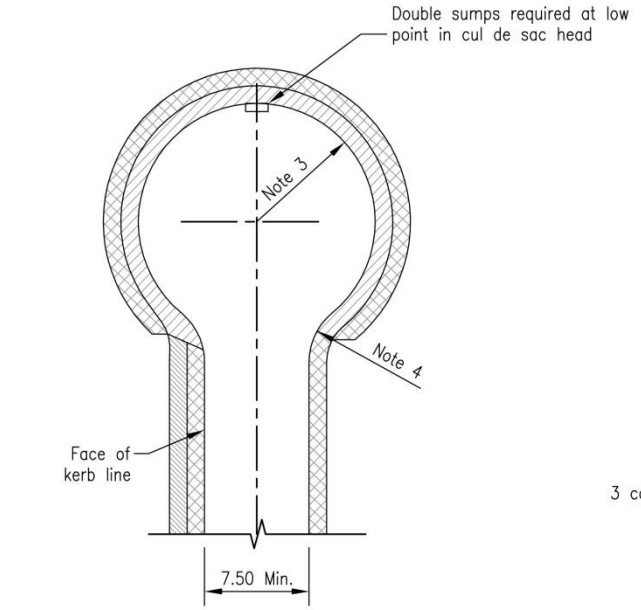
Sheet 11 Cul-de-sac Details

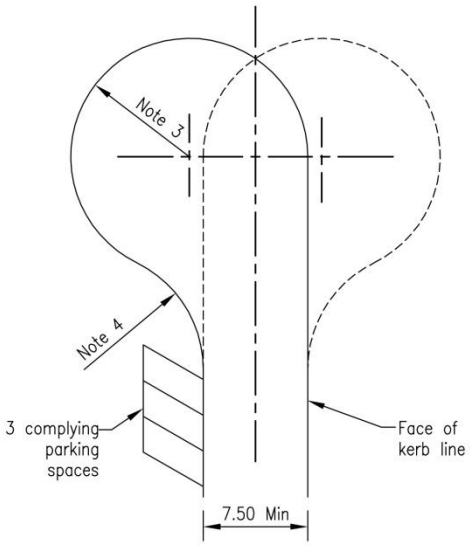


Berm

Reinforced Footpath to Commercial Crossing Standard – See Notes.

Ordinary Footpath

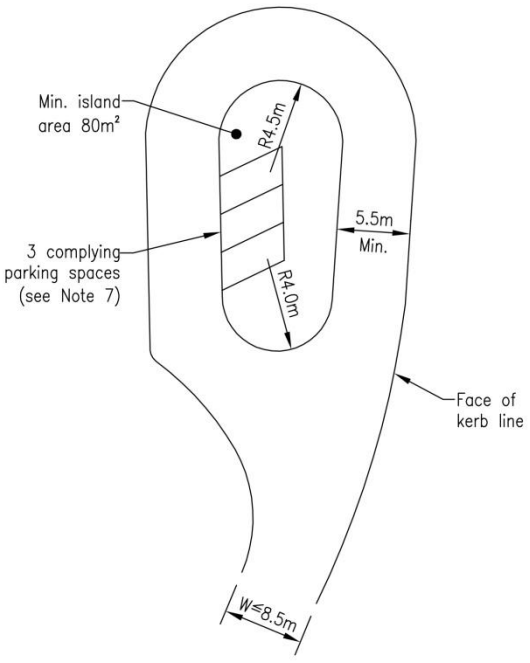
TYPE A



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. Footpaths and berm widths as required for Urban Cul de sac (refer Sheet 2).
6. Reinforced footpath to be 150mm thick concrete with 665 mesh. Concrete strength to be 30 MPa at 28 days.
7. 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 8m medium rigid truck – widening may be required.
8. The minimum kerb gradient shall be 0.5%.
9. 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 3.5 in NZS 4404:2004 is an acceptable solution in residential areas.



TYPE C

CUL DE SAC DETAILS	Date: APRIL 2010
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WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: NTS
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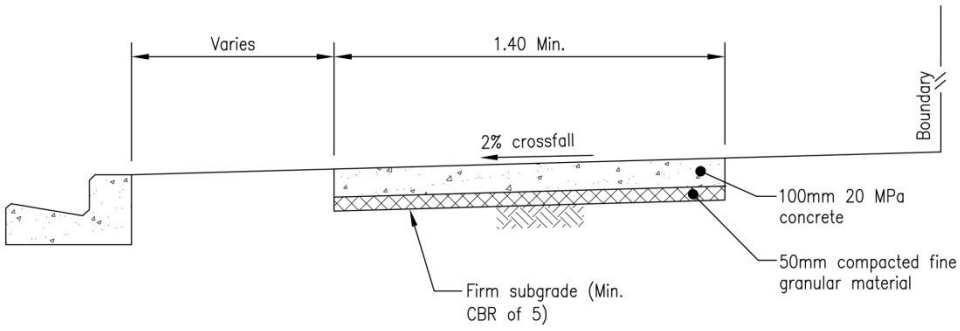
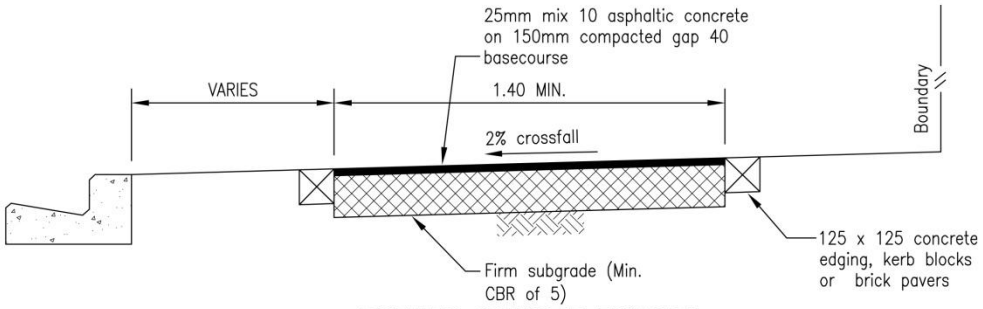
Sheet 12 Footpath and Stormwater Kerb Connection Details

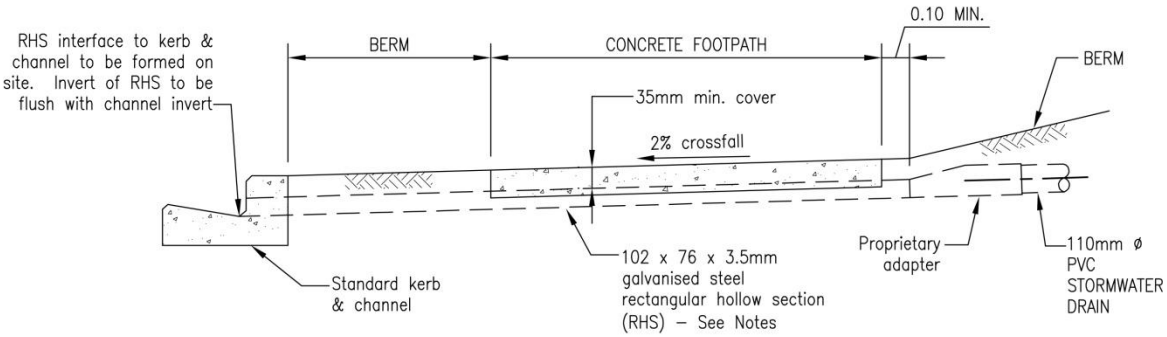


CONCRETE FOOTPATH
1:25 (A4)



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, 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)



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.
4. Acceptable alternatives to galv. steel RHS are:
   (a) 100mm dia. uPVC with concrete surround or
   (b) 100mm dia. galv. steel
   both with an approved type connection to the channel

FOOTPATH & STORMWATER KERB CONNECTION DETAILS	Date: APRIL 2010
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WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: AS SHOWN
	SHEET No. 12

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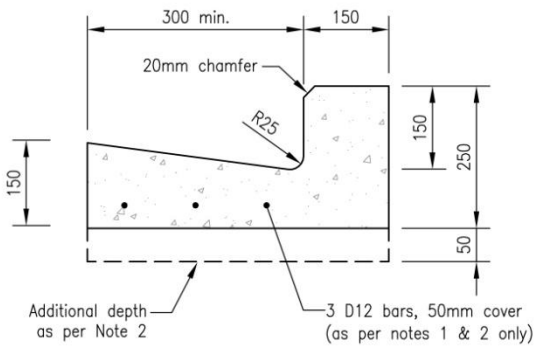
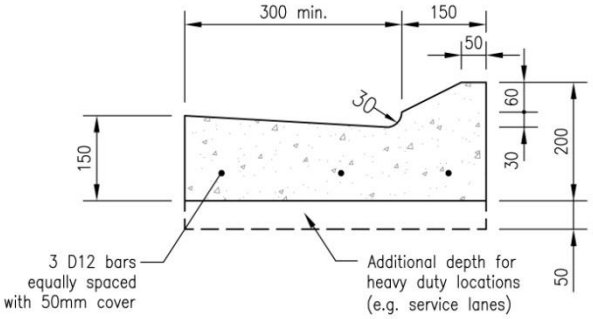
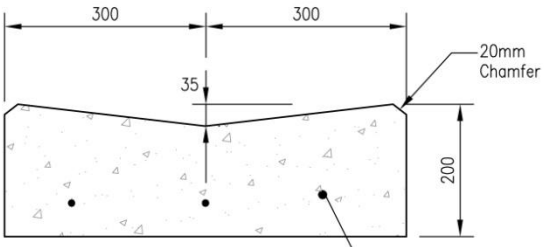
Sheet 13 Kerb and Channel Details



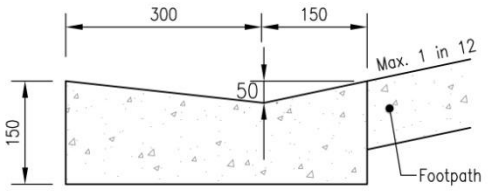
STANDARD KERB AND CHANNEL



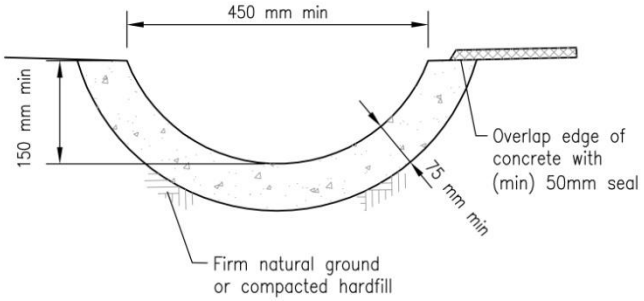
MOUNTABLE KERB AND CHANNEL



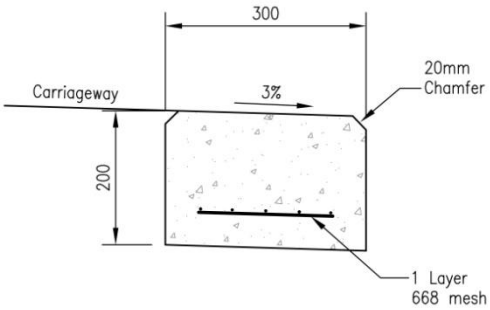
DISHED CHANNEL



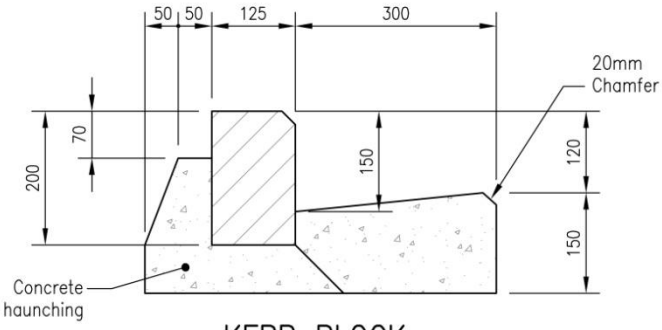
PRAM CROSSING



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 Dished Channel, Pram Crossing, Standard Kerb and Channel and Mountable Kerb and Channel shall be 30MPa at 28 days.
4. Concrete for Concrete Lined Channel – Rural shall be 25MPa at 28 days.
5. Crack control joints to be formed at maximum of 3.5 metre intervals. To be a minimum depth of 30mm.
6. Profiles may be modified slightly to suit kerbing machine.
7. Mountable kerbs are only to be used for service lanes, traffic islands and similar.
8. Use of kerb blocks subject to specific approval. Haunching to be 20 MPa at 28 days.

KERB & CHANNEL DETAILS
FOR ALL ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	APRIL 2010
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SHEET No.	13

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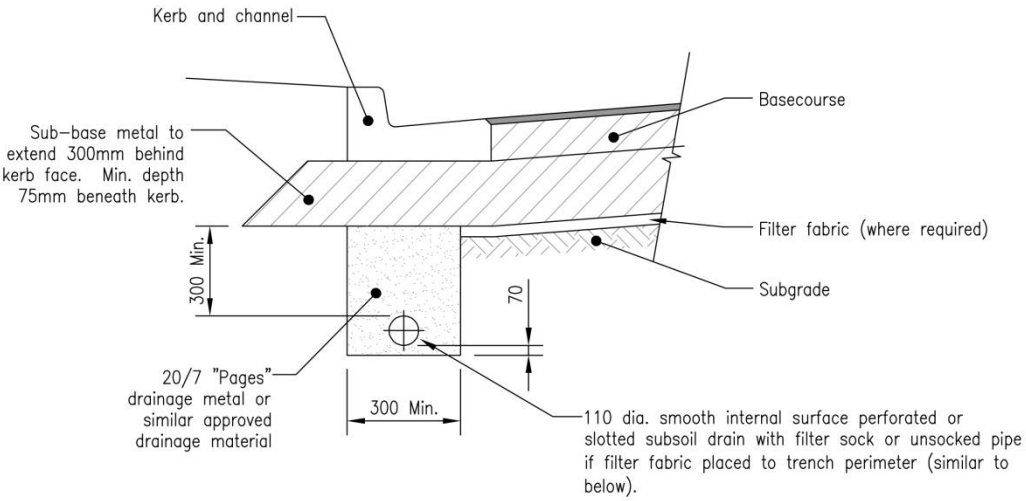
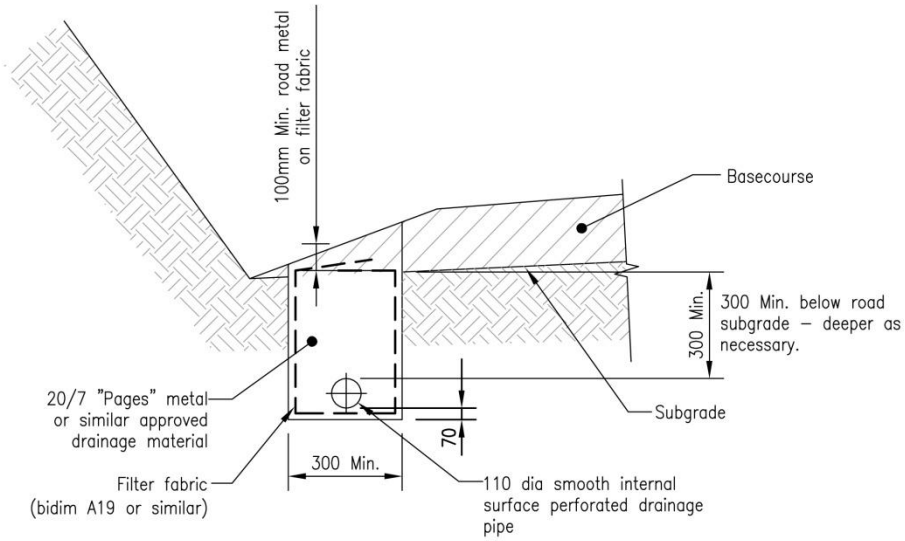
Sheet 14 Typical Subsoil Drainage Details



UNDER KERB DRAINAGE



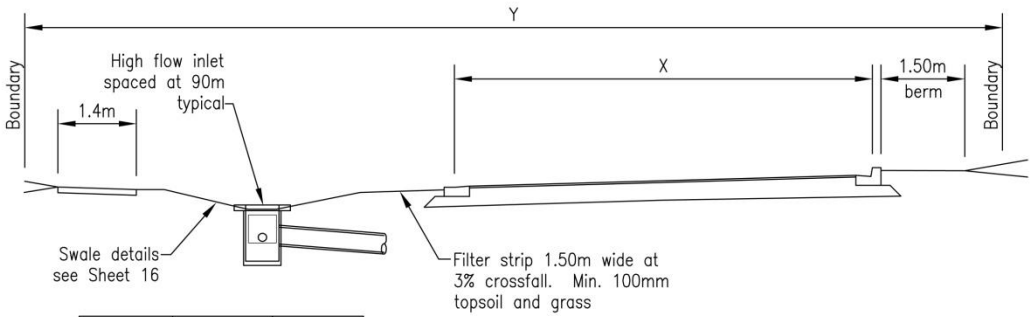
RURAL SUBSOIL DRAINAGE

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 3.4.15.4
4. Subsoil drains in clays to be PAP 7 or BMF (blue metal fines)

TYPICAL SUBSOIL DRAINAGE DETAILS	Date: APRIL 2010
	Revision: R0
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: AS SHOWN
	SHEET No. 14

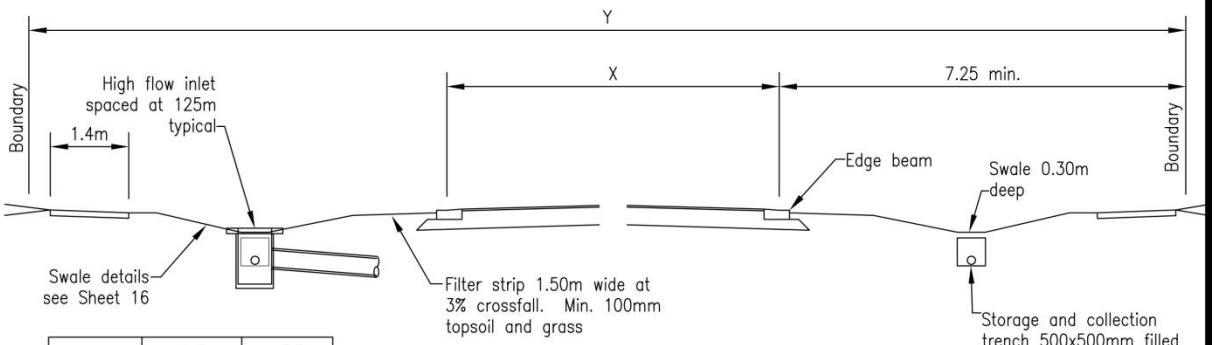
WDC 8036

Sheet 15 Standard Road Swale Details



Class	X(m)	Y(m)
A	7.5	18.0
B	8.5	20.5

UNIFORM CROSSFALL



Class	X(m)	Y(m)
A	7.5	22.0
B	8.5	23.0
C	11.0	25.5
D	14.0	28.5
E	15.0	29.5

STANDARD CROSSFALL

NOTES:
1. Refer to Table 3.1 for Road Classes.
2. Road reserve widths (Y) are typical minimum required.
3. Storage and collection trenches subject to specific design and approval.
4. Refer to Sheet 16 for further detail.

STANDARD ROAD SWALE DETAILS
FOR LIVING 1 & 2 AND ALL BUSINESS ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	APRIL 2010
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SHEET No.	15

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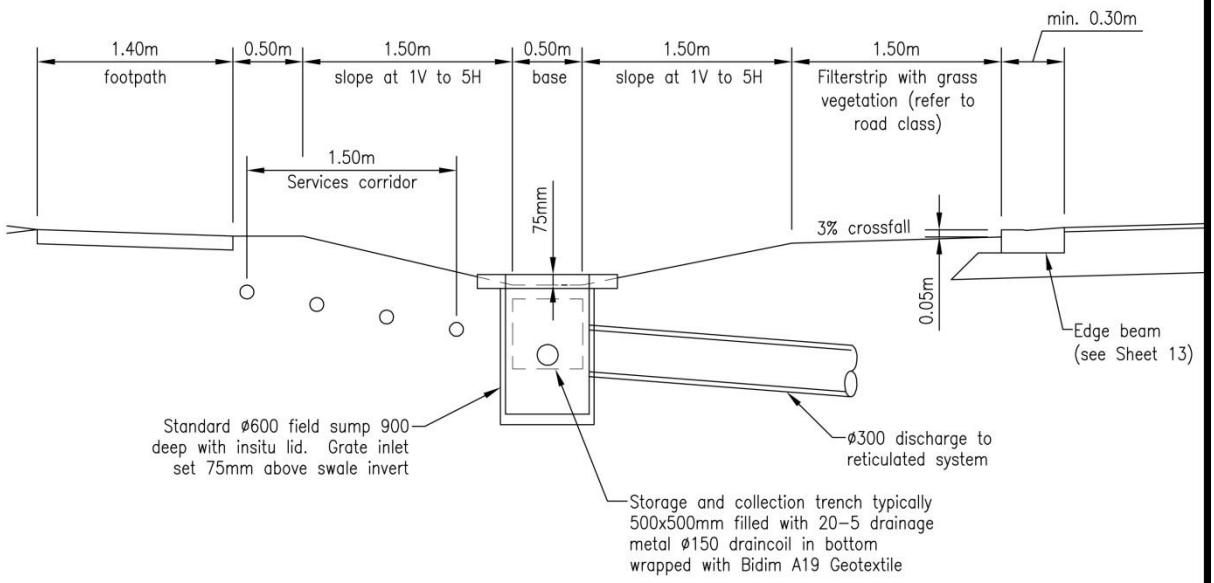
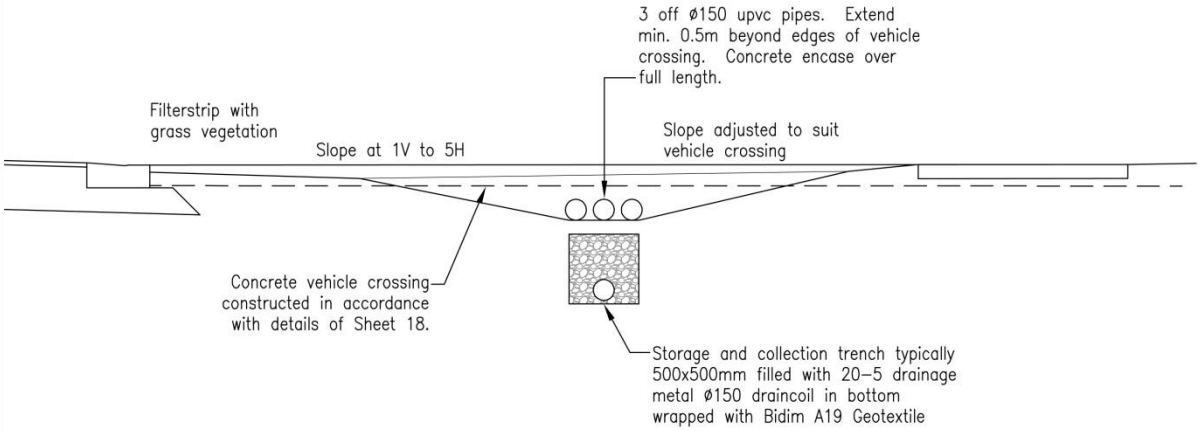
Sheet 16 Standard Road Swale Details (Cont)



SWALE DRAINAGE OUTLET DETAIL



SWALE VEHICLE CROSSING DETAIL

NOTE:
Refer to Sheet 15 for further detail.

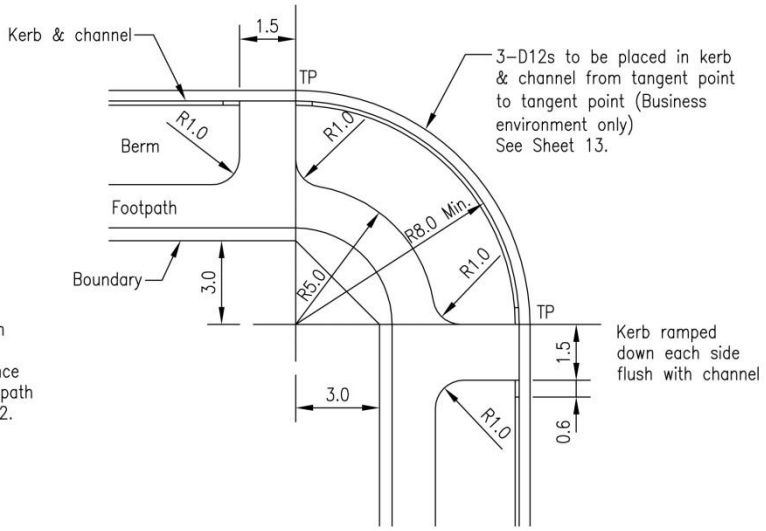
STANDARD ROAD SWALE DETAILS FOR LIVING 1 & 2 AND ALL BUSINESS ENVIRONMENTS	Date: APRIL 2010 Revision: R0
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: NTS SHEET No. 16

WDC 8036

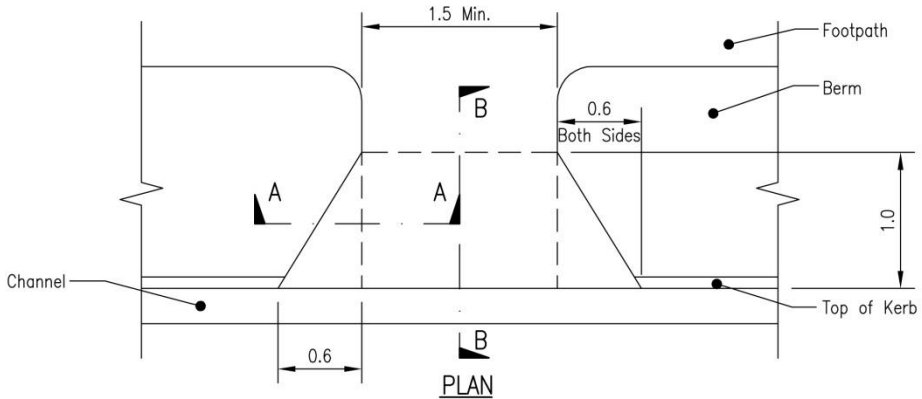
Sheet 17 Accessible Crossing Details

NOTES:

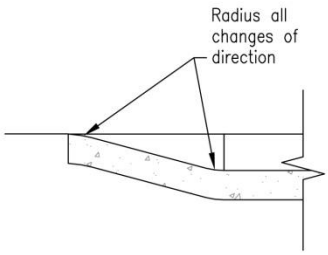
1. Maximum grade is 1 in 12
2. Edge of crossing to be finished flush with existing channel.
3. Crossing shall be constructed in accordance with the requirements for a concrete footpath unless otherwise approved – see Sheet 12.



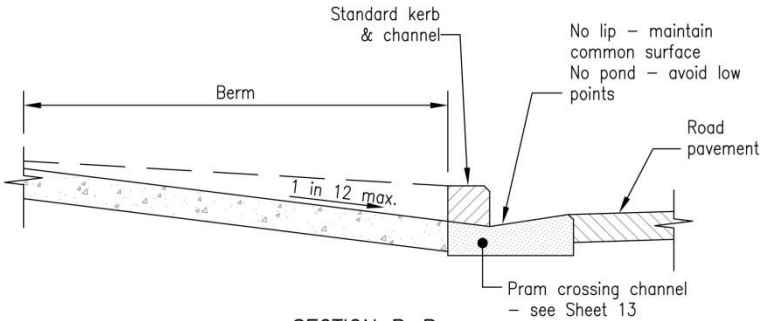
CROSS ROADS OR TEE INTERSECTION



PLAN



HALF SECTION A–A



SECTION B–B
1:25 (A4)

ACCESSIBLE CROSSING DETAILS (FOE ENVIRONMENTS LIVING 1 AND 2, AND BUSINESS 1–4)	Date: APRIL 2010
	Revision: R0
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: AS SHOWN
	SHEET No. 17

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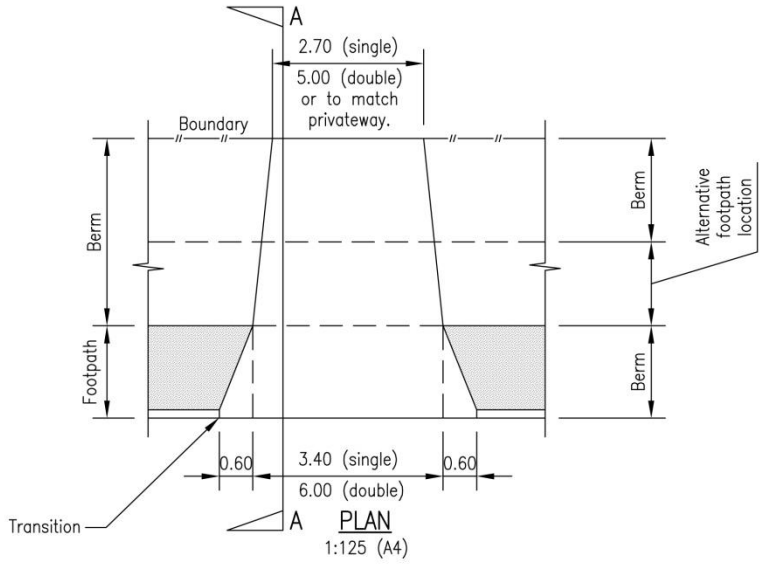
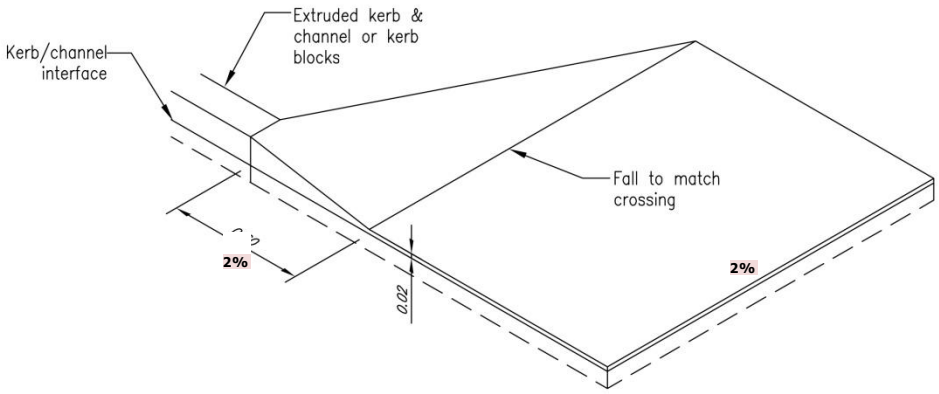
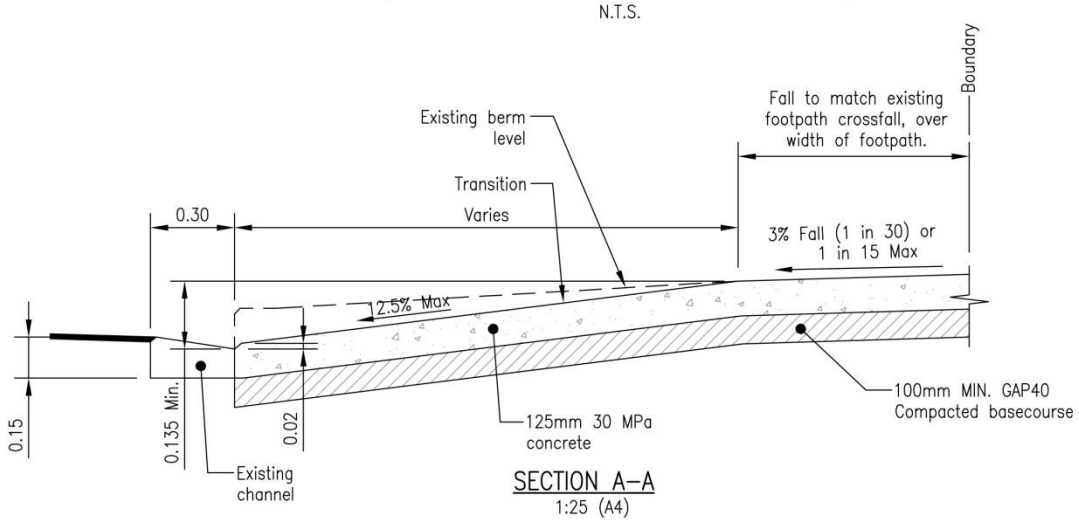
Sheet 18 Vehicle Crossing - Residential





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

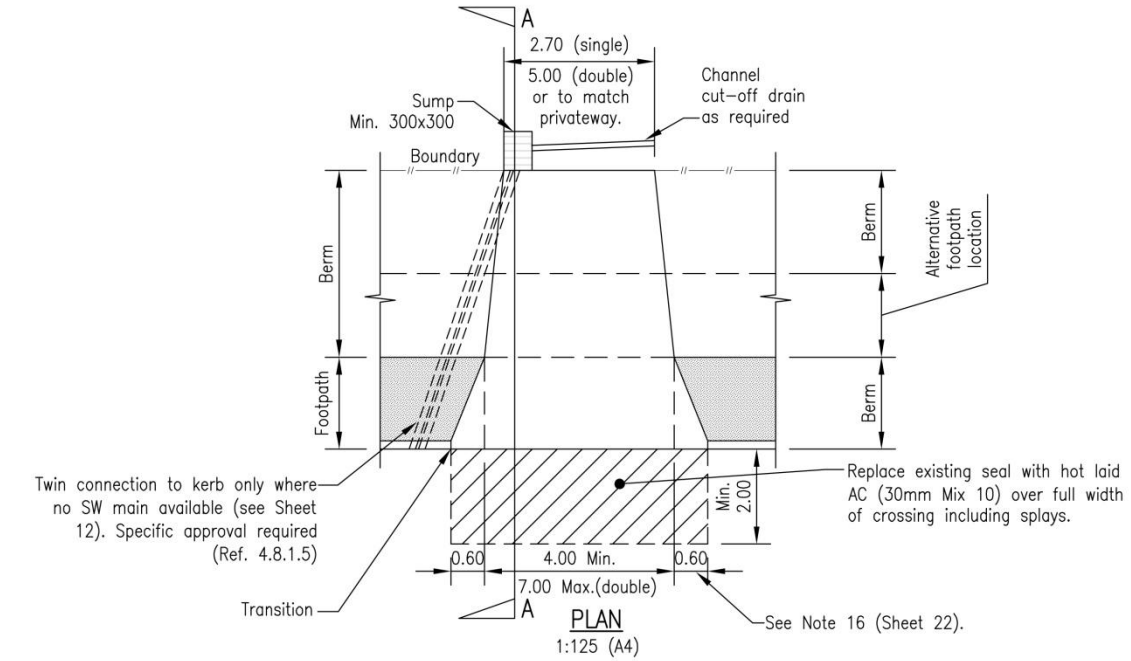


For further notes refer to Sheet 22

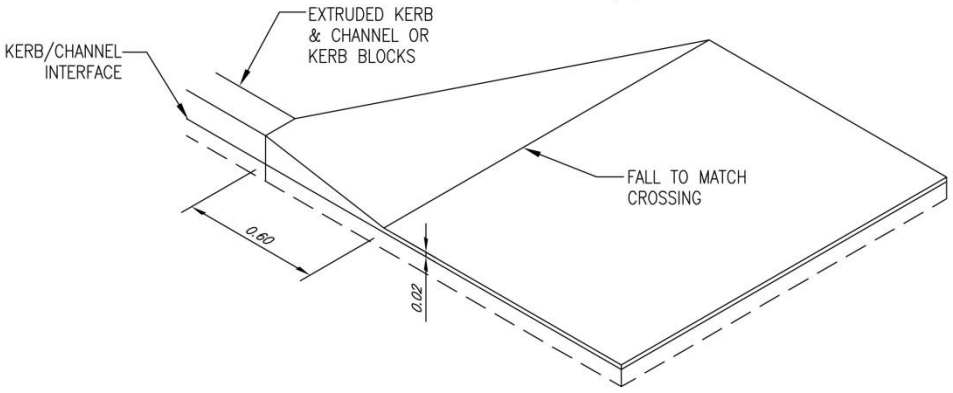
VEHICLE CROSSING – RESIDENTIAL	Date: APRIL 2010
	Revision: R0
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: AS SHOWN
	SHEET No. 18

WDC 8036

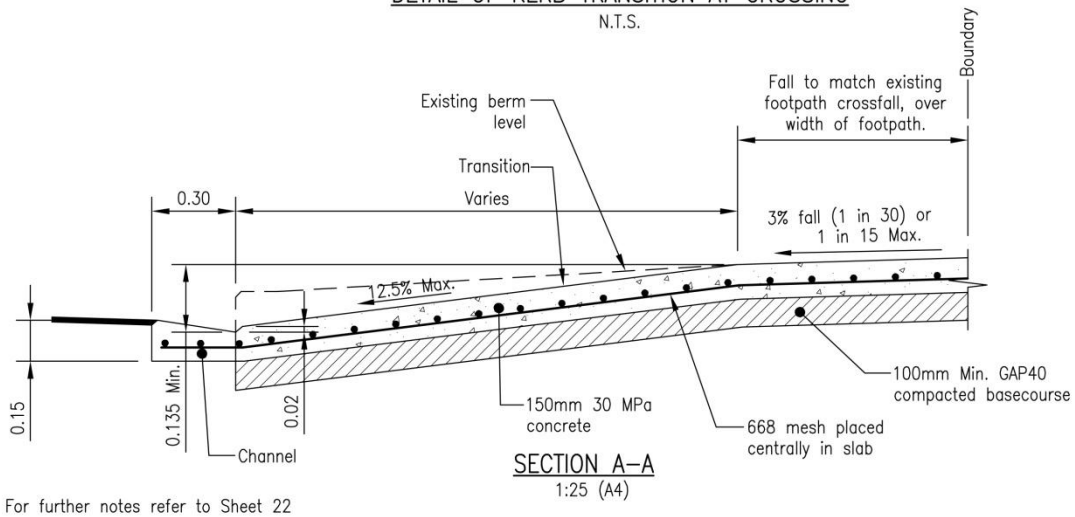
Sheet 19 Vehicle Crossing – Commercial/Industrial



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	Date: APRIL 2010
	Revision: R0
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: AS SHOWN
	SHEET No. 19

WDC 8036