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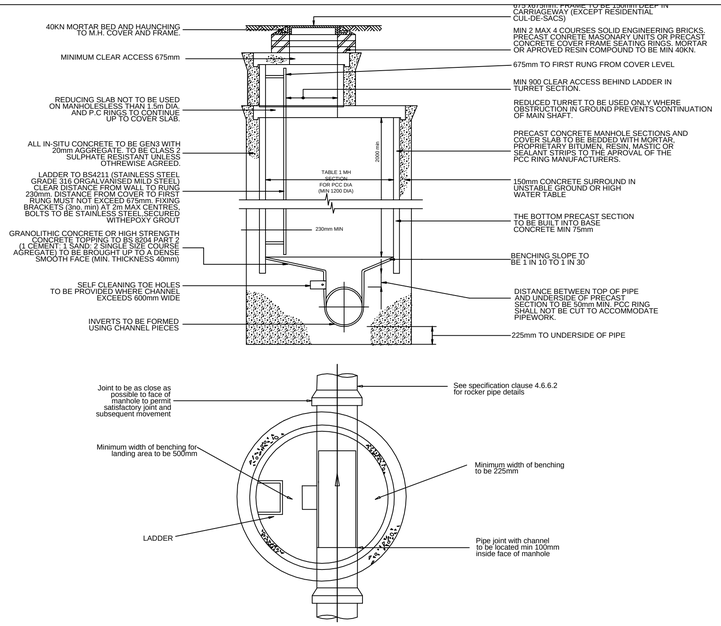
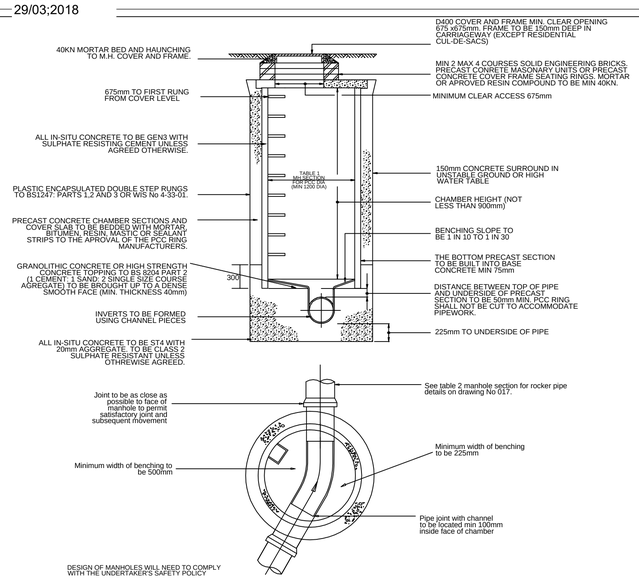
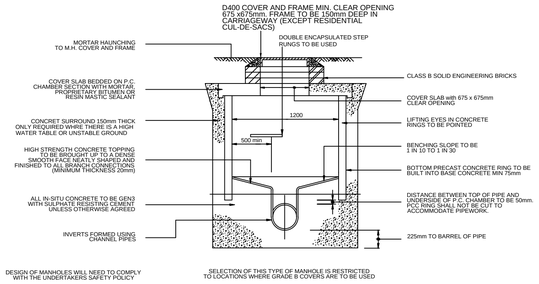


TYPICAL MANHOLE DETAIL - TYPE A
DEPTH FROM GROUND LEVEL TO SOFFIT OF PIPE 3m TO 6m.

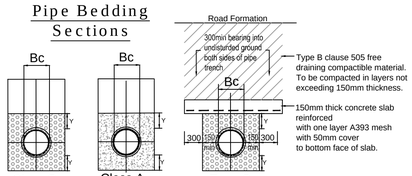


TYPICAL MANHOLE DETAIL - TYPE B
MAX DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 1.5m - 3.0m



TYPICAL MANHOLE DETAIL - TYPE E
DEPTH TO SOFFIT OF 1.0m TO 1.5m

Pipe Bedding Sections



Key

- Granular fill
- Concrete fill (min 20Kn/mm²
- Steel reinforcement
- Bc = external diameter over socket
- Dn = internal diameter

TABLE 3 - CLASS 'S' GRAVEL SIZE

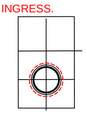
Nominal Pipe Diameter (mm)	Aggregate Size (mm)
< 140	4/10
140 - 400	4/10, 6/10 or 10/20
over 400	4/10, 6/14,10/20 or 20/40

NOTE:
CONTRACTOR / DEVELOPER TO CHECK PIPE BEDDING REQUIREMENTS WITH PIPE MANUFACTURER OR SUPPLIER (PIPE STRENGTH / BEDDING & PIPE DEFORMATION) PRIOR TO ANY PIPE MATERIALS BEING ORDERED FOR SITE USE.

PIPE BEDDING NOTES

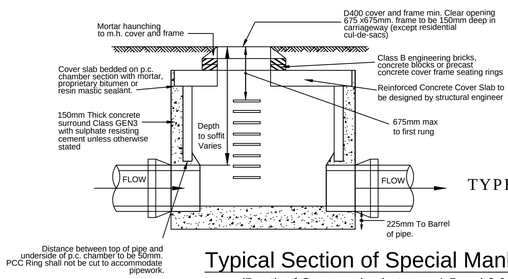
1. BEDDING BENEATH AND AT THE SIDES OF PIPE TO BE WELL COMPACTED.
2. BEDDING / BACK FILL DIRECTLY ABOVE PIPE TO BE LIGHTLY COMPACTED.
3. DIMENSION Y...
   - 3.1. 1/6 BC OR 100MM UNDER BARRELS, AND 50MM MIN UNDER SOCKETS WHICHEVER IS GREATER (400MM MAX).
   - 3.2. ROCK ETC, 1/4 BC AND 150MM UNDER SOCKETS (400MM MAX)
4) GEOTEXTILES MAY BE USED TO CONTAIN BEDDING MATERIAL IN RUNNING SAND ETC.
5) CONCRETE CRADLES MAY EXTEND TO SIDES OF TRENCH.
6) TRANSVERSE STEEL AT MINIMUM OF 0.4% OF CONCRETE AT X-X GIVES FM = 3.4
7) TRANSVERSE STEEL AT MINIMUM OF 1% OF THE CONCRETE AT X-XGIVES FM = 4.8

NOTE:
DUE TO POTENTIAL HIGH WATER TABLE, THE FWS IS TO BE WRAPPED IN IMPERMEABLE MEMBRANE / GEOTEXTILE TO PREVENT SURFACE WATER INGRESS.



WHERE A TRENCH BACK-FILL IS TO BE ABOVE THE 300mm LINE THE MATERIAL SHALL BE DESCRIBED AS CLAUSES 505 AND 507.7 OF THE STANDARD FOR HIGHWAYS OR MANUAL CONTROL DOCUMENT FOR HIGHWAYS WORKS VOLUME 3 SECTION 1 - HIGHWAY CONSTRUCTION DETAIL - F SERIES - DRAINAGE - DRAWING F1.

ALL SEWERS ARE TO COMPLY WITH SEWERS FOR ADOPTION 6TH EDITION AND SEVERN TRENT WATER REQUIRMENTS



Typical Section of Special Manholes

(Depth of Cover varies between 1.5 and 0.9m)

SFA 6th Edition - Table 4
Minimum Clear Access Opening Sizes and Requirements for Fittings

Sewerage Undertaker	Standard Access (Sewer Access (mm)) Manhole Types A & B Only			Manhole Fitting Requirements All Manhole Types			Non-Man Entry Chambers Accepted?
	150-874	875-1074	1075 or greater	Double Encapsulated Step Rungs	Safety Chains (Materials)	Ladders (230mm Clearance Wall to Ladder)	For Sewer Manholes
General	675x675	675x675	675x675	Less than 3m	No	Greater than 3m	No

* = Note - Min 675 x 675 access to chambers fitted with a ladder or flow control device

PRELIMINARY
SUBJECT TO SECTION 104
APPROVAL

GENERAL MANHOLE REQUIREMENTS FOR SEWERS FOR ADOPTION 6TH EDITION - ADOPTIONS & DIVERSIONS

GENERAL REQUIREMENTS

COPIES OF DELIVERY NOTES FOR CONCRETE AND PIPE BEDDING WILL BE REQUIRED INTERMITTENTLY AS THE JOB PROGRESSES. ALL OTHER COMPONENT UNITS MUST BE KITE-MARKED.

CHANNELS AND BENCHING

ALL CHAMBERS WITH PIPE SIZES 150MM, 225MM, 300MM MUST HAVE SWEPT BENDS AND CHANNELS. ALL BENCHING TO BE A *MINIMUM 40MM THICK* GRANOLITHIC CONCRETE *TROWELLED TO A SMOOTH FINISH.*

IRONWORK IN MANHOLES

IF THE CHAMBER IS LESS THAN 3M DEEP WE REQUIRE DOUBLE ENCAPSULATED STEP RUNGS UNLESS OTHERWISE APPROVED. IF THE CHAMBER IS OVER 3M DEEP WE REQUIRE *HOT DIPPED GALVANISED MILD STEEL LADDERS* . THERE MUST BE 900MM BETWEEN LADDER AND BACK OF SHAFT. DEPTH IS MEASURED FROM FINISHED COVER LEVEL TO THE TOP OF THE BENCHING. THE MAXIMUM DISTANCE BETWEEN COVER LEVEL AND THE FIRST STEP MUST BE 675MM.

BRICKWORK

MIN 2 MAX 4 COURSES UNDER FRAME AND MUST BE SOLID CLASS B ENGINEERING BRICKS OR CONCRETE SPACING RINGS NEATLY POINTED UP. ENGLISH BOND TO BE USED ON ALL BRICKWORK. SULPHATE RESISTING CEMENT MUST BE USED IN ALL LOCATIONS.

COVER AND FRAMES

COVER SLAB OPENING, COVER AND FRAMES MUST BE 675 X 675 *UNLESS OTHERWISE APPROVED*. D400 SHALL BE USED AT ALL LOCATIONS. ON SPINE ROADS MUST BE 150MM DEEP. ON RESIDENTIAL CUL-DE-SACS 100MM MAY BE USED SUBJECT TO APPROVAL. FRAMES FOR MANHOLE COVERS SHOULD BE BEDDED IN A POLYESTER RESIN BEDDING MORTAR IN ALL SITUATIONS WHERE COVERS ARE SITED IN NRSWA ROAD CATEGORIES I, II OR III.

'INFILL' TYPE COVERS SHOULD NOT BE USED.

IN BLOCK PAVED AREAS 150MM DEEP FRAMES MUST BE USED (IN ACCORDANCE WITH CL 2.8.6 SFA6 P.25)

LATERALS

THEY SHOULD BE LAID TO THE SAME STANDARD AS PUBLIC SEWERS. THEY SHOULD HAVE NO CHANGES OF LINE OR GRADIENT BETWEEN THE SEWER AND THE DEMARCATION CHAMBER. THEY SHOULD HAVE AN ADOPTABLE MANHOLE AS THE DEMARCATION CHAMBER UNLESS THERE IS ONLY ON PROPERTY WHEN A PLASTIC CHAMBER TO BS7158 IS ALLOWED. LOCKABLE B125 AND A15 COVERS MAY BE ALLOWED IN CERTAIN LOCATIONS SUBJECT TO APPROVAL. THE DEMARCATION SHOULD BE INSIDE THE BOUNDARY OF THE PROPERTY, NO MORE THAN 1M INSIDE THE BOUNDARY, PREFERABLY IN THE DRIVEWAY AND NOT IN THE WHEEL TRACKS OF VEHICLES.

1. ALL DIMENSION IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DESIGN DRAWINGS AND OTHER INFORMATION.
3. ALL ADOPTABLE DRAINAGE MUST COMPLY WITH SEWERS FOR ADOPTION 6TH EDITION.
4. ALL MANHOLE COVERS AND FRAMES TO BE IN ACCORDANCE WITH 4.2.30 OF THE CIVIL ENGINEERING SPECIFICATION.
5. ALL LIFTING EYES IN MANHOLE CHAMBER SECTIONS AND COVER SLABS TO BE POINTED.
6. REINFORCED COVER SLAB, REDUCER SLAB AND MANHOLE BASE TO BE DESIGNED BY CLIENTS STRUCTURAL ENGINEER. FLOATATION CHECKS MAY BE REQUIRED IN AREAS OF HIGH GROUND WATER.
7. PIPE BEDDING FACTOR IN ACCORDANCE WITH BS 1295-1:1998
8. A SCREEN IS TO BE FITTED OVER THE OUTGOING PIPE TO THE LAST NEW SURFACE AND FOUL MANHOLES BEFORE ENTERING THE EXISTING SEWERS IN ACCORDANCE WITH SEWERS FOR ADOPTION 6. THE SCREEN SHALL ONLY BE REMOVED ONCE ON SITE CONSTRUCTION WORKS HAVE BEEN COMPLETED.
9. CONCRETE RINGS NOT TO BE CUT ON SITE TO SUIT. EITHER MANHOLE RING TO BE CONSTRUCTED DEEPER TO SUIT OR ALTERNATIVE BRICK MANHOLE TYPE TO BE USED.
10. ALL MANHOLE COVERS REQUIRE A MINIMUM DIAMETER OF 675X675, AS PER OUR CURRENT HEALTH AND SAFETY REQUIREMENTS.

TABLE 1 - MANHOLE DIAMETERS

Internal Diameter of Largest Pipe in Manhole (mm)	Minimum Nominal Internal Dimension of Manhole (mm)
< 375	1200
375 - 750	1500
750 - 900	1800
Greater Than 900	Pipe Diameter + 900

TABLE 2 - ROCKER PIPE DIMENSIONS

Nominal Diameter of Pipe (mm)	Maximum Effective Length (mm)
150 to 600	600
600 to 750	1000
over 750	1250

TABLE 3 - CLASS 'S' GRAVEL SIZE

Nominal Pipe Diameter (mm)	Aggregate Size (mm)
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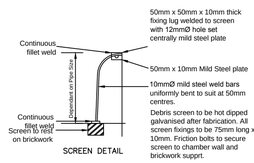
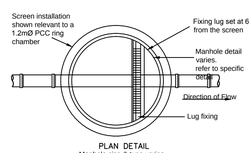
over 400	4/10, 6/14,10/20 or 20/40





Debris Screen Detail

NOTES:

1. Screen installation to be provided to chamber immediately upstream of sewer connection point.
2. All sumps debris to be removed and chamber pressure jetted if required prior to formation of final benching and channel configuration compliant with the relevant manhole construction detail required.
3. Screen and brickwork support not to be removed until immediately prior to occupation of premises served by the sewer.
4. Alternative similar design may be used. Detail provided to illustrate principles of debris screen.
5. Dimensions dependant upon chamber and pipe sizes.

SCREEN SIZES

Chamber Size	Screen Length across MH (mm)
1200	1020
1350	1170
1500	1300
1800	1560

Refer to scheme drawings and manhole schedules for pipe and channel configuration and levels

The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard Specifications , Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided. This drawing is not intended to show details of foundations, ground conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable method of foundation should be provided allowing for existing ground conditions. Any suspect or fluid ground, contaminates on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.
Where existing trees / structures are to be retained they should be subject to a full specialist inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings. A suitable method of foundation is to be provided to accommodate the proposed tree planting.
Residential & Commercial Engineering Limited do not accept any responsibility for any losses (financial or otherwise) to any Client or third party arising out of the Clients (be it Developer or Contractor but not limited thereto) non-compliance with afore mentioned provisos.

Rev	Description	Date	Drawn	Check

Revisions:

Lioncourt Homes
RACE
RESIDENTIAL & COMMERCIAL ENGINEERING

Drawing Status:
Subject to the following approvals:
S111 - Subject to Technical Approval from Staffordshire CC Highways
S104 - Subject to Technical Approval from Severn Trent Water
S106 - Developer to complete application/approval with STW.
Consent to Discharge - Developer to complete application/approval with SCC Land Drainage Team

Client:
Lioncourt Homes

Project:
Tatenhill Lane, Branston

Title:
Manhole Construction Details

Job Number.
RACE/LCH/TLB
Drawing No.
ENG_260
Revision. #

Scale: NTS @ A1
Date: June ' 17
Drawn by: SM
Checked by: #

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