

## TYPICAL MANHOLE DETAIL TYPE A

(DEPTH TO SOFFIT 3m - 6m)

Ductile iron cover & frame to BS EN124 D400, bedded on class M1, M2 or Epoxy Mortar. Approved packing material may be used if required. Cover to badged FW or SW as appropriate. Min. frame depth to be 150mm when used in block paved areas.

Class M1, M2 or epoxy mortar haunching to manhole cover & frame

Heavy duty reinforced concrete reducing slab to BS.5911

Lifting eyes in concrete rings to be pointed

Ladder fixing brackets (3 No. Min) at 2m max. centres or as required. All fixing bolts to be stainless steel & secured with epoxy grout. (to be only used in manholes with depth greater than 3m)

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

In-situ concrete grade GEN 3 (Designed to BRE Special Digest 1 Concrete in aggressive ground)

Self cleaning toe holds to be provided in channel of sewers above 600mm diameter

CHAMBER DIAMETERS	
DIA. OF LARGEST PIPE IN MANHOLE (mm)	INTERNAL DIAMETER OF MANHOLE (mm)
LESS THAN 375	1200
375 TO 700	1500
750 TO 900	1800

Chambers with outgoing pipes greater than 600mm diameter shall be fitted with removable stainless steel (Grade316) safety chains or polypropylene rope. Manholes greater than 6m depth shall be subject to specific design

Minimum width of benching to be 500mm

Joint to be as close as possible to face of manhole to permit satisfactory joint and subsequent movement

For manholes of 1800 dia or larger. Below 1800 dia chamber rings continue to cover slab (no shaft)

Cover slab with 600x600 access (BS752-3) with max. 4 courses Class B Engineering Brick with 600 x 600 eccentric access hole

10mm uncompressed thickness of approved sealant to all horizontal joints

Precast concrete chamber sections and cover slab to be bedded with mortar, proprietary bitumen or resin mastic sealant

150mm thick concrete grade GEN 3 surround (sulphate resisting)

Precast concrete shaft & chamber sections set 75mm into base slab

Distance between top of pipe and underside of precast section to be minimum 100mm to maximum 300mm

Invert within chamber to be formed using a channel pipe

All pipes entering or leaving manholes shall have a flexible joint within 600mm of the inside face of the manhole. The next pipe shall be a short 'rocker pipe' with length as table below.

ROCKER PIPES	
SEWER DIAMETER (mm)	EFFECTIVE LENGTH (mm)
150 TO 600	600
601 TO 750	1000
OVER 750	1250

Minimum width of benching to be 225mm

## TYPICAL MANHOLE DETAIL TYPE B

(Maximum depth from cover level to soft of pipe 3m)

600x600 ductile iron cover & frame to BS EN124 D400, bedded on class M1, M2 or epoxy mortar. Approved packing material may be used if required. Cover to badged FW or SW as appropriate. Min. frame depth to be 150mm when used in block paved areas

Class M1, M2 or epoxy mortar haunching to manhole cover & frame

Lifting eyes in concrete rings to be pointed

Stainless steel (grade 316S31 BS.5970) or polypropylene encapsulated all to BS.1247 parts 1-2, double step rungs (280mm min. width at 250mm centres max. distance from cover level to first step 675mm)

High strength concrete topping (Min. 20mm thick) to be brought up to a dense, smooth face, neatly shaped & finished to all branch connections. Benching slope to be between 1 in 10 & 1 in 30

In-situ concrete grade GEN 3 (Designed to BRE Special Digest 1) Concrete in aggressive ground

Toe holds to be provided in channel of sewers above 450mm diameter

CHAMBER DIAMETERS	
DIA. OF LARGEST PIPE IN MANHOLE (mm)	INTERNAL DIAMETER OF MANHOLE (mm)
LESS THAN 375	1200
375 TO 700	1500
750 TO 900	1800

Minimum width of benching to be 500mm

Chambers with outgoing pipes greater than 600mm diameter shall be fitted with removable stainless steel (Grade 316) safety chains or polypropylene rope

Cover slab with 600x600 access (BS752-3) with max. 4 courses Class B Engineering Brick with 600 x 600 eccentric access hole

Precast concrete chamber sections and cover slab to be bedded with mortar, proprietary bitumen or resin mastic sealant

150mm thick in-situ concrete grade GEN 3 surround (Designed to BRE Special Digest 1) Concrete in aggressive ground

Precast concrete chamber sections set 75mm into base slab

Distance between top of pipe and underside of precast section to be minimum 50mm to maximum 300mm

Invert within chamber to be formed using channel pipes

225mm to barrel of pipe

Rocker pipe to table

ROCKER PIPES	
SEWER DIAMETER (mm)	EFFECTIVE LENGTH (mm)
150 TO 600	600
601 TO 750	1000
OVER 750	1250

Minimum width of benching to be 225mm

Pipe joint with channel to be located minimum 100mm inside face of manhole

Joint to be as close as possible to face of manhole to permit satisfactory joint and subsequent movement

## TYPICAL MANHOLE DETAIL TYPE X (NON ACCESS)

(Depth to soffit up to 1.5m)

600x600 ductile iron cover & frame to BS EN124 D400, bedded on class M1, M2 or epoxy mortar. Approved packing material may be used if required. Cover to badged FW or SW as appropriate. Min. frame depth to be 150mm when used in block paved areas

Class M1, M2 or epoxy mortar haunching to manhole cover & frame

Precast concrete chamber sections to B.S.5911

Grano concrete benching (Min. 20mm thick) to be brought up to a dense smooth face neatly shaped & finished to all branch connections. Benching slope to be between 1 in 10 & 1 in 30

Grade GEN3 concrete (Sulphate resisting)

CHAMBER DIAMETERS	
DIA. OF LARGEST PIPE IN MANHOLE (mm)	INTERNAL DIAMETER OF MANHOLE (mm)
UP TO 375	1200

Notes:-

Where the pipe diameter is 375mm or greater, a 1500mm ring should be used.



Notes

- Contractors must check all dimensions on site. Only figured dimensions are to be worked from. Discrepancies must be reported to the Architect or Engineer before proceeding. © This drawing is copyright
- All works to be undertaken in accordance with Sewers for Adoption 6th Edition with any Anglian Water additions or deletions

Notes.

- Backfilling under roads and paving: Backfill from top of granular bedding up to formation level with Granular Subbase Material Type 1 to Highways Agency specification for Highway Works 1988 Clause 803, laid and compacted in 150mm layers.
- Backfilling under landscaped areas: Backfill from top of granular bedding up to underside of topsoil with selected Class 1B material. Class 1B fill whether selected from locally excavated material or imported, shall consist of uniform readily compactable material, free from vegetable matter, building rubbish and frozen material, or materials susceptible to spontaneous combustion, and excluding clay of liquid limit greater than 80 and/or plastic limit greater than 55 and materials of excessively high moisture content. Clay lumps and stones retained on 75mm and 37.5mm sieves respectively shall be excluded from the fill material. Laid and compacted in layers not exceeding 300mm.
- Do not use heavy compactors before there is 600mm of material over pipe.

Table - Granular bedding and sidefill materials for rigid pipes

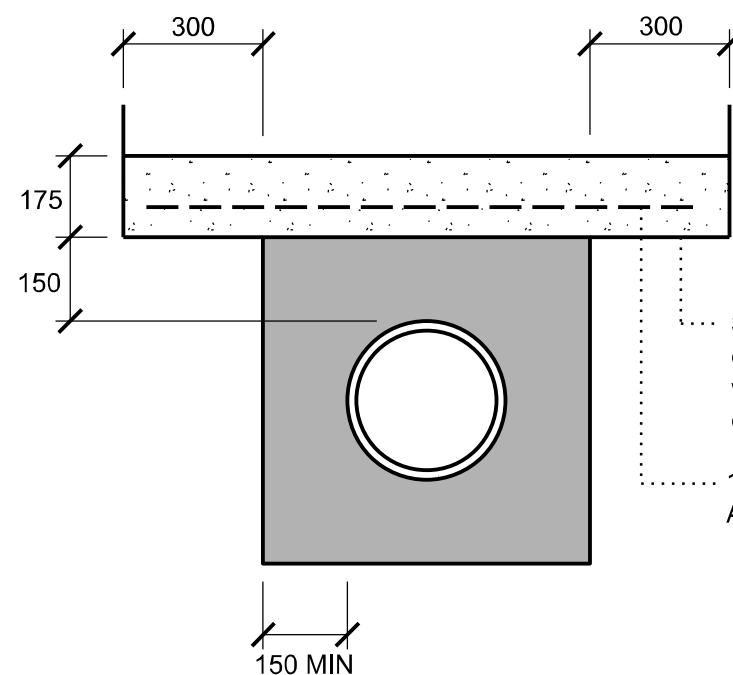
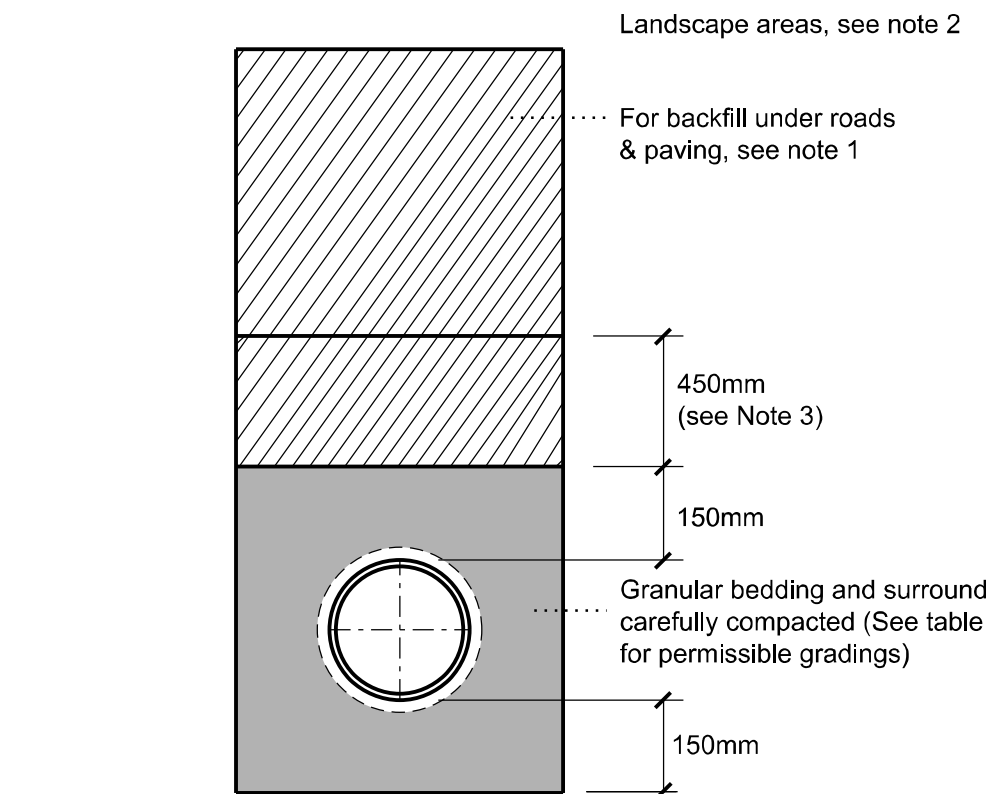
Pipe Nominal Bore (DN)	Maximum Particle Size (mm)	Class of Bedding	Suitable materials	
			Imported granular materials (Note a)	Maximum CF value for as-dug granular material (Note b)
100	10	S	10mm nominal single- size	0.15
		B		0.30 (Note c)
		F		0.15
		N	Course, Medium or fine sand	
Over 100 to 150	15	S	14mm to 5mm graded	0.15
		B		0.30 (Note c)
		F		0.15
		N	Coarse, medium or fine sand	
Over 150 to 500	20	S	14mm to 5mm graded or 20mm to 5mm graded	0.15
		B		0.30 (Note c)
		F		0.15
		N	All in aggregate or coarse medium or fine sand	
Over 500 (Note d)	40	S	14mm to 5mm graded or 20mm to 5mm graded or 40mm to 5mm graded	0.15
		B		0.30 (Note c)
		F		0.15
		N	All in aggregate or coarse medium or fine sand	

Notes

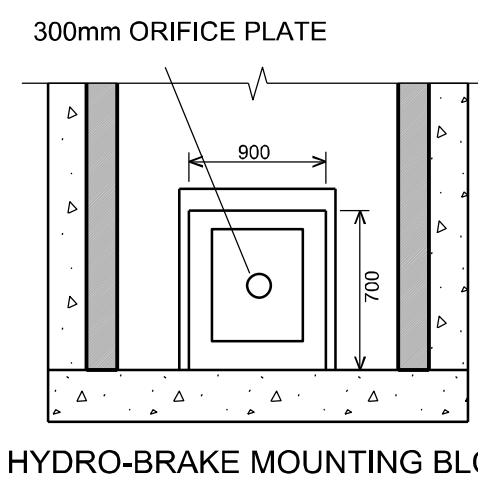
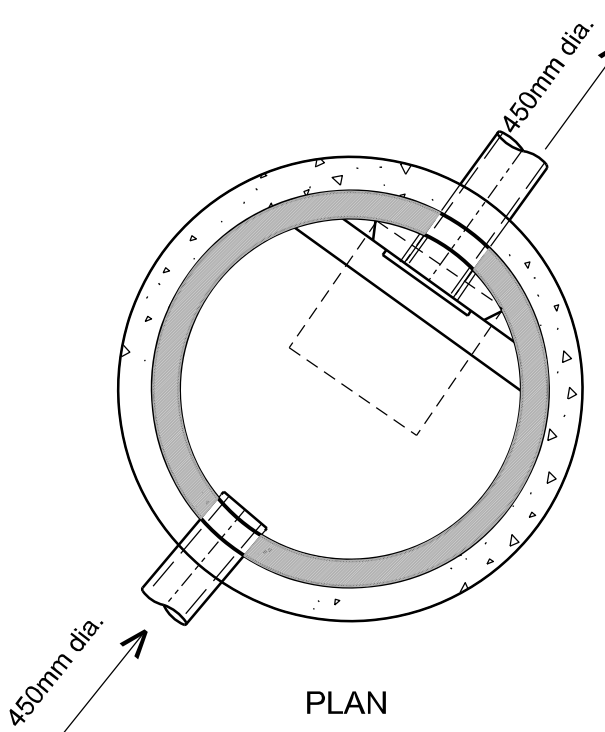
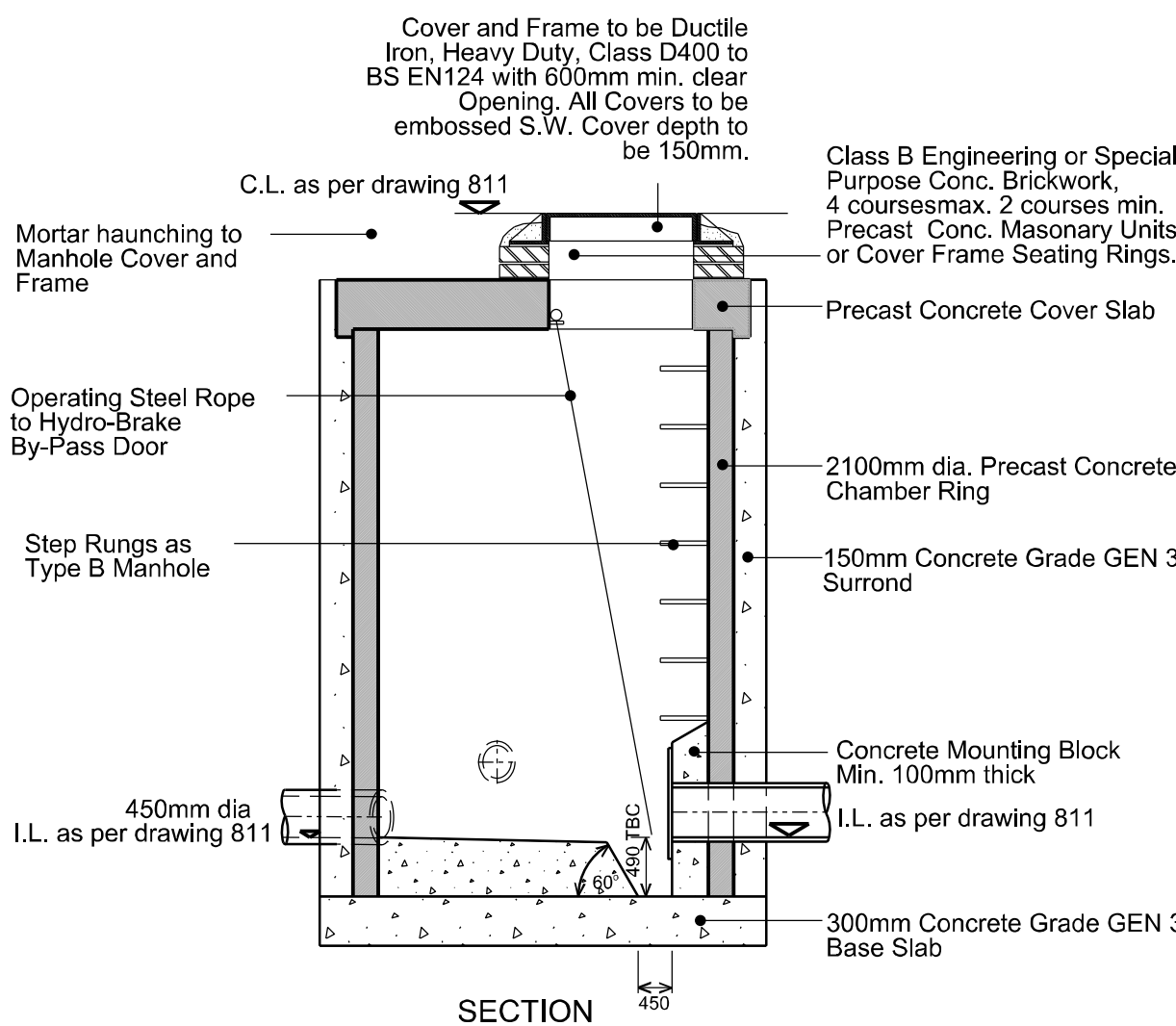
- Imported granular materials to include aggregates to BS 882, air-cooled blast furnace slag to BS 1047 and sintered pulverized-fuel ash to BS 3797 Compaction fraction value, See Appendix A
- The higher the CF value for as dug bedding and sidefill materials the greater the required effort for adequate compaction.
- Angular materials should be chosen to ensure sufficient support is provided to these heavier pipes. Crushed rock aggregates to BS 882 are recommended. Air-cooled blast furnace slag to BS 3797 or other granular materials may be used if they show a similar degree of angularity

## CLASS S BEDDING DETAIL

(Rigid Pipes)



## CLASS S(S) CONCRETE PROTECTION



## CONTROL CHAMBER

WITH ORIFICE PLATE