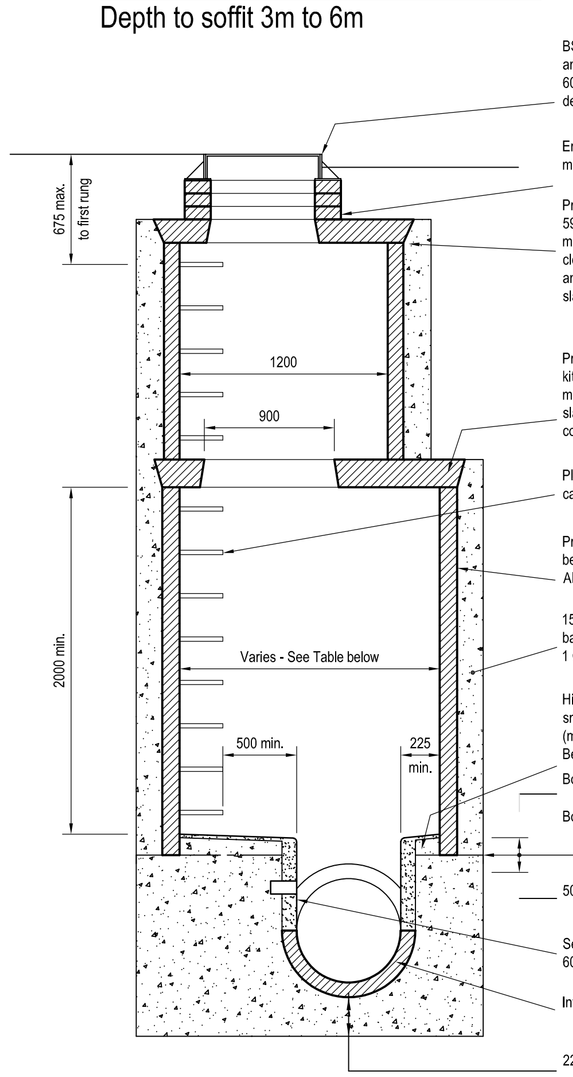
H-3-264-150

TYPE A MANHOLE TYPICAL DETAILS
Depth to soffit 3m to 6m



BSI Kitemarked ductile iron cover and frame with mortar bedding and haunching. Manhole covers must have a clear opening of 600 x 600 and shall be Class D400 to BS EN 124 with 150mm deep frames in highway.

Engineering brick or special purpose concrete brick (2 course min. 4 course max.) and/or pre-cast cover frame seating rings.

Pre-cast cover slabs to comply with BSEN 1917:2002 and BS 5911 with 600 x 600 opening, be kitemarked and bedded with mortar, proprietary bitumen or resin mastic sealant. Where the clear opening of the cover slab is different to that of the cover and frame, a load bearing slab should be fitted above the cover slab to bring the size down to the specified cover size

Pre-cast reducing slabs to comply with BSEN 1917:2002, be kitemarked and bedded with mortar, proprietary bitumen or resin mastic sealant. On manholes less than 1500 diameter, reducing slabs are not to be used, with pre-cast sections continuing upto cover slab.

Plastic encapsulated stainless steel double width/rung step rungs cast in vertical alignment to BS EN 13101:2002 at 250 c/c.

Pre-cast concrete manhole sections and cover slabs to be bedded with mortar, proprietary bitumen or resin mastic sealant. All lifting eyes in concrete sections to be pointed.

150 insitu concrete surround to adoptable manholes and backdrops to be Gen3 concrete (designed to BRE special Digest 1 Concrete in Aggressive Ground).

High strength concrete topping to be brought up to a dense smooth face neatly shaped and finished to all branch connections (minimum thickness 20mm).
Benching slope to be 1 in 10 to 1 in 30.

Bottom pre-cast section to be built 100 min. into base concrete.

Bottom pre-cast section to be built 75 min. into base concrete.

Construction Joint

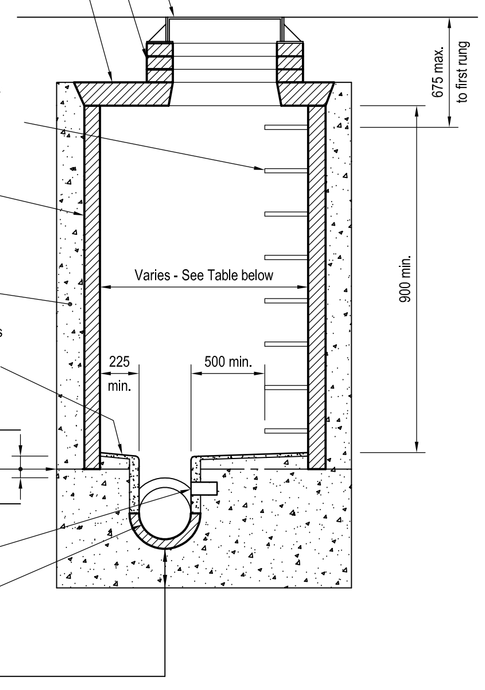
50 min. between top of pipe and underside of pre-cast section.

Self cleansing toe holds to be provided where channel exceeds 600.

Inverts to be formed using channel pipes.

225 min. (to barrel of pipe) insitu concrete base.

TYPE B MANHOLE TYPICAL DETAILS
Depth to soffit 1.5m to 3m

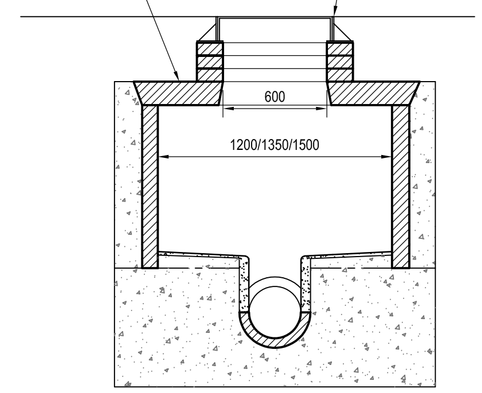


TYPE B1/E MANHOLE TYPICAL DETAILS
Depth to soffit 1m to 1.5m

CONSTRUCTION NOTES AS TYPE B MANHOLE EXCEPT STEP RUNGS NOT REQUIRED

Pre-cast cover slabs to comply with BSEN 1917:2002 and BS 5911 with 600 x 600 opening, be kitemarked and bedded with mortar, proprietary bitumen or resin mastic sealant. Where the clear opening of the cover slab is different to that of the cover and frame, a load bearing slab should be fitted above the cover slab to bring the size down to the specified cover size.

BSI Kitemarked ductile iron cover and frame with mortar bedding and haunching. Covers to be positioned over channel and must have a clear opening size of 600 x 600. Manholes less than 1.5m to soffit with 1500mm chamber size or larger should have a 1220x600mm opening (central or eccentric) sited over channel with double twin 600 x 600 covers. Covers to be Class D400 to BS EN 124 with 150mm deep frames in highways.



TYPE S MANHOLE TYPICAL DETAILS
Depth to soffit less than 1m

BSI Kitemarked ductile iron cover and frame with mortar bedding and haunching.
Covers to be twin 600 x 600 be class D400 to BSEN 124 and to have 150mm deep frames.

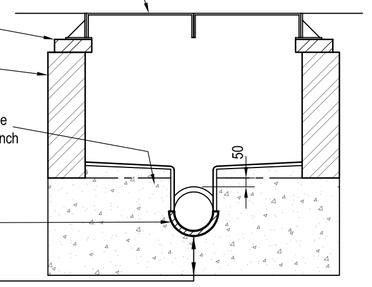
Walls corbelled as necessary to suit cover.

215 thick Class B Engineering brick walls.

High strength concrete topping to be up to a dense smooth face neatly shaped and finished to all branch connections (minimum thickness 20mm).
Benching slope to be 1 in 10 to 1 in 30.

Inverts to be formed using channel pipes.

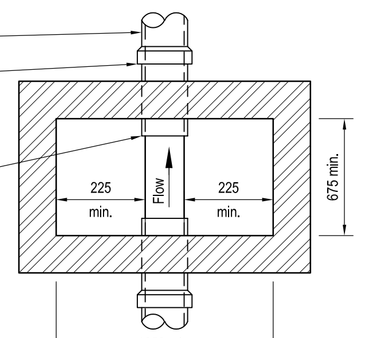
225 min. (to barrel of pipe) insitu concrete base.



Rocker pipe - see Note 2.

Pipe joints to be as close as possible to face of manhole to permit satisfactory joint and subsequent movement.

Pipe joints with channel to be 100 min. inside face of manhole.



150mm reinforced GEN3 concrete slab with A393 mesh

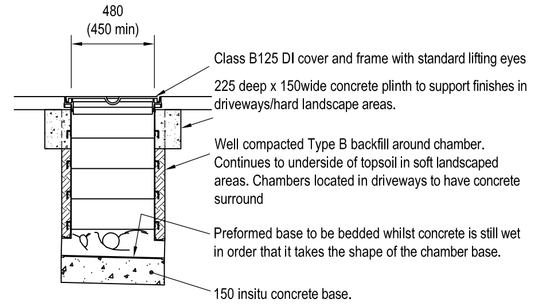
TYPE G DEMARCATION CHAMBER DETAILS
Depth to invert less than 1.2m

If depth to invert is greater than 1.2m standard Type B and B1 manhole are to be used.
Details shown are based on Hepworth PPIC.

MINIMUM LATERAL GRADIENTS

Diameter (mm)	Gradient	
	Foul	SW
100Ø	1:40	1:100
150Ø	1:80	1:150
225Ø	1:125	1:225

All lateral pipes to have a class S bed and surround as detailed, and the trench backfilled with Type B excavated material in landscaped areas and Type 1 granular material elsewhere.



ALLOWABLE LATERAL PIPE MANUFACTURERS

Product Name	Diameter (mm)	Manufacturer	Material
SuperSleve	100 & 150 (ID)	Hepworth	Vitrified Clay
SuperSeal	150 & 225 (ID)	Hepworth	Vitrified Clay
Densleeve	100, 150 & 225 (ID)	Naylor	Vitrified Clay
Denseal	100, 150 & 225 (ID)	Naylor	Vitrified Clay
Ultra-Drain	110 & 160 (OD)	Uponor	uPVC
Plastidrain	110 & 160 (OD)	Hepworth	uPVC
OsmaDrain	110 & 160 (OD)	Wavin	uPVC
Osma UltraRib	150 & 225 (ID)	Wavin	uPVC
Solid Wall	110 & 160 (OD)	Marley	uPVC
Quantum	150 & 225 (ID)	Marley	uPVC
Underground Drain	110 & 160 (OD)	Polypipe	uPVC
Ridgisewer	150 & 225 (ID)	Polypipe	uPVC

Vitrified clay pipes to BS EN 295 Kitemarked

Unplasticised PVC pipes to BS 4660:2000 & BS EN 1401-1 kitemarked

Structured Wall Unplasticised PVC pipes to WIS 4-35-01 kitemarked

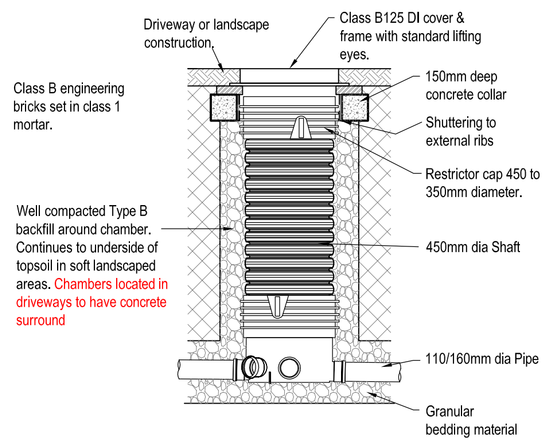
ALLOWABLE DEMARCATION CHAMBER MANUFACTURERS

Manufacturer	Product Name	Material	Max Depth	Cover Type
Naylor	Plastic Inspection Chamber	Polypropylene	Up to 1200mm	Class B125
Hepworth	PPIC	Polypropylene	Up to 1200mm	Class B125
Uponor	Inspection Chamber (450mmØ)	Polypropylene	Up to 1200mm	Class B125
Marshalls	Inspection Chamber to BS5911 pt 2	PCC	Up to 1000mm	Class B125
Wavin	Osma UltraRib Inspection Chamber	Polypropylene	Up to 1200mm	Class B125
Wavin	OsmaDrain Universal Inspection Chamber	Polypropylene	Up to 1200mm	Class B125
Marley	Inspection Chamber (450mmØ)	Polypropylene	Up to 1200mm	Class B125
Polypipe	110mm Inspection Chamber (460mmØ)	Polypropylene	Up to 1200mm	Class B125

Precast concrete to BS 5911:Part 2 and BS 8301 kitemarked, up to 1.0m deep

Polypropylene Inspection Chambers to BS 7158:2001 kitemarked, min. 450mm diameter up to 2.0m deep.

TYPE H DEMARCATION CHAMBER DETAILS
Depth to soffit 1.2m to 2.0m
DETAILS SHOWN ARE BASED ON WAVIN 450 RANGE



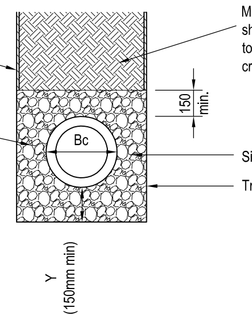
TYPE B MATERIAL

In Public Highways and other hardstanding areas as may be noted on the scheme drawings, the material referred to as Type B is to be D.O.T Type 1 granular material to Clause 803 of the Specification For Highway Works, subject to the approval of the adopting Highway Authority.

Elsewhere, Type B selected material, whether imported or locally excavated, shall consist of uniform, readily compactable material, free from vegetable matter, building rubbish, frozen material and material susceptible to spontaneous combustion. Clay with a Liquid Limit greater than 80 and/or a Plastic Limit greater than 55 is to be excluded. Clay lumps and stones retained on 75 and 37 sieves respectively and all material with an excessively high moisture content to be excluded.

Trench box/sheeting to terminate 150mm above crown of pipe to prevent displacement of granular sidefill. Boxes/sheeting to be removed progressively during placement of main backfill.

Sidefill material to be placed evenly on both sides of the pipe taking care to work the material under the lower quadrant of the pipe ensuring the pipe is not lifted. Both sides of the trench should be filled simultaneously to avoid horizontal movement of the pipe.



Mechanical compaction of Type B backfill should not be commenced until there is a total cover depth of 300mm above the crown of the pipe.

Single size 10mm clean gravel.

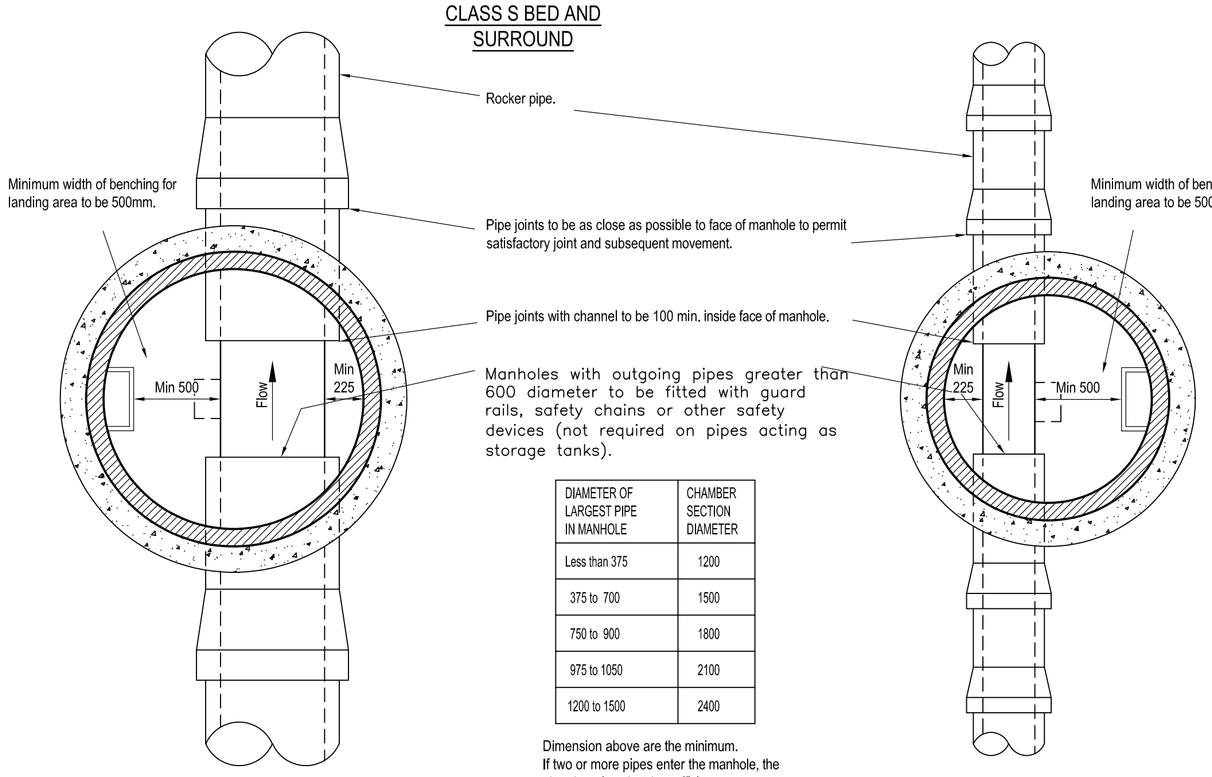
Trench width = pipe Ø + 300mm.

TYPE A GRANULAR MATERIAL

All granular material to be single sized or graded in accordance with the following table :-

NOMINAL PIPE BORE	SIZE	
	SINGLE SIZE	GRADED
100-125	10	-
150-200	10 or 14	14 to 5
225-300	10,14 or 20	14 to 5 or 20 to 5
375-500	14 or 20	14 to 5 or 20 to 5
Over 500	14,20 or 40	14 to 5, 20 to 5 or 40 to 5

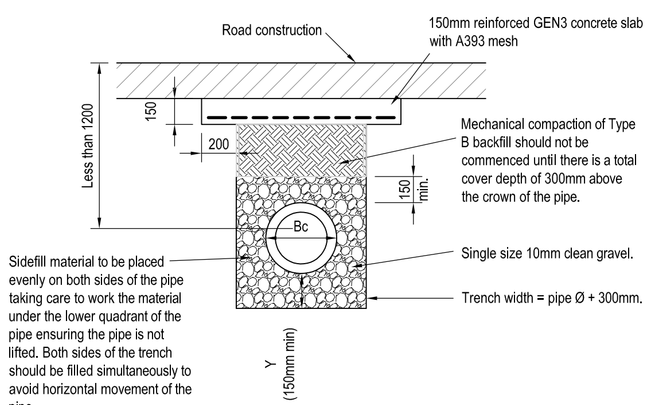
CLASS S BED AND SURROUND



DIAMETER OF LARGEST PIPE IN MANHOLE	CHAMBER SECTION DIAMETER
Less than 375	1200
375 to 700	1500
750 to 900	1800
975 to 1050	2100
1200 to 1500	2400

Dimension above are the minimum.
If two or more pipes enter the manhole, the chamber size shall be sufficient to accommodate the minimum benching requirements.

CLASS S BED & SURROUND WITH CONCRETE SLAB PROTECTION



INFORMATION WITHIN THIS DRAWING IS NOT NECESSARILY PRODUCED TO SCALE. ALWAYS USE FIGURED DIMENSIONS AND CO-ORDINATES - IF IN DOUBT, ASK.

NOTES

1. All pipes shall be either:

   A - Vitrified clay to BS EN 295 with a minimum crushing strength as follow :-
   150 dia. - 40 kN/m
   225 dia. - 45 kN/m
   300 dia. - 72 kN/m

   B - PVC (certified to WIS 4-35-01 & BS/EN 13476)

   C - Class 120 concrete to BS 5911-1:2002/EN 1916.

2. All pipes should always connect soffit to soffit unless noted otherwise.
3. All sewers to have BSI kitemark status (certified to WIS 4-35-01 & BS EN 13476). Maximum pipe length to be 3m. Plastic channel sections in manholes are not acceptable, Clay channel sections shall be used.
4. Sewers to be laid in Class "S" Bedding (150mm granular bed and surround). Where depth of cover to top of the sewer is less than 1.2m in highways and verges (or less than 900mm in none vehicular access areas) then a concrete slab should be provide above granular bed and surround.
5. Manhole covers shall have a clear opening of 600 and shall be class D400 to BS EN 124 with 150 deep frames in highways. Covers to have closed keyways and are to be bedded on steel shims with 1:3 mortar haunching.
6. Pipes entering manholes and road gullies shall have a flexible joint within 600 of the inside the manhole or gully joining with a short Rocker pipe.
7. The adoptable sewers should be a minimum of 1m and manholes 0.5m from kerb faces and service margins.
8. Sewers must have 5m clearance from trees and hedges (refer to Figure 2.3 page 33 in "Sewers For Adoption"6th Edition for restrictions on tree planting adjacent to sewers).
9. All trenches in roads and paved areas shall be backfilled with Type 1 DOT granular sub-base material, or other granular material approved by the highway authority.
10. Filled ground must be filled and consolidated under the supervision and to the satisfaction of Yorkshire Water before any sewer works are carried out.
11. All insitu concrete to be designated mix FND2 to BS 8500-1 unless agreed otherwise.
12. The invert levels at the proposed points of connection to existing public sewers shall be checked before any new drains are constructed. Any variation to the levels shown on the drawing shall be notified to Eastwood & Partners.
13. The chamber size of manholes with more than one connection in them may need to be increased an increment to accommodate the connections and bends.
14. Cover levels are indicative only. Covers to be set to suit camber/gradient of existing and proposed roads.
15. Cover slabs must carry the BSI Kitemark or will be rejected by Yorkshire Water Inspector. Where the clear opening of the Kitemarked product is different to that of the cover and frame, a loading bearing slab should be fitted above the cover slab to bring the size down to 600mm x 600mm for the Yorkshire Water specified cover size. Please refer to Concrete Pipe Systems Association (CPSA), 'Technical Bulletin' issued Autumn 2004 for Kitemarked cover slab opening sizes.
16. All foul lateral sewers and drains to be 100Ø unless noted otherwise.
17. Yorkshire Water policy is not to accept Type "C" brick manholes and 1050mm dia manhole rings. Instead it is preferred that you use a type "B" manhole with 1200mm dia or 1500mm dia rings, with the opening sited over the channel where depth of cover to pipe soffit is 1 - 1.5m.
18. Manhole covers shall/must have a clear opening of 600mm and shall be Class D400 to BS EN 124 with 150mm deep frames in highways.
19. Where a B125 cover and frame has been approved, this must not be coated in plastic and must have lifting eyes suitably sized to accommodate standard lifting keys. Screw down covers are not acceptable.
20. All adoptable sewer works and material to be in accordance with "Sewers for Adoption" 6th Edition, The Relevant British/European and Yorkshire Water's Standards/Requirements/Addendum to the Mechanical and Electrical Specification and Kitemarked.
21. Yorkshire Water is not obliged to accept filter drain/land drainage run-off into the public sewer network or adoptable drainage system (directly or in-directly). An alternative method of disposal of the land drainage run-off will therefore be required and you will have to liaise with the Local Authority, Land Drainage Section with regard to the disposal of the filter drain/land drainage run-off.
22. Sulphate resistant cement (C20-DC2) and precast concrete products must be used or a laboratory report provided proving that such precautions are not necessary.
23. Bedding and backfill material to conform to the requirement of Water Industry Specification 4-08-02 (Table A2).
24. Adoptable plastic sewer pipes to be BSI Kitemarked (certified to WIS 4-35-01 and BS/EN13476).Adoptable plastic sewer pipes to be laid in maximum 3 metre lengths unless there is a specific operational need to lay longer lengths. Plastic channel sections in manholes are not acceptable and Yorkshire Water would prefer clayware channel in manholes. We have found that plastic channels are difficult to set in concrete because they float and a satisfactory finish cannot be obtained on the benching.

REV	DESCRIPTION	SIG	CHK	DATE
C	Manhole plan and Demarcation chamber amended following YW comments	TB	CH	12.12.18
B	Amendments made following YW comments	TB	CH	28.11.18
A	First Issue.			

STRATEGIC TEAM GROUP

BONDFIELD CLOSE, WOMBWELL

MANHOLE CONSTRUCTION DETAILS

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SCALE WHEN PLOTTED AT A1	DRAWING STATUS
1:25	PRELIMINARY

DRAWN	CHECKED	DATE	DRAWING NUMBER	REV
RJ	CH	06.09.18	42937/005	C