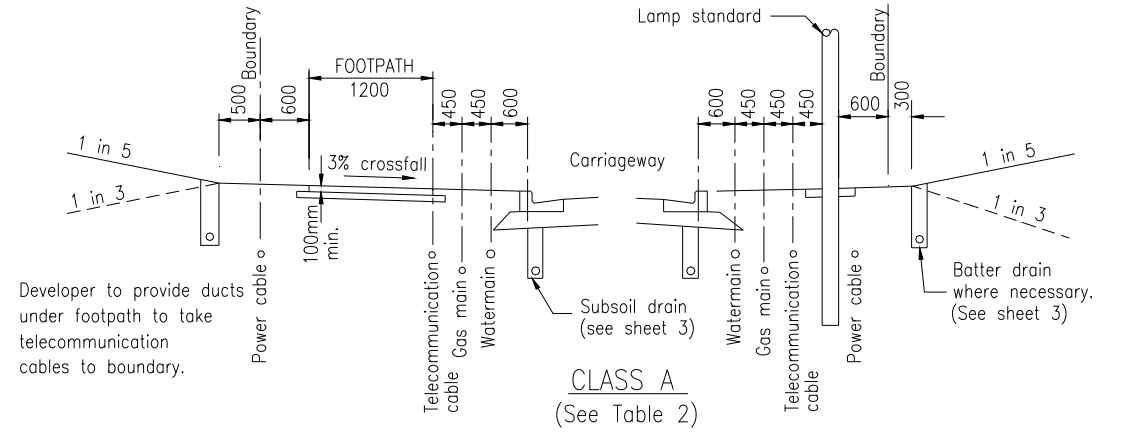
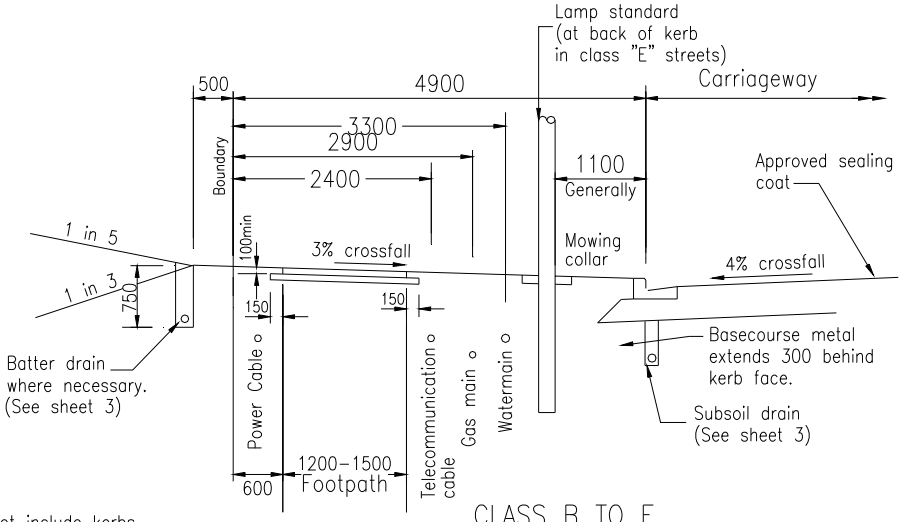


CLASS A
(See Table 2)

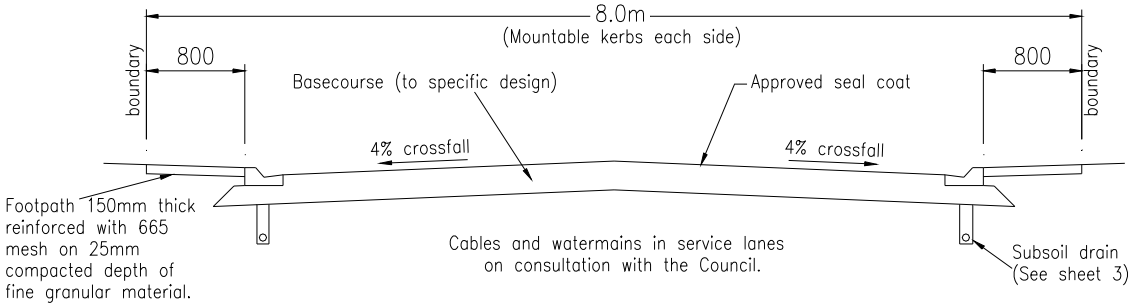


(See table 2)

CLASS B TO E
(See Table 2)

NOTES

1. Footpath widths do not include kerbs.
2. Footpaths shall be not less than 100mm thick 17.5MPa ordinary grade concrete at 28 days with construction joints at 3.5m crs.
3. 25mm depth of fine granular material under footpaths. Soft areas to be dug out & replaced with compacted metal fill.



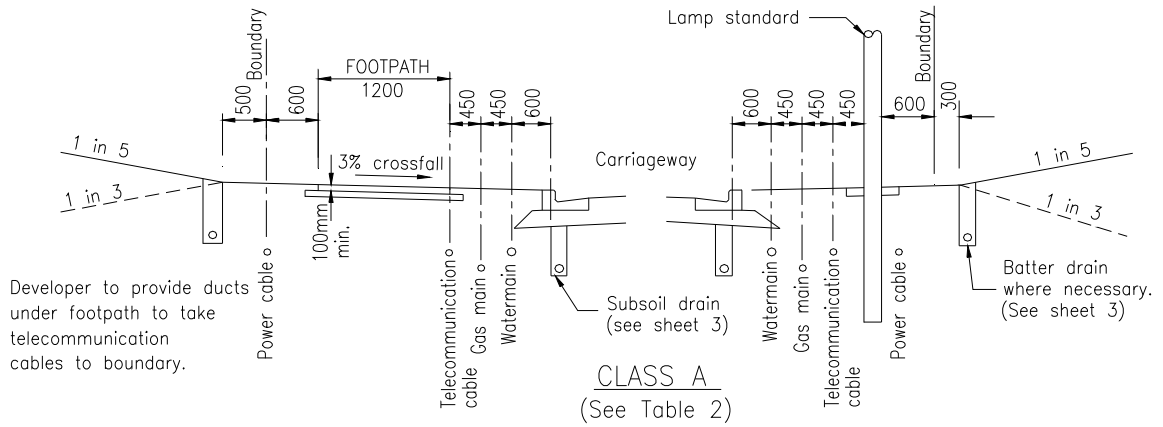
SERVICE LANES (Class F)
–see table 2

ROAD CROSS SECTIONS FOR ENVIRONMENTS LIVING 1 AND 2, AND BUSINESS 1–5

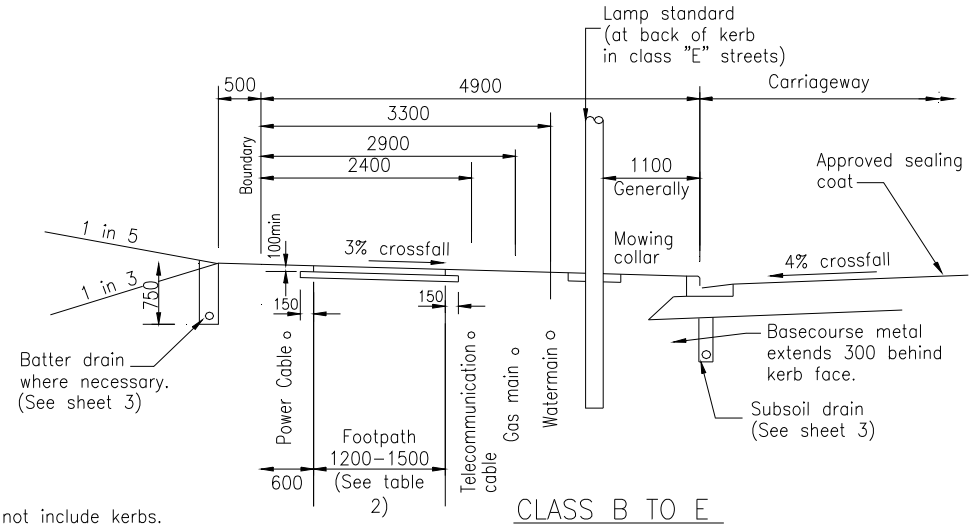
WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
Revision:	
SHEET No.	1

WDC 8036



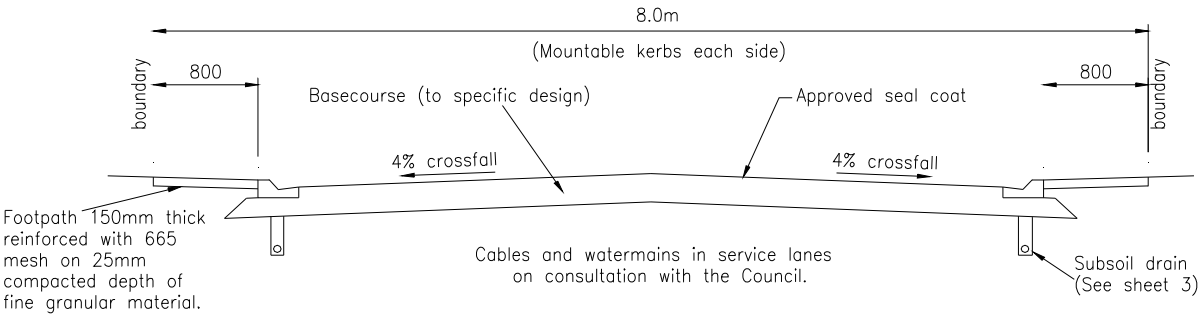
CLASS A
(See Table 2)



CLASS B TO E
(See Table 2)

NOTES

1. Footpath widths do not include kerbs.
2. Footpaths shall be not less than 100mm thick 17.5MPa ordinary grade concrete at 28 days with construction joints at 3.5m crs.
3. 25mm depth of fine granular material under footpaths. Soft areas to be dug out & replaced with compacted metal fill.



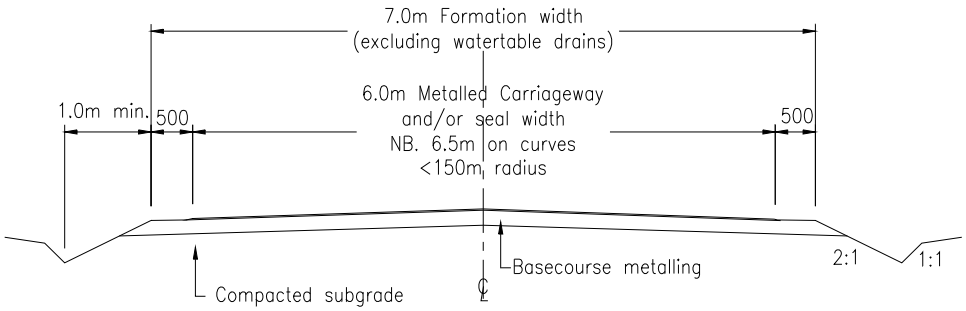
SERVICE LANES (Class F)
–see table 2

ROAD CROSSING CROSS SECTIONS FOR ENVIRONMENTS LIVING 1 AND 2, AND BUSINESS 1–5

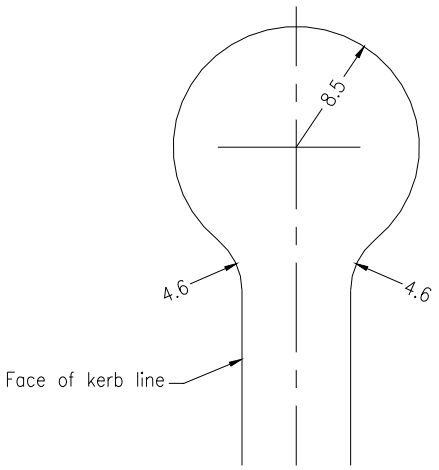
WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
Revision:	
SHEET No.	1-1

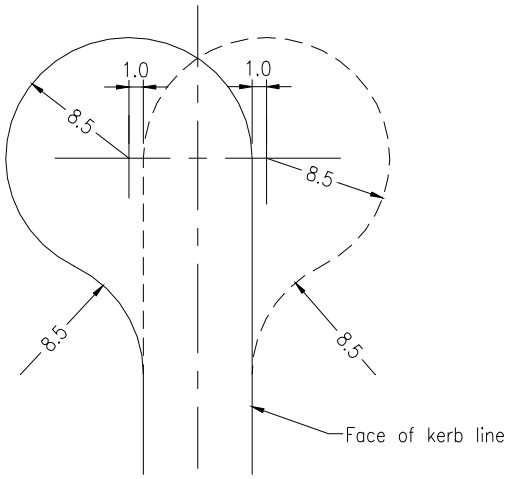
WDC 8036



TYPICAL MINIMUM RURAL ROADING
CROSS SECTION N.T.S.



CIRCULAR TURNING AREA
FOR CUL–DE–SAC



OFFSET CIRCULAR TURNING AREA
FOR CUL–DE–SAC

NOTE:

(1) The turning area dimensions shown are absolute minima.

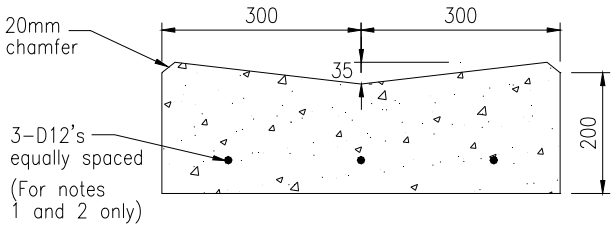
(2) Industrial or commercial areas the radius of cul–de–sac turning areas shall be 13 metres minimum

(3) Alternative turning areas (including parking and planting) will be subject to specific design.

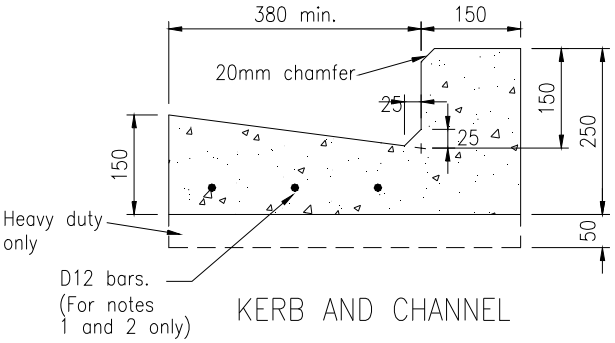
CUL DE SAC TURNING & RURAL ROAD CROSS SECTION

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
Revision:	
SHEET No.	2



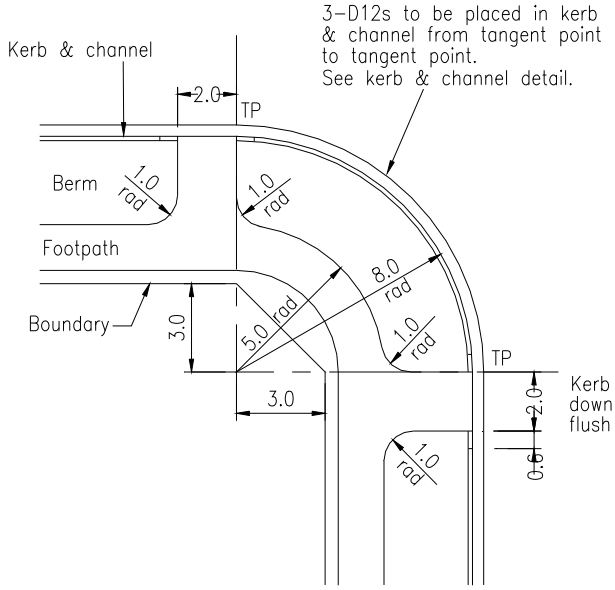
DISHED CHANNEL



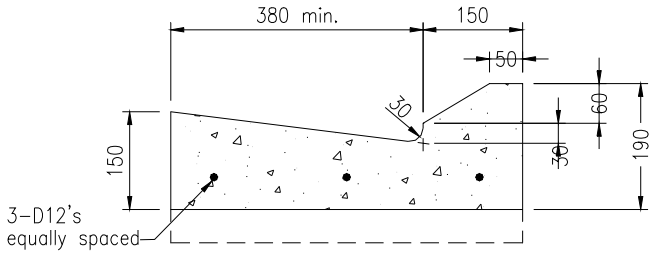
KERB AND CHANNEL

NOTES –

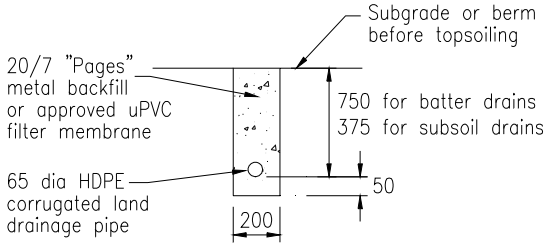
1. 3/D12 reinforcing bars to be placed around all curves, and intersections between tangent points.
2. Commercial crossings to be additional 50mm in depth as well as having 3–D12's equally spaced in the channel.
3. Concrete to be Ordinary Grade 17.5 MPa (cast insitu) & 25 MPa (slip formed) at 28 days.
4. Crack control joints to be formed at maximum of 3.5 metre intervals.
5. Profiles may be modified slightly to suit kerbing machine.
6. 300mm channels can be used for privateways and carparks.
7. Mountable kerbs are only to be used for service lanes, traffic islands and similar.



CROSS ROADS OR TEE INTERSECTION



MOUNTABLE KERB AND CHANNEL



SUBSOIL & BATTER
DRAIN DETAIL
(For all Environments)

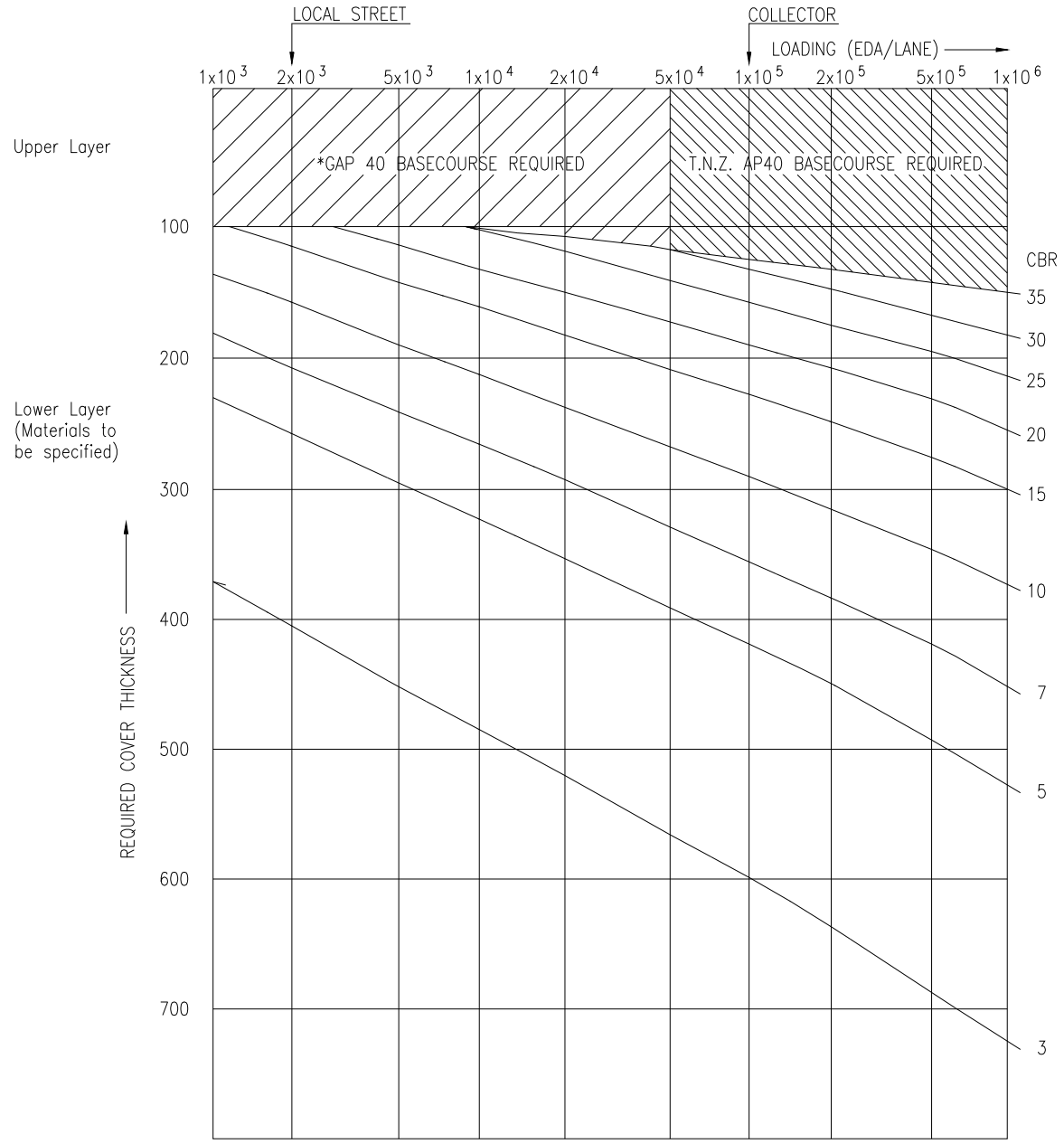
FOR ENVIRONMENTS LIVING 1 AND 2, AND BUSINESS 1–5

KERB & CHANNEL, PRAM CROSSING, SUBSIOL & BATTER DRAIN DETAILS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
Revision:	
SHEET No.	3

WDC 8036



NOTES:

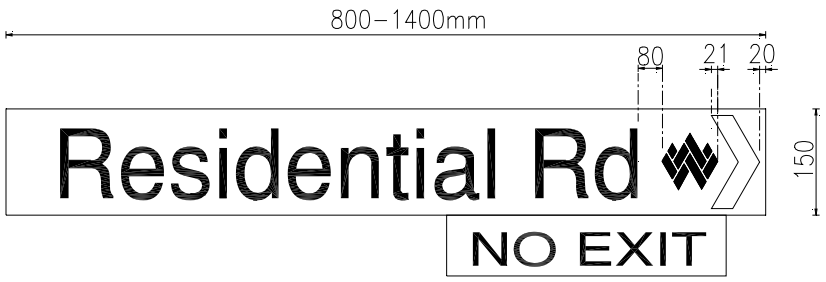
1. Principal, arterial and industrial streets shall be the subject of specific design based upon an estimate of their E.D.A. (Equivalent Design Axle) loading.
2. The curves give minimum cover requirements above the subgrade and greater depths of higher quality materials may be necessary.
3. The minimum pavement depth for streets shall be 200mm.
4. Scala penetrometer testing is required to confirm designed aggregate depths.
5. Maximum stone size 40mm. 90% passing 37.5mm sieve, 61–85% passing 19mm sieve, 12–25% passing 1.18mm sieve. A crushing resistance greater than 120 KN when tested in accordance with NZS 4407 Test 3.10. The clay index shall be <3 when tested in accordance with NZS 4407 Test 3.5 or the material shall have a sand equivalent of not less than 40.
6. Lime or cement stabilised subgrade and/or basecourse is acceptable subject to design by a suitably experienced Registered Engineer.

DESIGN CHART FOR FLEXIBLE PAVEMENTS

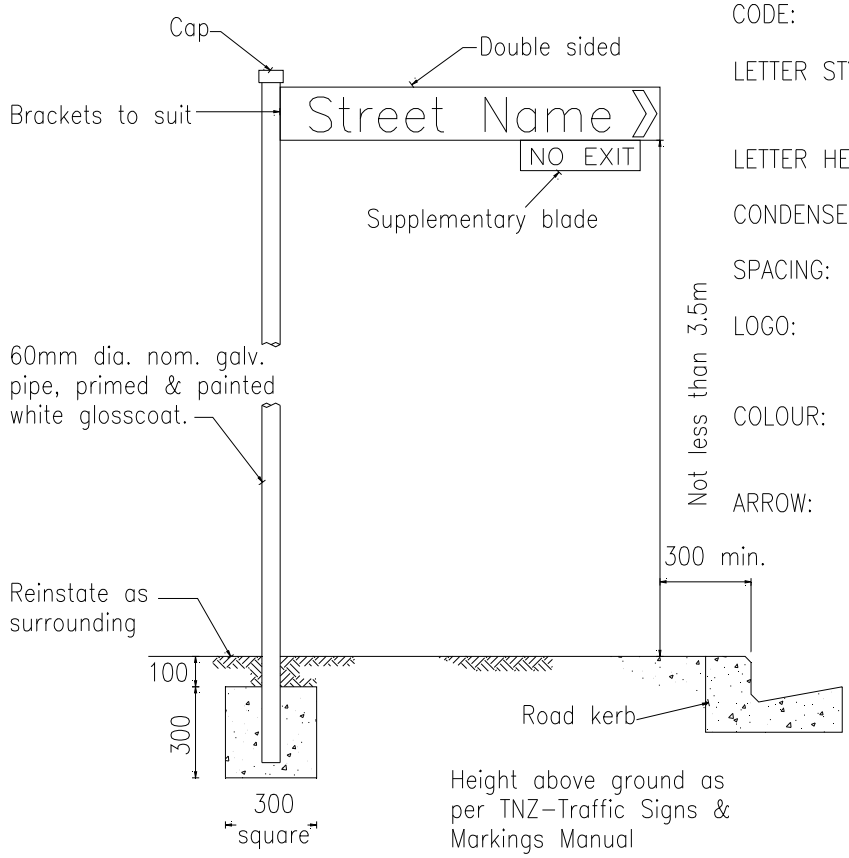
FOR ALL ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
Revision:	
SHEET No.	4



BLADE SIZE:	150mm/200mm/250mm
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:	E.C. Film Blue on High Intensity White
ARROW:	120° 150mm blade –40mm wide 200mm blade –45mm wide 250mm blade –50mm wide



1. Rights of way, access lots, common areas, and private roads do not require names. Where a name is preferred for any such accessway, the applicant shall submit 3 (three) names in order of priority for council approval.

2. When a road is to be vested in the Council the applicant shall submit 3 (three) preferred names in order of priority for council approval.

3. The applicant is responsible for installation of necessary signage and road marking in accordance with the Transit New Zealand Manual of Traffic Signs and Markings for any access vested as road to be maintained by the Council.

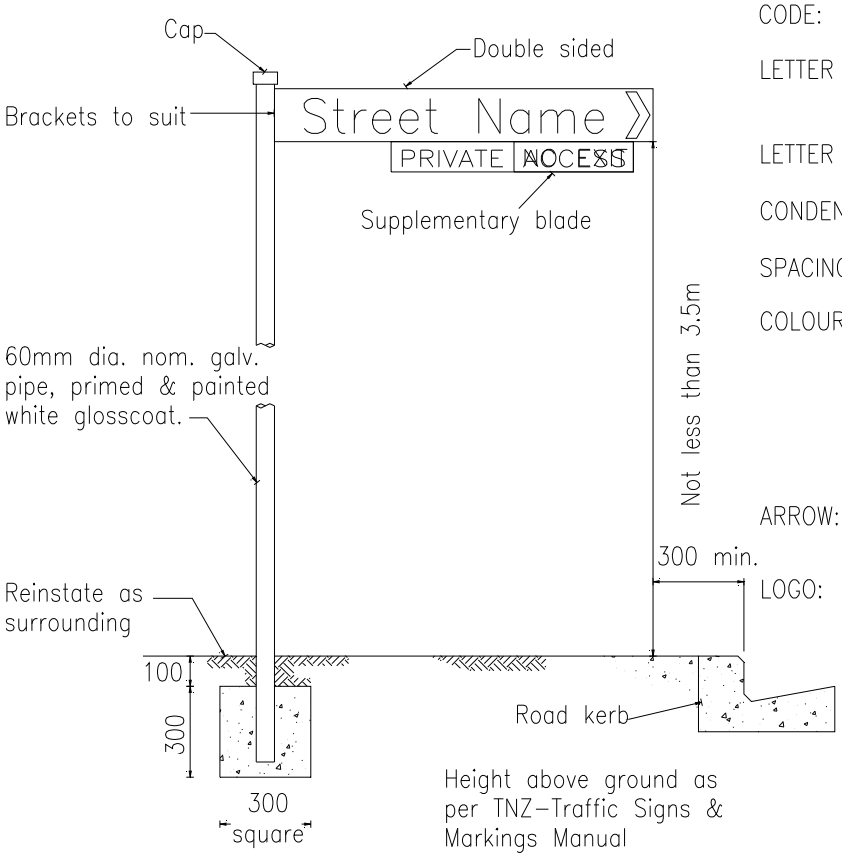
STREET SIGNS, PRIVATE ROW, ACCESS LOT, COMMON AREA OR PRIVATE ROAD

FOR ALL ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
Revision:	
SHEET No.	5

BLADE SIZE:	150mm/200mm
BLADE TYPE:	"I" Section Aluminium Extrusion
CODE:	SNB 150mm/200mm
LETTER STYLE:	Transport–Upper & lower case
LETTER HEIGHT:	100mm/150mm
CONDENSED:	To Suit
SPACING:	To Suit
COLOUR:	Engineering Grade Reflective Material with Blue Letters on a white background (Screen printed or electronically cut letters)
ARROW:	120° 40mm wide
LOGO:	NO LOGO



1. Rights of way, access lots, common areas, and private roads do not require names. Where a name is preferred for any such accessway, the applicant shall submit 3 (three) names in order of priority for Council approval.

2. When a road is to be vested in the Council the applicant shall submit 3 (three) preferred names in order of priority for Council approval.

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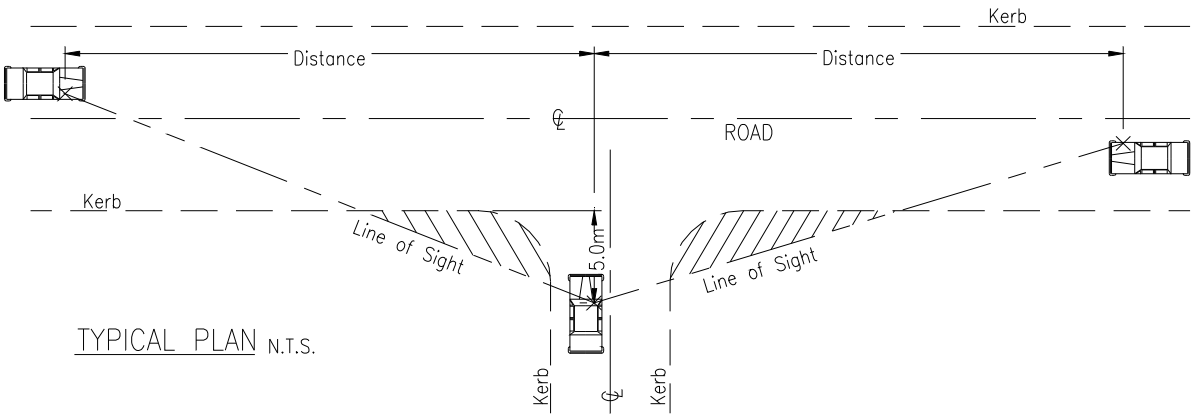
STREET SIGNS, PRIVATE ROW, ACCESS LOT, COMMON AREA OR PRIVATE ROAD

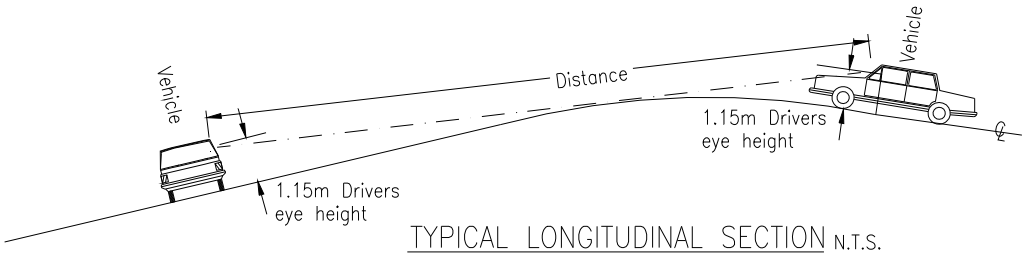
FOR ALL ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
Revision:	
SHEET No.	6



TYPICAL PLAN N.T.S.



TYPICAL LONGITUDINAL SECTION N.T.S.

		Minimum Sight Distance		
		Frontage Road Classification		
Vehicle Crossing Classification	Operating Speed Environment (Km/hr)	Local	Collector	Arterial
LOW VOLUME Up to 200 vehicle movements per day per access	40	30	35	70
	50	40	45	90
	60	55	65	115
	70	85	85	140
	80	105	105	175
	90	130	130	210
	100	160	160	250
	110	190	190	290
	120	230	230	330
HIGH VOLUME More than 200 vehicle movements per day per access	40	30	70	70
	50	40	90	90
	60	55	115	115
	70	85	140	140
	80	105	175	175
	90	130	210	210
	100	160	250	250
	110	190	290	290
	120	230	330	330

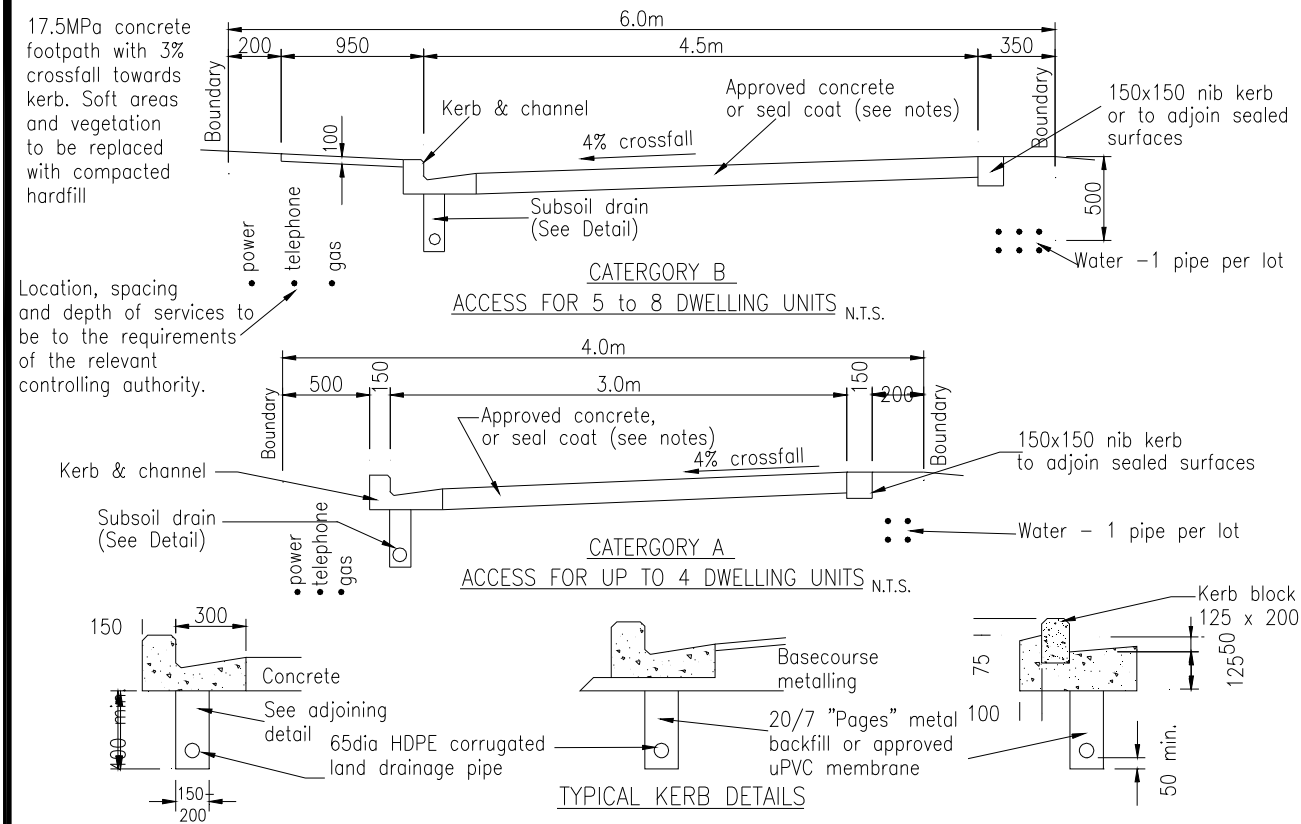
MOTES:
1. Full visibility is required 1.15 metres above the visibility splay areas

2. One way roads and dual carriageways only require visibility in the direction of approaching traffic.

TRAFFIC SIGHT LINES AT NON SIGNALISED INTERSECTIONS FOR ALL ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date: SEPT 1998
Revision:
SHEET No. 7



NOTES:

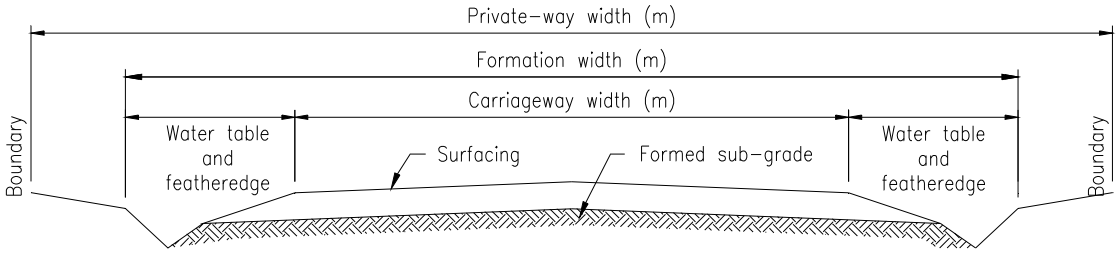
1. THE ABOVE STANDARDS ARE THE MINIMUM and wider widths and/or alternative surface types may be necessary to cope with TOPOGRAPHICAL OR DRAINAGE PROBLEMS.
2. a) Accessways are to be 125mm min. of 17.5 MPa concrete reinforced with 665 mesh or equivalent with expansion joints @ 3.5m centres.
   OR b) Compacted pavement depths shall be determined using the Design Chart for Flexible Pavements specified on sheet 4.
   OR c) 150mm GAP 65 basecourse and 50mm selected blue GAP40 topcourse, or approved equivalent.
   OR d) A specific design from a suitably experienced Registered Engineer, which may include lime or cement stabilisation.
3. The min. pavement subgrade soaked CBR rating to be 7 (Scala penetrometer–Min.No. of blows to 150 below subgrade=5)
4. Compaction prior to sealing the dried and cured metal surface shall have a Clegg impact value of 40 for 90% of the surface tested at 20m intervals, and not record any value less than 30.
5. Where an access falls towards a road a stormwater cesspit is to be installed at the property boundary with a 100mm dia. pipeline (or multiple) discharging to the kerb, or other approved outfall. (Refer sheet 10)
6. STORMWATER PIPES are to comply with the relevant NZ Standard and manufactures requirements and be rubber ring jointed where practicable. Outfall structures, concrete or stonework headwalls and aprons, and wooden flume outfalls, or similar, are to be installed where stability or scour problems are likely.
   Pipes are to be adequate for the immediate upstream catchments and be not less than 200mm dia.
   (NB Concrete, aluminium, uPVC, & galvanised steel pipes are acceptable). Refer to sheet 23.
7. Piped vehicle crossings are to comply with Sheet 11. Concrete vehicle crossings are to comply with sheet 10.
8. Passing bays are to be constructed where appropriate.
9. Seal surfacing for private ways shall consist of a grade 3 sealing chip, with a grade 6 dry locking chip rolled in within 5 hours of the application of the grade 3 chip.
   Alternatively, 25mm of asphaltic concrete over a seal coat is preferred where substantial vehicle manoeuvring is likely.
10. Privateways to be maintained by the Council shall be surfaced with concrete or asphaltic concrete, unless specifically approved.
11. Maximum gradient 1:4.5 (Gradients steeper than 1:8 shall comply with 2(a) above.)
12. Proposals exceeding 8 dwelling units require public road access or Resource Consent approval.
13. No inside curve radius shall be less than 8.0m

URBAN PRIVATEWAY CROSS SECTIONS

FOR ENVIRONMENTS LIVING 1 AND 2, AND BUSINESS 1–5
Open space Environments adopt standards applying to the surrounding Environment, or if there is more than one Environment contguous to the site, then more stringent standard applies. Refer to Sheet 9.

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
Revision:	
SHEET No.	8

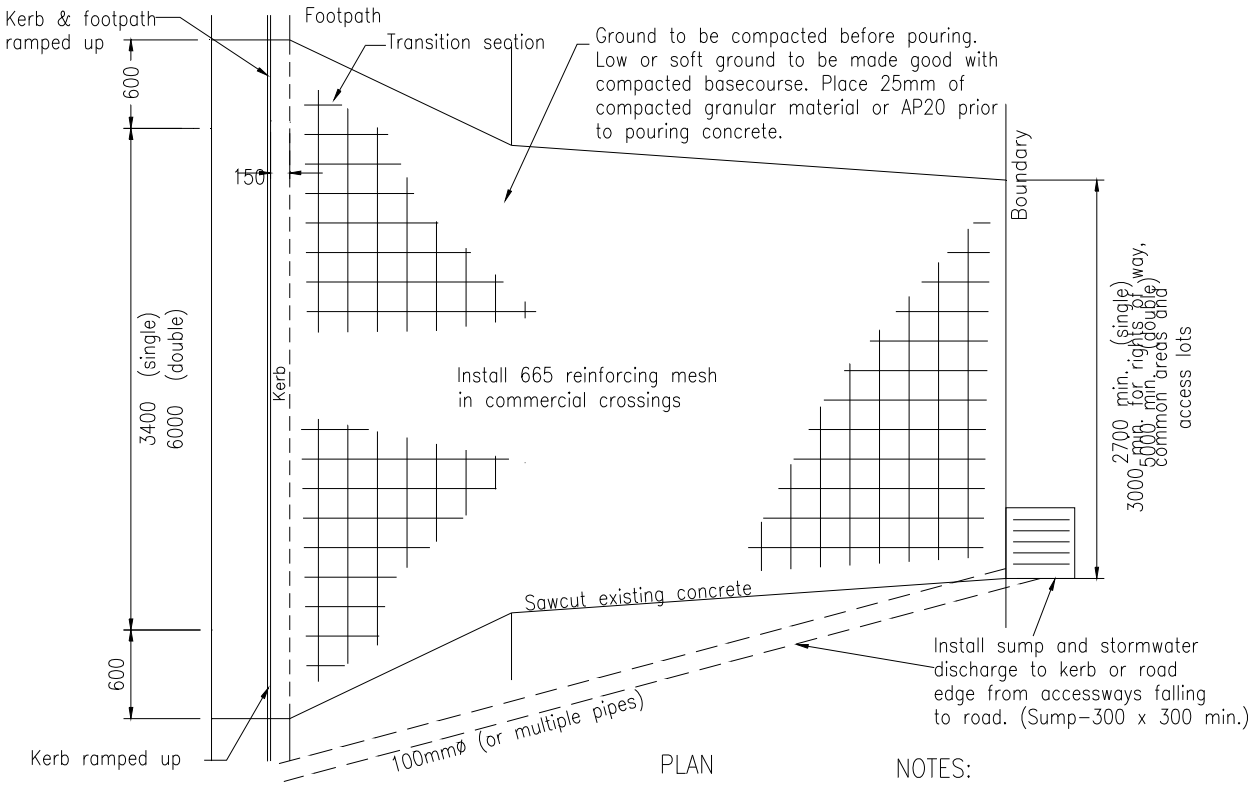


DEFINITIONS	PRIVATEWAYS					
CATEGORY	A	B	C	D	E	F
No of prop served	2	2	3-5	3-5	6-8	9 or more
Environment of property	Living 3	Countryside	Living 3	Countryside	All types shown	Public road or as per Resource Consent
Maximum Gradient	22.22% 1:4.5	22.22% 1:4.5	22.22% 1:4.5	22.22% 1:4.5	22.22% 1:4.5	
Carriageway surfacing width	3	3	4	4	5.5	
Formation width	4	4	5	5	7	
Min Privateway width	4	4	6	6	10	
Type of surfacing	Seal or concrete 3m wide	Metal 3m wide	Seal or concrete 4m wide	Metal 4m wide	Seal 5.5m wide	

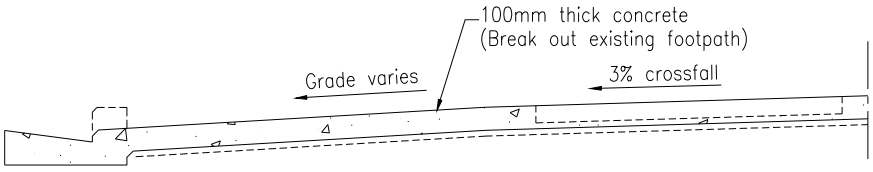
NOTES:
1. THE ABOVE STANDARDS ARE THE MINIMUM and wider widths and/or alternative surface types may be necessary to cope with TOPOGRAPHICAL OR DRAINAGE PROBLEMS.
2. Compacted pavement depths shall be determined using the Design Chart for Flexible Pavements specified on sheet 4. or 150mm GAP 65 basecourse and 50mm selected blue GAP40 topcourse, or approved equivalent.
   OR A specific design from a suitably experienced Registered Engineer, which may include lime or cement stabilisation.
3. For pavement depths in 2, minimum subgrade soaked CBR rating to be 7 (Scala penetrometer-Minimum No. of blows to 150 below subgrade=5).
4. Compaction prior to sealing the dried and cured metal surface shall have a Clegg impact value of 40 for 90% of the surface tested at 20m intervals, and not record any value less than 30.
5. Sealed pavements may be replaced by 125mm of 17.5 MPa concrete reinforced with 665 mesh or equivalent.
6. OPEN WATER-TABLES are to be lined with not less than 75mm thick of 17.5MPa concrete on steep gradients where scouring/or erosion is likely. Velocity control may be necessary.
7. STORMWATER PIPES are to comply with the relevant NZ Standard and manufactures requirements and be rubber ring jointed where practicable. Concrete or stonework headwall and aprons, and wooden flume outfalls, or similar, are to be installed where stability or scour problems are likely.
   Pipes are to be adequate for the immediate upstream catchments and be not less than 200mm dia.
   (NB Concrete, aluminium, uPVC, & galvanised steel pipes are acceptable). Refer to sheet 23.
8. Piped vehicle crossings are to comply with Sheet 11.
9. Passing bays are to be constructed where appropriate for privateways within categories A-D.
10. Seal surfacing for private ways shall consist of a grade 3 sealing chip, with a grade 6 locking chip rolled in within 5 hours of the application of the grade 3 chip.
    Alternatively, 25mm of asphaltic concrete over a seal coat is acceptable.
11. All longitudinal gradients between 1:4.5 and 1:5.5 inclusive, are to have concrete or seal surfacing.

FOR ENVIRONMENTS LIVING 3, AND COUNTRYSIDE
Open space Environments: adopt standards applying in the surrounding Environment, or if there is more than one Environment contiguous to the site, then the more stringent standard applies. Refer to Sheet 8.

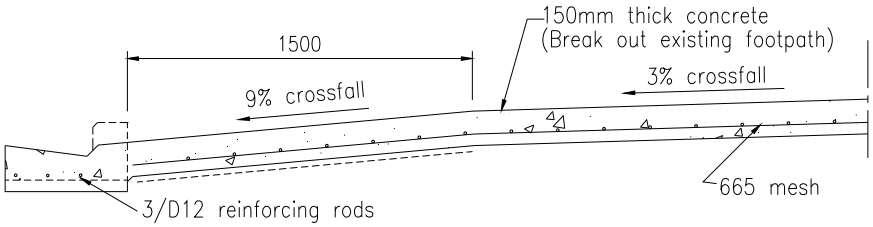
RURAL PRIVATEWAY DETAILS



PLAN



A. RESIDENTIAL (SECTION)

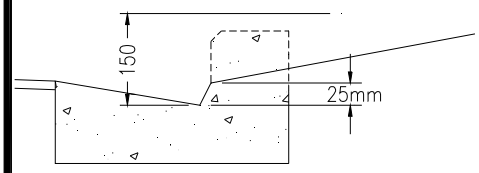


B. COMMERCIAL AND PRIVATE ACCESSWAYS (SECTION)

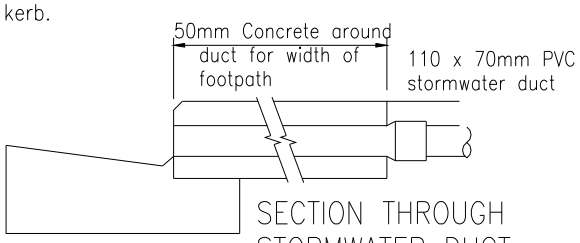
No crossing is to be constructed to a width greater than 6.0m at the boundary and 7.0m at the kerb.

NOTES:

1. If no footpath, allowance shall be made for such with a 3% crossfall to the kerb as part of any property vehicle access.
2. If the crossing is constructed at the time of subdivision, the channel is to be reinforced with 3-D12, and the crossing with 665 mesh. (See sheet 3)
3. Concrete to be ordinary grade 17.5MPa at 28 days.
4. Site distance requirements for entrance crossings are to comply with sheet 7.
5. All crossings require Council inspection prior to pouring concrete.



DETAIL AT BASE OF CROSSING



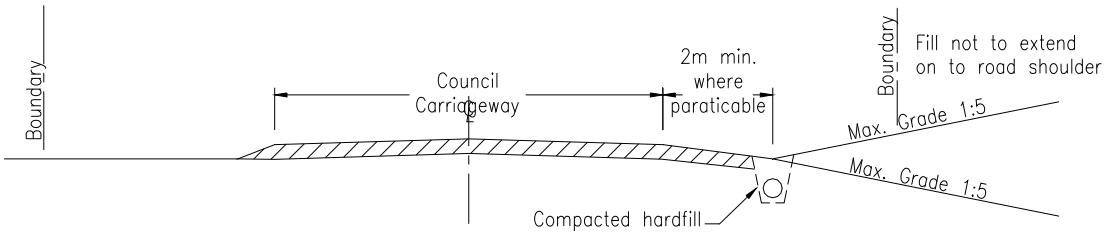
SECTION THROUGH STORMWATER DUCT AND KERB & CHANNEL

RESIDENTIAL AND COMMERCIAL VEHICLE CROSSINGS

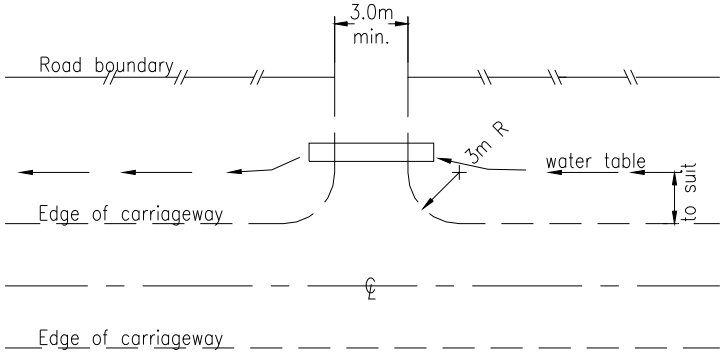
WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
Revision:	
SHEET No.	10

WDC 8036

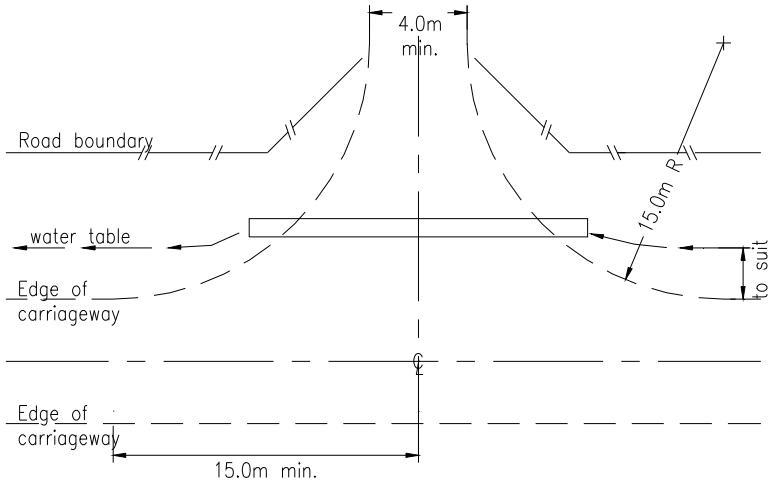


SECTIONAL PROFILE



PLAN – LIGHT VEHICLES

For All Environments – excluding heavy vehicle crossings. N.B. Living 1 and 2, and Business Environments to be sealed or concrete to boundary.



PLAN – HEAVY VEHICLE CROSSINGS

N.B. To be sealed or concrete if approved in Living and Business Environments, or specific discretionary approvals.

NOTES:

1. Pipes are to comply with the relevant N.Z. Standards and the manufacturers recommendations, and may be concrete, aluminium, or uPVC, or galvanised steel. N.B. Concrete and uPVC pipes are to be rubber ring jointed.
2. Pipes are to be adequate for the upstream catchment, but not less than 300mm dia., and have a minimum cover of 300mm where practicable unless specifically identified by the manufacturer.
3. Concrete or stonework headwalls and/or concrete aprons are to be constructed where instability is likely.
4. Crossings are to be surfaced with not less than 125mm compacted depth of GAP65 and 75mm of compacted selected blue GAP40, or 200mm of compacted selected blue GAP40, or equivalent.
5. Gateways shall be located to allow vehicle parking clear of the road shoulder.
6. Minimum sight distance requirements for entrance crossings are to comply sheet 7.
7. Check underground services with relevant authorities before excavation.
8. Crossings steeper than 12.5% (1 in 8) adjoining sealed public roads or any accessway where metal migrates onto the sealed carriageway are to be surfaced with not less than 25mm of adequately prepared asphaltic concrete, or, bitumen using a grade 3 sealing chip with a grade 6 sealing chip rolled in within 5 hours, or concrete, to the property boundary.
9. Any heavy duty entrance crossings requiring acceleration or deceleration tapers, or similar, will require specific design.
10. Concrete entrance crossings are to be 100mm of 17.5MPa concrete for Living 1 and 2 Environments. Business Environments and heavy vehicle crossings shall be 150mm thick reinforced with 665 mesh unless specifically designed.
11. Superfluous entrance crossings along the property road frontage are to be removed and the site reinstated similar to the immediate surrounding.

PIPED VEHICLE ENTRANCE CROSSING FOR ALL ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
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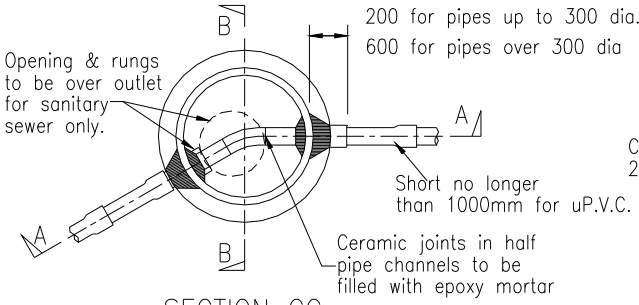
SHEET No.	11

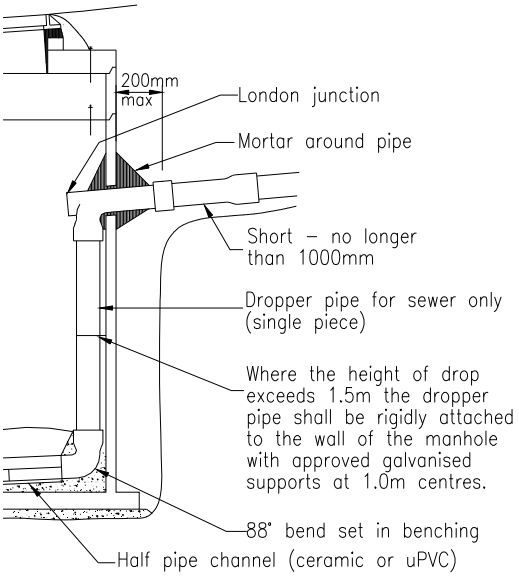
WDC 8036



SECTION CC

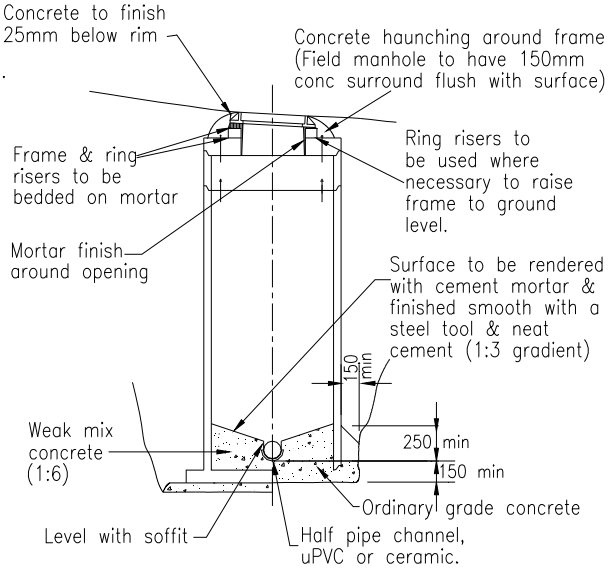
NOTES:

1. This detail is applicable for pipe diameters up to 600mm & for manhole depths up to 5.0m.
2. All steel fittings to be hot dip galvanised Zinc coatings to be not less than 700g/m
3. 150mm thick concrete lids with heavy duty cast 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.
4. Precast manhole bases shall be used in all instances with minimum sized holes cut for pipe entry.
5. No additional thin plastering of benching or inverts is permitted.
6. All manhole covers are to be painted red for stormwater, white for sewer.
7. All concrete to be 17.5 MPa at 28 days unless specified as weak mix.
8. Stormwater manholes do not require half pipe channels, or short pipe sections beyond the entry or exits.



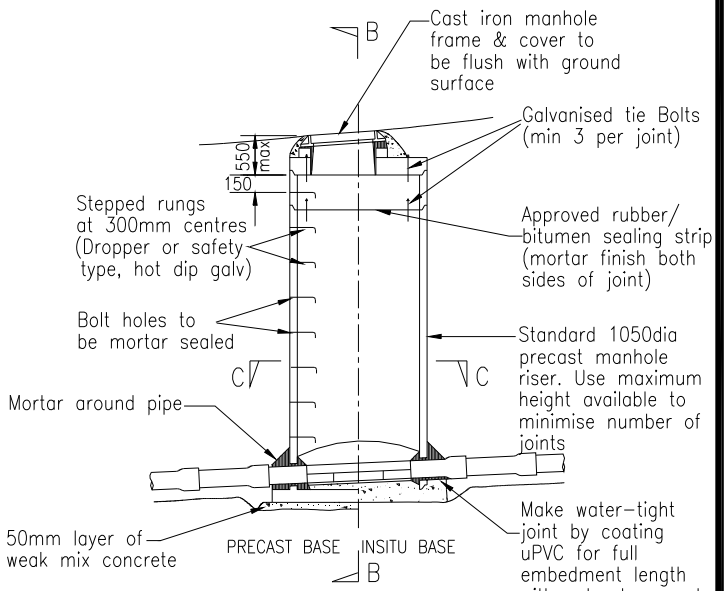
SECTION A–A INTERNAL DROP

This detail is applicable for pipe diameters up to 250mm & for manhole depths up to 5.0m.



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

SECTION BB



SECTION AA

STANDARD PRECAST MANHOLE

SEWER AND STORMWATER

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
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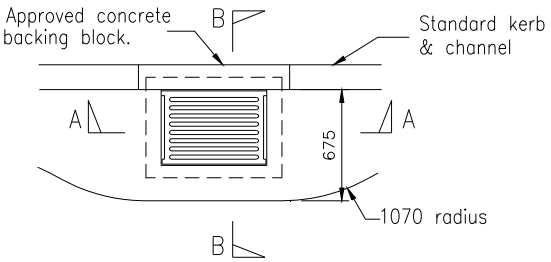
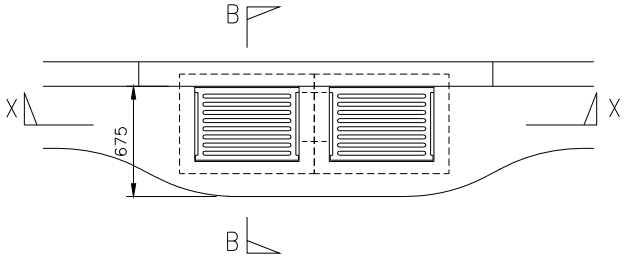
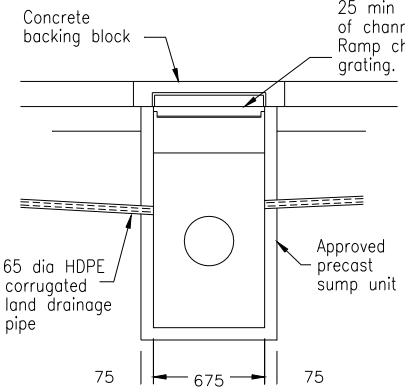
WDC 8036



PLAN

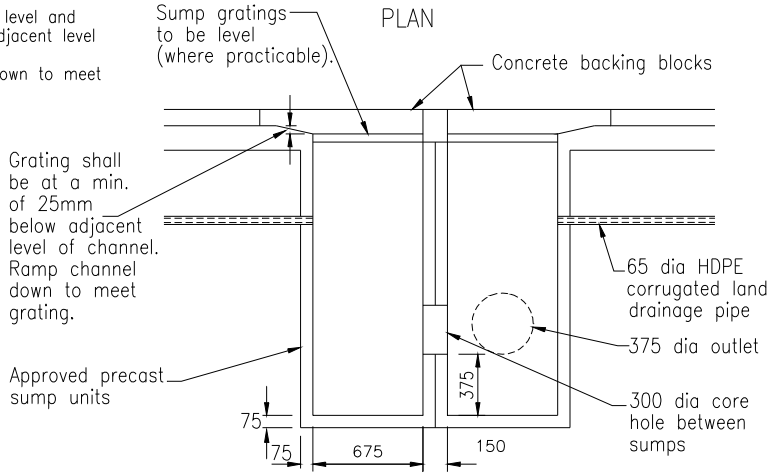


PLAN



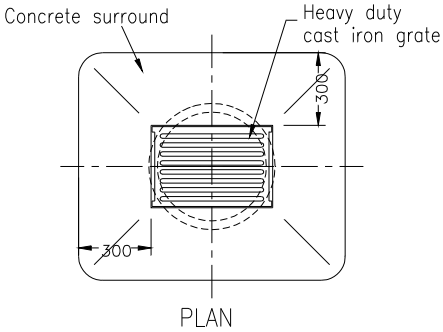
SECTION A–A

SINGLE SUMP

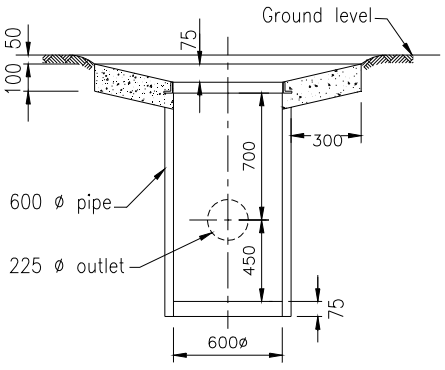


SECTION X–X

DOUBLE SUMP



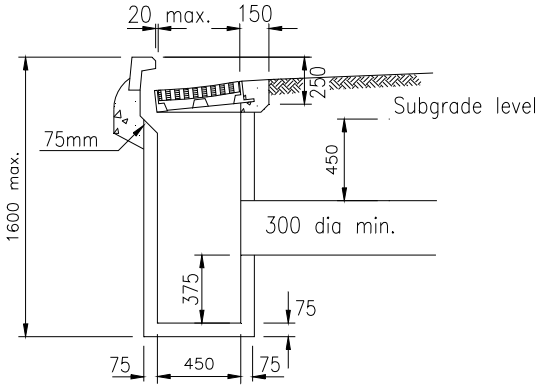
PLAN



SECTION

FIELD SUMP DETAIL

(All Environments)



SECTION B–B

NOTES

1. Concrete to be ordinary grade (17.5MPa) in accordance with NZS 3109.
2. Sump outlet pipes to be 1:100 min gradient.

SUMP DETAILS

FOR ENVIRONMENTS LIVING 1 AND 2, AND BUSINESS 1–5

WHANGAREI DISTRICT COUNCIL

ENVIRONMENTAL ENGINEERING STANDARDS

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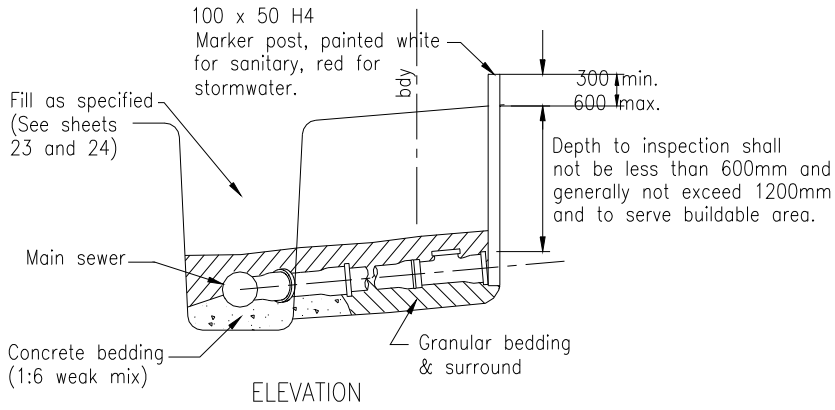
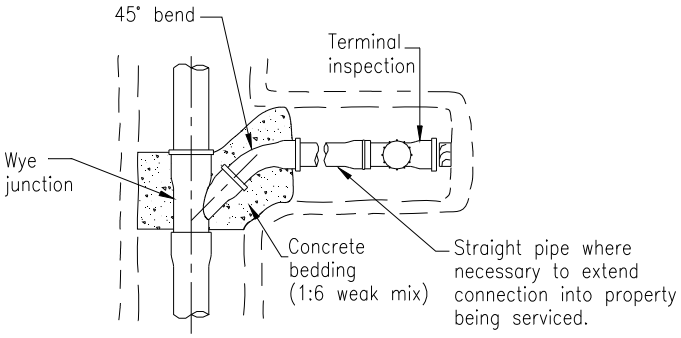
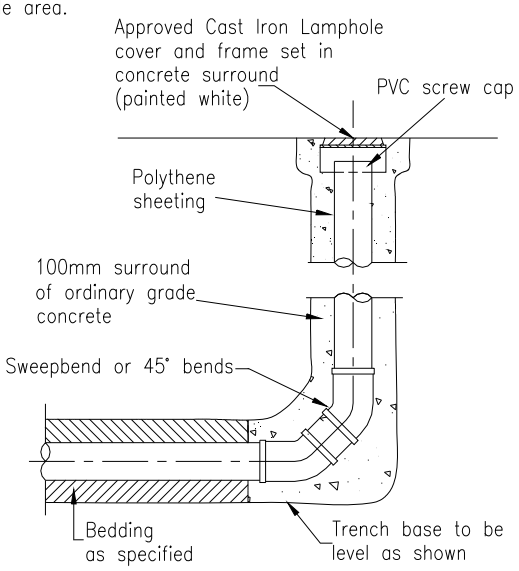


ELEVATION



PLAN

STANDARD CONNECTION

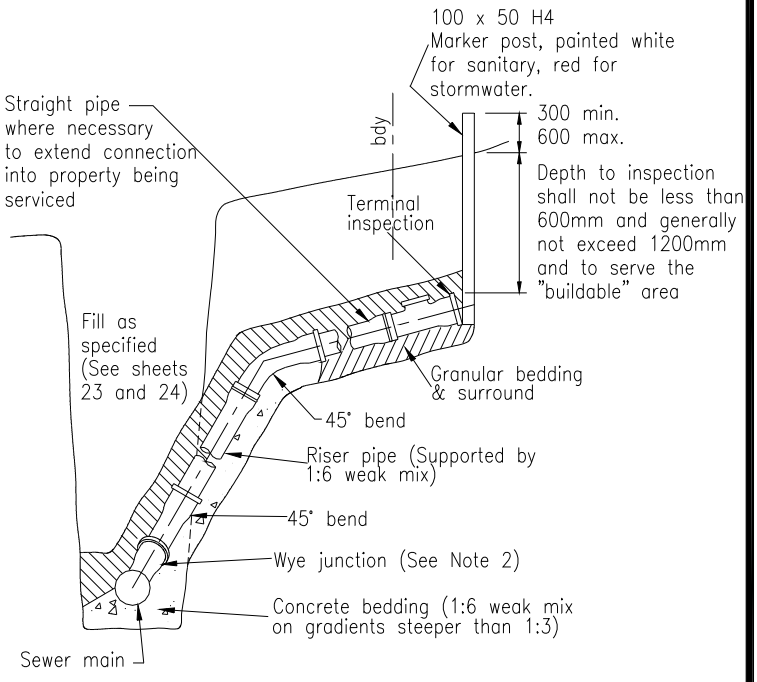


FOR BRANCH LINES LESS THAN 50m LONG

LAMPHOLE

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,
   c. Field fabricated epoxy mortared saddled flange connection with appropriate insert adapter.
3. Terminal blank end required for stormwater connections.
4. Pipes and fittings are to be sewer grade uPVC, Vitrified clay, concrete or ceramic, and 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

(Requires specific approval)

LAMPHOLES, STORMWATER AND SEWER CONNECTIONS

WHANGAREI DISTRICT COUNCIL

ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
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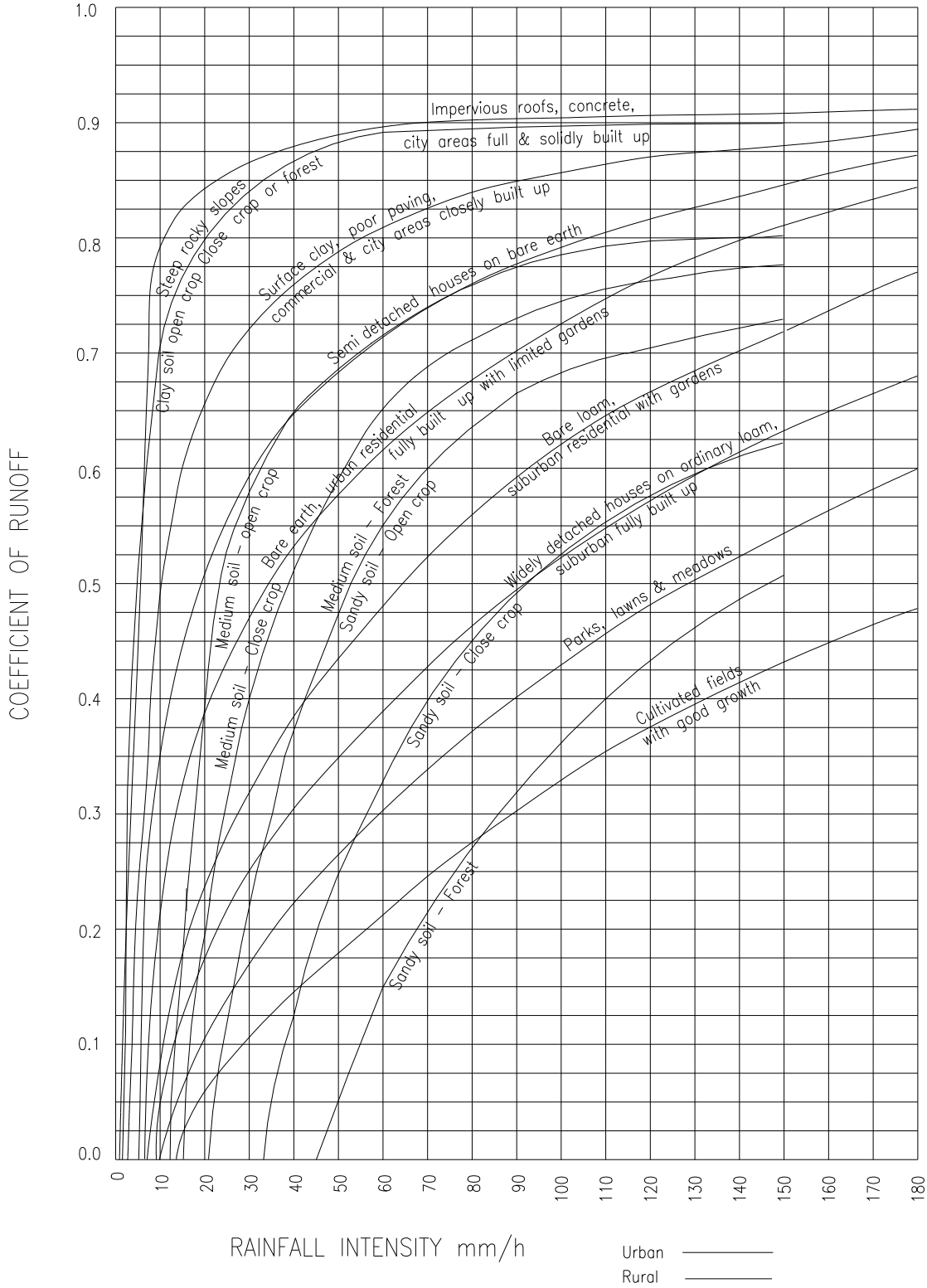
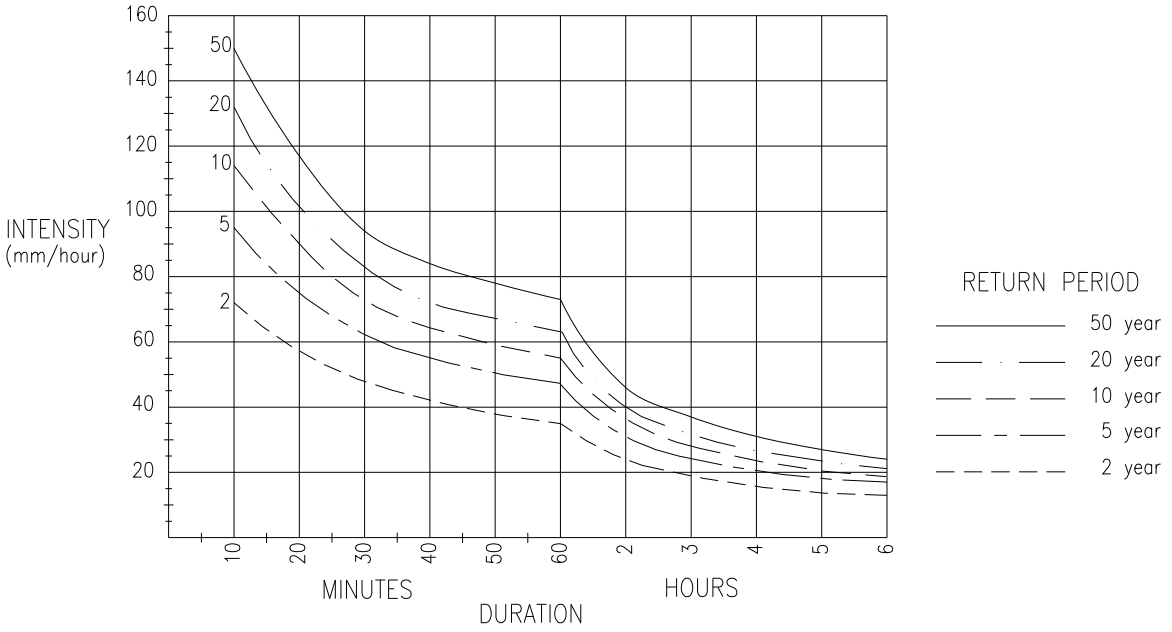


STORMWATER RUNOFF COEFFICIENTS

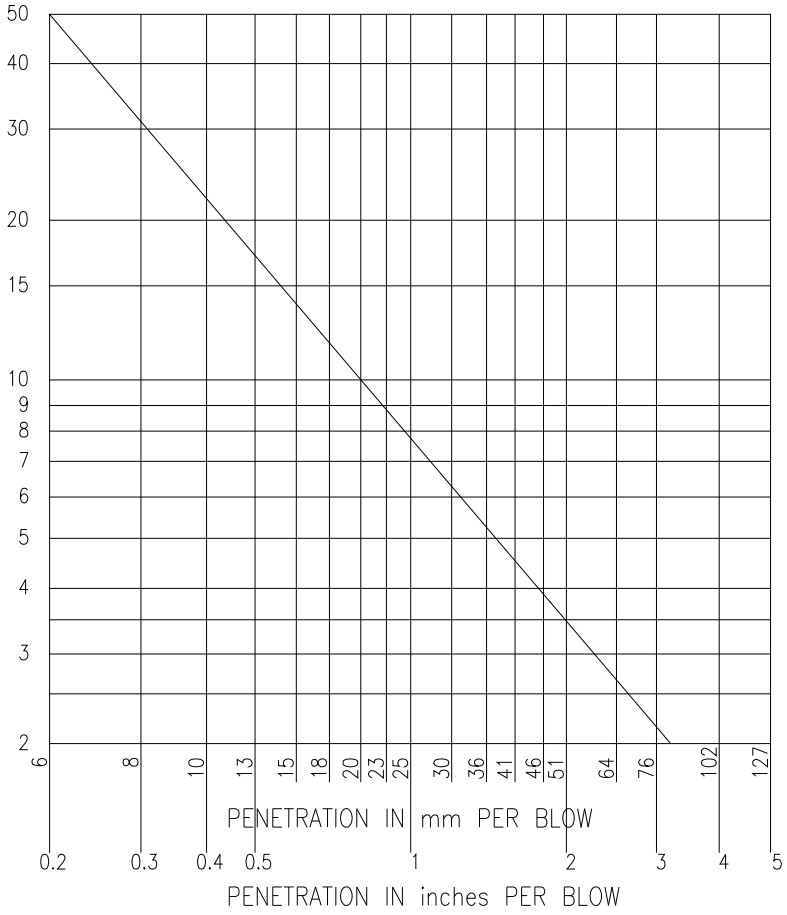
FOR ALL ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date:	SEPT 1998
Revision:	
SHEET No.	15



STORMWATER INTENSITY – DURATION CURVES



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

STORMWATER INTENSITY – DURATION CURVES & SCALA PENETROMETER CHART

FOR ALL ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date: SEPT 1998
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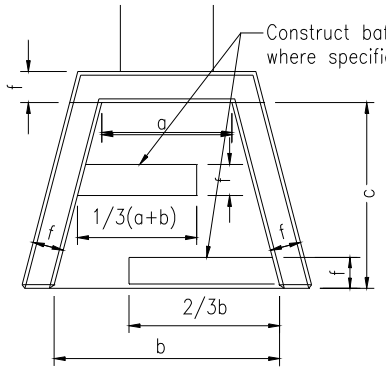
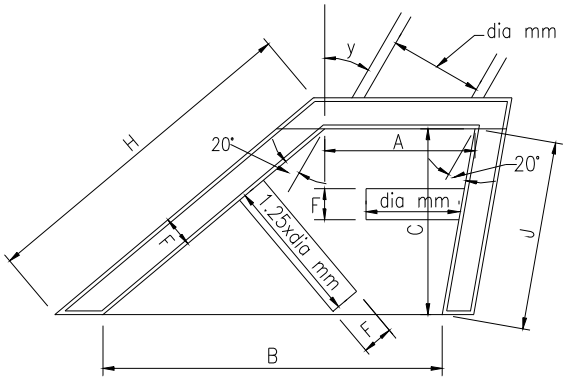
SHEET No. **16**

WDC 8036

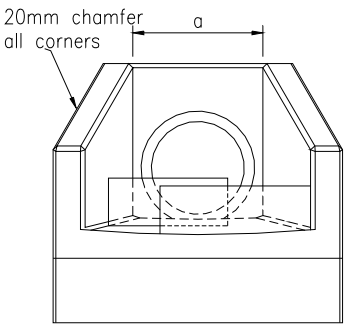


PLAN

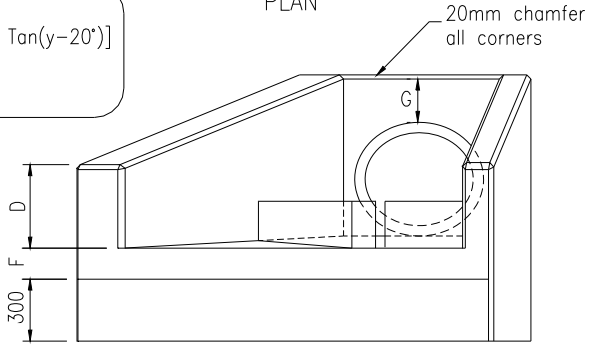


PLAN

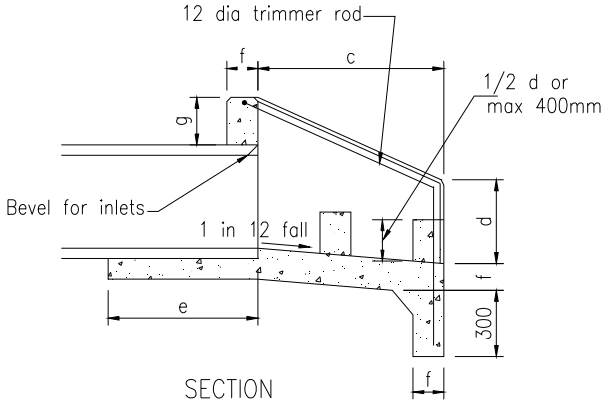
A. Sec y x (a)
B. C Tan (y+20°) + [A−C Tan(y−20°)]
H. C x Sec (y + 20°)
J. C x Sec (y − 20°)



END ELEVATION



END ELEVATION



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

NOTES

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 ordinary grade (17.5MPa) in accordance with NZS 3109.
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

FOR ALL ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

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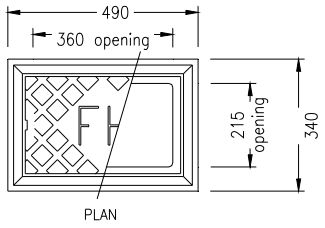
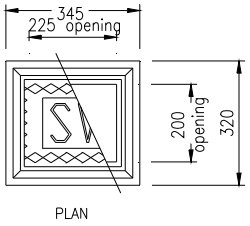
WDC 8036

"TALL TYPE"screw down hydrant to conform to NZS/BS 750
To close clockwise when viewed from above.
To be fitted with Nylon, Polypropylene or other approved washes.



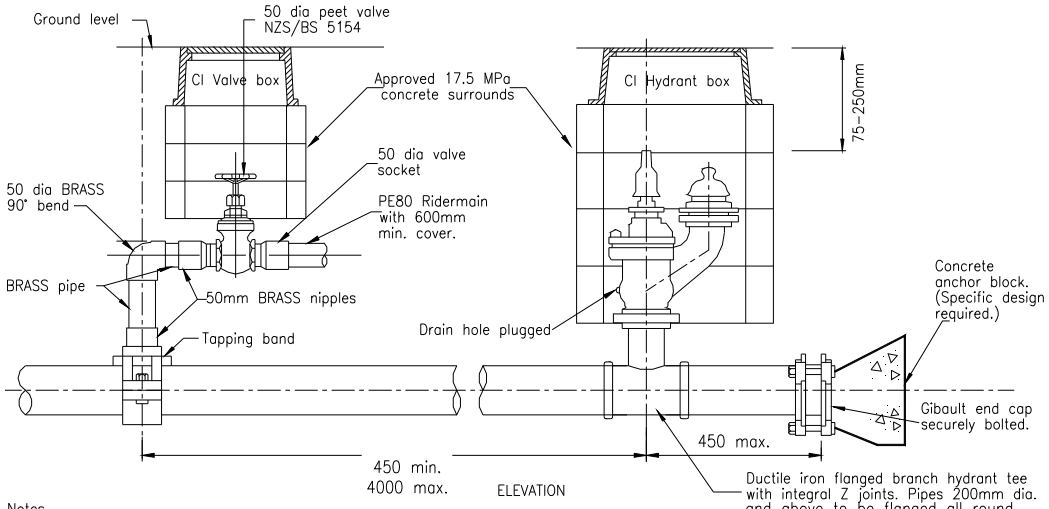
PLAN

CAST IRON HYDRANT BOX



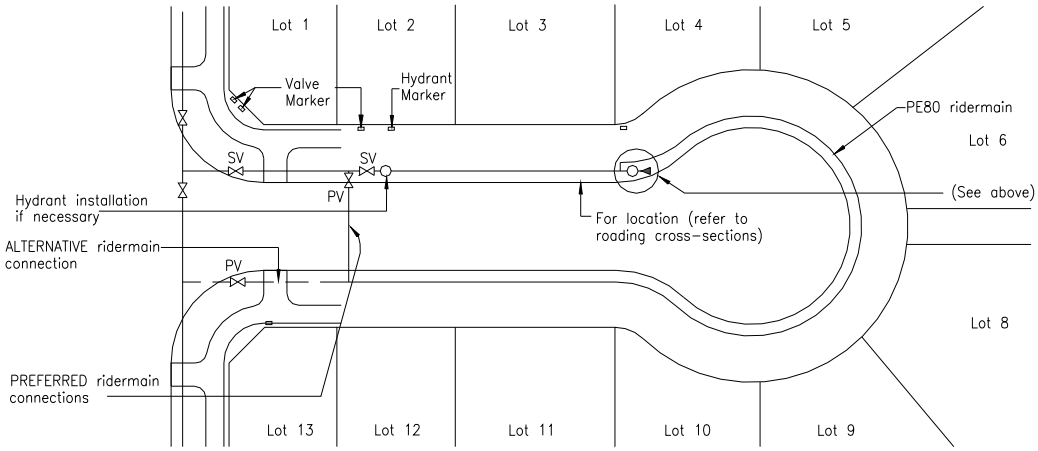
PLAN

CAST IRON VALVE BOX



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 wrapped with denso tape.
4. Service connections to terminate 300mm from boundary with an approved gate valve.
5. Dimensions to be supplied with as–builts.



WATER PIPELINE DETAILS

FOR ALL ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

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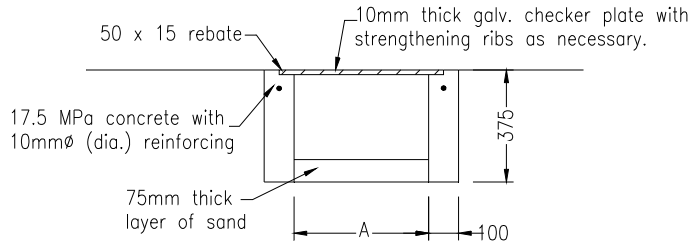
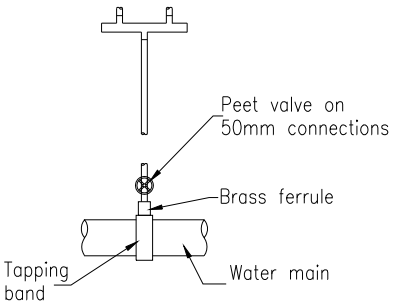
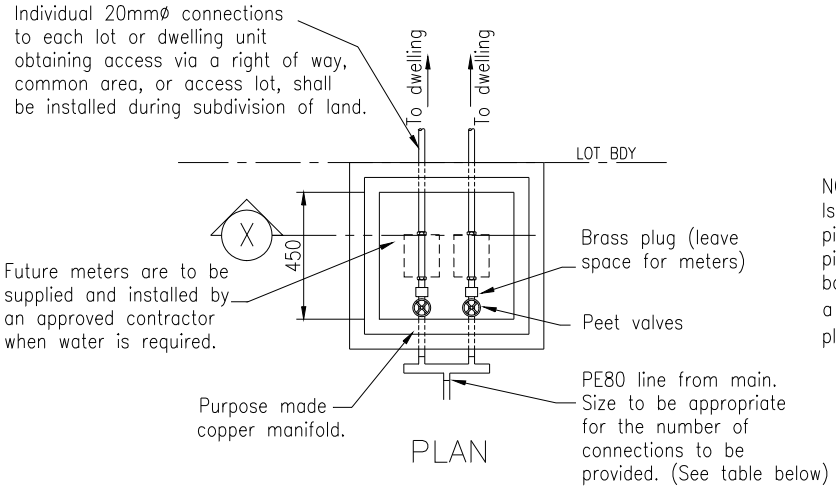


SECTION XX



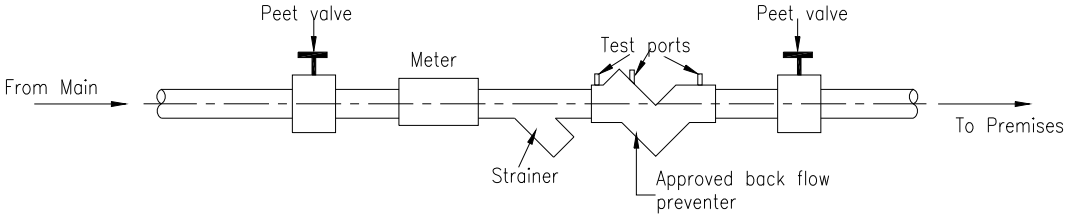
TYPICAL WATER CONNECTION DETAIL



PLAN

NOTE:
Isolating valves are required on all pipes less than 50mm dia. i.e. AC pipes require a tapping band and a ball valve. uPVC and PE80 pipes require a self tapping band with an "inbuilt plug" valve.

NUMBER OF CONNECTIONS	WIDTH AT A	ID SIZE OF CONNECTION FROM MAIN
1	450mm	20mm
2	600mm	25mm
3	750mm	32mm
4	900mm	50mm
5	1050mm	50mm



METERED SUPPLY WITH DOUBLE CHECK VALVE BACK FLOW PREVENTER

MULTIPLE WATER CONNECTIONS, BACKFLOW PREVENTERS FOR ALL ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

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SHEET No. 19

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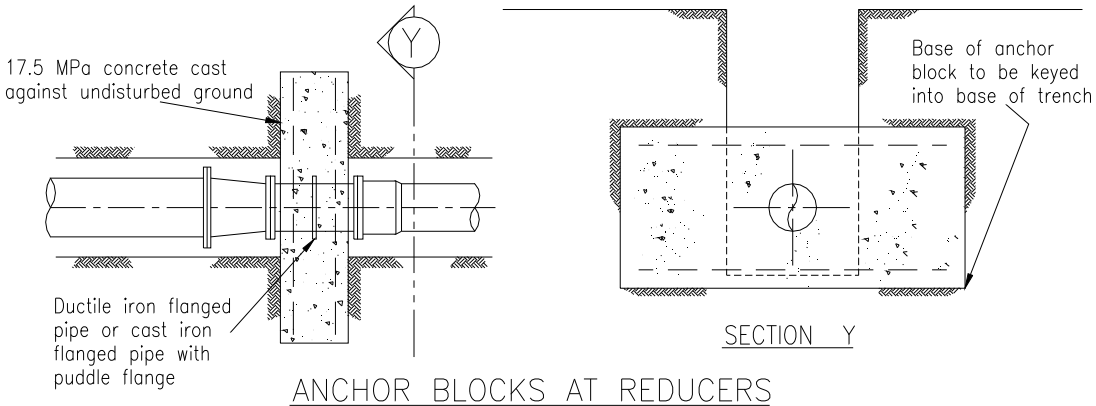
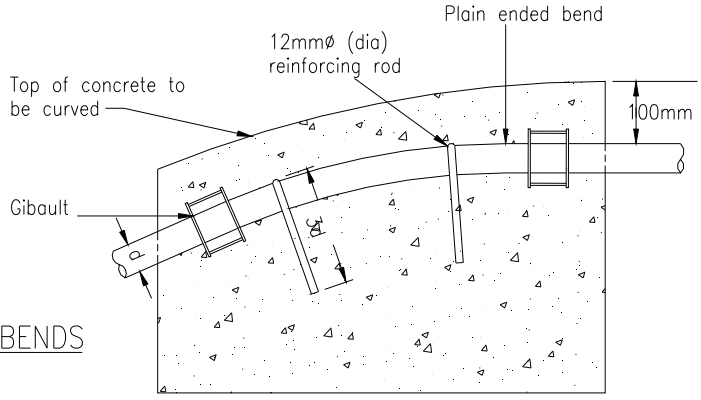
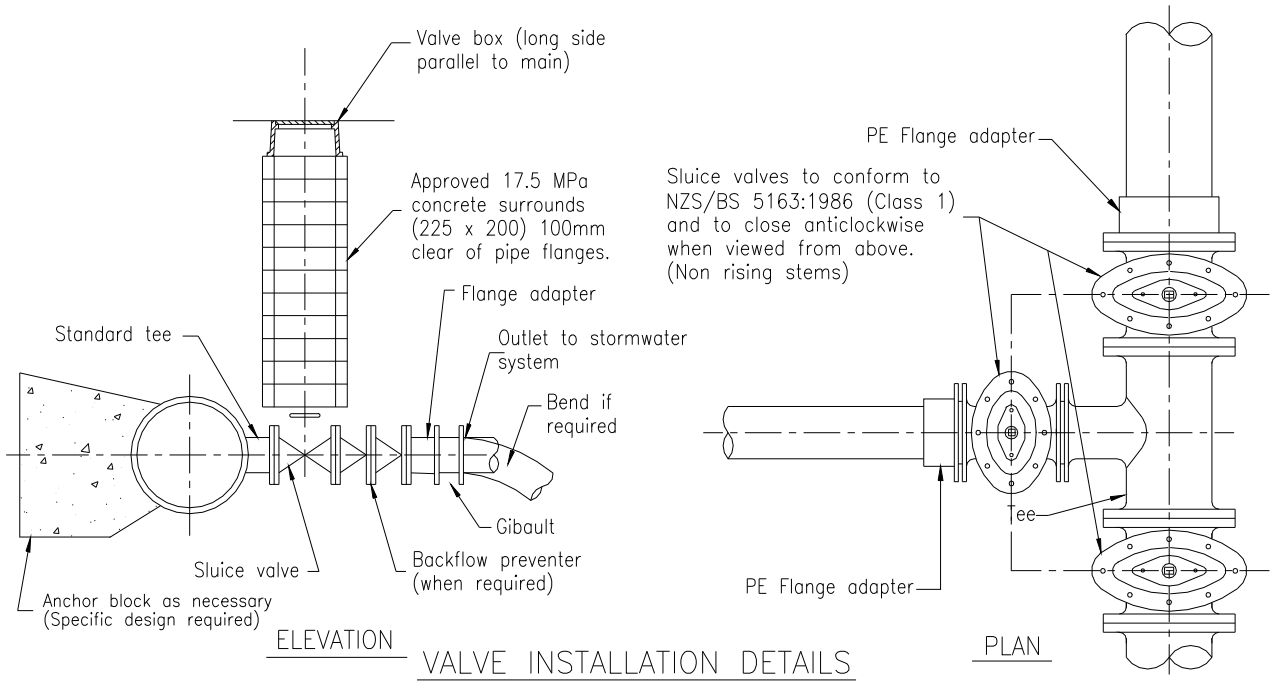


ANCHOR BLOCKS AT REDUCERS

NOTE:
Calculations for anchor blocks at reducers and vertical curves must be shown with Engineering drawings.



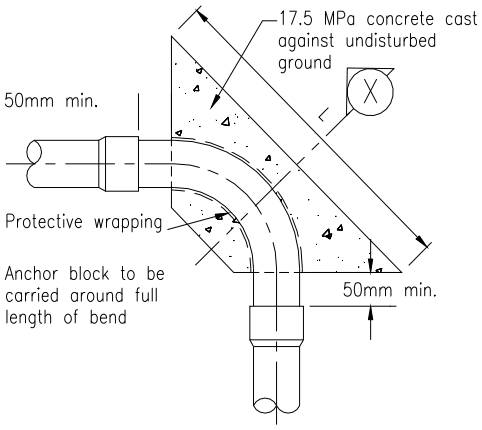
ANCHOR BLOCKS AT BENDS IN VERTICAL PLANE



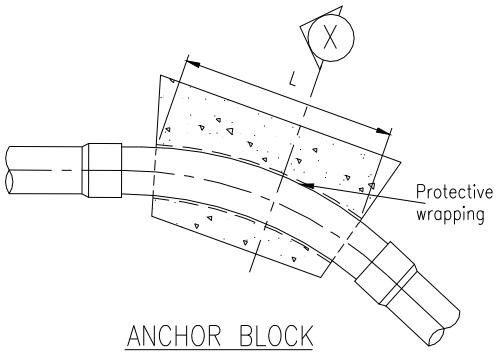
VALVE INSTALLATION DETAILS

Refer also to Sheet 21
same note of conditions apply

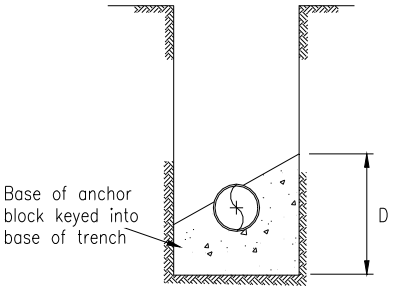
ANCHOR BLOCK AND VALVE INSTALLATION DETAILS FOR ALL ENVIRONMENTS



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

NOTE:
1) Anchor block dimensions for firm soil conditions.
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.
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.

ANCHOR PILE DETAILS

FOR ALL ENVIRONMENTS

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

Date: SEPT 1998
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SHEET No. **21**

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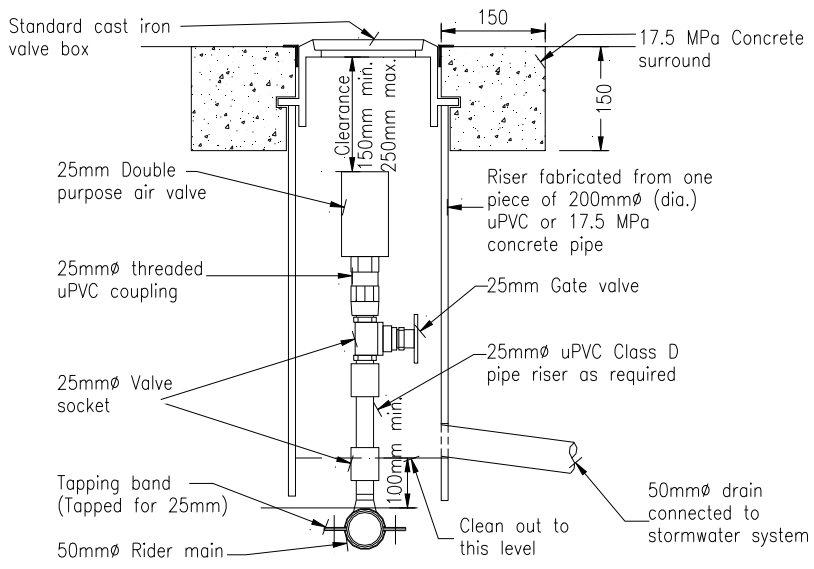
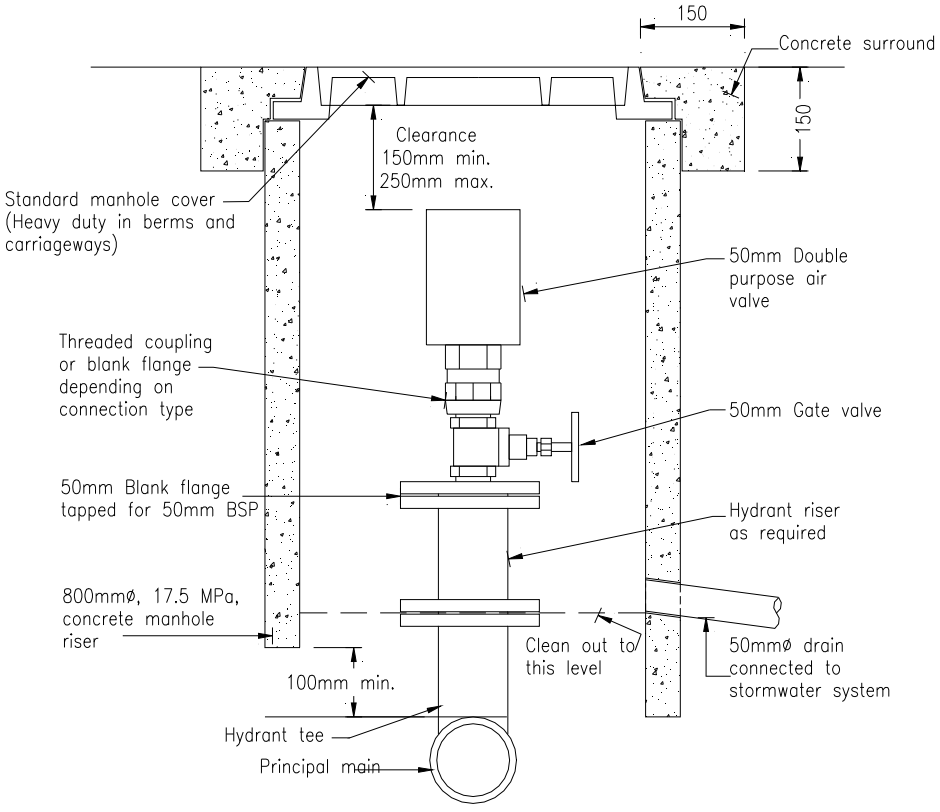


STANDARD AIR VALVE DETAIL FOR 50mmø RIDER MAINS

NB: Underground bolts to be wrapped with DENSO tape



STANDARD AIR VALVE DETAIL FOR PRINCIPAL MAINS

NB: Underground bolts to be wrapped with DENSO tape

AIR VALVE DETAILS

FOR ALL ENVIRONMENTS

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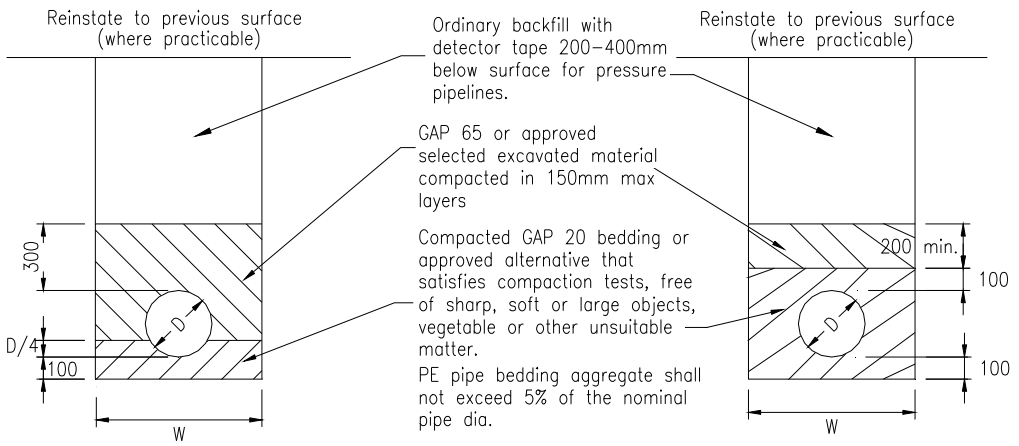
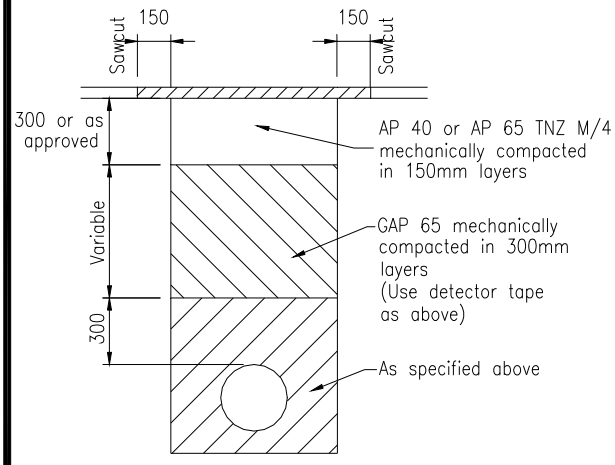


ALUMINIUM, CONCRETE GALVANISED STEEL OR VITRIFIED CLAY PIPE

(Where specifically approved)

uPVC AND PE PIPE



ADDITIONAL BACKFILL REQUIREMENTS UNDER CARRIAGEWAYS

(All types of pipe)

W	TYPE OF PIPE
D + 600	Aluminium
D + 600	Galv. steel
D + 450	Concrete
D + 450	Vitrified clay
D + 400	uPVC

Variations in W require additional design compensation.

NOTES

1. Concrete pipes to be RCRRJ "Class X" or stronger installed to manufacturers requirements.
2. Aluminium pipes to be "Aluflo" or "Highflo" type design, or similar.
3. Ordinary backfill shall be free from stones or rocks greater than 150mm nominal diameter compacted in 300mm layers.
4. Replace topsoil to original depth as necessary.
5. Existing sealed roadway excavations are to be resurfaced with 50mm of asphaltic concrete.
6. Scala Penetrometer test:
   The number of blows required for penetration through successive layers within carriageway trenches is as follows:
   a. 0 to 150mm deep; 18 minimum
   b. 150mm to 300mm deep; 12 minimum
   c: 300mm to 450mm deep; 8 minimum
   d. Deeper than 450mm; 6 minimum per 150mm depth
   NB. Berm every 50mm; 2 minimum
7. PRIVATEWAY basecourse metalling within pipe trenches may be in accordance with the privateway Standards.
8. Trench width shall not exceed W at the pipe crown level.
9. 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.
10. Pipelines at 1:8 gradient or steeper shall have cement stabilised bedding and/or surrounds.
11. Pipelines at 1:3 gradient or steeper shall have weak mix concrete bedding (10MPa). Large pipes will require specific pier design.
12. Concrete bedding shall be allowed to cure for 48 hours prior to backfilling.
13. Backfilling – carriageways may be with 'flowable fill' (low strength fly–ash concrete).
14. Granular bedding is to satisfy N.Z.S. 7643 Appendix B.
15. Minimum cover over pipes (unless specifically designed or protected in accordance with sheet 24).
    A. 600mm if not subjected to traffic loading
    B. 750mm under carriageways and trafficed areas.

PIPE BEDDING & BACKFILL

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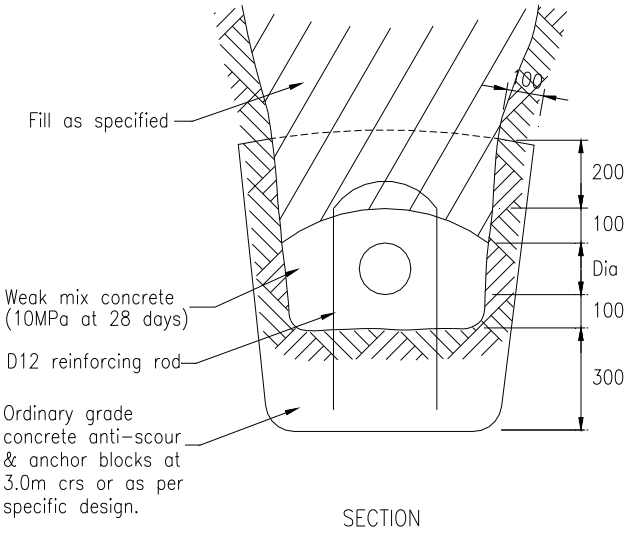
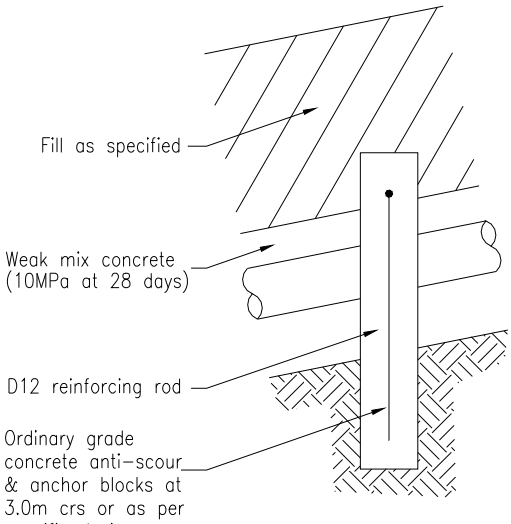


SECTION



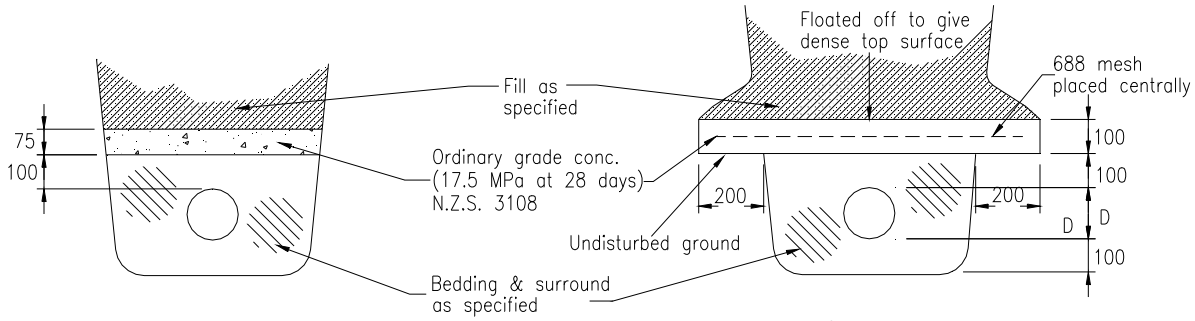
ELEVATION

STEEP PIPE DETAILS
(For pipeline gradients 1:3 or steeper)

NOTE:

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.



UNREINFORCED CONCRETE
SLAB PROTECTION

REINFORCED CONCRETE
SLAB PROTECTION

(Where additional loading or
other requirements necessitate)

GENERAL:

A. Weak mix concrete:
1 part cement to 6 parts aggregate.

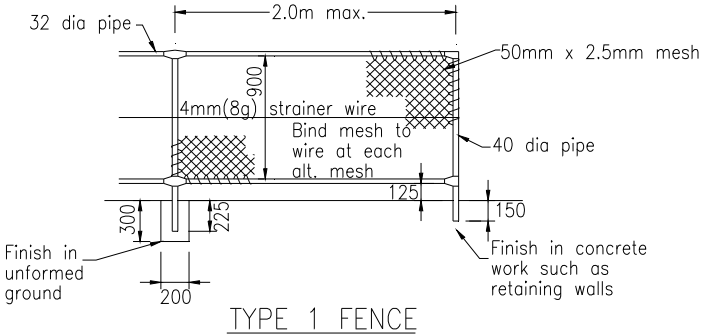
B. Cement stabilised bedding and backfill:
1 part cement to 20 parts aggregate.

C. Allow 48 hours curing prior to backfilling any concrete or stabilised material.

Refer to Sheet 23

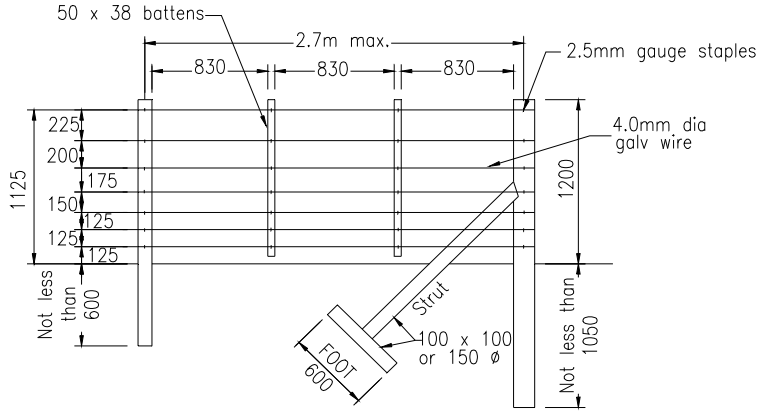
PIPE PROTECTION

FOR ALL ENVIRONMENTS



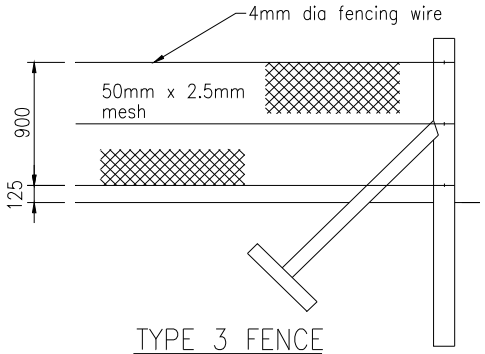
TYPE 1 FENCE

WALKWAYS AND SIMILAR



TYPE 2 FENCE

WALKWAYS AND SIMILAR



TYPE 3 FENCE

WALKWAYS AND SIMILAR

(Posts, struts, and footings as per Type 2 fence.)

TYPE 4 FENCE

1. To be used for fencing bush covenants and areas where stock proofing is essential.

2. Details are to conform with a Type 2 fence with the exception that:
   a) Posts shall not be more than 5.0m apart.
   b) Battens shall be approx. 800mm apart (i.e. 5 battens between posts)

3. Posts and hollow areas subject to lifting from wire strain are to be securely footed and/or stayed.

4. Bush covenant fencing shall only have one access gate which is to be securely wired closed in two positions each end.

NOTES

1. TYPE 2, 3 and 4 FENCES to have concrete or wooden posts and struts, securely rammed.
2. Timber posts shall be treated to H4 specification.
3. Timber posts and struts 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. 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

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