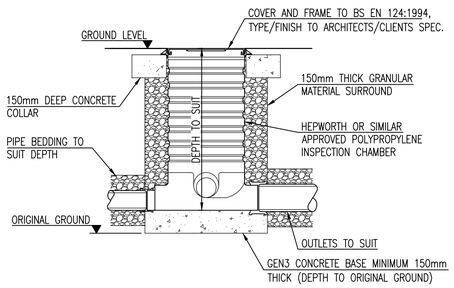


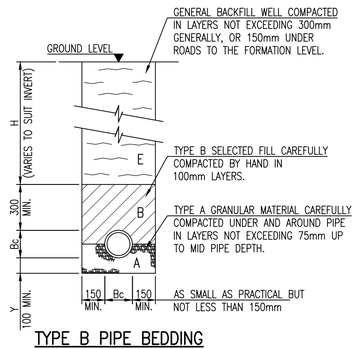
TYPICAL POLYPROPYLENE INSPECTION CHAMBER IN AREAS SUBJECT TO VEHICLE LOADING

SCALE 1:20



TYPICAL POLYPROPYLENE INSPECTION CHAMBER IN PEDESTRIAN AREAS

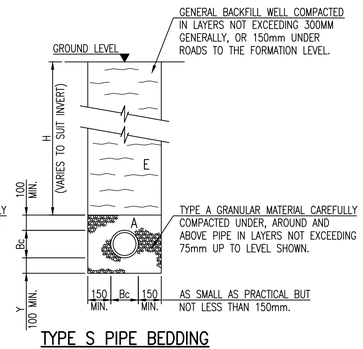
SCALE 1:20



TYPE B PIPE BEDDING

(GRANULAR BED & SURROUND)

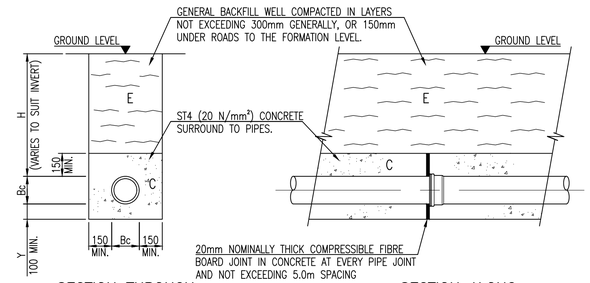
SCALE 1:20



TYPE S PIPE BEDDING

(GRANULAR BED & SURROUND)

SCALE 1:20



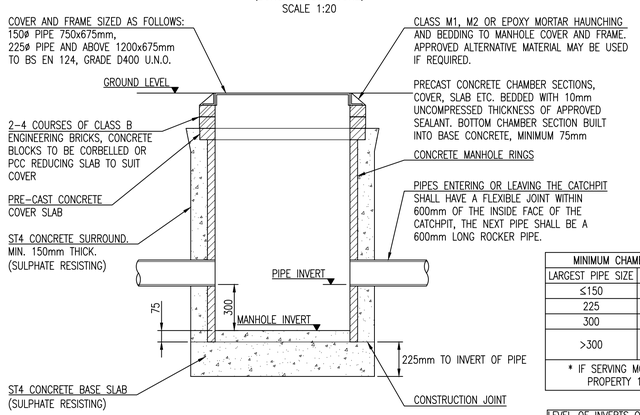
SECTION THROUGH PIPE TRENCH

SECTION ALONG PIPE TRENCH

TYPE Z PIPE BEDDING

(CONCRETE SURROUND)

SCALE 1:20



CIRCULAR PRE-CAST CATCHPIT MANHOLE DETAIL LESS THAN 1.5m TO SOFFIT

SCALE 1:20

MINIMUM CHAMBER DIAMETER	
LARGEST PIPE SIZE	MIN. DIAMETER
≤150	1000*
225	1200
300	1200
>300	THE LARGER OF 1800 OR DN+450
* IF SERVING MORE THAN ONE PROPERTY 1200ø MIN.	

LEVEL OF INVERTS OF INCOMING & OUTGOING PIPES TO BE EQUAL U.N.O.

TABLE SHOWING PRIVATE MANHOLE/INSPECTION CHAMBER COVER GRADES AND AREAS OF USE

COVER GRADE TO BS EN: 124	LOCATION
D400	FOR USE IN INDUSTRIAL ROADS AND PARKING AREAS ACCESSIBLE TO ALL TYPES OF ROAD VEHICLES INCLUDING HGV'S.
C250*	FOR USE IN PRIVATE ROADS OR PARKING AREAS eg. CAR PARKS AND MINOR PRIVATE ROADS ACCESSIBLE TO REFUSE VEHICLES, FIRE APPLIANCES ETC WITH POSSIBLE OCCASIONAL HGV USE.
B125	FOR USE IN FOOTWAYS, PEDESTRIAN AREAS, DRIVEWAYS AND CAR PARKS ACCESSIBLE BY LIGHT VEHICLES ONLY.
A15	FOR USE IN AREAS WHICH CAN ONLY BE USED BY PEDESTRIANS AND PEDAL CYCLISTS
* D400 MAY BE USED IN LIEU OF C250 IF PREFERRED.	

PERMITTED PIPE/BEDDING TYPES

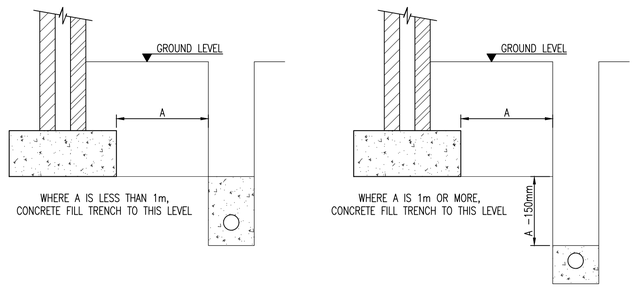
	DEPTH OF COVER WITHIN LIGHTLY TRAFFICKED AREAS	
	1.2m–3.5m	0.9m–3.5m
PIPE BEDDING	TYPE B	TYPE S
PIPE TYPE	VITRIFIED CLAY TO BS:65, WITH FLEXIBLE JOINTS SUPER STRENGTH CLASS FOR 225 AND 300mmø. EXTRA STRENGTH CLASS FOR ALL OTHER SIZES.	THERMOPLASTIC: UPVC TO BS EN 1404+ PP TO BS EN 1852+ STRUCTURE WALL PLASTIC PIPE TO BS EN 13476 ALL WITH NOMINAL RING STIFFNESS SN4
COVER DEPTH	<1.2m	<0.9m
PIPE BEDDING	TYPE Z	TYPE Z
PIPE TYPE	VITRIFIED CLAY TO BS:65, WITH FLEXIBLE JOINTS SUPER STRENGTH CLASS FOR 225 AND 300mmø. EXTRA STRENGTH CLASS FOR ALL OTHER SIZES.	THERMOPLASTIC: UPVC TO BS EN 1404+ PP TO BS EN 1852+ STRUCTURE WALL PLASTIC PIPE TO BS EN 13476 ALL WITH NOMINAL RING STIFFNESS SN4

TABLE A

GRANULAR BEDDING AND SIDEFILL MATERIAL FOR VITRIFIED CLAY PIPES

PIPE SIZE DN (mm)	MAX. PARTICLE SIZE (mm)	NOMINAL SINGLE SIZE (mm)	GRADED SIZE (mm)	MAXIMUM CFE VALUE FOR AS-DUG
110	10	10	NOT PERMITTED	0.15
OVER 110 to 160	15	10 or 14	14 to 5	0.15
OVER 160 to 300	20	10,14 or 20	14 or 20 to 5	0.15
OVER 300 to 600	20	14 or 20	14 or 20 to 5	0.15

FOR THERMOPLASTIC PIPES (NOMINAL RING STIFFNESS SN4) WHERE COVER TO PIPE IS LESS THAN 0.6m IN SOFT LANDSCAPED AREAS, THEN CONCRETE PIPE PROTECTION IS TO BE USED AS AGREED WITH THE BUILDING INSPECTOR



PIPE RUNS NEAR BUILDINGS

SCALE 1:20

MINIMUM DIMENSIONS FOR ACCESS FITTINGS AND INSPECTION CHAMBERS

TYPE OF ACCESS	DEPTH TO INVERT FROM COVER LEVEL (m)	MINIMUM INTERNAL DIMENSIONS (1)		MINIMUM CLEAR OPENING SIZE (1)	
		LENGTH x WIDTH (mm x mm)	CIRCULAR (mm)	LENGTH x WIDTH (mm x mm)	CIRCULAR (mm)
RODDING EYE	–	AS DRAIN BUT MINIMUM 100mm.	–	–	SAME SIZE AS PIPEWORK
ACCESS FITTING SMALL 150mm DIA. SMALL 150x100mm LARGE 225x100mm	0.6m OR LESS EXCEPT WHERE SITUATED IN A CHAMBER	150 x 100 225 x 100	150 225	150 x 100 (1) 225 x 100 (1)	SAME SIZE AS ACCESS FITTING
INSPECTION CHAMBER					
SHALLOW	0.6m OR LESS	225 x 100	190 (2)		190 (1)
MEDIUM	1.2m OR LESS	450 x 450	450	MIN 430 x 430	430
DEEP	GREATER THAN 1.2m	450 x 450	450	MAX 300 x 300 (3)	ACCESS RESTRICTED TO MAX 350 (3)

NOTES:
(1) THE CLEAR OPENING MAY BE REDUCED BY 20mm IN ORDER TO PROVIDE PROPER SUPPORT FOR THE COVER AND FRAME.
(2) DRAINS UPTO 150mm DIAMETER.
(3) A LARGER CLEAR OPENING COVER MAY BE USED IN CONJUNCTION WITH A RESTRICTED ACCESS. THE SIZE IS RESTRICTED FOR HEALTH AND SAFETY REASONS TO DETER ENTRY.

MINIMUM DIMENSIONS FOR MANHOLES

TYPE OF ACCESS	SIZE OF LARGEST PIPE (DN)	MINIMUM INTERNAL DIMENSIONS (1)		MINIMUM CLEAR OPENING SIZE (1)	
		RECTANGULAR LENGTH x WIDTH (mm x mm)	CIRCULAR DIAMETER (mm)	RECTANGULAR LENGTH x WIDTH (mm x mm)	CIRCULAR DIAMETER (mm)
MANHOLE LESS THAN 1.5m DEEP TO SOFFIT	LESS THAN OR EQUAL TO 150	750 x 675 (7)	1000 (7)	750 x 675 (2)	N/A (3)
	225	1200 x 675	1200	1200 x 675 (2)	
	300	1200 x 750	1200		
	GREATER THAN 300	1800 x (DN+450)	THE LARGER OF 1800 or (DN+450)		
MANHOLE GREATER THAN 1.5m DEEP TO SOFFIT	LESS THAN OR EQUAL TO 225	1200 x 1000	1200	600 x 600	600
	300	1200 x 1075	1200		
	375–450	1350 x 1225	1200		
	GREATER THAN 450	1800 x (DN+775)	THE LARGER OF 1800 or (DN+775)		
MANHOLE SHAFT (4) GREATER THAN 3.0m DEEP TO SOFFIT OF PIPE	STEPS (5)	1050 x 800	1050	600 x 600	600
	LADDER (5)	1200 x 800	1200		
	WINCH (6)	900 x 800	900		

NOTES:
(1) LARGER SIZES MAY BE REQUIRED FOR MANHOLES ON BENDS OR WHERE THERE ARE JUNCTIONS.
(2) MAY BE REDUCED TO 600x600mm WHERE REQUIRED BY HIGHWAY LOADING CONSIDERATIONS, SUBJECT TO A SAFE SYSTEM OF WORK BEING SPECIFIED.
(3) NOT APPLICABLE DUE TO WORKING SPACE NEEDED.
(4) MINIMUM HEIGHT OF CHAMBER IN SHAFTED MANHOLE 2m FROM BENCHING TO UNDERSIDE OF REDUCING SLAB.
(5) MINIMUM CLEAR SPACE BETWEEN LADDER OR STEPS AND THE OPPOSITE FACE OF THE SHAFT SHOULD BE APPROXIMATELY 900mm.
(6) WINCH ONLY – NO STEPS OR LADDERS, PERMANENT OR REMOVABLE.
(7) THE MINIMUM SIZE OF ANY MANHOLE SERVING A SEWER (i.e. ANY DRAIN SERVING MORE THAN ONE PROPERTY) SHOULD BE 1200x750mm RECTANGULAR OR 1200mm DIAMETER.

NOTES ON BEDDING DETAILS

GENERALLY VITRIFIED CLAY DRAINAGE PIPEWORK SHOULD BE LAID IN ACCORDANCE WITH BS 65 AND BS 8301.

A–TYPE A GRANULAR MATERIAL SHALL COMPLY WITH WIS NO. 4–08–01 AND SHALL BE:–
(A) IMPORTED SINGLE SIZE OR GRADED AGGREGATE IN ACCORDANCE WITH BS 882 AS SHOWN IN THE TABLE A.
(B) SELECTED AS–DUG GRANULAR BEDDING AND SIDEFILL MATERIAL SHALL BE FREE FROM ORGANIC MATTER, COMBUSTABLE MATERIALS, FROZEN SOIL, CLAY LUMPS LARGER THAN 75mm AND STONES LARGER THAN THE MAXIMUM PERMITTED PARTICLE SIZE SPECIFIED IN TABLE A DEPENDING ON PIPE SIZE. THE SELECTED MATERIAL SHALL BE EVALUATED USING THE COMPACTION FRACTION TEST DETAILED IN APPENDIX A OF WIS NO. 4–08–01.
MATERIAL EXCAVATED FROM TRENCHES DUG THROUGH LAND CONTAMINATED WITH DOMESTIC, BUILDING OR INDUSTRIAL WASTE SHOULD NOT BE USED.

B–TYPE B SELECTED FILL SHALL BE:
UNIFORM READILY COMPACTABLE MATERIAL WHICH IS FREE FROM TREE ROOTS, VEGETABLE MATTER, BUILDING RUBBISH, FROZEN SOIL, CLAY LUMPS AND MATERIAL RETAINED ON A 40mm SIEVE.

C–CONCRETE PROTECTION TO PIPE. FOR CONCRETE GRADE REFER TO NOTE 4 AND CONCRETE MIX SPECIFICATION

E–GENERAL BACKFILL SHALL BE:
SUITABLE EXCAVATED MATERIAL FROM THE TRENCH (OR IMPORTED) EXCLUDING BOULDERS, LUMPS OF CONCRETE, TIMBER AND VEGETABLE MATTER. DO NOT USE HEAVY COMPACTORS BEFORE THERE IS 600MM COVER OF MATERIAL OVER THE PIPES.

Bc–EXTERNAL DIAMETER OF PIPE.

H–WHEN 'H' (DEPTH OF COVER) IS LESS THAN 0.9m BELOW THE FINISHED SURFACE OF A ROAD OR LESS THAN 0.3m ELSEWHERE USE BEDDING CLASS A OR Z AS APPROPRIATE FOR THE MATERIAL BEING USED, OR; ELSEWHERE USE BEDDING CLASS B OR P AS APPROPRIATE FOR THE PIPE BEING USED. PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION AGAINST MECHANICAL DAMAGE AND FROST.

Y–DEPTH OF GRANULAR BEDDING Y SHALL BE NOT LESS THAN 100mm BENEATH PIPE BARRELS AND SHALL BE GREATER IN SOFT OR WET CONDITIONS OR WHERE THE TRENCH BOTTOM IS IRREGULAR.

GENERAL DRAINAGE NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DETAILS.

2. ALL MATERIAL & WORKMANSHIP TO BE IN ACCORDANCE WITH 'SEWERAGE SECTOR GUIDANCE APPENDIX C: DESIGN AND CONSTRUCTION GUIDANCE'.

3. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT BRITISH STANDARDS, B.S. CODES OF PRACTICE & BUILDING REGULATIONS.

4. REFER TO SSG DCG SPECIFICATION FOR CONCRETE GRADES & SAND/CEMENT MORTAR GRADES. ALL PRECAST & IN–SITU CONCRETE TO CONTAIN A MINIMUM CLASS 3 SUPHATE RESISTING CEMENT.

5. PRE–FORMED CHANNELS ARE TO BE USED AT MANHOLES.

6. GRANOLITHIC CONCRETE BENCHING TO BE STEEL TROWELLED TO A DENSE SMOOTH FACE NEATLY SHAPED & FINISHED TO ALL BRANCH CONNECTIONS & LAID IN ACCORDANCE WITH THE SPECIFICATION.

7. ALL DIMENSIONS ARE IN MILLIMETRES U.N.O.

8. PIPE BENDS TO SUIT DIRECTION OF FLOW.

9. MANHOLE COVERS AND FRAMES TO BE TO EN 124. USE GRADE D400 COVERS IN VEHICULAR MOVEMENT AREAS AND GRADE A15 COVERS IN NON–VEHICULAR AREAS.

10. ALL TRENCHES UNDER CARRIAGEWAY TO BE BACKFILLED WITH TYPE 1 SUB–BASE, WELL COMPACTED IN LAYERS NOT EXCEEDING 150mm LOOSE DEPTH.

0 0.2 0.4 0.6 0.8 1.2 1.6 2m
1:20

REV.	DESCRIPTION	DRN.	APP.	DATE
–	PRELIMINARY – FOR APPROVAL	MRB	APW	21.07.23

SHIELDS WILSON
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STRUCTURAL AND CIVIL ENGINEERING

STATUS: FOR INFORMATION

CLIENT: SEAGATE HOMES

PROJECT: 6 PLOT RESIDENTIAL DEVELOPMENT
37 FLEET ROAD, HOLBEACH,
LINCOLNSHIRE, PE12 8LA

TITLE: PROPOSED DRAINAGE DETAILS
(SHEET 1 OF 2)

DATE	JUNE '23	SCALE @A1 1:20	DRAWING NO.	REV.
DRAWN	MRB		SW23–218–106	–

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