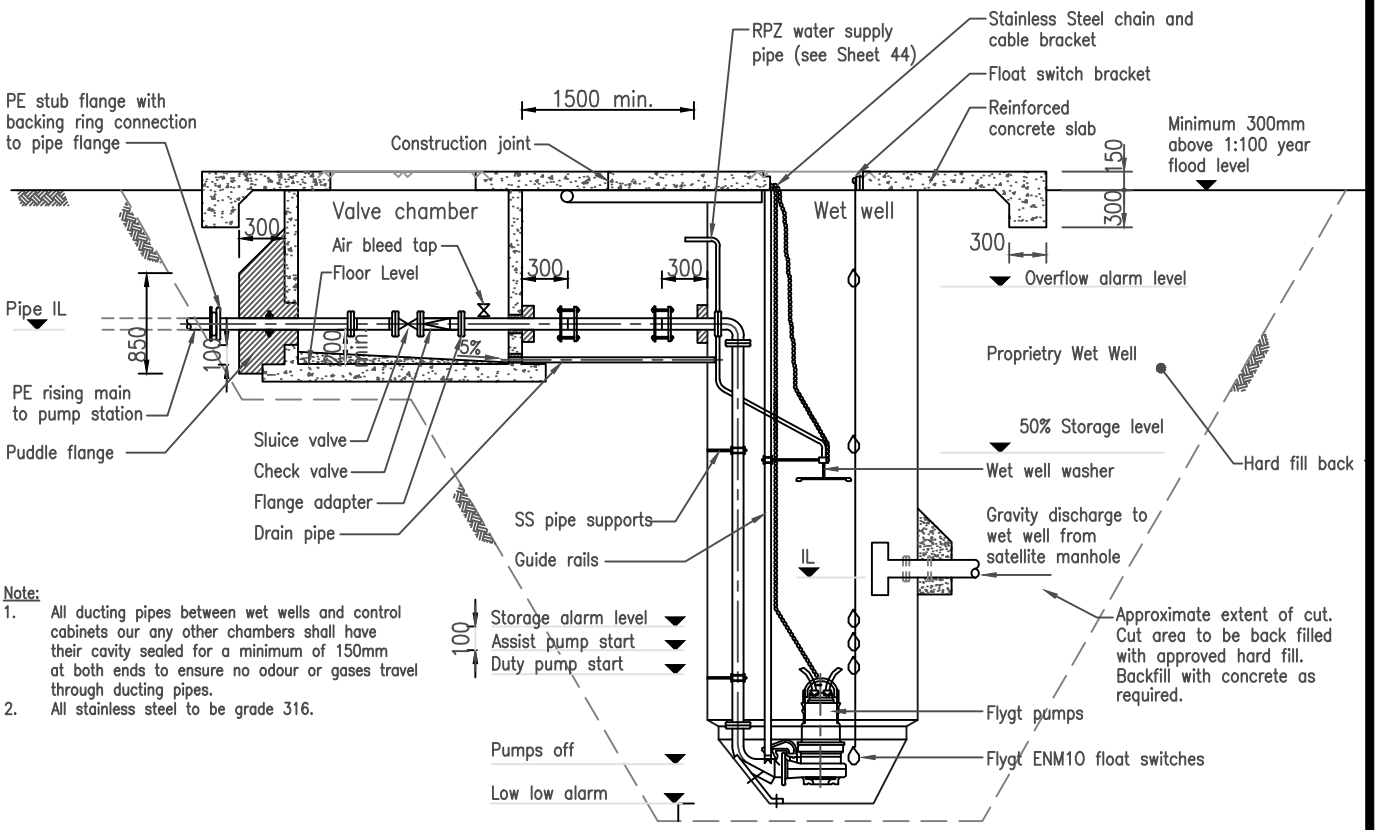
1. The detail on this drawing is typical only.
2. Pump Station Offset is measured from the driveway centreline to the centreline of the furthest pump.
3. Area around pump station shall be graded to prevent surface water flowing onto or over pump station cover slabs

WASTEWATER PUMPING STATION – SITE LAYOUT PLAN	Date: MARCH 2018
	Revision: R0
	Scale: AS SHOWN
Whangarei District Council | Engineering Standards	SHEET No. 41



WET WELL AND VALVE CHAMBER PLAN

N.T.S.



Note:
1. All ducting pipes between wet wells and control cabinets our any other chambers shall have their cavity sealed for a minimum of 150mm at both ends to ensure no odour or gases travel through ducting pipes.
2. All stainless steel to be grade 316.

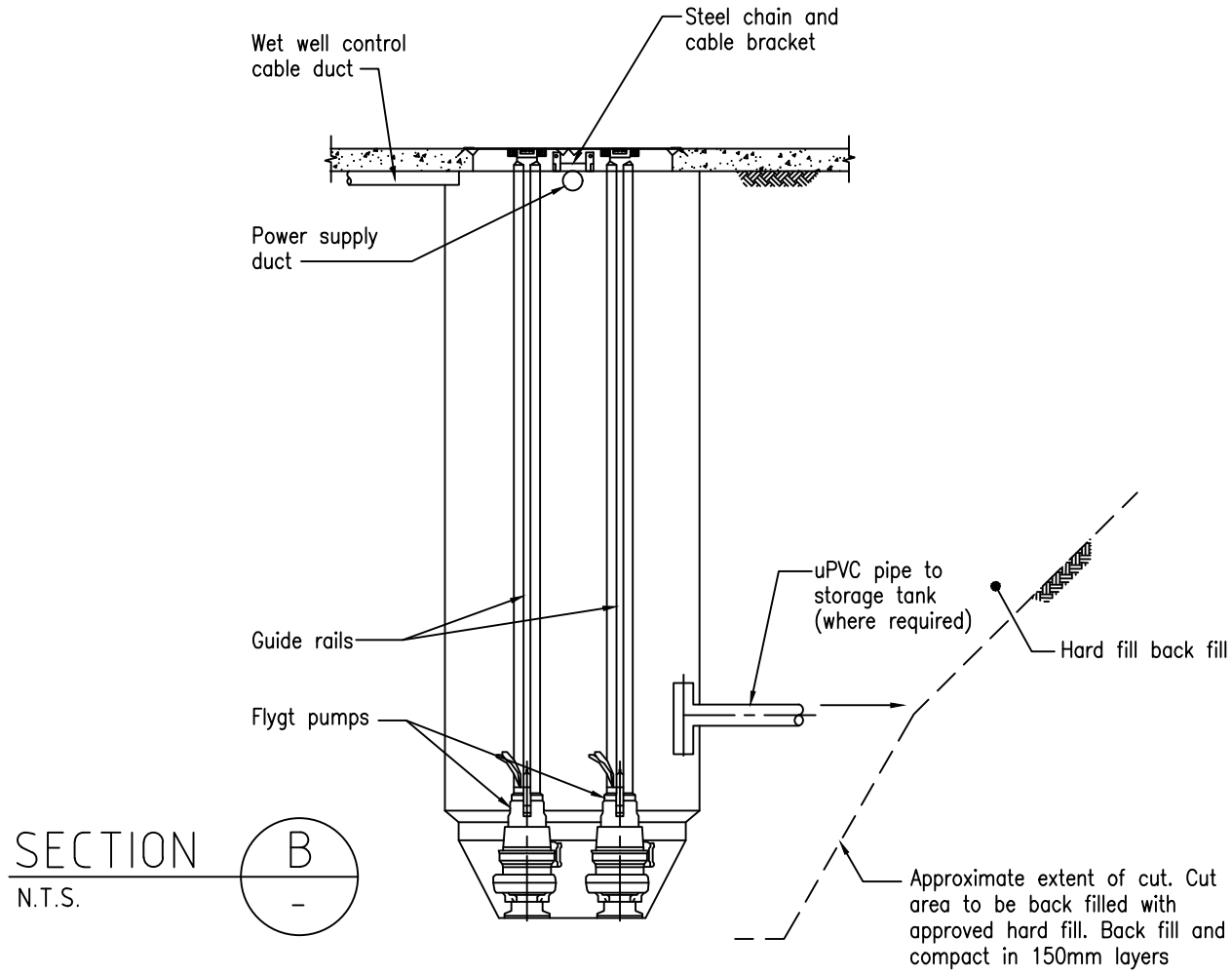
SEWER PUMP STATION TYPICAL DETAILS (1)

Date:	MARCH 2018
Revision:	R0
Scale:	AS SHOWN
SHEET No.	42

Whangarei District Council | Engineering Standards

Notes:

1. Emergency storage tank to be at least sufficient for 4 hours design average dry weatherflow(ADWF)above standby pump on level.
2. Pumps to be in accordance with Approved Materials List.
3. Pump configuration is to be duty/assist with operator selectable duty.
4. All pumps 5 kw or greater to have variable speed drive.
5. Power supply to include generator connection.
6. IP55 single phase connection to be included in power supply unit.
7. Telemetry unit to include backup 24 hr power supply.
8. Pump station PLC to have 20% redundant I/O.
9. The following alarms are to be available via telemetry: overflow, high level, low level, pump run fault.
10. On site indication shall be available for: cumulative pump run hours, amps (each pump), volts (phase selectable).
11. Pump run signal and current to be available via telemetry.
12. All tanks/ chambers to include buoyancy control based on groundwater being at ground level.
13. All fittings within pump well to be 316 stainless steel including guide rails, lifting chains and safety grids.
14. Float or probe controls for pump and alarm operations.
15. Access to be minimum 900mm x 900mm.
16. Lids shall be in accordance with Approved Material List – Wastewater and Stormwater.
17. Pump stations to be provided with lighting.
18. Odour control to be provided as required.
19. Refer to Sections 5.2.12 & 5.3.8 for further details.

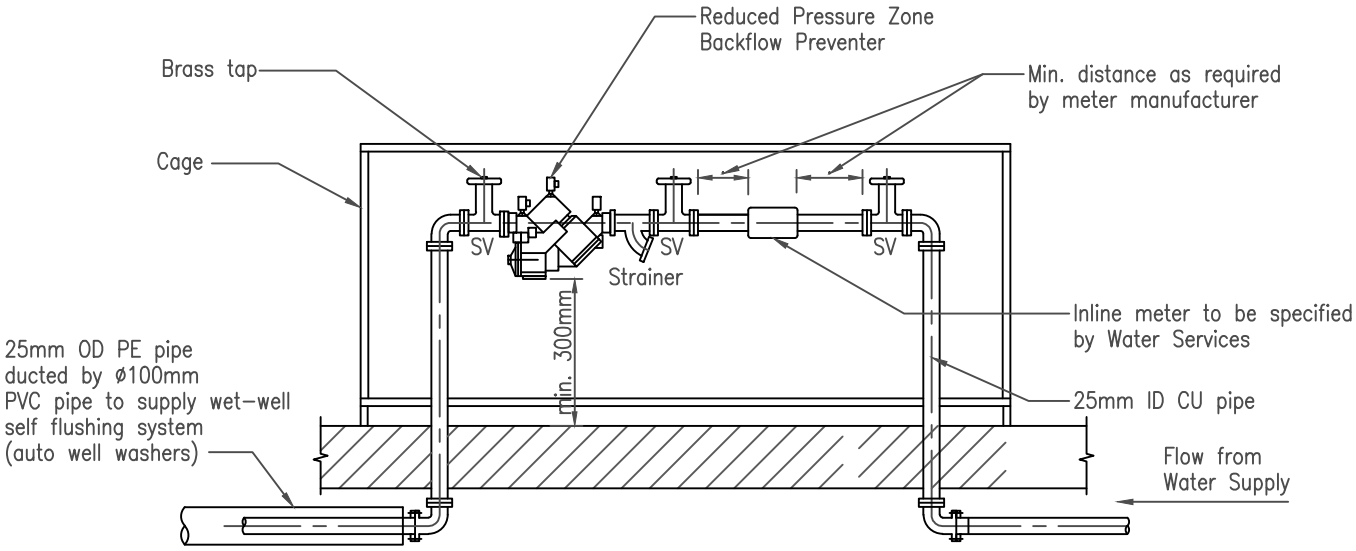


SECTION B – N.T.S.

SEWER PUMP STATION TYPICAL DETAILS (2)

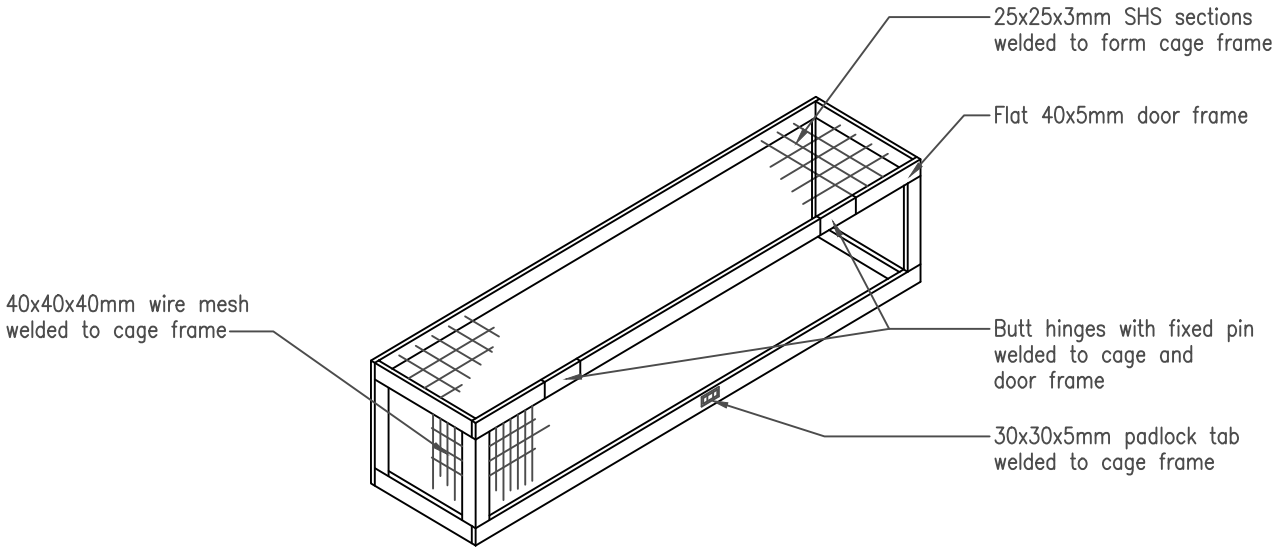
Date:	DEC 2021
Revision:	R1
Scale:	AS SHOWN
SHEET No.	43

Whangarei District Council | Engineering Standards



TYPICAL PIPE DETAIL N.T.S.

FOR 50mm + ID BFP



CAGE DETAIL

N.T.S.

RPZ WATER CONNECTION

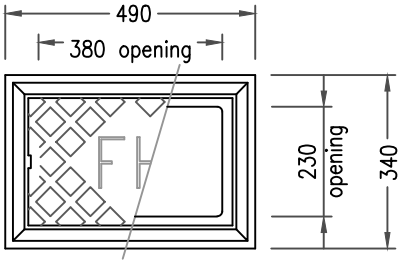
REQUIRED FOR SEWER PUMP STATIONS

Whangarei District Council

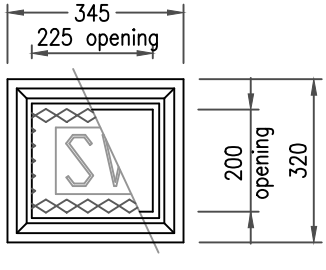
Engineering Standards

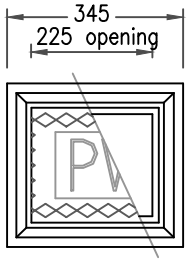
Date:	FEB 2015
Revision:	R0
Scale:	AS SHOWN
SHEET No.	44

"TALL TYPE" screw down DI hydrant to NZS 4522:2010. To close clockwise when viewed from above.

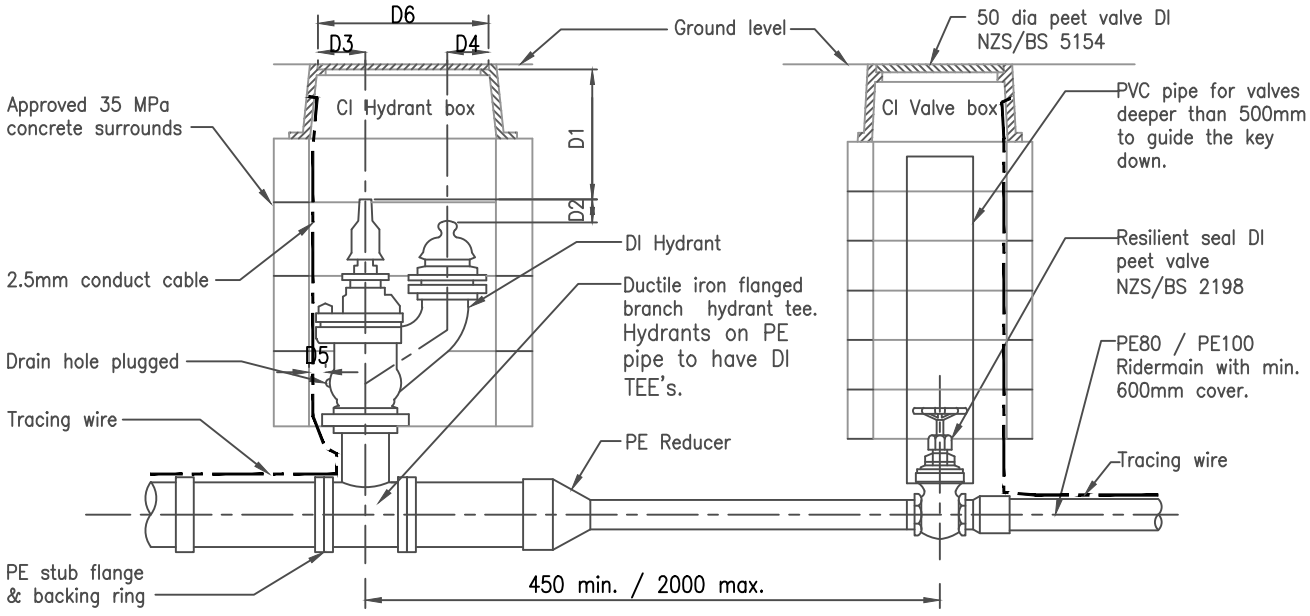


PLAN CAST IRON HYDRANT BOX





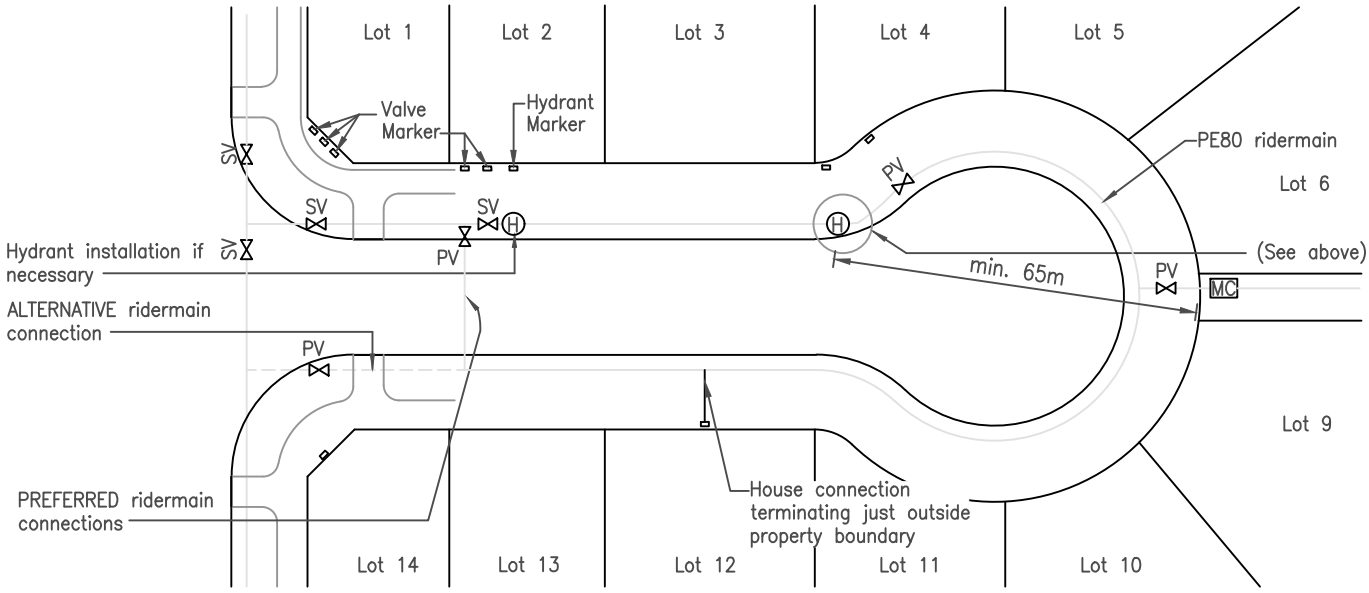
PLAN CAST IRON VALVE BOX



ELEVATION

Notes

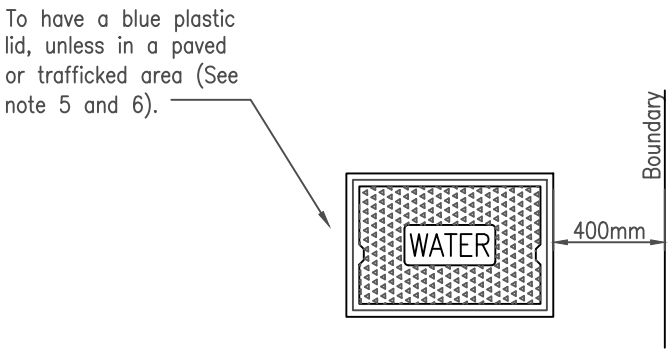
1. Deflection of joints is not to exceed the manufacturers recommendation.
2. Where there are more than 15 connections from a rider main, an isolating peet valve should be provided in the middle of the rider main.
3. All underground bolts to be stainless steel and wrapped with denso tape, mastic and polytape.
4. Service connections to terminate just outside from boundary with an approved manifold, meter box (including base) and diaphragm valve including dual check valve.
5. Allowable dimensions (D1 to D6) in accordance with Table 1 of NZS 4522:2010. Dimensions to be supplied with as-builts.



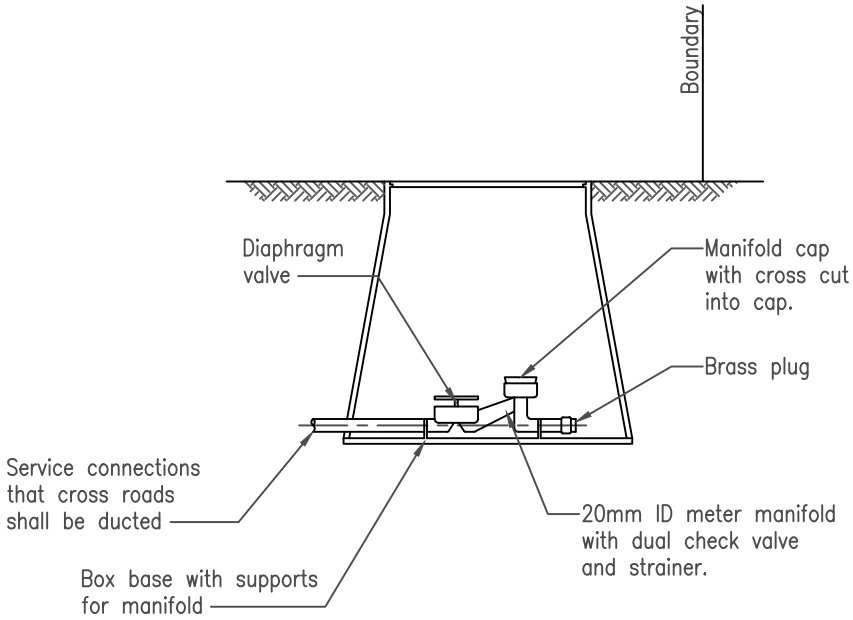
WATER PIPELINE DETAILS
(FOR ALL ENVIRONMENTS)

Date:	JANUARY 2015
Revision:	R1
Scale:	AS SHOWN
SHEET No.	45

Whangarei District Council | Engineering Standards



PLAN

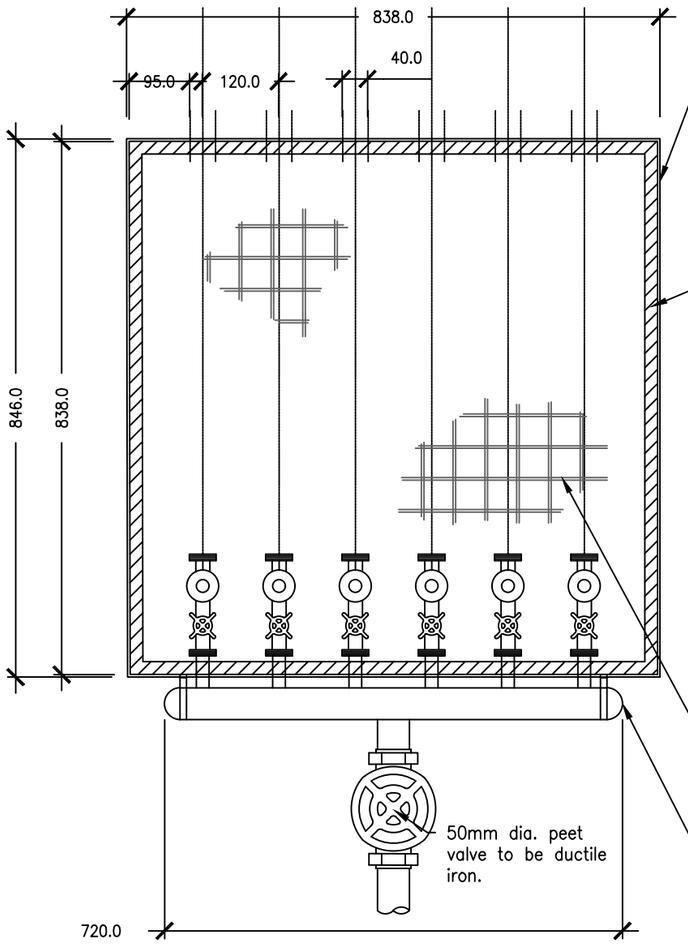


SINGLE METER BOX CONNECTION

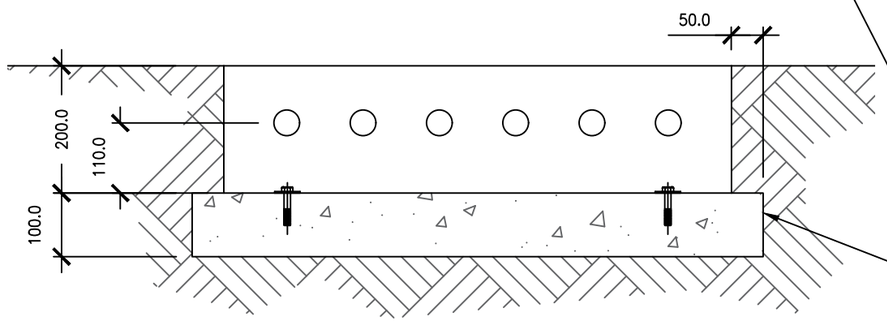
NOTE:

1. All fittings to be in accordance with WDC Water Services Approved Materials List.
2. Installation shall be in accordance with WDC Water Services Specification for the Installation of Service Connections.
3. Backflow preventers shall be provided if required by WDC bylaws or this standard and shall be installed in a separate box.
4. Box to be bedded on stable material (compacted metal/fines) below pipework, so not to put pressure on pipework.
5. In trafficked areas, a cast iron box and cover is to be used.
6. In paved areas, meter boxes shall have cast iron framed lids, mounted on minimum 2x concrete surrounds. If the meter box is outside a property boundary but in an area that is likely to be concreted e.g. may become a footpath, then the same shall apply.

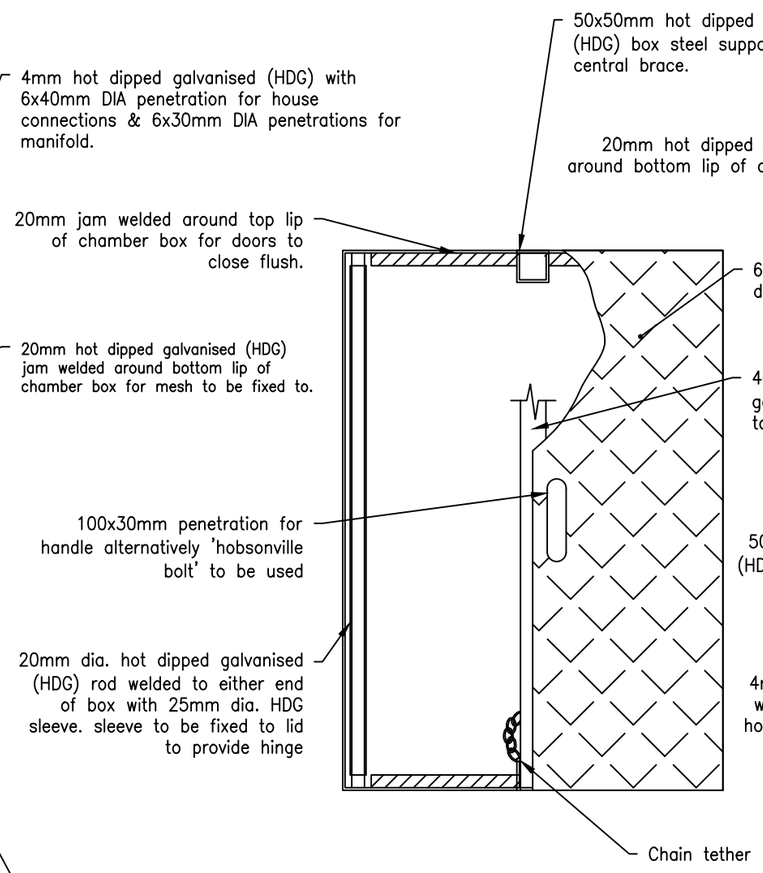
SINGLE METER BOX CONNECTION (FOR ALL ENVIRONMENTS)	Date: DEC 2021
	Revision: R2
Whangarei District Council | Engineering Standards	Scale: AS SHOWN
	SHEET No. 46



6 way manifold – typical plan
scale 1:10.



6 way manifold – typical front elevation
scale 1:10

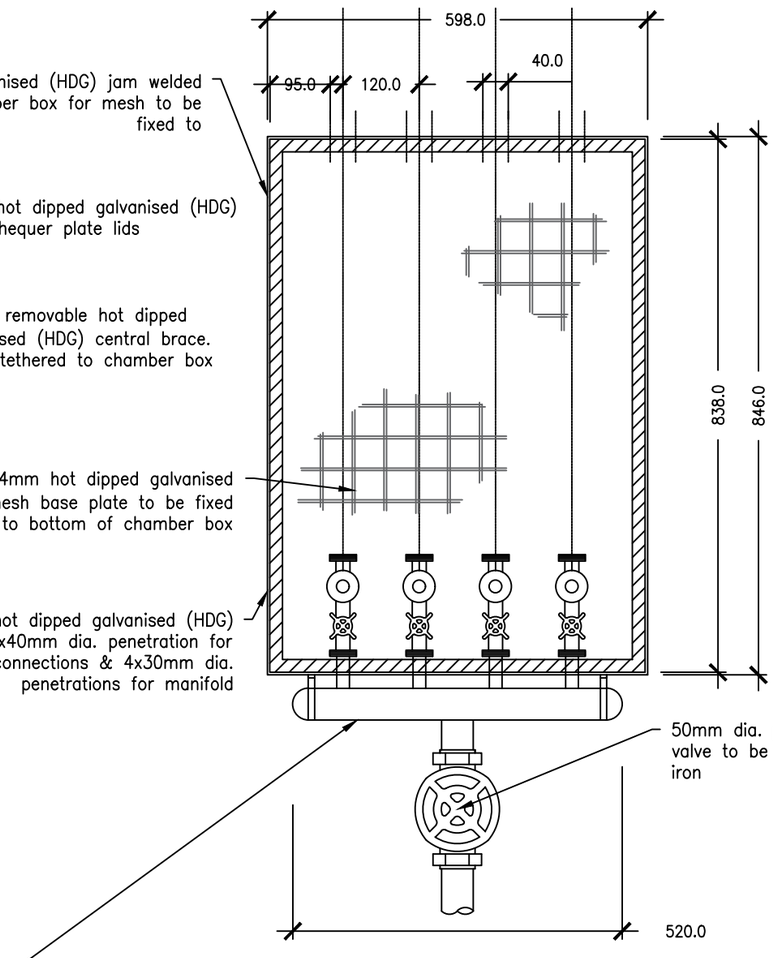


Chamber box – typical lid detail
scale 1:10

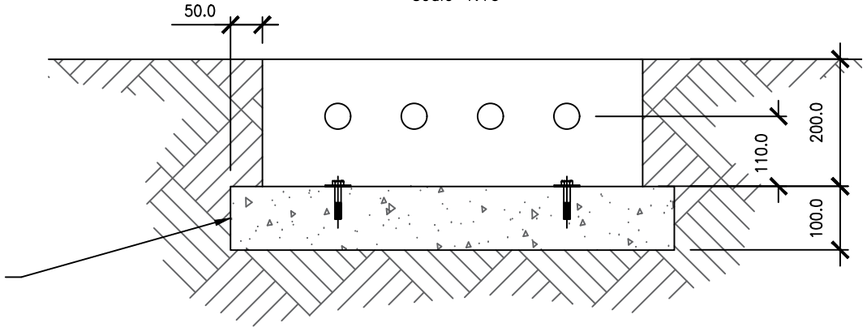
50x50x4mm hot dipped galvanised (HDG) mesh base plate to be fixed to bottom of chamber box.

50mm dia. stainless steel (SS) manifold fixed to box exterior. 6/4x30mm dia. penetrations for individual manifold feed

100mm concrete base poured on good ground.
chamber box to be fixed to base by 4 chemsets or cast insitu rag end bolts. min of 50mm embedment. minimum 75x75mm hot dipped galvanised (HDG) washer or plate to be used to span gap in mesh.



4 way manifold – typical plan
scale 1:10

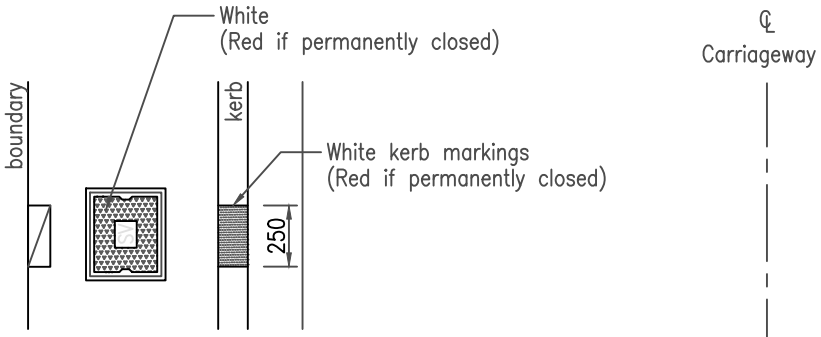


4 way manifold – typical front elevation
scale 1:10

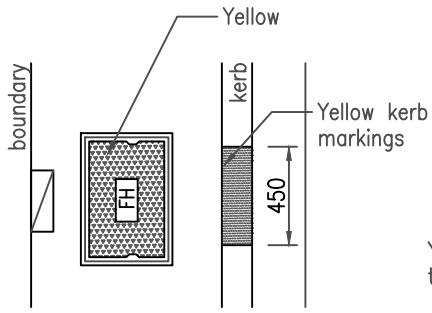
MULTIPLE WATER CONNECTIONS
FOR ALL ENVIRONMENTS

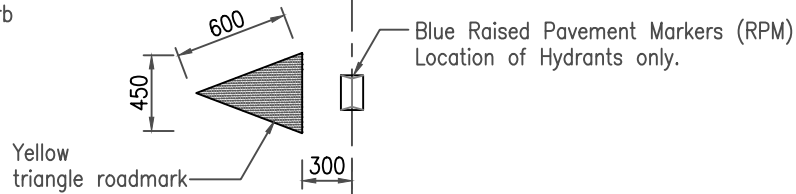
Whangarei District Council | Engineering Standards

Date:	DEC 2021
Revision:	R2
SHEET No.	47

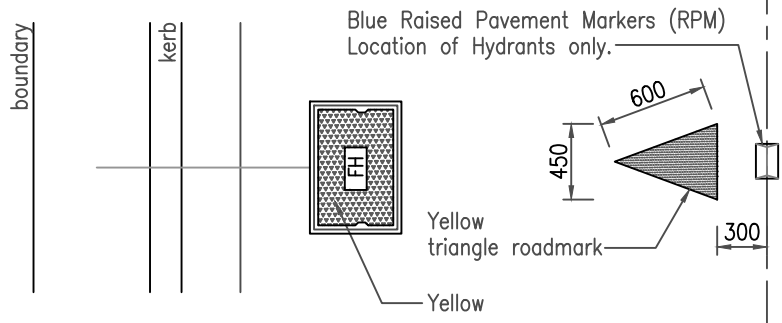


SLUICE VALVE MARKING



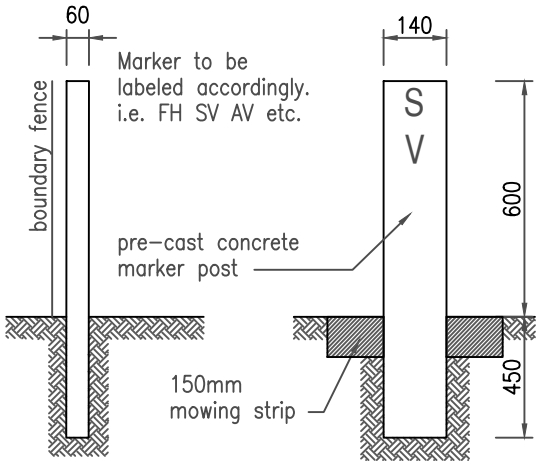


Hydrant located in Berm area



Hydrant located in Carriageway

HYDRANT MARKINGS

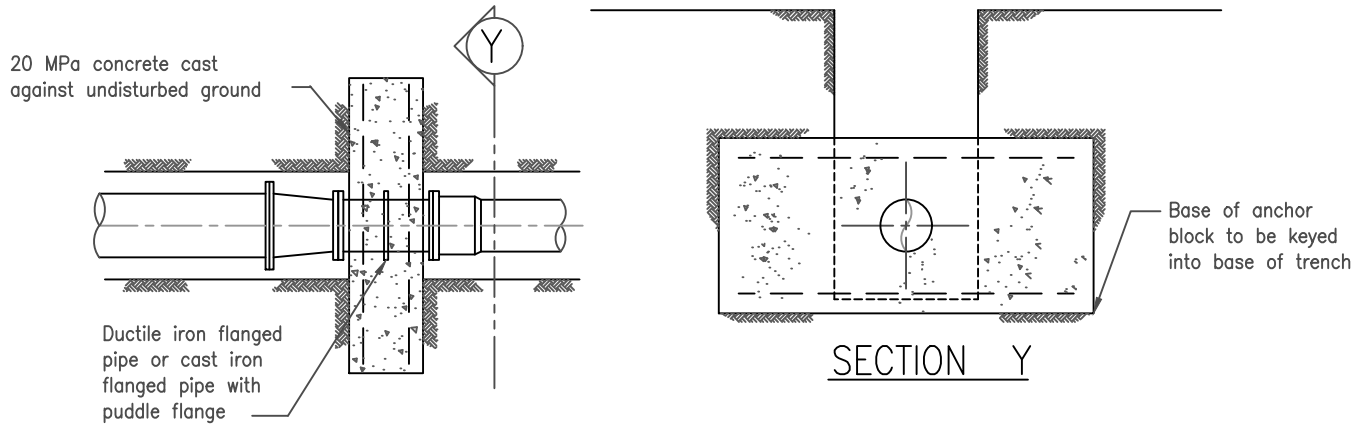


HYDRANT / SLUICE VALVE MARKER POSTS

Note:

1. Pre-cast concrete marker post to be painted white for valves and yellow for hydrants, using NZTA M7:2009 Class B Paint.
2. Surface box lids shall meet AS 3996:2019, and shall be painted using NZTA M7:2009 Class B paint.
3. Surface box lids shall be trafficable in carriageways.

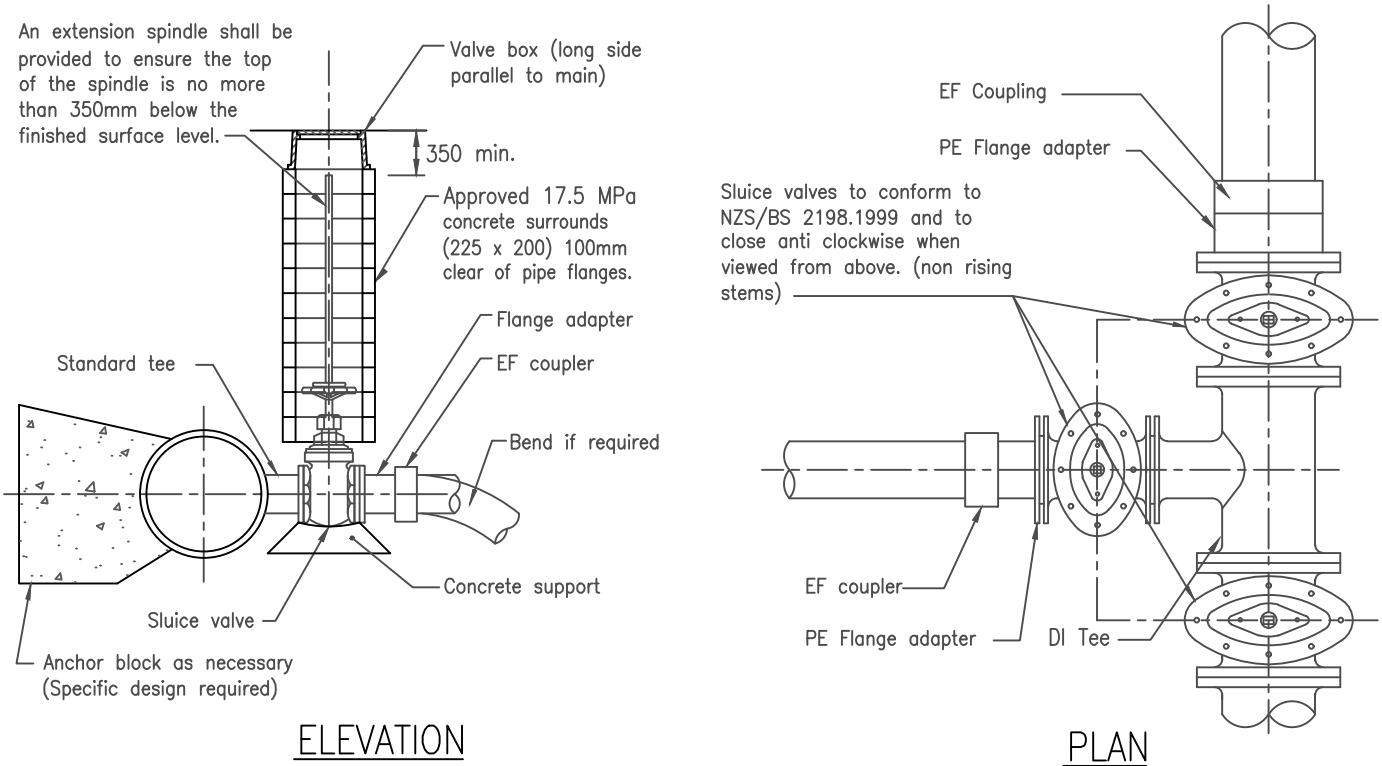
VALVE AND HYDRANT MARKERS	Date: DEC 2021
	Revision: R2
Whangarei District Council | Engineering Standards	Scale: AS SHOWN
	SHEET No. 48



ANCHOR BLOCKS AT REDUCERS

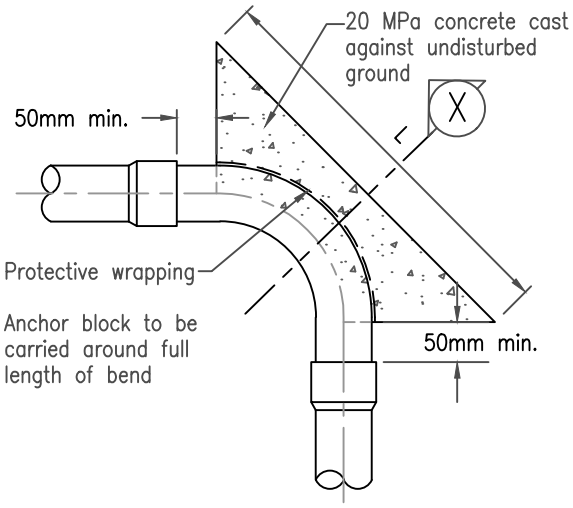
NOTES:

1. Calculations for anchor blocks at reducers and vertical curves must be shown with Engineering drawings.
2. Refer to Sheet 50 for anchor block dimensions.

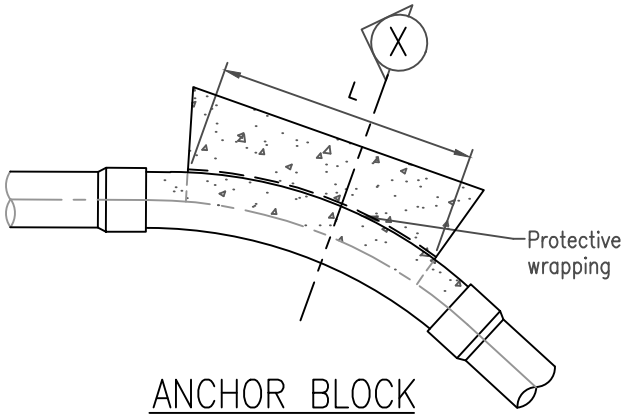


VALVE INSTALLATION DETAILS

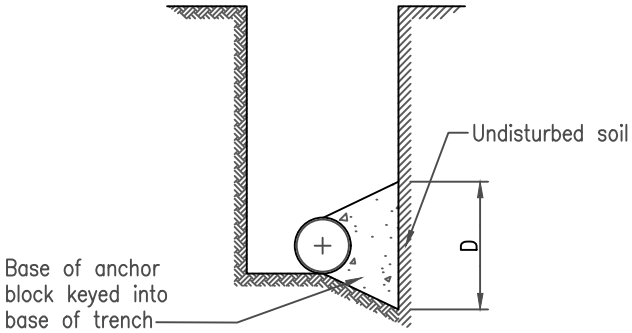
ANCHOR BLOCK AND VALVE INSTALLATION DETAILS (FOR ALL ENVIRONMENTS)	Date: MAR 2018
	Revision: R1
	Scale: AS SHOWN
Whangarei District Council | Engineering Standards	SHEET No. 49



ANCHOR BLOCK
FOR 90° BENDS



ANCHOR BLOCK
FOR 45° BENDS



SECTION X

Nom Pipe Diameter	90° Bend L	90° Bend D	45° Bend L	45° Bend D	Tee or Closed End L	Tee or Closed End D	22.5° Bend L	22.5° Bend D	11.25° Bend L	11.25° Bend D
100	740	400	500	320	520	400	300	300	300	300
150	1340	460	700	470	870	500	500	340	300	300
200	1610	660	960	600	1150	650	740	400	490	300
250	2000	800	1250	700	1420	800	890	500	640	350
300	2330	1000	1560	800	1650	1000	1080	600	810	400

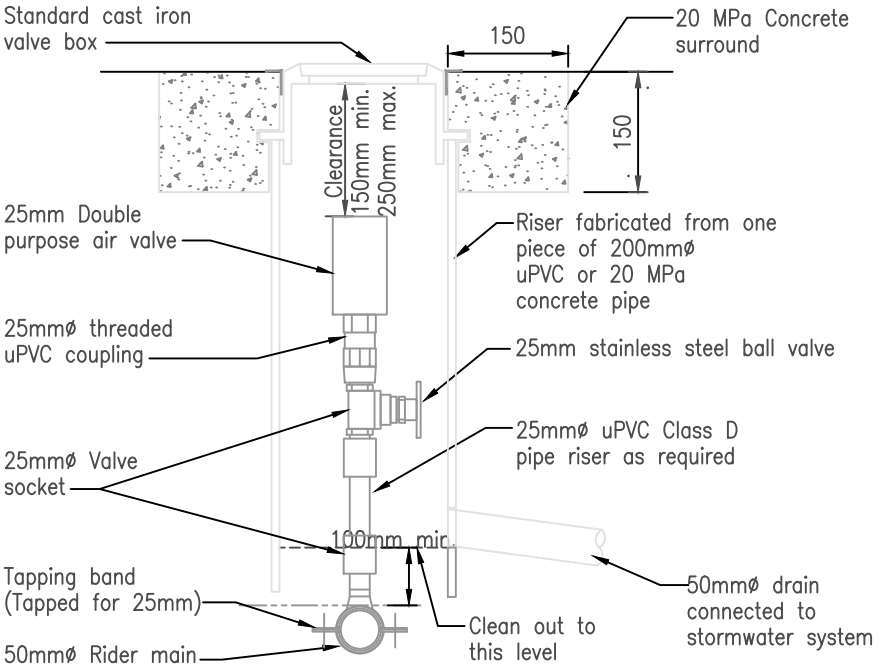
NOTES:

1) Anchor block dimensions for firm soil conditions. (⩾ CBR of 5)
2) The dimensions to be increased or decreased for variation in soil conditions.
3) Allowable bearing stress used – 100 KPa.
4) Internal pipe test pressure up to 1800 KPa (18Bar).
5) All underground bolts to be wrapped with denso tape.
6) Protective membrane to be bitumised paper, thin roofing felt or polythene film applied to a thickness of 2.5mm.
7) If an anchor block is to be supported by engineered fill material, it shall be specifically designed, taking into account all design actions, including the weight of the concrete, with allowance for safety factors.

ANCHOR BLOCK DETAILS
(FOR ALL ENVIRONMENTS)

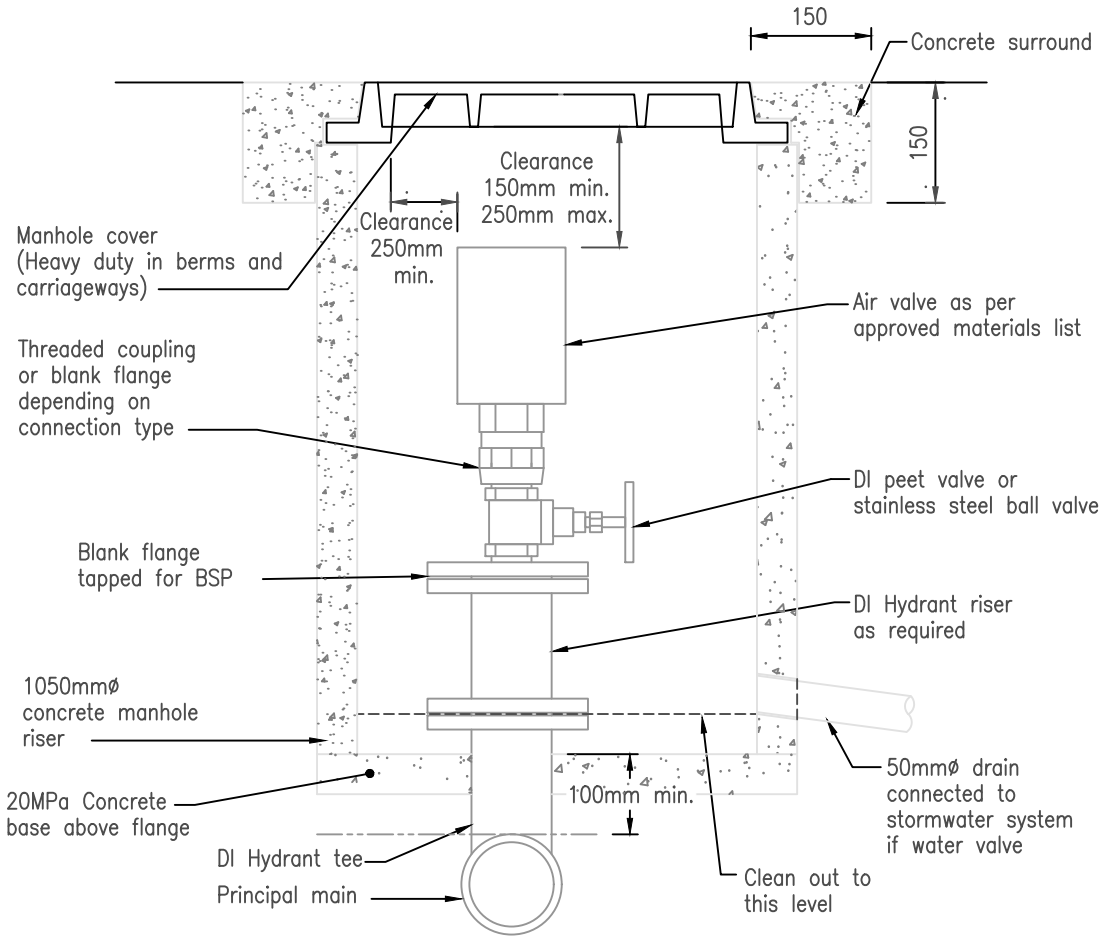
Whangarei District Council | Engineering Standards

Date:	MAR 2018
Revision:	R1
Scale:	AS SHOWN
SHEET No.	50



STANDARD AIR VALVE DETAIL FOR 50mmø RIDER MAINS

NB: Underground bolts to be wrapped with DENSO tape



STANDARD AIR VALVE DETAIL FOR PRINCIPAL MAINS & PRESSURE SEWER SYSTEMS

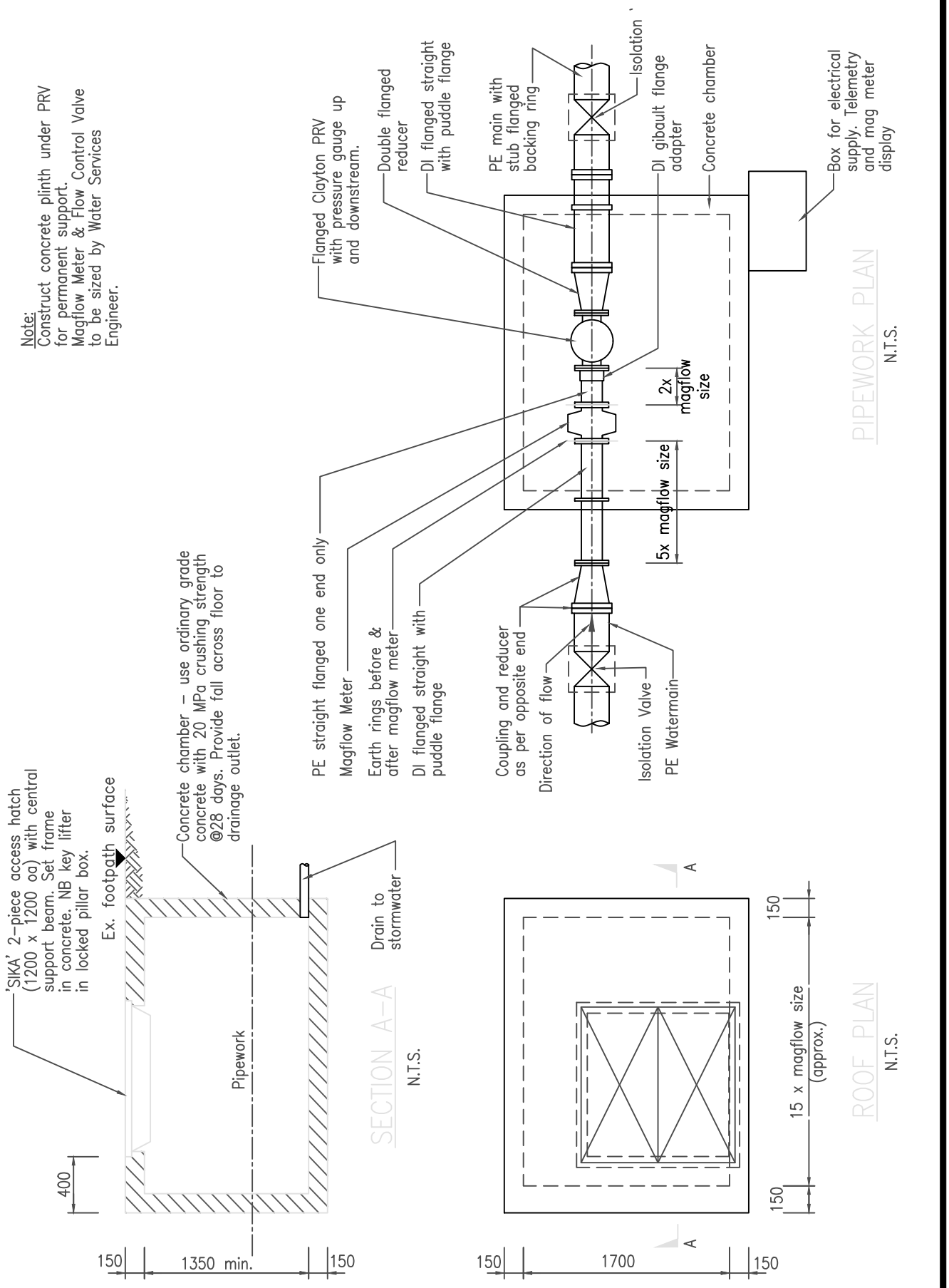
NB: Underground bolts to be wrapped with DENSO tape

AIR VALVE DETAILS

FOR ALL ENVIRONMENTS

Date:	DEC 2021
Revision:	R2
Scale:	AS SHOWN
SHEET No.	51

Whangarei District Council | Engineering Standards

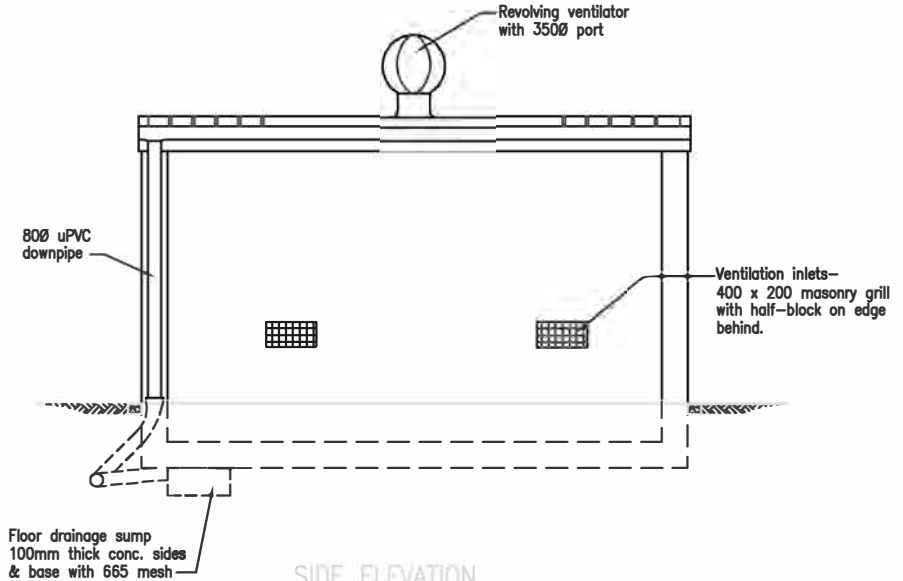


MAGFLOW & FLOW CONTROL VALVE INSTALLATION

FOR ALL ENVIRONMENTS

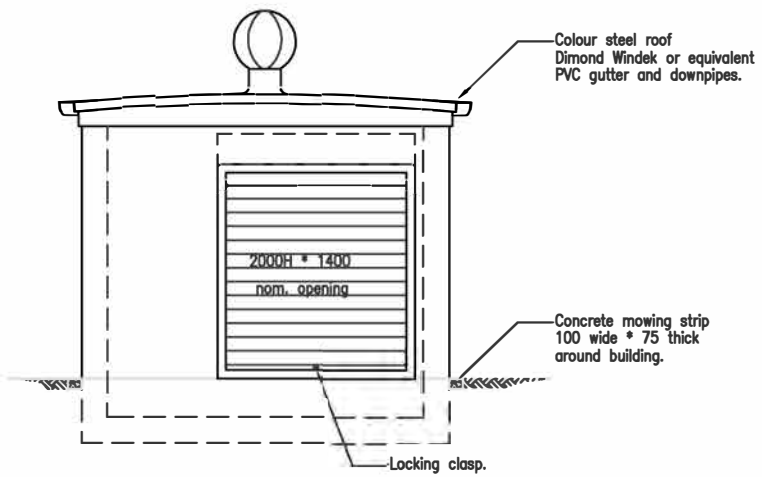
Date:	FEB 2015
Revision:	R0
Scale:	NTS
SHEET No.	52

Whangarei District Council | Engineering Standards



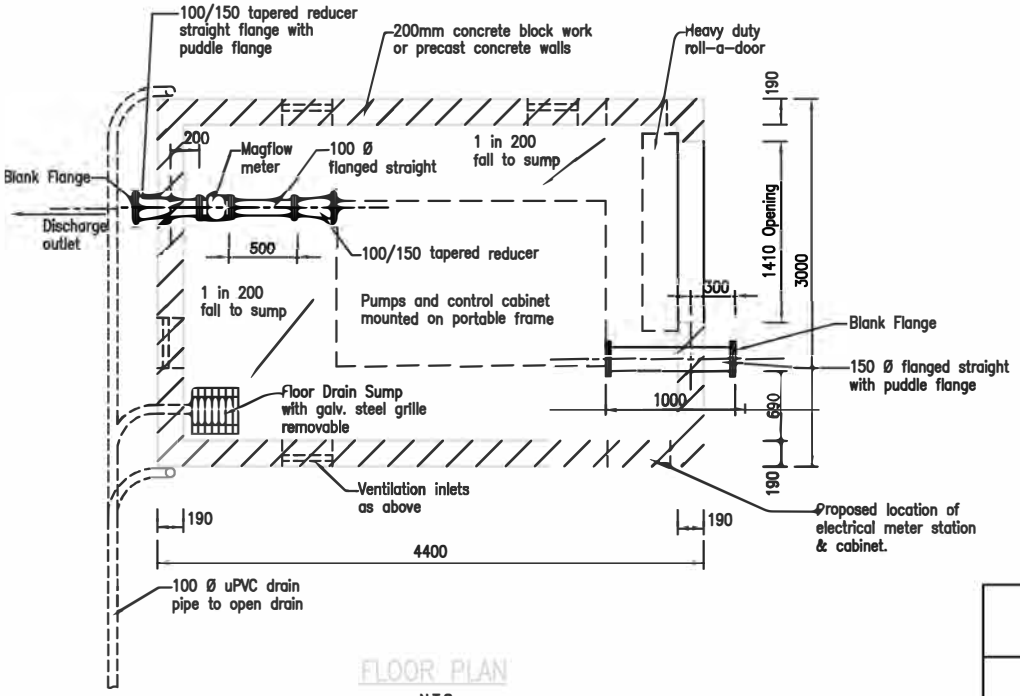
SIDE ELEVATION

N.T.S.



FRONT ELEVATION

N.T.S.



FLOOR PLAN

N.T.S.

NOTES:

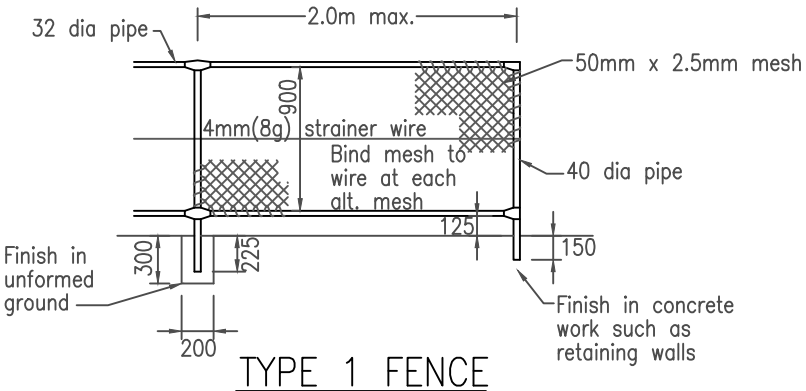
1) The details & dimensions shown are for guidance only and may need to be changed for particular situations.
2) All fabricated pipework to be "Class K9 cement mortar lined ductile iron pipe in accordance with AS/NZS 2280.
3) Jointing to be with "Tyton" rubber rings.
4) Pump set to be as per Approved Materials List.
5) The details shown are based on 150mm dia pipework and should be used for guidance only.
6) All details including structure, access etc. shall comply with the New Zealand Building Code and related documents.
7) Steps shall be provided as required between the doorway and floor level.
8) A minimum space of 800mm should be provided around pumps and electrical/ control cabinets for maintenance access.
9) The building shall be provided with internal lighting and power points.
10) The pump house shall be located on a separate lot, or within the road reserve where approved by the water manager.
11) Provision shall be made for parking and access to the doorway by maintenance vehicles.
12) Details of power & telemetry required to be obtained from Water Services Manager.

WATER SUPPLY PUMP STATION DETAILS

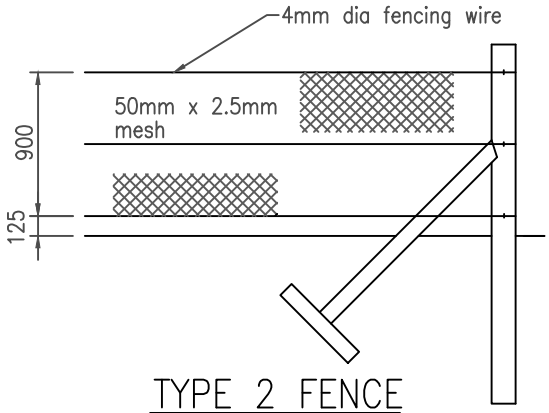
FOR ALL ENVIRONMENTS

Whangarei District Council | Engineering Standards

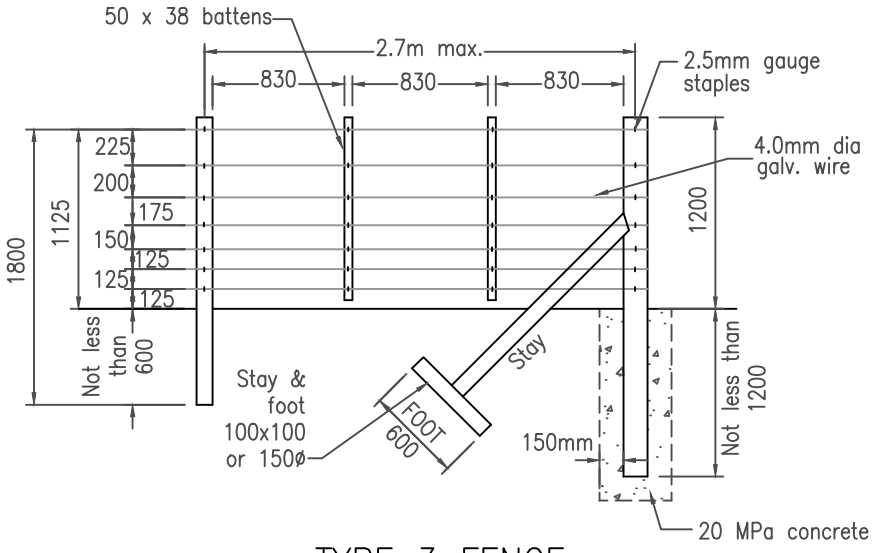
Date:	MAR 2018
Revision:	R1
SHEET No.	53



TYPE 1 FENCE
WALKWAYS AND SIMILAR



TYPE 2 FENCE
WALKWAYS AND SIMILAR
(Posts, stays, and footings as per Type 3 fence.)



TYPE 3 FENCE
STOCK PROOF

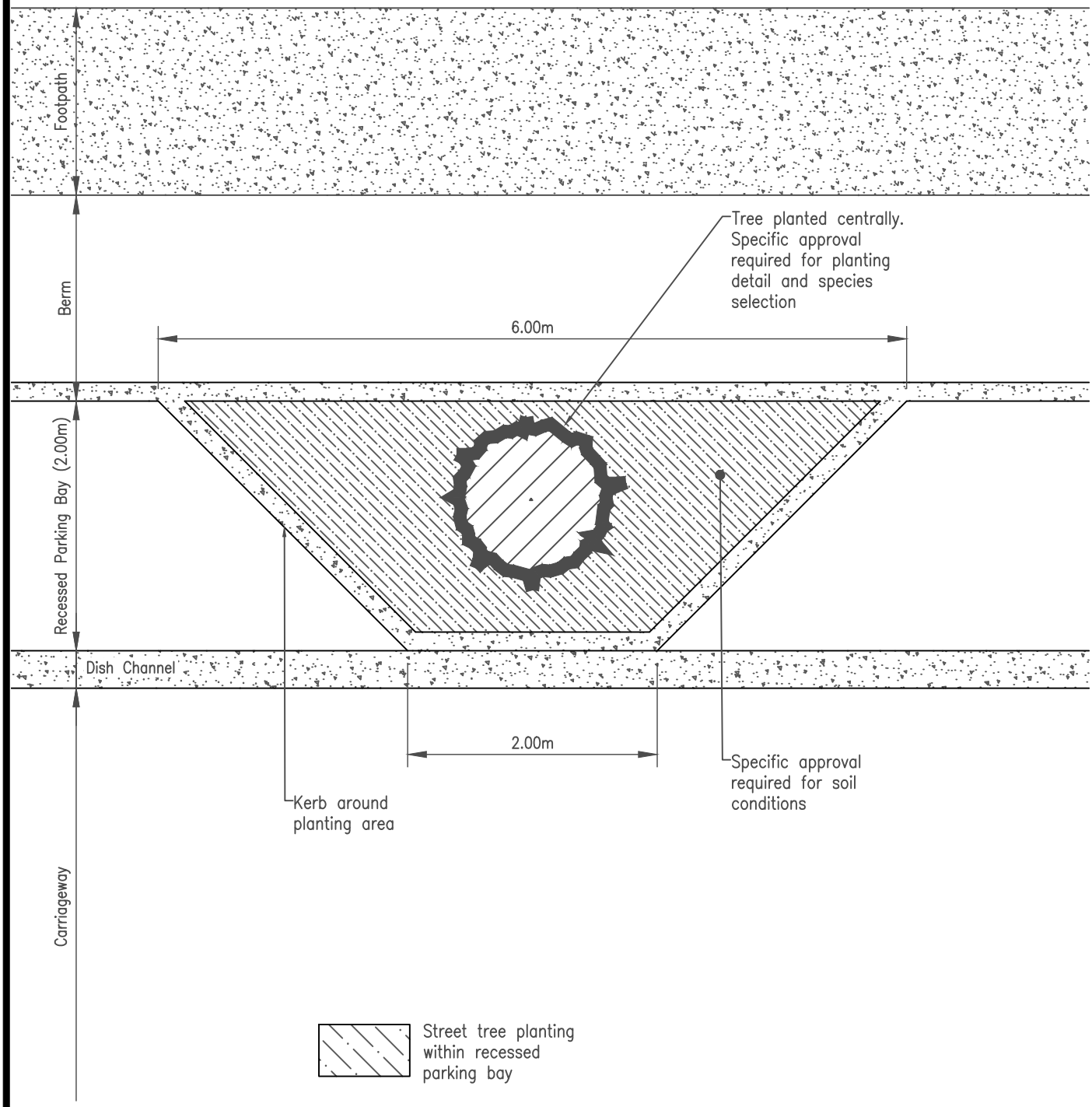
NOTES:

1. Type 2, 3 and 4 fences to have concrete or wooden posts and stays, securely rammed.
2. Timber posts shall be treated to H4 specification.
3. Timber posts and stays to be 100 x 100 or 150 DIA MIN.
4. Timber strainer posts to be 150 x 150 or 250 DIA MIN.
5. Mesh to be tied to railings and standards with galvanised binder wire as shown (Not bag ties)
6. Fittings to be "Kee Klamp" or similar pattern.
7. All pipes, wire, mesh and staples to be galvanised.
8. Stock proof fence shall be approriate for stock to be excluded. The District Council reserves the right to request modification for specific purpose.
9. GENERAL:
   Safety fencing, safety railing, alternative fencing, cycle barriers, and walkway surfacing shall be subject to specific design and approval otherwise specified.

FENCE TYPES
FOR ALL ENVIRONMENTS

Whangarei District Council | Engineering Standards

Date:	MAR 2018
Revision:	R1
Scale:	AS SHOWN
SHEET No.	54

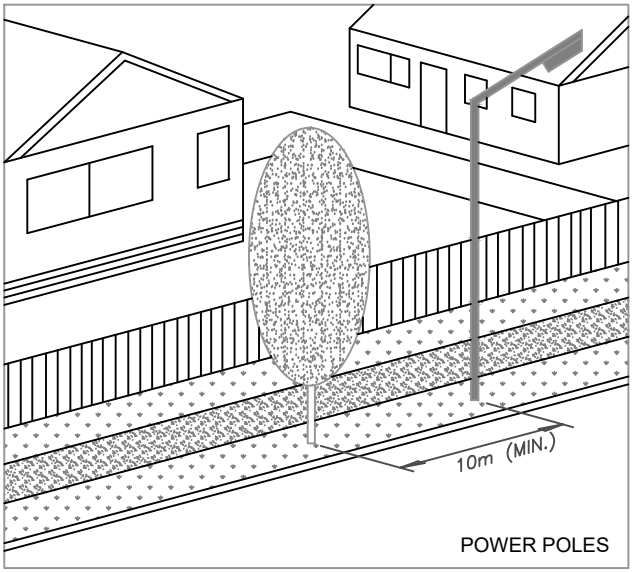


- Refer to section 3.2.24 & Sheet 56 for restrictions.
- Refer Sheet 57 for staking details.

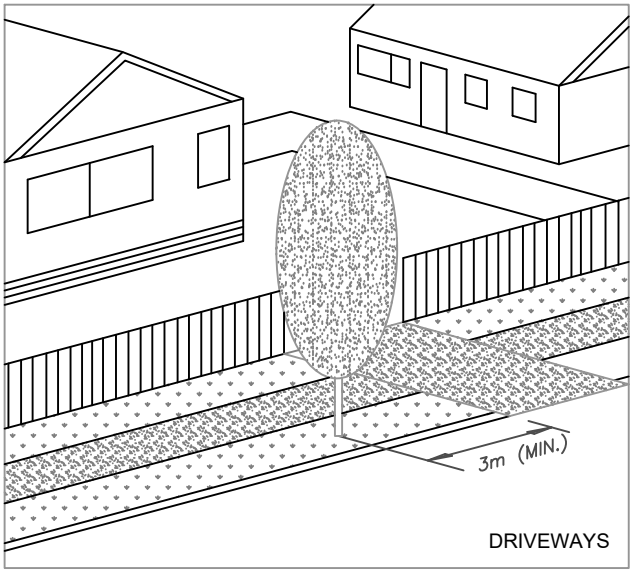
STREET TREE PLANTING WITHIN RECESSED PARKING BAY –FOR ALL ENVIRONMENTS

Date:	MARC 2018
Revision:	R0
Scale:	AS SHOWN
SHEET No.	55

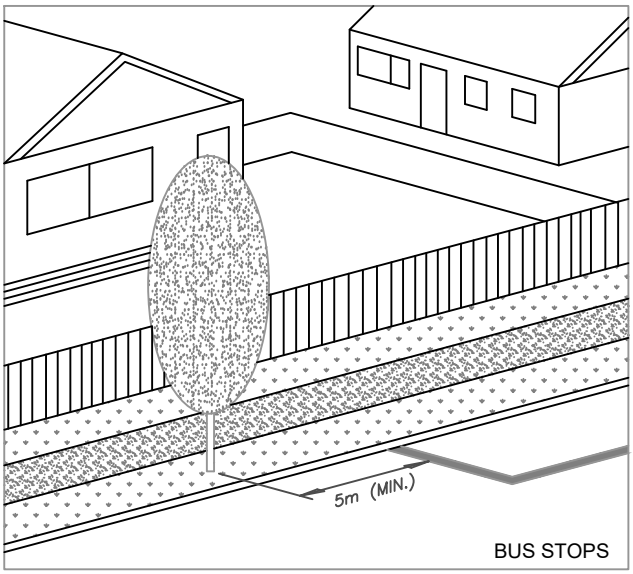
Whangarei District Council | Engineering Standards



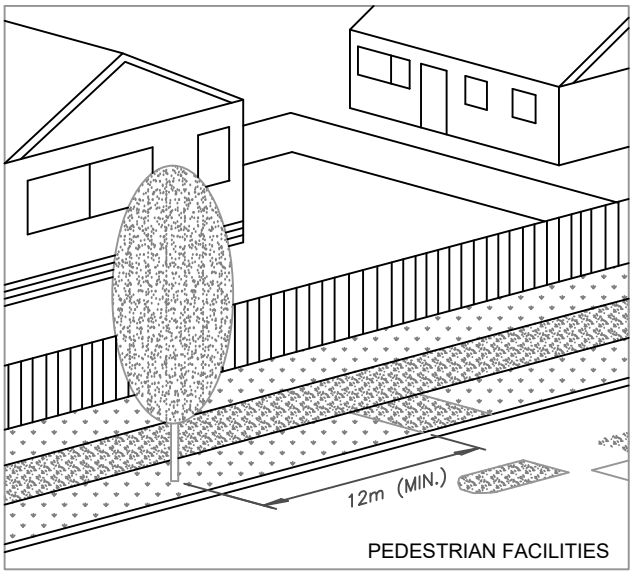
POWER POLES



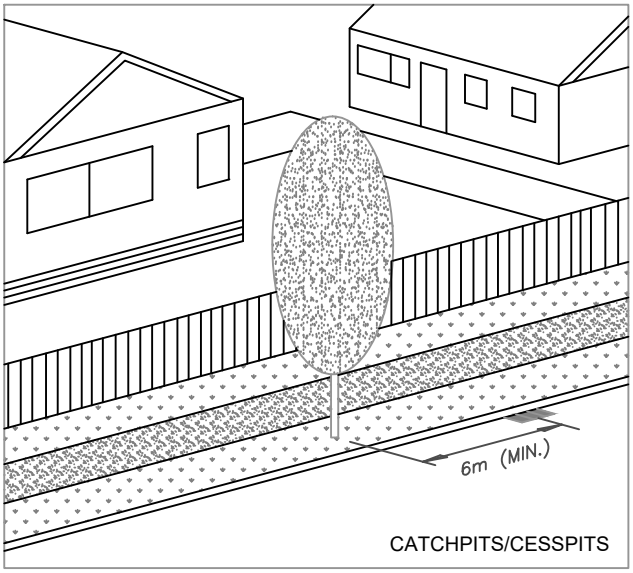
DRIVEWAYS



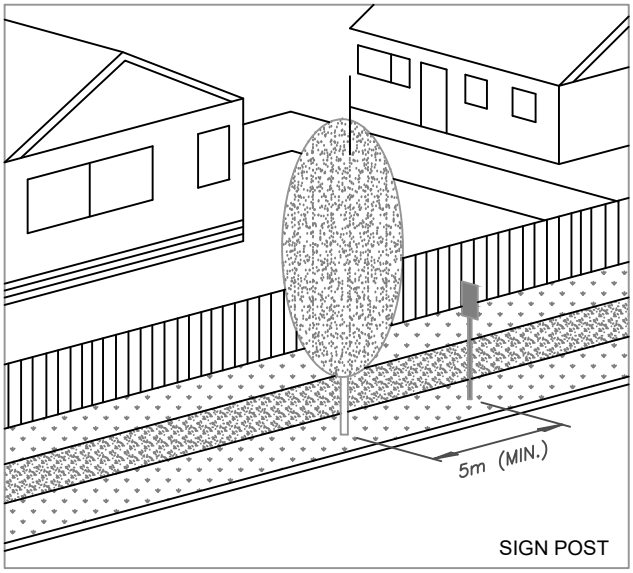
BUS STOPS



PEDESTRIAN FACILITIES



CATCHPITS/CESSPITS



SIGN POST

NOTES:
1.Clearances for lighting columns shall comply with the NTA Design Manual - Street Lighting.

STREET TREE PLANTING CLEARANCES
(LIVING 1 AND 2, AND ALL BUSINESS ENVIRONMENTS)

Date:	FEB 2022
Revision:	R1
Scale:	AS SHOWN
SHEET No.	56

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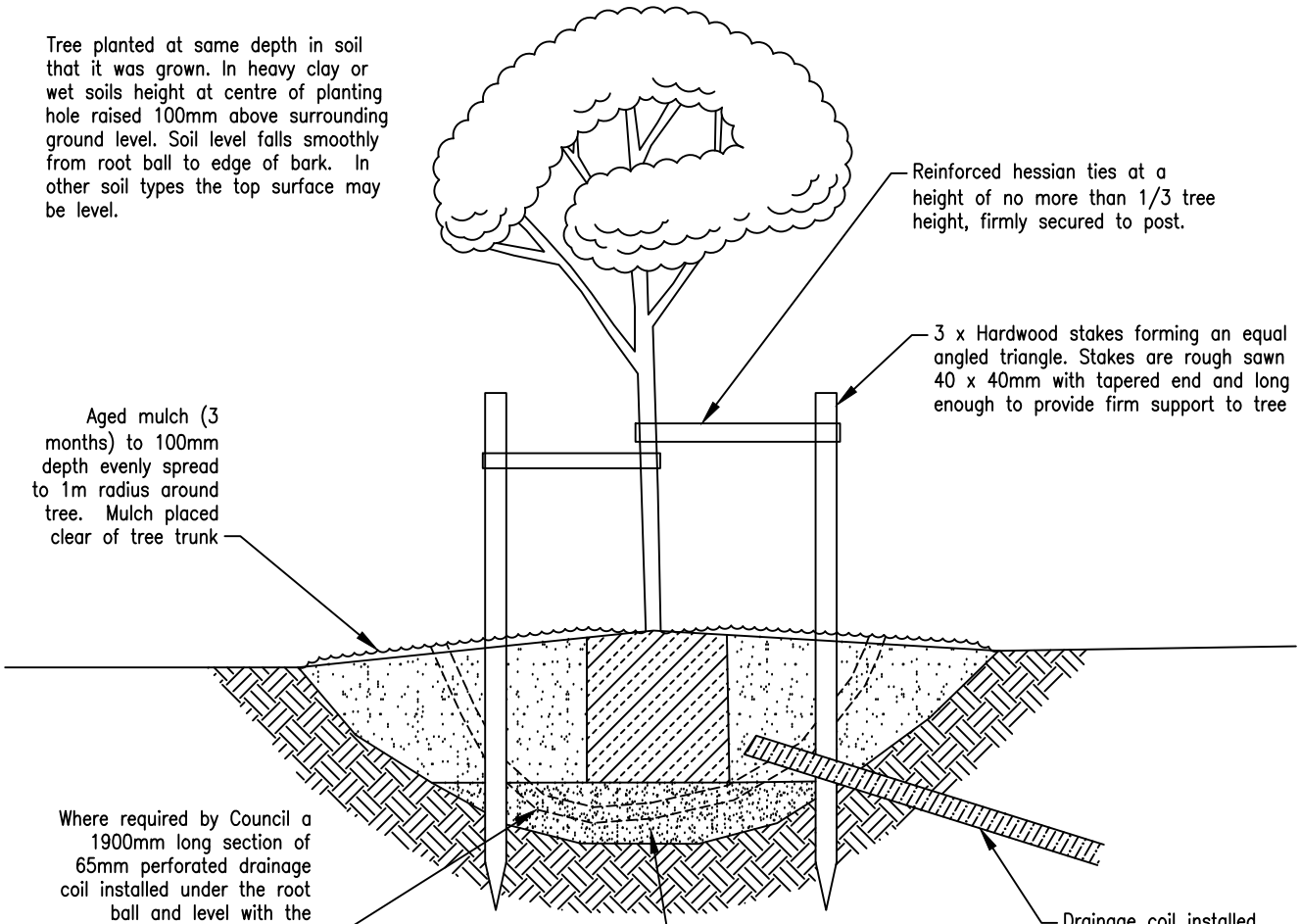
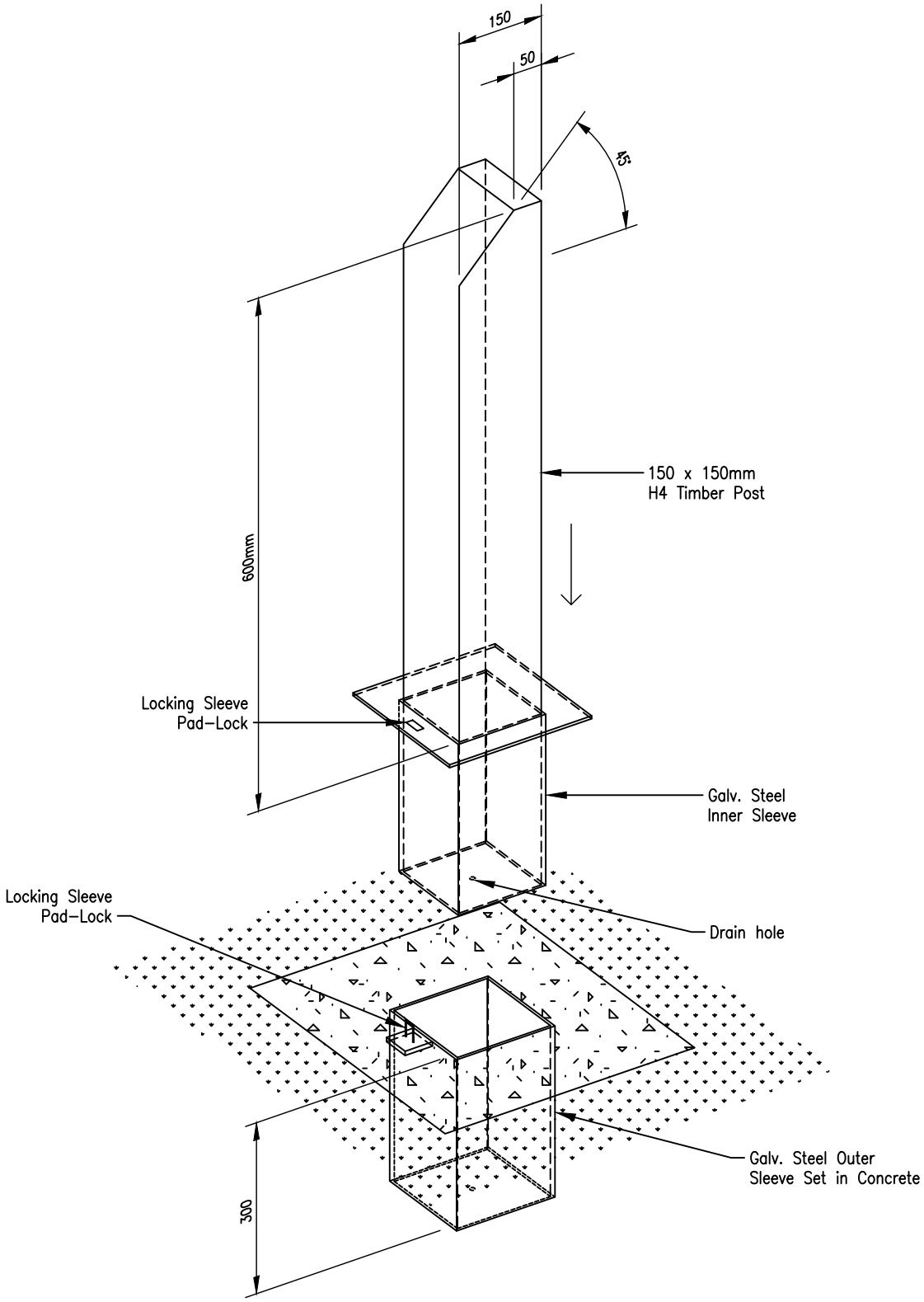


TREE PLANTING DETAIL

Date:	DEC 2021
Revision:	R1
Scale:	AS SHOWN
SHEET No.	57

Whangarei District Council | Engineering Standards



REMOVABLE BOLLARD DETAIL

Date:	DEC 2021
Revision:	R1
Scale:	AS SHOWN
SHEET No.	58

Whangarei District Council | Engineering Standards

Whangarei District Council

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