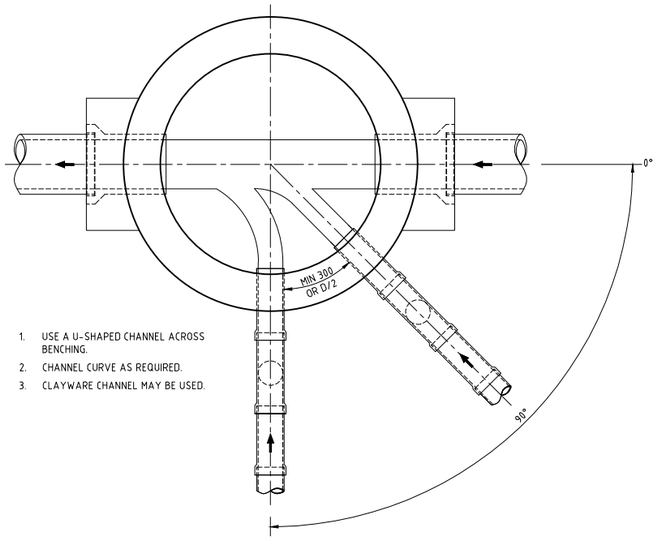
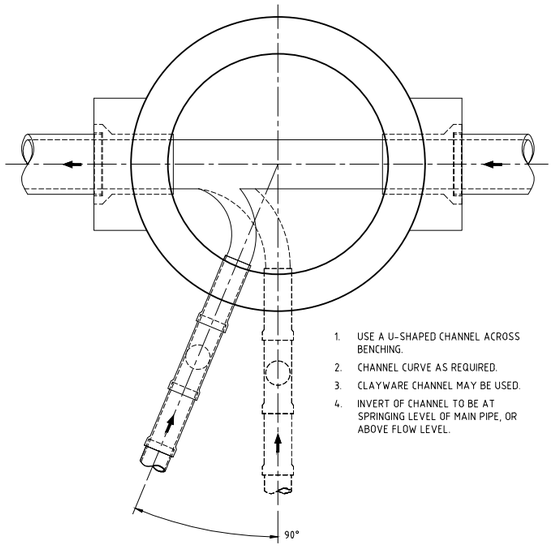


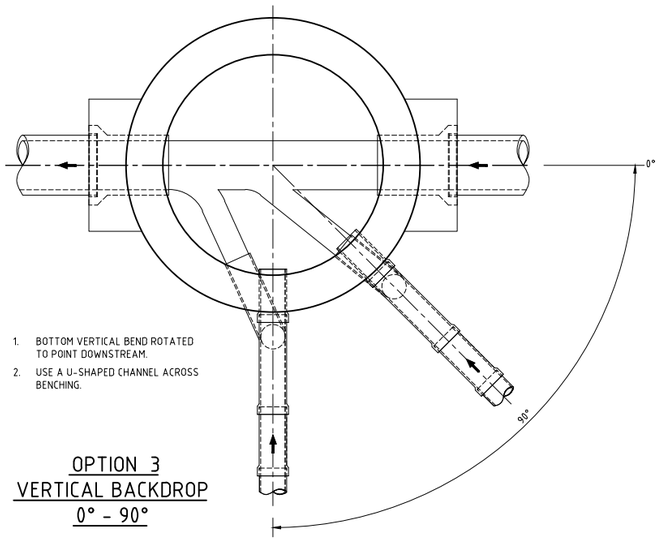
1. USE A U-SHAPED CHANNEL ACROSS BENCHING.
2. CHANNEL CURVE AS REQUIRED.
3. CLAYWARE CHANNEL MAY BE USED.

OPTION 1 RAMPED OR VERTICAL BACKDROP
0° - 90°



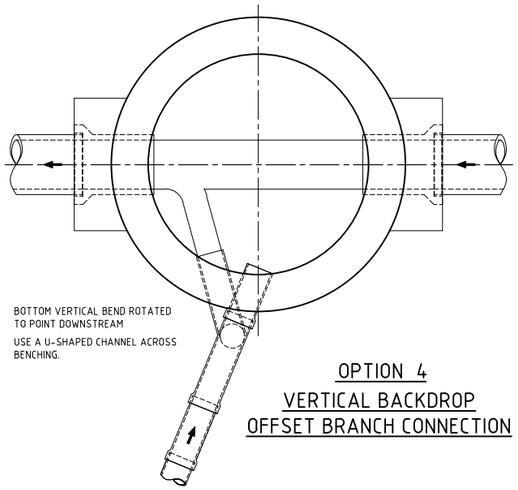
1. USE A U-SHAPED CHANNEL ACROSS BENCHING.
2. CHANNEL CURVE AS REQUIRED.
3. CLAYWARE CHANNEL MAY BE USED.
4. INVERT OF CHANNEL TO BE AT SPRINGING LEVEL OF MAIN PIPE, OR ABOVE FLOW LEVEL.

OPTION 2 - RAMPED OR VERTICAL BACKDROP
90° - 120°



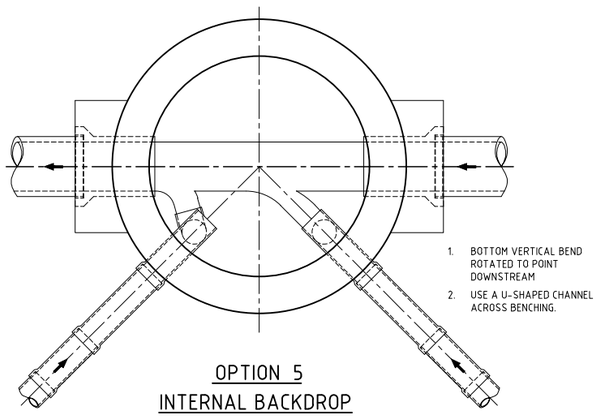
1. BOTTOM VERTICAL BEND ROTATED TO POINT DOWNSTREAM.
2. USE A U-SHAPED CHANNEL ACROSS BENCHING.

OPTION 3
VERTICAL BACKDROP
0° - 90°



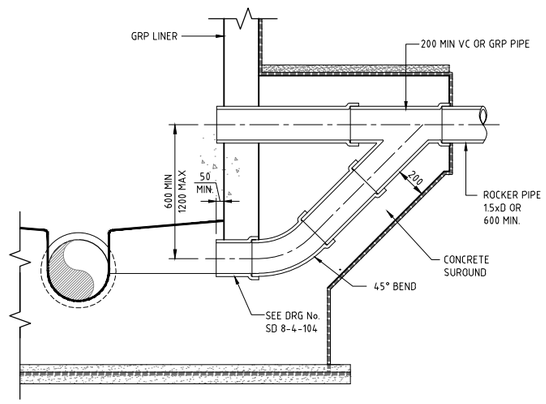
1. BOTTOM VERTICAL BEND ROTATED TO POINT DOWNSTREAM
2. USE A U-SHAPED CHANNEL ACROSS BENCHING.

OPTION 4
VERTICAL BACKDROP
OFFSET BRANCH CONNECTION

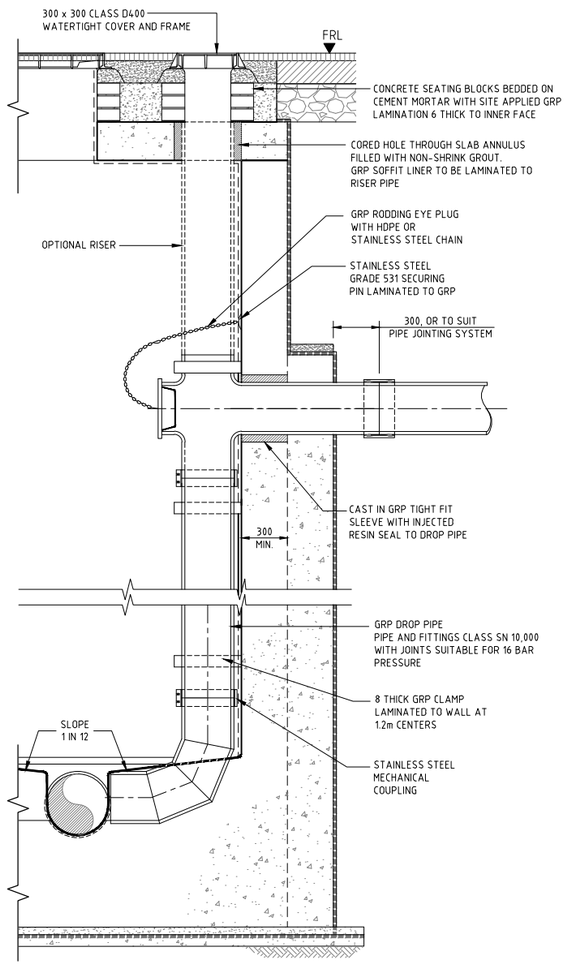


1. BOTTOM VERTICAL BEND ROTATED TO POINT DOWNSTREAM
2. USE A U-SHAPED CHANNEL ACROSS BENCHING.

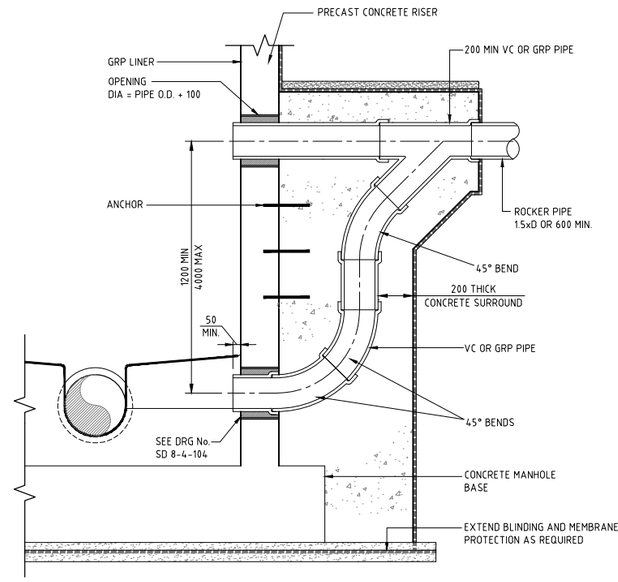
OPTION 5
INTERNAL BACKDROP



TYPICAL RAMP BACKDROP CONNECTION DETAIL
(IN-SITU MANHOLE)



INTERNAL BACKDROP (GRP PIPE SHOWN)



TYPICAL VERTICAL BACKDROP CONNECTION DETAIL
(PRE-CAST MANHOLE)

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT Q.C.S. UNLESS OTHERWISE AGREED WITH THE ENGINEER.
3. WHERE THERE IS A DISCREPANCY BETWEEN THE REQUIREMENTS IN THE SPECIFICATION AND THOSE SHOWN ON THIS DRAWING THE SPECIFICATION SHALL TAKE PRECEDENCE.
4. VC PIPES ARE EN 295-1 WITH SPIGOT AND SOCKET JOINTS.
5. VARIATION TO STANDARD DETAILS ARE PERMISSIBLE TO MEET SITE SPECIFIC REQUIREMENTS SUBJECT TO ENGINEERS APPROVAL.
6. SEE DRAWING No. SD 8-4-106 FOR STANDARD NOTES AND DETAILS.
7. ALL JOINTS BETWEEN SECTIONS OF GRP LINERS SHALL BE LAMINATED OVER WITH 200mm WIDE RESIN RICH GLASS.
8. ALL JOINTS BETWEEN PIPES, FIXTURES AND GRP LINERS ARE SEALED.
9. ALL JOINTS BETWEEN PIPES AND CONCRETE SECTIONS ARE WATERTIGHT.
10. ALL INCOMING PIPES ARE LAID SOFFIT TO SOFFIT WITH THE OUTGOING PIPE UNLESS A RAMP/BACKDROP IS CONSTRUCTED OR AS SHOWN ON THE PLAN.
11. ROCKER PIPE IS 600mm IN LENGTH OR 1.5xD WHICHEVER IS GREATER. MAXIMUM LENGTH OF ROCKER TO BE 1/2 OF MANUFACTURER'S NOMINAL PIPE LENGTH OR AS AGREED ON SITE.
12. GRP PIPES AND FABRICATIONS CAST INTO CONCRETE SHALL BE GRIT COATED.
13. SEE DRAWING No. SD 8-4-103 FOR TANKING DETAILS
14. DI MANHOLE COVERS SHALL BE BADGED 'FOUL WATER' IN ENGLISH AND ARABIC.
15. WHERE THERE IS LIMITED WORKING SPACE FOR CONSTRUCTION OR WHERE WORKS HAVE TO BE COMPLETED WITHIN A RESTRICTED TIME PERIOD, MANHOLES IN THE CARRIAGEWAY AND PAVED AREAS MAY BE BACKFILLED FOR FULL HEIGHT FROM THE EXCAVATED SURFACE TO THE MANHOLE TO UNDERSIDE OF THE SUB BASE WITH 4N/mm² FOAMED CONCRETE, MAXIMUM AGGREGATE SIZE IS 5mm. AT TRENCH OPENINGS, ROUGH SHUTTERING SHALL BE PROVIDED TO GIVE A MINIMUM THICKNESS OF 300mm OF FOAMED CONCRETE AROUND THE MANHOLE. WHERE FOAMED CONCRETE IS USED FOR BACKFILL, TANKING MEMBRANE TO WALLS IS NOT REQUIRED. USE OF FOAMED CONCRETE SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
16. INTERNAL BACKDROP SHALL BE MAXIMUM 300 DIAMETER AND SHALL BE PROVIDED WHERE EXTERNAL BACKDROP IS NOT POSSIBLE AND SUBJECT TO APPROVAL OF THE ENGINEER. INTERNAL BACKDROP MAY BE FORMED IN GRP OR DUCTILE IRON. DUCTILE IRON PIPES AND FITTINGS SHALL BE SUITABLE FOR 16 BAR (PFA) WITH EXTERNAL COATING. THE CONTRACTOR SHALL SUBMIT DETAILS OF ALTERNATIVE PROPOSAL FOR THE APPROVAL OF THE ENGINEER.
17. DRG No. SD 6-1-201 TO SD 6-1-205 FOR CONSTRUCTION IN EXISTING PAVEMENT.
18. THERE SHALL BE A MINIMUM OF 1 AND MAXIMUM OF 4 PRECAST CONCRETE SEATING RINGS INSTALLED SUBJECT TO THE APPROVAL OF THE ENGINEER.
19. SEE DRAWING SD 8-4-204 FOR MANHOLE SIZE INFORMATION.

NOTES APPLICABLE TO BACKDROP MANHOLES:

1. WHERE THERE IS A DIFFERENCE IN LEVEL BETWEEN THE INVERT LEVEL OF INCOMING AND OUTGOING SEWERS THE FOLLOWING RULES APPLY:
   a. WHERE THE DIFFERENCE IN LEVEL IS LESS THAN 600 THE PIPE CONNECTION MAY BE DIRECT THROUGH THE MANHOLE OR GRADIENT ADJUSTED TO SUIT.
   b. WHERE THE DIFFERENCE IN LEVEL IS GREATER THAN 600 AND LESS THAN 1200 A RAMP BACKDROP SHALL BE CONSTRUCTED.
   c. WHERE THE DIFFERENCE IN LEVEL IS 1200 AND LESS THAN 8000 A VERTICAL BACKDROP SHALL BE CONSTRUCTED.
   d. EXTERNAL BACKDROPS ARE PREFFERED. INTERNAL BACKDROP MAY BE USED SUBJECT TO APPROVAL BY THE ENGINEER.
   e. FOR INTERNAL BACKDROPS WHERE DIFFERENCE IN LEVEL IS 4,000 OR GREATER, A VERTICAL RISER SHALL BE CONSTRUCTED.
2. WHERE INCOMING AND OUTGOING PIPE DIA. DIFFER A TAPERED CHANNEL IN THE BENCHING SHALL BE PROVIDED.
3. WHERE INCOMING PIPE CONNECTING TO BACKDROP IS LESS THAN THE SPECIFIED MINIMUM DIA. OF THE BACKDROP, A LEVEL INVERT TAPER SHALL BE PROVIDED IN THE GRP FABRICATION. IF INCOMING PIPE IS GREATER THAN OR EQUAL TO MIN. DIA. THE BACKDROP SHALL BE OF THE SAME DIAMETER AS THE INCOMING PIPE.
4. VORTEX PIPE TO BE USED WHEN FALL > 8.0m AND FLOW > 30 L/SEC OR VELOCITY > 1.2m/SEC. DESIGN OF VORTEX DROP TO BE APPROVED BY THE ENGINEER.

Rev.	Date	Revision Details	Appd.
2	APR 19	ISSUED FOR USE	
1	01 MAR 19	UPDATED ISSUE	
0	21 JAN 16	ISSUED FOR USE	

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QCS Section:
Section 8 - Drainage Works
Part 4 - Pipeline Installation

Drawing Title:
FOUL SEWER MANHOLE DETAILS OPTIONS FOR BACKDROP CONNECTIONS

Approved:	Sheet No: 1 OF 1
Date: APRIL 2019	Scale: 1:25 ON A1
Drawing Number: SD 8-4-227	Revision: 2