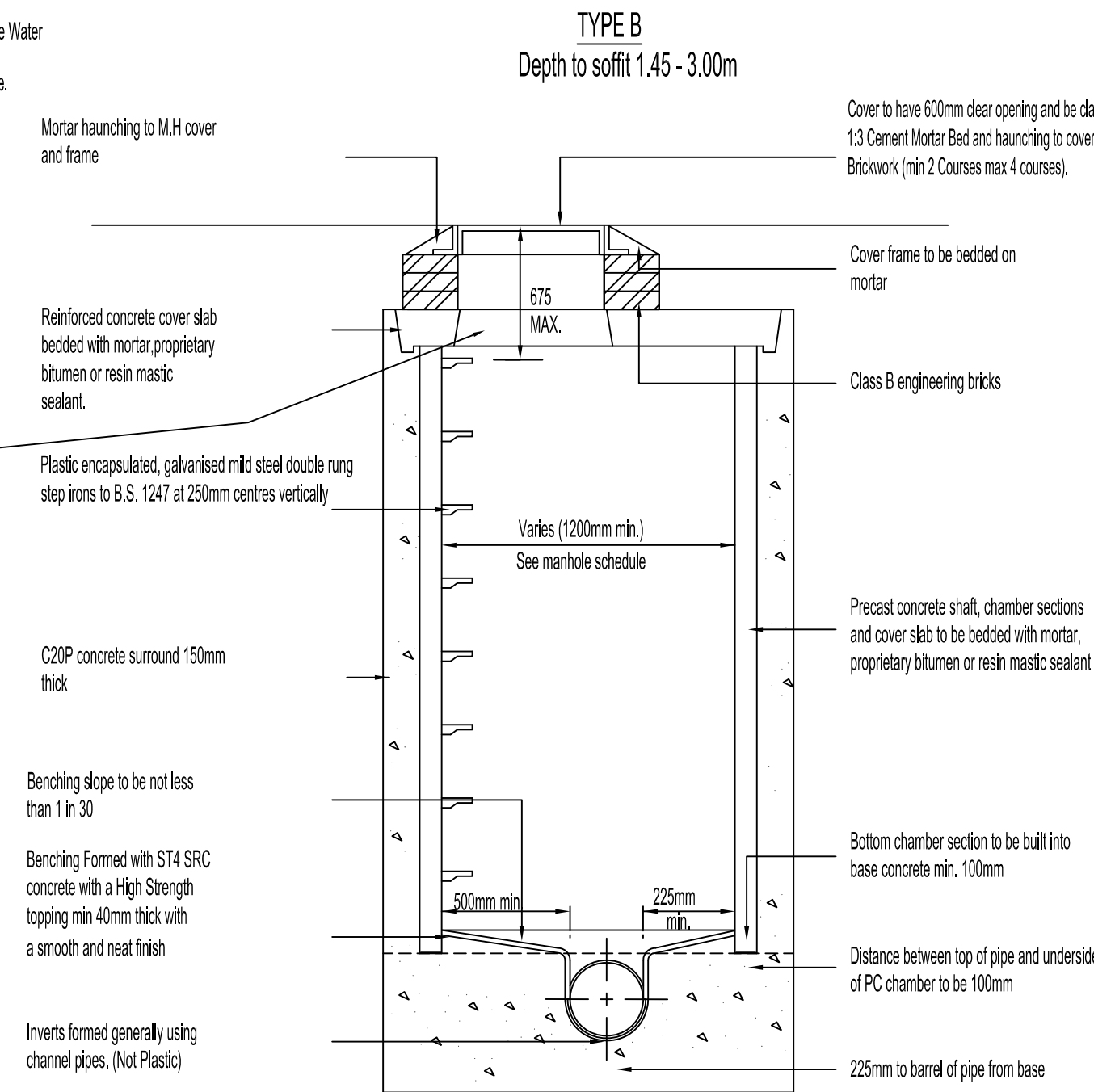
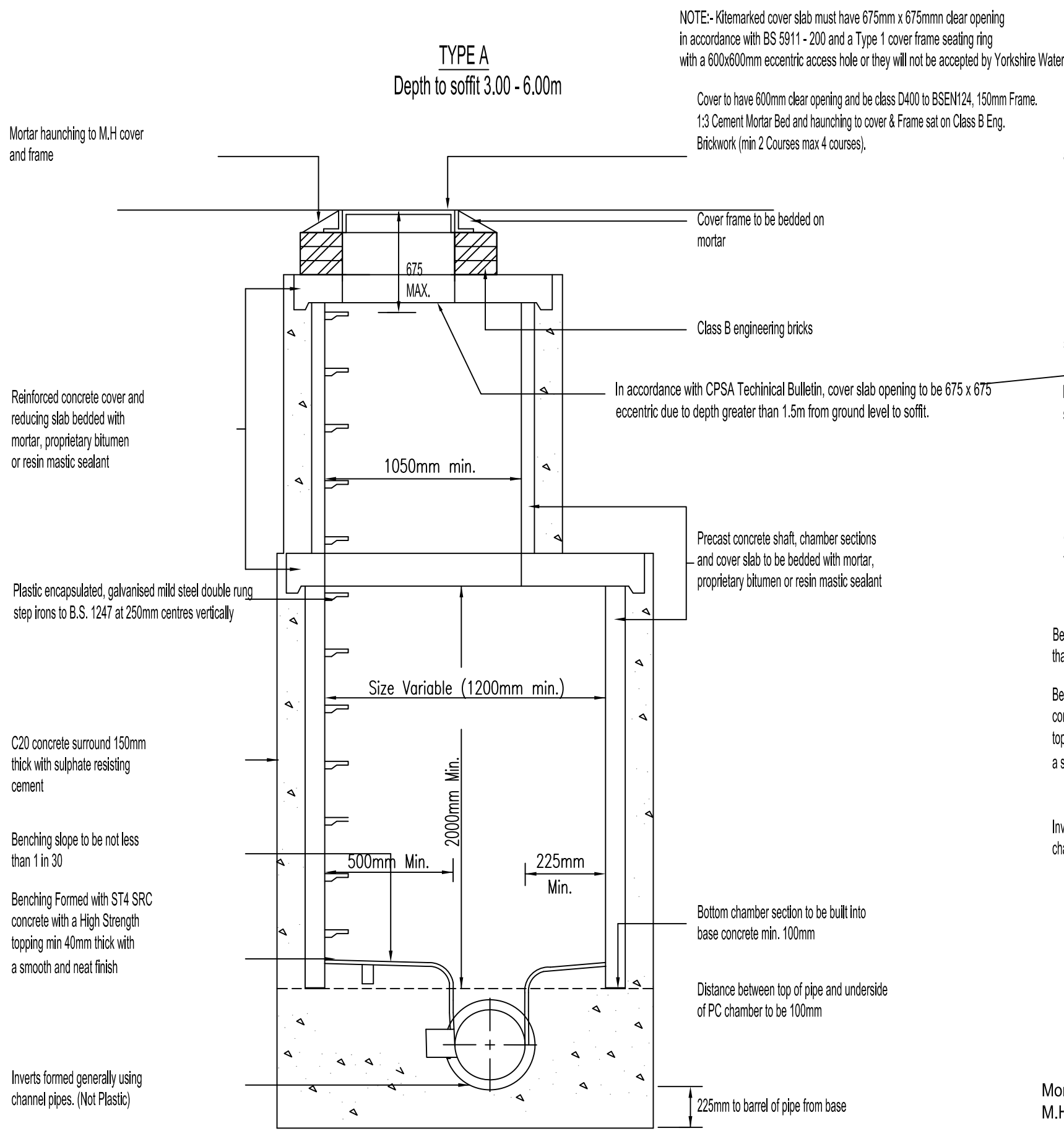




Joint to be as close as practicable to face of manhole to permit satisfactory joint and subsequent movement

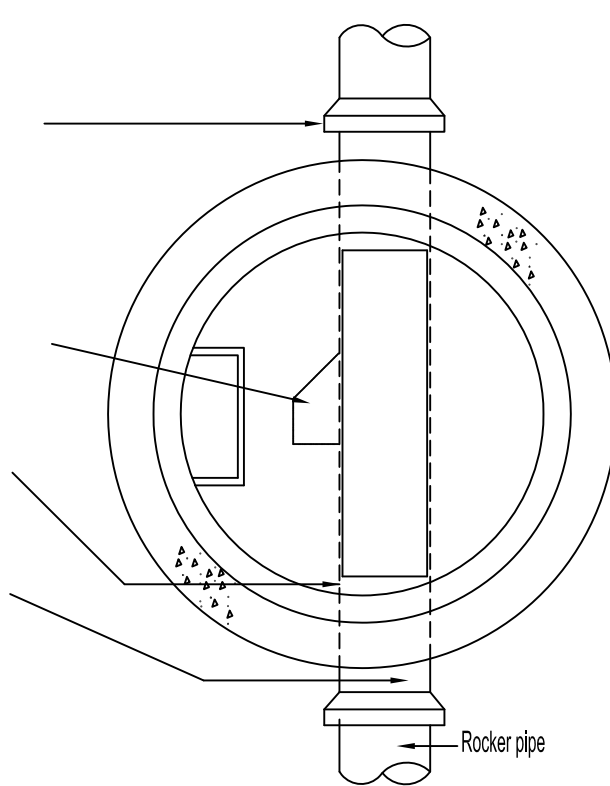
Toe holes to be provided in benching of sewer greater than 450mm dia. for access to invert

Pipe joint with channel to be located 100mm min. to inside face of chamber

Short length pipe to be similar length to rocker pipe

Chambers with outgoing pipes greater than 600mm dia. shall be fitted with guard bars, safety chains or other safety devices

PIPE DIA. mm	ROCKER PIPE LENGTH mm
150-450	0.50-0.75
451-750	0.75-1.00
>750	Seek Guidance



TYPE B1/E

Depth to soffit less than 1.5m

Cover to have 600mm clear opening and be class D400 to BSEN124, 150mm Frame, 1:3 Cement Mortar Bed and haunching to cover & Frame sat on Class B Eng. Brickwork (min 2 Courses max 4 courses).

Mortar haunching to M.H. cover and frame

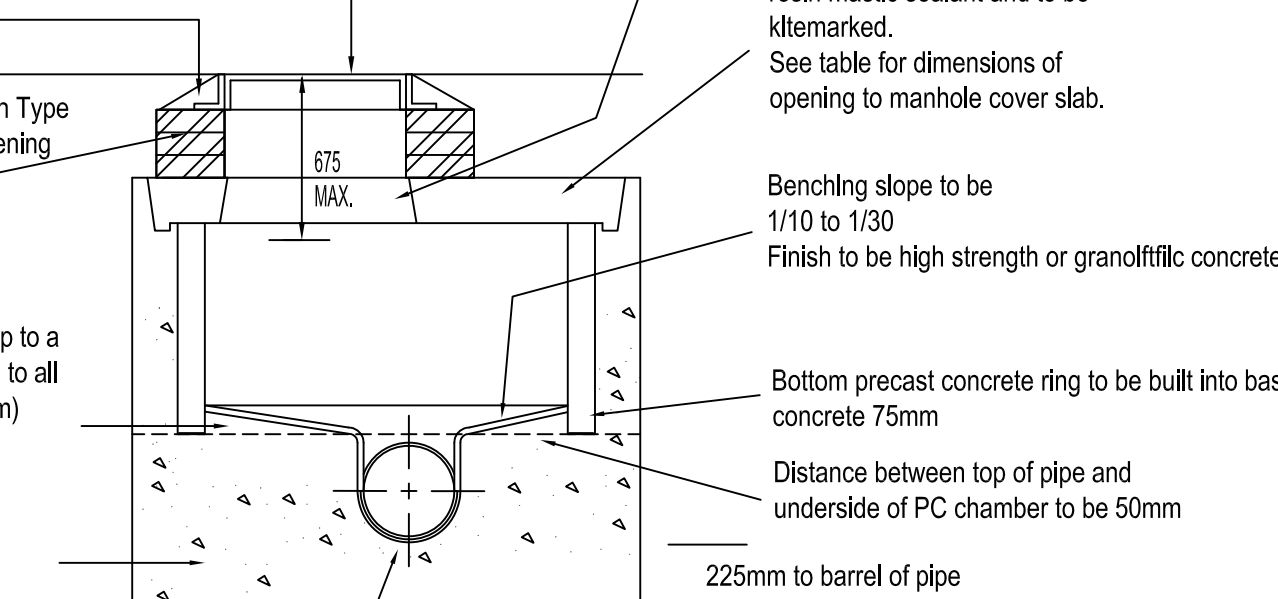
Type 2 precast cover frame seating ring laid on Type 1 precast cover seating ring reducing clear opening to 600x600mm.

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

All insitu concrete to be GEN 3 with sulphate resisting cement unless otherwise agreed.

Inverts formed, using channel pipes

NOTE:- Where manhole depths are between 1m and 1.45m these are to be constructed as Type B manhole but with opening (cover) placed centrally



Reinforced concrete cover slab to be kitemarked and to BS EN 1917:2002 bedded on mortar, proprietary bitumen or resin mastic sealant and to be kitemarked. See table for dimensions of opening to manhole cover slab.

Benching slope to be 1/10 to 1/30
Finish to be high strength or granolithic concrete

Bottom precast concrete ring to be built into base concrete 75mm
Distance between top of pipe and underside of PC chamber to be 50mm

NOTE
Manholes less than 1.5m to soffit with 1500mmØ chamber size or larger should have a 1200x675mm opening (central or eccentric) sited over channel with double twin 600x600mm covers.

Bedding Table					
Diameter mm	Min	Max	Pipe Trench Width	Y	Material
150	900	178	150	10 or 14	14/5
225	1021	271	150	10, 14 or 20	14/5 or 20/5
300	1160	410	150	10, 14 or 20	14/5 or 20/5
375	1241	480	150	14 or 20	14/5 or 20/5
450	1328	576	150	14 or 20	14/5 or 20/5
525	1420	670	150	14, 20 or 40	14/5, 20/5 or 40/5
600	1522	772	150	14, 20 or 40	14/5, 20/5 or 40/5

All granular material to comply with the requirements of BS 882:1983

MIN 2 SHORT ROCKER PIPES.

CARE TO BE TAKEN TO MAINTAIN FLEXIBILITY OF JOINT.

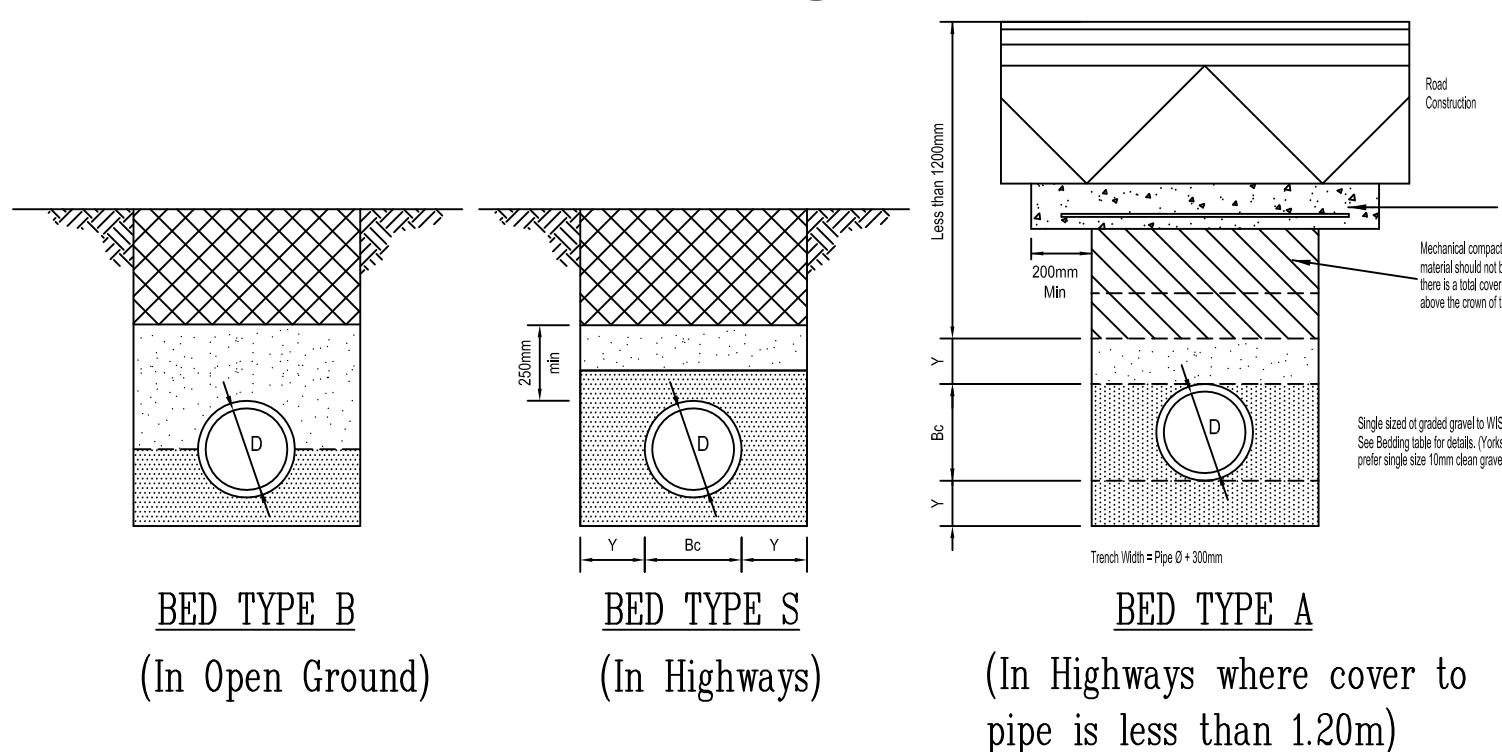
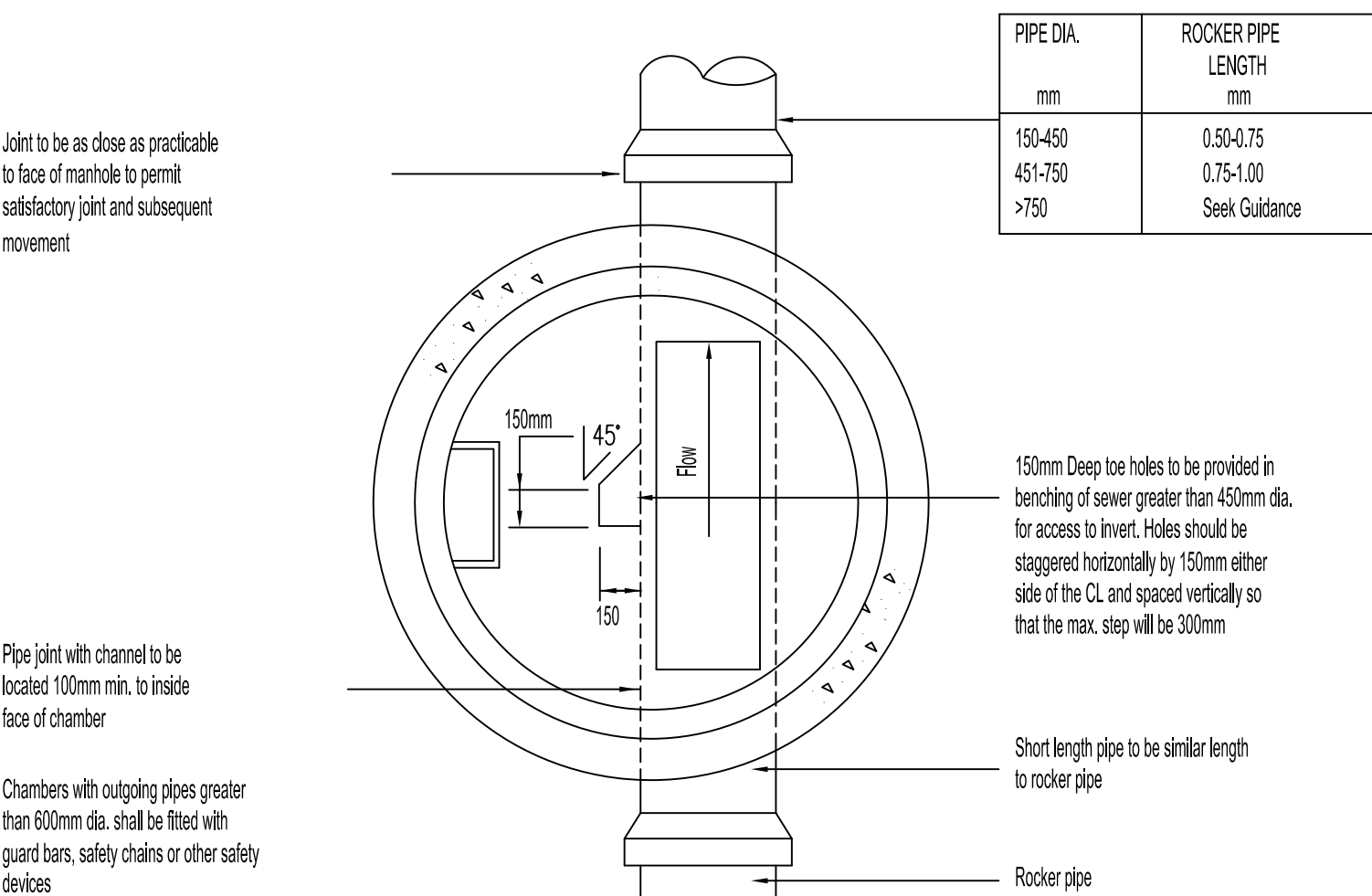
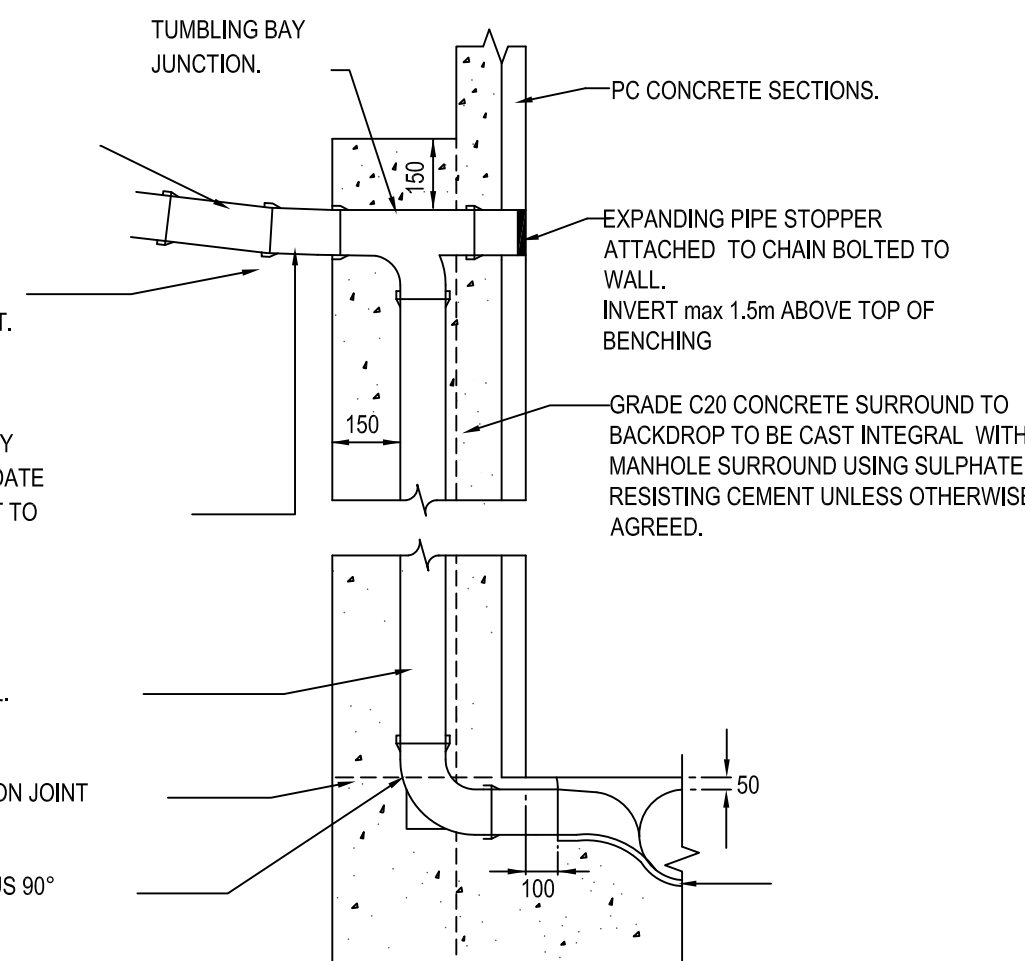
ADDITIONAL ROCKER PIPES MAY BE NECESSARY TO ACCOMMODATE TRANSITION OF PIPE GRADIENT TO VERTICAL DOWNPIPE.

BACKDROP PIPE SET VERTICAL.

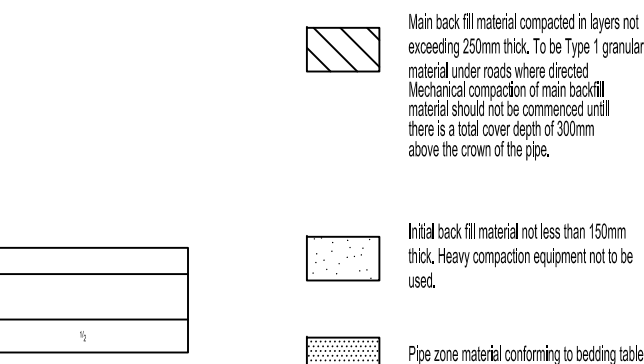
CONSTRUCTION JOINT

SHORT RADIUS 90° BEND

TYPICAL EXTERNAL VERTICAL BACKDROP DETAIL.



BED FOR STRUCTURED WALL SEWER PIPE TO WIS 4-35-01



Concrete Mixes and Workability

1. Standard concrete mixes in accordance with BS 5328 shall be used with a 20mm nominal maximum size of aggregate and a 75mm slump.

Subtle applications for the concrete mixes are shown in the following table:

Standard Mix	Grade of concrete	Applications
ST1	C15	Fillings, bedding, soft spots
ST4	C20	All other applications

2. Compressive strength testing shall not be used to judge the compliance of a concrete batch when reported by the Engineer. The Developer shall provide evidence of the batch masses used to produce any concrete.

3. Admixtures (including calcium chloride and pigments) shall not be used in the production of concrete.

Compressible Filler and Packing for Protection

1. Compressible filler to be used in the bedding of concrete protection to pipes shall consist of bitumen-impregnated expanding board to BS 1142 part 3 or other equally compressible material. The thickness of compressible filler shall be as follows:

Normal diameter of pipe (mm)	Thickness of compressible filler (mm)
Less than 150	15
150 - 225	20
Exceeding 225	25

2. Compressible packing for use between pipes and pre-cast concrete walling shall consist of bitumen-impregnated expanding complying with BS 143.

Notes

1. Materials shall be mixed only as and when required, in the correct proportions indicated in the following table, and its colour and consistency are uniform. The constituent materials shall be accurately weighed, allowance being made for bulking of sand.

Alternative nominal mixes by volume	Consistency with
Concrete/Gravel	Concrete/Gravel
1:1.2	1:1.3
1:1.2	1:1.3

Pipe core material conforming to bedding table

C20 grade concrete with compressible filler as described in table placed at each pipe joint to preserve flexibility

ALL SEWERAGE WORKS TO BE IN ACCORDANCE
SEWERS FOR ADOPTION - 6th EDITION.

General Notes:-

- DO NOT USE THIS DRAWING IN ISOLATION. This drawing has been prepared as part of a set, and must therefore be read in conjunction with all other drawings. Any discrepancies must be reported to the engineer prior to commencing work.
- Third party information is used to prepare the engineering design (including architectural layout, ground investigation, existing utilities records, and specialist design items). The engineering design must therefore be read in conjunction with all third party information prior to commencing work. Queensberry Design Ltd are not responsible for any third party information or details.
- House type working drawings are to be used in conjunction with the plot setting out drawing.
- Drawing status will remain preliminary until full technical approval is received from local authority and sewerage undertaker. Works commenced prior to technical approval are done so at risk and may be subject to change.
- The contractor is expected to prepare appropriate construction method statements for all aspects of approved work. This should include any temporary protection works.
- Land drainage is not permitted to discharge into the public sewer network. Any need for land drainage should be assessed by the ground worker and landscaper during construction and placement of gardens on an individual plot basis. If land drainage designs are required, they should be submitted prior to plot completion.
- The contractor is expected to cross check all drainage inverts prior to commencing work, this may involve completion of trial holes if invert levels have been interpolated.
- The position, line and diameter of all existing drainage apparatus should be confirmed on site prior to the commencement of the works. Any discrepancies must be reported to the engineer immediately.
- The connection of foul and surface water drainage to the existing public sewer system shall be subject to the approval of the local sewerage undertaker. The contractor is expected to apply for relevant permits prior to commencing the work.
- The contractor is expected to make appropriate allowances and produce specific method statements for dealing with ground water.

Highways

- All highway works to be carried out in accordance with the current Leeds City Council design guide and specification.
- All excavations below proposed and existing highways to be back filled with granular Type 1 sub-base and well compacted in layers not exceeding 150mm, unless otherwise agreed.
- Highway authority to be notified by the contractor prior to the commencement of works.

Adoptable Drainage

Yorkshire Water Notes

- All adoptable sewer works and materials to be in accordance with "Sewers For Adoption 6th Edition". The Relevant British/European and Yorkshire Water Standard/Requirements/Adoption to the Mechanical and Electrical Specification and 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.
- Filled ground must be filled and consolidated under the supervision and to the satisfaction of Yorkshire Waters before any sewer works are carried out.
- Yorkshire water is not obliged to accept filter drain / land drainage runoff into the public sewer network or adoptable drainage system (directly or indirectly). An alternative method of disposal of the land drainage runoff will therefore be required and you will have to base with the Local Authority. Land Drainage Section with regards to the disposal of the filter drain / land drainage runoff.
- 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 675x675mm for the Yorkshire Water specified cover size. Please refer to Concrete Pipe Systems Association (CPSA) 'Technical Bulletin' issued autumn 2004 for kitemarked cover slab operating sizes.
- 675 x 675mm access cover slabs are now available which must be kitemarked for use on Yorkshire Waters network.
- 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 refer to Figure 2.3 on page 33 in "Sewers for Adoption 6th Edition for restrictions on tree planting adjacent to sewers".
- Sewers laid in Class "S" Bedding (150mm granular bed and surround). Where depth of cover to top of sewer is less than 1.2m in highway and verges or less than 300mm in more vehicular access areas) then a concrete slab should be provided above granular bed and surround.
- All adoptable sewers to be BSI Kitemark (Certified to WIS 4-3501).
- Adoptable sewer pipes to be laid in maximum 3m lengths unless there is a specific operational need to lay longer lengths.
- Bedding and backfill material to conform to the requirement of Water Industry Specification 4-26-42 (Table A2).
- Plastic channel sections in manholes are not acceptable and Yorkshire Water would prefer daywears 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. 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" back-manholes and 1000mm Ø manhole rings. Instead it is preferred that you use a Type "B" manhole with 1200mm Ø or 1500mm Ø rings, with the opening sited over the channel where depth of cover to pipe is 1 - 1.5m.
- Concrete pipes should be Class 120 to EN 1916 / BS 5911-1 : 2002.
- The position, line and diameter of all existing drainage apparatus should be confirmed on site prior to the commencement of the work. Any discrepancies must be reported to the engineer immediately.
- The connection of foul and surface water drainage to the existing public sewer system shall be subject to the approval of the local sewerage undertaker. The contractor is expected to apply for relevant permits prior to commencing the work.
- 1500Ø chamber rings are allowed on the adoptable network and are to be kitemarked.
- The position, line and diameter of all existing drainage apparatus should be confirmed on site prior to the commencement of the works. Any discrepancies must be reported to the engineer immediately.
- The connection of foul and surface water drainage to the existing public sewer system shall be subject to the approval of the local sewerage undertaker. The contractor is expected to apply for relevant permits prior to commencing the work.

Existing Services

Prior to the commencement of any works under ground mapping surveys and constraints plan is to be referred to any discrepancies are to be reported to engineer.

Any existing services which may be affected by the proposed works should be located by means of a hand dig in close liaison with the statutory service authorities. The contractor shall inform the developer of any services that may affect the proposed design. Contractor to notify statutory service authorities prior to commencement of work. As Constructed Information it is the contractors responsibility to provide the following as constructed drawings to the developer upon the completion of the works covered by the contract :-

- Position/coordinates of all adoptable manholes.
- Invert and cover levels of all adoptable manholes.
- New gully positions and connections.
- Position and depth of service ducts for water, gas, electric, BT, cable and street lighting, staling size and number of ducts.

Drawing Status

PRELIMINARY

Title

Keepmoat Homes
Thurnscoe Phase 2
Barnsley
Adoptable Manhole Details

Scale
1:25 @ A1

Date
24.07.2017

Drawn By
NL

Checked By
-

Drawing No
QD814-08-01

Revision
-

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