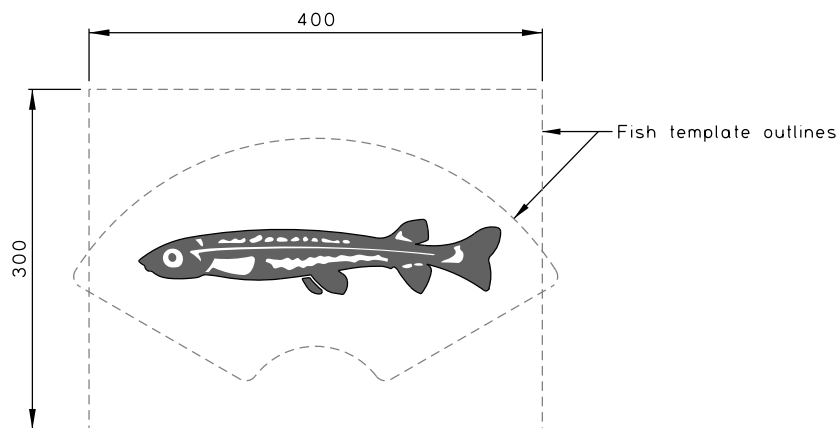
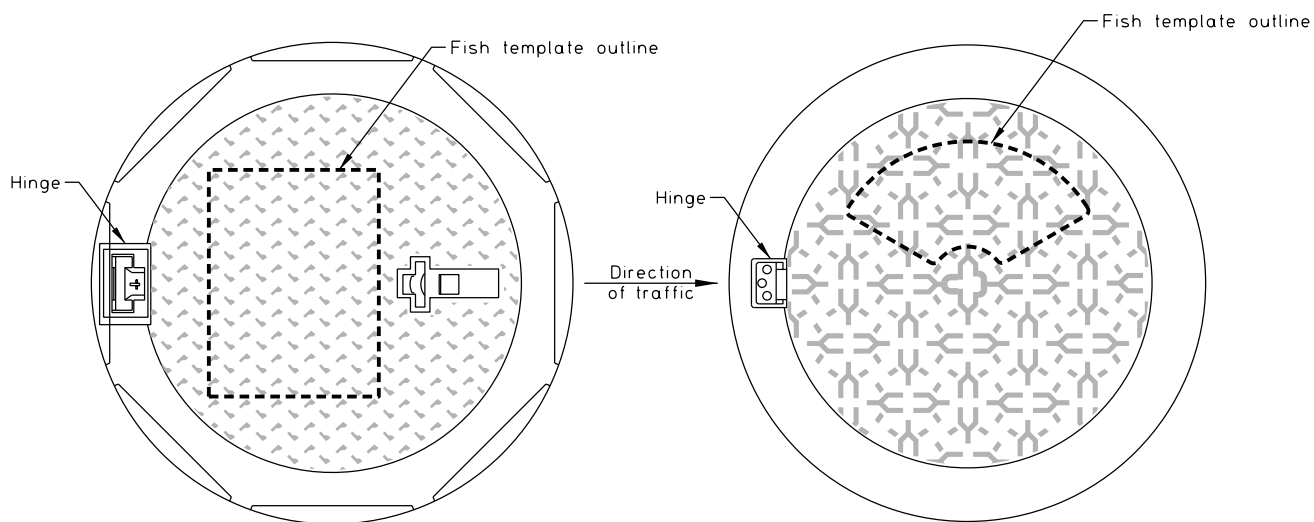


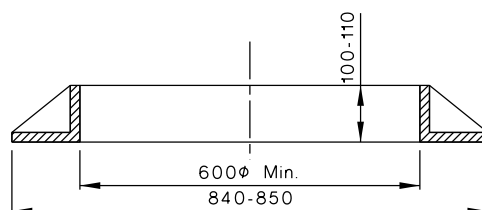


OPTIONAL
FISH TEMPLATE



FRAME PLAN

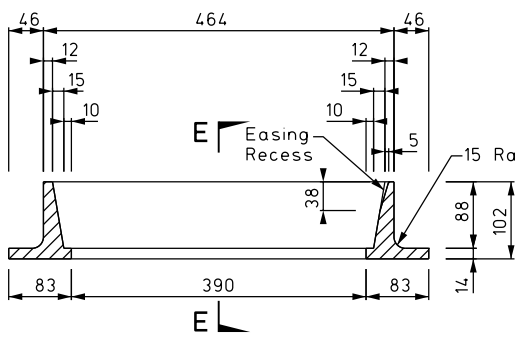
FRAME PLAN



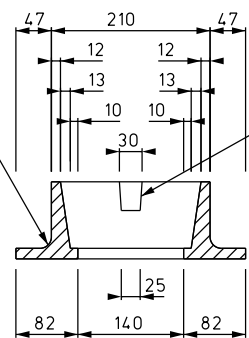
TYPICAL SECTION

NOTES:

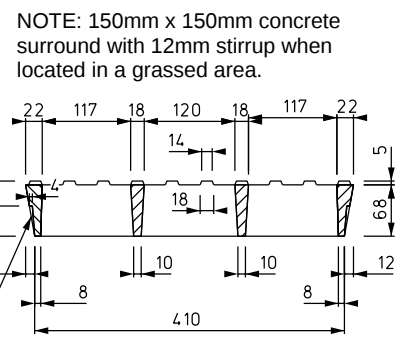
1. Manholes to comply with CCC approved materials list including lid markings (not shown).
2. Plan and section are diagrammatic.
3. Sump grates to be AS 3996 Class C.
4. Fish template dwg available from CCC on request.
5. Manhole hinge to be installed in direction of traffic.
6. Frames to be fixed to concrete with 316 stainless threaded rod, nuts and washers.



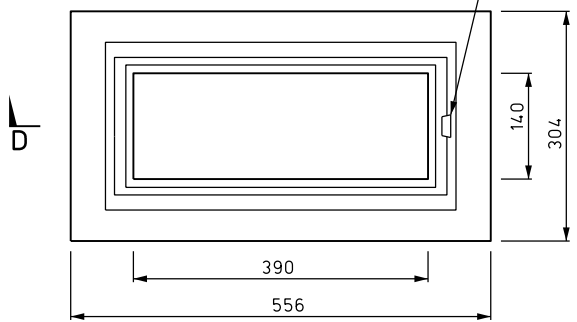
SECTION D-D



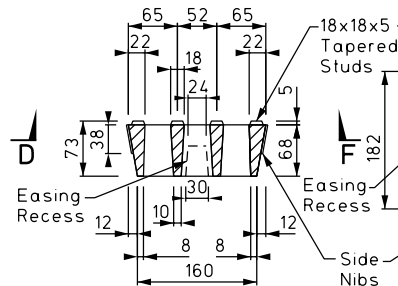
SECTION E-E



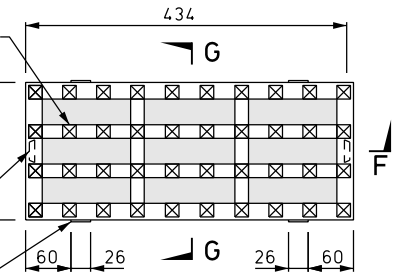
SECTION F-F



PLAN OF VENT FRAME

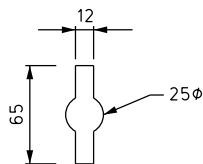


SECTION G-G

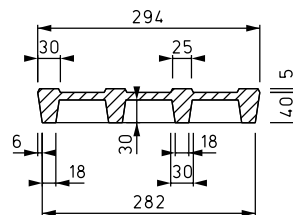


PLAN OF COVER

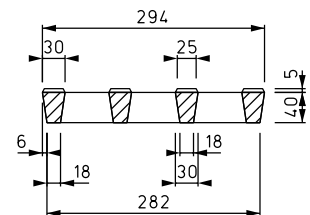
VENT FRAME AND COVER



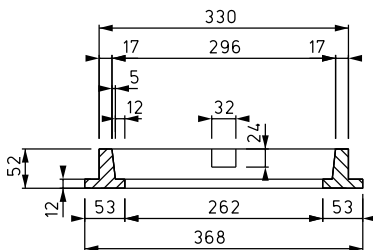
KEYWAY



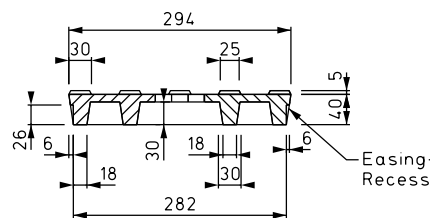
SECTION I-I



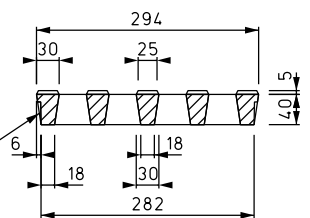
SECTION K-K



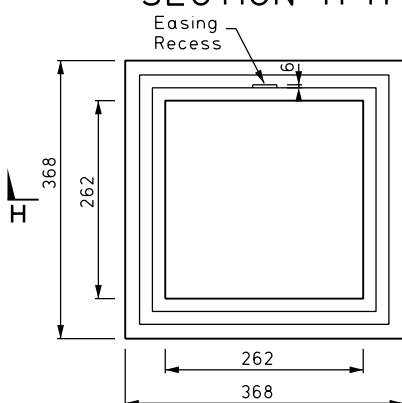
SECTION H-H



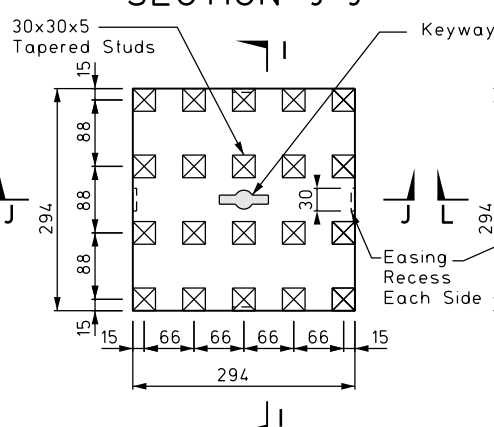
SECTION J-J



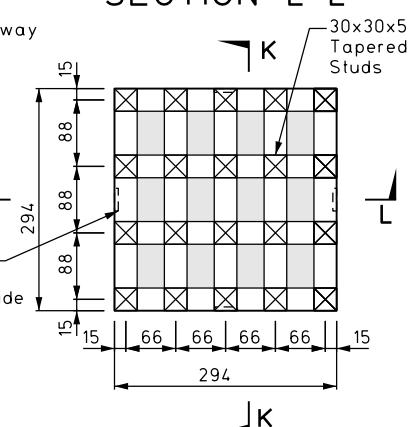
SECTION L-L



PLAN OF FRAME

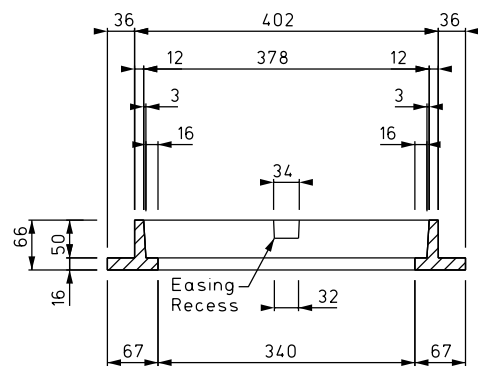


PLAN OF COVER
WITHOUT HOLES

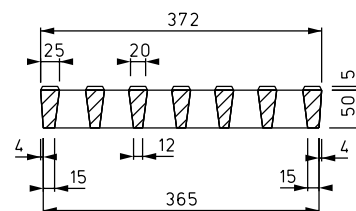


PLAN OF COVER WITH HOLES

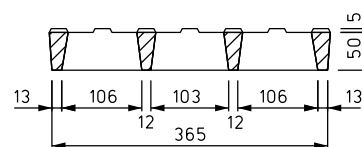
TRAFFICABLE HOUSE DRAIN SUMP FRAME AND COVERS



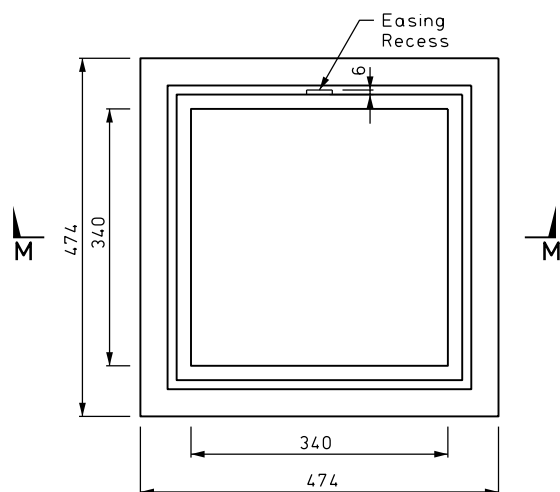
SECTION M-M



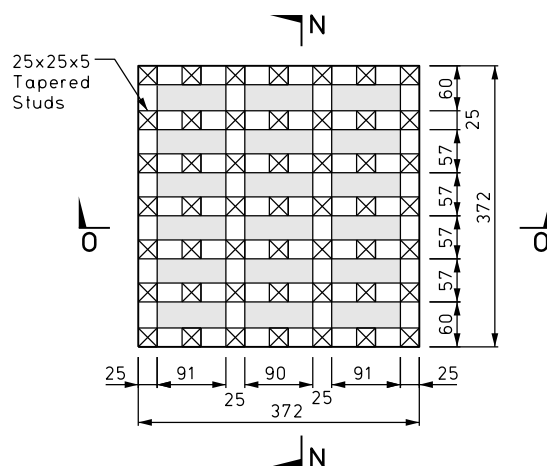
SECTION N-N



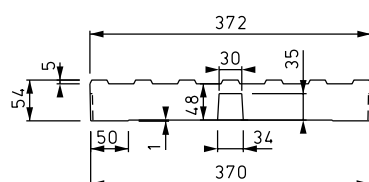
SECTION 0-0



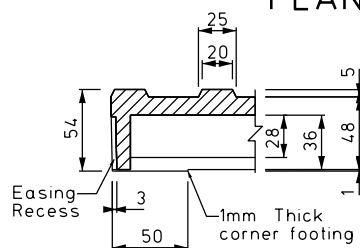
PLAN OF FRAME



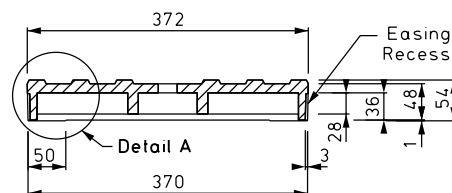
PLAN OF COVER WITH HOLES



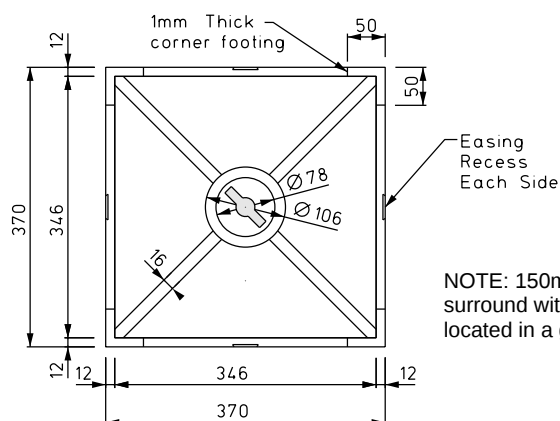
ELEVATION OF COVER



DETAIL A

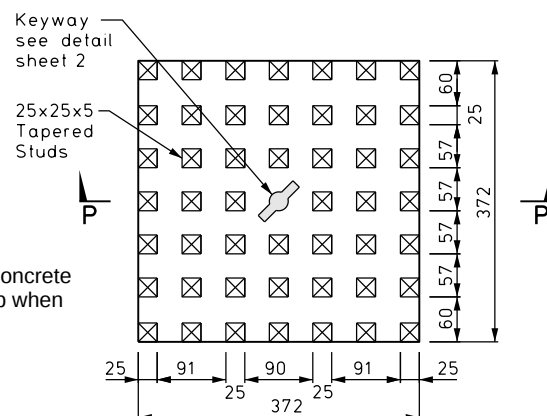


SECTION P-P

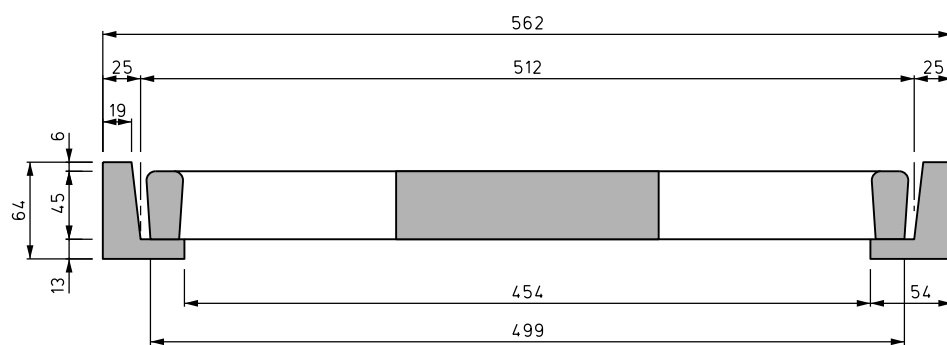


PLAN OF UNDERSIDE
OF COVER

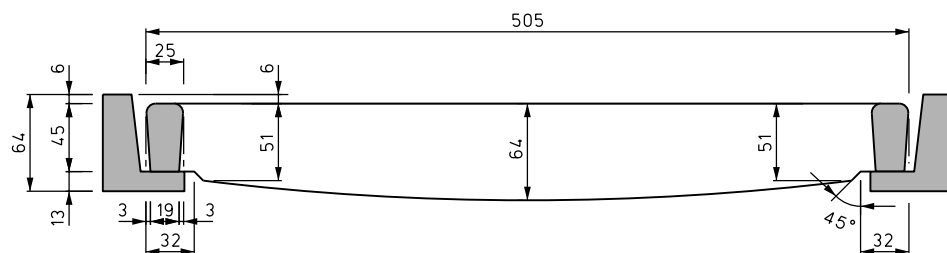
NOTE: 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.



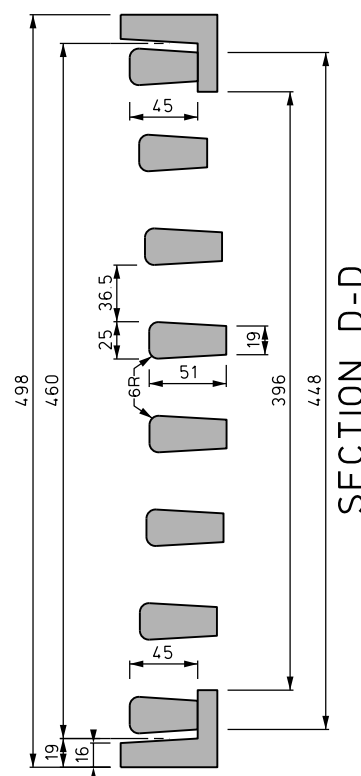
PLAN OF COVER
WITHOUT HOLES



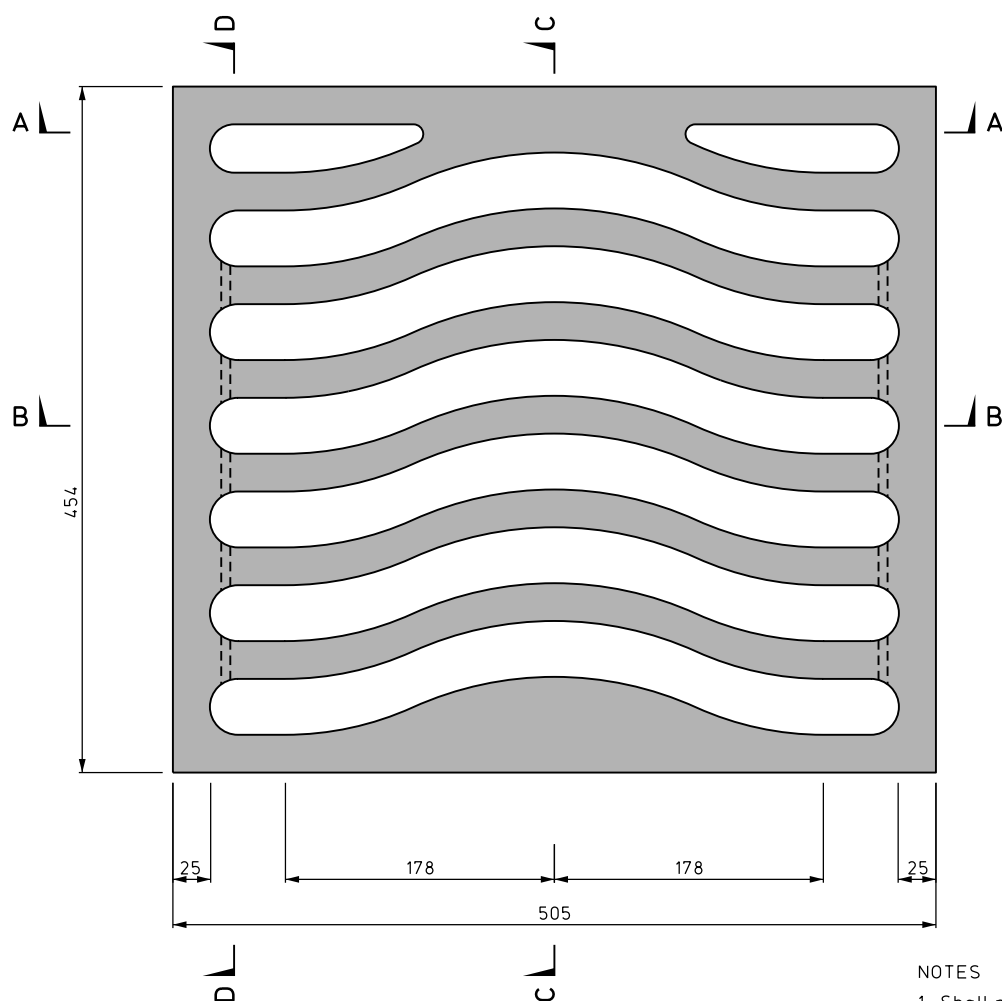
SECTION A-A



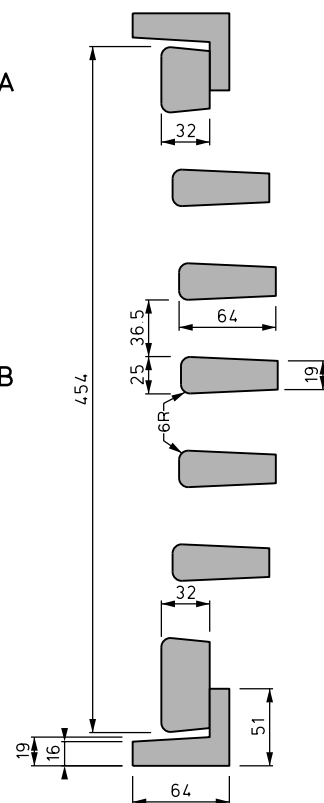
SECTION B-B



SECTION D-D



PLAN



SECTION C-C

NOTES

1. Shall not be installed in cycleways.
2. Sections A-A & B-B are parallel to kerb.
3. Grate pattern indicative.

To comply with AS3996 clause 3.3.6

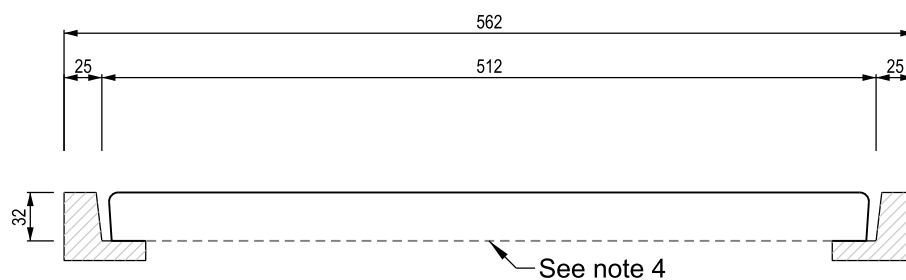
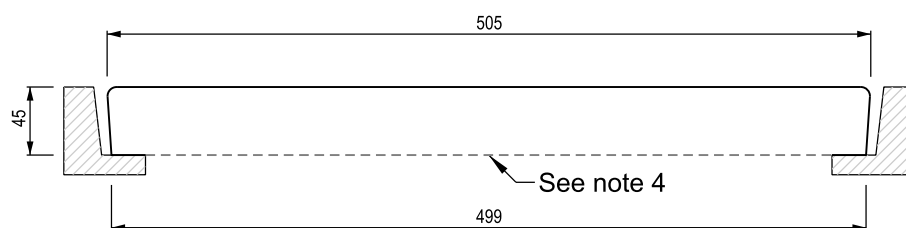
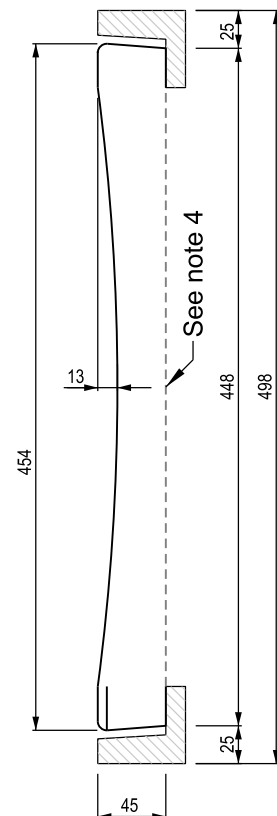
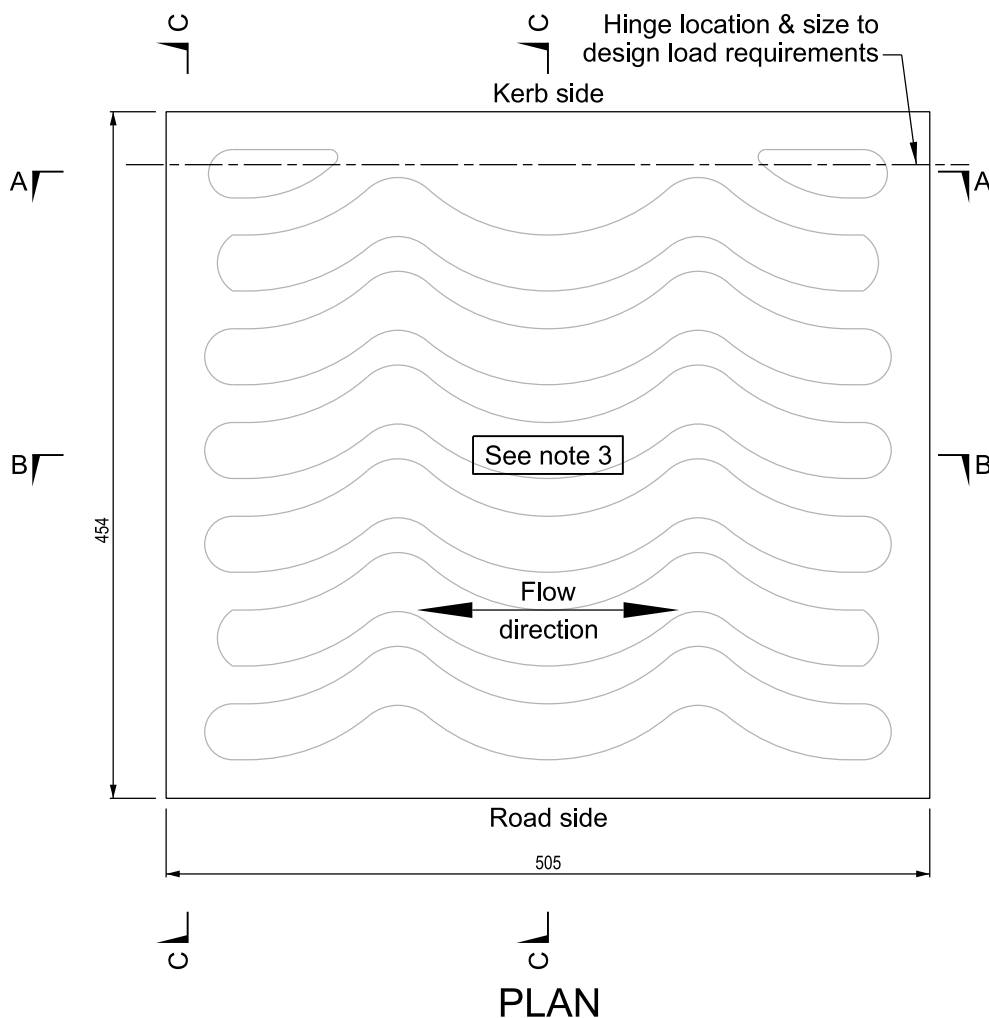
[illegible]

Technical drawing of a hinge pin assembly. The drawing shows a side view of the assembly with the following dimensions:

- Overall length: 559
- Pin diameter: ϕ Hinge pin
- Pin length: 16
- Pin offset from end: 64
- Pin offset from end (other side): 19
- Pin offset from end (other side): 31
- Pin offset from end (other side): 25
- Pin offset from end (other side): 87
- Pin offset from end (other side): 48
- Pin offset from end (other side): 13
- Pin offset from end (other side): 19
- Pin offset from end (other side): 51
- Pin offset from end (other side): 457
- Pin offset from end (other side): 51
- Pin offset from end (other side): 19

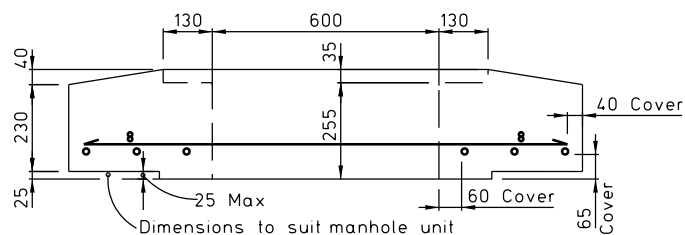
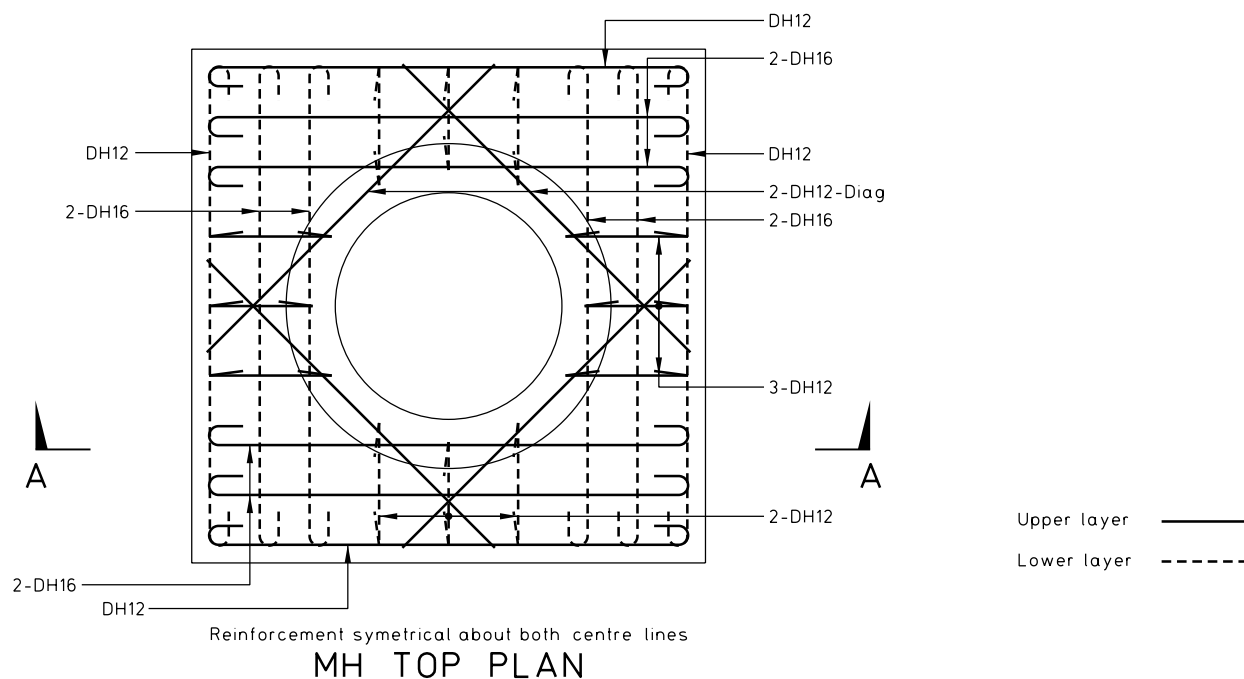
SECTION B-B

1. Shall not be installed in cycleways or vehicle crossings.
2. Standard sumps require project specific approval and shall only be installed where approval in writing given by the Engineer.

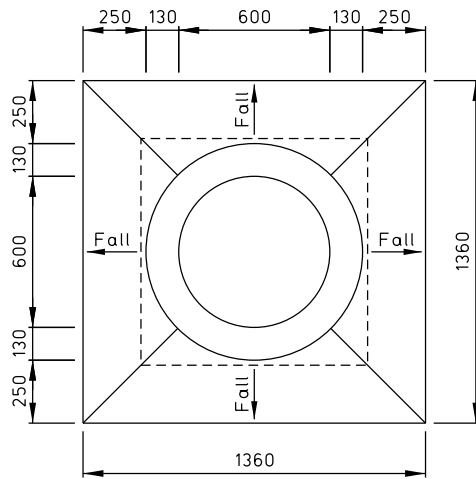


NOTES:

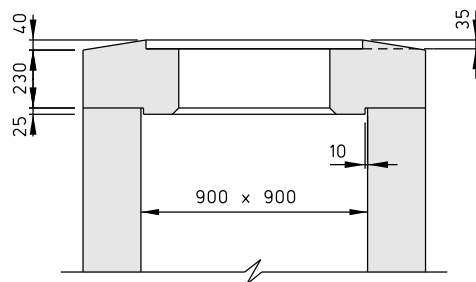
1. Sumps in cycleways shall use this grate.
2. Sections A-A & B-B are parallel to kerb.
3. Sumps to comply with CCC approved materials list including lid markings (not shown).
4. Grate slot pattern layout is indicative.
Grate pattern must comply with AS3996 clause 3.3.6 or 4.2.2.2 - 4.2.2.4
5. Grate hinge and bar dimensions to be determined by design load requirements.



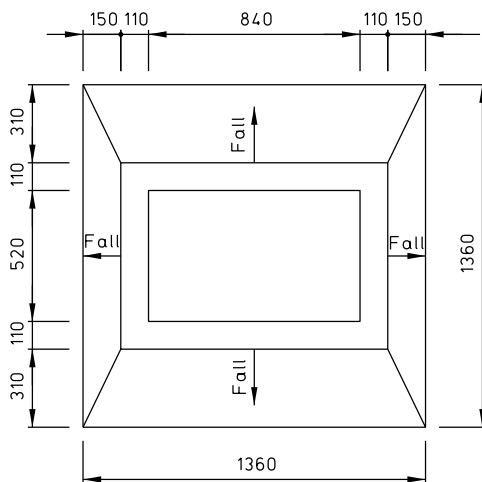
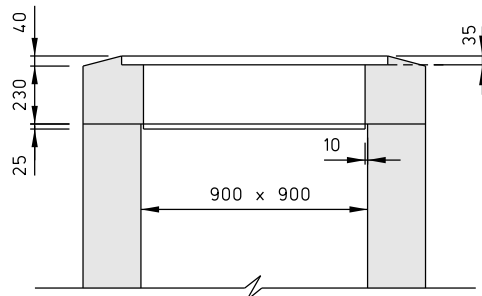
NOTES:



MH PLAN



PRECAST TOP MH

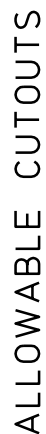
DOUBLE COVER MH
PLANPRECAST TOP
DOUBLE COVER MH

NOTES:

1. These tops are to fit cast in-situ square manholes only.
2. Precast tops to be seated on a cement sand mortar bed. Excess mortar on inside of MH to be struck clean.
3. Where manhole cover requires adjustment above the rebate use concrete to retain cover in position.
4. 2 M12 cast in fixings in precast tops for lifting.
5. See the notes on SD303/3.
6. See plan SD301/1, 2 & 7 for manhole frames & lids.
7. Concrete work to comply with NZS 3109.
8. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.



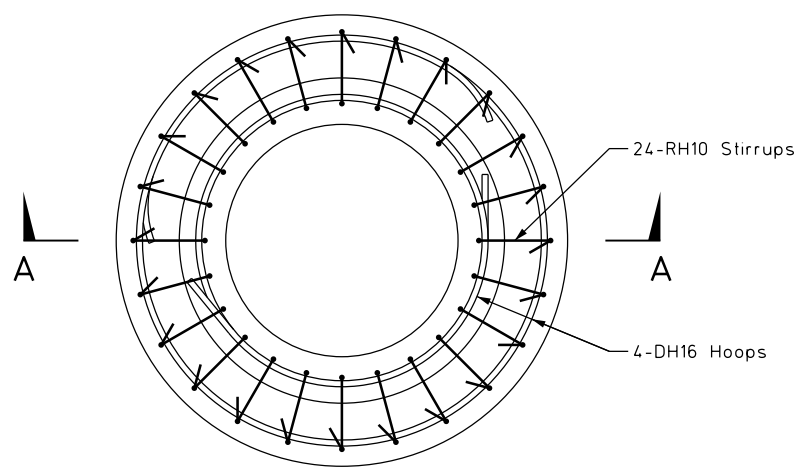
SHEET 1 of 5



150mm x 150mm concrete
surround with 12mm stirrup
when located in a grassed area.

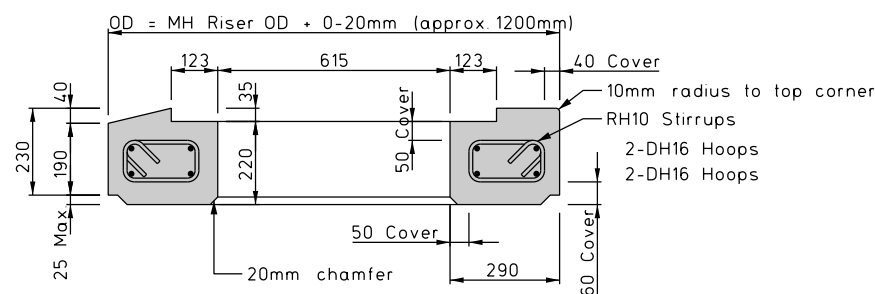


- 1) Notes on SD303/3 apply.
- 2) For manhole top slab reinforcement steel refer to SD303/2
- 3) 100mm risers not allowed



Reinforcement symetrical
about both centre lines

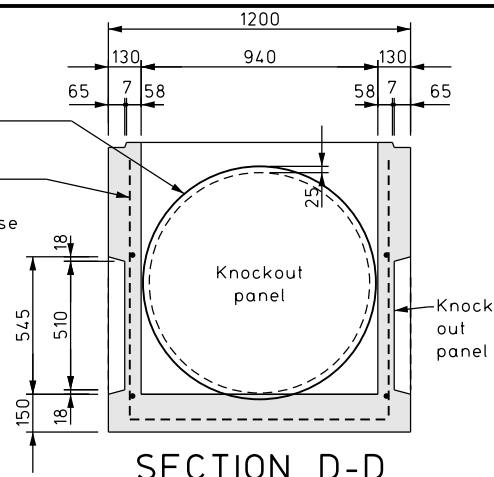
MH PLAN



SECTION A-A
SLOPED OR SQUARE TOP OPTIONS

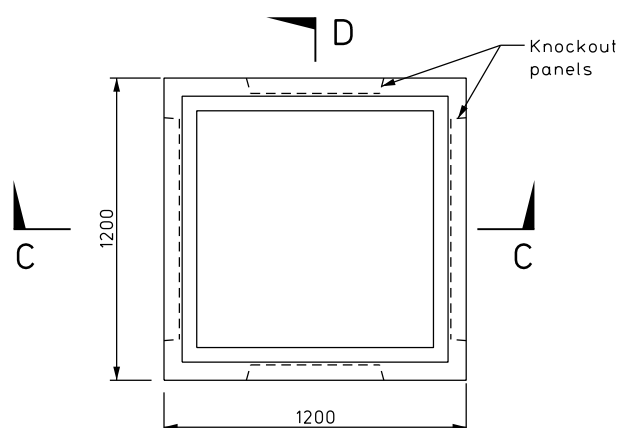
NOTES:

- 1. All concrete to be 40 MPa.
- 2. All manhole tops to be precast.
- 3. Design Loading: HN-HO-72
- 4. Reinforcing shall be grade 500
- 5. Design life 100 years.
- 6. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.

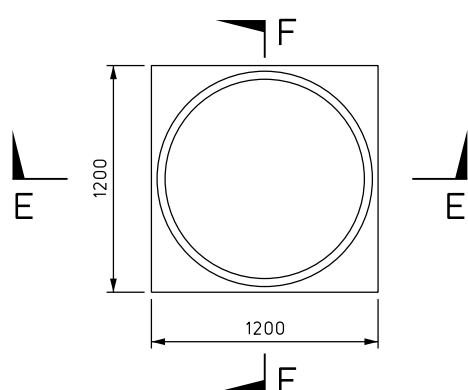


SECTION C-C

SECTION D-D



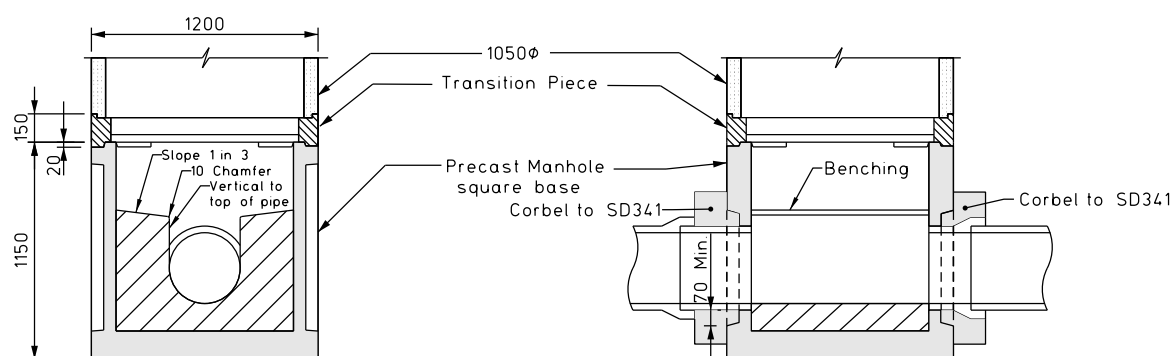
PLAN PRECAST MANHOLE



PLAN TRANSITION PIECE

- NOTES:

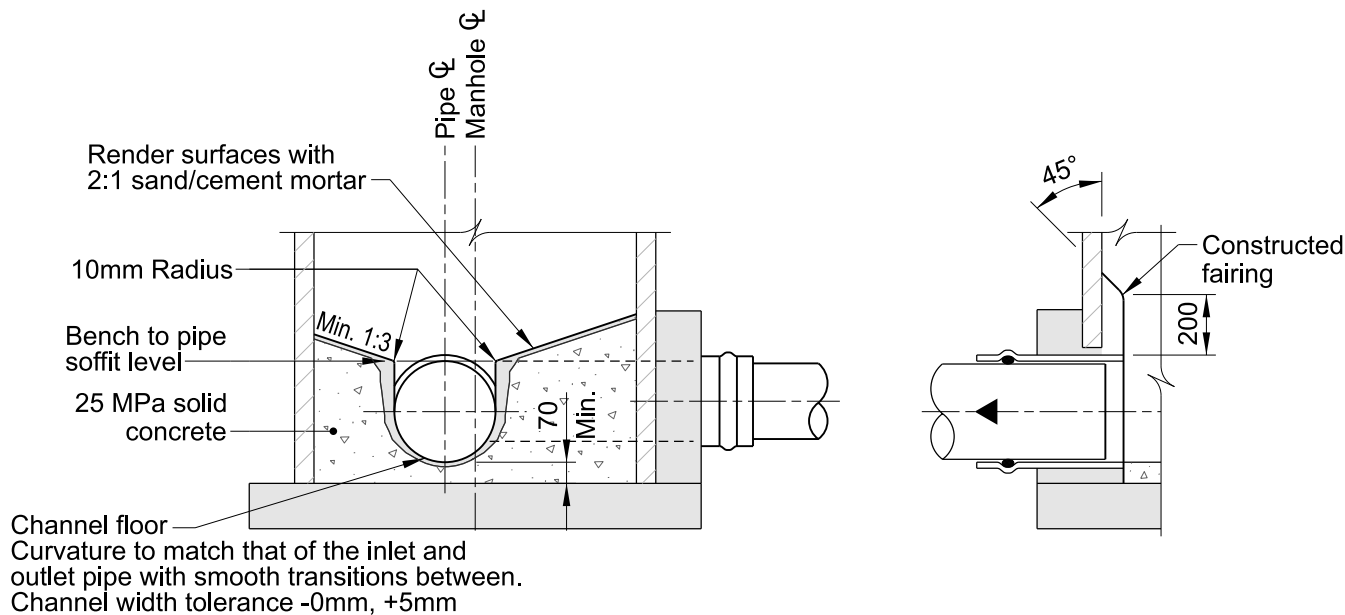
1. Joints shall not exceed 5mm at any point.
2. All joints are to be positioned as high as possible.
3. A 300mm riser or shorter shall be placed immediately below the manhole top.
Use the deepest risers possible to achieve the height, to minimise joints.
4. Construction sealant shall be used for sealing all joints.
All joints shall be clean. Jointing work shall be protected from rain.
All sealant joints shall be butted, with a short lapping piece on the outside.
5. Benching details shall be in accordance with SD303/1.
6. Circular base precast manholes shall be used for pipes up to 400mm OD,
square base precast manholes for pipes up to 750 ϕ except where the pipe changes direction in the manhole where the maximum reduces to 675 ϕ .
7. Maximum Depth (G.L. to invert) for standard manholes shall be 5m.
8. Resistance to flotation is dependent on well compacted backfilling.
9. Unused Knockout panels to be filled to full wall width.
10. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.



SECTION E-E

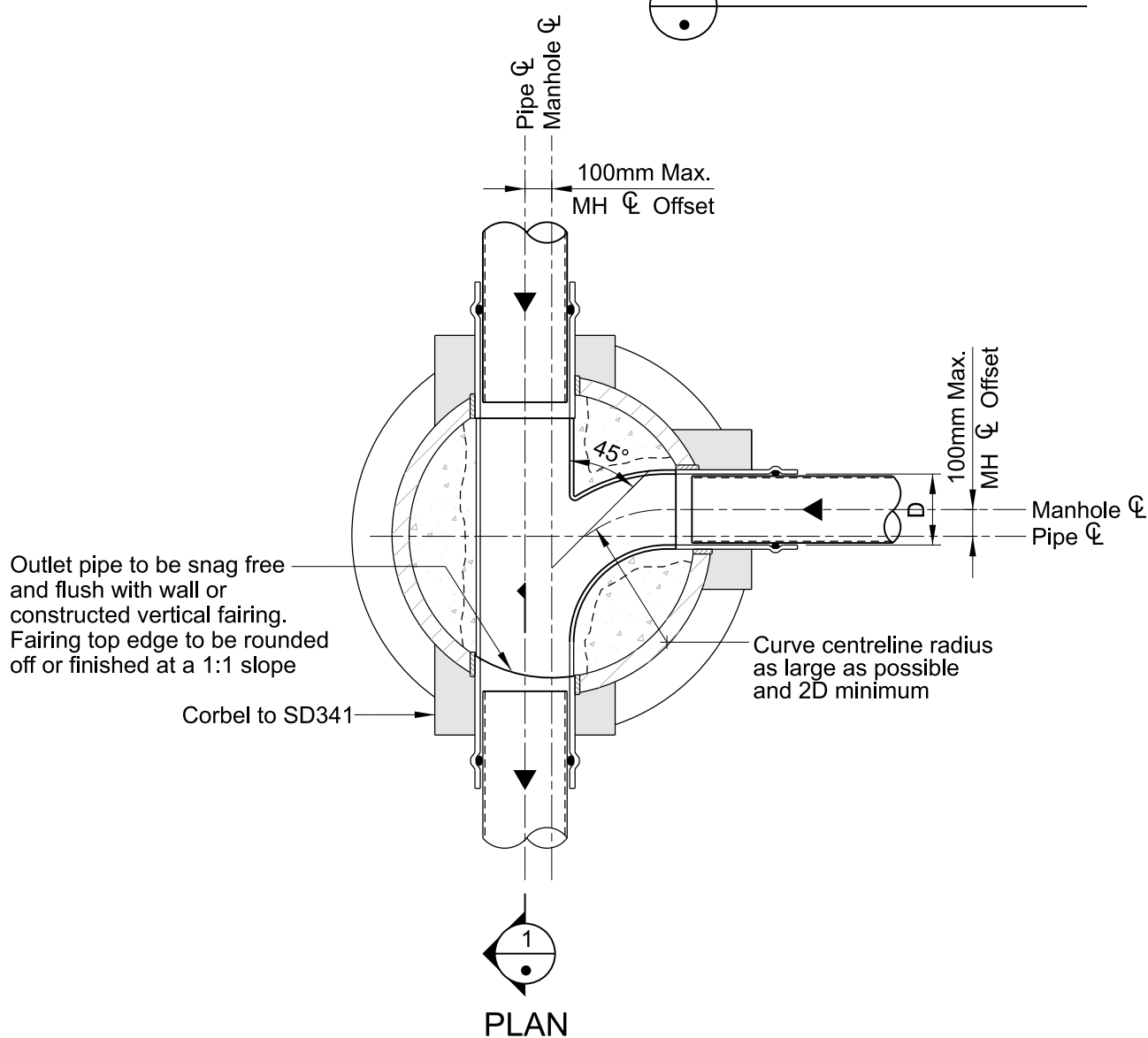
SECTION F-F

PRECAST MANHOLE AND TRANSITION PIECE

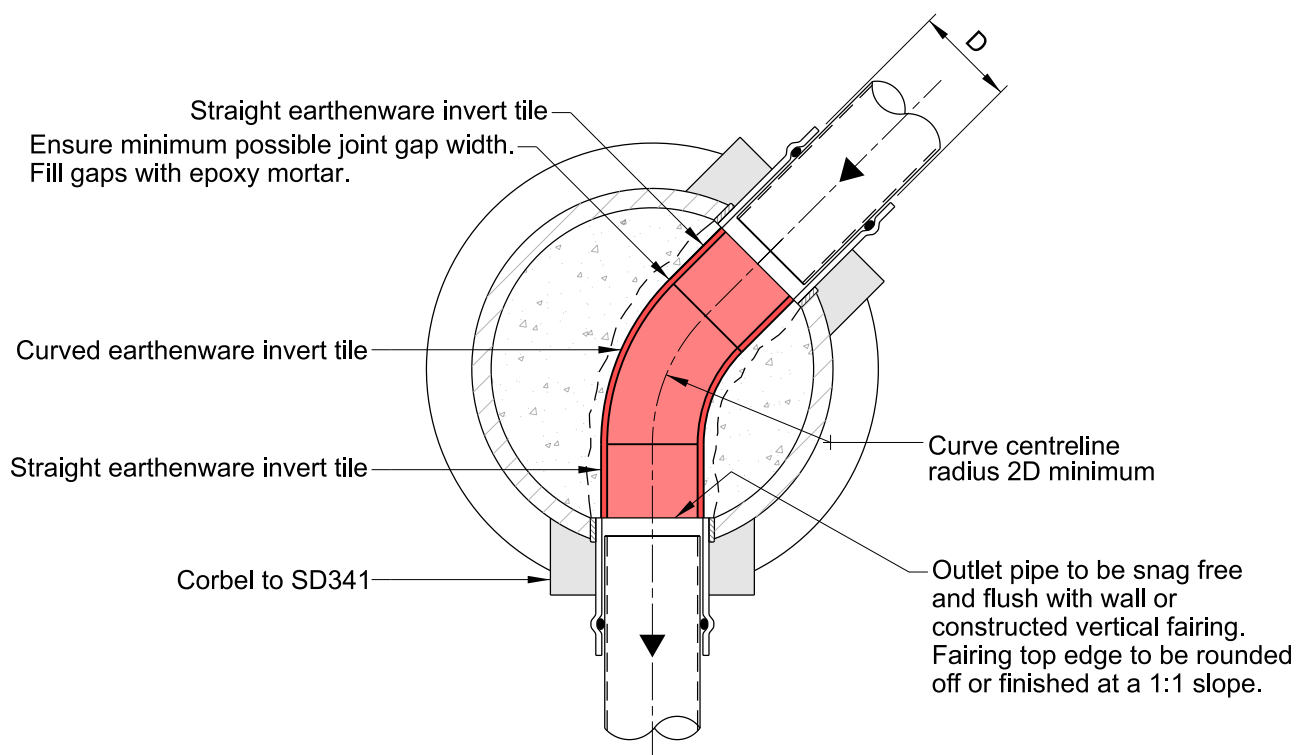
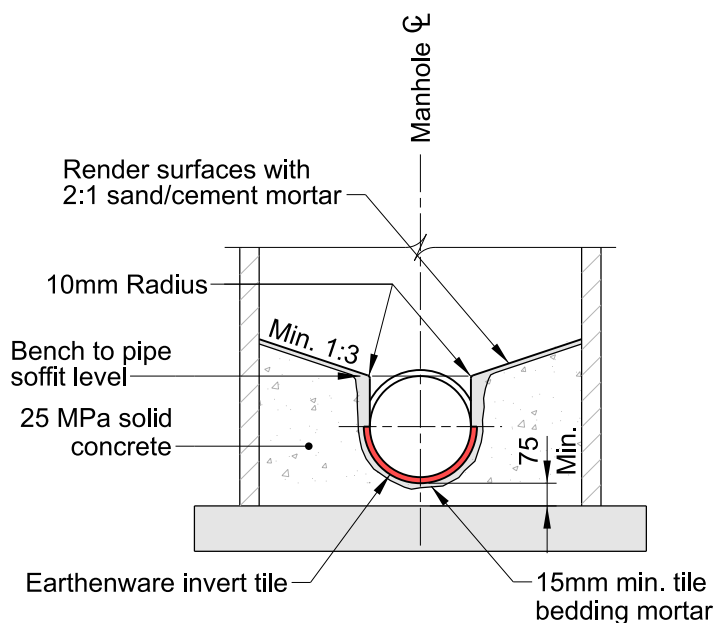


SECTION

1 FAIRING ALTERNATIVE

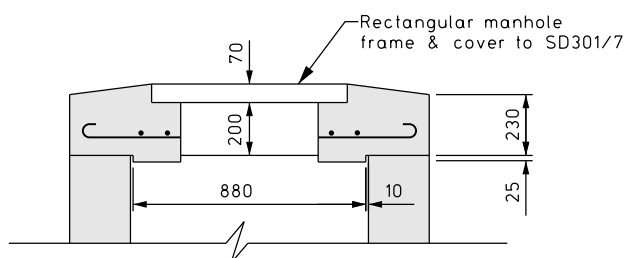
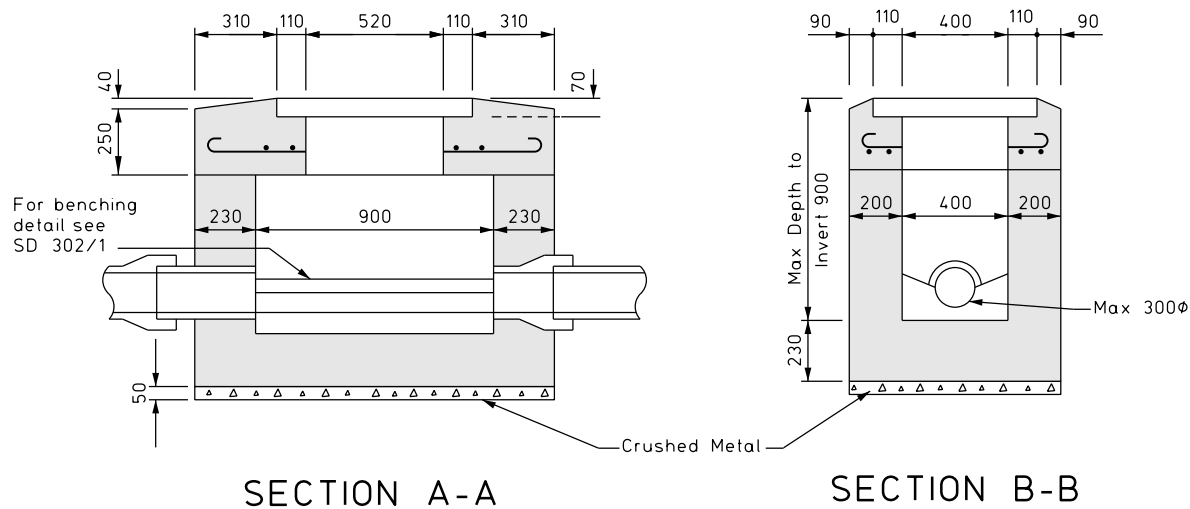


1. Fall from 100Ø lateral invert to outlet invert of main line sewer shall be 50mm.
2. This requirement applies to manholes at the top end of a sewer line only.
3. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.

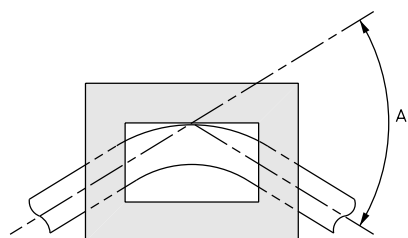
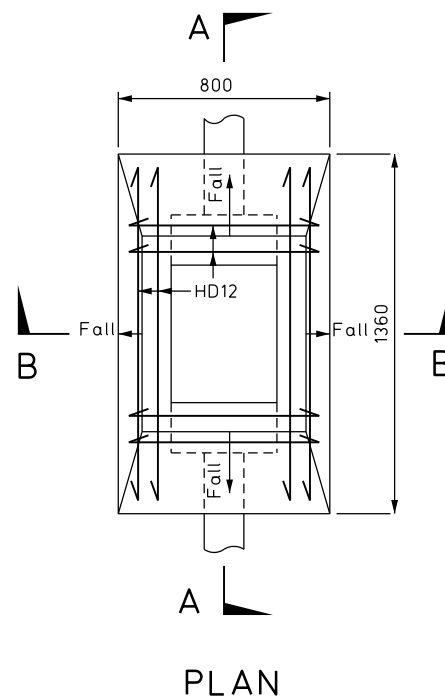


NOTES:

1. Fall from 100Ø lateral invert to outlet invert of main line sewer shall be 50mm.
2. This requirement applies to manholes at the top end of a sewer line only.
3. Tiled inverts may be installed only in manholes with no sideline junctions.
4. Only factory made invert tiles are to be used.



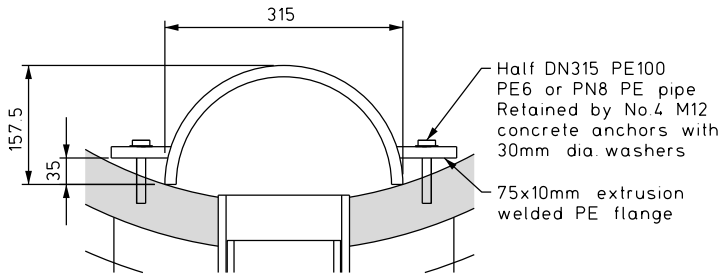
NOTE:
150mm x 150mm concrete surround with
12mm stirrup when located in a grassed area.



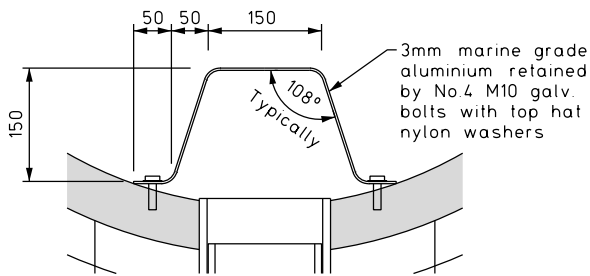
		Nominal Pipe Diameter					
		100	150	200	225	250	300
Maximum angle of deviation for Narrow Manhole.	A	30°	26°	20°	20°	18°	15°

NOTES:

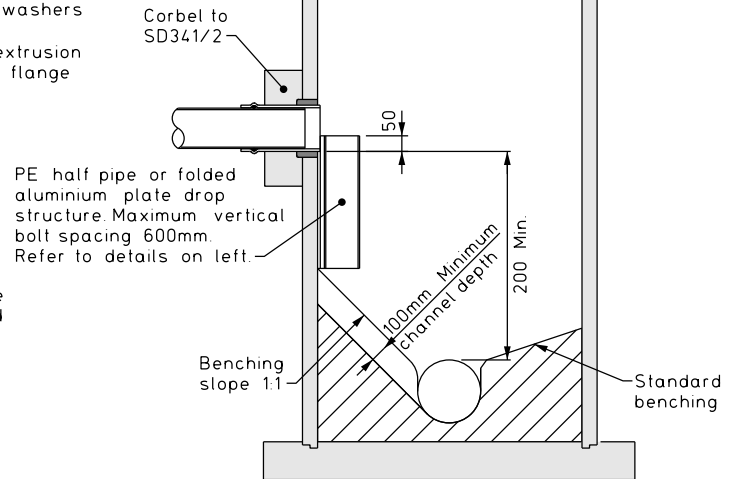
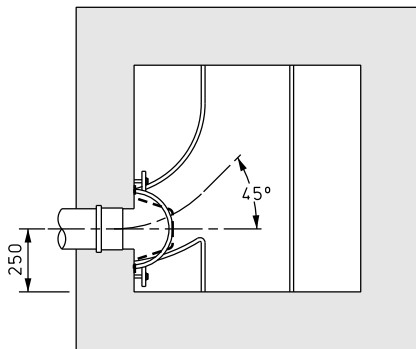
- Notes on sheet SD302/2 apply.
- For site constructed structures, minimum concrete cover to all reinforcement is 40mm.



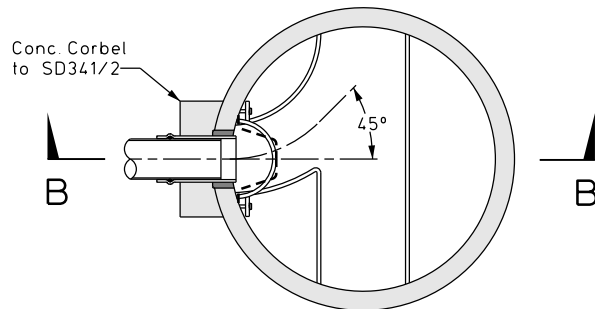
PE STRUCTURE



ALUMINIUM STRUCTURE

SECTION B-B
DROP INSTALLATION
CIRCULAR PRECAST MANHOLE

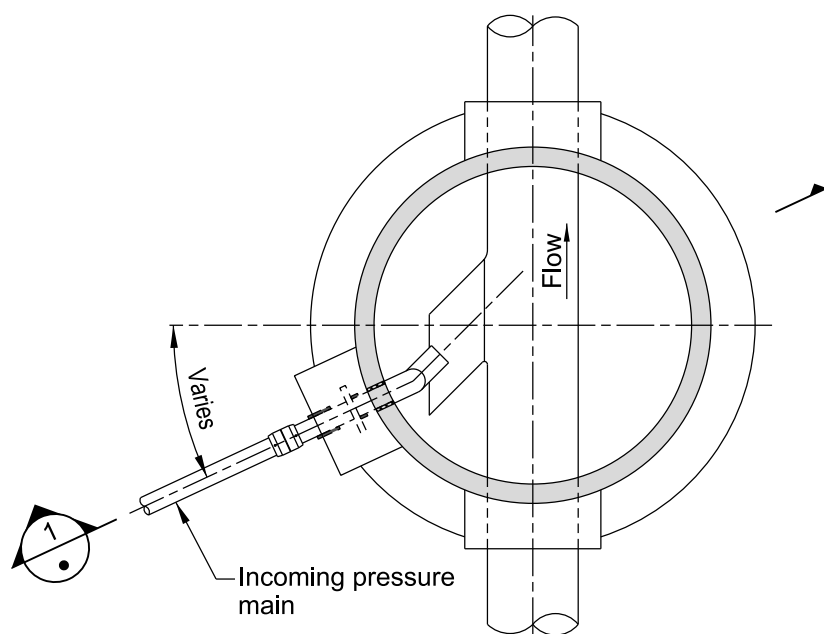
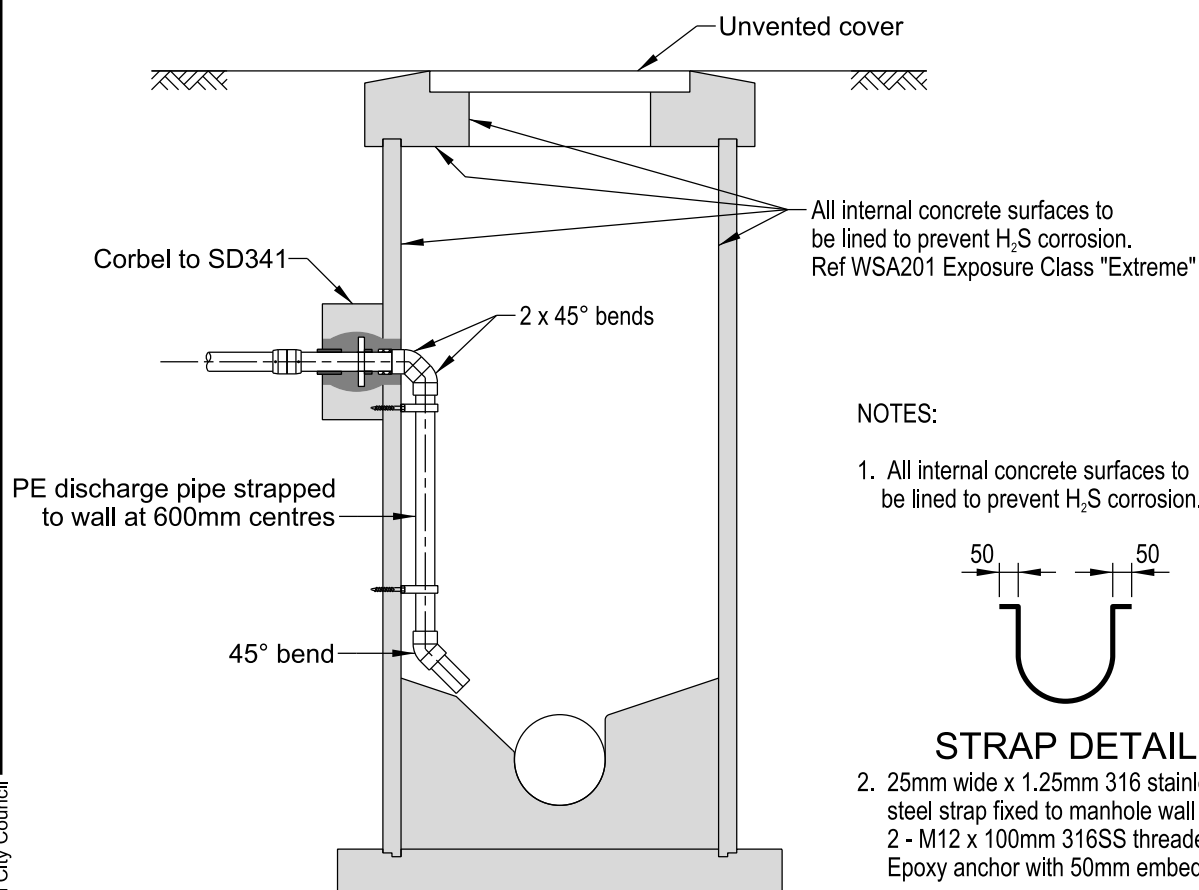
PLAN



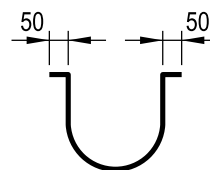
PLAN

NOTES:

1. Drop structures over 225 ϕ require special design
2. Manholes to be constructed as detailed on plans SD 302 & 303. Pipelaying at manholes to be constructed as detailed on plan SD341.
3. Channelling in new manholes shall be vertical to top of main sewer and benching graded at 1 in 3 as applicable.
4. Benching and channelling in existing manholes shall be reformed in easy curves.
5. Opening for manhole starter and corbel shall be clear of any joint in precast manhole by at least 300mm.
6. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.
7. Remove all old steps, ladders and fittings. Epoxy over any exposed steel.

**PLAN****SECTION****NOTES:**

1. All internal concrete surfaces to be lined to prevent H₂S corrosion.

**STRAP DETAIL**

2. 25mm wide x 1.25mm 316 stainless steel strap fixed to manhole wall with 2 - M12 x 100mm 316SS threaded studs. Epoxy anchor with 50mm embedment depth.
3. Remove all old steps, ladders and fittings. Epoxy over any exposed steel.



All internal concrete surfaces to be lined to prevent H₂S corrosion.
Ref WSA201 Exposure Class "Extreme"

Bolt into corbel

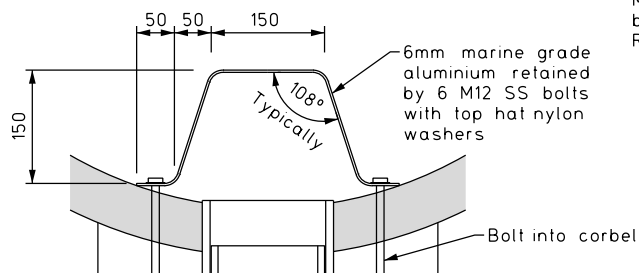
Corbel to SD341/2

Bolt into corbel

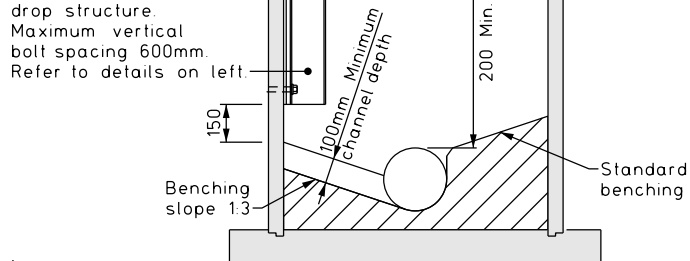
Folded aluminium plate drop structure.

Maximum vertical bolt spacing 600mm.

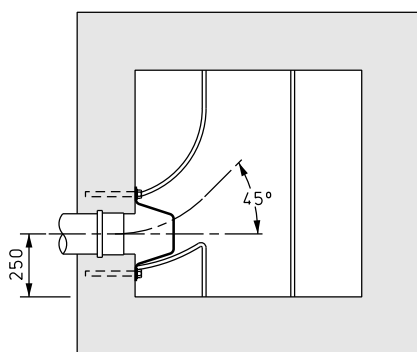
Refer to details on left.



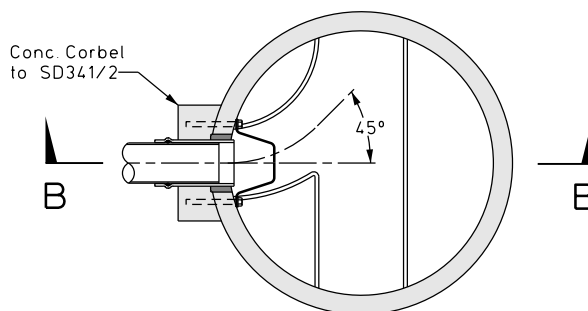
ALUMINIUM STRUCTURE



SECTION B-B
DROP INSTALLATION
CIRCULAR PRECAST MANHOLE



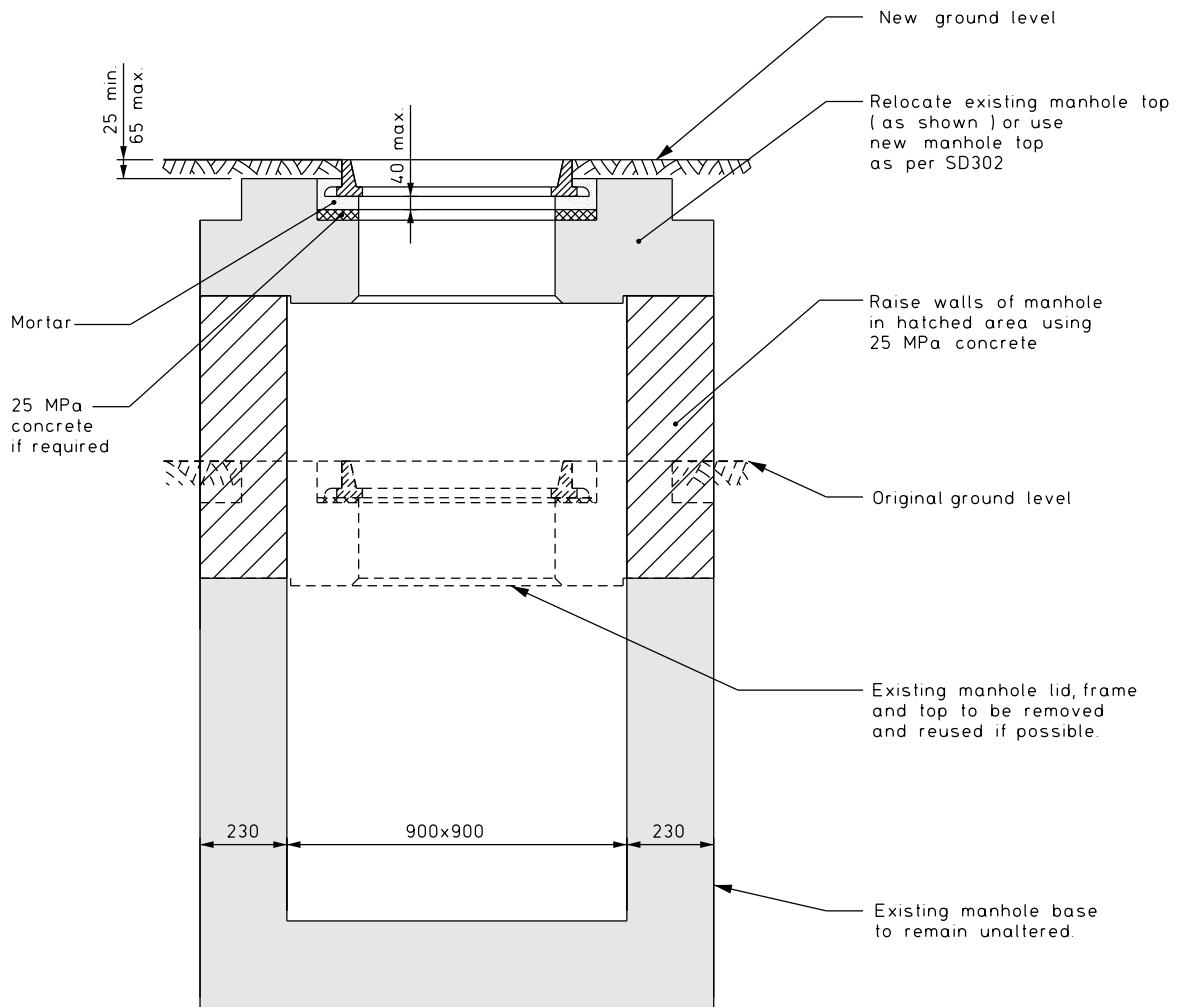
PLAN



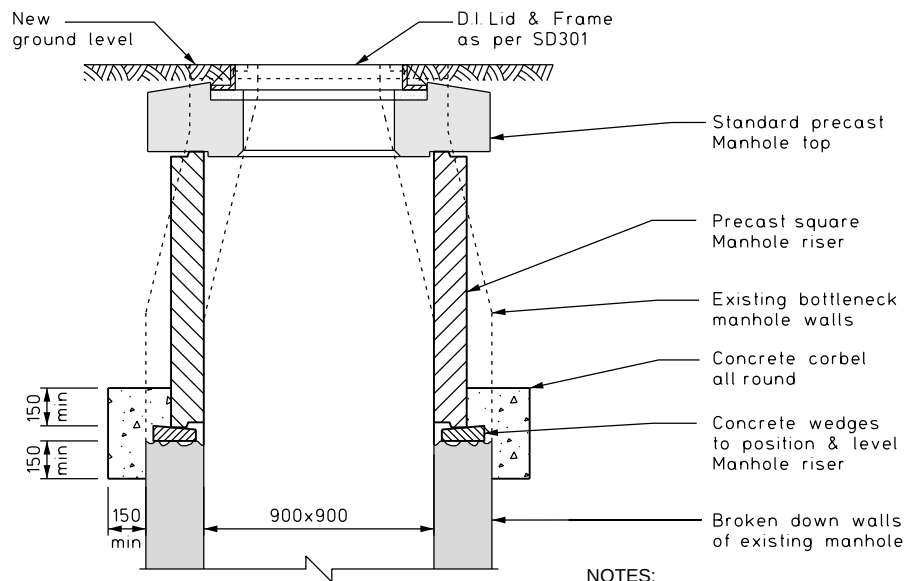
PLAN

NOTES:

- Drop structures over DN180 require special design
- Manholes to be constructed as detailed on plans SD 302 & 303. Pipelaying at manholes to be constructed as detailed on plan SD341.
- Channelling in new manholes shall be vertical to top of main sewer and benching graded at 1 in 3 as applicable.
- Benching and channelling in existing manholes shall be reformed in easy curves.
- Opening for manhole starter and corbel shall be clear of any joint in precast manhole by at least 300mm.
- For PE pressure connections, use SD341 Sheet 5.
- Remove all old steps, ladders and fittings. Epoxy over any exposed steel.



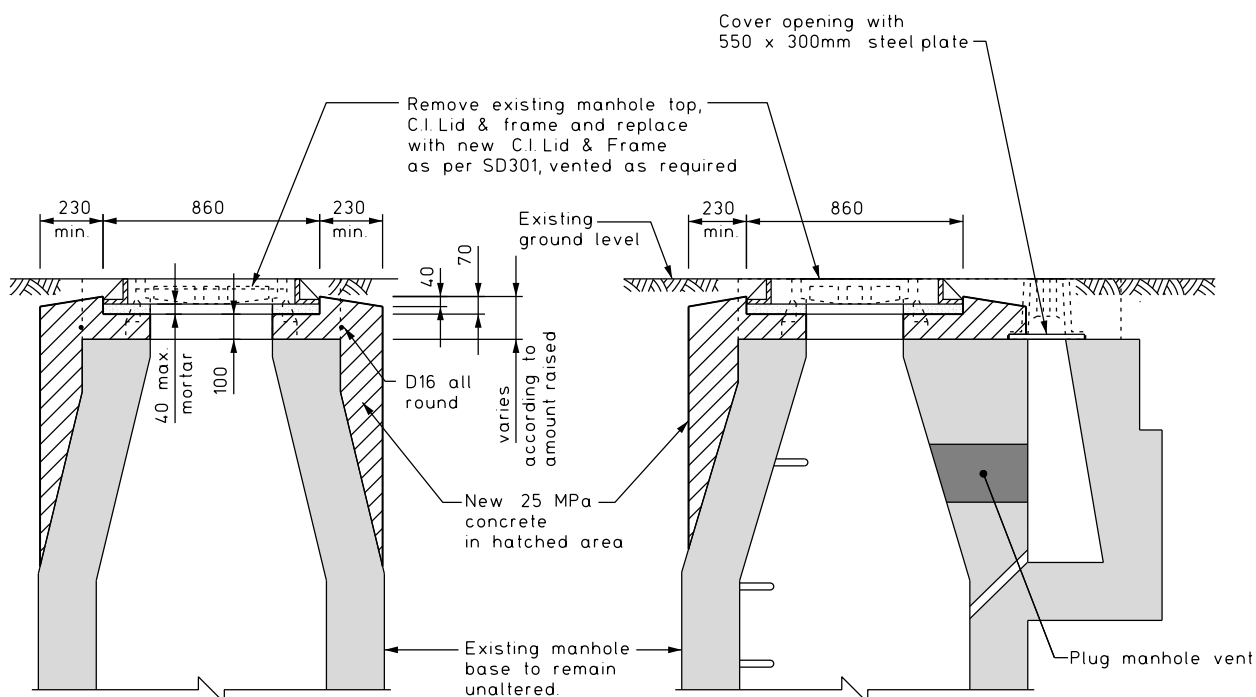
SQUARE MANHOLE LEVEL ADJUSTMENT



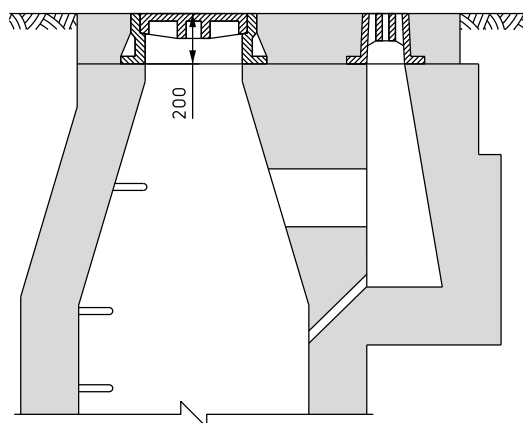
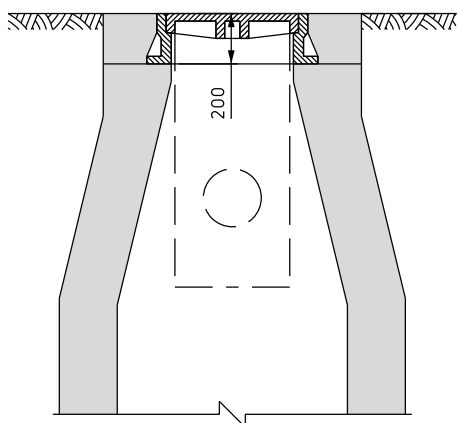
BOTTLENECK MANHOLE LEVEL ADJUSTMENT

NOTES:

1. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.
2. Remove all old steps, ladders and fittings. Epoxy over any exposed steel.



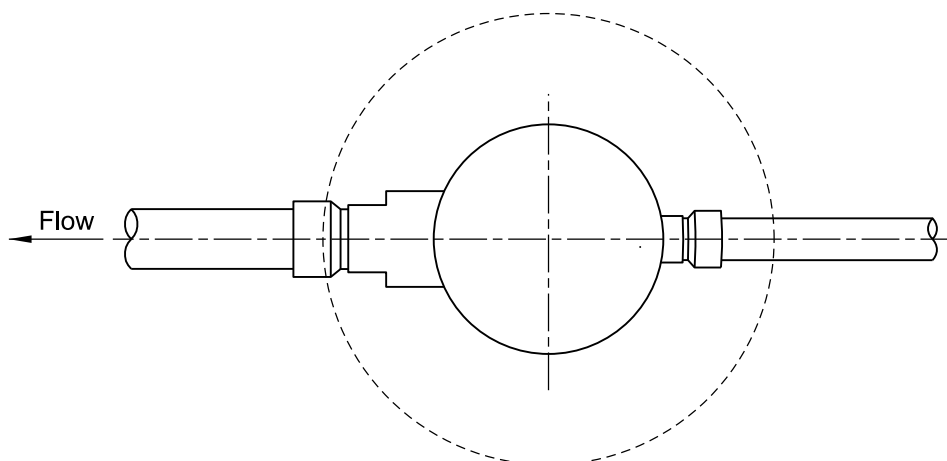
DETAILS OF INSTALLATION OF 100mm FRAME TOP



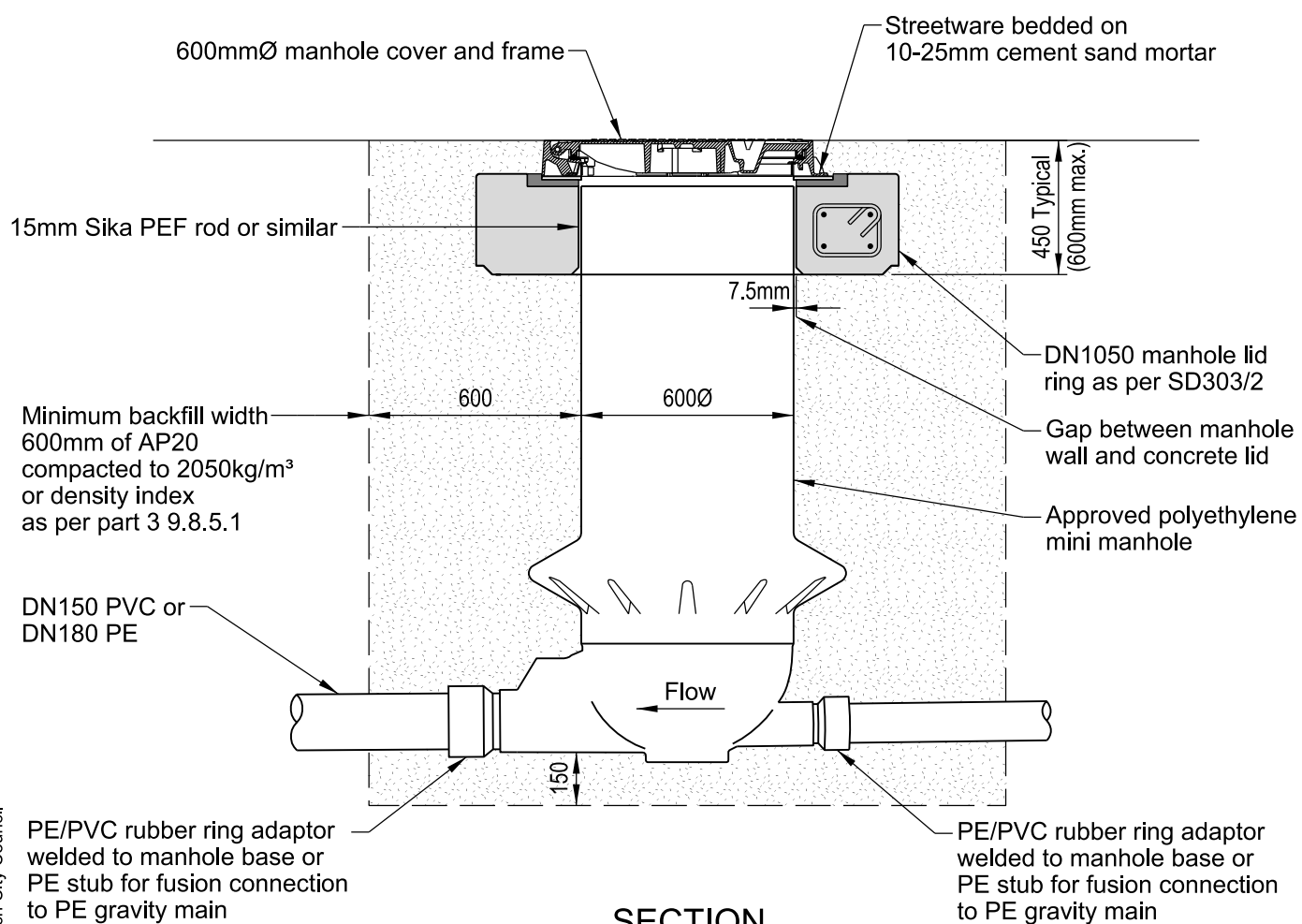
TYPICAL BOTTLENECK MANHOLE SHOWING 200mm FRAME TOP

NOTES:

1. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.
2. Remove all old steps, ladders and fittings. Epoxy over any exposed steel.



PLAN

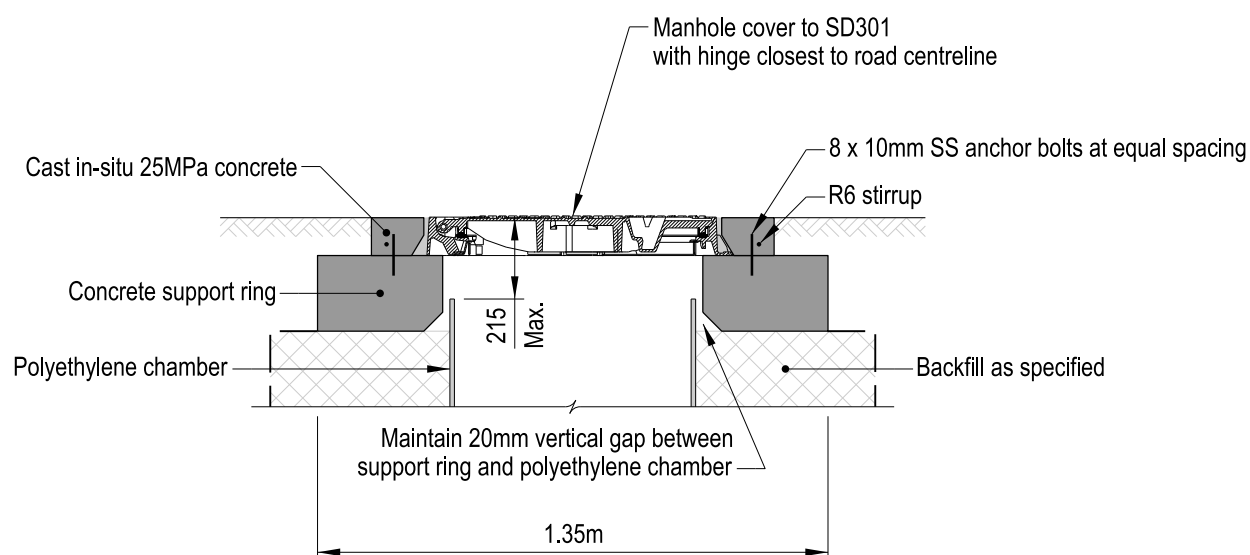


SECTION

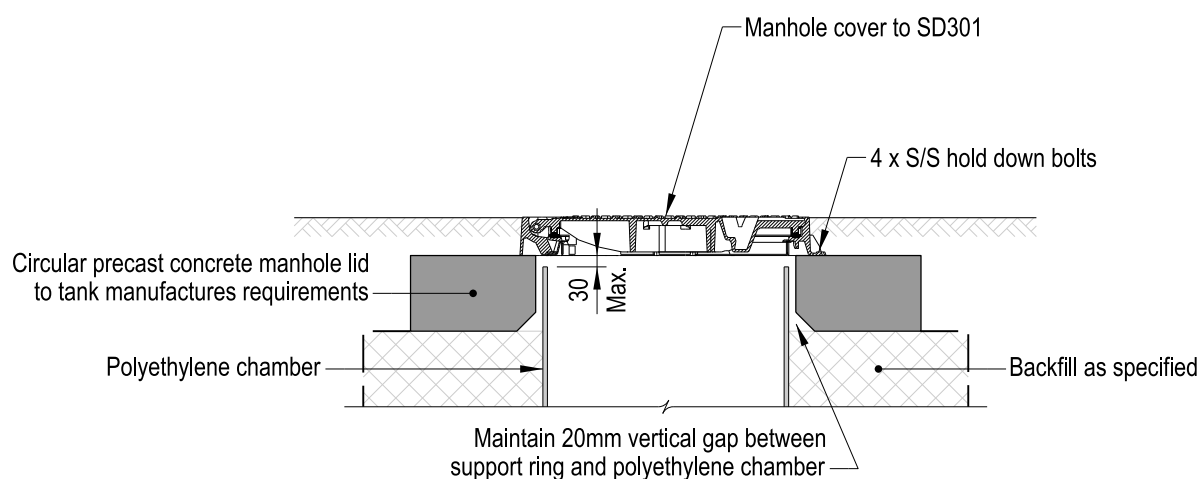
NOTES:

3. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.

1. Maximum depth 2.5m.
2. Load limit AS3996 Class C.

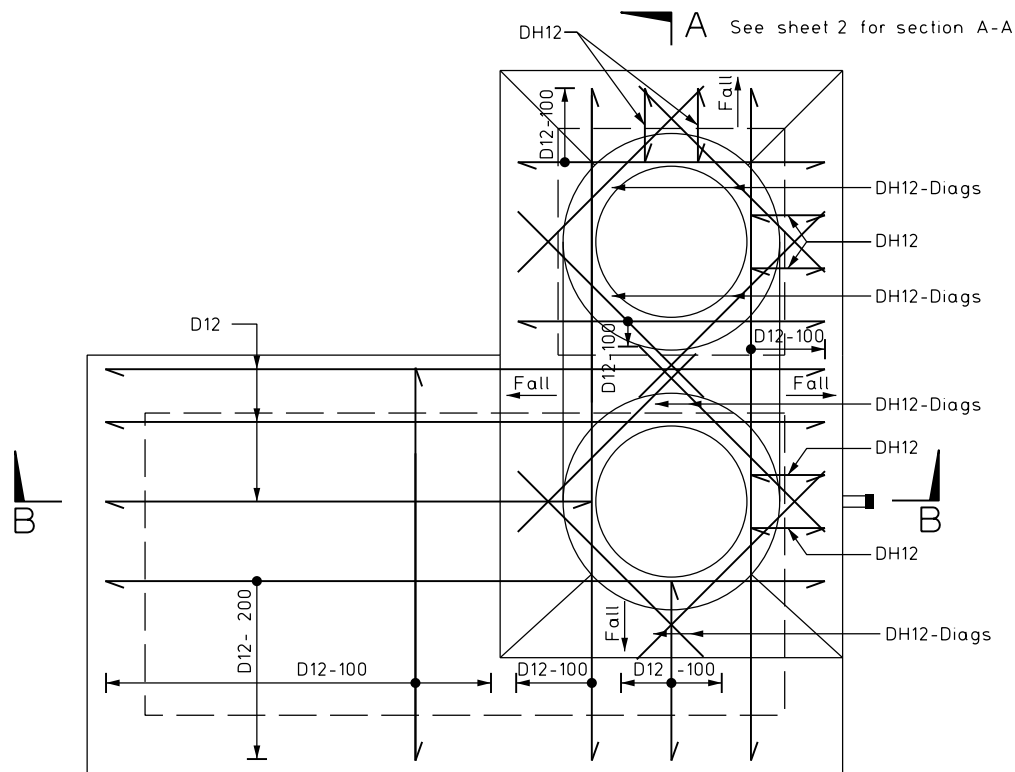
**NOTE:**

1. Minimum concrete cover to all reinforcement is 45mm.

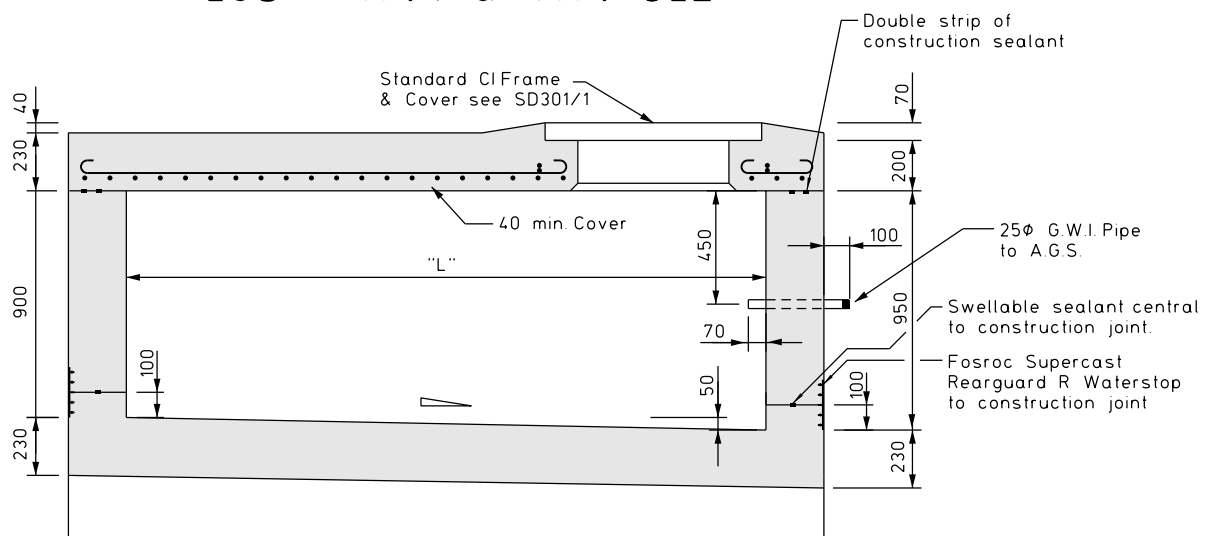
**NOTE:**

1. Minimum concrete cover to all reinforcement is 45mm.
2. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.





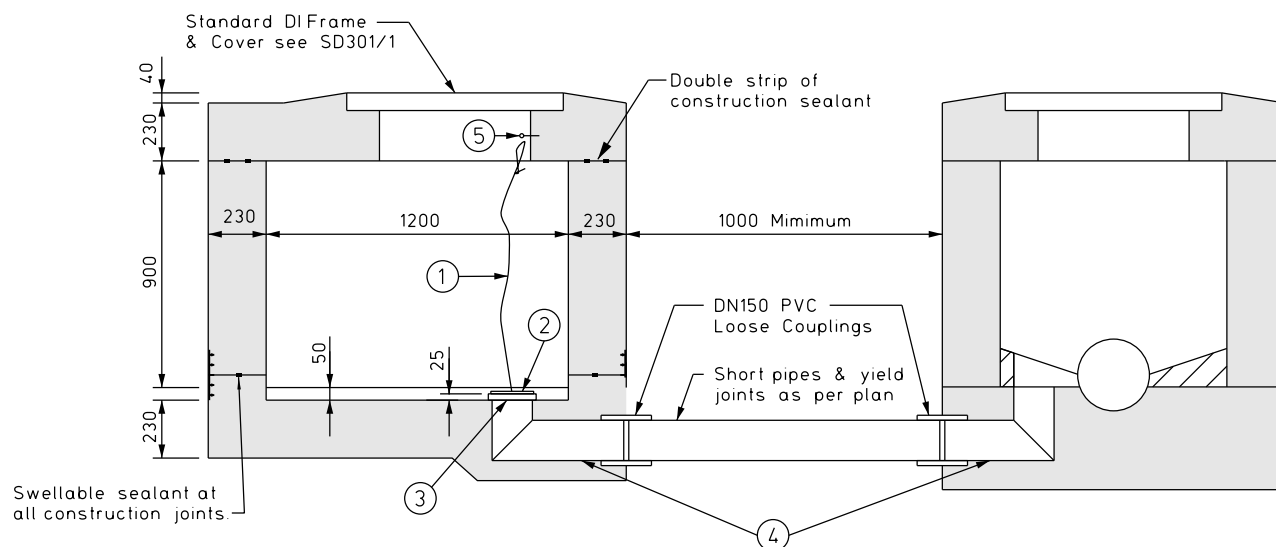
PLAN OF COMMON WALL
FLUSH TANK & MANHOLE



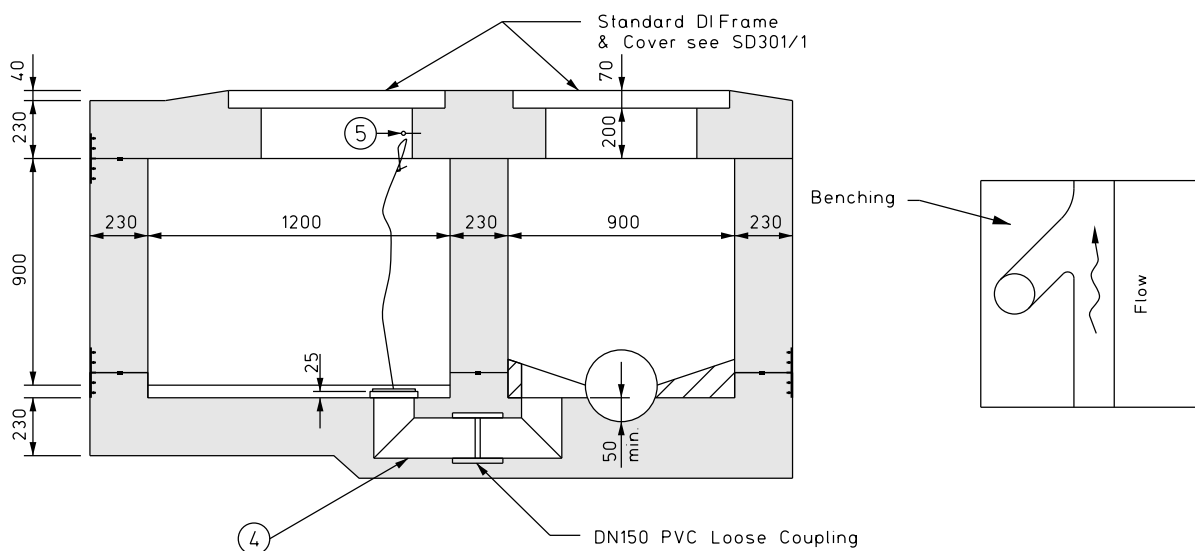
SECTION B-B THROUGH STANDARD
FLUSH TANK

NOTES:

1. The nominal capacity of the flush tank, (cubic metres) shall be as specified and shall equal the internal length "L" in metres.
2. Unless specified otherwise the length of the tank shall be parallel with the direction of the sewer.
3. For cast-iron frames and covers see SD301/1.
4. Where "L" exceeds 4m the floor slab and longitudinal wall shall be reinforced with AS/NZS 4671 SE62 mesh with 50mm internal cover.
5. Setting of flush tank top slab must allow for road crossfall.
6. See Plan SD313 for air gap separator.
7. All concrete to be 40 MPa.
8. Concrete work to comply with NZS 3109.



SECTION THROUGH REMOTE FLUSHTANK & MANHOLE

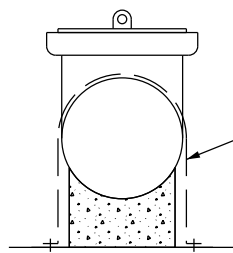
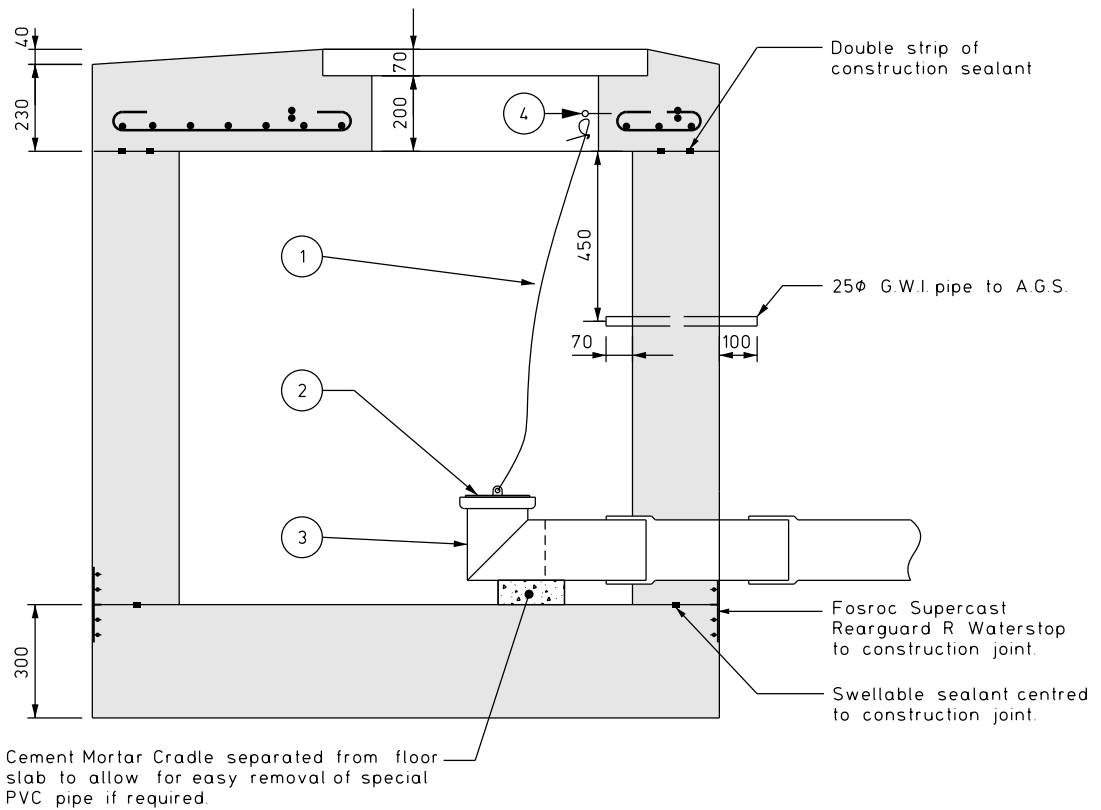


SECTION A-A THROUGH COMMON WALL FLUSHTANK & MANHOLE

(FOR LOCATION SEE Sheet 1)

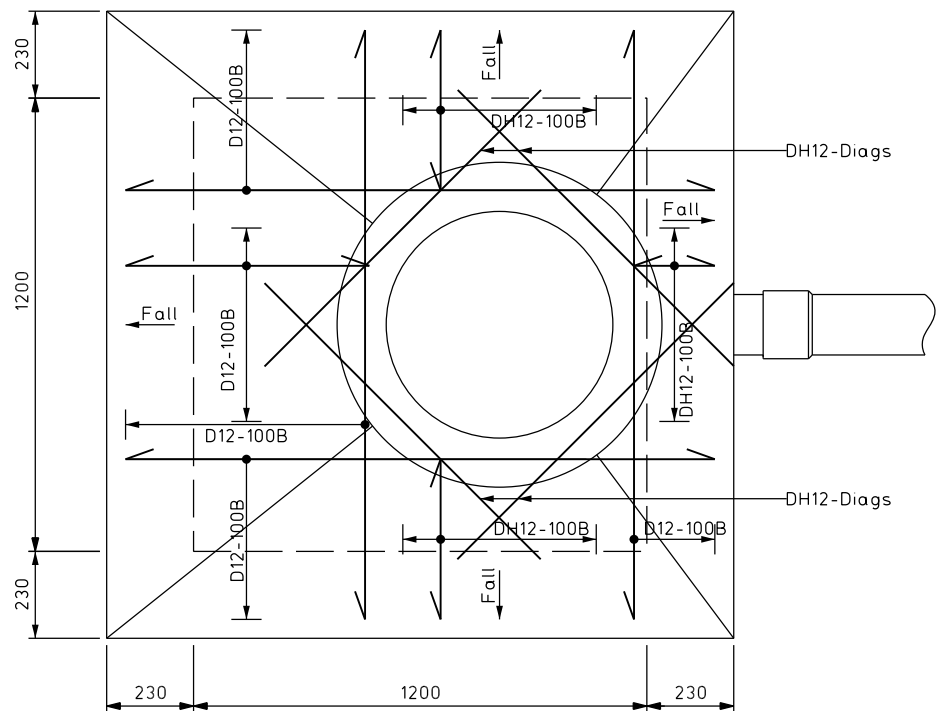
NOTES:

1. 8 ϕ Polypropylene Rope complete with hook.
2. Flushtank Plug.
3. PVC Insert.
4. 2 special PVC pipes.
5. 16mm eyelet.
6. All concrete to be 40 MPa.



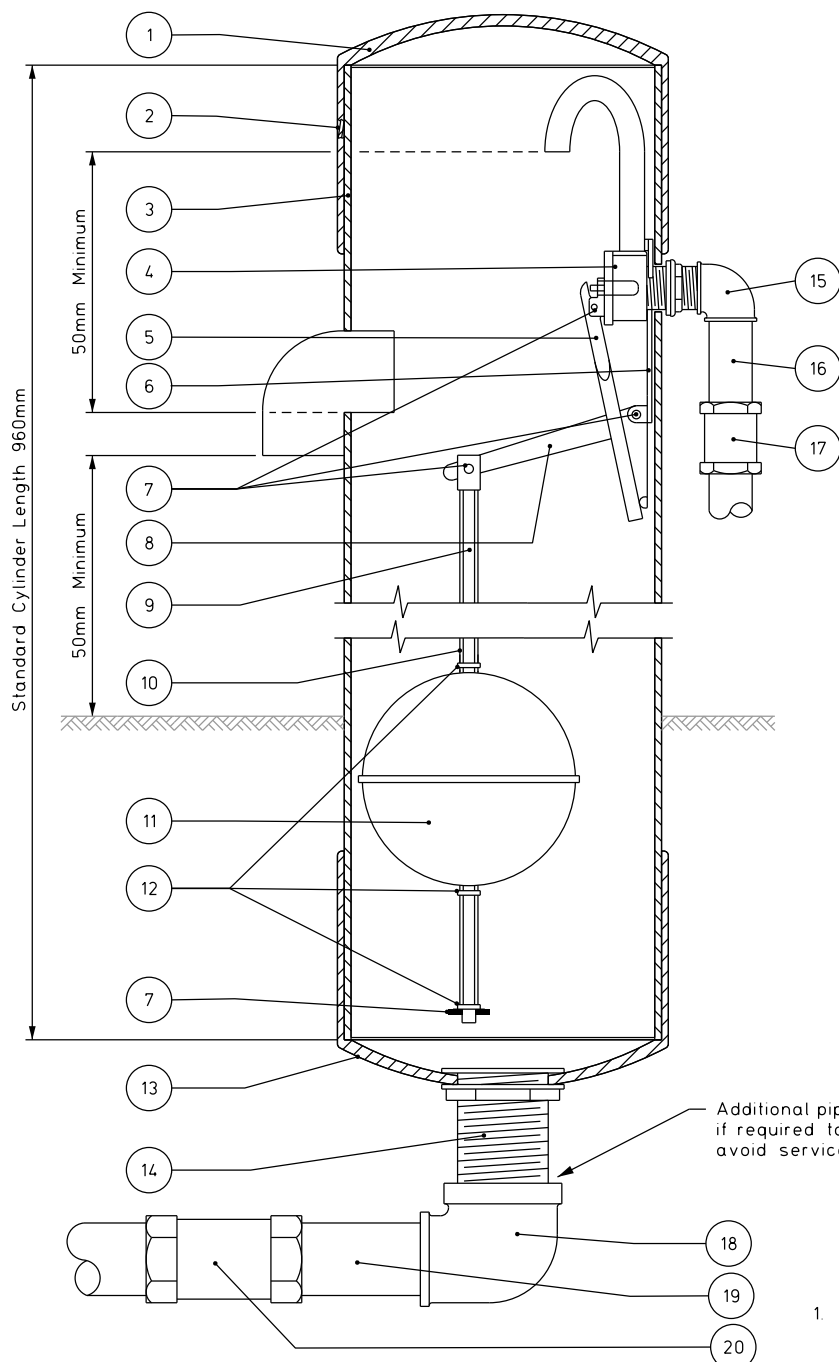
Fix item ③ to manhole floor with 25mm x 1.25mm type 316 stainless steel strap and 2-38mm x 12 gauge stainless steel self tapping screws into plastic rawl plugs.

- ① 8 ϕ Polypropylene rope complete with hook.
- ② Flush tank plug.
- ③ Special PVC pipe.
- ④ 16mm eyelet.



NOTES:

1. See SD302 for further construction details.
2. Minimum concrete cover to all reinforcement is 40mm.



PARTS OBTAINABLE FROM THE COUNCIL'S PAGES ROAD STORE:

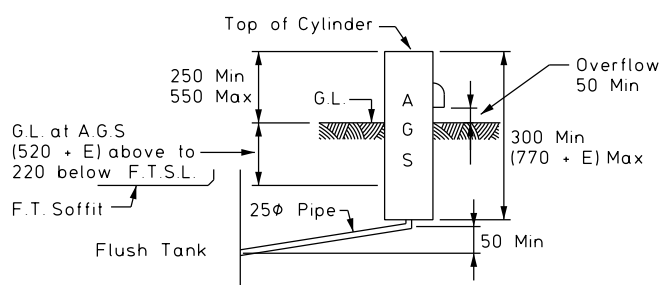
1. Top cap - PVC removable.
2. 10mm x 10mm hex socket head S.S. grub screw.
3. Cylinder 150mm ϕ PVC PN9 pipe with overflow.
4. "Secol" diaphragm valve, backnut and delivery tube.
5. Valve lever.
6. Valve assembly back plate.
7. Split pins.
8. Bell crank lever.
9. Float rod and clevis.
10. Plastic float adjustment tube.
11. PVC float.
12. Washers.
13. Bottom cap - PVC cemented in place.
14. 38mm ϕ shower waste sealed in bottom cap.

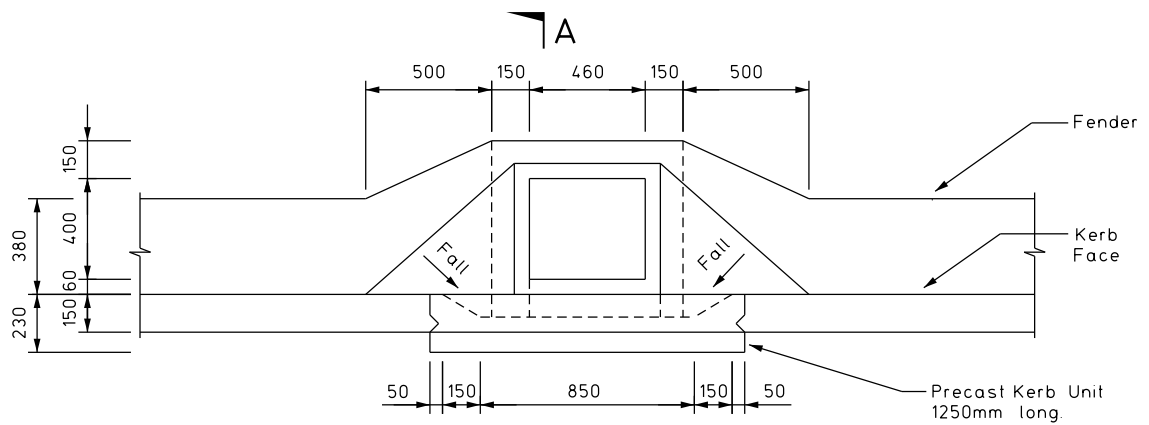
PARTS NOT SUPPLIED WITH UNIT:

15. 15mm ϕ G.W.I. elbow.
16. 15mm ϕ G.W.I. pipe.
17. 15mm ϕ G.W.I. Johnson coupling.
18. 38 - 25mm ϕ G.W.I. reducing elbow.
19. 25mm ϕ G.W.I. pipe.
20. 25mm ϕ G.W.I. Johnson coupling.

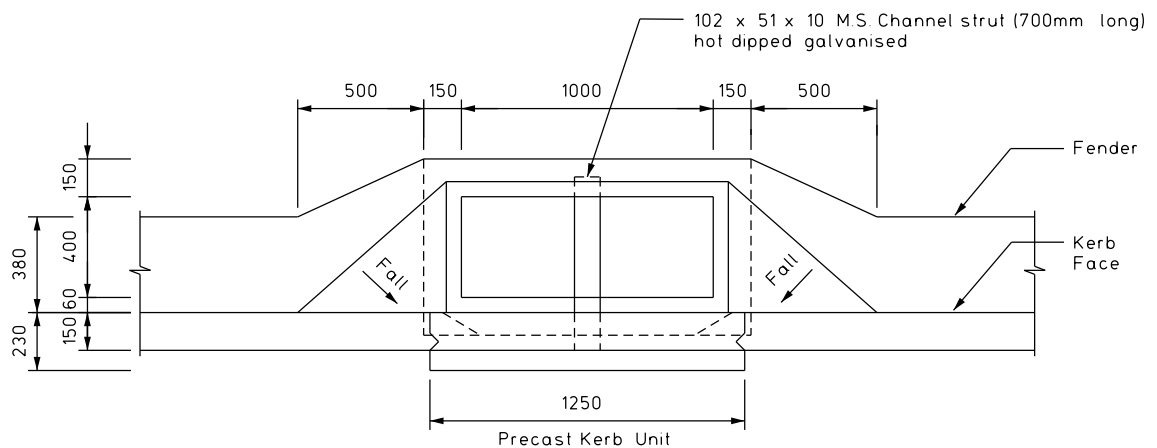
NOTES :

1. Air gap separators shall be located within the limits shown in the diagram above.
2. Cistern shall be placed in footpath as close as possible to the road/property boundary and to a common lot boundary.
3. High pressure water connection shall be made to water main wherever possible but where connection has to be made to a small service pipe a flexible loop of 15mm ϕ polythene pipe shall be used between the water meter and the air gap separator cistern to reduce water hammer effects.
4. The float shall be adjusted by manipulating distance pieces to obtain water level 30 +/- 10mm above tank soffit, but enough adjustment will be left to allow W.L. to be set 30mm below tank soffit.
5. A special extended air gap separator will be required when ground level is too high, ie, standard barrel and float rod shall be extended by length E with maximum of 500mm. E = 0 mm for Standard air gap separator.
6. Low pressure 25mm ϕ pipe to be laid on grade, as shown, to prevent air locks and debris accumulation.

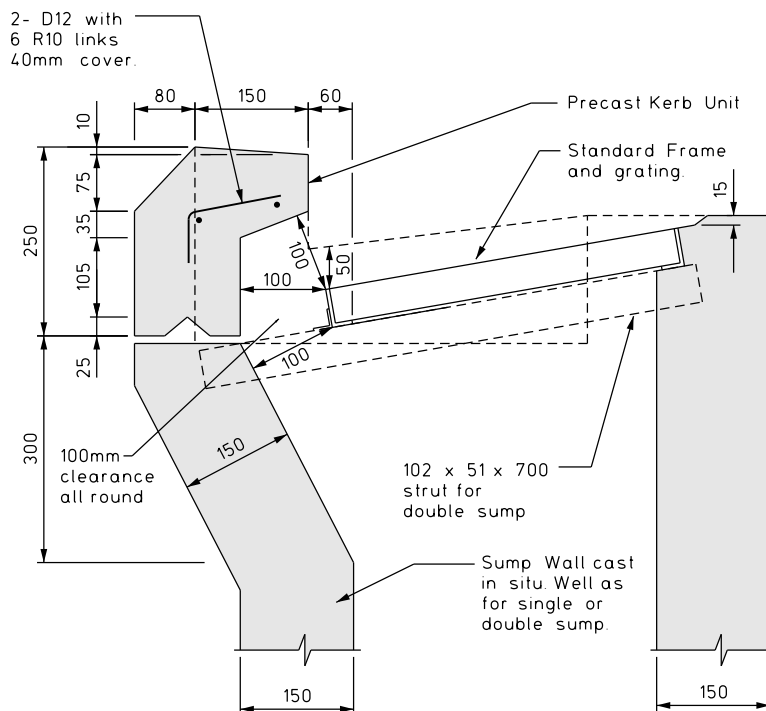




PLAN - SIDE ENTRY SINGLE SUMP



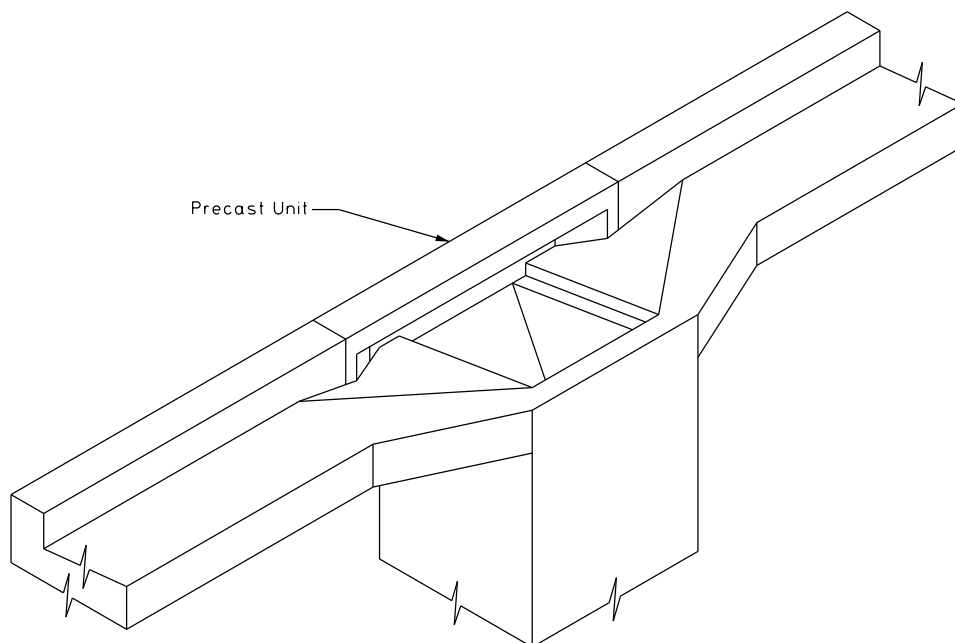
PLAN - SIDE ENTRY DOUBLE SUMP



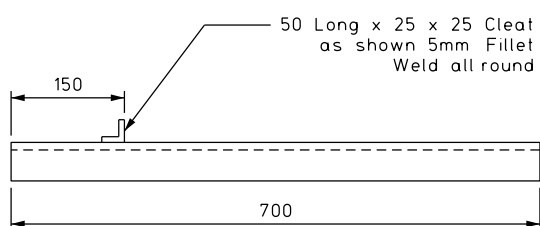
SECTION A-A

NOTES:

1. Concrete work to comply with NZS 3109.
2. All concrete to be 40 MPa.
3. Coat end faces of precast units with an approved epoxy tiecoat before joining.
4. Use 50 x 50 x 8 Angle 700mm long (hot dipped galvanised) to support end of frame at K & F.C./K & D.C. junction.

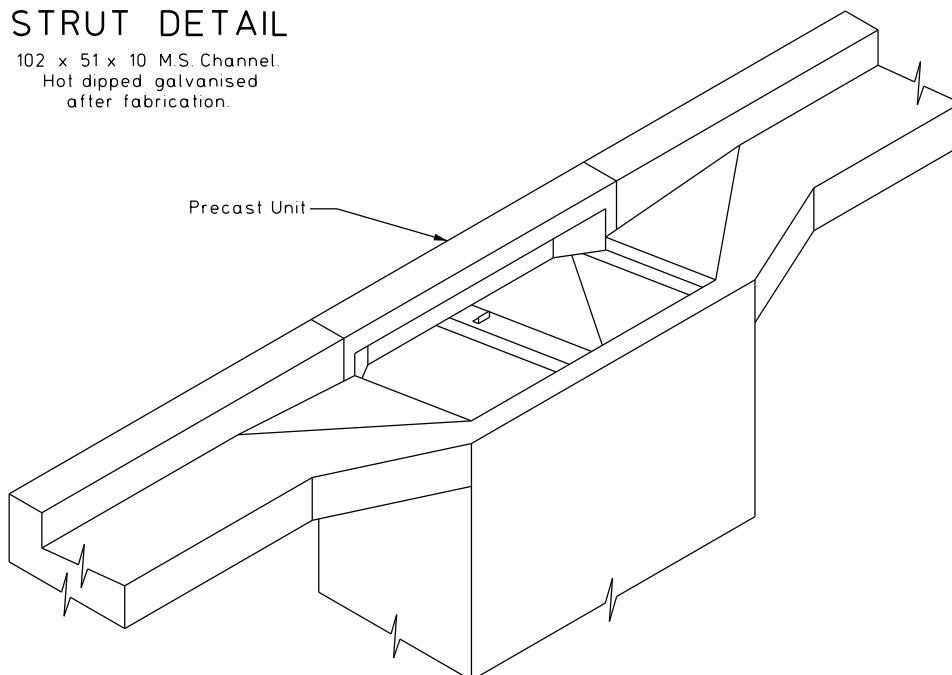


SINGLE SUMP



STRUT DETAIL

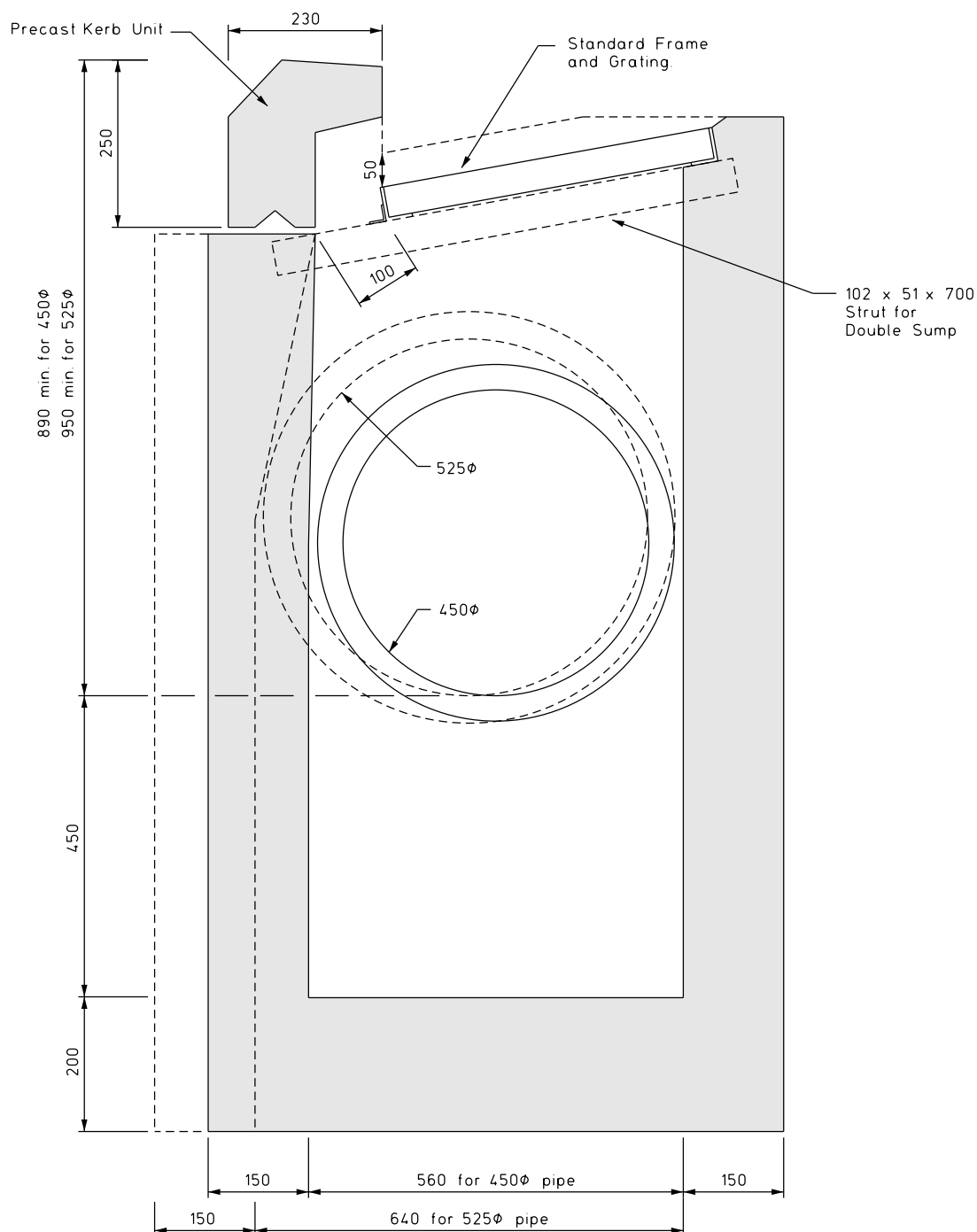
102 x 51 x 10 M.S. Channel.
Hot dipped galvanised
after fabrication.



DOUBLE SUMP

NOTES:

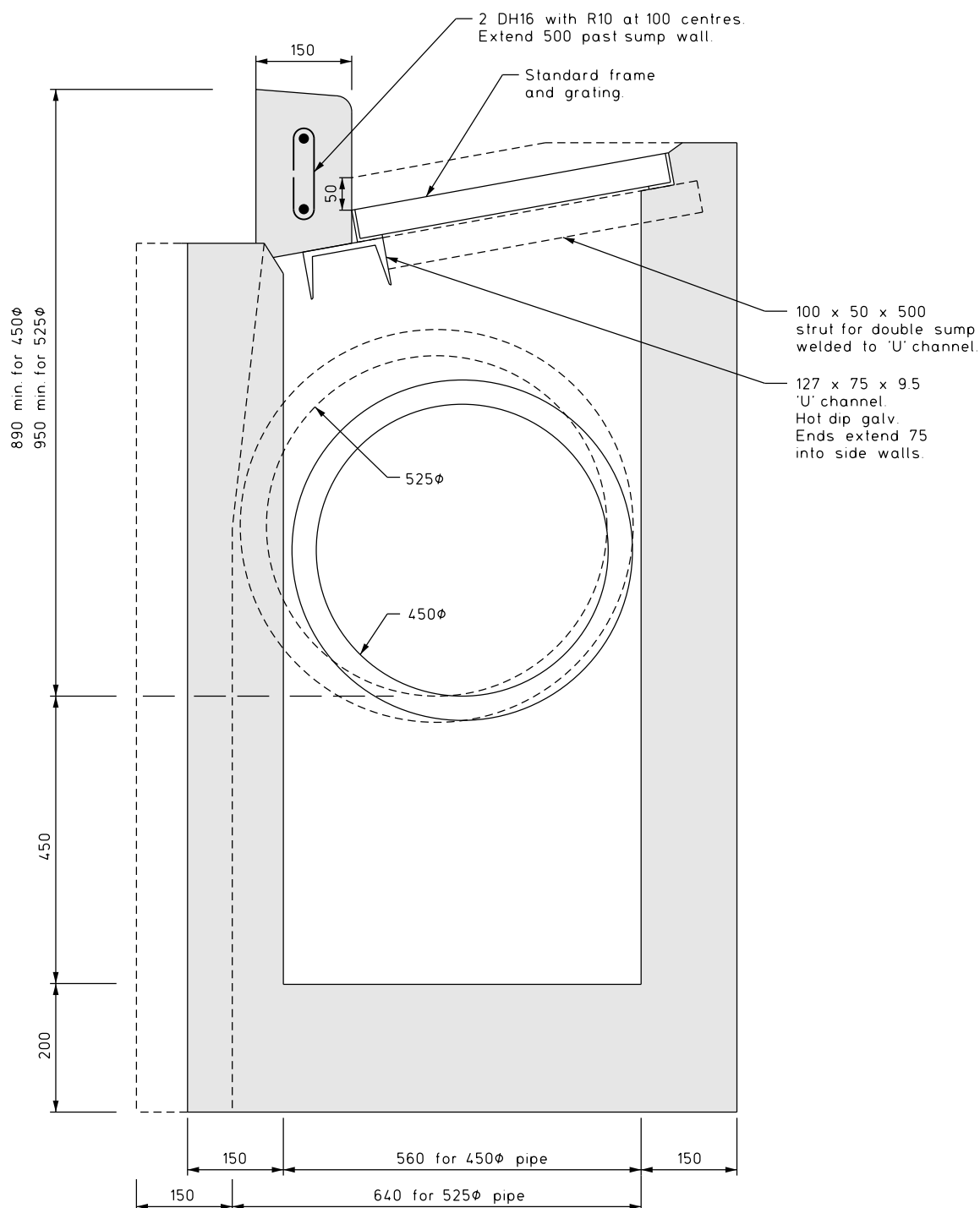
1. Risers 200mm minimum depth.



NOTES:

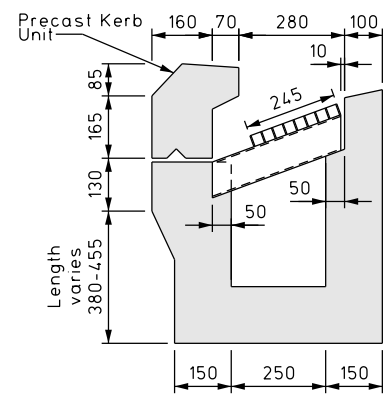
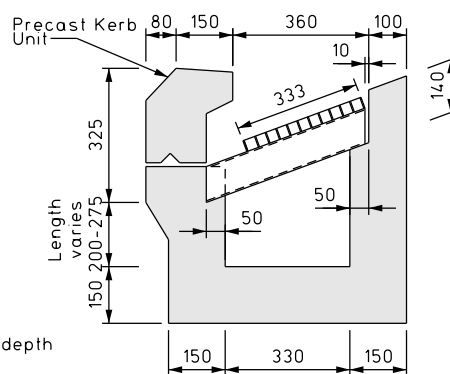
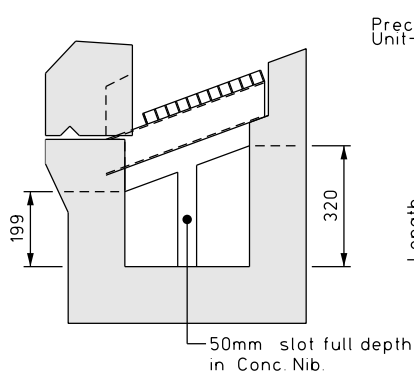
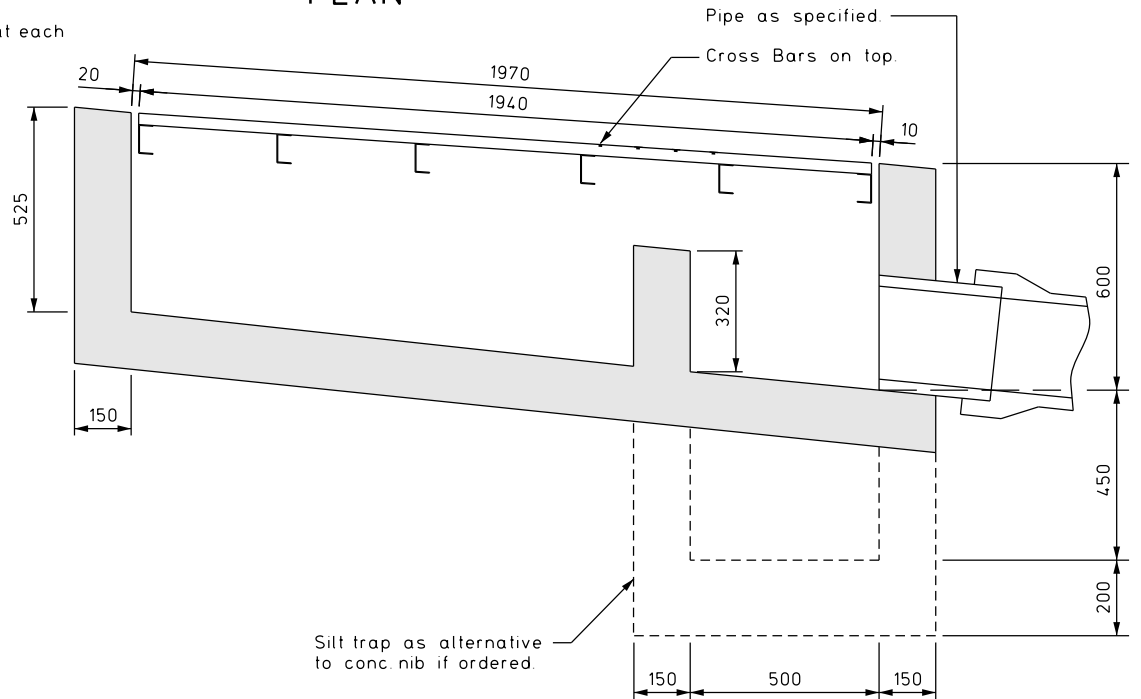
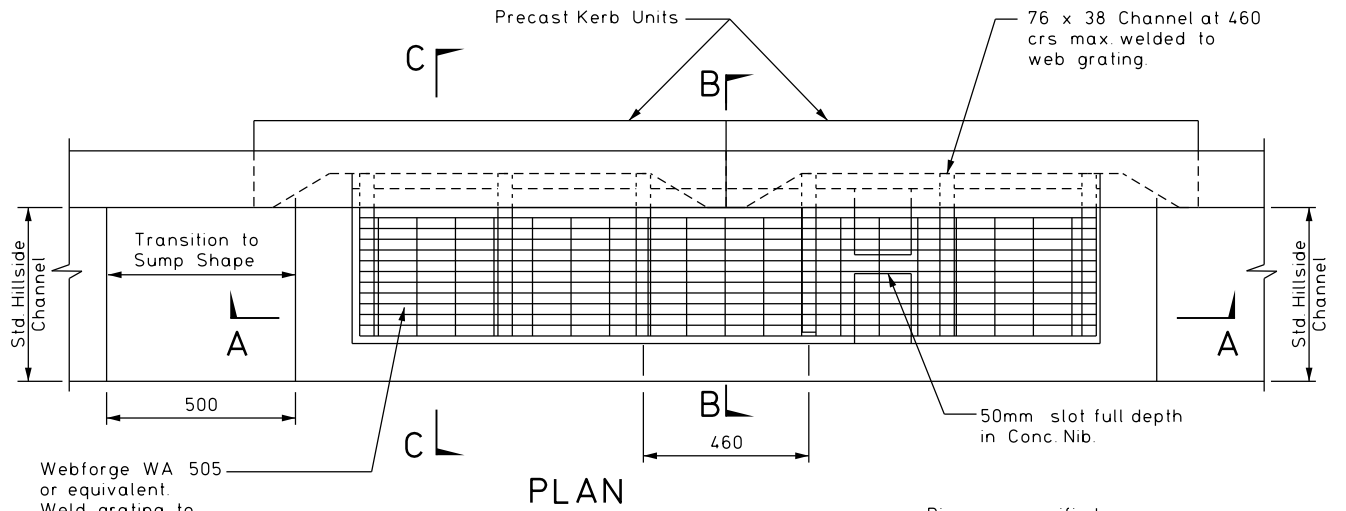
1. Notes on sheet SD321/1 apply.
2. Maximum cover to pipe to be:
 - 0.75m where a single sump is being installed.
 - 1.20m where a double sump is being installed.
3. Risers 200mm minimum depth.





NOTES:

1. Notes on sheet SD321/1 apply.
2. Maximum cover to pipe to be:
 - 0.75m where a single sump is being installed.
 - 1.20m where a double sump is being installed.
3. Risers 200mm minimum depth.

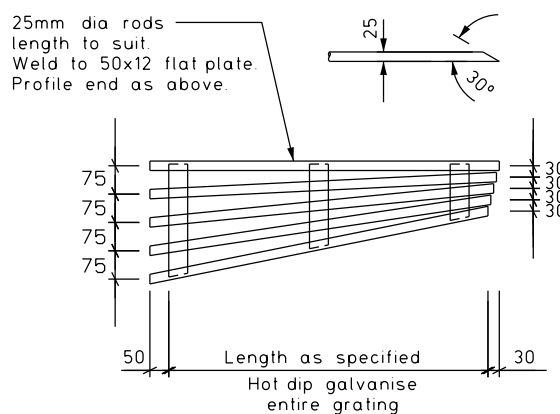
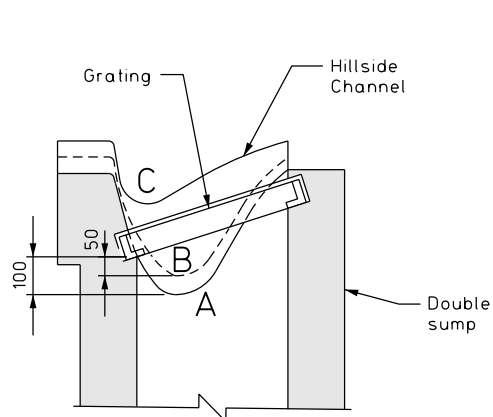
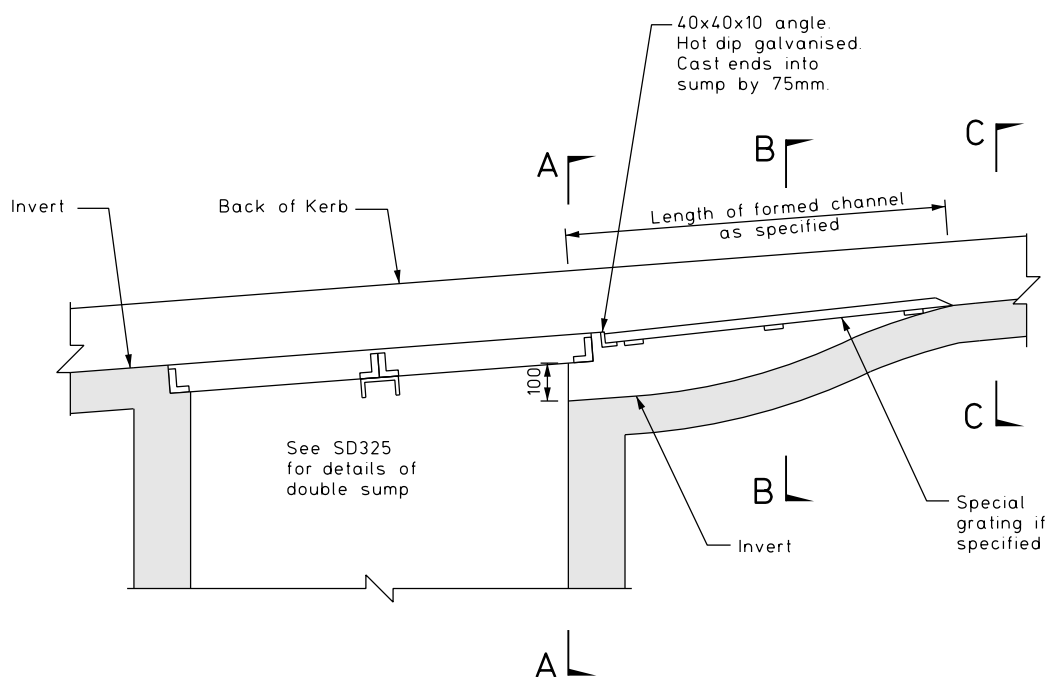
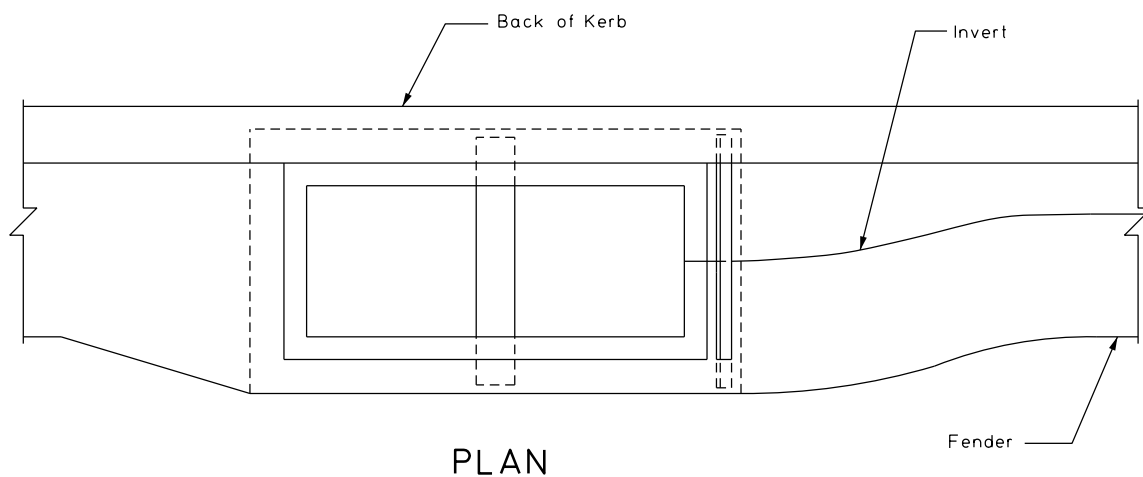


SECTION B-B

SECTION C-C
HILLSIDE CHANNELSECTION C-C
KERB & FLAT CHANNEL

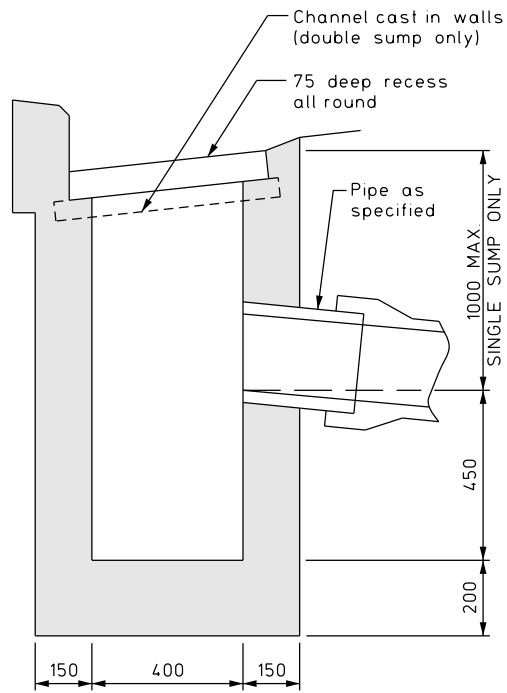
NOTES:

1. Notes on sheet SD321/1 apply.

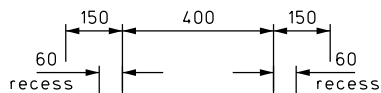
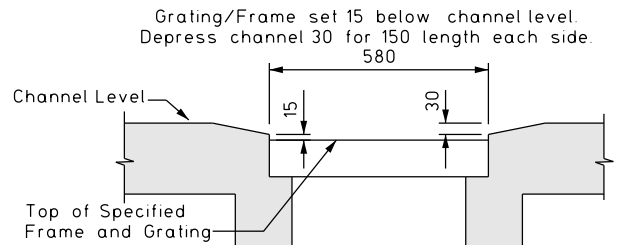


NOTES:

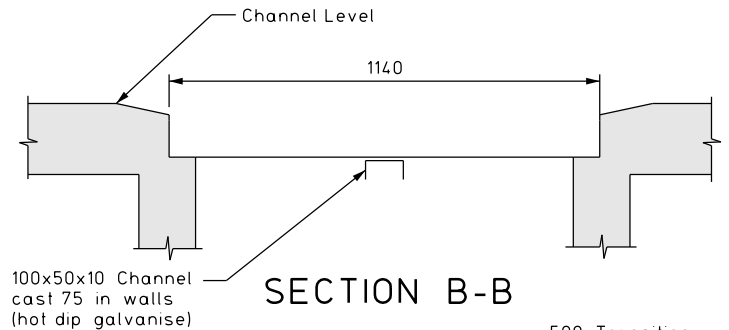
- Notes on sheet SD321/1 apply.



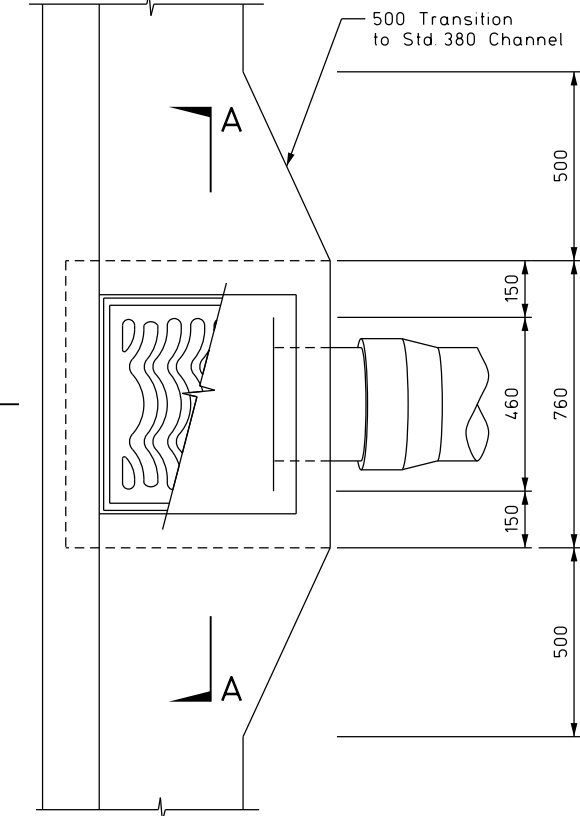
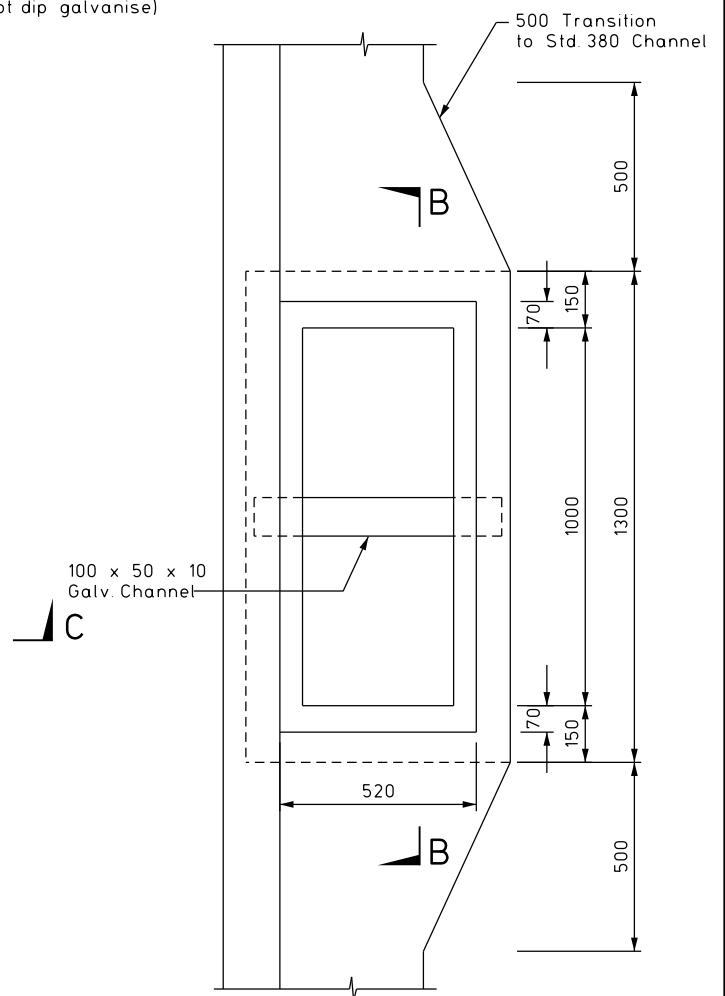
SECTION C-C

PLAN
SINGLE SUMP

SECTION A-A

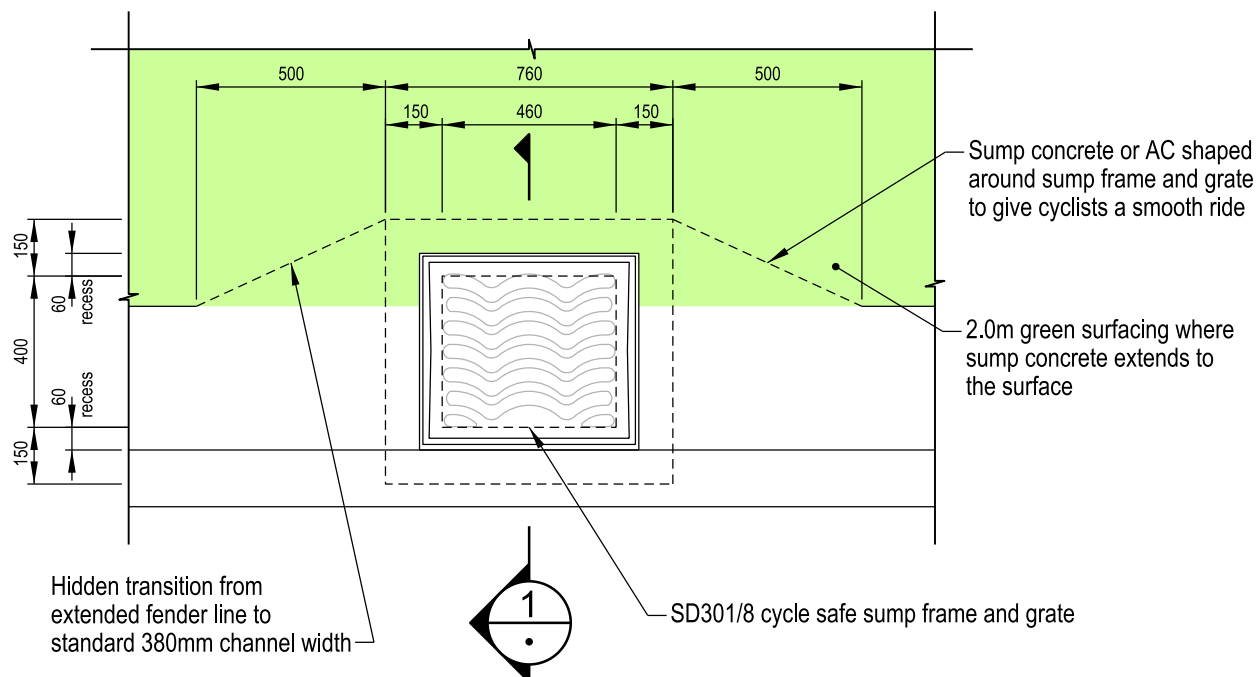


SECTION B-B

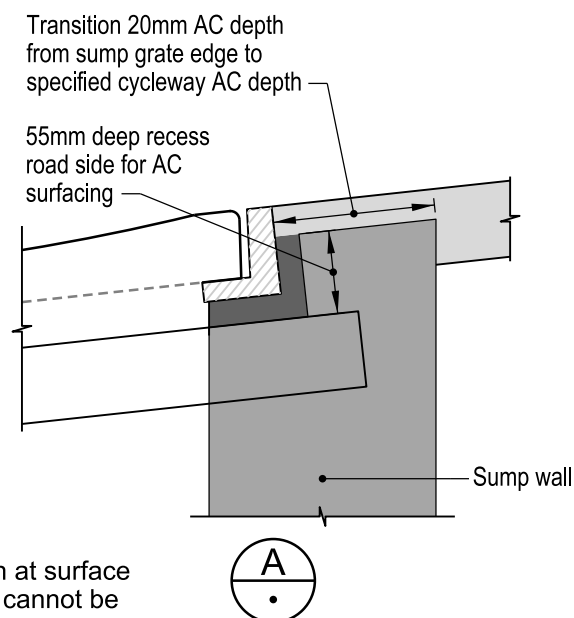
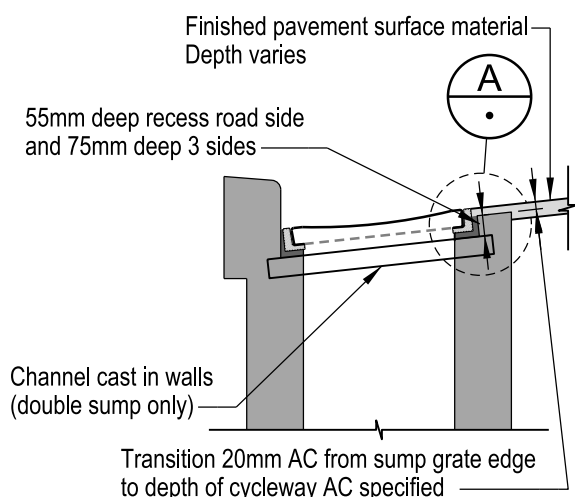
PLAN
DOUBLE SUMPPLAN
DOUBLE SUMP

NOTES:

1. Yield joints shall be provided in accordance with plan SD341 except that in all cases two yield joints and one short pipe shall be used.
2. General method of pipelaying, angle connections, corbels, etc. to be in accordance with plan SD341.
3. Concrete work to comply with NZS 3109.
4. All concrete to be 40MPa.
5. Risers 200mm minimum depth.



PLAN SINGLE SUMP IN CYCLEWAYS



Note:

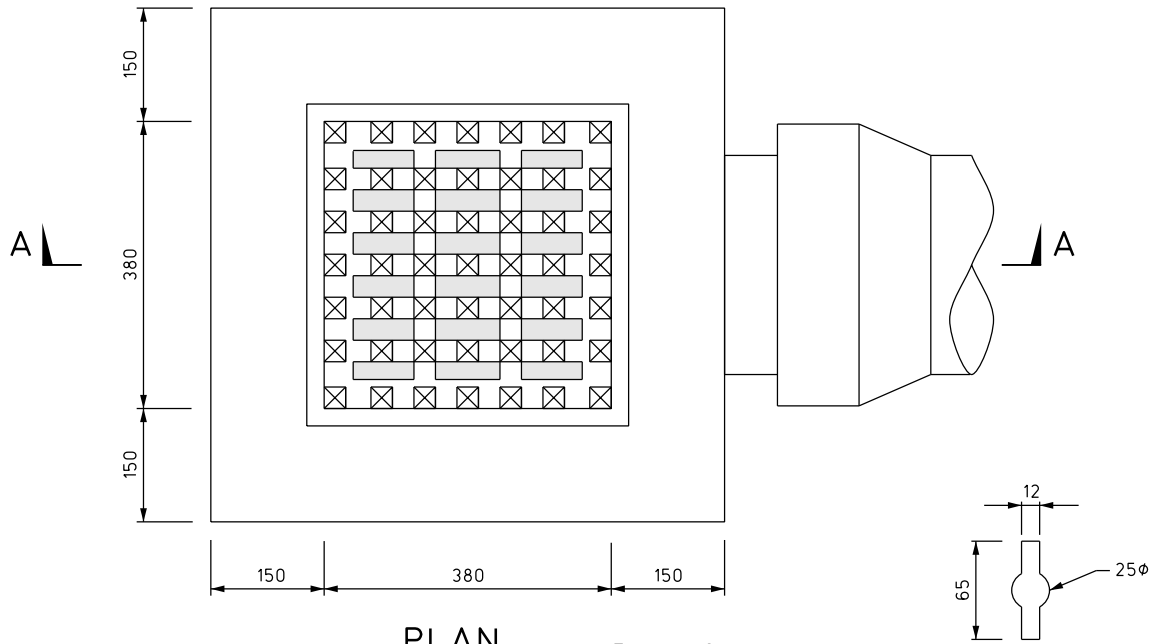
Concrete to remain at surface
when adjacent AC cannot be
laid to 20mm depth.

RETROFIT A NEW CYCLE SAFE GRATE AND NEW CYCLE SAFE FRAME ONTO AN EXISTING SUMP

1. Remove non-cycle safe grate and frame.
2. From 'extended fender line', grind exposed concrete up to the frame edge 20mm below final surface levels. Concrete to remain at surface when adjacent AC cannot be laid to 20mm depth.
3. Install new SD301/8 grate and frame.
4. Ensure sump frame secured into fender concrete with epoxy mortar.

NOTE TO DESIGNER:

1. Installing any new sump grate flush with fender (eg SD325/2) as opposed to the standard SD301/6 detail where the grate is depressed ~45mm below fender reduces the sump grate collection capacity by ~50%. This needs to be taken into account during stormwater roading design.



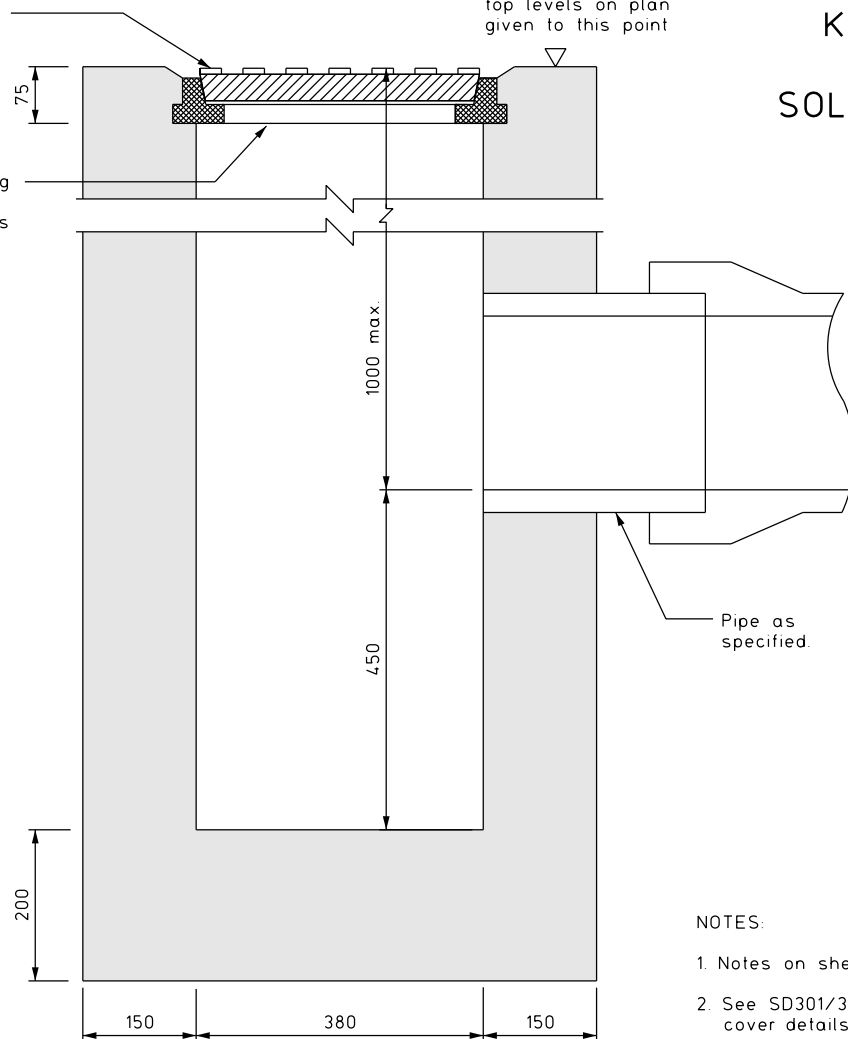
PLAN

Top of grating 15mm below channel invert or grass areas (or flush with road surface where used in roadway).

Finished Sump top levels on plan given to this point

Standard type grating either solid plate or holes for drainage as specified.

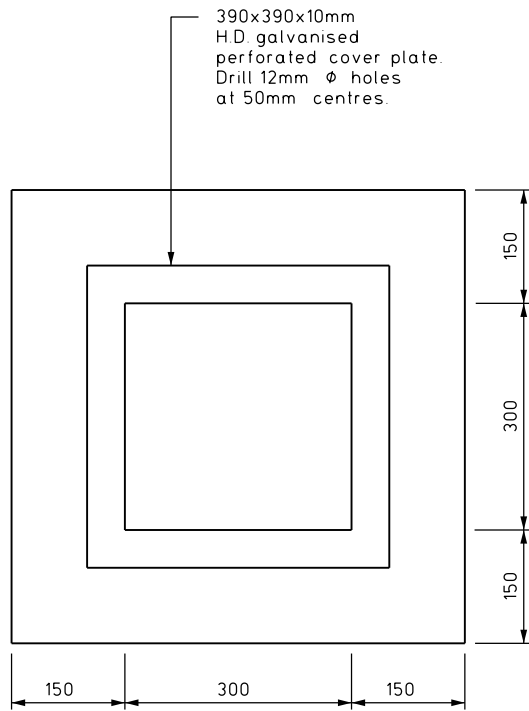
KEYWAY
FOR
SOLID PLATE



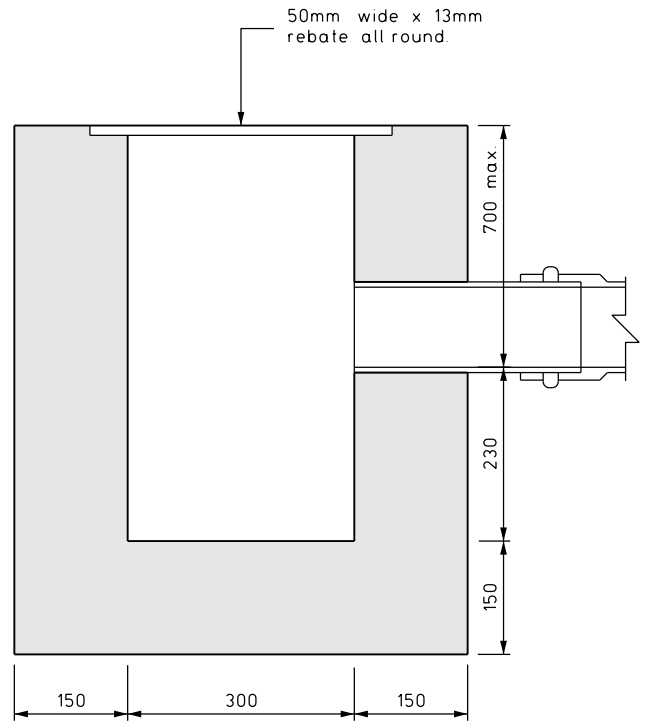
SECTION A-A

NOTES:

1. Notes on sheet SD325 apply.
2. See SD301/3 for frame and cover details.
3. Risers 200mm minimum depth.
4. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.

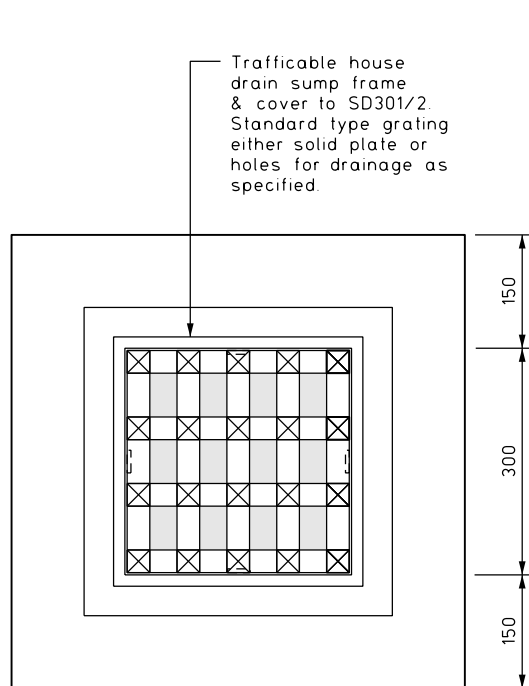


PLAN

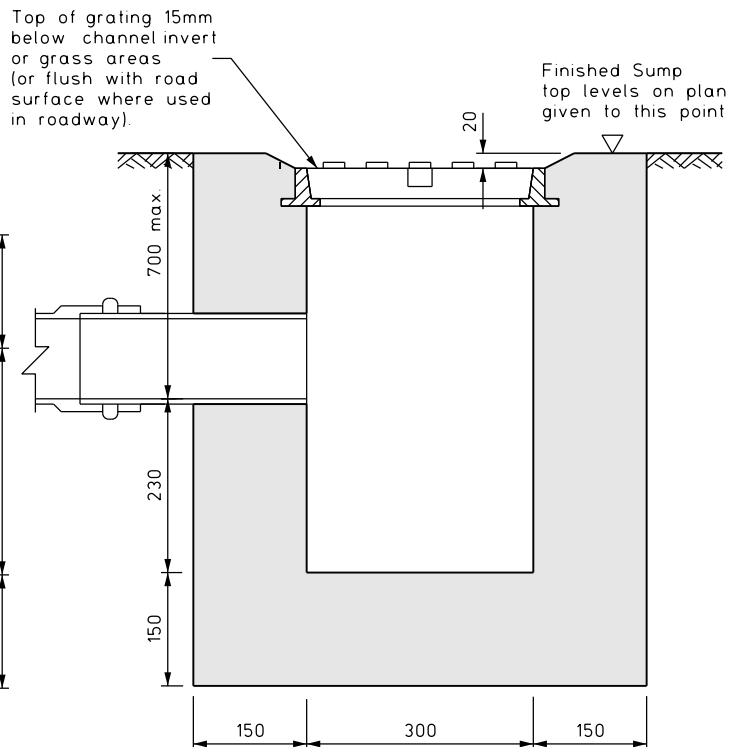


CROSS SECTION

HOUSE DRAIN SUMP (PRIVATE PROPERTY ONLY UNLESS OTHERWISE SPECIFIED)



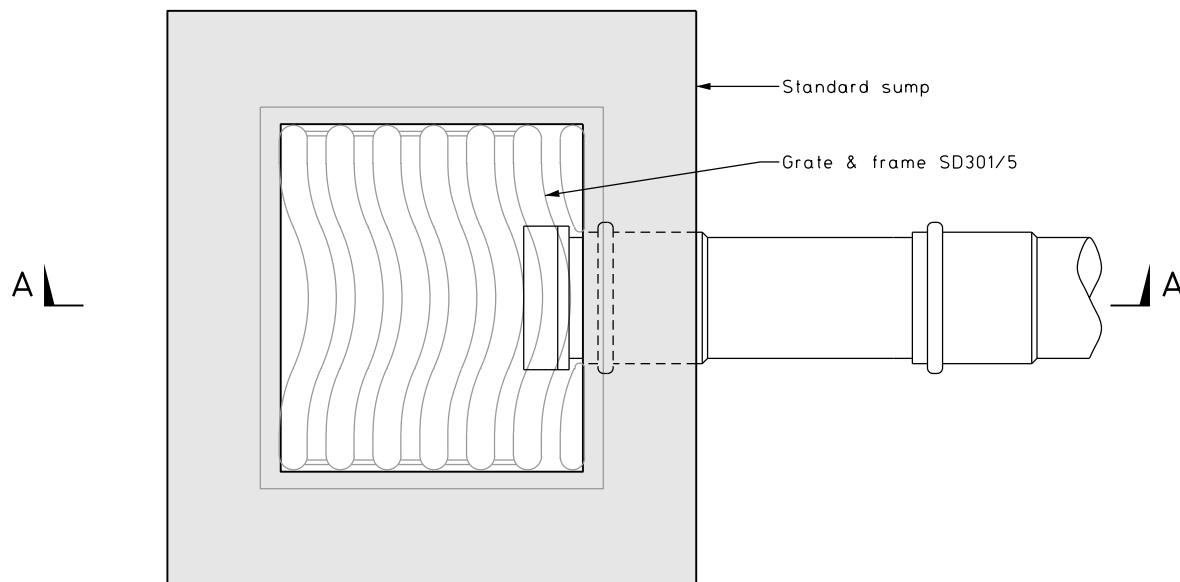
PLAN



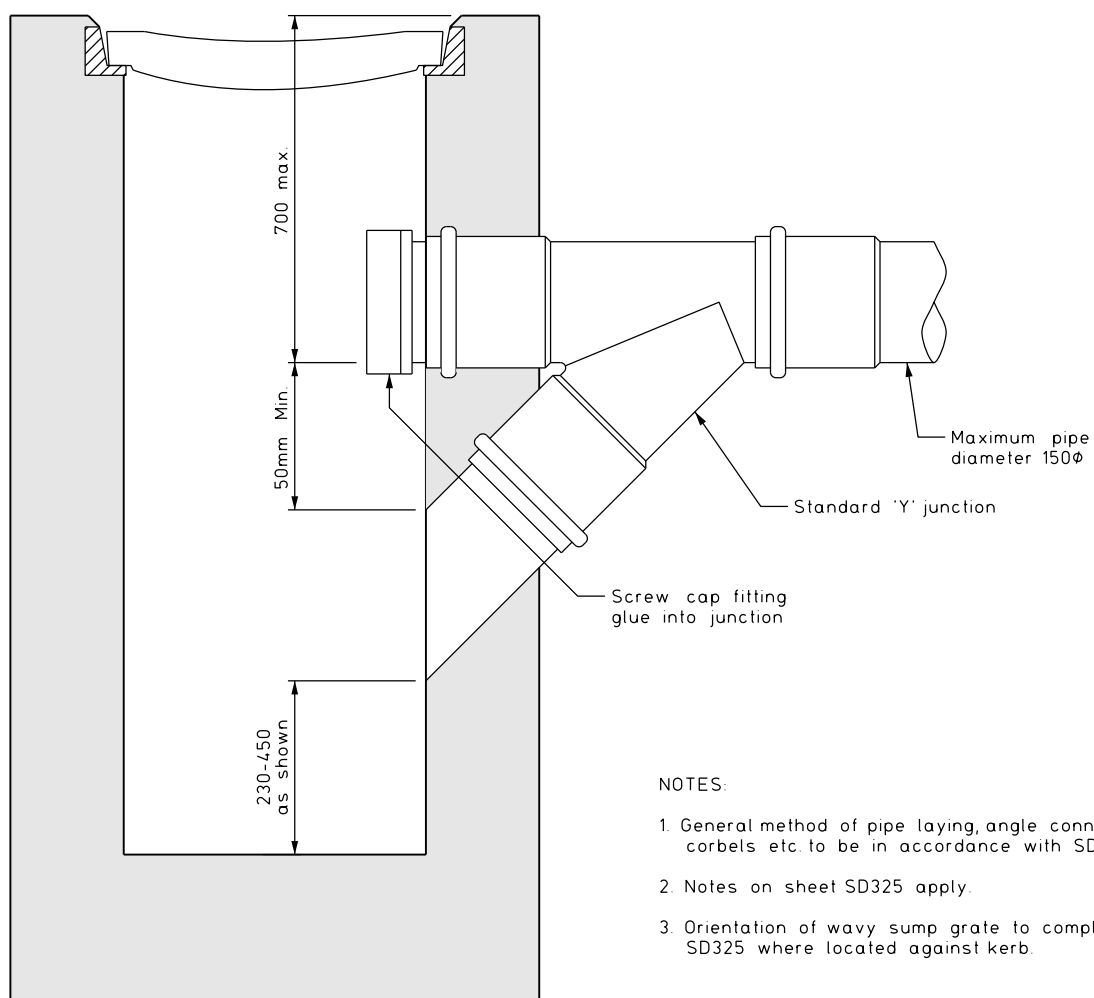
CROSS SECTION

SMALL TRAFFICABLE SUMP

NOTE:
150mm x 150mm concrete surround
with 12mm stirrup when located in a
grassed area.



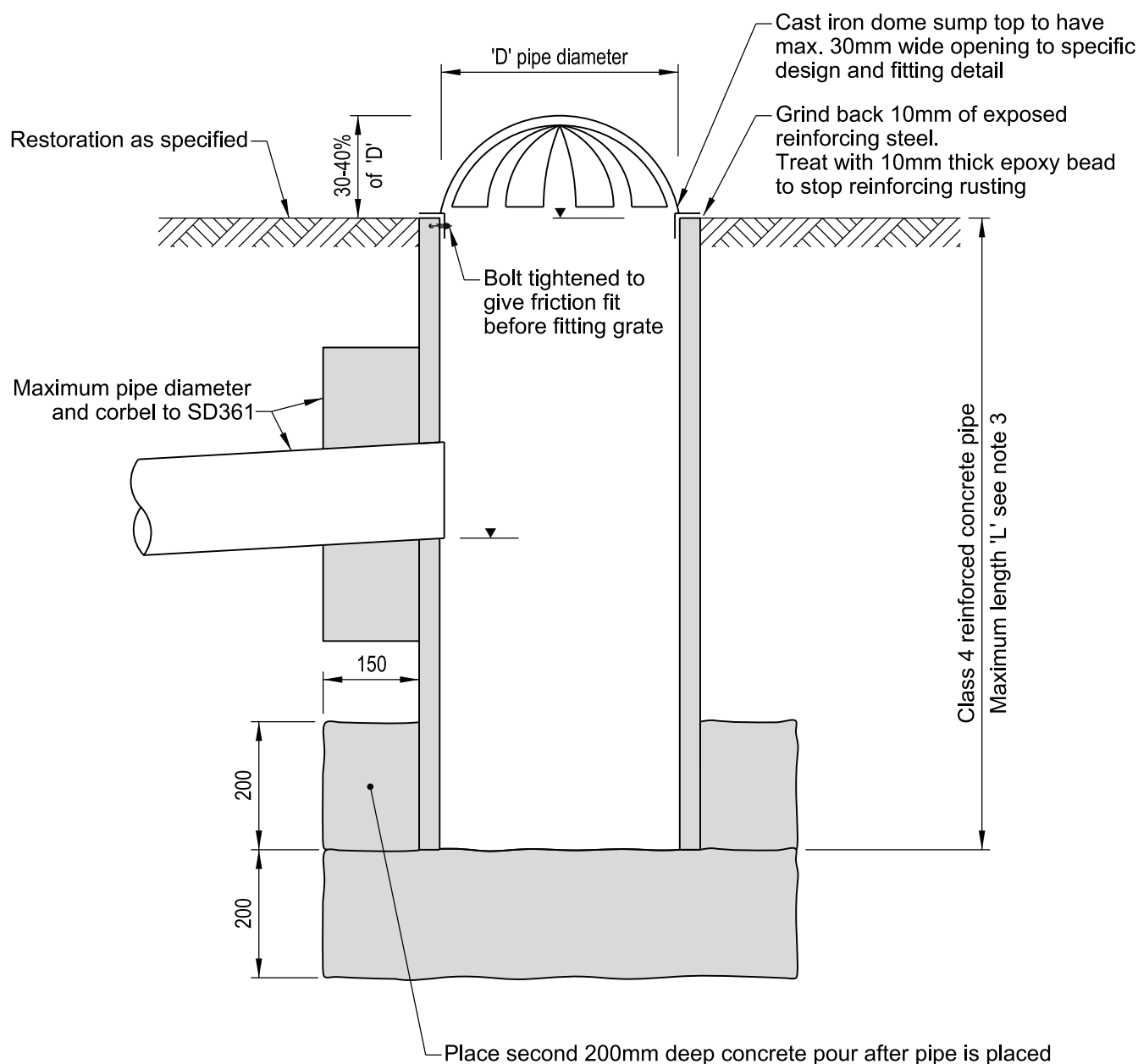
PLAN



SECTION A-A

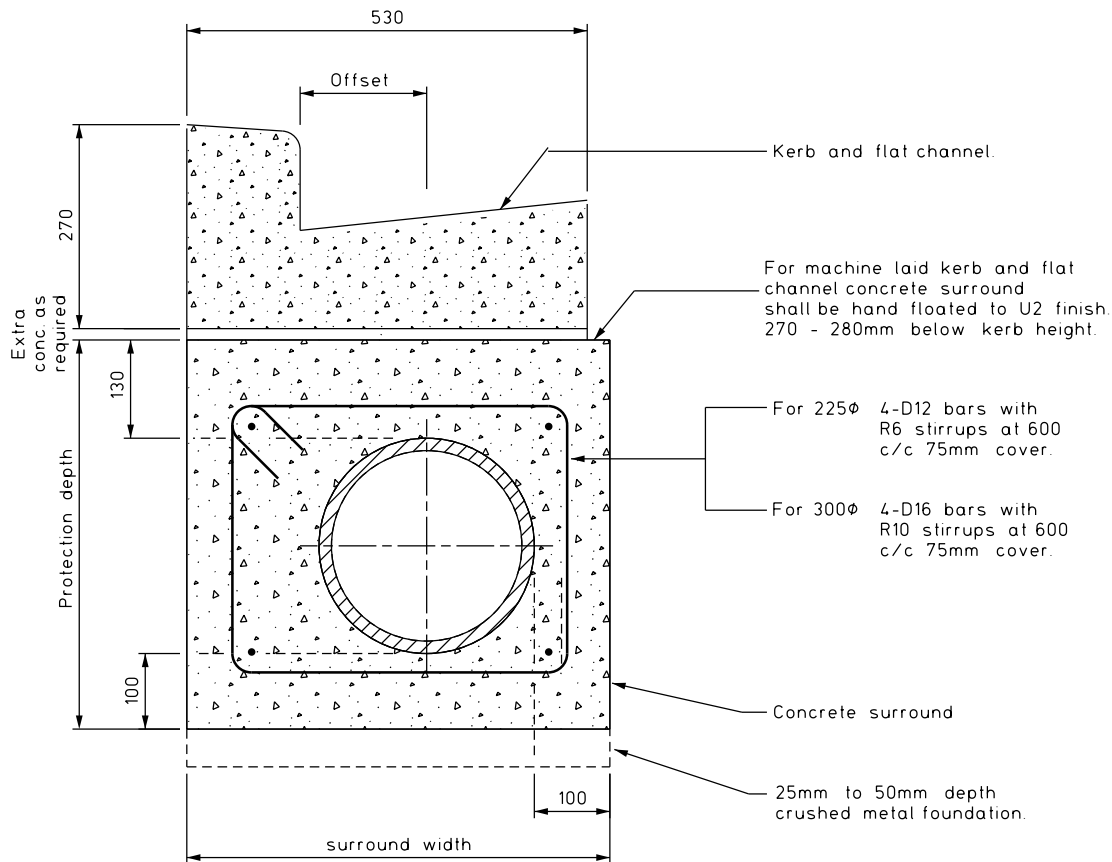
NOTES:

1. General method of pipe laying, angle connections, corbels etc to be in accordance with SD341.
2. Notes on sheet SD325 apply.
3. Orientation of wavy sump grate to comply with SD325 where located against kerb.



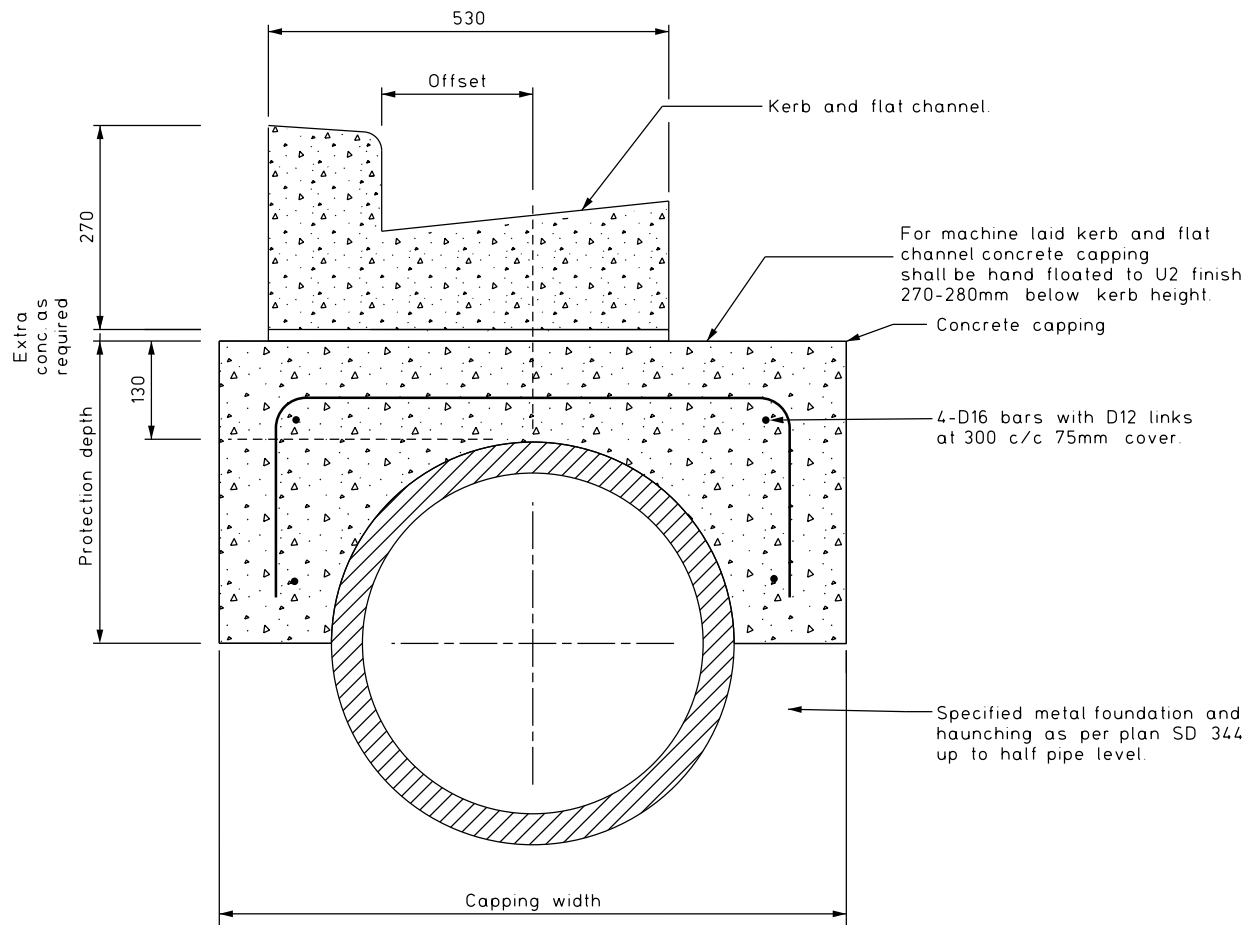
NOTES:

1. Where 100mm or 150mm outlet specified, submerge outlet to SD329.
2. Design sump cover to allow maintenance access.
3. 'L' = 1.0m for 375mm - 750mm diameter
'L' = 4.0m for 900mm - 1050mm diameter
4. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.



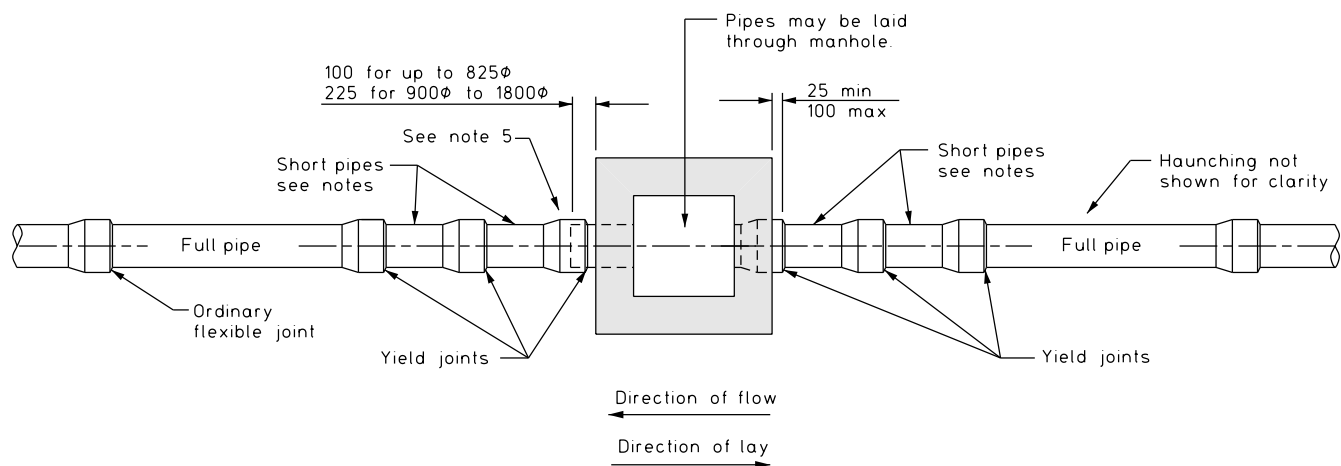
NOTES:

- Concrete protection shall extend to a pipe joint.
 - Concrete surround, reinforced at commercial crossings only. Reinforcement to extend each side of a commercial crossing by 1.5m minimum to a pipe joint.
 - Concrete surround shall be a minimum of 20 MPa 100mm slump with a tolerance of +0,-20mm.
 - Yield joints shall be formed at pipe joints by interrupting concrete with 12mm Softboard or equivalent and applying pipe clay or similar to the pipe joint to prevent entry of concrete. Any reinforcing steel shall be stopped unhooked 50mm from joint.
- | Pipe dia. | Min depth
kerb to invert | Conc. surround
width | Protection depth | Pipe offset from
kerb face |
|-----------|-----------------------------|-------------------------|------------------|-------------------------------|
| 225 | 660 | 570 | 520 | 180 |
| 300 | 740 | 640 | 600 | 210 |
- Yield joints are not required at structures provided reinforced concrete surround is rebated 50mm into structure walls (to prevent shear failure).
 - Concrete pipe to Class 2 unless otherwise specified.

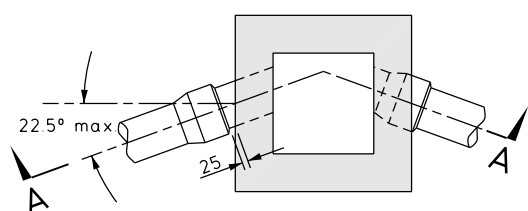


NOTES:

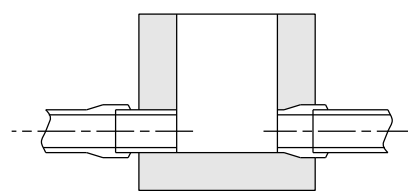
- Concrete protection shall extend to a pipe joint.
 - Concrete strength to be 20 MPa 100mm slump, with a tolerance of +0,-20mm.
 - Pipes shall be Class 4 unless otherwise specified.
 - Concrete capping reinforced at commercial crossings only Reinforcement to extend each side of a commercial crossing by 15m minimum to a pipe joint.
 - Contraction joints shall be formed at pipe joints by interrupting concrete with Softboard or equivalent, sealed to prevent grout entry with approved sealant. Any reinforcing steel shall be stopped unhooked 50mm from joint.
- | Pipe Dia. | Min depth
kerb to invert | Capping
width | Protection
depth | Pipe offset from
kerb face |
|-----------|-----------------------------|------------------|---------------------|-------------------------------|
| 375 | 810 | 770 | 350 | 250 |
| 450 | 890 | 830 | 400 | 200 |
| 525 | 950 | 910 | 440 | 160 |
- Yield joints shall be constructed at sumps with one short pipe and two yield joints.



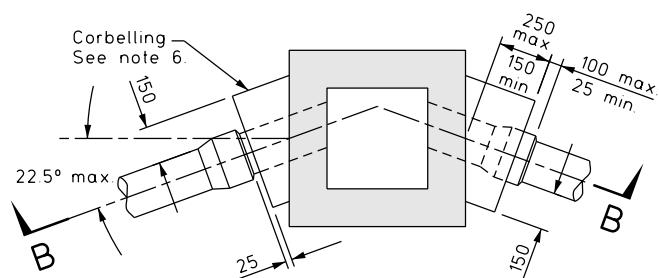
GENERAL METHOD OF PIPELAYING AT MANHOLES AND SUMPS



ANGLE CONNECTIONS

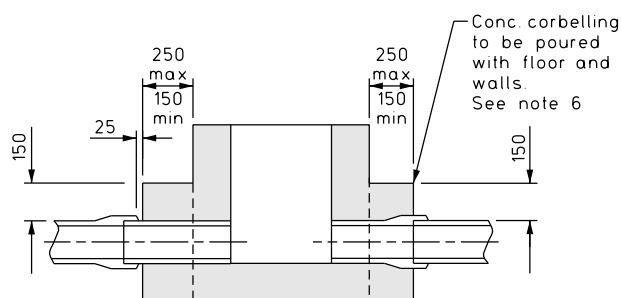


SECTION A-A



CORBEL DETAILS

Applies to straight & angle connections.
Angle connections will be permitted for
100φ to 300φ pipelines. Special design
required for pipes greater than 300φ



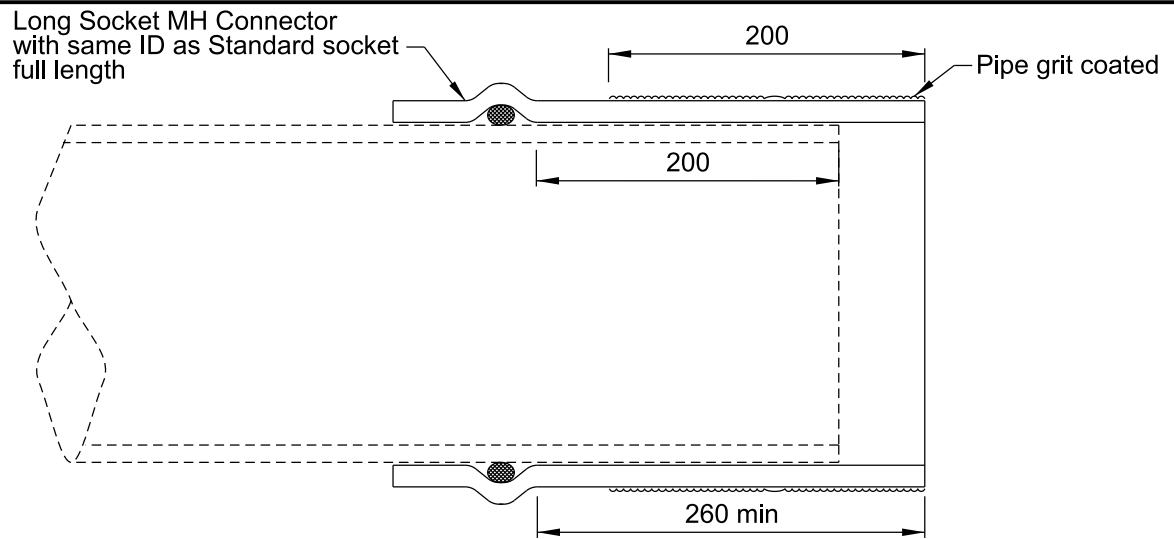
SECTION B-B

NOTES:

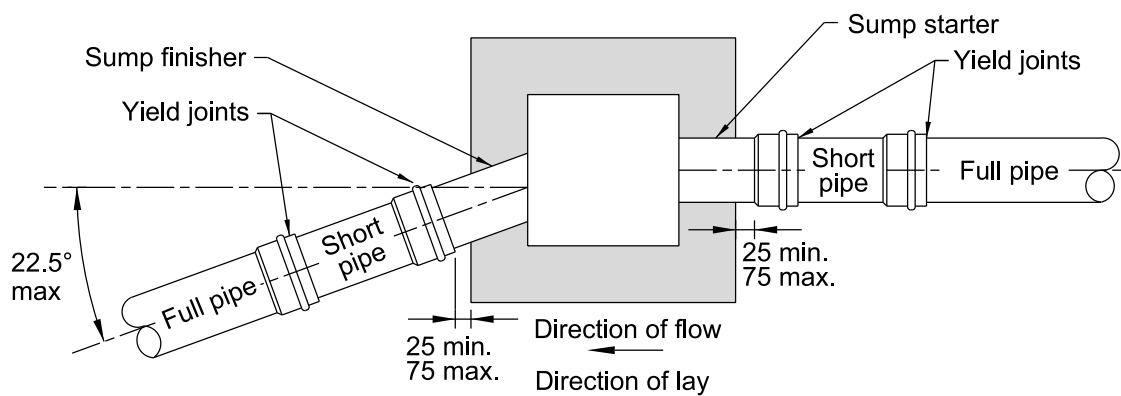
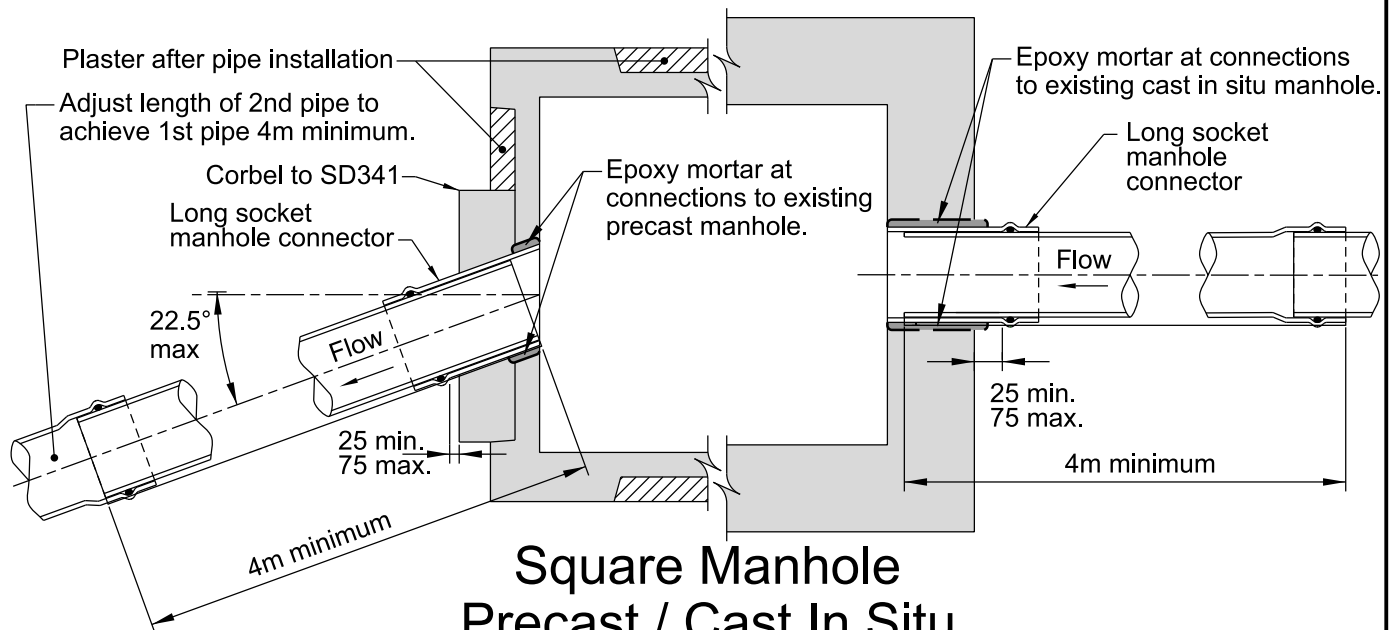
- Pipelines that are concrete haunched or concrete surrounded shall have the concrete interrupted at each yield joint with softboard or equivalent.
- Vertically cast short pipes shall be minimum of 500mm & maximum of 800mm long.
- For reinforced concrete short pipes the following table shall apply.

PIPE DIAMETER	MIN	MAX
225	600	800
300	750	1000
375	900	1200
450	1100	1450
525	1300	1700
600	1500	1900
675	1700	2100
- At each pipeline connecting to a manhole or sump, the No. of short pipes and yield joints shall comply with the following table:

PIPE DIAMETER	SHORT PIPES	YIELD JOINTS
100 to 525	2	3
600 to 675	1	2
750 to 2100	0	1
Sump	1	2
- This pipe may be double spigot pipe with a socket finisher in the manhole wall with Engineer's approval. Maximum length pipe 1300mm, minimum length 450mm.
- Corbelling where suitable pipe lengths are not available shall only be used with the Engineer's approval. For corbelling on precast manholes see SD341/2 and SD341/4.
- Gibault joints shall not be used as yield joints unless approved by the Engineer.

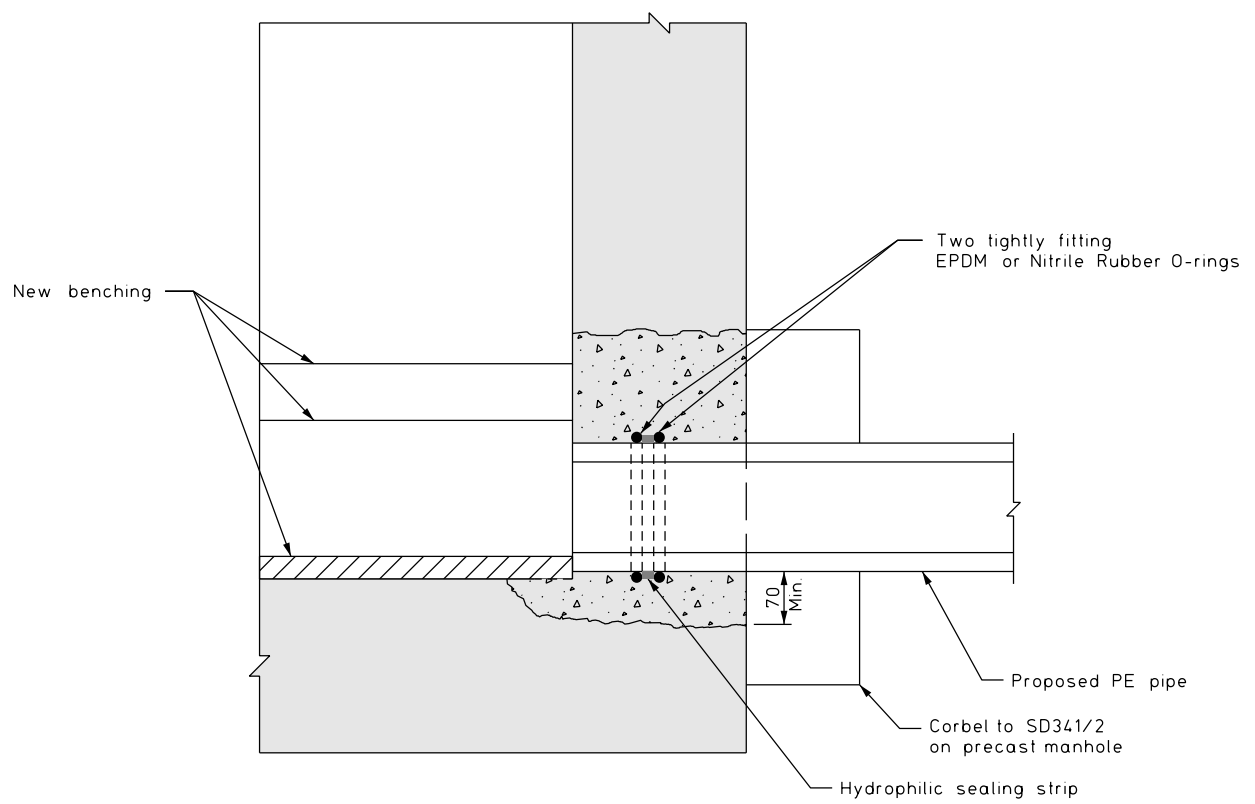


PVC Long Socket Manhole Connector



NOTES:

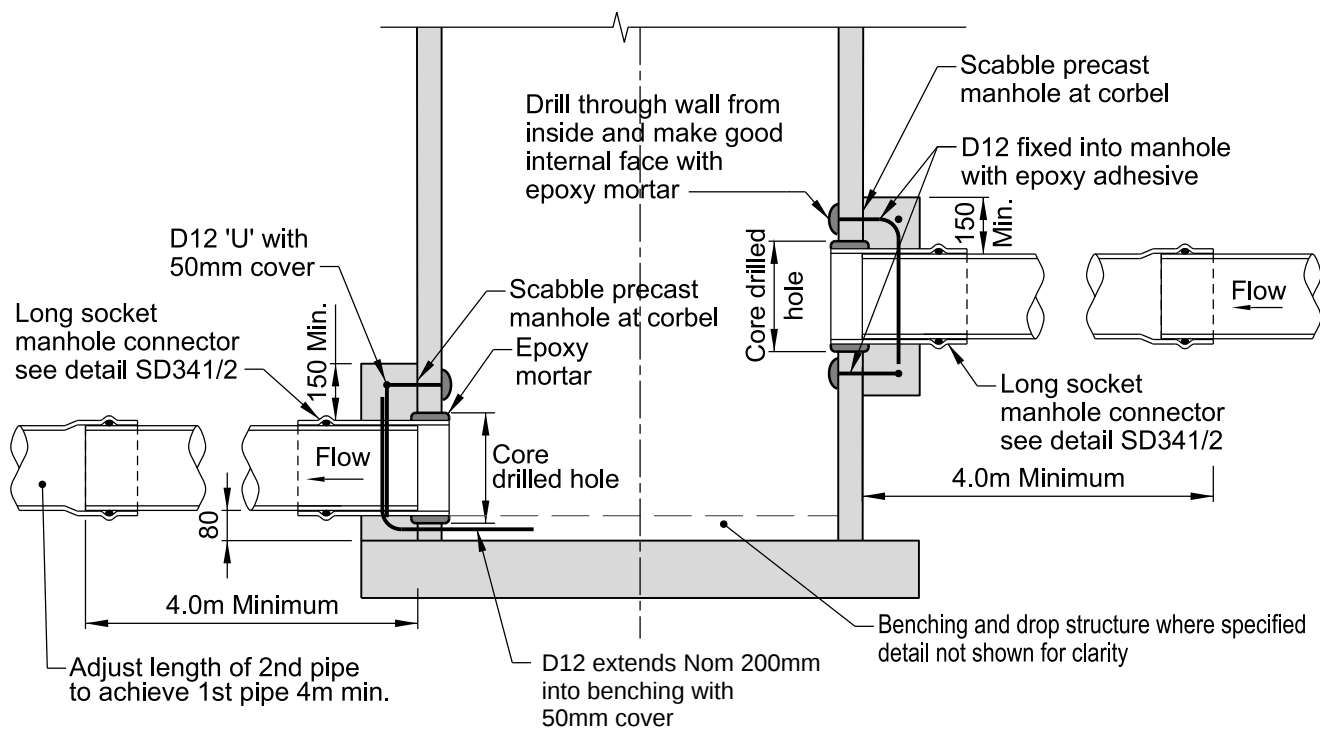
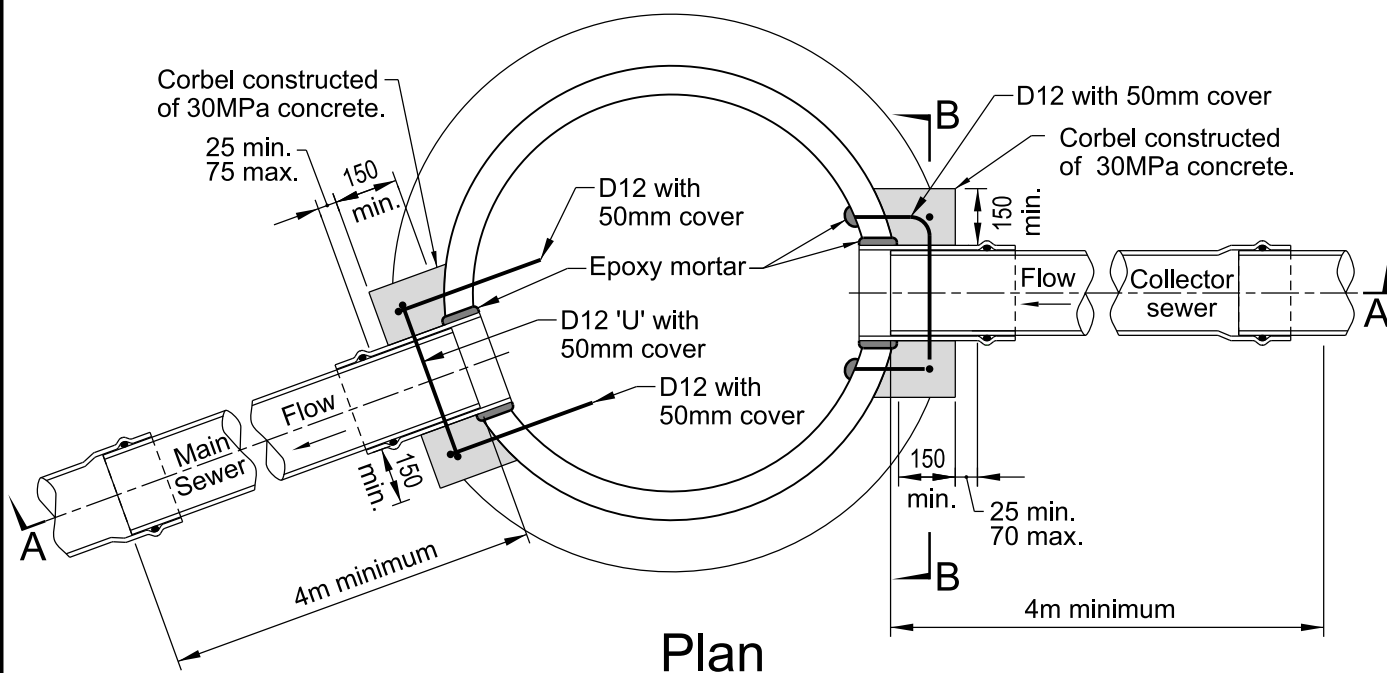
1. Sump starters and finishers to plan SD343.
2. Sump short pipes shall have a minimum length of 700mm & a maximum of 1000mm.
3. On each pipeline connecting to a sump there shall be one short pipe and two yield joints.
4. Pipes may be laid straight through manhole but must be gritted.



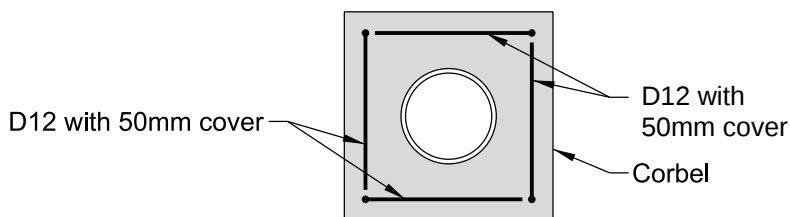
NOTES

1. Nitrile rubber O-Rings shall be used in contaminated soil.





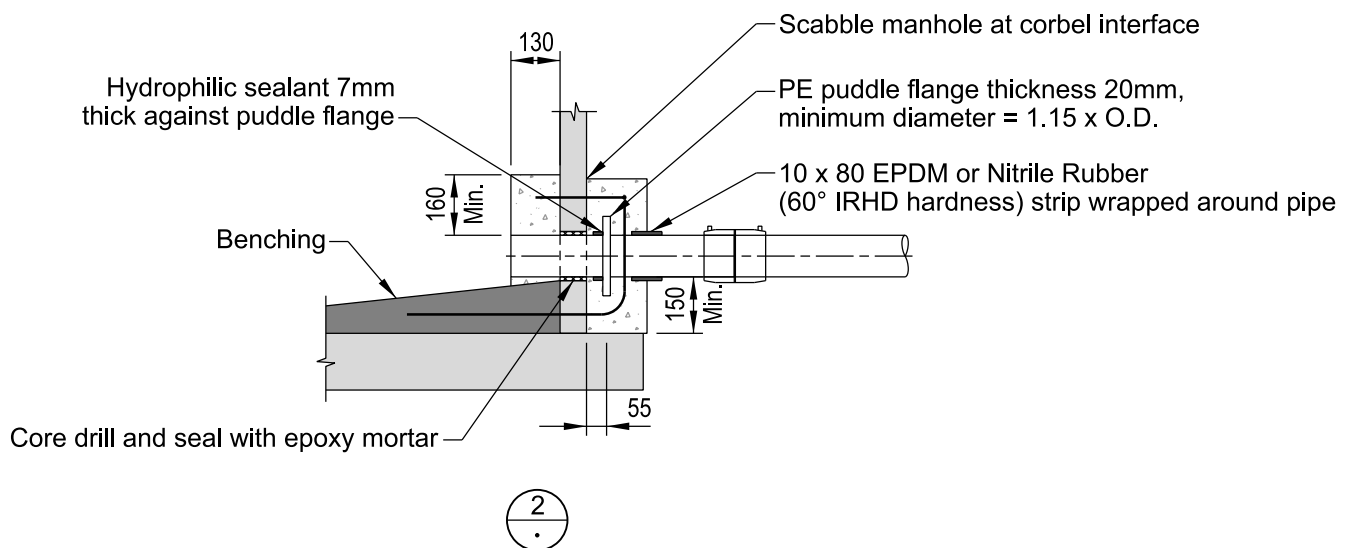
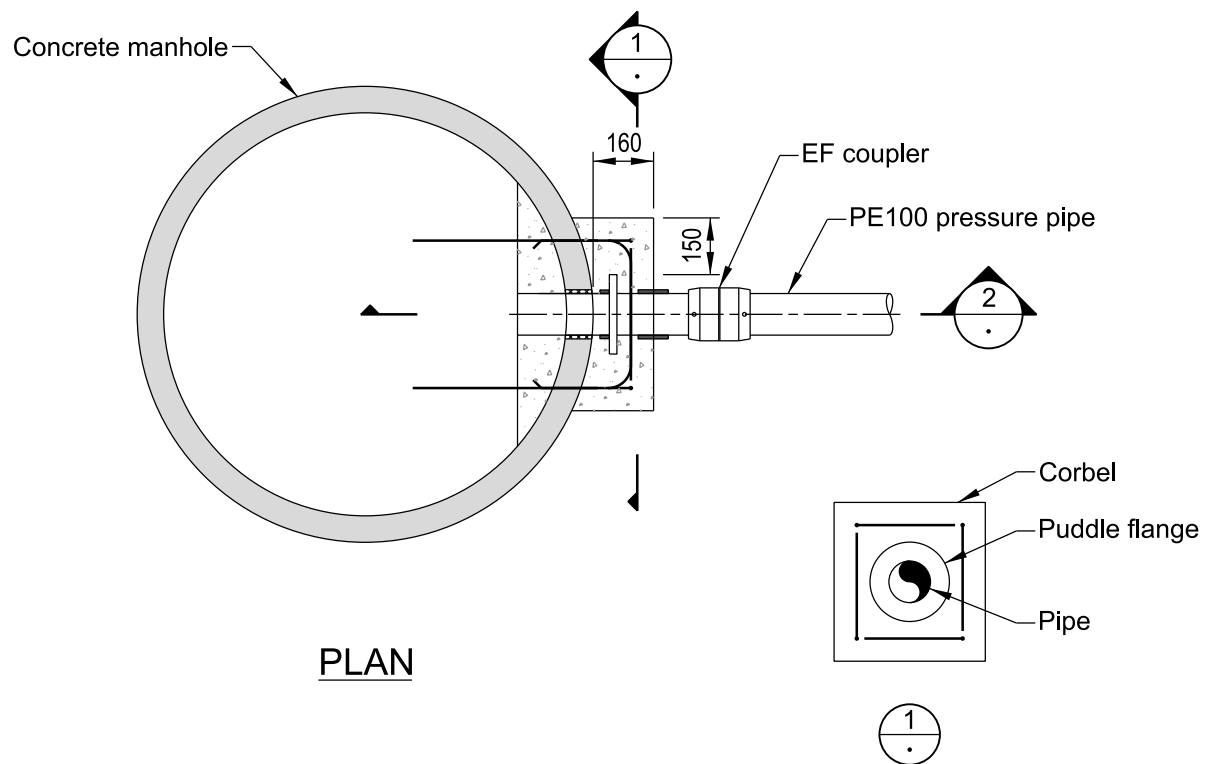
Collector to Main Section A-A



Corbel Section B-B

NOTE:

1. Pipe opening and corbels shall be at least 300mm clear of any joint in precast manhole.
2. Corbel to have at least 70mm concrete below starter / finisher.
3. Remove all old steps, ladders and fittings. Epoxy over any exposed steel.

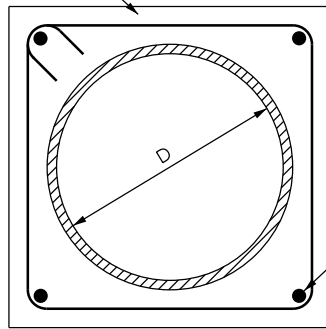


NOTES:

1. Prefabricated PE pipe and puddle flange unit to be same nominal diameter and SDR as pressure pipe.
2. Nitrile rubber shall be used in contaminated soil.
3. 10 x 80 is a minimum, wider strips shall be used where specified by the Engineer.

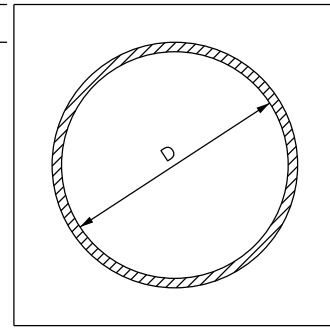


50 cover to reinforcing
all round.



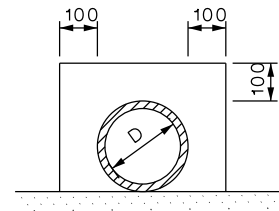
100 Cover to
pipe all round.

D16 Main Rods & R10
Stirrups at 600 c/c.



**REINFORCED
CONCRETE SURROUND**
D=150 ϕ to 450 ϕ
TYPE A

**PLAIN
CONCRETE SURROUND**
D=150 ϕ to 450 ϕ
TYPE B



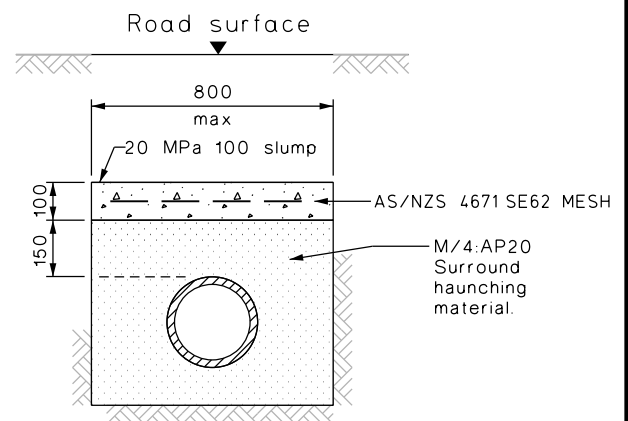
CONCRETE COVER
D=100 ϕ
TYPE D

NOTES:

- For concrete pipe diameters greater than 450mm or flexible pipe diameters greater than 300mm special design applies.
- Concrete shall be 20 MPa 100 slump with a tolerance of +0,-20mm.
- Type of surround shall be specified.
- Concrete surround shall terminate at a pipe joint.
- Contraction joints shall be formed at pipe joints by interrupting concrete with 12mm Softboard or equivalent and applying approved sealant to the pipe joint to prevent entry of concrete. Any reinforcing steel shall be stopped unhooked 50mm from joint.
- Contraction joint spacing - maximum:

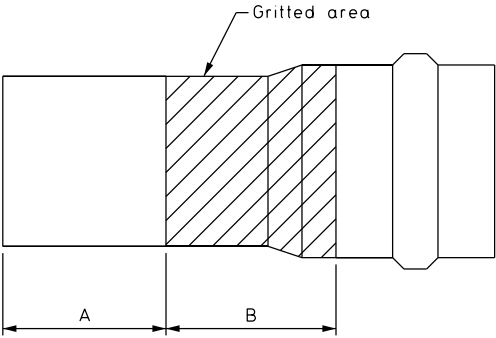
	R.C.R.R.	Ceramic Pipes or vertically cast
Type A	10m	3.2m
Type B	5m	1.6m
Type C	Engineer to specify	3.2m
Type D	specify	1.6m

- With flexible pipe Type E protection to be used unless otherwise specified.

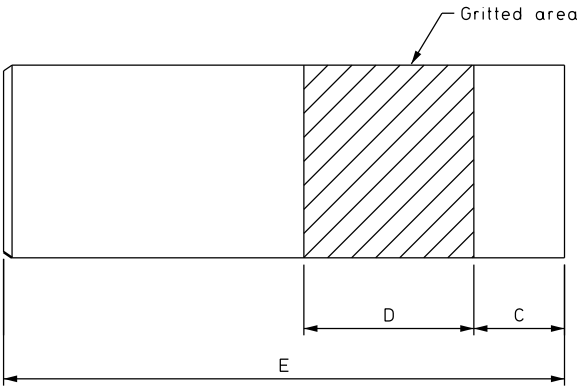


CONCRETE PROTECTION SLAB
MAXIMUM PIPE SIZE 300 ϕ
TYPE E

NOTE: Suitable for soils with an allowable
bearing pressure over 50KPa

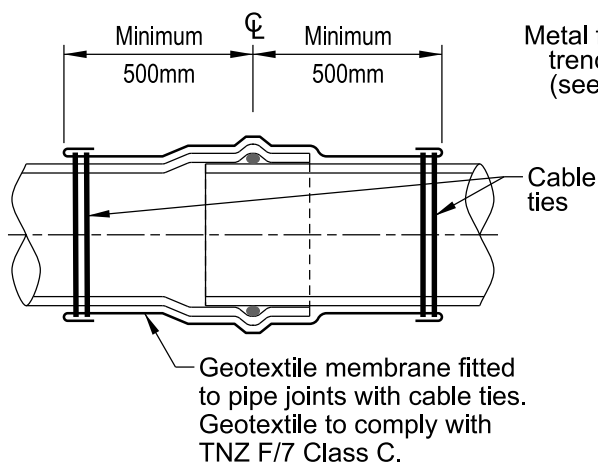


Pipe DN	A Max.	B Min.
100	144	150
150	129	150
175	113	150
225	95	150
300	82	150



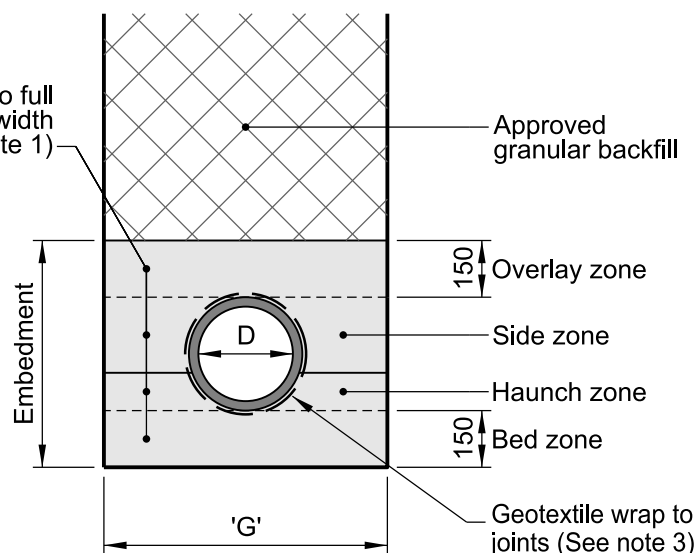
Pipe DN	C Max.	D Min.	E
100	80	150	500
150	80	150	500
175	80	150	500
225	80	150	500
300	80	150	520

- NOTES:
- 1. For use at sumps and headwalls only.
 - 2. SN of fitting to match SN of adjacent pipe.

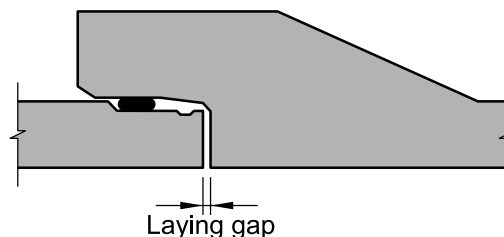


CONCRETE PIPE DETAIL

N.T.S.



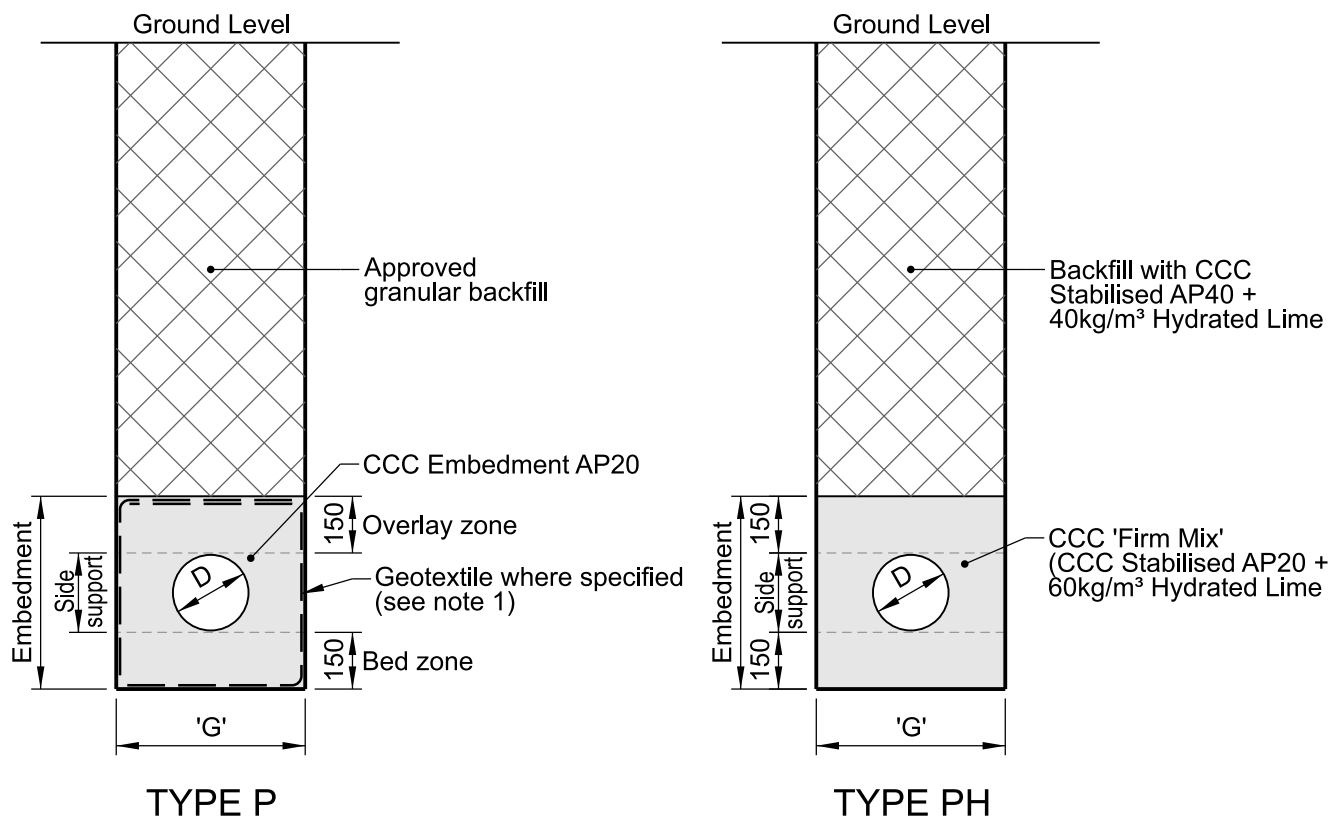
CCC Concrete Pipe Target and Maximum Joint Laying Gaps			Trench Width (mm)
Nominal Pipe Diameter (mm)	Target Laying Gap (mm)	Max Laying Gap (mm)	'G'
225	5	10	700
250	5	10	800
300	5	10	800
375	5	10	900
450	5	10	1000
525	5	10	1100
600	5	10	1200
675	5	10	1300
750	8	16	1300
825	8	16	1400
900	8	16	1500
975	10	20	1600
1050	10	20	1700
1200	10	20	1900
See note 1			
1350	10	20	2100
1600	12	20	2400
1800	12	20	2600



Note: The average joint gap should not exceed 1.5x the 'Target Laying Gap'

NOTES:

1. Use CCC Embedment AP20 for nominal diameters up to and including 1200mm. Use Drainage AP40 for nominal diameters 1350mm and above.
2. On hillsides or where in-trench scour is a potential issue use Lime Stabilised 'Firm Mix' and lime stabilized backfill.
3. Wrap joints to a minimum of 500mm each side of all joints with specified geotextile. Geotextile shall be snugly secured to the pipe using cable ties or similar. Refer detail above. Joint wrapping is not required where lime stabilised backfill and CCC 'firm mix' is used for pipe embedment.
4. Where specified, embedment shall be fully wrapped in geotextile in accordance with TNZ F/7.



TYPE P (Standard) & TYPE PH (Hillside)

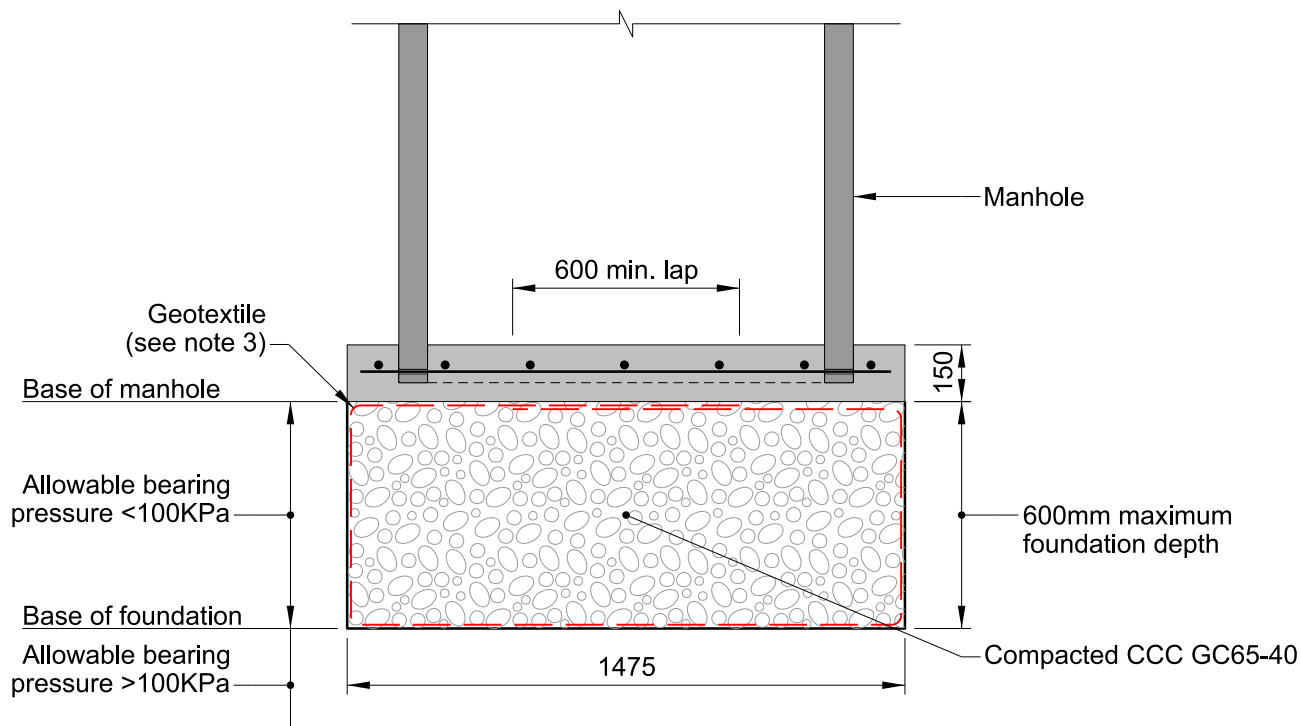
Nominal Pipe Diameter DN (mm)	Trench Width *'G'
100	460
150	500
175	550
200 (pressure)	575
225	600
300	700
375	800
475	1100

* 'G' may be increased in very soft ground.

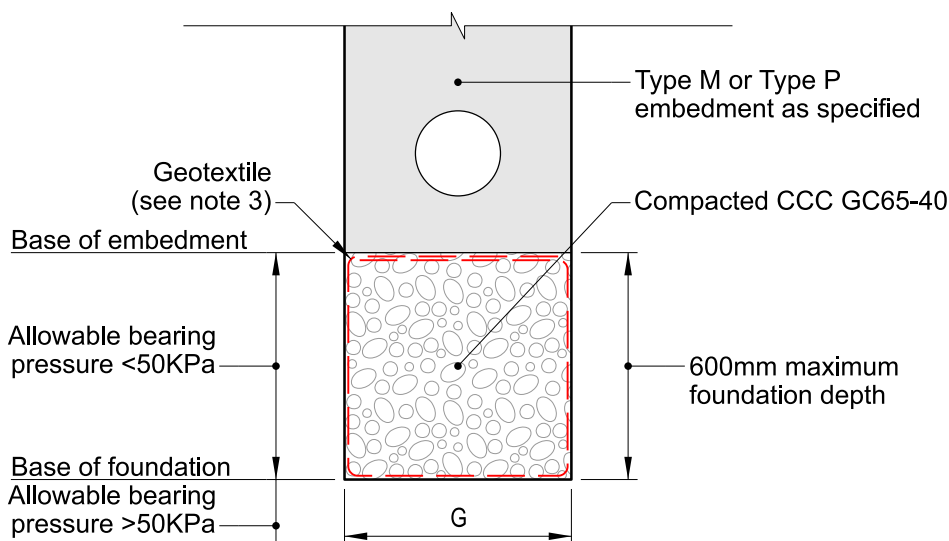
NOTES:

- Where specified, embedment shall be fully wrapped in geotextile in accordance with TNZ F/7.
- Where specified, wrap joints to minimum 500mm each side of all joints including laterals with specified geotextile. Secure the geotextile snugly to the pipe using cable ties or similar. Refer to the "Geotextile joint wrapping detail" on SD344, sheet 1.





MANHOLE SOFT GROUND FOUNDATION

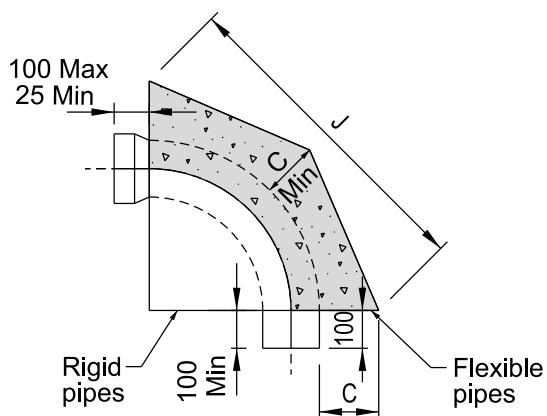


PIPE SOFT GROUND FOUNDATION

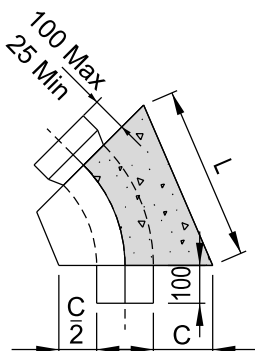
NOTES:

1. If the **pipe soft ground foundation** allowable soil bearing pressure is less than 50kPa below 600mm of the base of the embedment, site specific design is required.
If the **manhole soft ground foundation** allowable soil bearing pressure is less than 100kPa below 600mm of the base of the manhole, site specific design is required.
2. Where the depth to the base of the foundation exceeds 3.0m from the finished ground level, site specific design is required.
3. Geotextile installation shall be in accordance with TNZ F/7.

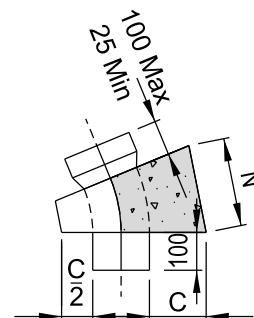
NOTE : Faces J, L & N to be poured against natural ground
See specification.



90° BEND



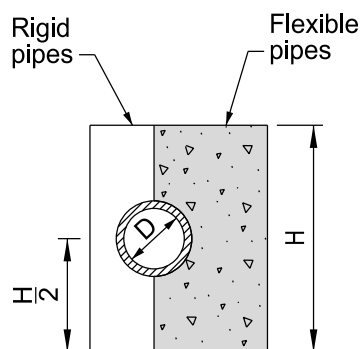
45° BEND



22 $\frac{1}{2}$ ° & 11 $\frac{1}{4}$ °
BEND

Diameter	Height	Cover	90° Bend	45° Bend	22.5° & 11.25° Bend
NB (mm)	H (m)	C (m)	J (m)	L (m)	N (m)
100	300	200	300	250	150
125	375	200	350	300	150
150	450	200	450	350	175
175	525	230	500	400	200
200	600	230	600	450	225
225	675	230	650	500	250
250	750	230	750	550	300
300	900	300	900	700	350

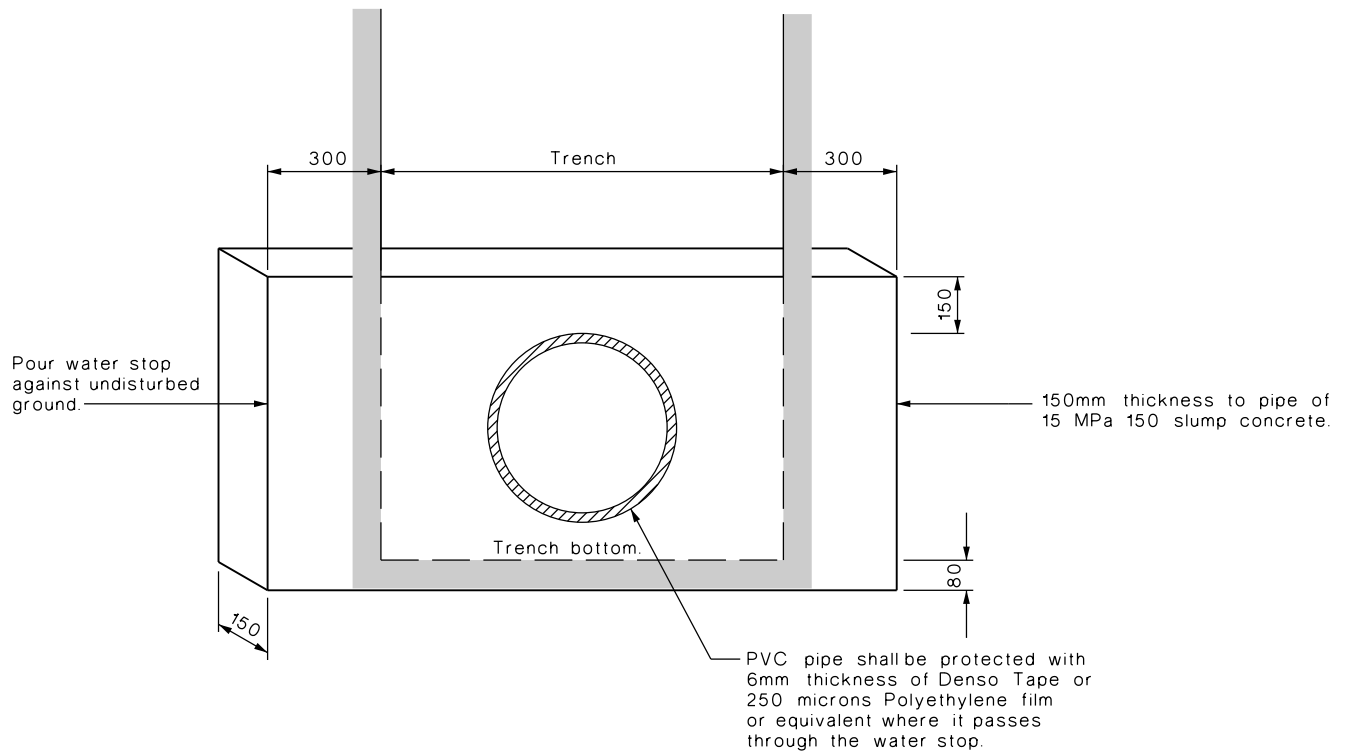
HORIZONTAL BENDS ONLY



TYPICAL SECTION
THROUGH THRUST BLOCK

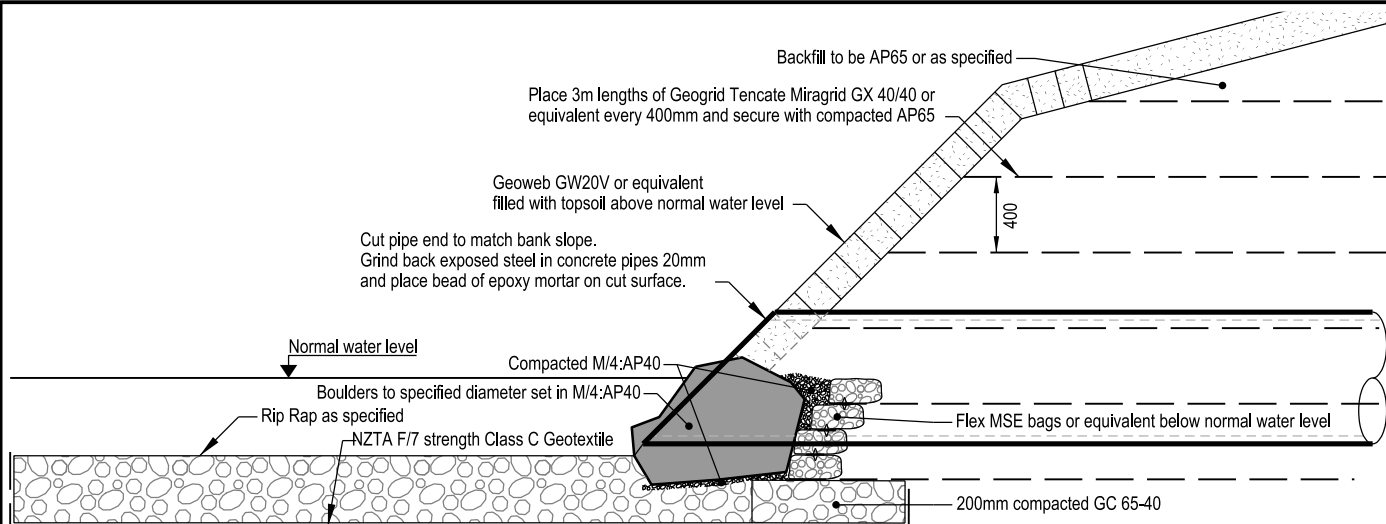
NOTES:

1. Thrust block designed for an allowable bearing load of 50 kPa at pipeline pressure 390 kPa.
2. Thrust blocks in unsuitable soils require special design.
3. Concrete to be 17.5 MPa 150 slump unreinforced.
4. Do not use for upward thrust (special design only).
5. PVC pipes adjacent to concrete shall be wrapped with 6mm Denso tape or 250 microns Polyethylene film or equivalent.

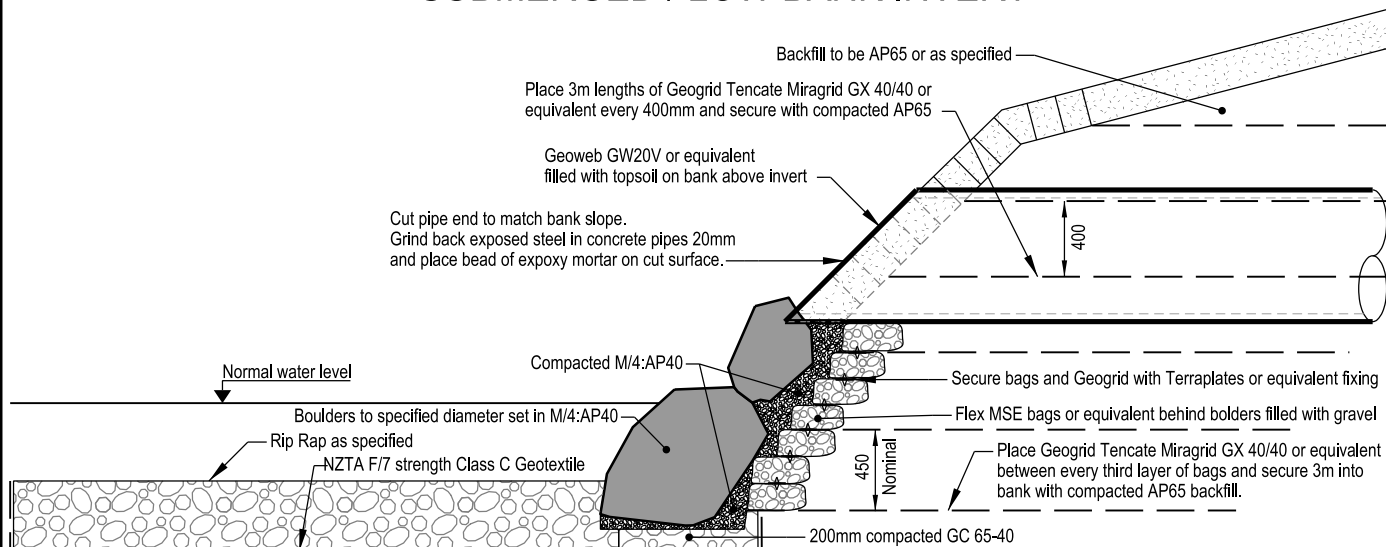


NOTES:

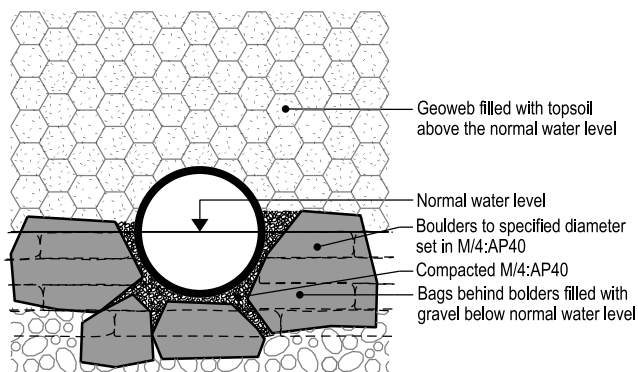
1. Water stop spacing is as specified.



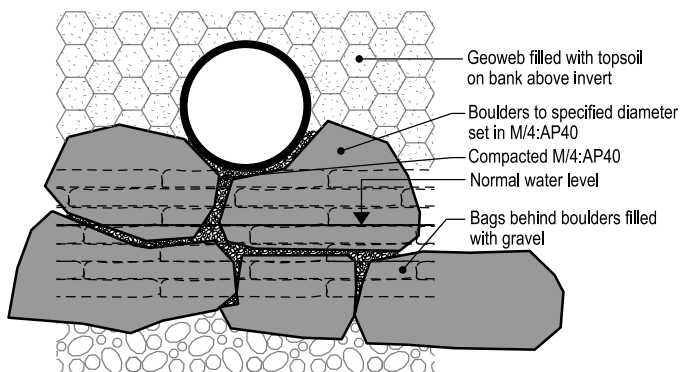
SUBMERGED / LOW BANK INVERT



DRY / HIGH BANK OUTLET



END ELEVATION - SUBMERGED / LOW BANK

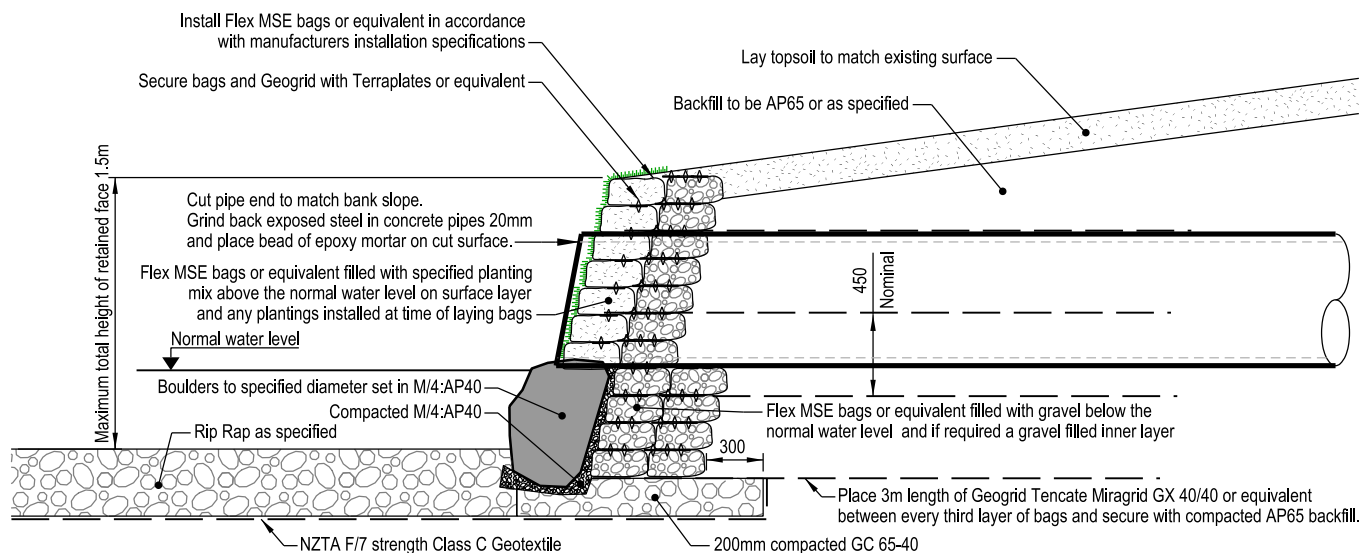


END ELEVATION - DRY / HIGH BANK

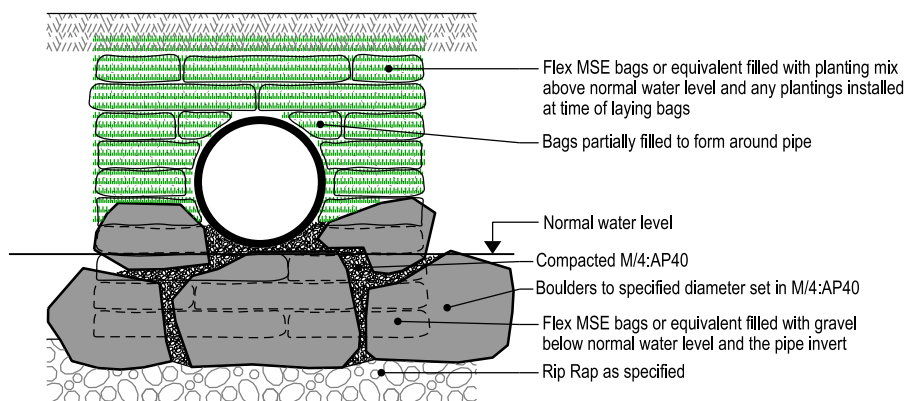
NOTES:

1. In tidal areas use the high tide level as the normal water level.
2. Topsoil to be 200mm min. thickness for grass or 400mm min. thickness for planting. Max. 200mm in Geoweb.
3. If bank vertical height is less than 1.5m, consider reducing length of Geogrid to 2m.
4. For grassed areas hydroseed.

5. Bank stabilisation to be implemented to the full extent of modified/excavated ground.
6. If bearing capacity under outfall pipeline is less than 50kPa refer to detail SD352.
7. Flex MSE, Geogrid and Geoweb are for representation purposes only.
8. Boulder diameter as specified by designer. (Minimum diameter 300mm. Maximum diameter 2/3rd Pipe dia. for pipes larger than 600mm dia.)



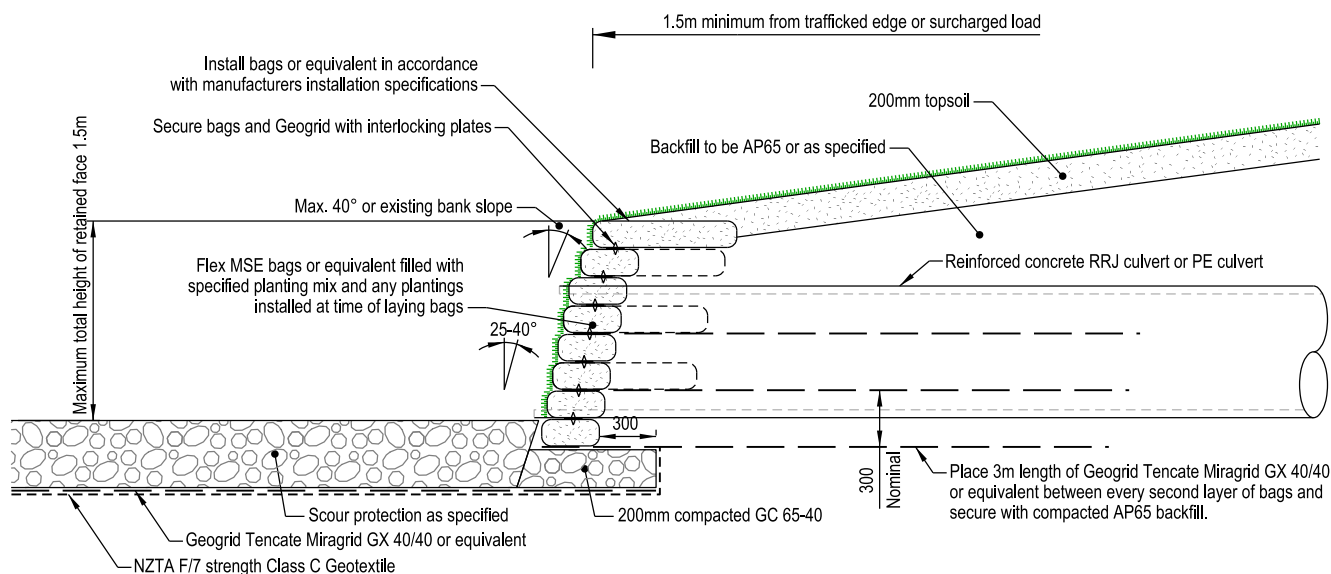
SECTION



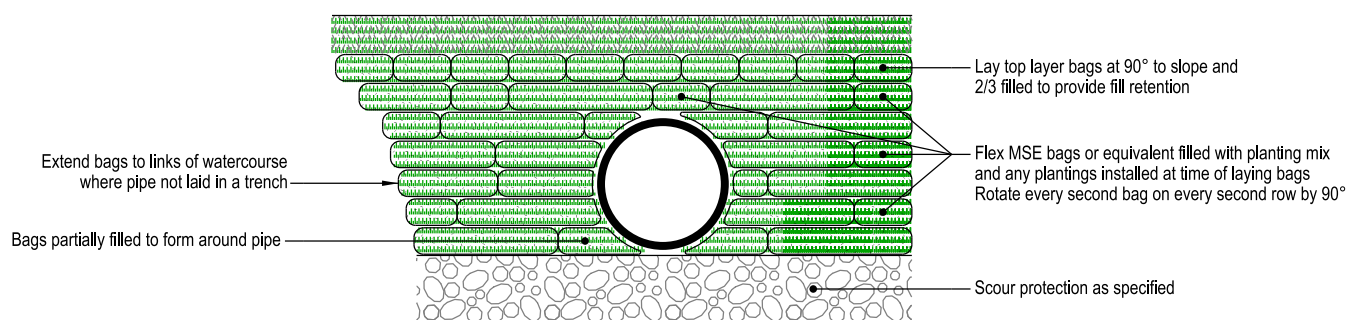
END ELEVATION

NOTES:

1. SEE NOTES ON SHEET 1
2. MSE bags must be protected from UV with vegetation. Planned vegetation must have a commitment from the asset owner to be regularly maintained. Vegetation cover is an essential part of the design, construction procedure, durability and longevity of the headwall. If planting proposed, the roots must be installed between the uncut bags at the same time as FlexMSE wall construction. If grasses are proposed they must be hydroseeded using an appropriate polymer adhesive additive.



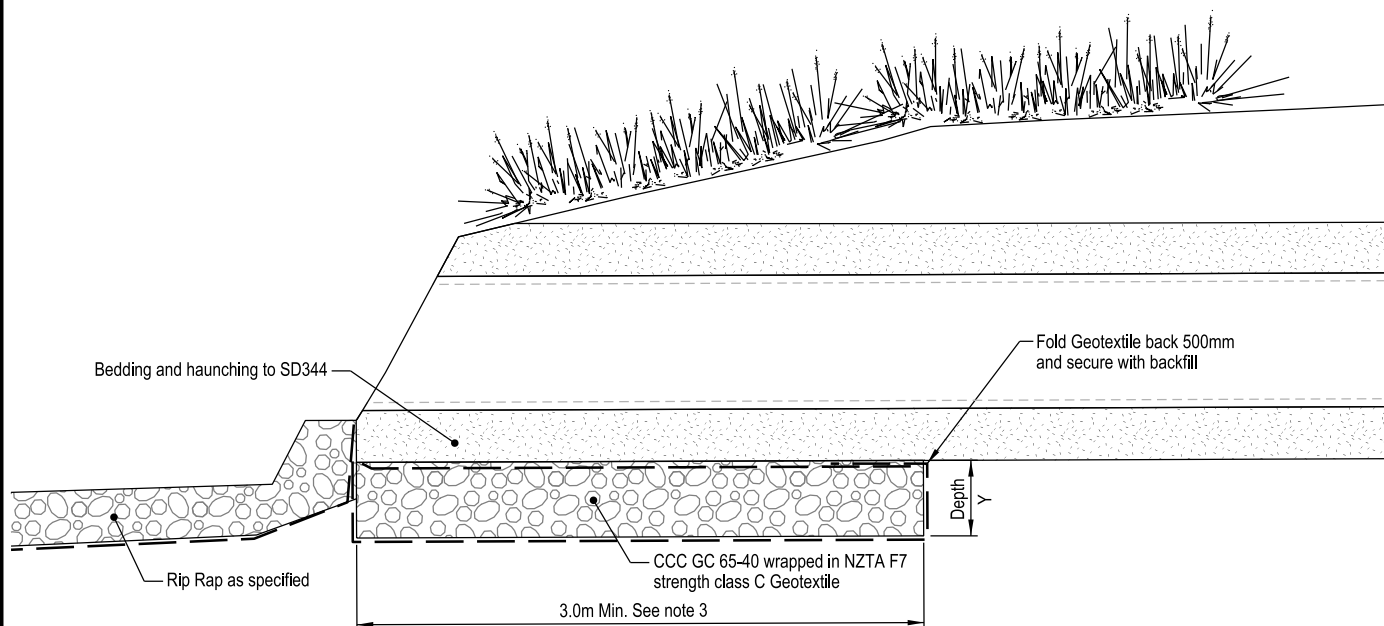
SECTION



END ELEVATION

NOTES:

- Where headwall is generally wet, scour and inlet shaping requires specific design.
- MSE bags must be protected from UV with vegetation. Planned vegetation must have a commitment from the asset owner to be regularly maintained. Vegetation cover is an essential part of the design, construction procedure, durability and longevity of the headwall. If planting proposed, the roots must be installed between the uncut bags at the same time as FlexMSE wall construction. If grasses are proposed they must be hydroseeded using an appropriate polymer adhesive additive.
- This detail is not suitable for use where the vertical bank height exceeds 1.5m
- Flex MSE bags are for representation purposes only. Bag system to provide 80 year service life.
- Retaining wall to be installed in accordance with the manufacturers installation specification. Note vegetation cover requirement.
- If bearing capacity under pipeline is less than 50kPa refer to detail SD352.
- The trench backfill shall be lime stabilised on hillsides.
- SD351 is a suitable detail for ephemeral waterways or swale outlets only.
- Lateral spread risk needs to be assessed on a case by case basis.



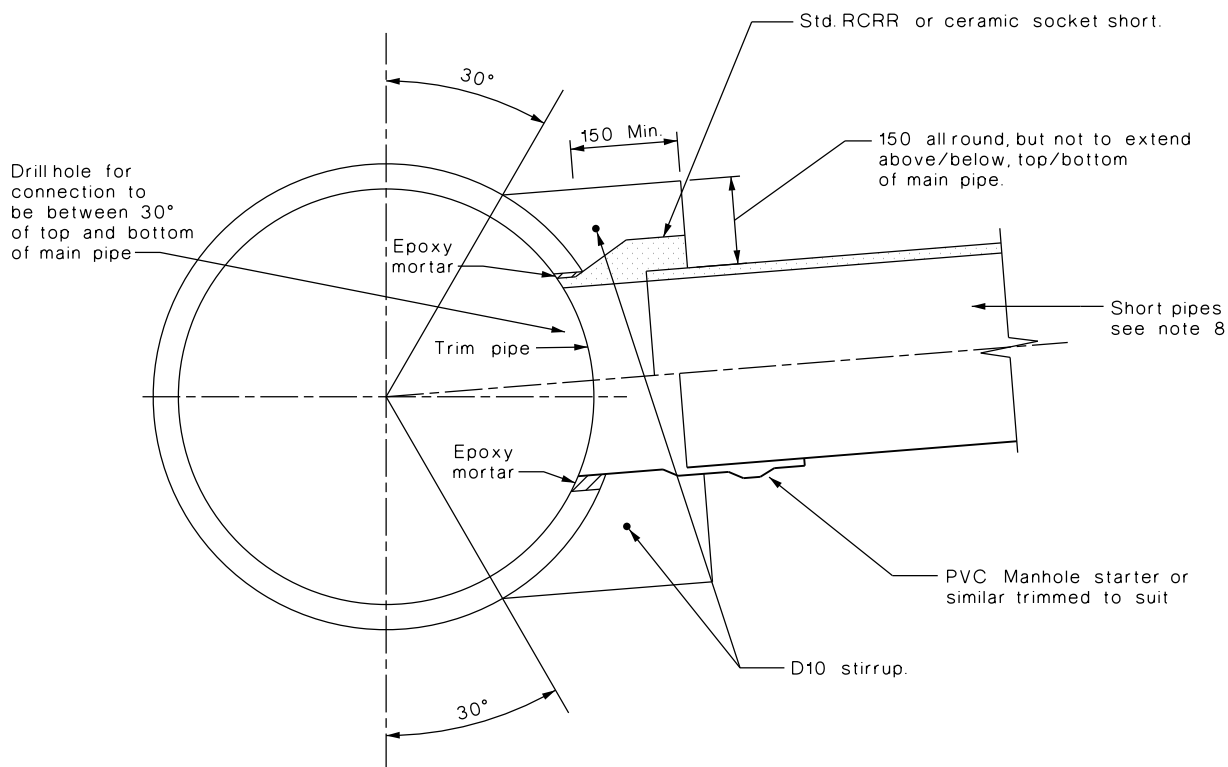
SECTION

RAFT DEPTH	
PIPE DIAMETER	DEPTH (Y)
< 300 Ø	300mm
300 - 600 Ø	400mm
> 600 Ø	500mm

NOTES:

1. Suitable for soils with an allowable bearing pressure over 50kPa.
2. Width of raft to match trench width.
3. Extend raft foundation 0.5m minimum past rubber ring joint where within 3.0m of outlet.



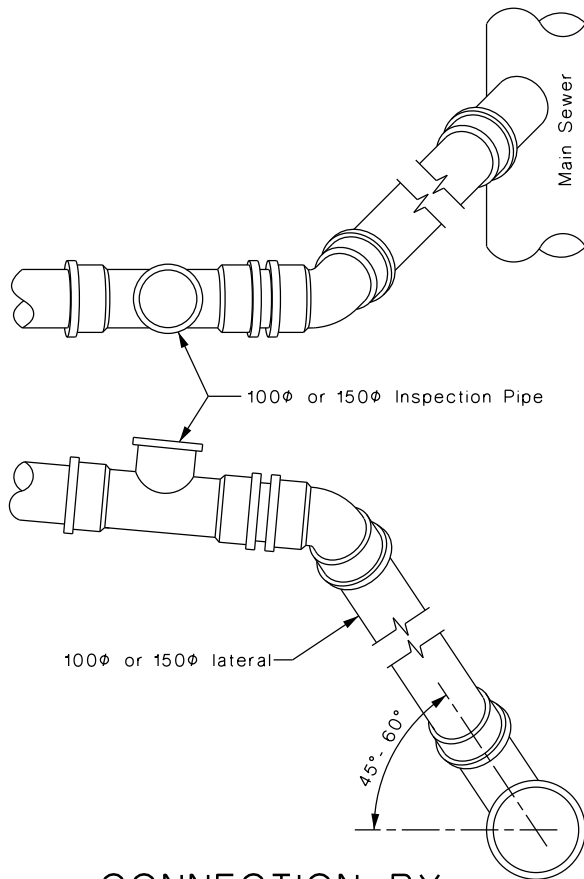


NOTES:

1. Special design required for :
main pipes other than reinforced concrete;
more than one connection per main pipe.
2. Direct connections of this type are not permitted on plastic mains.
3. Outside edge of main pipe cut-in hole shall be not less than 300mm from collar or end of pipe.
4. Maximum diameter of cut-in hole shall be less than two thirds of the internal diameter of main pipe.
5. Epoxy mortar shall be applied strictly according to the manufacturer's recommendations, and shall be fully cured before the corbel is poured and the sideline laid.
6. Main pipe backfill under sideline shall be thoroughly compacted AP40 metal.
7. Main pipe surface shall be roughened and grout coated before concrete corbel is poured.
8. Sidelines shall have yield joints in accordance with standard detail plan SD341.
9. Sidelines shall be tested.
10. Diameter of the `sideline pipe shall be less than half the internal diameter of the main pipe.

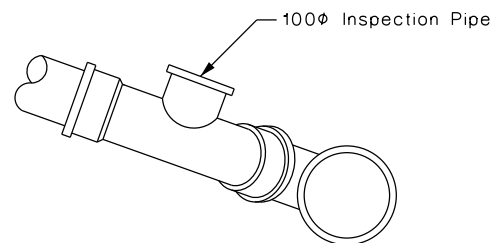
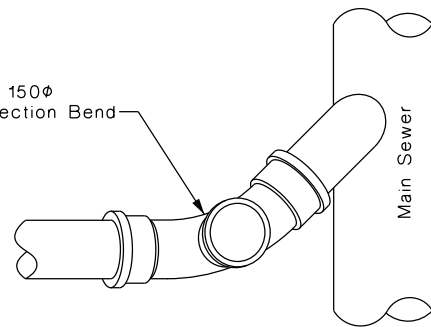
SQUARE RADIAL DIRECT CONNECTIONS:

Nominal Sideline Diameter	Minimum Main Pipe Diameter
100	225
150	375
200	450
225/250	525
300	675
375	825
450	975
525	1050
600/675	1350
750	1600
825/900	1800
975	1950
1050	2100



CONNECTION BY
RAMPED RISER

100φ or 150φ
45° Inspection Bend

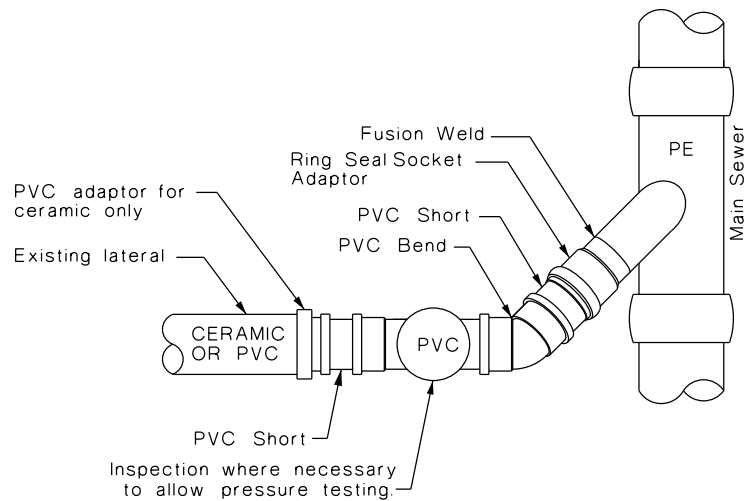


CONNECTION TO 45°
SIDE JUNCTION

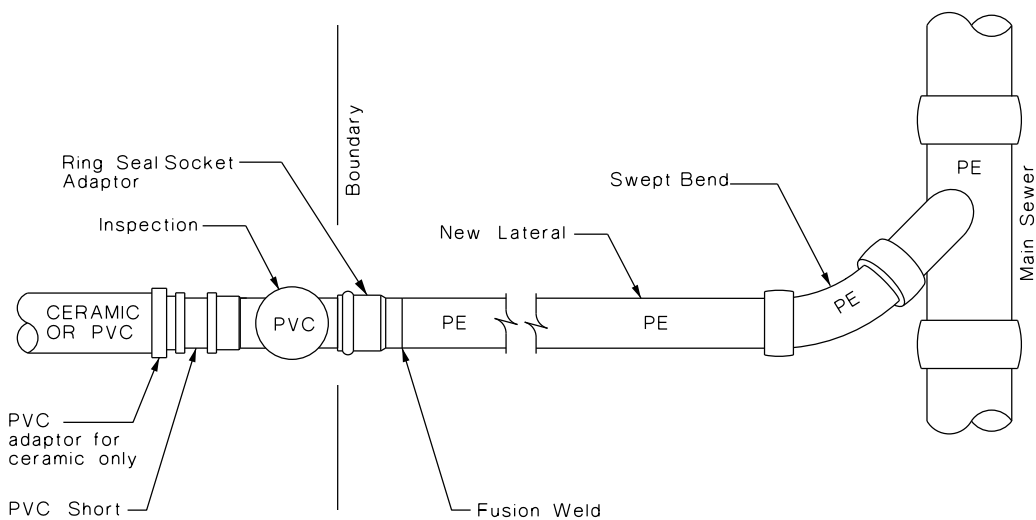
NOTES:

1. PVC pipes adjacent to concrete shall be wrapped with 6mm Denso tape or 250 microns Polyethylene film or equivalent.
2. Bottom of trench to be a stable and approved foundation.
3. Inspection points may be installed to allow pressure testing of the main.
4. Not to be used on main to main connections.

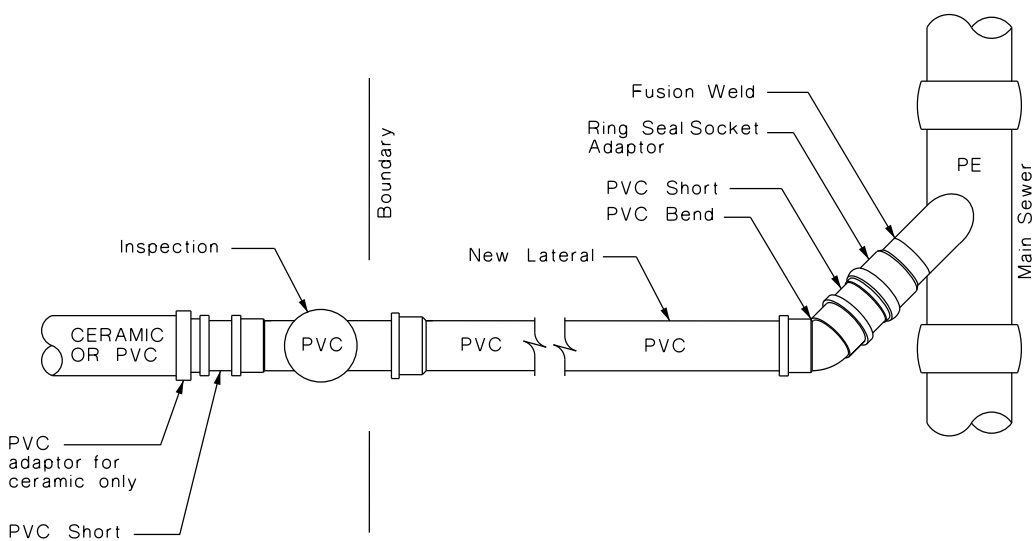




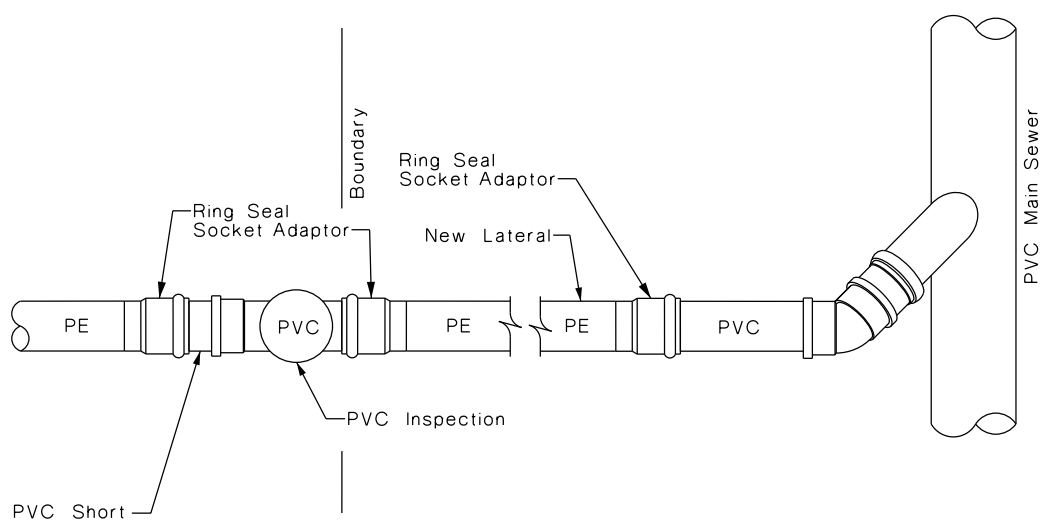
TYPE 1



TYPE 2



TYPE 3

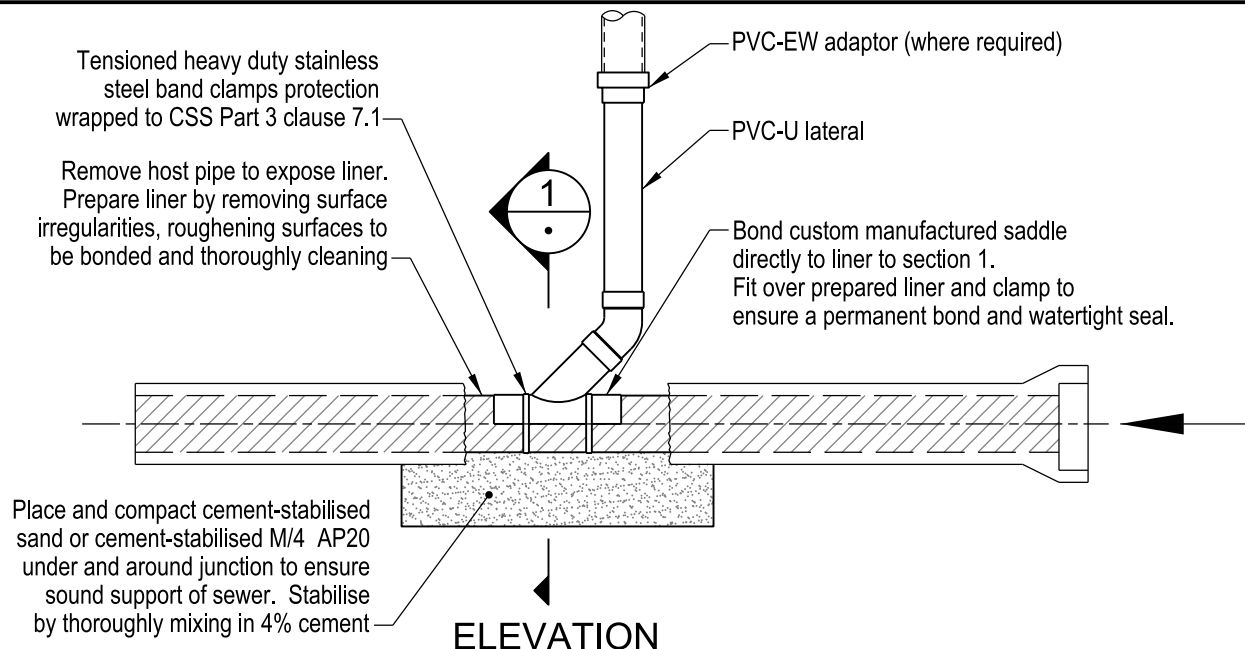


TYPE 4

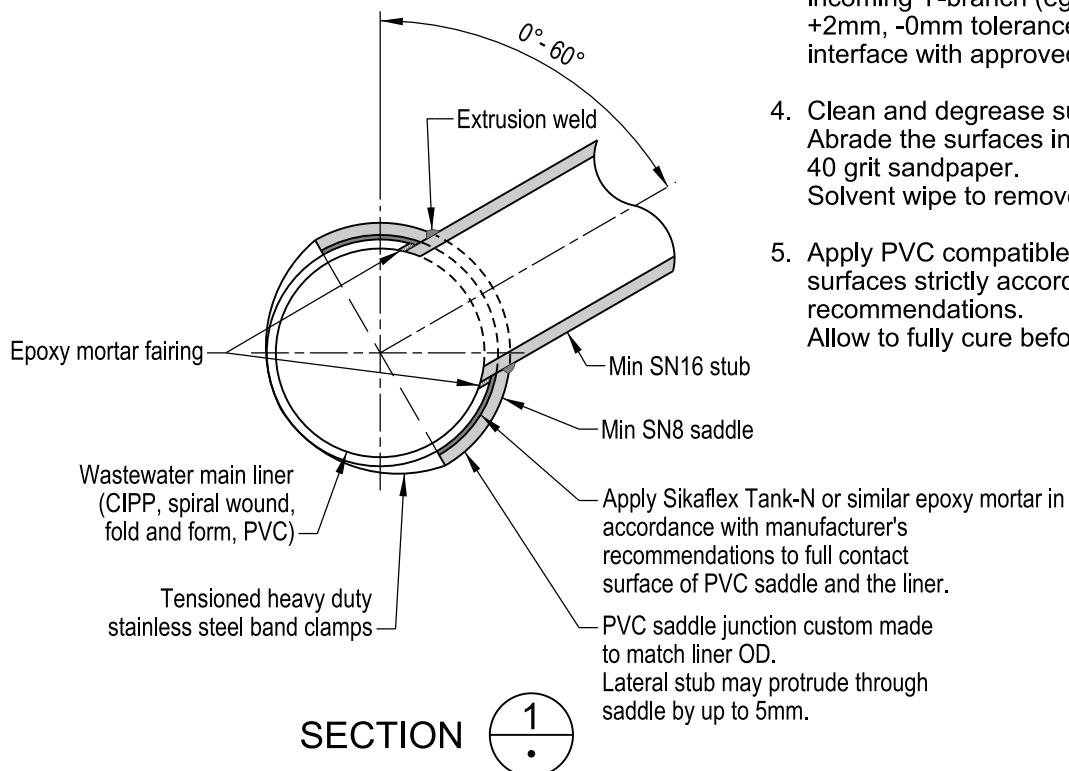
NOTE:

1. Inspection points may be installed adjacent to the main to allow pressure testing.





SADDLE DETAIL

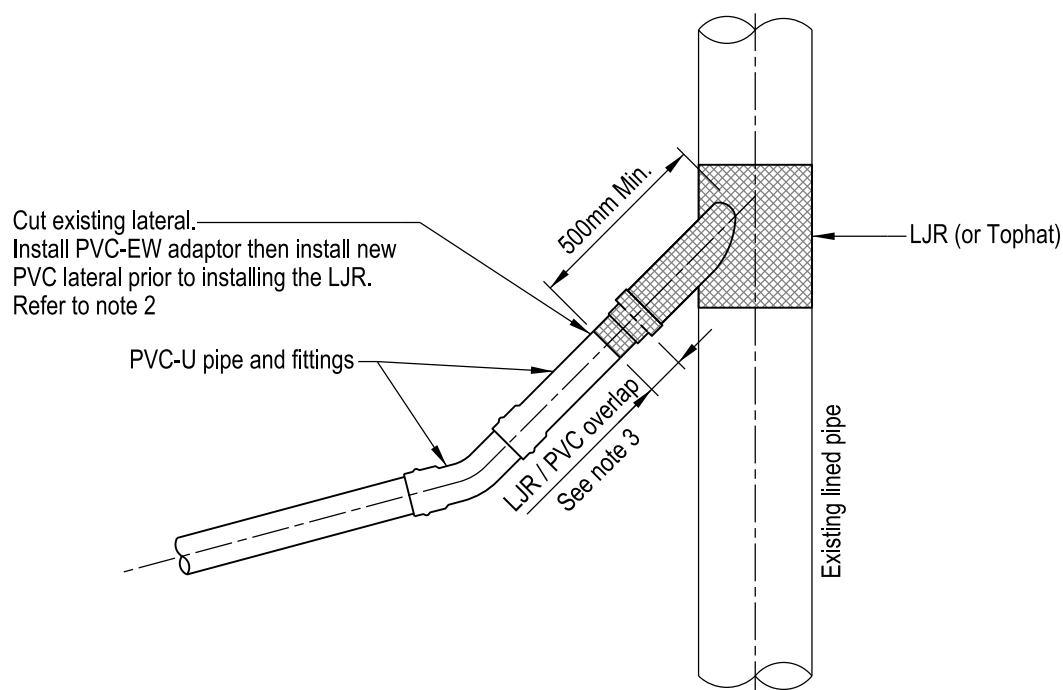


NOTES:

1. Ensure outside edge of main pipe cut-in hole is greater than 300mm from collar or end of host pipe.
2. Maximum diameter of cut-in hole shall be less than two thirds of the internal diameter of main pipe as per table below.

Y-Junction saddle direct connections	
Main pipe dia.	Max. nominal sideline dia.
150	100
225	150
300	175
375	225

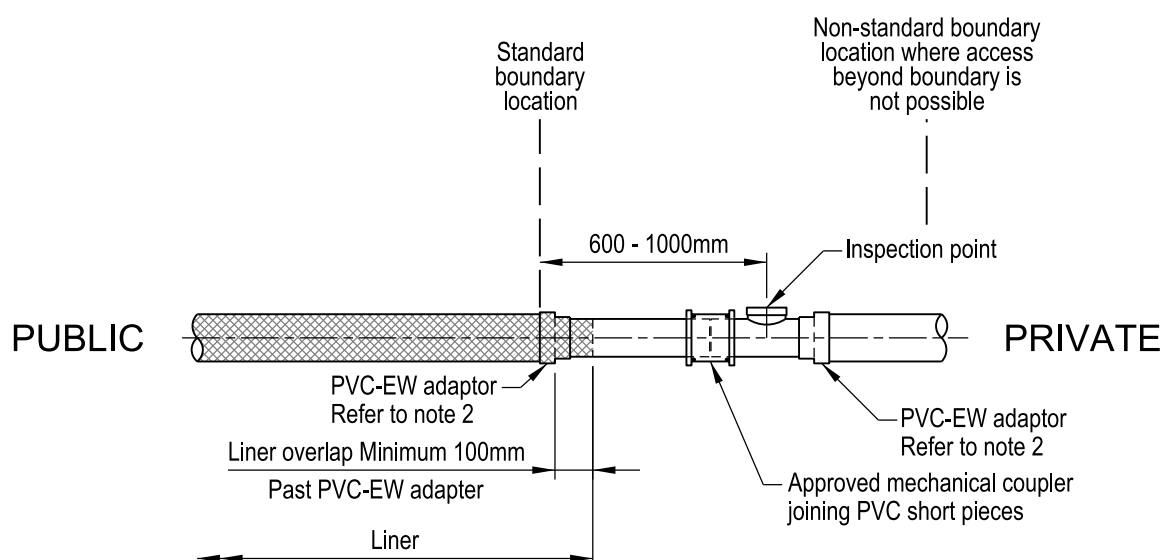
3. Cut in hole must be shaped to match incoming Y-branch (egg shaped) to within +2mm, -0mm tolerance. Smooth junction interface with approved epoxy mortar.
4. Clean and degrease surfaces to be bonded. Abrade the surfaces in two directions with 40 grit sandpaper. Solvent wipe to remove dust.
5. Apply PVC compatible epoxy mortar to both surfaces strictly according to the manufacturer's recommendations. Allow to fully cure before the lateral is laid.



LATERAL JUNCTION REPAIR (LJR) TRANSITION TO PVC LATERAL

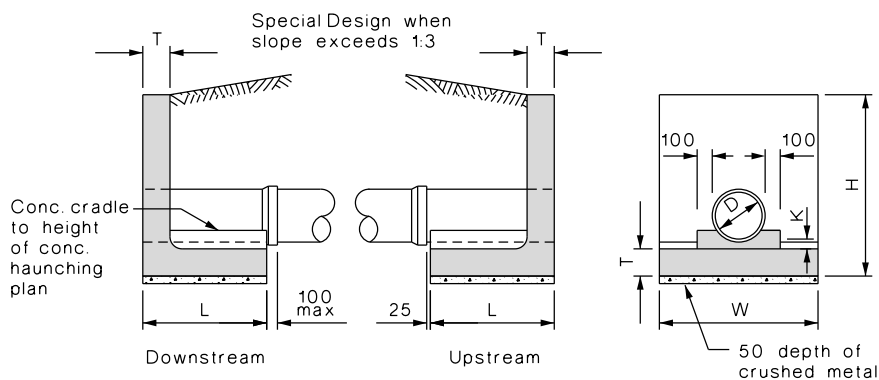
NOTES:

1. Cut earthenware lateral within 500mm of main pipe.
2. Ensure PVC-EW adaptor rubber ring is snug fitting.
Pack void with epoxy mortar all around to form a secure seal and bond.
Roughen inside of PVC-EW adaptor prior to epoxy application.
3. Install the LJR with an overlap into the PVC pipe of at least 200mm.

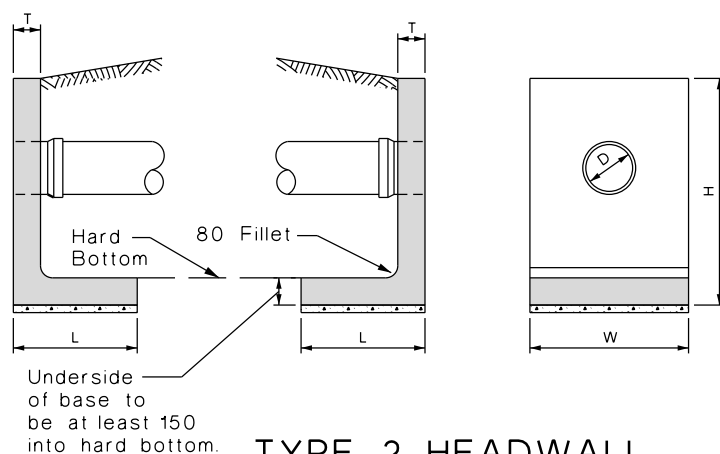


NOTES:

1. Where access beyond the property boundary is not possible, install the PVC inspection point as close to the property boundary as possible.
2. Ensure PVC-EW adaptor rubber ring is snug fitting.
Pack void with epoxy mortar all around to form a secure seal and bond.
Roughen inside of PVC adaptor prior to epoxy application.



TYPE 1 HEADWALL

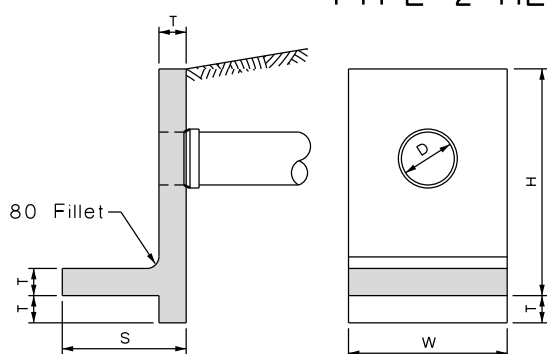


TYPE 2 HEADWALL

NOTES:

1. Type 1 headwall required if "K" is 200 or less otherwise type 2 is satisfactory.
2. Concrete shall be 25 MPa 75mm slump.
3. If "W" exceeds the minimum, reinforcing shall correspond to actual width.
4. One yield joint (see SD341) shall be adjacent to the headwall and for pipes 900 ϕ or less, a second yield joint shall be within 1.3m.
5. For pipes with diameter greater than 1200mm special design shall apply.
6. Pipe ends shall be plain unless otherwise specified.

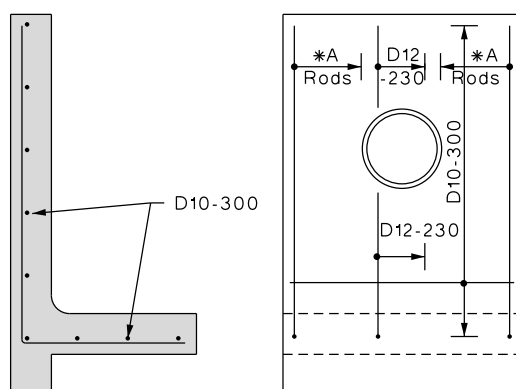
TABLE 1				
H up to	L min	T	S	A, B & C Rods ϕ
900	500	180	750	10
1200	680	180	1050	10
1500	820	180	1300	12
1800	900	180	1600	16
2100	1050	200	1800	20
2400	1200	230	2000	20



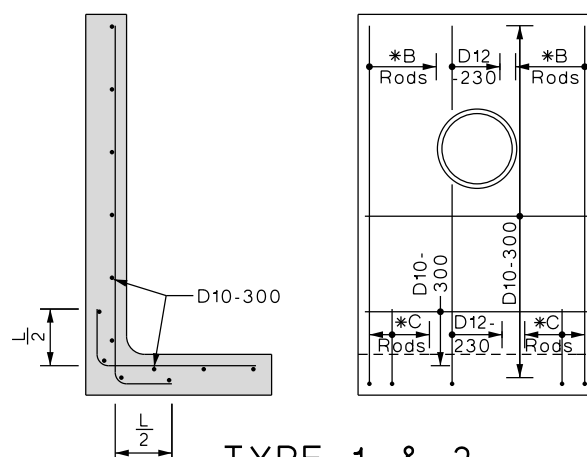
TYPE 3 HEADWALL

Minimum Width of Headwalls "W"	
"D"	"W"
Up to 900 ϕ	3 x "D"
Greater than 900 ϕ	"D" + 1800

TABLE 2	
No. of A, B & C Rods	
"W" up to (mm)	min No.
1000	4
1400	6
1800	8
2500	10
2900	12
3200	14



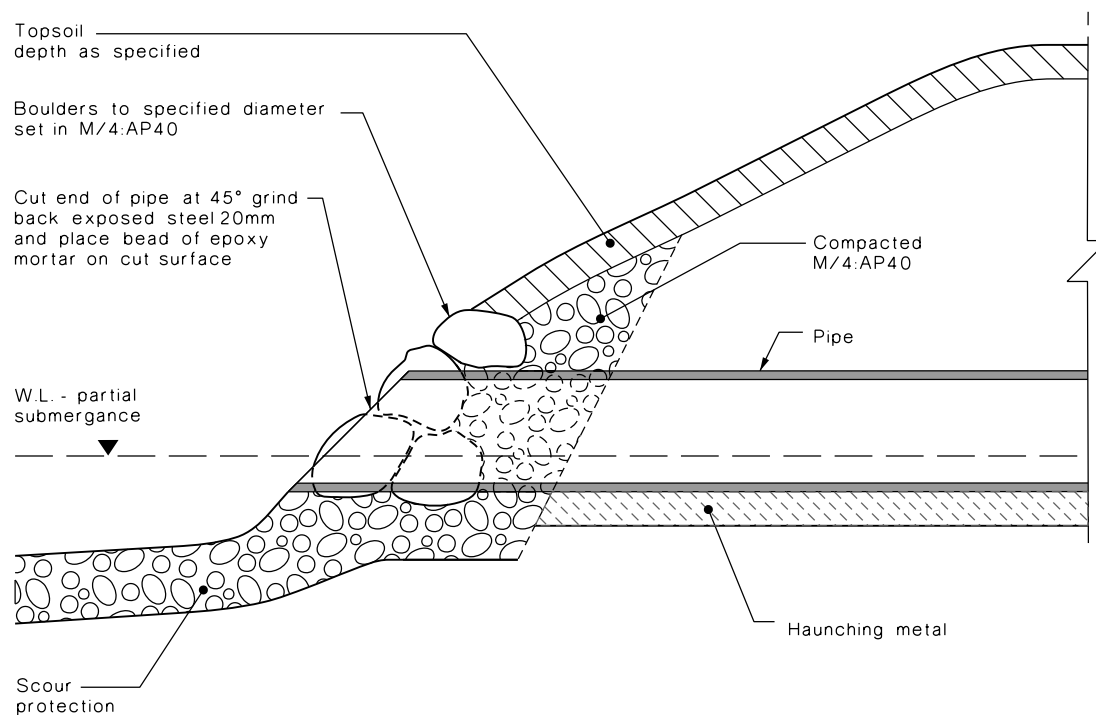
TYPE 3



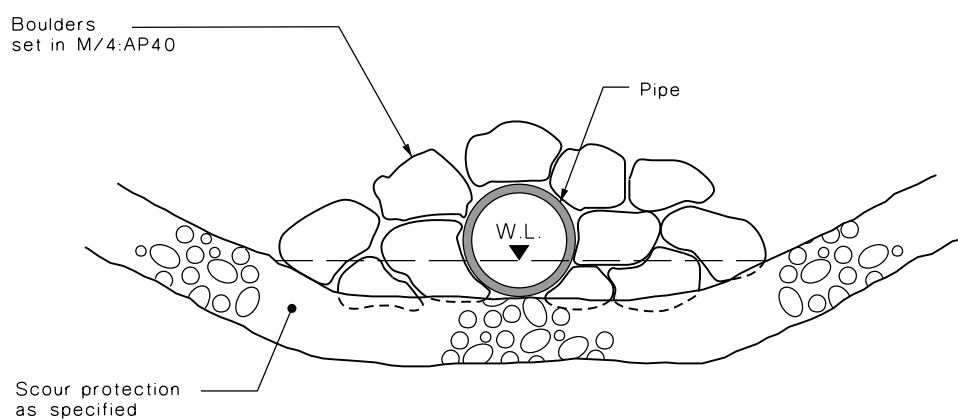
TYPE 1 & 2

REINFORCING DETAILS

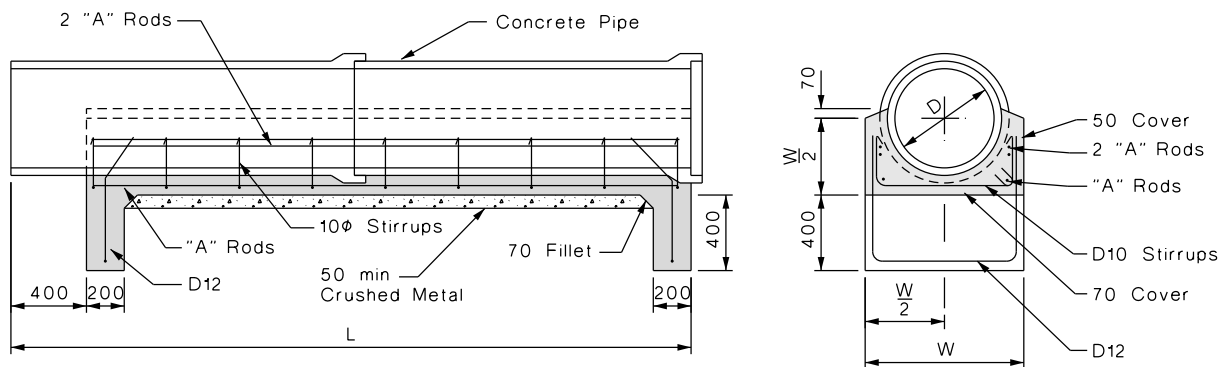
* Rods in accordance with Table 1 & 2



OUTFALL DETAILS



END VIEW



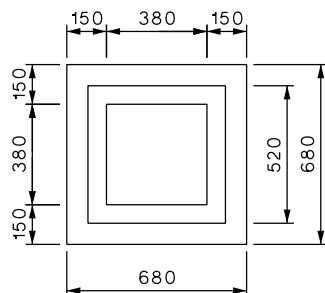
150 ϕ TO 750 ϕ PIPES

Table of Dimensions and Reinforcing			
Nominal Pipe Diameter "D"	"W"	"A" Rods Diameter	Spacing of 10 ϕ Stirrups
150	500	12	300
200	580	12	300
225	580	12	400
250	600	12	450
300	660	12	450
375	740	16	450
450	860	20	300
525	940	20	400
600	1020	24	450
675	1100	24	450
750	1200	24	450

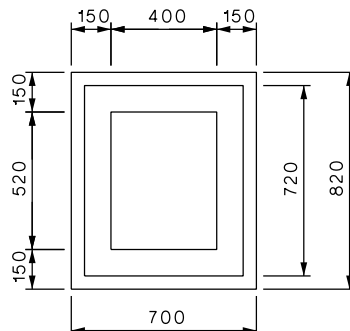
Beam Lengths		
No. of Pipes	Pipe Length	Beam Length "L"
3 RCRR	2.44	6.92
3 RCRR	1.83	5.09
2 RCRR	2.44	4.48
2 RCRR	1.83	3.26

NOTES:

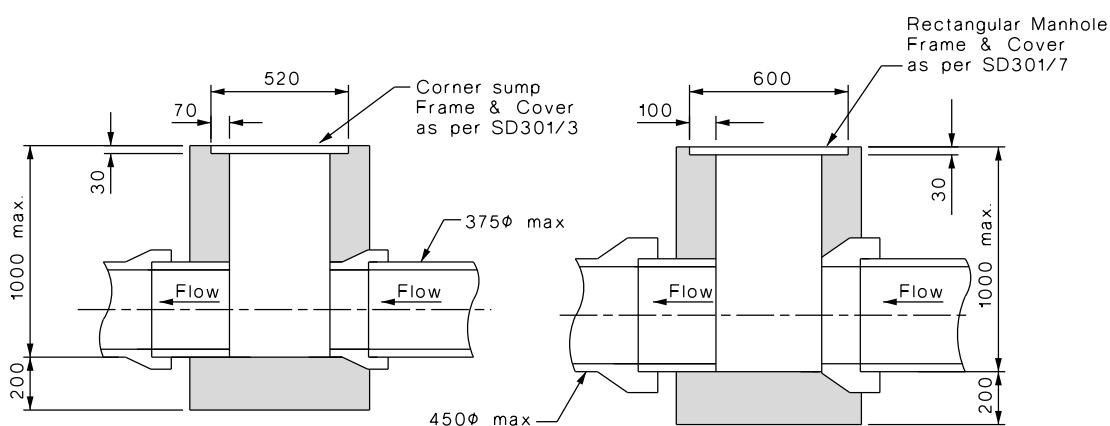
- Concrete to be 25 MPa 75 slump.
- Steel to be deformed rods to AS/NZS 4671.
- Beam length shall be specified.
- For pipes larger than 750mm ϕ special design required.
- First yield joint shall be adjacent to upstream end of beam and second yield joint shall be not more than 1.3m away.



TYPE B



TYPE C

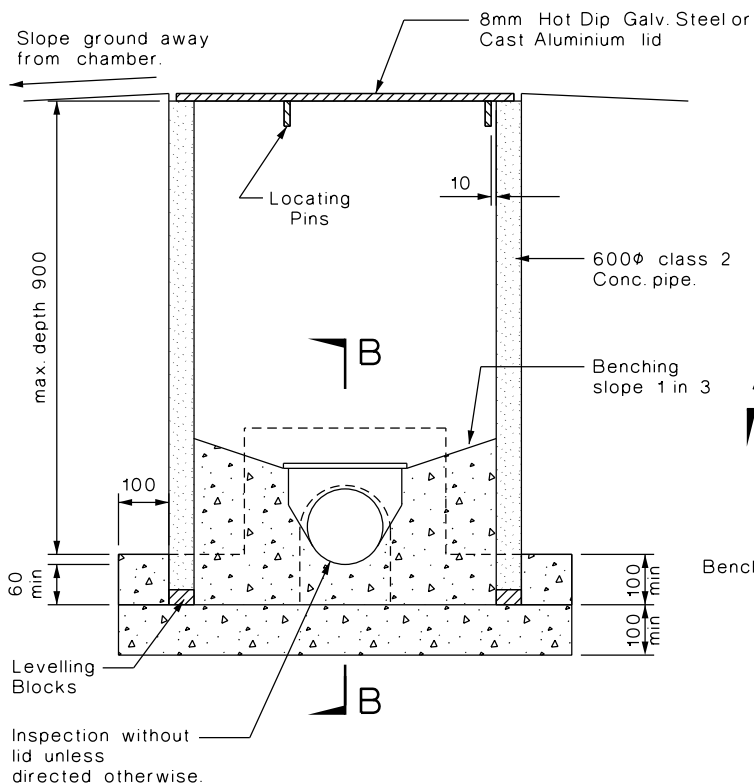


SECTION TYPE B

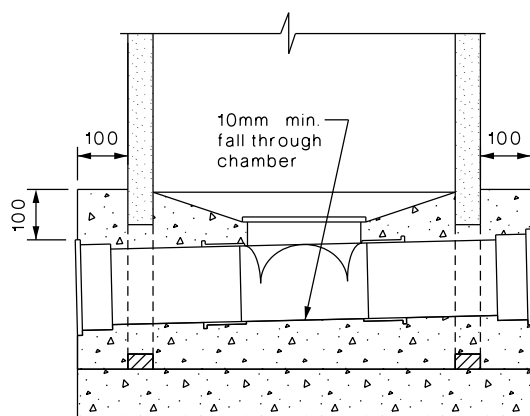
SECTION TYPE C

NOTES:

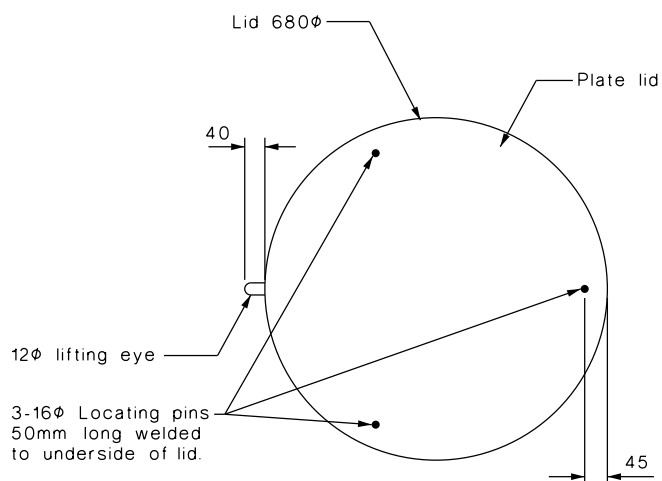
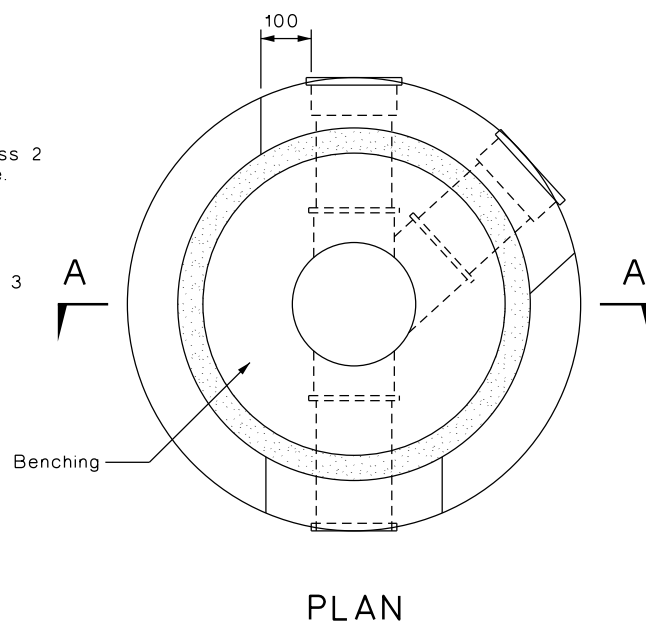
1. Cast iron frames to be seated on cement sand mortar, and set in with plant mix asphalt or mortar as required.
2. Yield joints shall be provided in accordance with plan SD341 except that in all cases two yield joints and one short pipe shall be used.
3. General method of pipelaying, angle connections, corbels, etc. to be in accordance with plan SD341.
4. Concrete work to comply with NZS 3109.
5. All concrete to be 40MPa.
6. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.



SECTION A-A



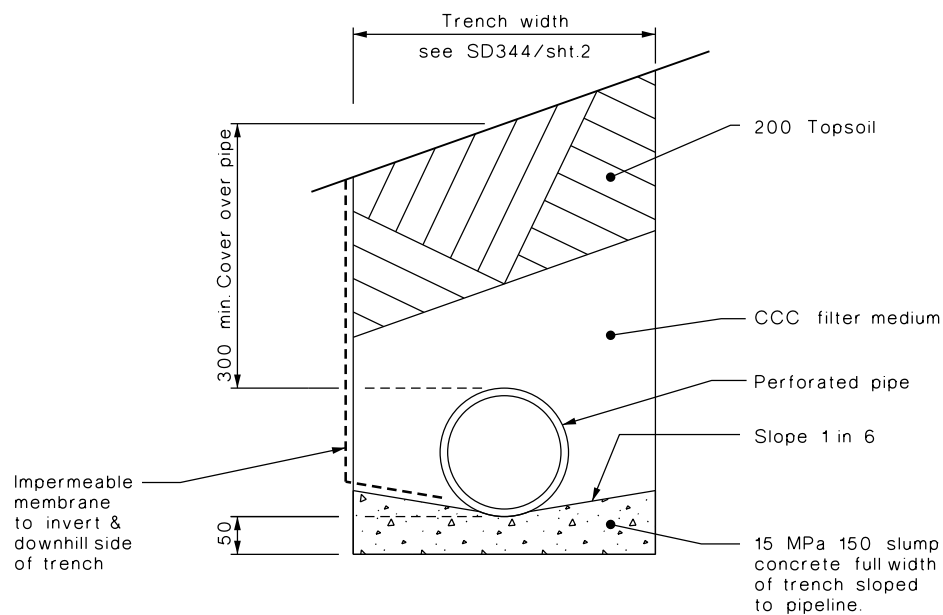
SECTION B-B



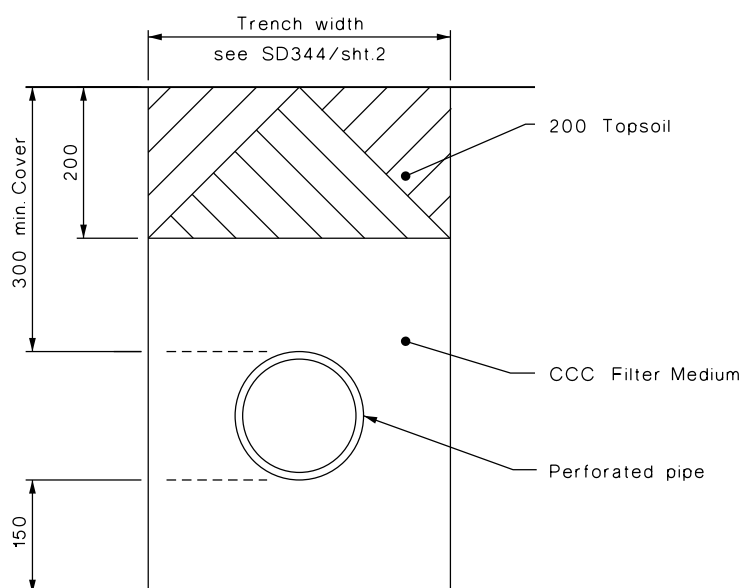
LID DETAIL

NOTES :

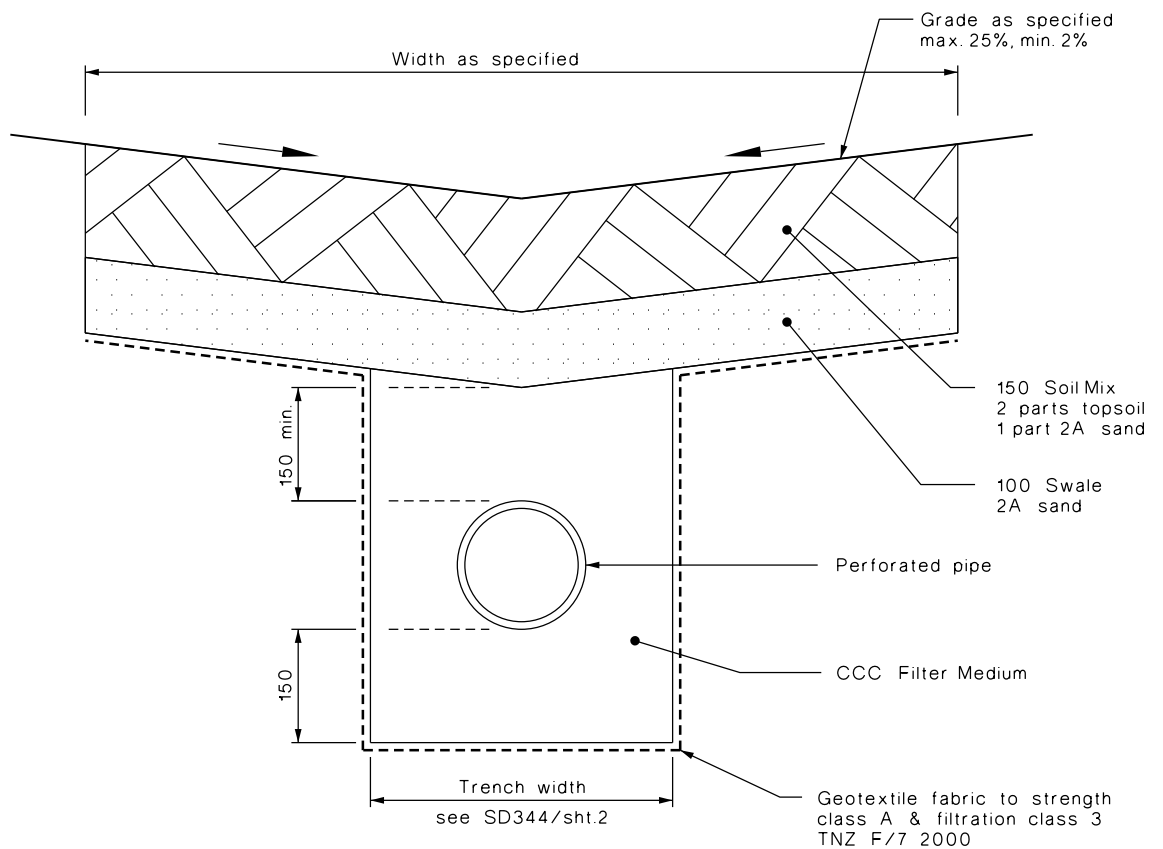
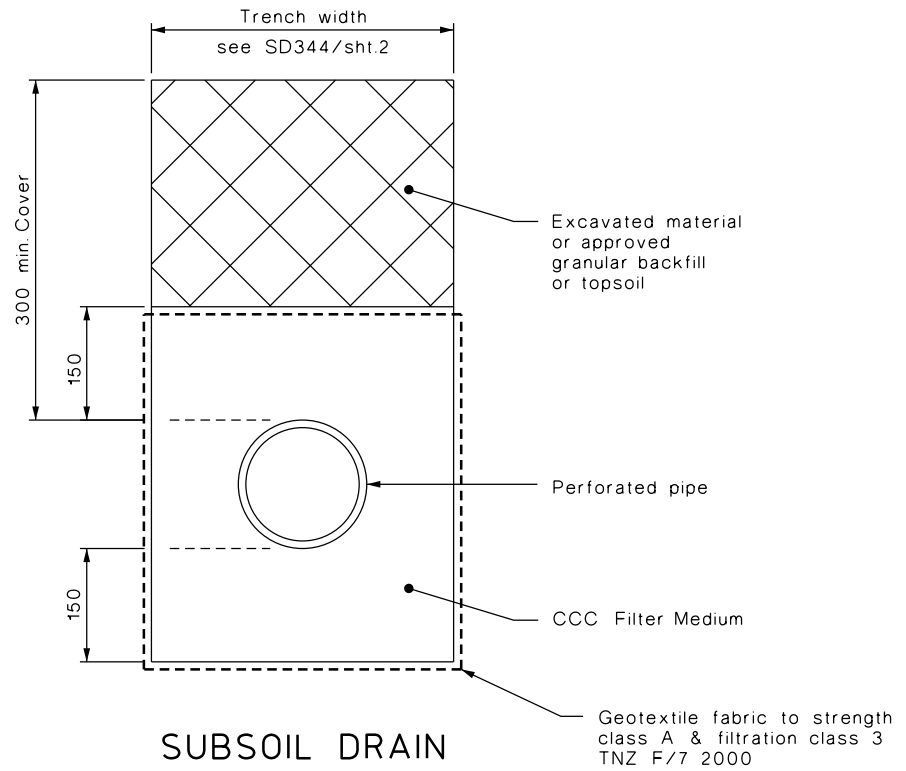
1. Inspection chamber lid as detailed shall not be subject to traffic loading.
2. A standard manhole shall be used when the depth exceeds 900mm.
3. Inspection chambers on drains connected to sanitary sewer shall be positioned so as to avoid the entry of surface water and grit.
4. Bends adjacent to the inspection chamber shall not be greater than 45°.
5. Steel lids shall be hot dip galvanized after fabrication. Lids shall be a good fit to avoid rocking or jamming.
6. Notes on sheet SD375 apply.
7. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.

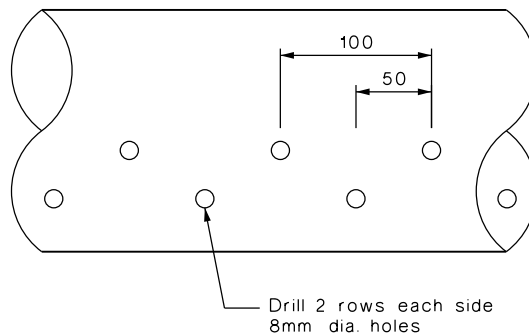
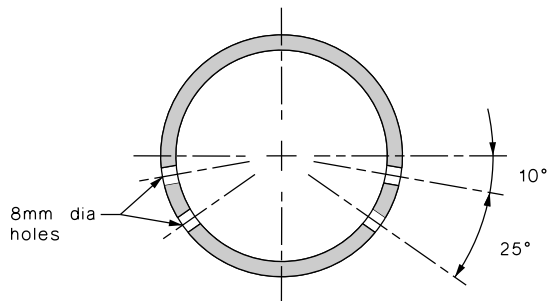


HILLSIDE INTERCEPTOR DRAIN

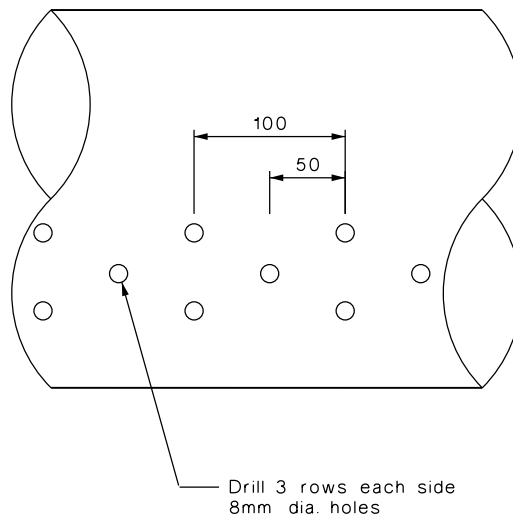
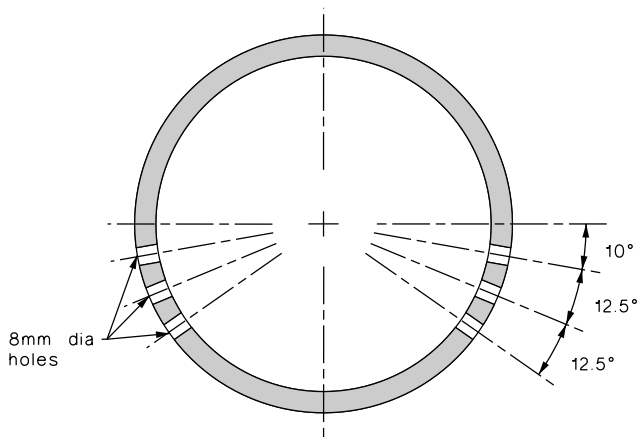


INTERCEPTOR DRAIN

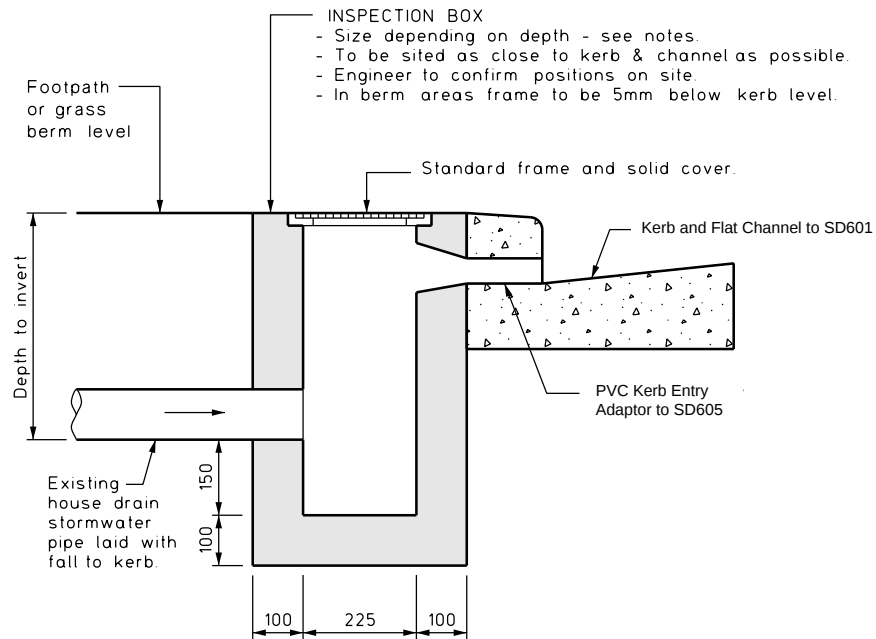




DN100 and DN150

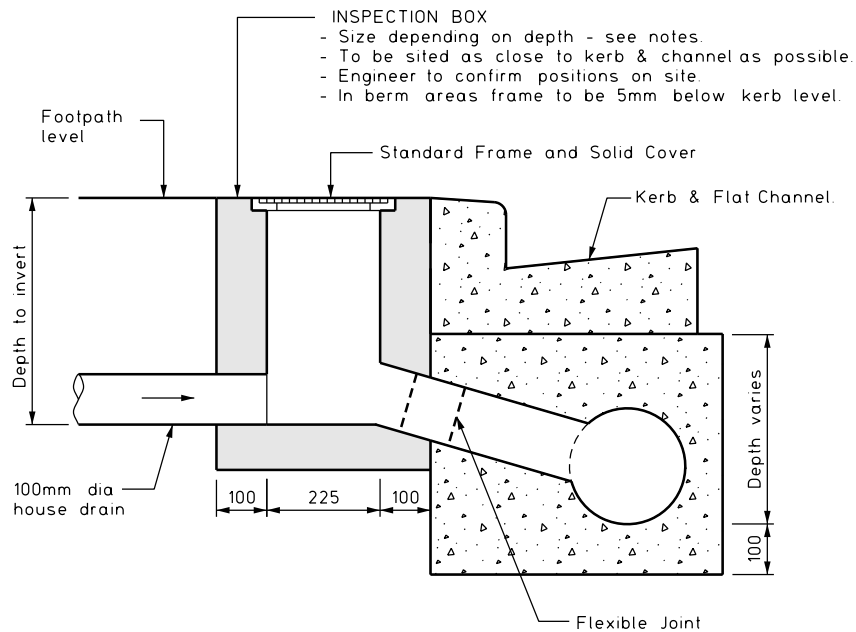


DN200, DN225 and DN300



TYPE A

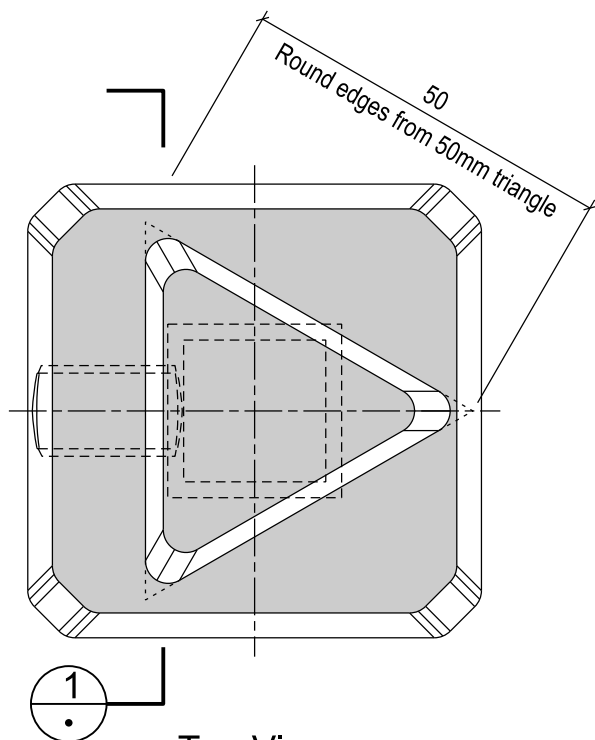
- All concrete to be 20MPa at 28 days
- All stormwater piping to comply with CSS Part 3



TYPE B

NOTES:

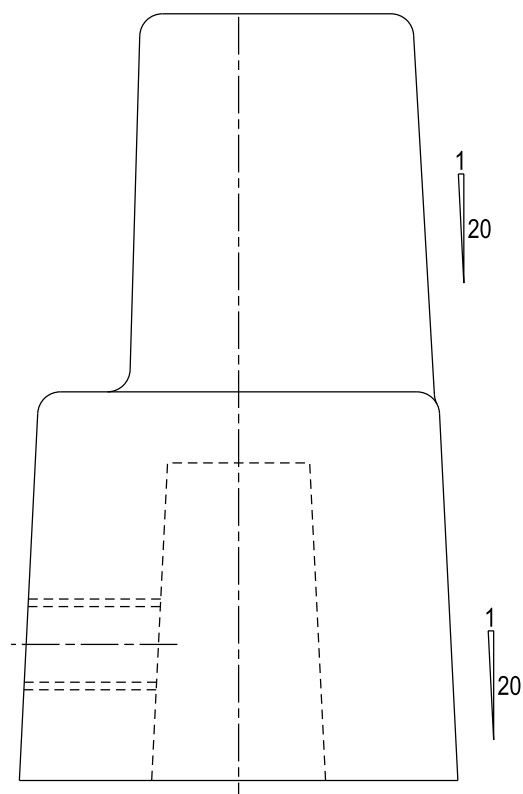
1. Use 225 x 125 Inspection box up to 350 depth to invert (lowest pipe),
Use 300 x 175 Inspection box over 350 depth to invert (lowest pipe) & up to 500 depth,
Use House drain sump over 500 depth to invert.
2. Polyethylene inspection boxes are acceptable. See Approved Materials List.



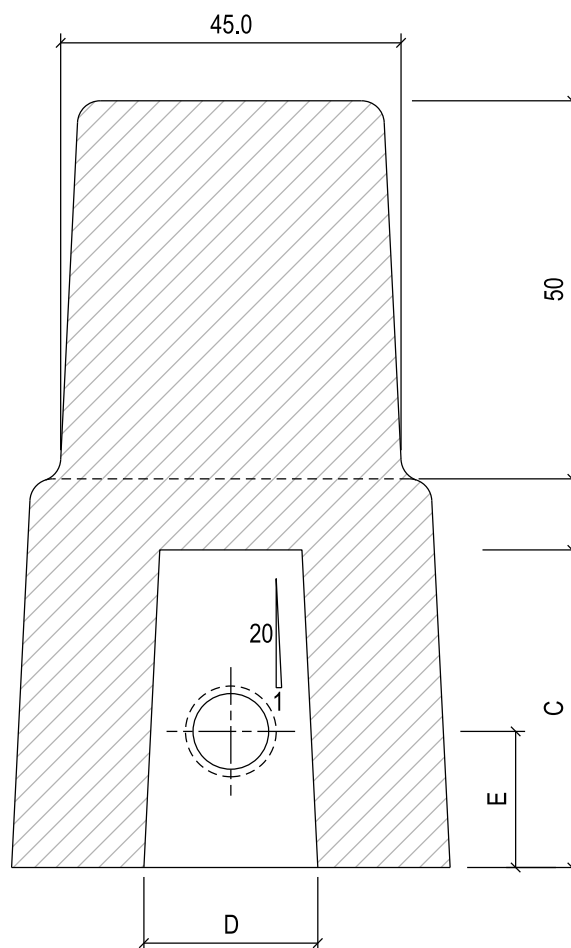
Top View

NOTES:

- 1) Spindle cap to be made from Cast Iron to AS 1830.
- 2) Spindle cap to be polymeric coated to AS/NZS 4158.
- 3) Fix to valve shaft with M12 stainless steel set screw.
- 4) Dimple valve shaft at set screw location to aid fixing.
- 5) The spindle cap external shape can be circular.



Side View



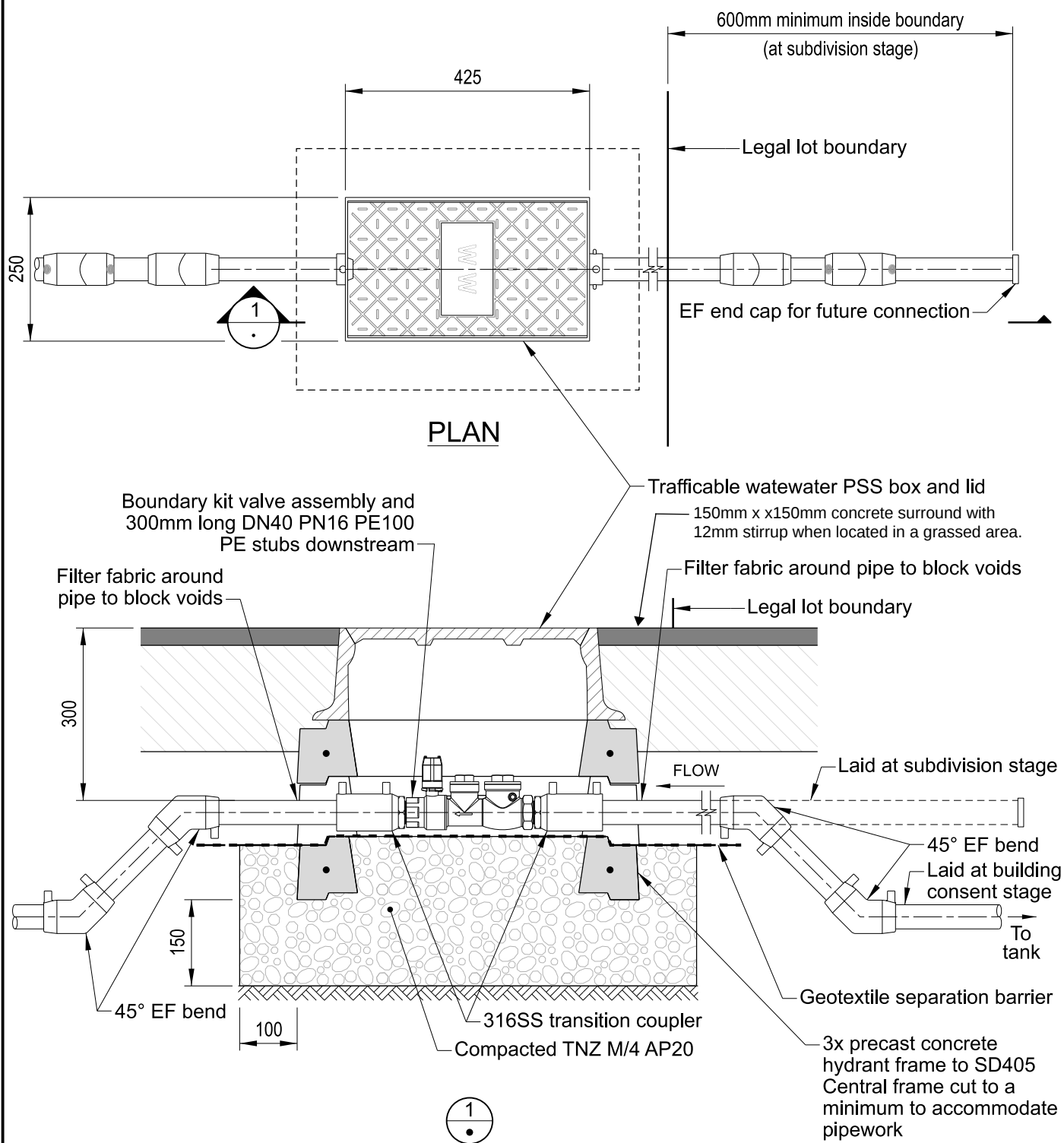
Section 1

SPINDLE CAP DIMENSIONS

TYPE	C	D	E
Valve / 50, 80 & 100mm	42	23	18
Valve / 150, 200, 250 & 300mm	49	32.75	21



1. Concrete work to comply with NZS 3109.
2. All concrete to be 40MPa.
3. DN160 mains and above require 75Ø flushing point off DN90 lateral.

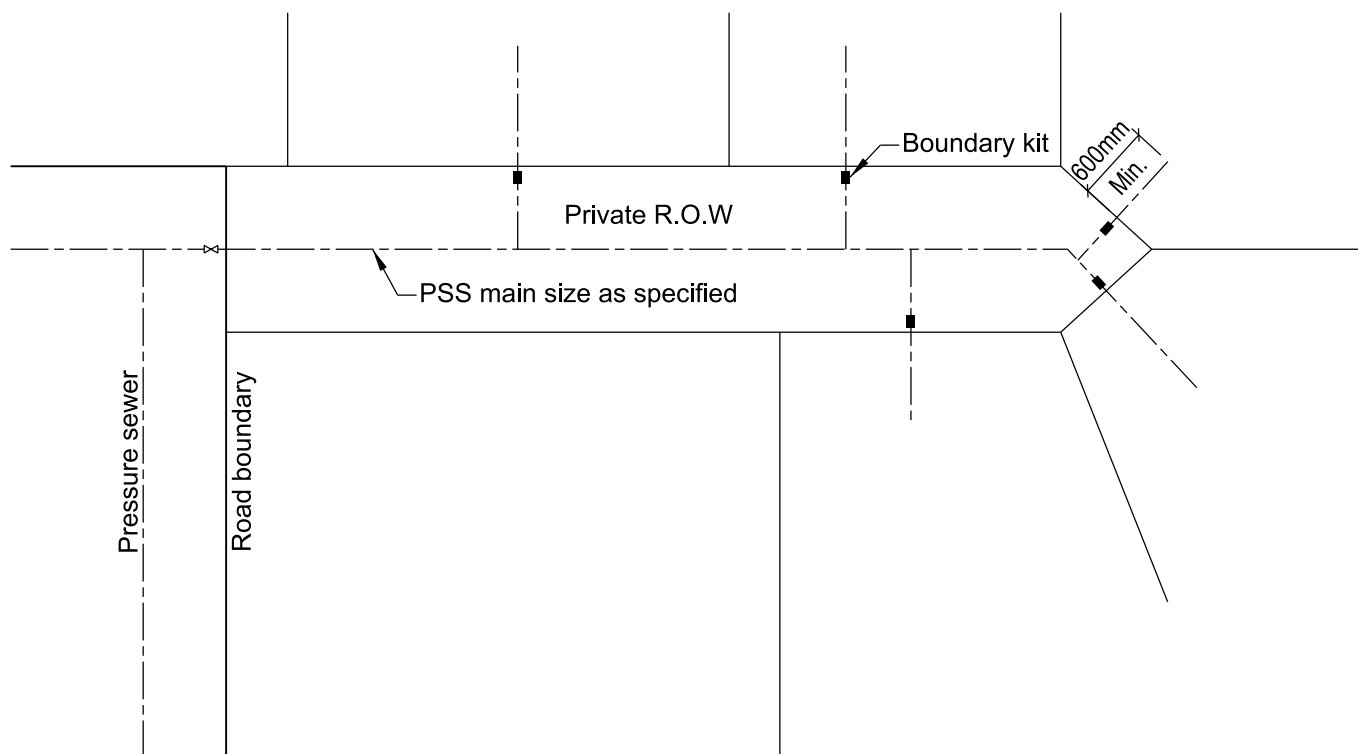


NOTES:

1. Valve kit to be centre of valve box.
2. Geotextile around entry and exit to prevent aggregate entering.
3. Lid orientation must be consistent along ROW or road.
4. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.



1. Valve kit to be centre of valve box.
2. Geotextile around entry and exit to prevent aggregate entering.
3. Lid orientation must be consistent along ROW or road.



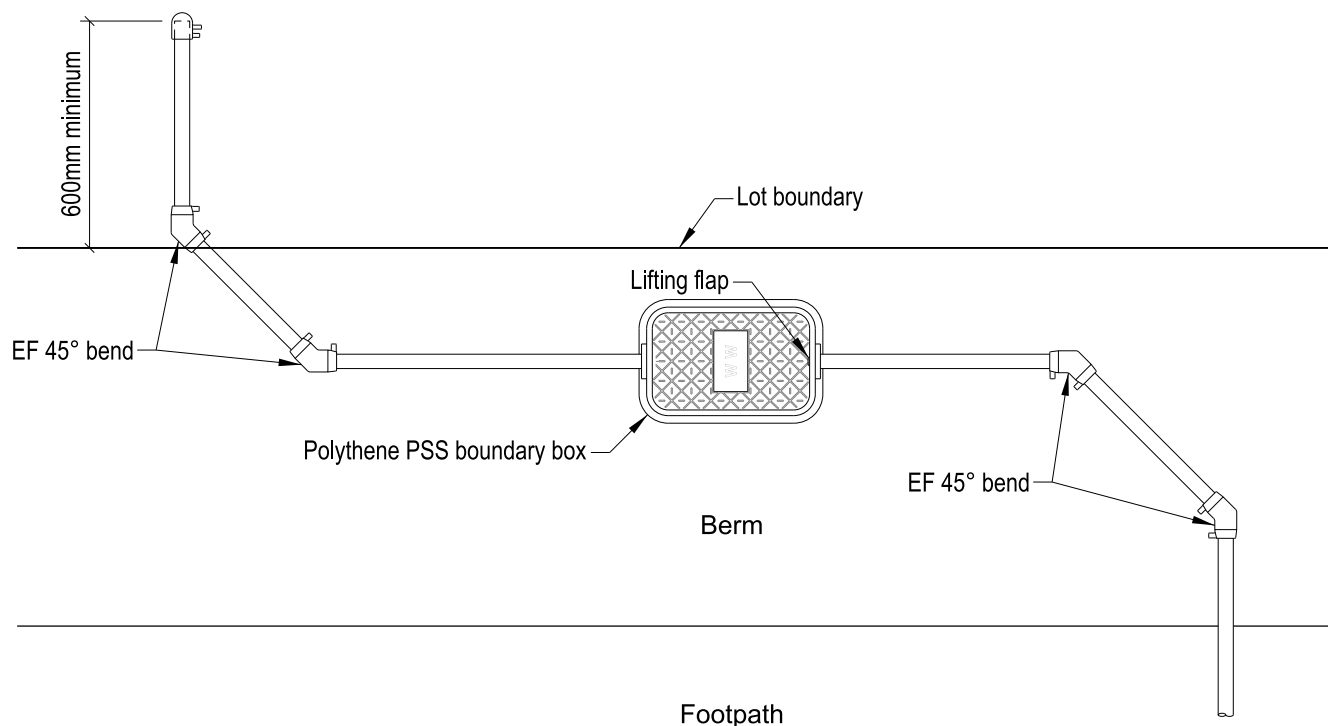
COMMON LAND CONNECTION POSITION

Not to Scale

NOTE:

1. Where there is only 1 connection laid in the right of way the boundary kit is to be installed within the legal road at the road boundary.
2. Laterals to extend a minimum of 600mm into the lot with an EF End Cap.



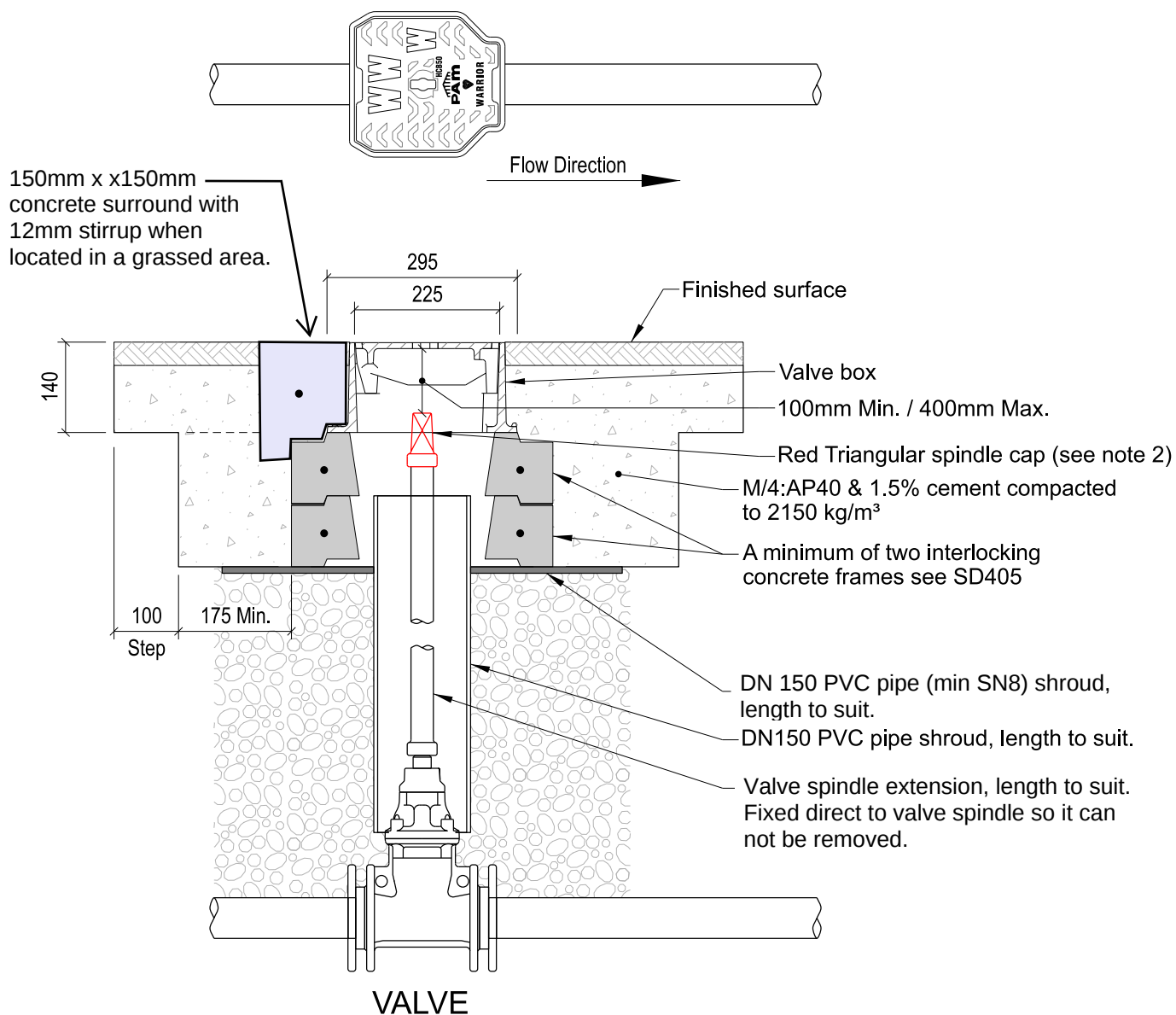


PLAN

NOTES:

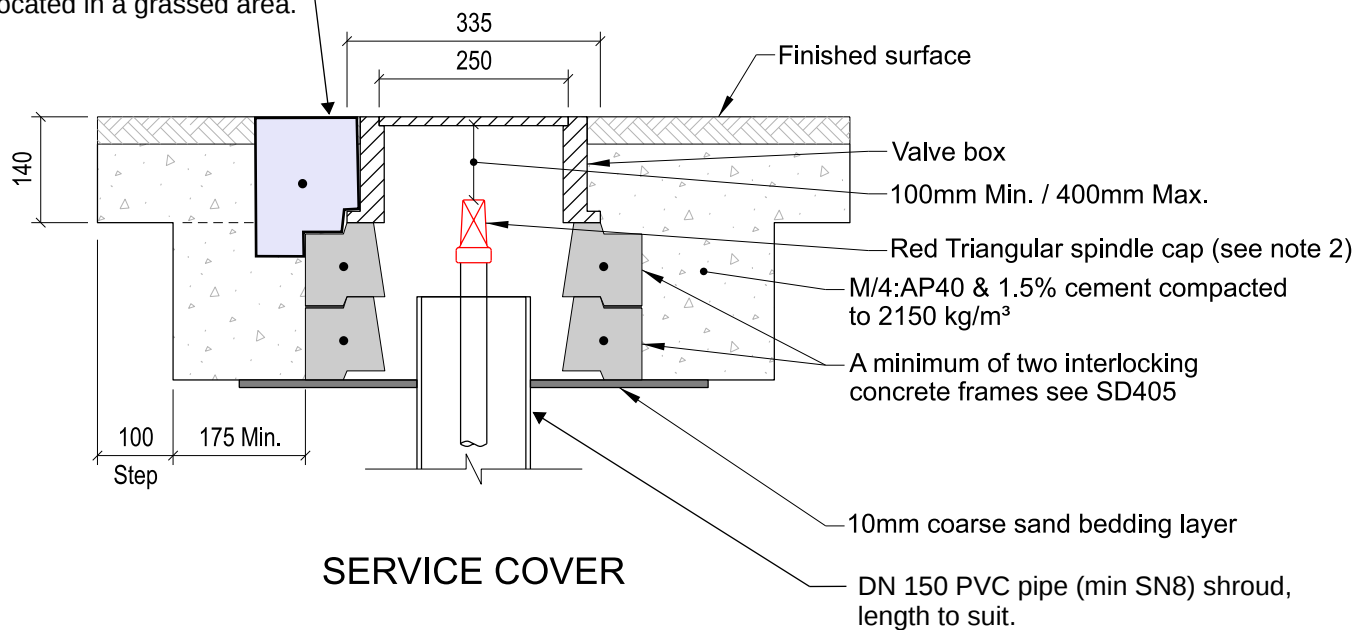
1. Lid orientation must be consistent along ROW or road.



**NOTE:**

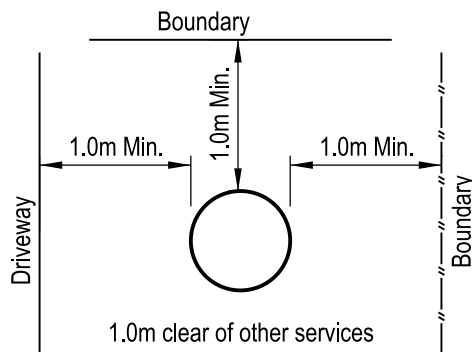
- 1) All backfill in accordance with CSS Part 1.
2. Fit triangular spindle cap and extension to triangular spindle.
3. 150mm x 150mm concrete surround with 12mm stirrup when located in a grassed area.

150mm x 150mm
concrete surround with
12mm stirrup when
located in a grassed area.

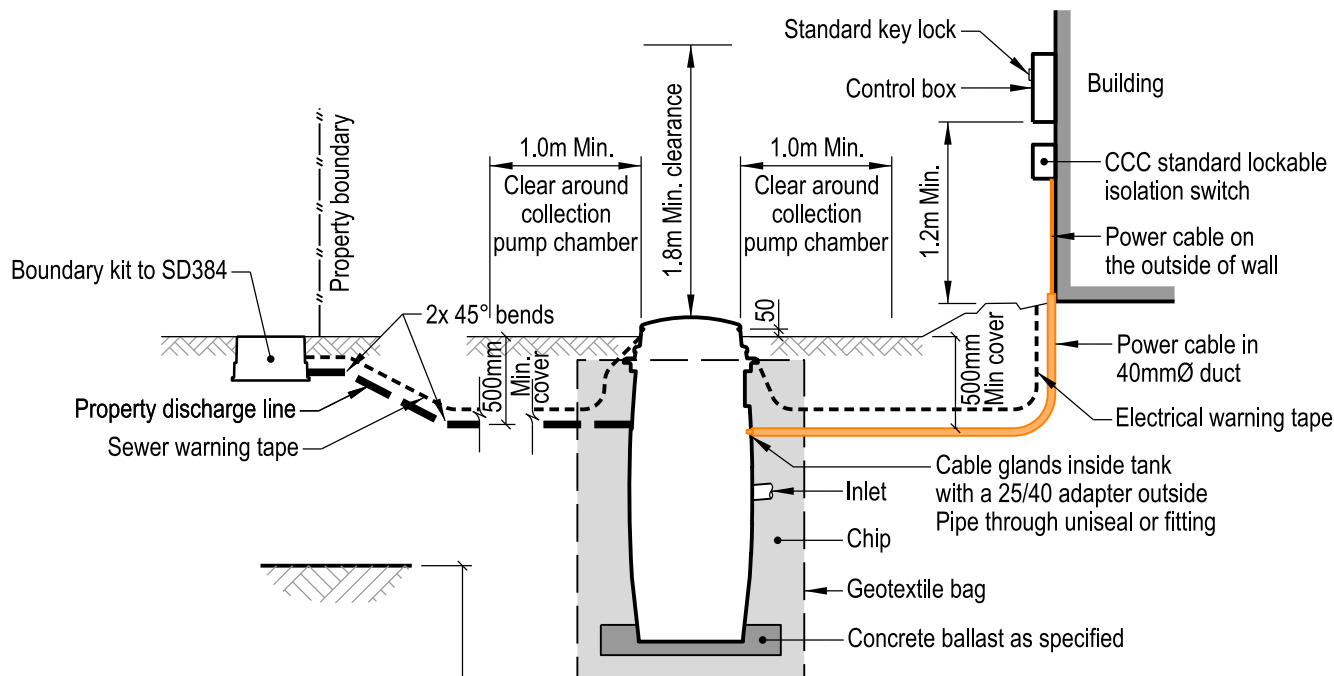


NOTE:

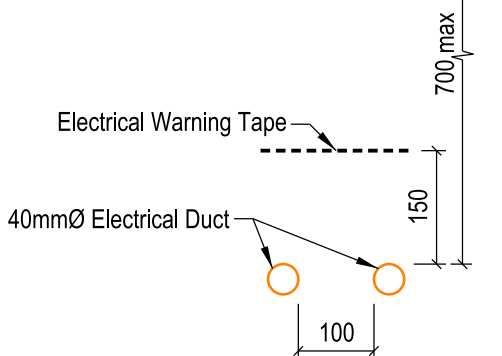
- 1) Service cover to include "WW".
- 2) Fit triangular spindle cap and extension to triangle spindle.



Layout



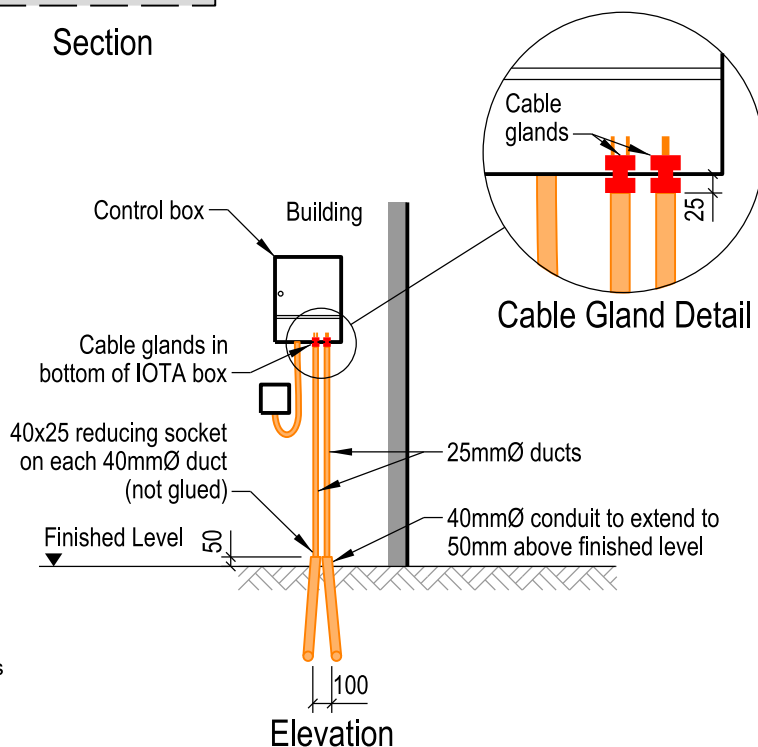
Section



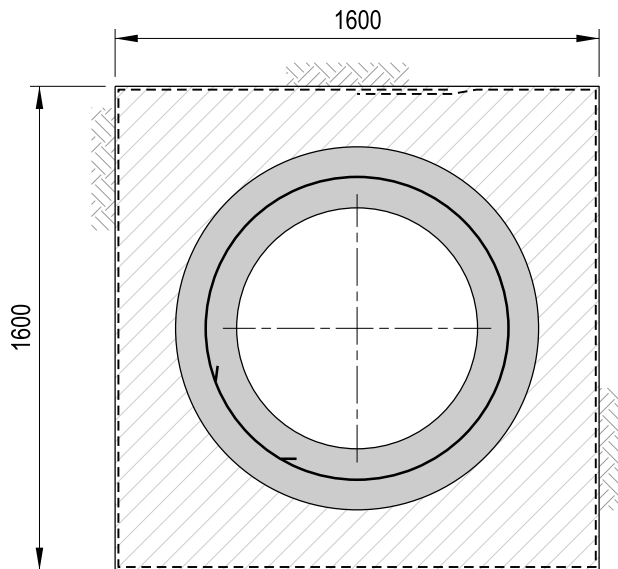
Electrical Conduit Section

NOTE:

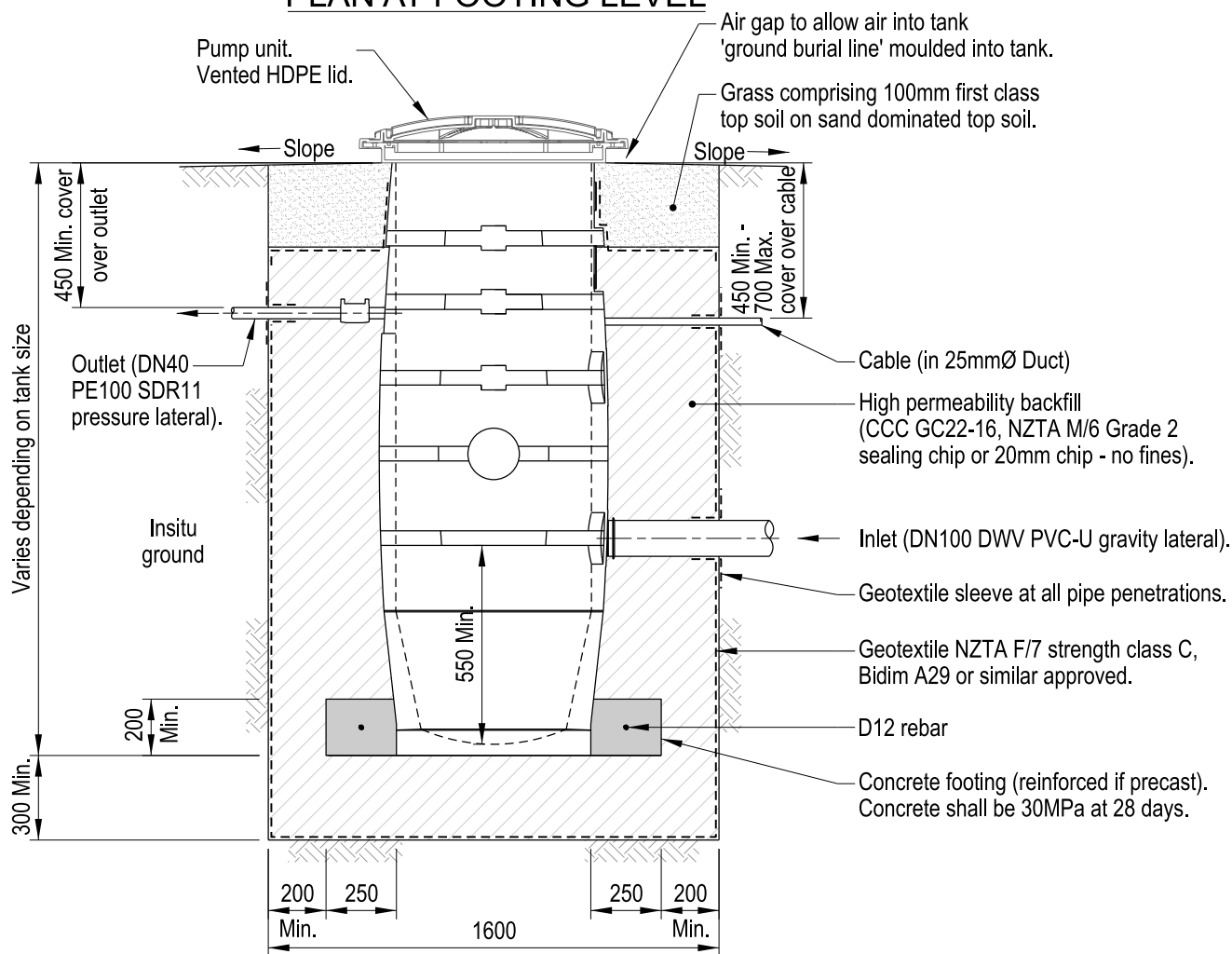
1. Where the pump chamber lid requires an external vent (Trafficable or susceptible to inundation from flooding), it shall be 50mm diameter; mounted on the dwelling; extending above the roofline, and away from windows and comply with NZBC G13.
2. All electrical work shall comply with the latest standards and requirements.
3. All 40mm bends must be long radius.
4. All installations must be as per the Three Waters stamped plan no exceptions.
5. Electrical conduits must not pass under structures.
6. Flexible conduits only allowed between the isolation switch and the Iota box.



Elevation



PLAN AT FOOTING LEVEL

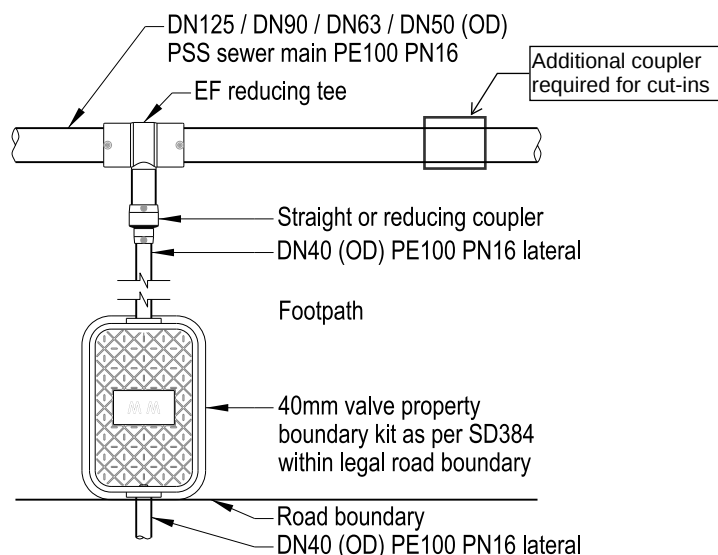


NOTES:

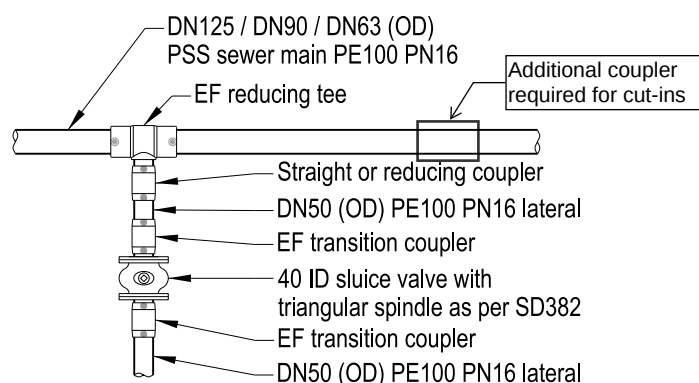
SECTION

- 1) Make all connections through the tank wall in accordance with manufacturers installation instructions and using supplied connection fittings.
- 2) Penetrations through the geotextile bag to be kept to a minimum.
- 3) Precast based tanks must be lifted with a spreader bar to ensure that there is no stress on tank side or lid.





A MAIN / DN40 (OD) PSS DWELLING CONNECTION DETAILS

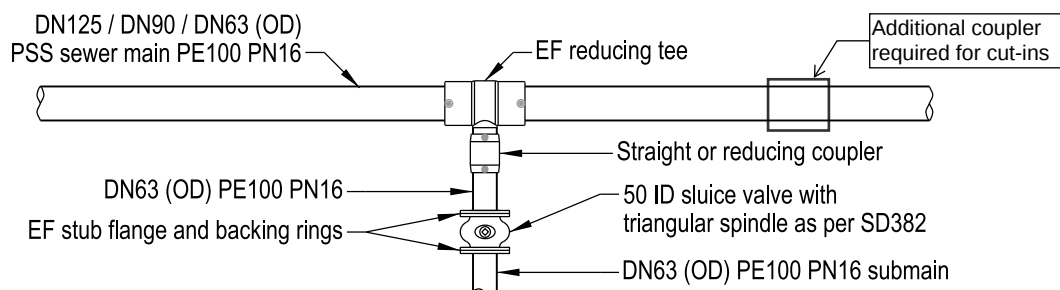


B MAIN / DN50 (OD) PSS SUBMAIN CONNECTION DETAILS

PE Tee and Reducer Summary			
DN40 PSS Dwelling Connections			
Main	Tee	Reducer	Reducer
DN125	125/90	+ 90/50	+ 50/40
DN90	90/50	+ 50/40	
DN63	63/50	+ 50/40	
DN50 PSS Submain Connections			
Main	Tee	Reducer	Valve
DN125	125/90	+ 90/50	+ 40 ID Sluice valve
DN90	90/50	---	+ 40 ID Sluice valve
DN63	63/50	---	+ 40 ID Sluice valve

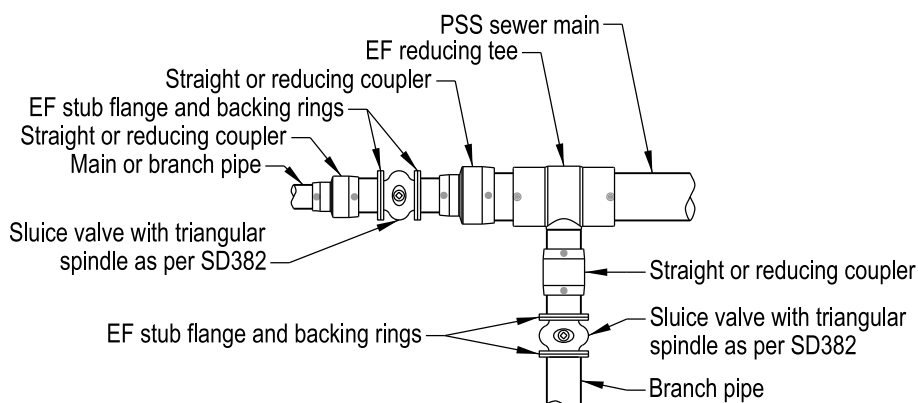
NOTES:

- Saddles or self tapping joints may be used on pipes with an outside diameter (OD) of 90mm or greater.
- Self-Tapping joints on branch pipes shall be at a depth of not less than 600mm.
- For pipes less than DN90 (OD), only Electrofusion Tee joints shall be used.
- Saddle joints **shall not** be used on pipes that are supplied in coils.
- No brass fittings are to be used in any part of a pressure sewer system.
- Mechanical couplers shall only be used on polyethylene pressure pipe DN90 (OD) or less for emergency repairs. And then only as a temporary measure.



C MAIN / DN63 (OD) PSS SUBMAIN CONNECTION DETAILS

PE Tee and Reducer Summary			
DN63 PSS Submain Connections			
Main	Tee	Reducer	Valve
DN125	125/90	+ 90/63	+ 50 ID Sluice valve
DN90	90/63	- - -	+ 50 ID Sluice valve
DN63	63/63	- - -	+ 50 ID Sluice valve



D ISOLATION VALVE CONNECTION DETAILS

PE Pipe / Sluice Valve Sizing	
PE Pipe	Valve Size
DN125	100 ID
DN90	75 ID
DN63	50 ID
DN50	40 ID

NOTES:

1. With Council Approval, Saddles or Self Tapping Saddles may be used on pipes 90mm outside diameter (OD) or greater.
2. For pipes less than DN90 (OD), only Electrofusion Tee joints shall be used.
3. Saddle joints **shall not** be used on pipes that are supplied in coils.
4. No brass fittings are to be used in any part of a pressure sewer system.
5. Mechanical couplers shall only be used on polyethylene pressure pipe DN90 (OD) or less for approved emergency repairs.