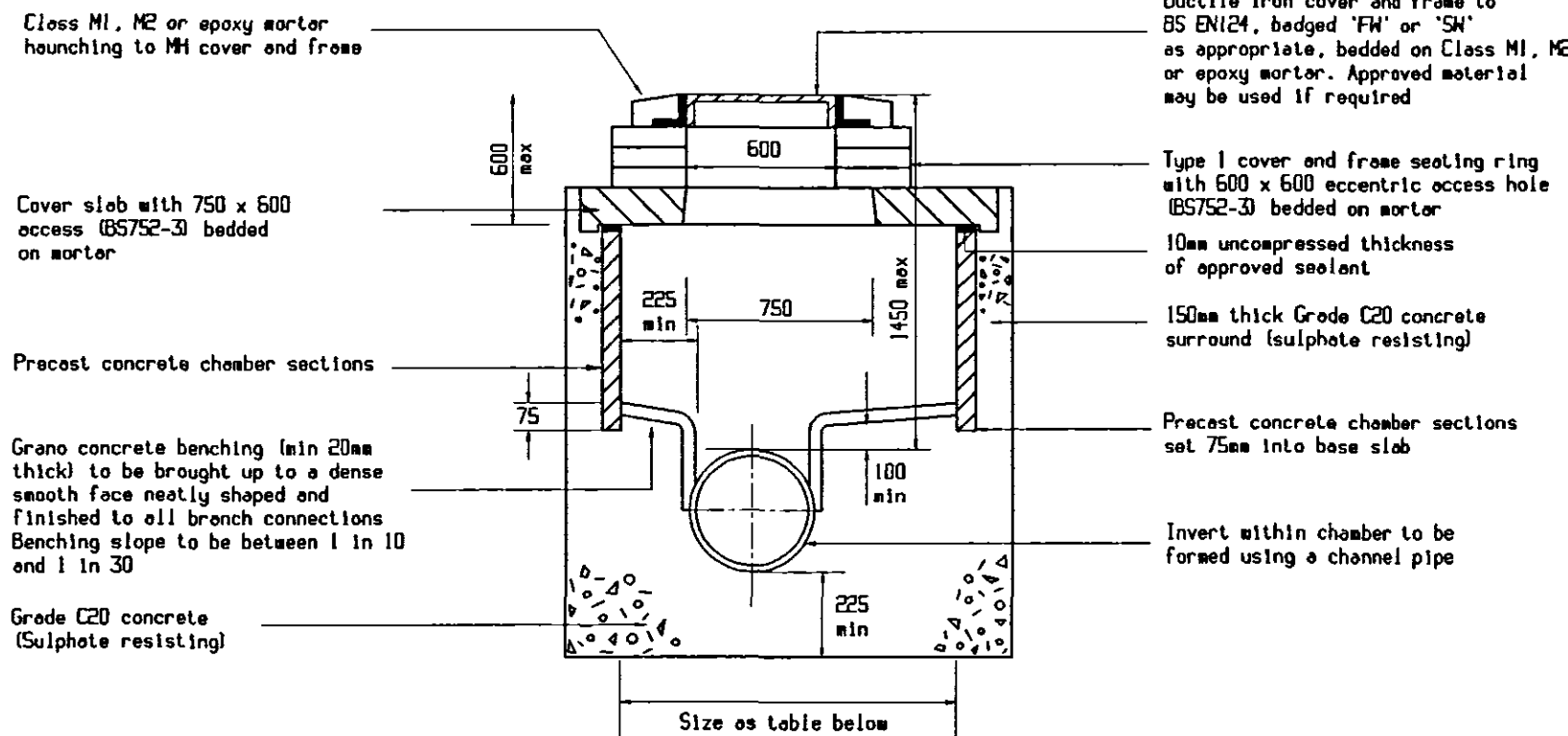
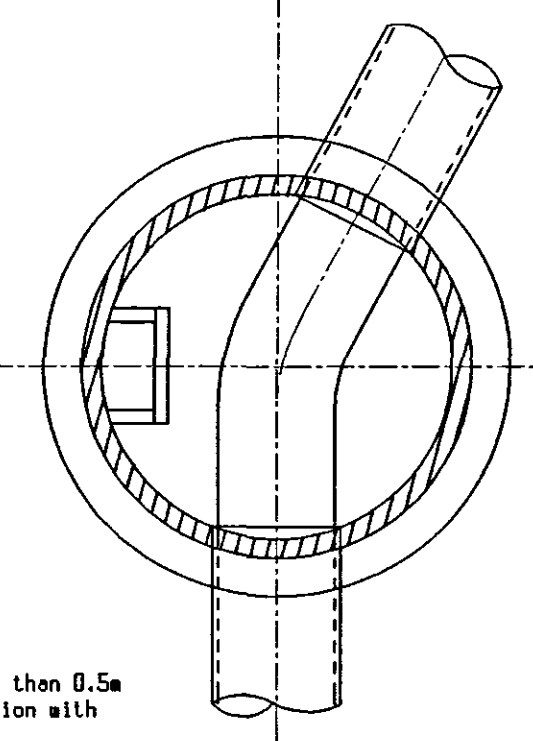


TYPICAL MANHOLE DETAIL TYPE X

(Depth to soffit UP TO 1.45m)



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' 600mm long



SHAFT DIAMETERS	
Dia of largest pipe in MH (mm)	Int. dia of MH (mm)
up to 450	1200

Note
If pipe diameter exceeds 450mm use manhole Type B or C

NOTE:-

TRENCH BACKFILL

- Where the soffit of the Pipe is less than 0.5m below formation - Backfill to formation with Class E concrete.
- Where the soffit of the Pipe is between 0.5m & 1.0m below formation - Backfill to formation with Type 1 Sub-base (allow for granular bedding material 150mm above crown of Pipe).
- Where the soffit of the Pipe is greater than 1.0m below formation - backfill with suitable fill.

MANHOLE SCHEDULE FOR MINIMUM DIAMETER					
Diameter of largest pipe	Diameter of chamber	Diameter of largest pipe	Diameter of chamber	Diameter of largest pipe	Diameter of chamber
150	1200	450	1500	750	1800
225	1200	525	1500	825	1800
300	1200	600	1500	900	1800
375	1500	675	1800	> 975	2400

CLAUSE 4.6.6 PIPES AND JOINTS ADJACENT TO STRUCTURES

- A flexible joint shall be provided as close as is feasible to the outside face of any structure into which a pipe is built, compatible with the satisfactory completion and subsequent movement of the joint.
- The length of the next pipe (rocker pipe) away from the structure shall be shown as in the Table below.

Nominal pipe dia. (mm)	Rocker Pipe Effective Length (m)
150 - 600	0.6
675 - 750	1.0
750 and over	1.25

SPECIFICATION CLAUSES TAKEN FROM "SEWERS FOR ADOPTION" 5TH EDITION.

CLAUSE 4.2.30 MANHOLE COVERS AND FRAMES

- Manhole covers and frames shall comply with the relevant provisions of BS EN 124 and they shall be of a non-rocking design which does not rely on the use of cushion inserts.
- REFER TO MANHOLE DETAIL FOR COVER SPECIFICATION AND TYPE
- Minimum frame depths for NRSMA road categories I-IV shall be as follows:

NRSMA Road Category	Description	Minimum Frame Depth (mm)
I	Trunk roads & dual carriageways	150
II	All other A roads	150
III	Bus services	150
IV	All other roads except Residential cul-de-sacs	150
	Residential cul-de-sacs	100

Class B 125 shall be used in footways, pedestrian areas & comparable locations.

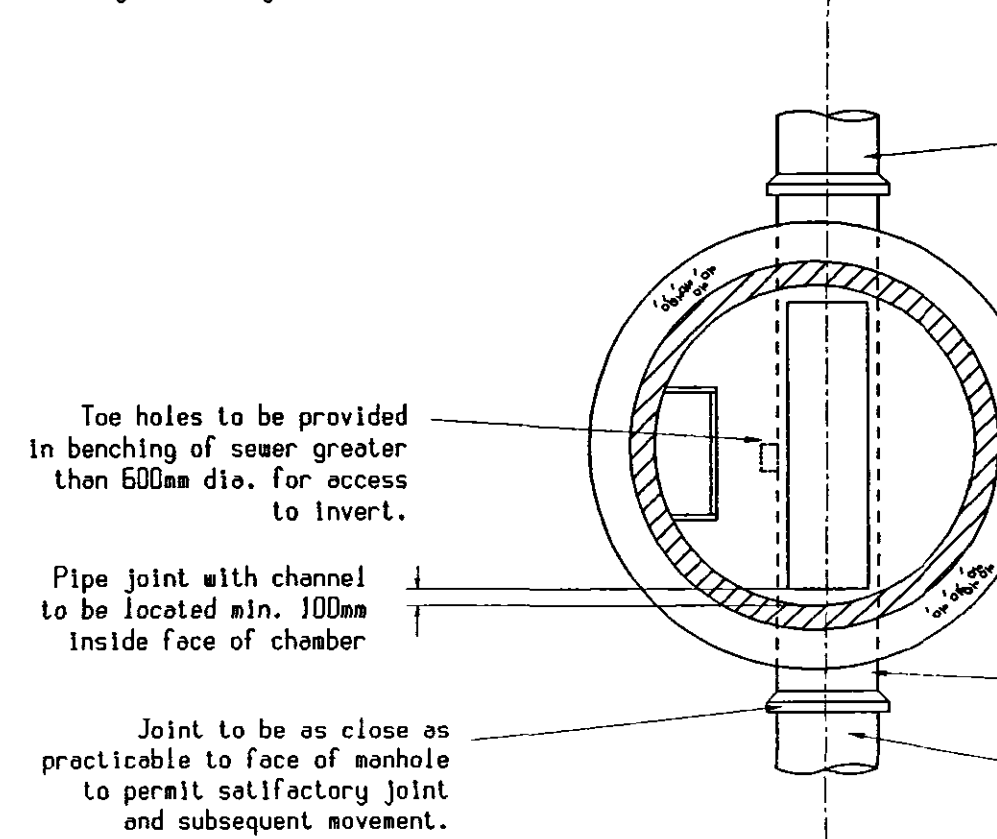
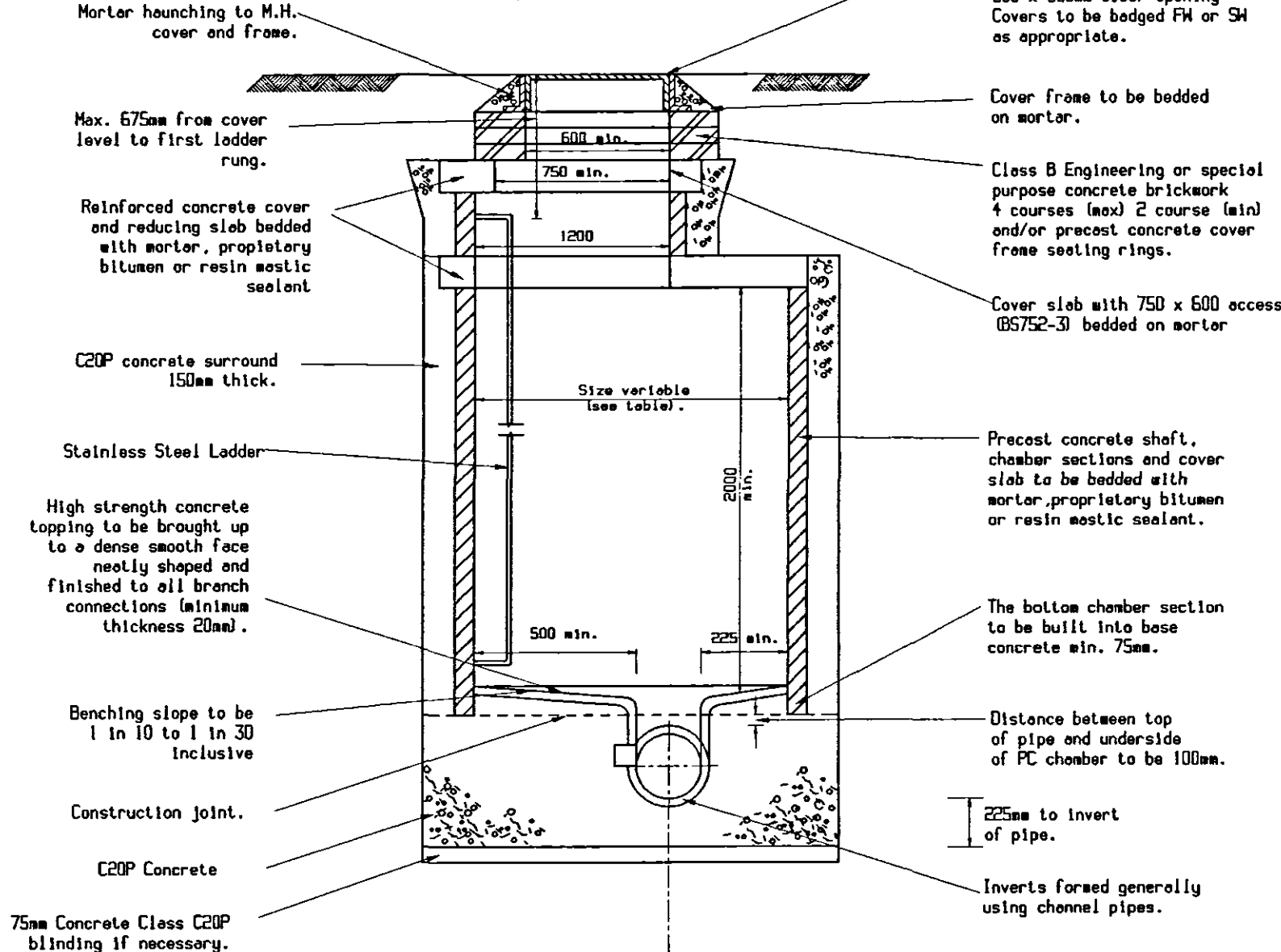
- All manhole covers shall be the non-ventilating type and shall have closed keyways.

NOTES:-

- The centre of any manhole is not necessarily co-incident with the centre line of the main pipe.
- Positioning of the manhole covers and step irons to be directed on site.
- Construction joints in the concrete surround must not coincide with the joints in the precast concrete chamber rings.
- The benching is to be formed to direct flow from side connections into the main flow.
- Sulphate resisting cement is required in all concrete products used for Section 104 works on the site.
- All lateral crossings to twin sewers shall be to the bedding and backfill standards described on the drawings, and protected as necessary. The high level sewer shall not be undermined by the low level lateral and connection. All end caps to laterals shall be painted 'FM' or 'SM' as appropriate.

TYPICAL MANHOLE DETAIL TYPE A

Depth to soffit 3 to 6m



MANHOLE COVER AND FRAME
Cover to be Grade A Type BS EN 124 Class D400 600 x 600mm clear opening Covers to be bedded FM or SM as appropriate.

Cover frame to be bedded on mortar.

Class B Engineering or special purpose concrete brickwork 4 courses (max) 2 course (min) and/or precast concrete cover frame sealing rings.

Cover slab with 750 x 600 access BS752-3 bedded on mortar

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

The bottom chamber section to be built into base concrete min. 75mm.

Distance between top of pipe and underside of PC chamber to be 100mm.

225mm to invert of pipe.

Inverts formed generally using channel pipes.

75mm Concrete Class C20P blinding if necessary.

Notes.

- Chambers with outgoing pipes greater than 600mm dia. shall be fitted with guard bars, safety chains or other safety devices.
- Manholes with an incoming sewer of 900mm and over to be approved by the Council Undertaker.

Short length pipe to be similar length to rocker pipe.

Rocker pipe

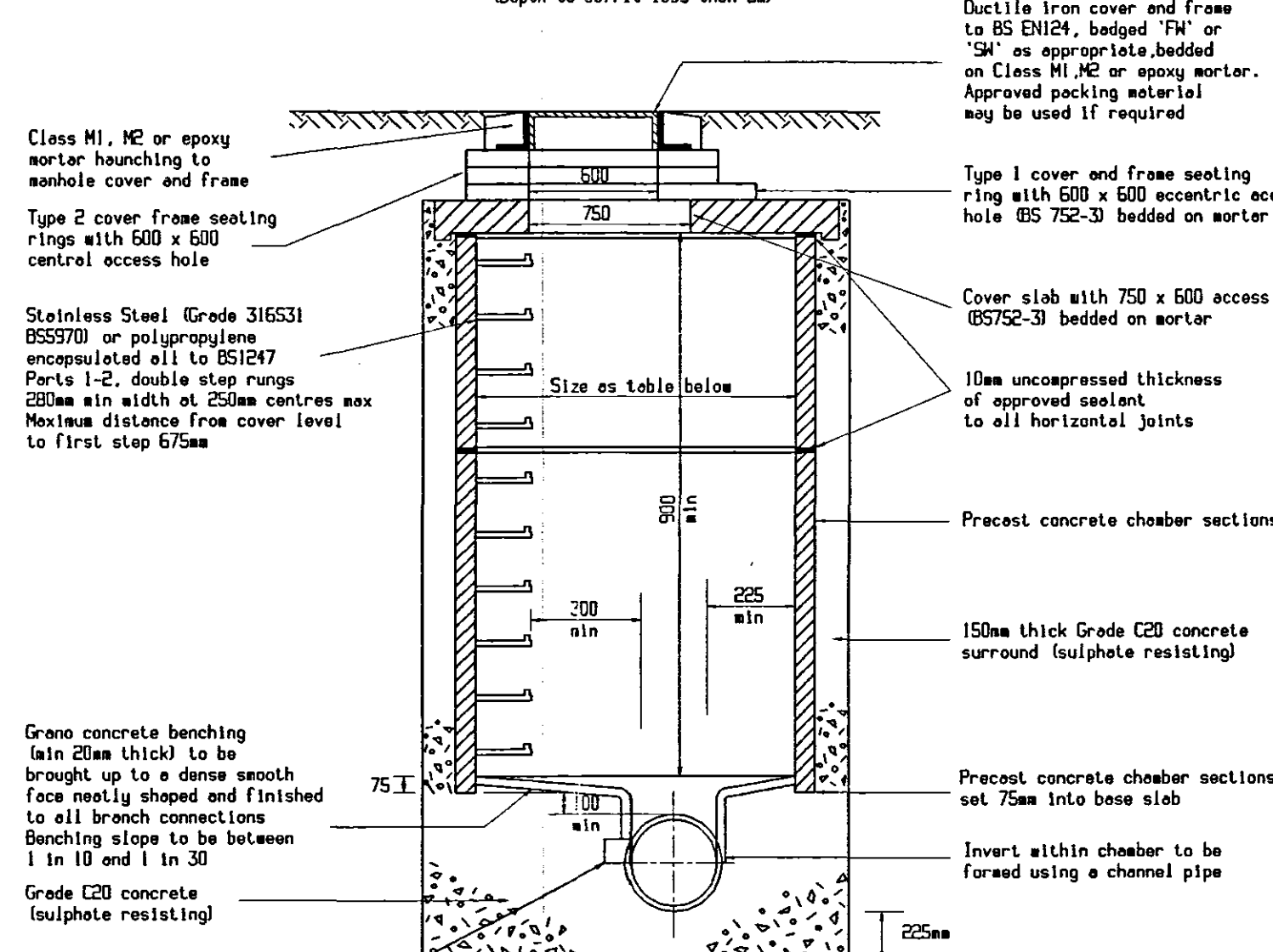
Toe holes to be provided in benching of sewer greater than 600mm dia. for access to invert.

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

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

TYPICAL MANHOLE DETAIL TYPE B

(Depth to soffit less than 3m)



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

Type 1 cover and frame sealing rings with 600 x 600 eccentric access hole BS752-3 bedded on mortar

Stainless Steel (Grade 316S31) BS5770 or polypropylene encapsulated all to BS1247 Parts 1-2, double step rungs 280mm min width at 250mm centres max Maximum distance from cover level to first step 675mm

Grade C20 concrete (sulphate resisting)

Toe holes to be provided in channel of sewers above 450mm dia

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

Notes.

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

Manholes with an incoming sewer of 900mm and over to be approved by the Council Undertaker.

Short length pipe to be similar length to rocker pipe.

Rocker pipe

Ductile iron cover and frame to BS EN124, bedded 'FM' or 'SM' as appropriate, bedded on Class M1, M2 or epoxy mortar. Approved packing material may be used if required

Type 1 cover and frame sealing rings with 600 x 600 eccentric access hole BS752-3 bedded on mortar

Cover slab with 750 x 600 access BS752-3 bedded on mortar

10mm uncompressed thickness of approved sealant to all horizontal joints

Precast concrete chamber sections

150mm thick Grade C20 concrete surround (sulphate resisting)

Precast concrete chamber sections set 75mm into base slab

Invert within chamber to be formed using a channel pipe

Grade C20 concrete (sulphate resisting)

Toe holes to be provided in channel of sewers above 450mm dia

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

Notes.

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

Manholes with an incoming sewer of 900mm and over to be approved by the Council Undertaker.

Short length pipe to be similar length to rocker pipe.

Rocker pipe

All adoptable drainage shall conform to the design and construction guide for developers, Sewers for Adoption 5th Edition, the Combined Addendum to that document both published by the WRc plc and Anglian Water's Adopting your Sewers-additions/deletions to Sewers for Adoption 5th Edition.

Rev. No.	REVISION	Date	Drawn By	Checked By

Written dimensions to be taken. Do not scale off the drawing. Any discrepancies, written or scaled, should be brought to the attention of the engineer immediately. This drawing to be read in conjunction with the relevant Bills of Materials and Local Authority Specification. CON NOTE: The design has been undertaken as far as possible to avoid risks to health and safety or to reduce and control the effects of any unavoidable risks. All relevant information identifying the unavoidable risks has been passed to the planning supervisor for inclusion in the Health & Safety plan. The Health & Safety plan will be issued by the planning supervisor with these drawings.

WORMALD, BURROWS PARTNERSHIP
Civil Engineering Consultants
12a & 14a Hitchin Street, Biggleswade, Beds SG18 8AX, U.K. Tel 01767 317244 Fax 315434

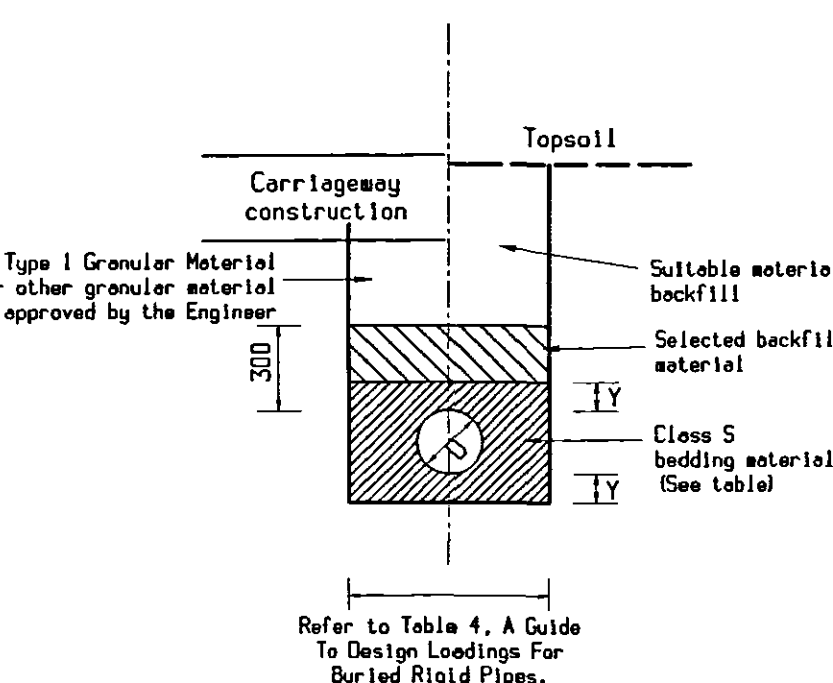
Project: Development at Wygate South, Spalding, Lincolnshire
SHDC Planning & Development
27 JUL 2007
Ref: 103067

Drawing Description: Standard Drainage Construction Details

Client: Allison Homes Eastern
Holland Place, Wardenhoe Park, Pinchbeck, Spalding, Lincs, PE11 3ZN
Client Drawing Number: A027/205/02

Drawn By: NJB
Date: 6.2.06
Scale: N.T.S.

Engineering Drawing Number: E1081/30 A
Checked By: [Signature]
Date: [Signature]



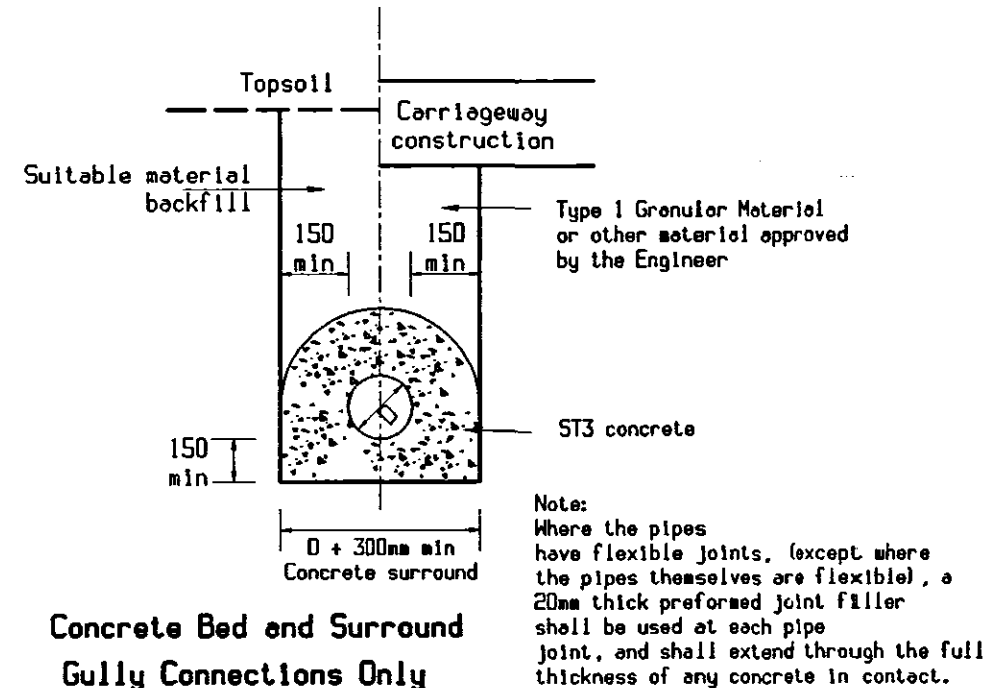
Refer to Table 4, A Guide To Design Loadings For Buried Rigid Pipes.

Class S Bedding (Fa - 2.2)

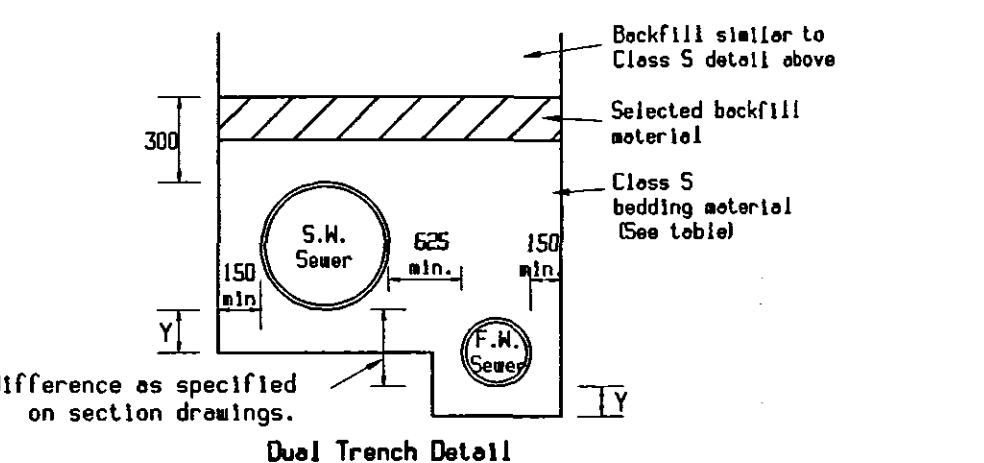
Nominal size DN	Pipe Bedding Requirement
150	14 to 5 graded
225 to 325	14 to 5 graded or 20 to 5 graded
400 and above	crushed rock or 14 to 5 graded or 20 to 5 graded or 40 to 5 graded

CONCRETE PIPE PROTECTION

CARRIAGEWAY - Less than 1200mm cover
OPEN SPACE - Less than 900mm cover



Concrete Bed and Surround Gully Connections Only



Dual Trench Detail

PIPE BEDDING DETAILS