Sheet 30 Minimum Clearance Between Services

MINIMUM CLEARANCE BETWEEN SERVICES

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

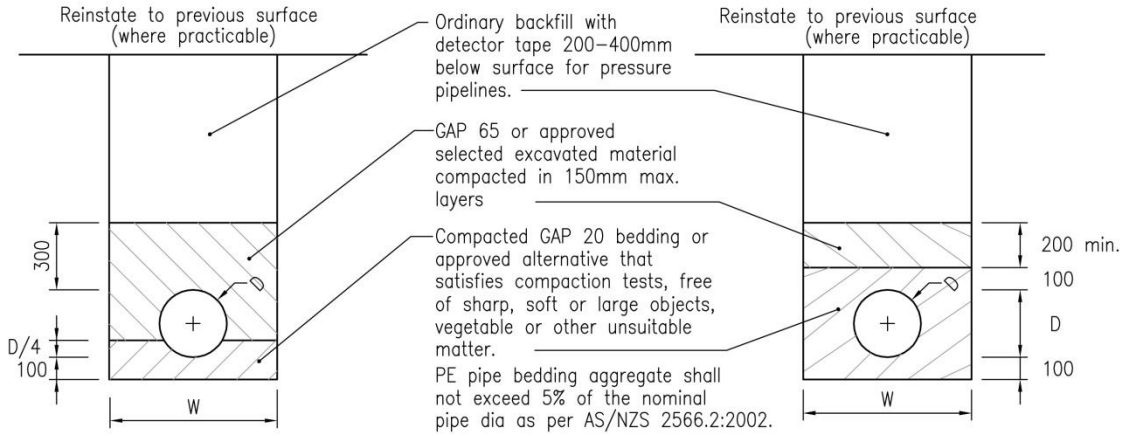
Stormwater:	300 H, 150 V
Wastewater:	300 H 150 V (except watermains as follows) 1000 H, 500 V or 600 H, 750 V to watermains as per Table 5.7.
Electricity:	500 H, 225 V (except watermains > 200mm ID as follows) 1000 H, 225 V to watermains > 200mm ID.
Telecom & Gas	300 H, 150 V (except watermains > 200mm ID as follows): 600 H, 150 V to watermains > 200mm ID.
Watermains:	Clearance to other services as above. Clearance to other watermains as follows: 600 H, 500 V where new pipeline is > 375mm ID 300 H, 150 V where new pipeline is ⩽ 200mm ID and where existing pipeline is ⩽ 375mm ID 600 H, 150 V where new pipeline is > 200mm ID and where existing pipeline is < 375 mm ID.

Notes:
1. All distances in mm.
2. All services shall have 600mm min. cover under footpaths and berms.
3. Refer to Tables 5.7 (Wastewater) and 6.4 (Water) for further notes.
4. Vertical clearances apply where services cross, except that watermains shall always maintain a clearance above a parallel wastewater pipeline.

MINIMUM CLEARANCES BETWEEN SERVICES FOR LIVING 1 AND 2 AND ALL BUSINESS ENVIRONMENTS	Date: APRIL 2010 Revision: R0
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: NTS SHEET No. 30

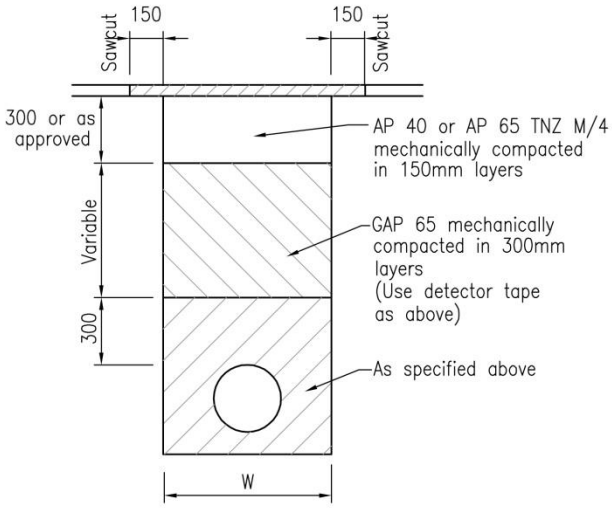
WDC 8036

Sheet 31 Pipe Bedding and Backfill



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. 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
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.

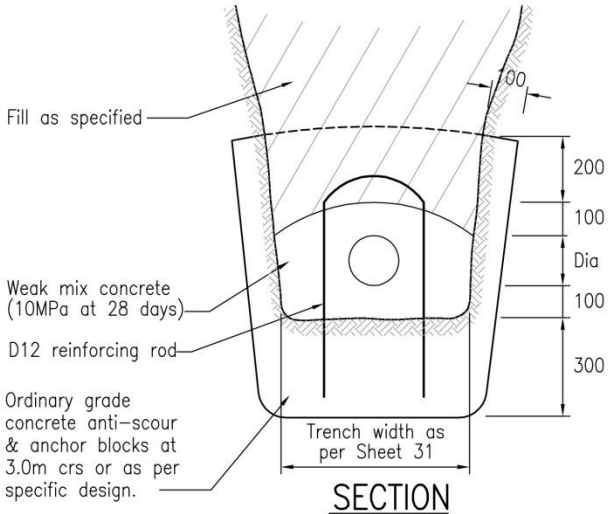
PIPE BEDDING & BACKFILL
(FOR ALL ENVIRONMENTS)

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

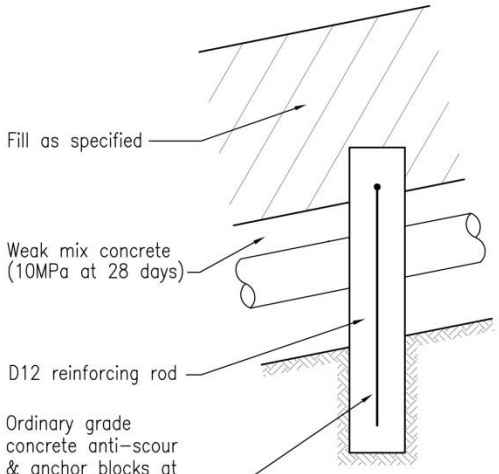
Date:	APRIL 2010
Revision:	R0
Scale:	AS SHOWN
SHEET No.	31

WDC 8036

Sheet 32 Pipe Protection and Bulkhead Details



SECTION



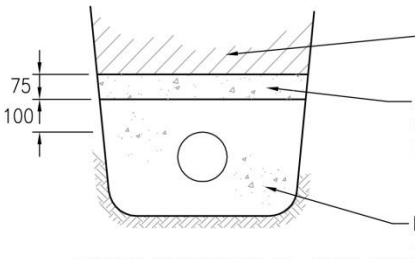
ELEVATION

STEEP PIPE DETAILS

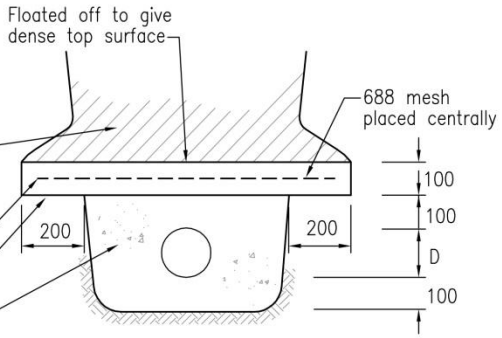
(For pipeline gradients 1:3 or steeper)

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.



UNREINFORCED CONCRETE SLAB PROTECTION

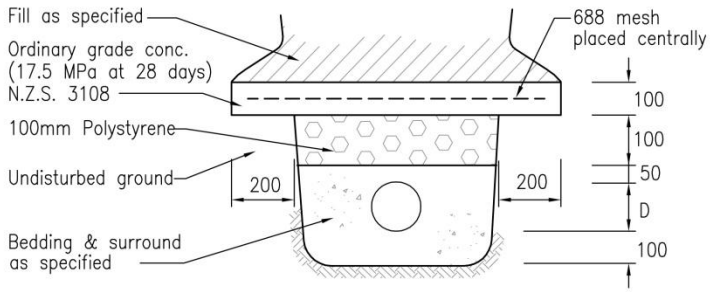


REINFORCED CONCRETE SLAB PROTECTION

(Where additional loading or other requirements necessitate)

GENERAL:

A. Weak mix concrete:
1 part cement to 6 parts aggregate.
B. Cement stabilised bedding and back fill:
1 part cement to 20 parts aggregate.
C. Allow 48 hours curing prior to back filling any concrete or stabilised material.

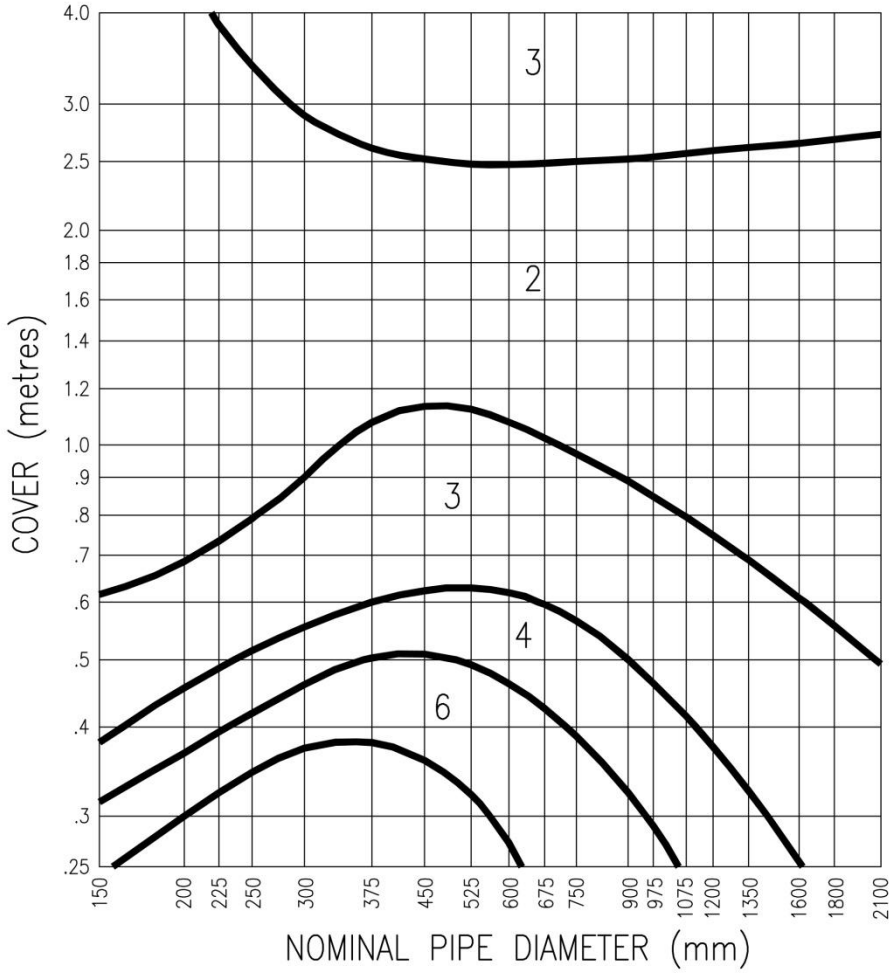


REINFORCED CONCRETE SLAB PROTECTION FOR WATER PIPELINES

PIPE PROTECTION AND BULKHEAD DETAILS (FOR ALL ENVIRONMENTS)	Date: APRIL 2010
	Revision: R0
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: AS SHOWN
	SHEET No. 32

WDC 8036

Sheet 33 Pipe Class and Cover



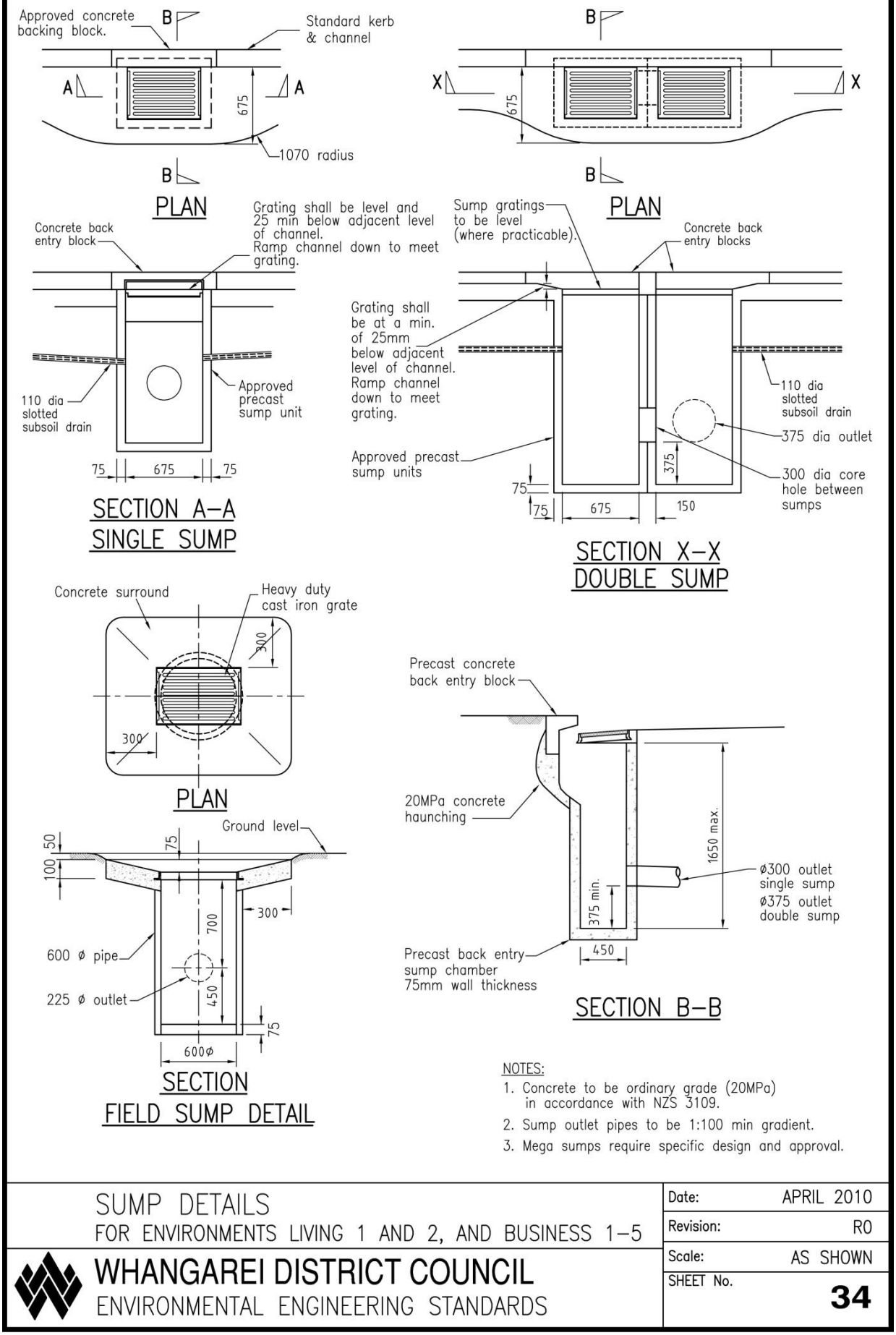
NOTES:

1. Applies to RCRRJ pipes to AS/ NZS 4058: 2007 where
   - Pipe Class 2 = former Class X
   - Pipe Class 3 = former Class Y
   - Pipe Class 4 = former Class Z
2. Design loading HN–HO–72.
3. Normal backfill material.
4. Specific design applies beyond the limit of the above chart or when traffic loads are lower. See AS/NZS 3726.
5. The minimum cover may be reduced by 0.1m in lightly trafficked areas and by 0.2m under residential driveways.

PIPE CLASS AND COVER FOR GRANULAR BEDDING AND HAUNCHING	Date: APRIL 2010 Revision: R0
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: AS SHOWN SHEET No. 33

WDC 8036

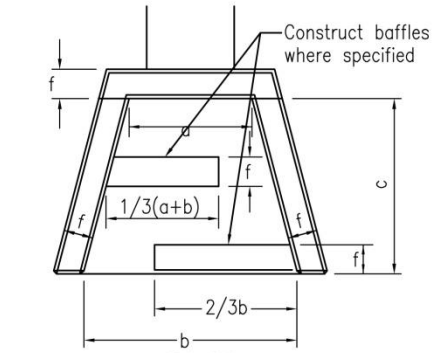
Sheet 34 Sump Details



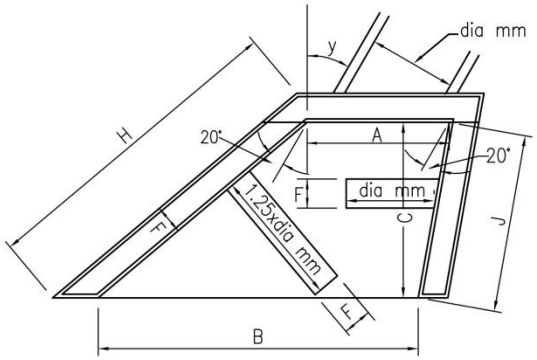
SUMP DETAILS FOR ENVIRONMENTS LIVING 1 AND 2, AND BUSINESS 1–5	Date: APRIL 2010 Revision: R0 Scale: AS SHOWN SHEET No. 34
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	

WDC 8036

Sheet 35 Inlet and Outfall Structures

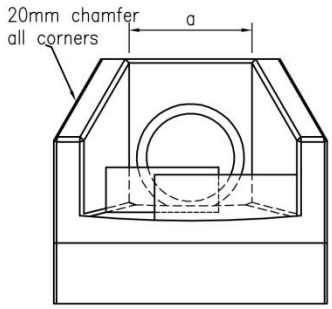


PLAN

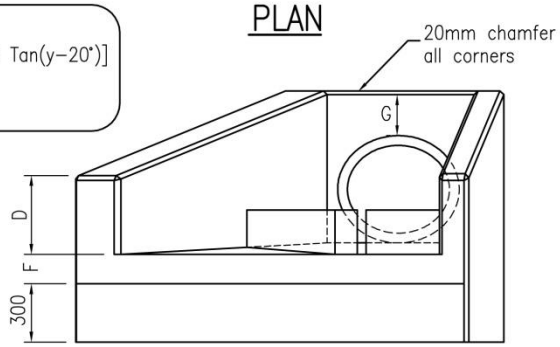


PLAN

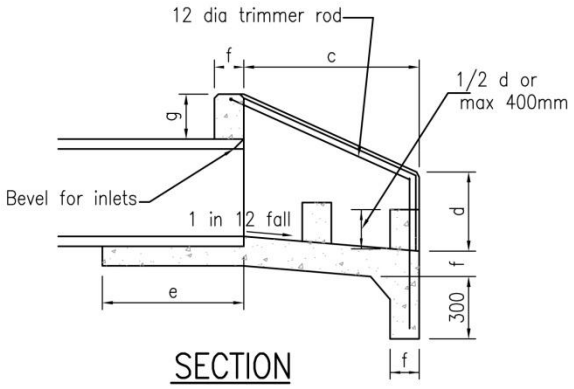
A. Sec y x (a)
B. C Tan (y+20°) + [A−C Tan(y−20°)]
H. C x Sec (y + 20°)
J. C x Sec (y − 20°)



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.

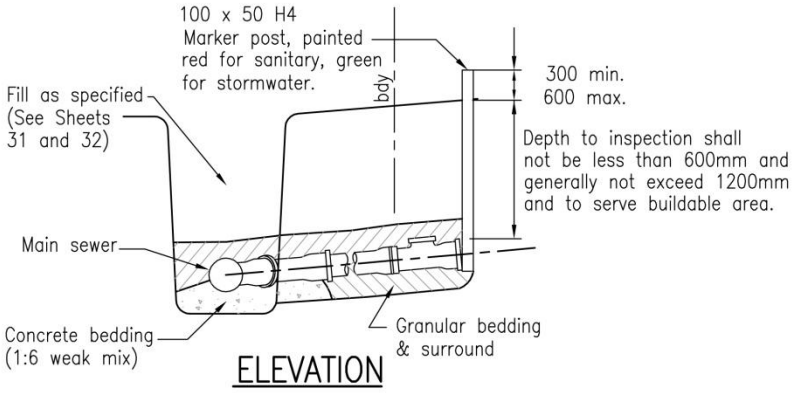
INLET AND OUTFALL STRUCTURES

WHANGAREI DISTRICT COUNCIL
ENVIRONMENTAL ENGINEERING STANDARDS

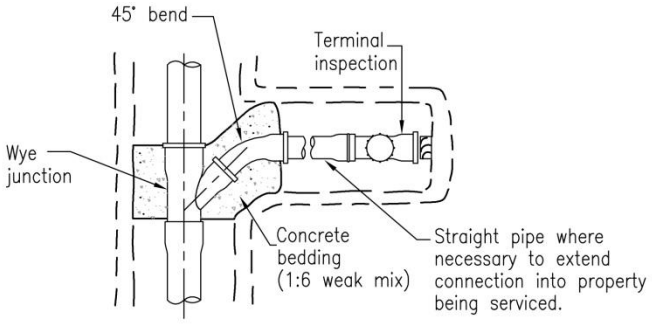
Date:	APRIL 2010
Revision:	R0
Scale:	AS SHOWN
SHEET No.	35

WDC 8036

Sheet 36 Stormwater and Sewer Connections



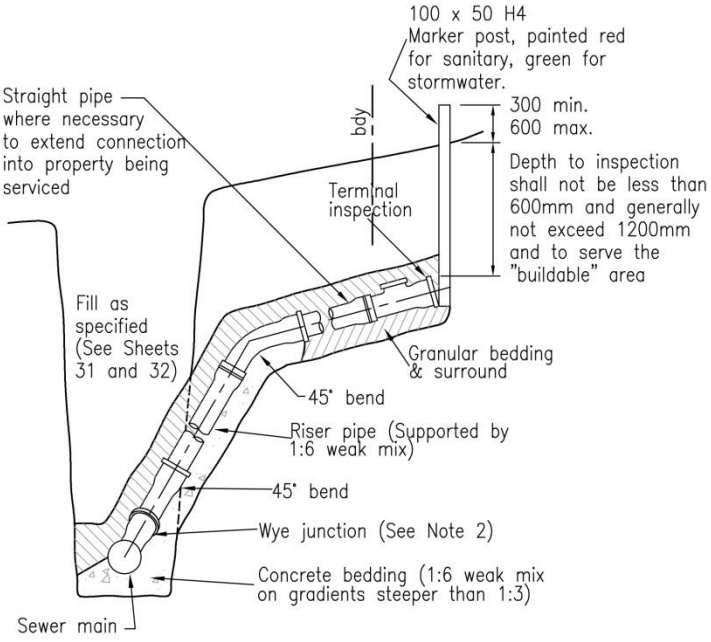
ELEVATION



PLAN STANDARD CONNECTION

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.

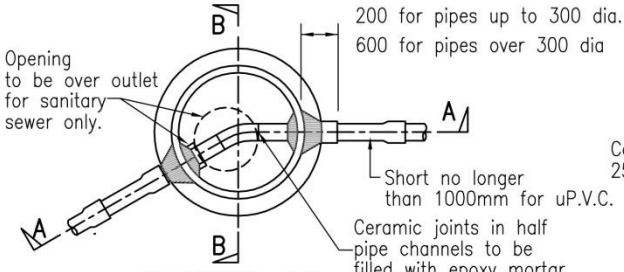


RAMPED RISER CONNECTION
(Requires specific approval)

STORMWATER AND SEWER CONNECTIONS FOR ALL ENVIRONMENTS	Date: APRIL 2010
	Revision: R0
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: AS SHOWN
	SHEET No. 36

WDC 8036

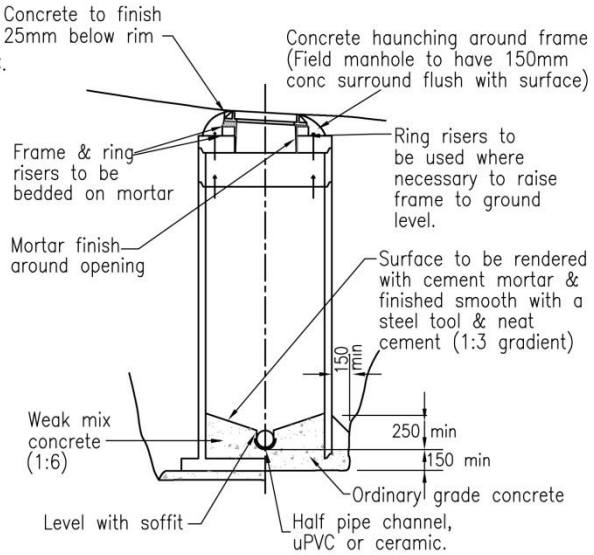
Sheet 37 Standard Precast Manhole



SECTION CC

NOTES:

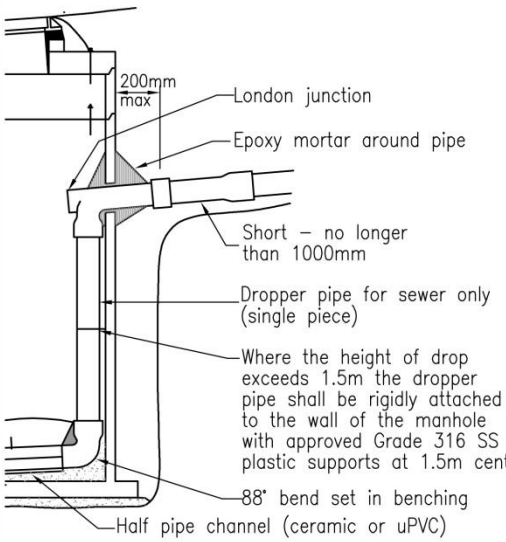
1. This detail is applicable for pipe diameters up to 600mm & for manhole depths up to 5.0m.
2. All steel fittings to be hot dip galvanised Zinc coatings to be not less than 700g/m
3. 150mm thick reinforced concrete lids with heavy dut**ductile** iron frames & covers to be used in driveways, carriageways & berms. 100mm thick concrete lids with light duty cast iron frames & covers may be used elsewhere.
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 of benching or inverts is permitted.
6. All manhole throats are to be painted green for stormwater, red for sewer. Painting on manhole covers is optional. If covers are painted they shall be green for stormwater, red for sewer with 50mm wide white strip painted through the centre of the cover.
7. All concrete to be 20MPa 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.
9. Stepped rungs not to be provided for sewer manholes.



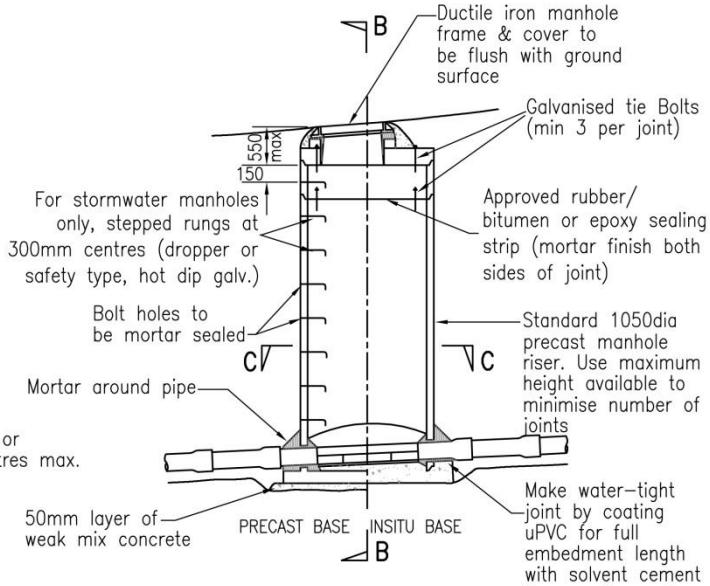
PRECAST BASE INSITU BASE (only permitted for pipes larger than 600mm)

SECTION BB

Ductile



SECTION A–A INTERNAL DROP



SECTION AA

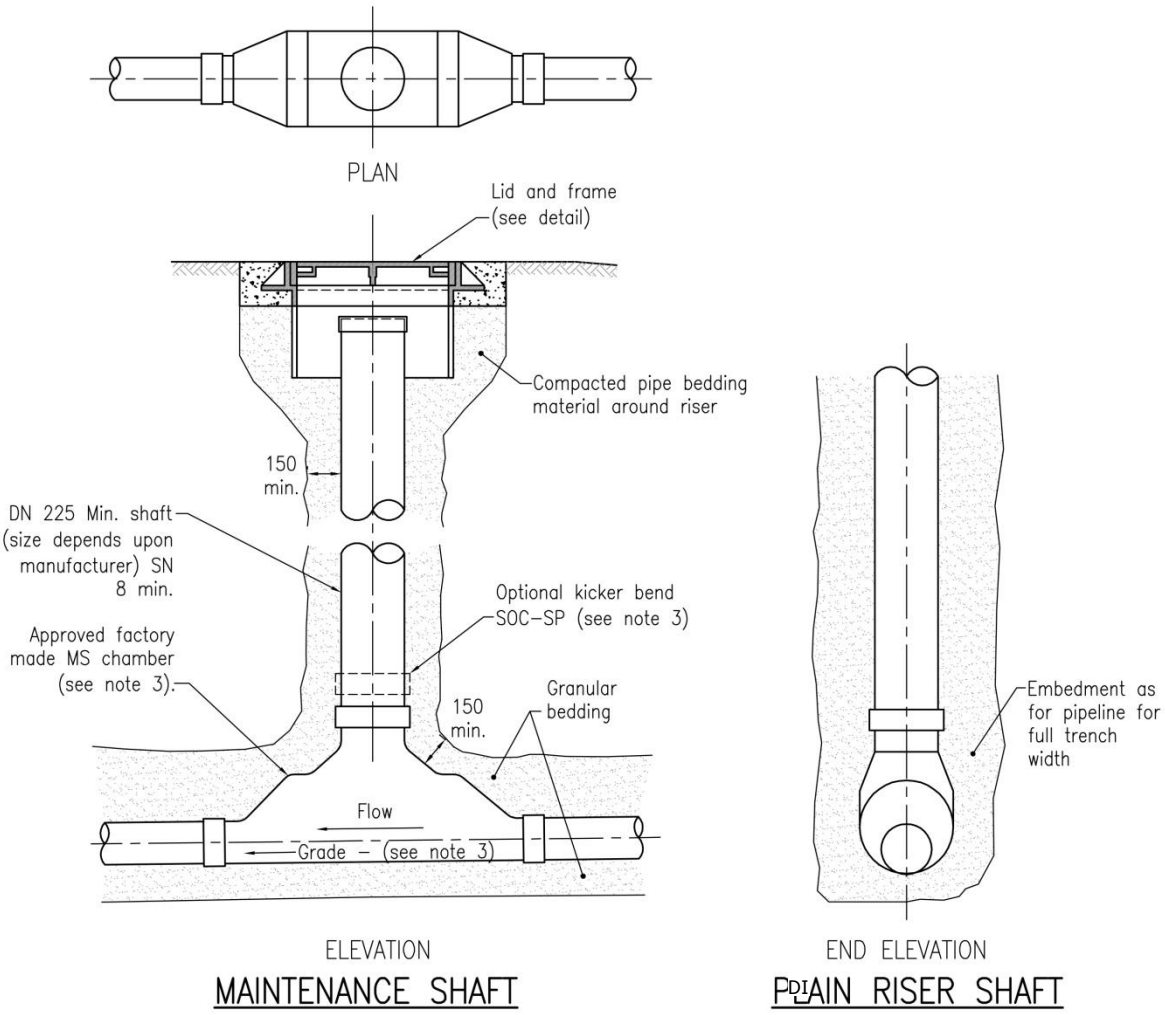
Note:

1. This detail is applicable for pipe diameters up to 250mm & for manhole depth up to 5.0m & for manhole diameters ⩾ 1200mm.
2. For manhole diameters < 1200mm an external drop must be used (See NZS 4404, Sheet CM–004.

STANDARD PRECAST MANHOLE SEWER AND STORMWATER FOR ALL ENVIRONMENTS	Date: APRIL 2010
	Revision: R0
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: AS SHOWN
	SHEET No. 37

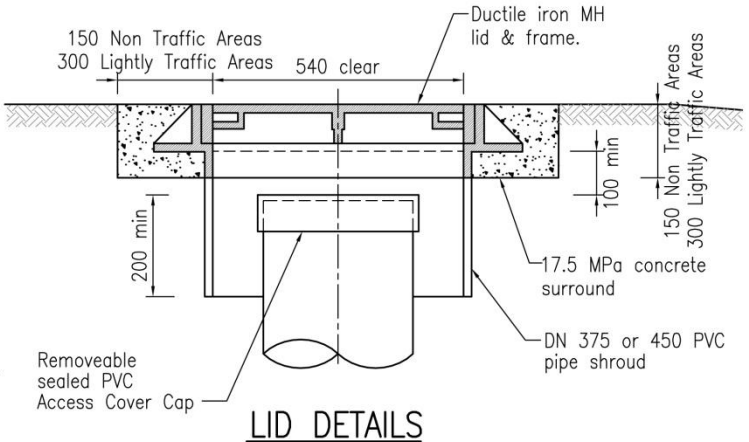
WDC 8036

Sheet 38 Sewer Maintenance Shaft Details



NOTES:

1. For use with DN150 and DN225 pipes only.
2. Maximum depth 3.6m.
3. Adjust MS to pipe grade by tilting chambers. Maximum deviation from vertical of riser to be 300mm at surface
4. Not to be located in carriageways or in heavily trafficked areas.
5. See Section 5.10.3.4 for restrictions on use.
6. See also Sheet 39.

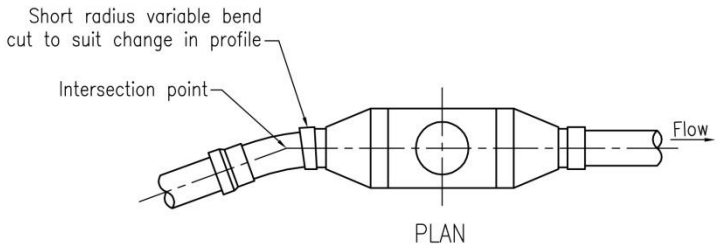


LID DETAILS

SEWER MAINTENANCE SHAFT DETAILS FOR ALL ENVIRONMENTS	Date: APRIL 2010 Revision: R0
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	Scale: Scale: NTS SHEET No. 38

WDC 8036

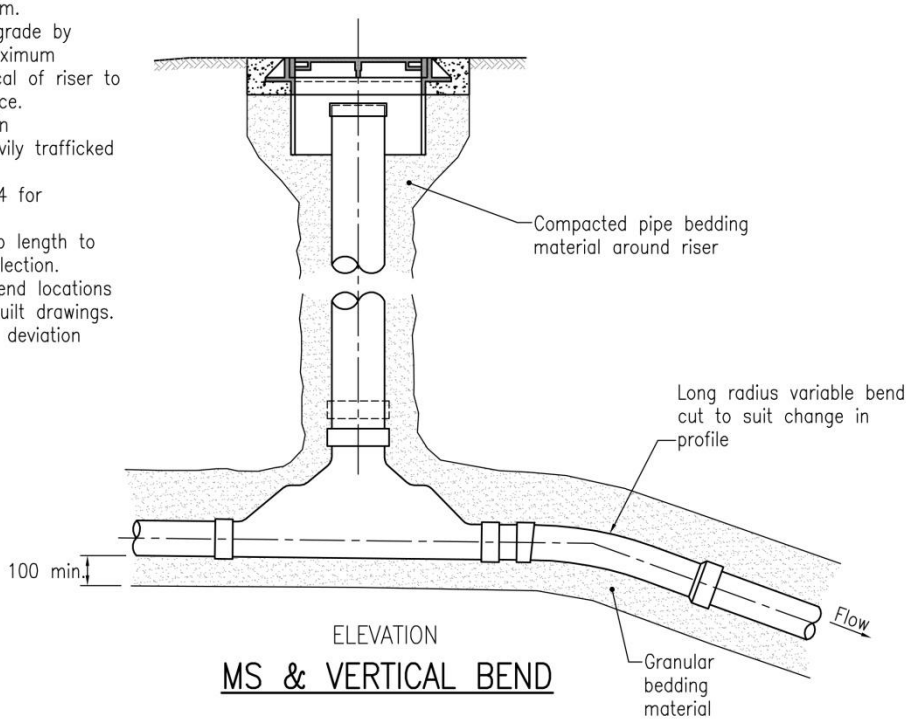
Sheet 39 Sewer Maintenance Shaft Bend Details



PLAN

MS & HORIZONTAL BEND

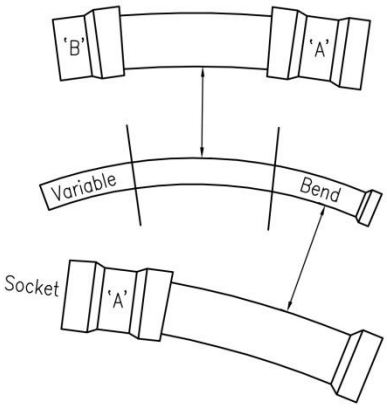
NOTES:
1. For use with DN150 and DN225 pipes only.
2. Maximum depth 3.6m.
3. Adjust MS to pipe grade by tilting chambers. Maximum deviation from vertical of riser to be 300mm at surface.
4. Not to be located in carriageways or heavily trafficked areas.
5. See Section 5.10.3.4 for restrictions of use.
6. Variable bend cut to length to achieve required deflection.
7. Record details of bend locations and angles on as built drawings.
8. Maximum horizontal deviation shall be 33°.



ELEVATION

MS & VERTICAL BEND

LEGEND



TYPICAL VARIABLE BENDS

SEWER MAINTENANCE SHAFT BEND DETAILS FOR ALL ENVIRONMENTS	Date: APRIL 2010 Revision: R0 Scale: Scale: NTS SHEET No. 39
WHANGAREI DISTRICT COUNCIL ENVIRONMENTAL ENGINEERING STANDARDS	

WDC 8036