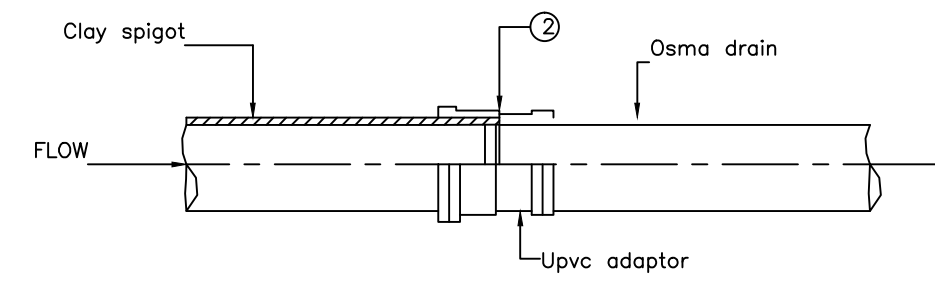
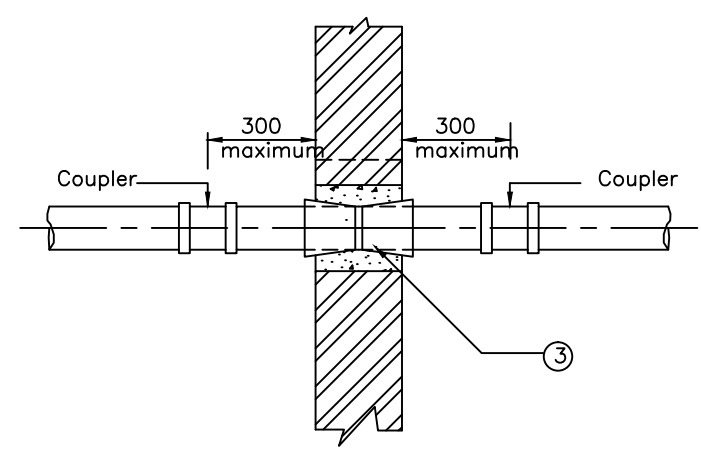


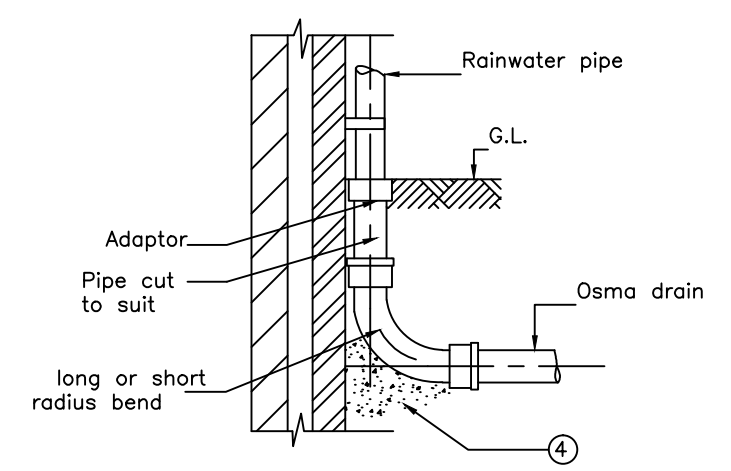
**CONNECTION TO CLAY OR CAST IRON SPIGOT**



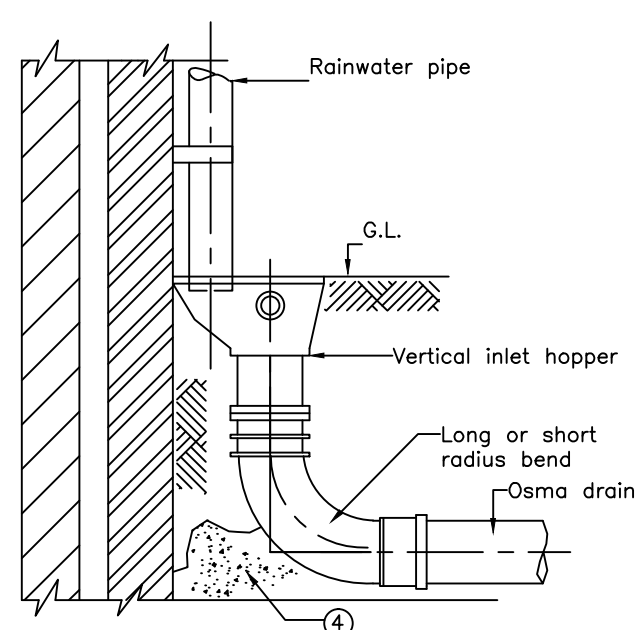
**CONNECTION TO CLAY SLEEVE PIPE**



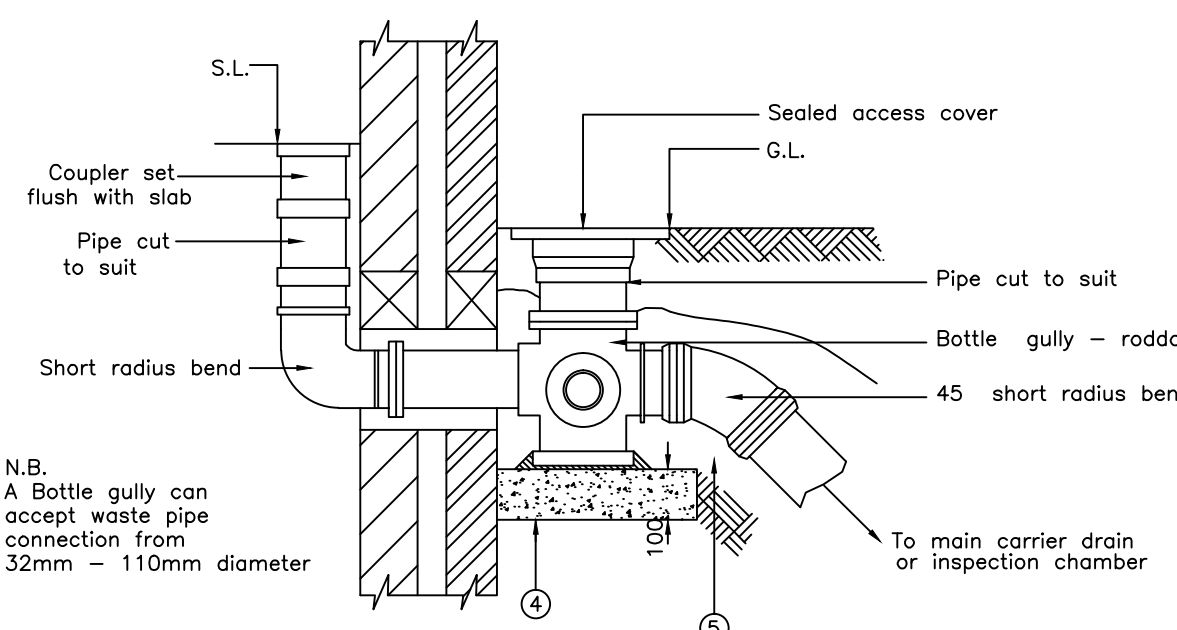
**WALL PROTECTION SLEEVE**



**RAINWATER PIPE CONNECTION TO DRAIN**

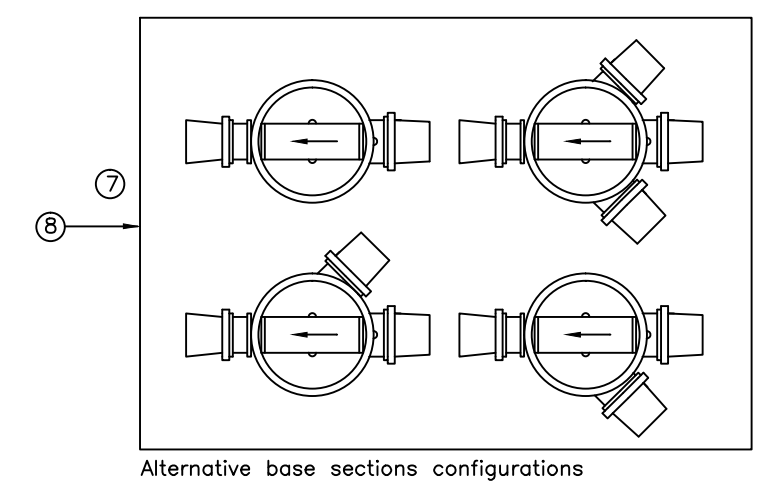


**UNIVERSAL GULLY WITH VERTICAL INLET**

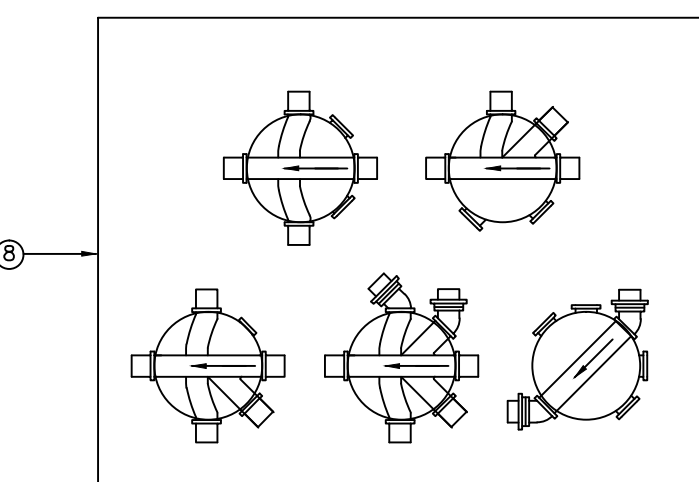


**BOTTLE GULLY AS BACK INLET CONNECTION**

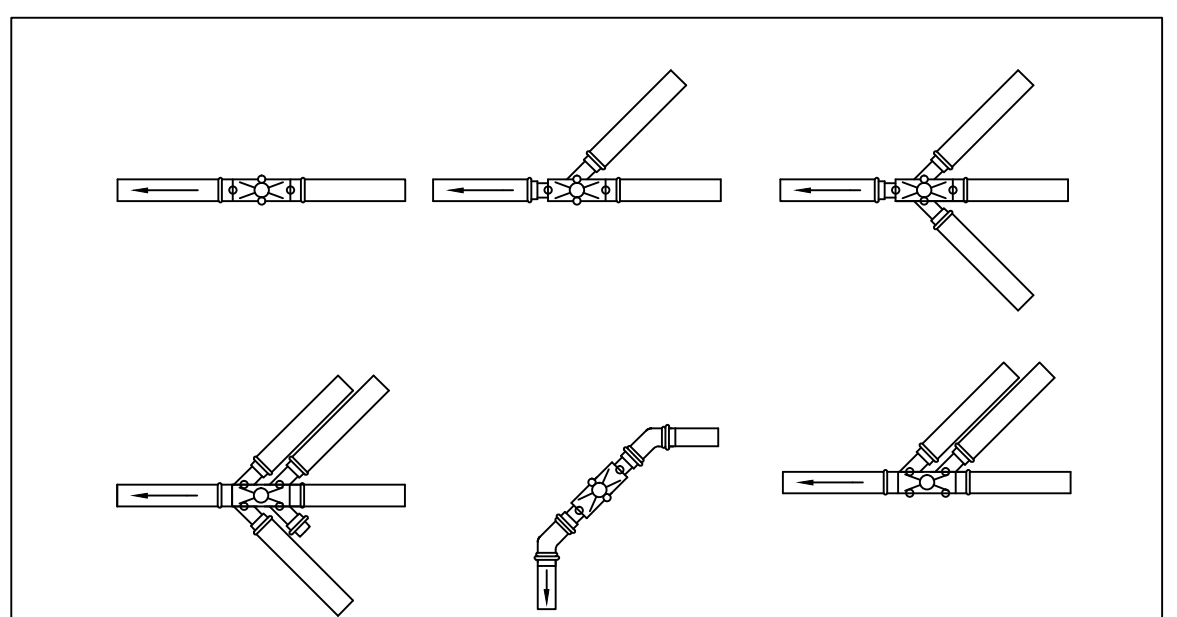
N.B. A bottle gully can accept waste pipe connection from 32mm - 110mm diameter



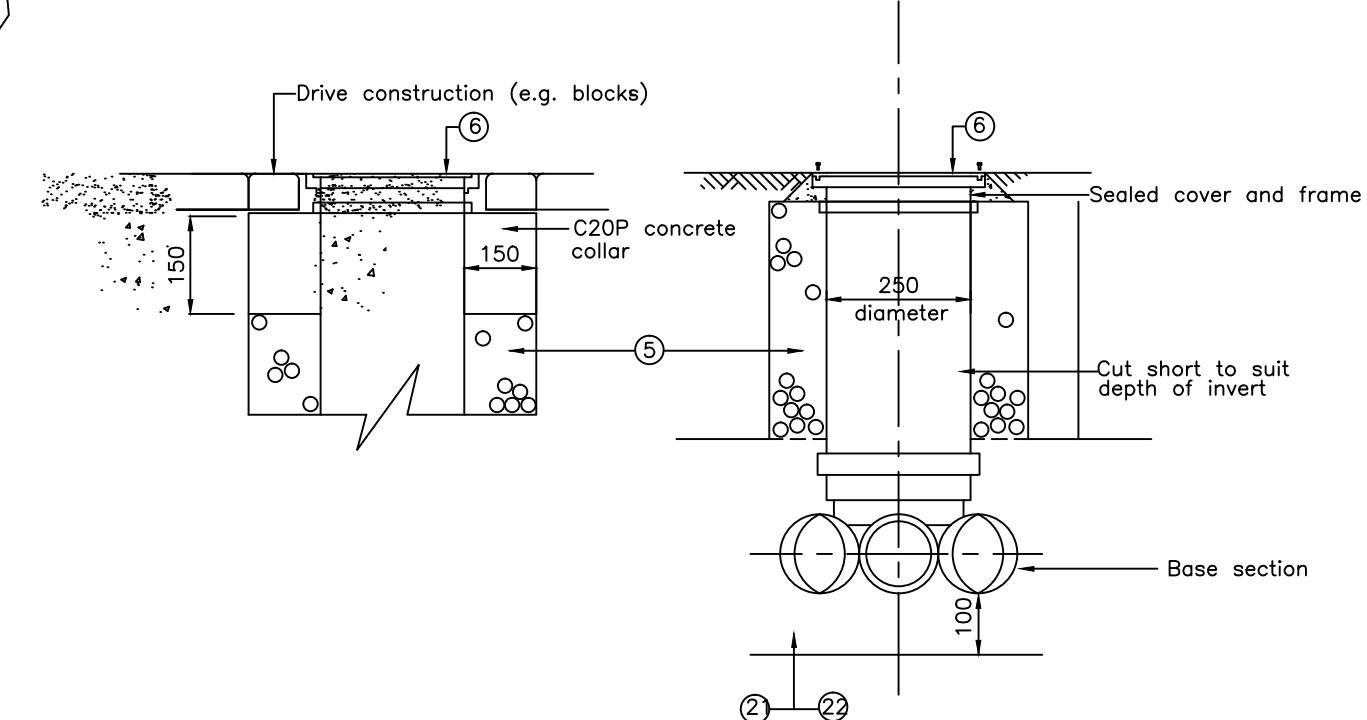
Alternative base sections configurations



Alternative connections

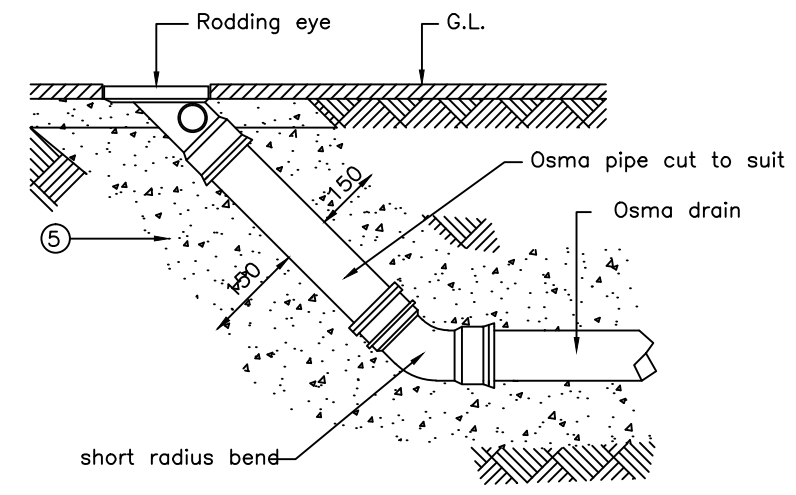


Alternative sealed access fittings configurations and connections

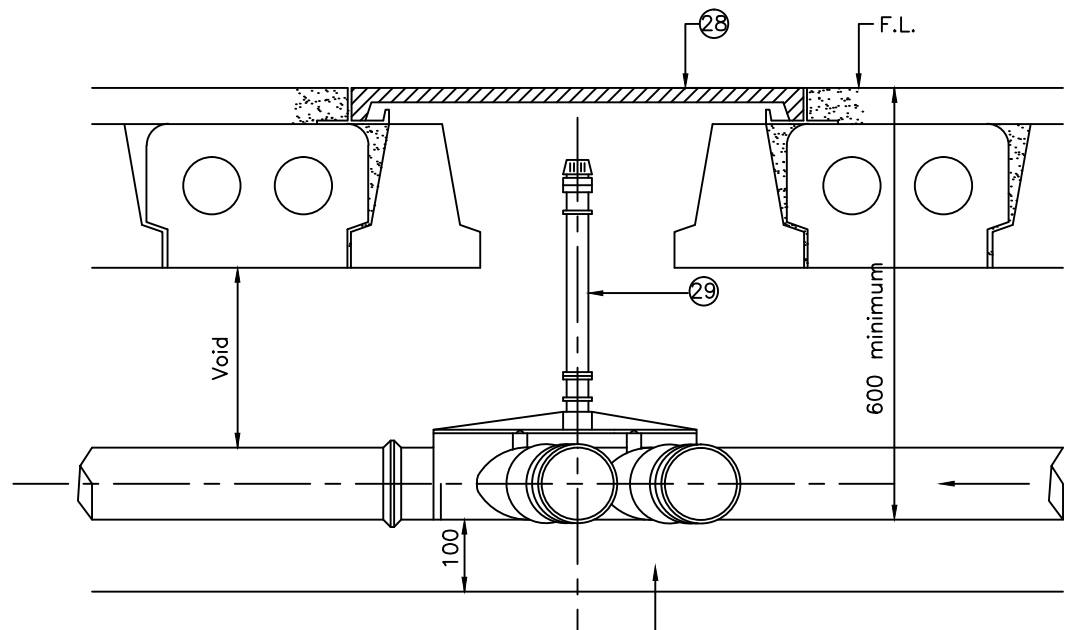


**SHALLOW INSPECTION CHAMBER**

For invert depths up to 600mm MAX

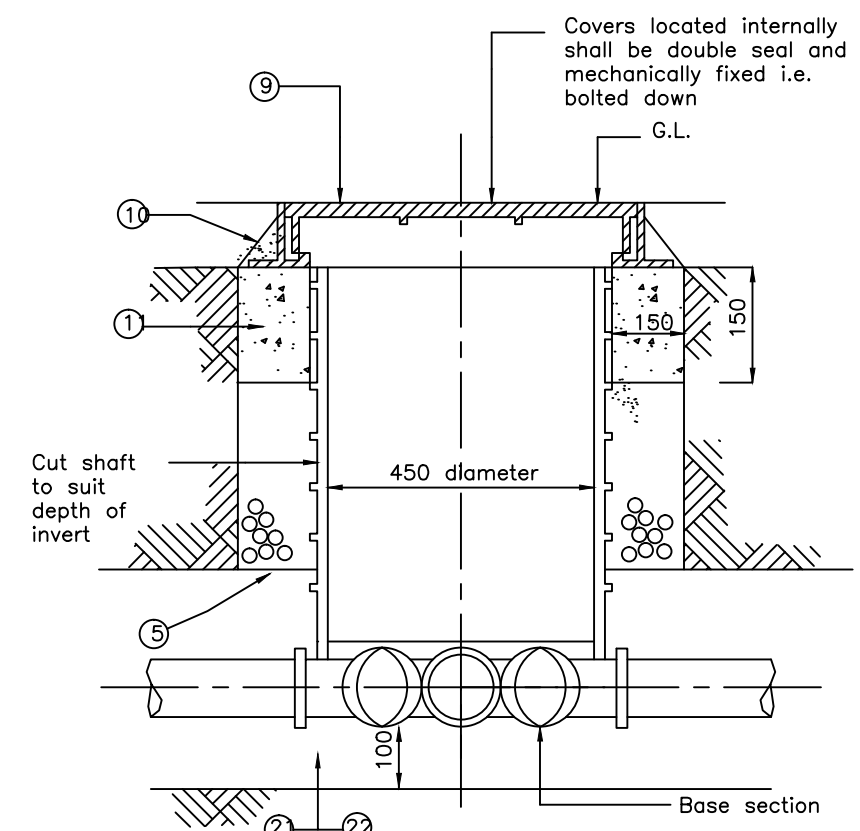


**RODDING EYE**



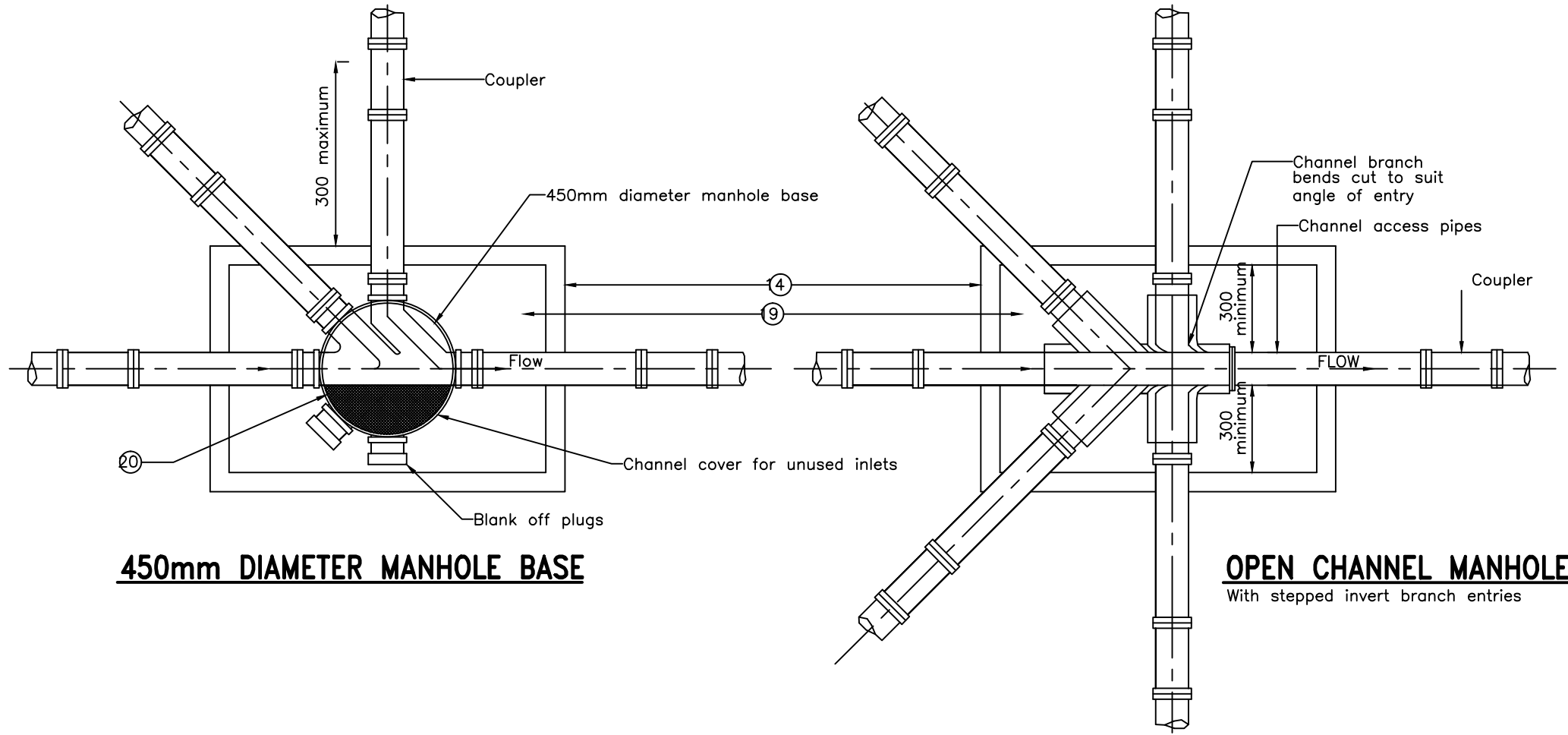
**SEALED ACCESS FITTING**

For use internally below suspended floors



**UNIVERSAL INSPECTION CHAMBER**

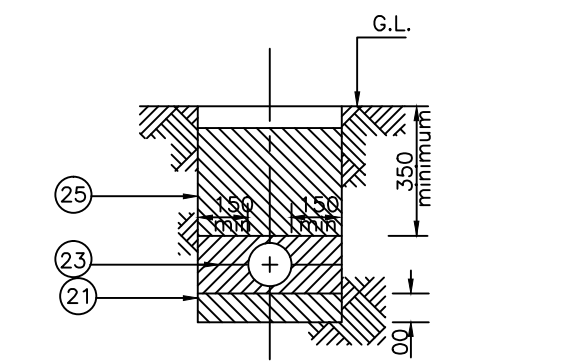
For invert depths up to 3.0m MAX



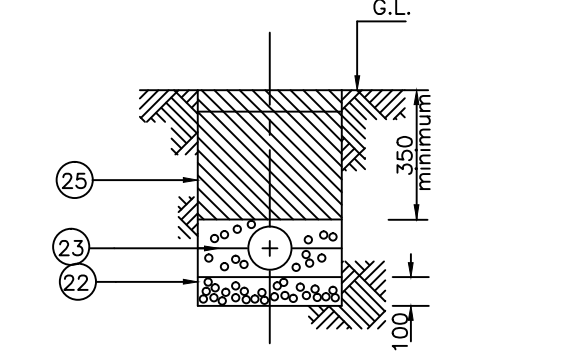
**450mm DIAMETER MANHOLE BASE**

**OPEN CHANNEL MANHOLES**

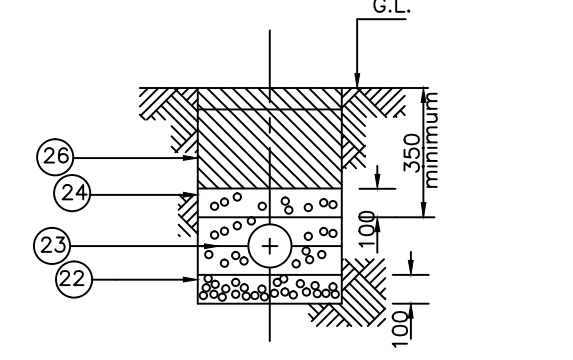
With stepped invert branch entries



**PIPES BEDDED IN SUITABLE 'AS DUG' MATERIAL**

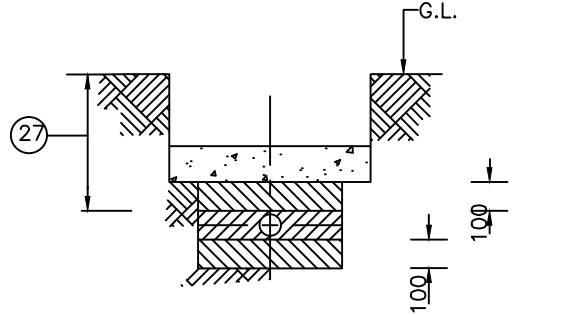


**PIPES BEDDED IN GRANULAR MATERIAL**

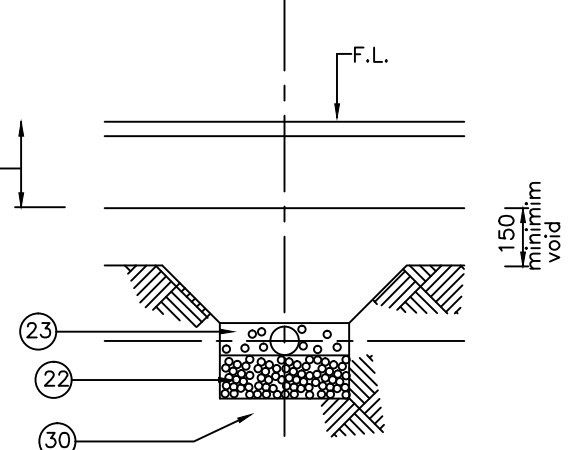


**PIPES BEDDED AND SURROUND IN GRANULAR MATERIAL**

Used where 'as dug' is unsuitable



**PIPES PROTECTED FROM SURFACE LOAD**



**PIPES BENEATH CONCRETE SUSPENDED FLOORS**

**KEY CONTINUED**

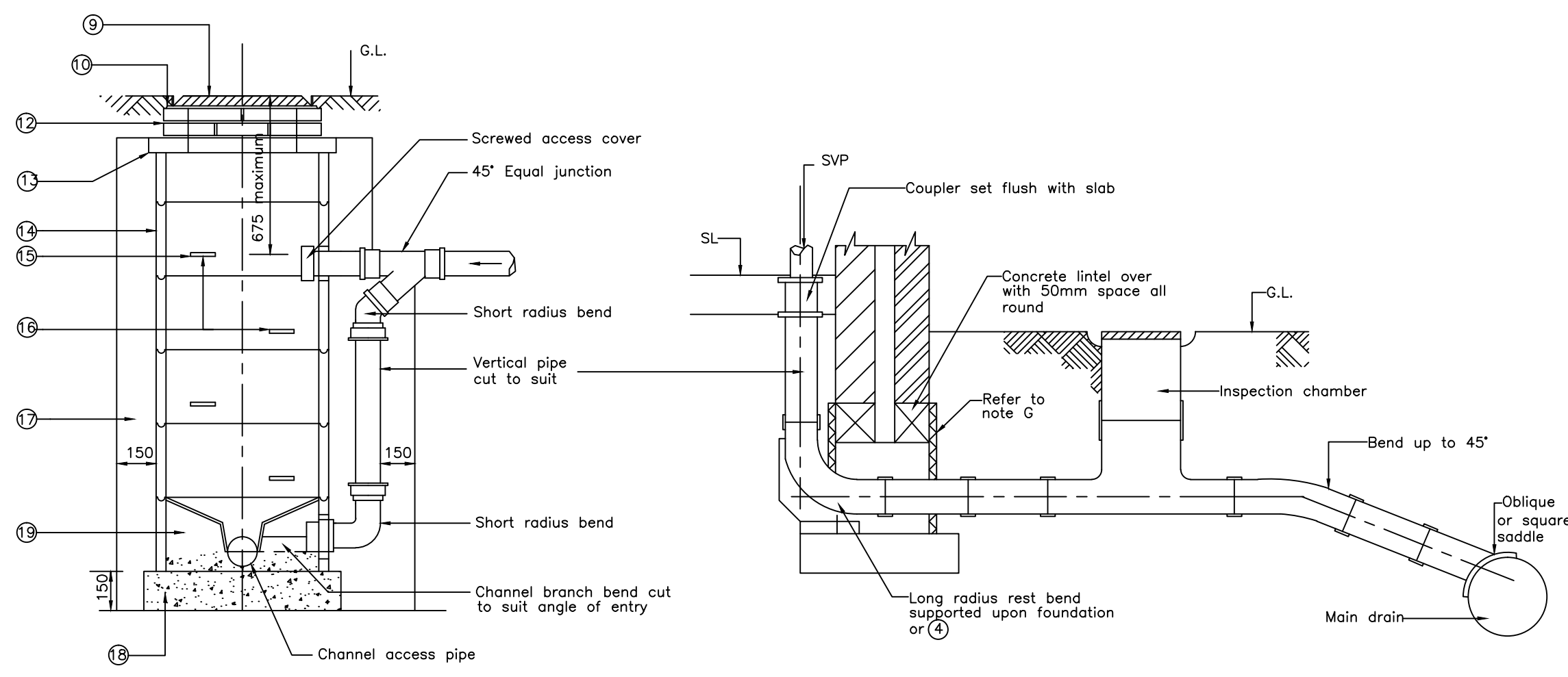
- 28. Grade 'B' class 2 single seal cover and frame 600 x 450mm.
- 29. 32mm diameter standpipe fitted with removable access plug to allow visual inspection.
- 30. Well compacted fill under pipe run using suitable 'as dug' material (see general notes).

Minimum dimensions for inspection chambers and manholes (taken from BS8301)

Type of Access	Depth to invert (m)	Minimum internal dimensions		Minimum nominal cover size		Remarks
		Rectangular length and width	Circular diameter	Rectangular length and width	Circular diameter	
Inspection chamber	<0.6 >1.0	450 x 450	190 450	450 x 450	190 450 (a)	
Manholes or inspection chamber	<1.5	1200 x 750	1050	600 x 600	600	
	>1.5	1200 x 750	1200	600 x 600	600	
Manhole access (b) shaft	>2.7	900 x 840	900	600 x 600	600	(c)

- (a) In the case of clayware and plastic inspection chambers, the clear opening may be reduced to 430mm in order to provide proper support for the cover and frame.
- (b) Minimum height of chamber in access shaft manhole is 2.0m from crown of pipe to underside of reducing slab.
- (c) Manholes to be constructed in accordance with the current publication 'Sewers for Adoption'.

**INSPECTION CHAMBER CONNECTION TO MAIN DRAIN AT LOWER LEVEL**



**BACKDROP MANHOLE**

Depth to invert in excess of 1.5m (MAX depth 6.0m)

- Drainage Notes**
1. Upvc connection to Clay Sleeve Pipe. Lubricate spigot of clay pipe and fit a upvc adaptor. Insert the upvc pipe spigot in the standard way.
  2. Wall protection sleeves used to protect pipes in passing through walls, other than at manholes, surrounded with mortar or concrete.
  3. 100mm bedding of C20P concrete.
  4. 150mm surround of well compacted (by hand tamped) granular material of 10mm nominal single size aggregate or suitable 'as dug' material (see general notes).
  5. Cover and frame to shallow inspection chambers will only withstand Grade 'C' loadings. Provide 150mm square C20P concrete collar if located in private drives.
  6. Shaft may be cut with a fine toothed saw and chamfered to accept cover assembly to suit depth of invert.
  7. 50l 'Tyc' (200mm) x 77 'A' (100V) UPVC (Vd 1) is maximum by use of appropriate band.
  8. Grade 'B' Class 2, or Grade 'C' cover and frame, dependant on location of I.C. (Grade B where vehicular access is necessary and Grade 'C' in soft landscape areas).
  9. Cover and frame bedded on and haunched with 1:3 mix mortar.
  10. C20P concrete collar 150mm square to provide bed for frame. When using Grade 'B' cover shutter external ribs to universal I.C.
  11. Class B engineering brickwork in stretcher bond 2 courses minimum (150mm), 3 courses maximum (225mm) and/or precast concrete frame sealing rings.
  12. Precast concrete light duty cover slab to BS5911 with 600 x 600mm offset access, bedded with mortar proprietary bitumen or resin mastic sealant.
  13. Precast concrete shaft to BS5911, 1200 x 750mm or 1500mm diameter minimum internal dimensions, sections to be bedded and sealed with mortar. If groundwater encountered then proprietary bitumen or resin mastic sealant, e.g. Tokstrip shall be used. Where depth to invert is less than 1.5m then a 1050mm diameter chamber may be used.
  14. Maximum 675mm from cover level to first step iron/ladder rung.
  15. Step irons to BS1247 at intervals of between 250mm and 300mm centres, in two vertical runs staggered at 300mm centres horizontally. The lowest step iron being not more than 300mm above benching. Ladders are to be used for invert depths exceeding 3.0m to BS4211.
  16. 150mm surround of well compacted 'as dug' or granular material in 200mm layers by hand tamping. Where inspection chambers/manholes are constructed in unstable ground or are likely to be subjected to wheel loads then a 150mm surround of C20P concrete shall be provided. Any joints should be staggered to chamber joints.
  17. Base of C20P concrete, 150mm thick.
  18. Benching of C20P concrete, to provide a slope of 1 in 12 topped with a hand smooth surface of 1:3 cement mortar.
  19. Manhole base to be bedded on 150mm thick C20P concrete and benched up to top flange and in accordance with note 18.
  20. 100mm bedding of suitable 'as dug' material well compacted. See general notes for description.
  21. 100mm bedding of granular material, 10mm nominal single size aggregate, well compacted.
  22. 150mm minimum width of side fill material (similar to bedding material) well compacted in 100mm layers by hand tamping to the pipe crown.
  23. 100mm minimum cover of granular material (similar to bedding material) lightly tamped by hand.
  24. 300mm minimum of compacted suitable 'as dug' material light hand tamping for first 100mm over crown and continue hand tamping until a finished layer of 300mm has been placed over the pipe.
  25. 'As dug' backfill hand tamped up to 300mm minimum above crown of pipe.
  26. Provide concrete protection to pipes where depth of cover is less than:
    - a. 600mm in soft landscape areas e.g. gardens, this may be reduced to 350mm if using 'plastic' products or protection may be omitted if footpath or patio provided at ground level.
    - b. 750mm in light traffic areas e.g. private drives and private shared access ways.

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Drawing **STANDARD DETAILS Private Drainage**

Project 46-48 Oakfield Road, Harpenden.

Scale N.T.S. Date 24.06.11 Approved

Drawing no. 1035/501 P3