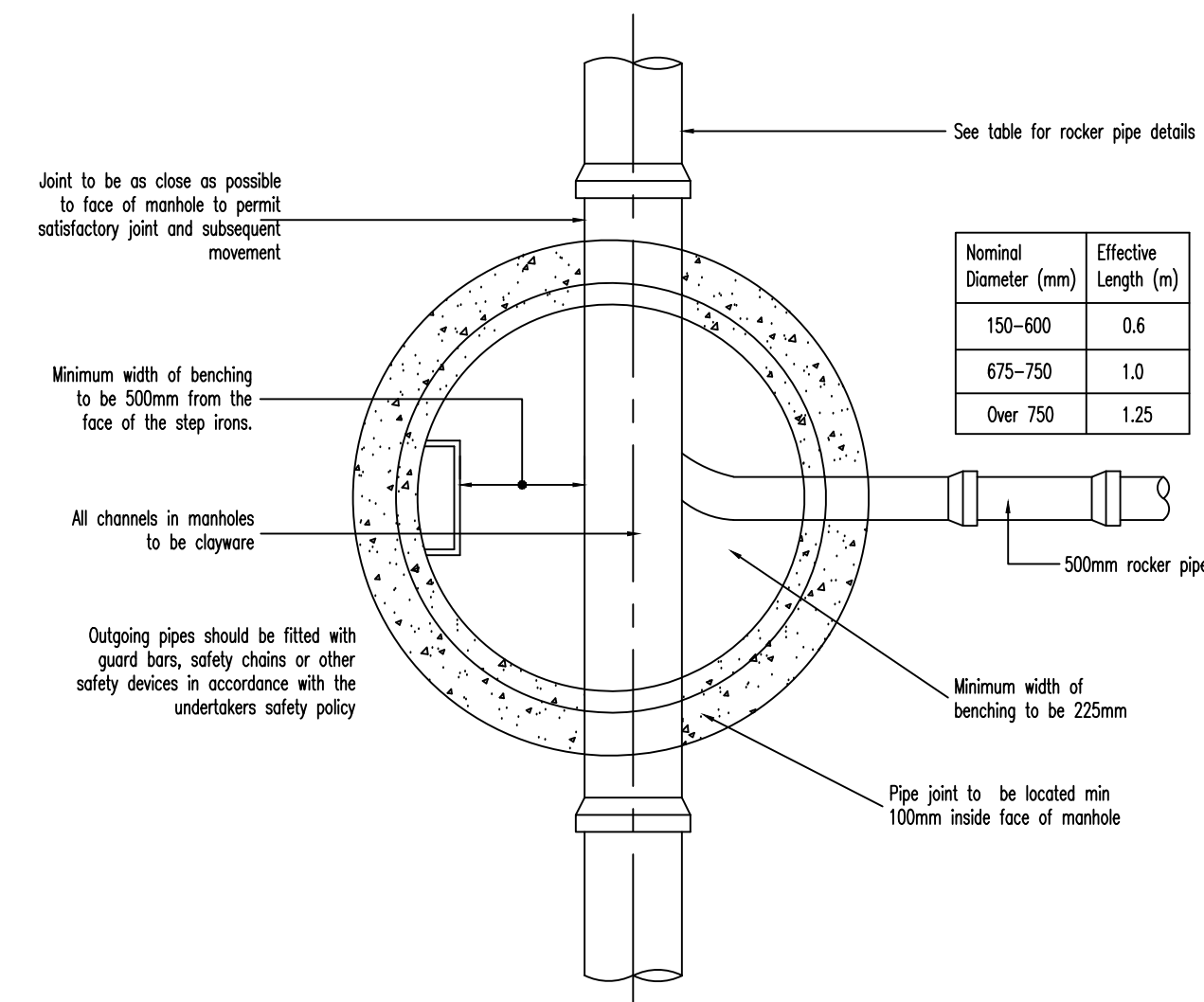
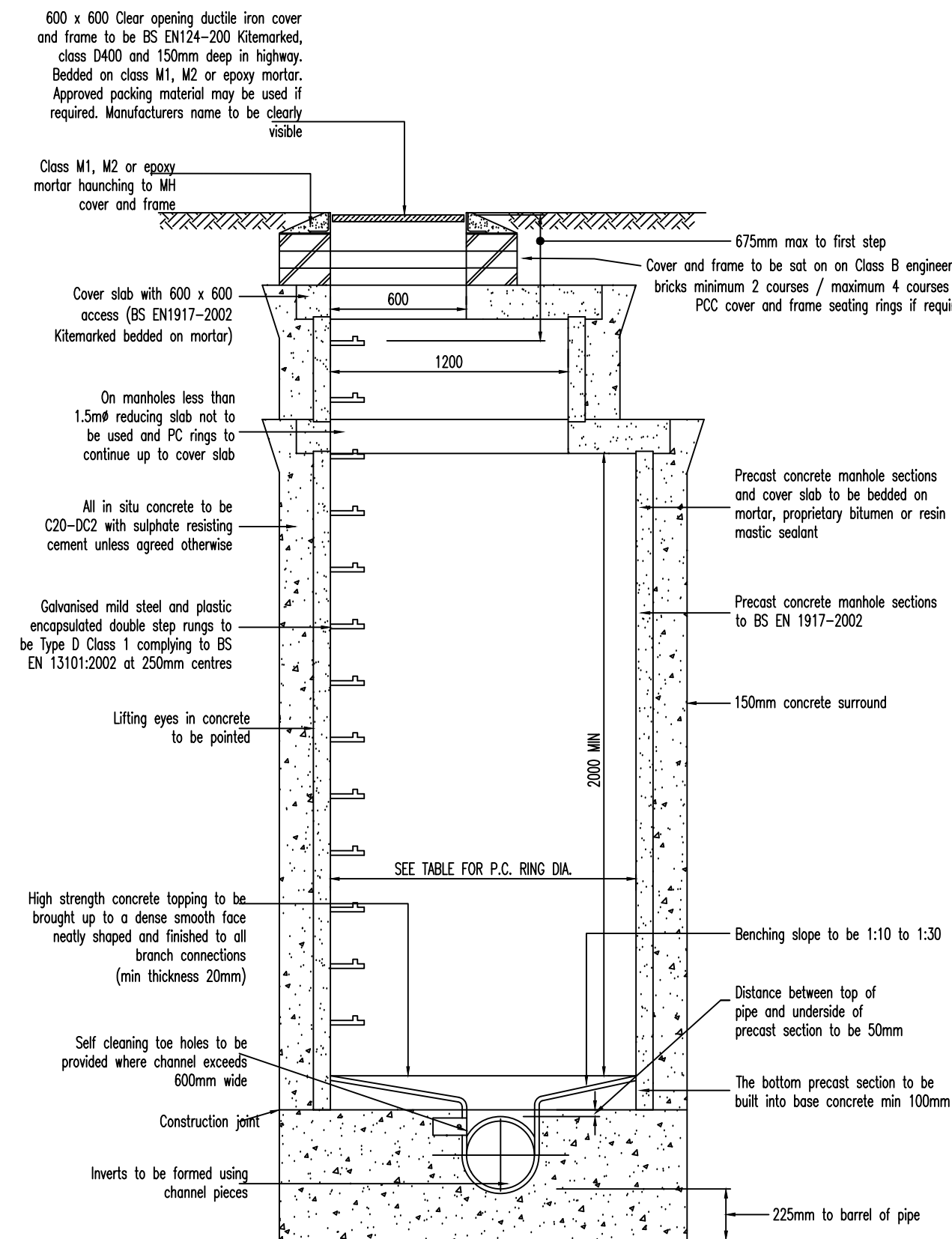
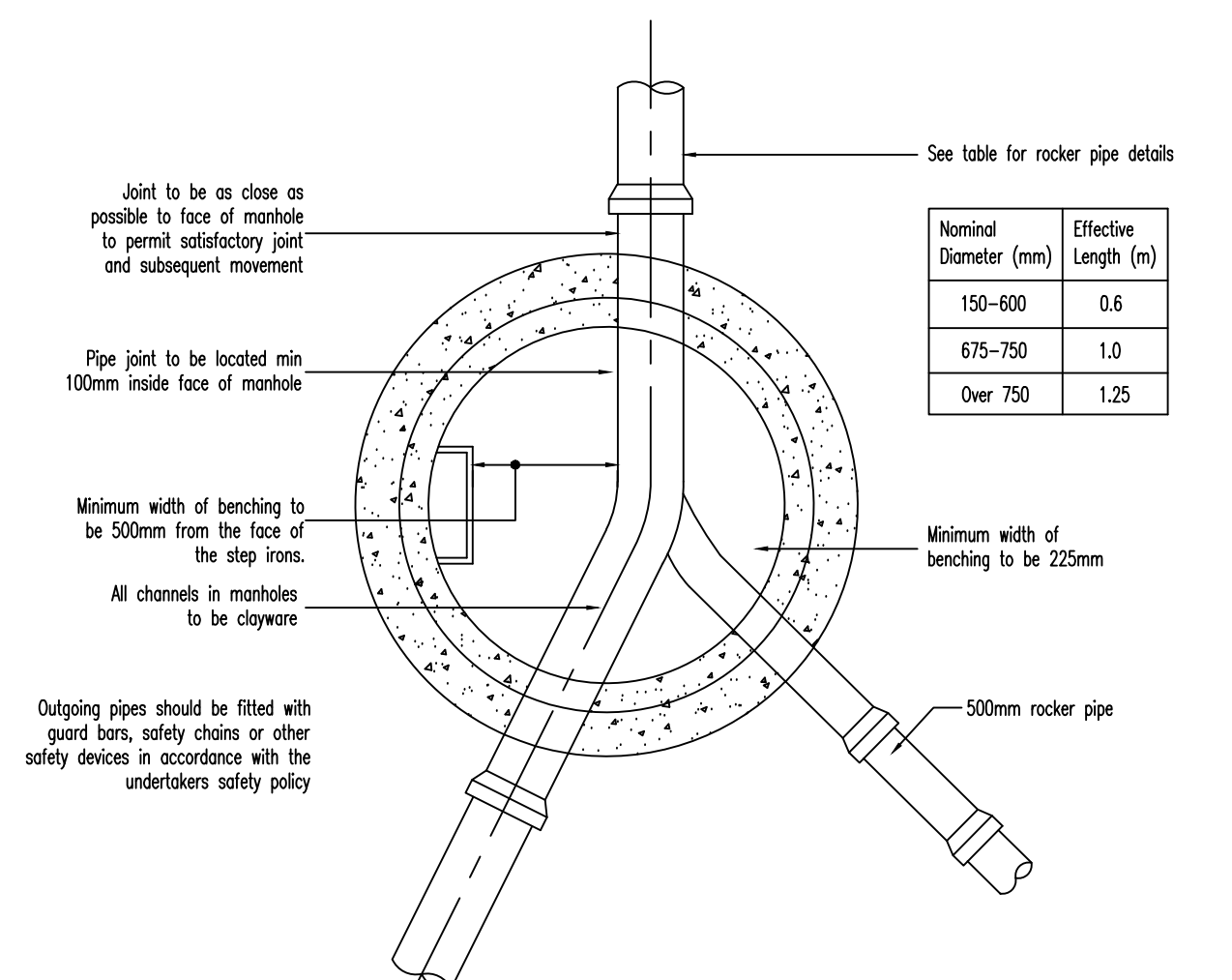
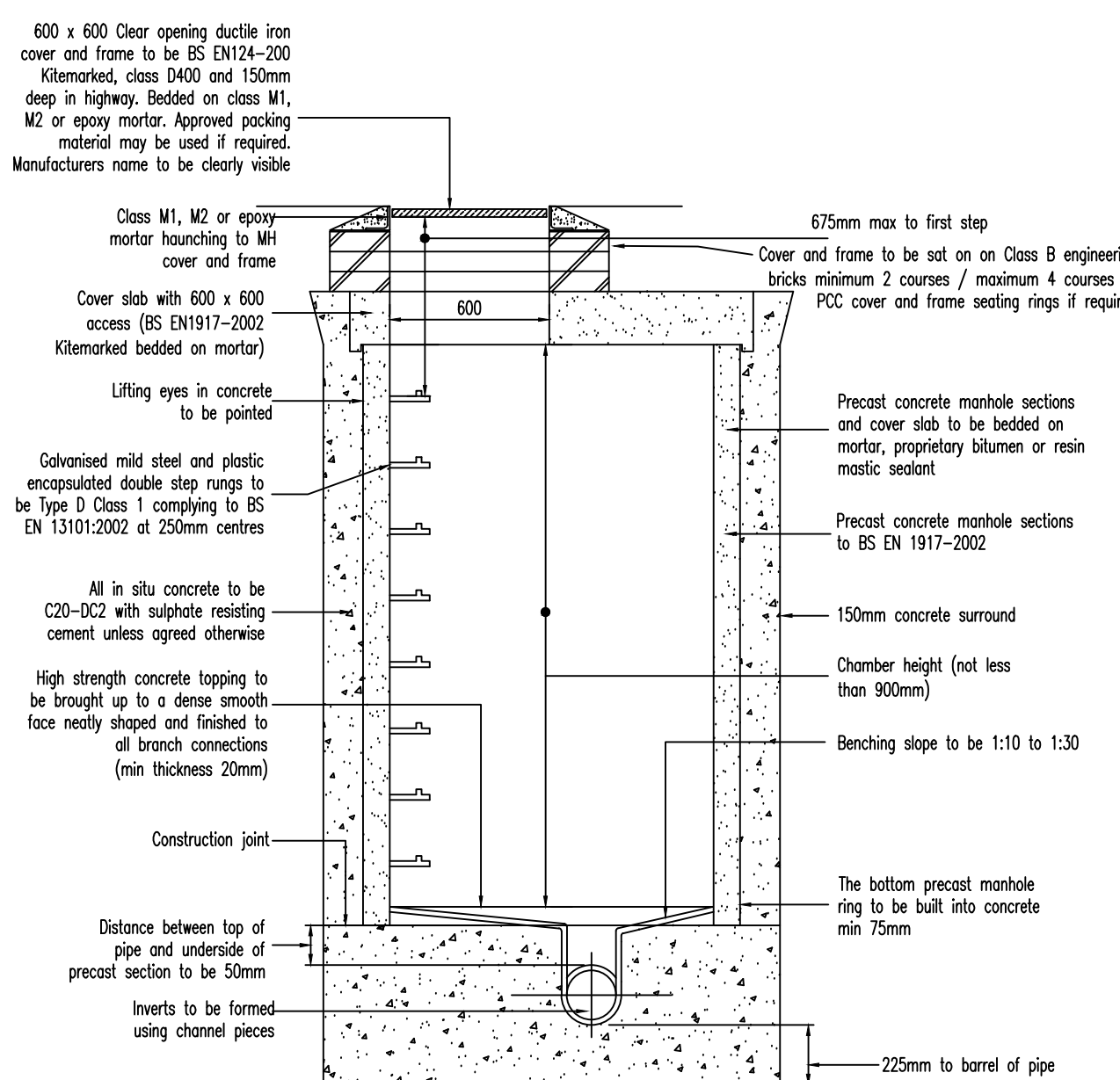


ALL ADOPTABLE SEWER WORKS AND MATERIALS TO BE IN ACCORDANCE WITH 'SEWERS FOR ADOPTION' 6th EDITION, THE RELEVANT BRITISH/EUROPEAN AND YORKSHIRE WATER'S STANDARDS/REQUIRMENTS/ADDENDUM TO THE MECHANICAL AND ELECTRICAL SPECIFICATION AND KITEMARKED



TYPICAL MANHOLE DETAIL - TYPE A

SEWERS FOR ADOPTION - 6TH EDITION
Max depth from ground level to soffit of pipe 3.0m to 6.0
The design of the manhole will need to comply with the undertakers safety policy



TYPICAL MANHOLE DETAIL - TYPE B

SEWERS FOR ADOPTION - 6TH EDITION
Max depth from ground level to soffit of pipe 3.0m
The design of the manhole will need to comply with the undertakers safety policy

Extract from Table A2 WIS 4-08-02

Processed granular bedding and sidefill materials for flexible pipes.

Pipe nominal bore (mm) see note (d)	Nominal maximum particle size (mm)	Materials specified in British Standards see note (a)
100	10	10mm nominal single size
Over 100 to 150	15	10-14mm nominal single size or 14mm to 5mm graded
Over 150 to 300	20	10-14mm or 20mm nominal single size or 14mm to 5mm graded or 20mm to 5mm graded
Over 300 to 500	20	14 or 20mm nominal single size or 14mm to 5mm graded or 20mm to 5mm graded
Over 500	40	14 - 20mm or 40mm nominal single size or 14mm to 5mm graded or 20mm to 5mm graded or 40mm to 5mm graded

Notes:

- Processed granular materials to include aggregates to BS 882, air-cooled blast furnace slag to BS1047 and lightweight aggregates to BS 3797
- For the purpose of this table, PE pipe of 630mm O.D. can be regarded as having nominal bores of over 550mm, irrespective of wall thickness.
- Nominal bore is used in preference to DN because of the different nominal size classifications for flexible pipes

Minimum recommended trench widths for structured wall pipes in poor ground conditions

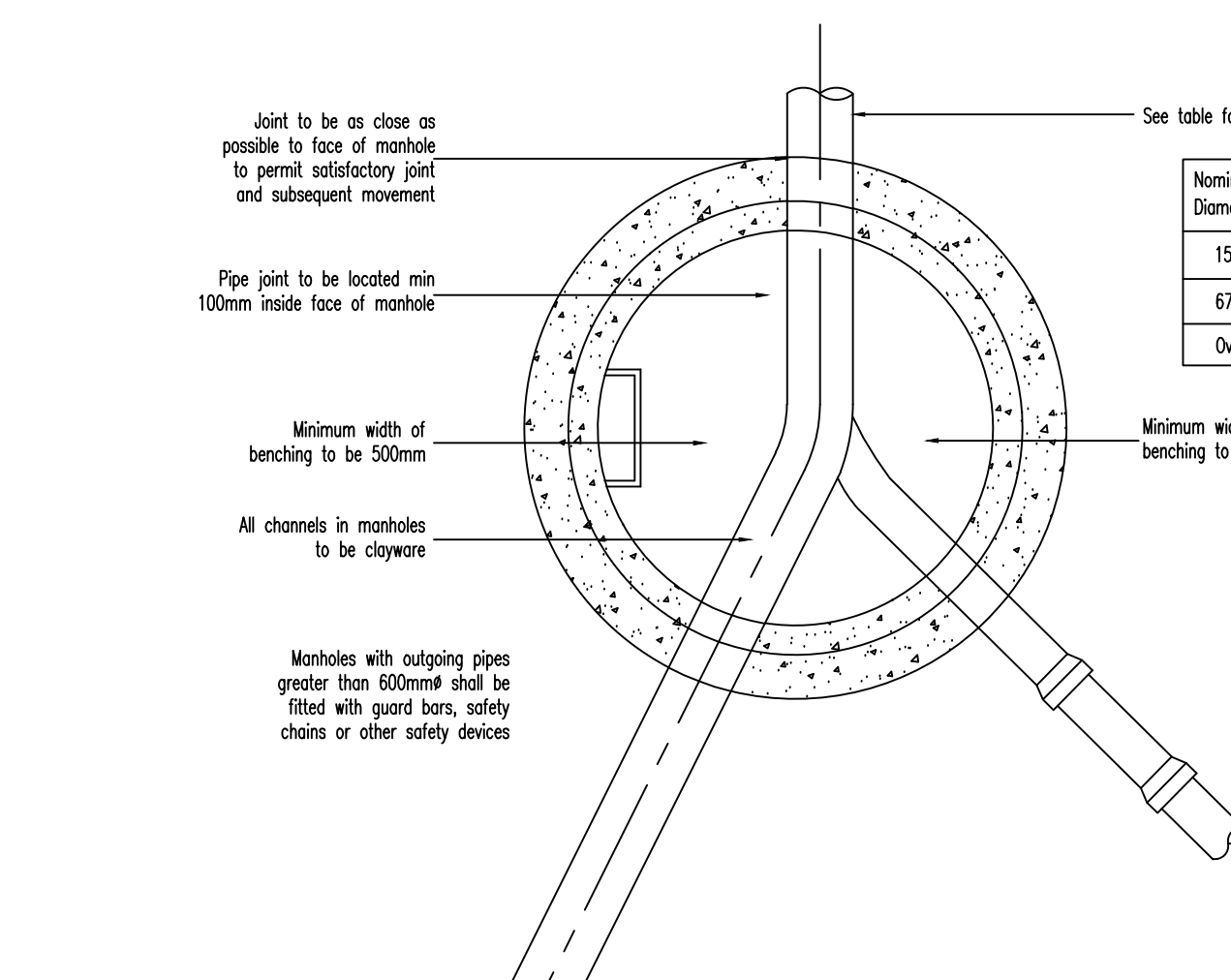
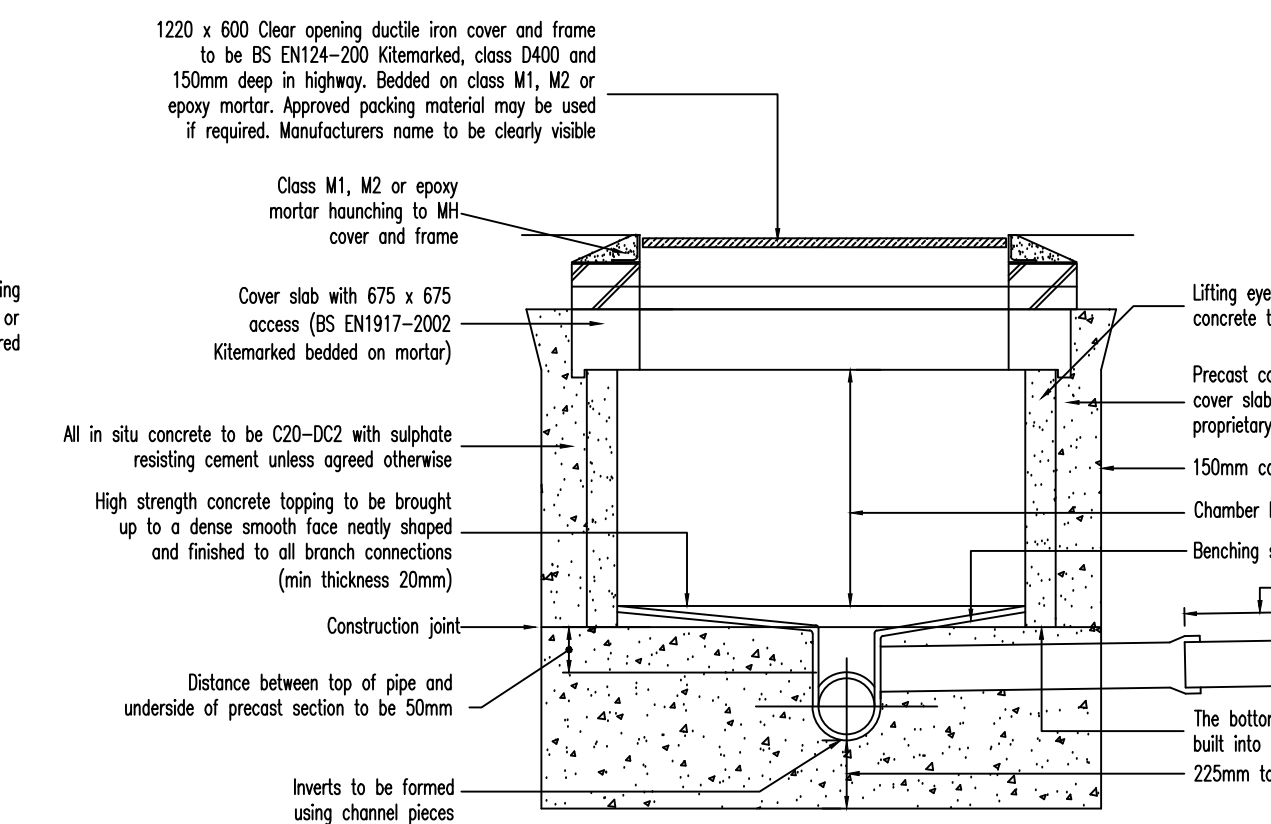
Native Soil Modulus between 3 and 4 Mpa
Typical Soil Classifications : Very loose gravel, loose sand, medium dense clayey silty sand, firm clay

Nominal Pipe Diameter (mm)	150	225	300	375	450	525	600	750	900
Minimum Trench Width (mm)*	450	525	600	750	900	1050	1200	1500	1800

* A vertical trench face has been assumed to allow a modulus of 7 Mpa to be achieved for the pipe bedding and sidefill material.

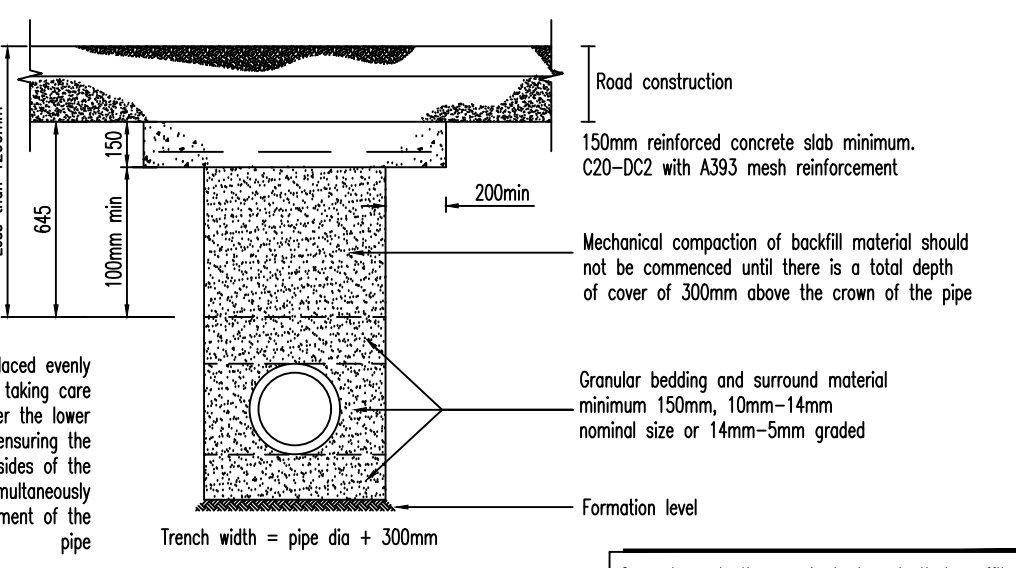
Other assumed values: Depth of cover = 6.0 metres (max)
Traffic Loading = S16
Pipe stiffness = S16

Note. Where the native soil modulus is below 3Mpa or the depth of cover exceeds 6 metres guidance should be sought from the pipe manufacturer regarding structural design and installation details.



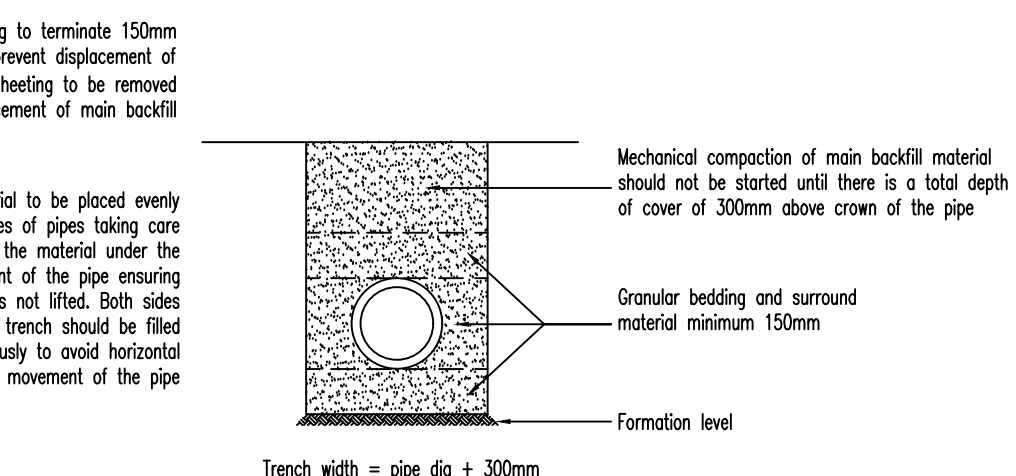
TYPICAL MANHOLE DETAIL - TYPE E

SEWERS FOR ADOPTION - 6TH EDITION
Max depth from ground level to soffit of pipe <1.0m
The design of the manhole will need to comply with the undertakers safety policy



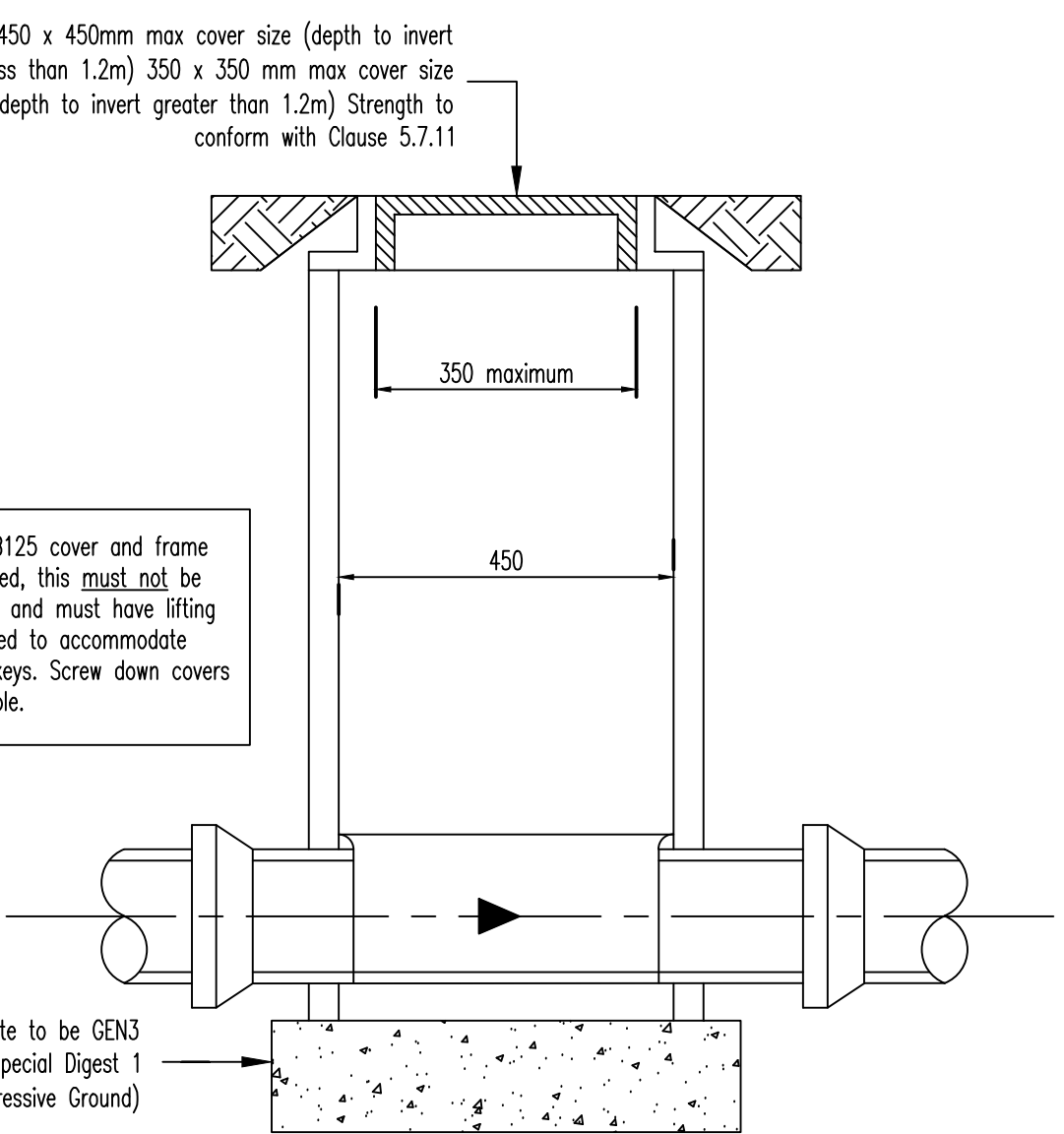
CONCRETE PROTECTION FOR PIPES AT DEPTHS OF COVER LESS THAN 1.2m

(1:20)

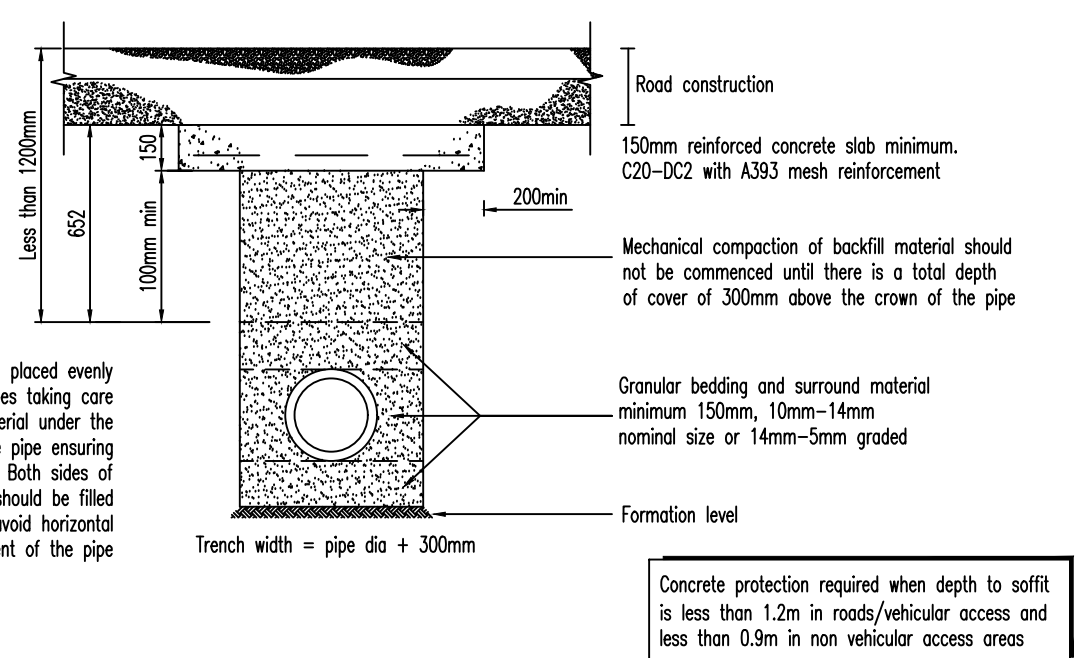


TYPICAL DETAIL THROUGH CLASS S BEDDING

(1:20)



TYPICAL DEMARCATION CHAMBER (1:10)



CONCRETE PROTECTION FOR PIPES AT DEPTHS OF COVER LESS THAN 1.2m

(1:20)

- Yorkshire Water General Notes
- 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 be Kitemarked.
 - 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.
 - 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.
 - Filled ground must be filled and consolidated under the supervision, and to the satisfaction, of Yorkshire Water before any sewer works are carried out.
 - 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.
 - Cover slabs must carry the BSI Kitemark or will be rejected by the 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 600x600mm for the Yorkshire Water specified cover size. Please refer to the Concrete Pipe Systems Association (CPSA), Technical Bulletin issued autumn 2004 for Kitemarked cover slab opening sizes.
 - Sulphate resistant cement (C20-DC2) and precast concrete products must be used or a laboratory report provided proving that such precautions are not necessary.
 - The adoptable sewers should be a minimum of 1m and manholes 0.5m from kerb faces and service margins.
 - Sewers must have 5 metres clearance from trees and hedges, (please also refer to Figure 2.3 on page 33 in "Sewers for Adoption" 6th Edition for restrictions on tree planting adjacent to sewers).
 - 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 provided above the granular bed and surround.
 - Adoptable plastic sewer pipes to be BSI Kitemarked (Certified to WIS 4-35-01 and BS/EN13476). Adoptable sewer pipes that are not acceptable and clayware is preferable. Plastic channels are difficult to set in concrete and a satisfactory finish cannot be obtained on the bedding.
 - Bedding and backfill material to conform to the requirement of Water Industry Specification 4-08-02 (Table A2).
 - 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.
 - Yorkshire Water policy is not to accept Type "C" brick manhole 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.
 - Surface water and foul rising mains to be provided with marker tape above the rising mains.
 - If plastic pipes are to be used then the following should apply:-
 - All adoptable sewers to be BSI Kitemarked (certified to WIS 4-35-01).
 - Bedding and backfill material to conform to the requirements of Water Industry Specification 4-08-02 (Table A2)
 - Where plastic pipes are proposed for adoptable sewers, structural calculations for the plastic pipes and a site investigation report to prove that the ground condition is suitable for the plastic pipes are to be produced.
 - Where plastic pipes are installed into the ground prior to getting full technical approval, the developer must provide a CCTV survey of the prospectively adoptable sewers and a deformation test (Light-Line test) of the plastic pipes.
 - Demarcation chambers to be a min. 450mmØ chamber for 100mmØ foul & 150mmØ surface water pipes up to 1.2m deep. For depths greater than 1.2m, restricted access opening to 350mm is required for safety reasons.
 - Maximum depth of demarcation chamber to be 2m, where depth exceeds 2m, manhole to be constructed as type B manhole.
 - Yorkshire Water is not obliged to accept filter drain/land drainage runoff into the public sewer network or adoptable drainage system (directly or in-directly). An alternative method of disposal of the land drainage runoff will therefore be required and you will have to liaise with the Land Drainage Authority/Land Drainage Section with regard to the disposal of the filter drain/land drainage runoff is required.
 - Strength of vitrified clay pipes (if used) to be 40KN/m for 1000, 40KN/m for 1500, 45KN/m for 2250 and 72KN/m for 3000. All concrete pipes to be Class 120 concrete to EN 1916/BS 5911-1:2002.
 - All levels of existing drainage to be confirmed prior to work commencing on site.
 - The contractor must allow for any fee's required for road and sewer opening permits, sewer connections and make the appropriate applications.
 - All pipes with a diameter equal or greater than 450mm shall be concrete.
 - Any existing sewers or culverts shown on this drawing are taken from records and exact location and levels should be determined prior to commencement of works.
 - There may be a requirement for the diversion or protection of statutory undertakers apparatus to facilitate the works shown on this drawing

General Notes

- All private drainage shall comply with current building regulations.
- Drains passing through buildings shall be protected with a lintel over.
- No building to be constructed within 3m of an adoptable sewer
- No services to be sited over an adoptable sewer without agreement from the water authority
- Private drainage connections not direct to manholes are to be made via a 45 degree junction
- Upon completion of the drainage works the contractor shall clean all drainage works by jetting, removing all debris from site. No debris shall be permitted to enter the public drainage or watercourse system. All drains shall be CCTV surveyed with the DVD passed to Redrow Homes technical department for review.

Rev	Amendment	Drawn	Date	Checked

Client	YGI LTD
Project Title	STUD FARM, BARNLEY LAND OFF SPRING LANE, CARLTON
Drawing Title	TYPICAL DRAINAGE DETAILS

Scale	N.T.S.	Drawn By	NJB
Drawing Size	A1	Checked By	PJM
Date	27.06.20	Approved By	PJM
QIM REGISTERED FIRM		Drawing Number	11444-005
		Rev	-