MINIMUM DIMENSIONS FOR MANHOLES

TYPE	SIZE OF LARGEST PIPE (DN)	INTERNAL DIMENSIONS (MINIMUM).1		MINIMUM CLEAR OPENING SIZE.1		TYPE OF COVER & FRAME
		LENGTH (mm) x WIDTH (mm)	CIRCULAR (mm dia.)	LENGTH (mm) x WIDTH (mm)	CIRCULAR dia. (mm)	
<1.5m TO SOFFIT	150 225 300 >300	750x675.7 1200x675 1200x750 1800x(DN+450)	1000.7 1200 1200 THE LARGER OF 1800 OR (DN+450)	750x675.2 1200x675.2	N/A.3	SEE NOTE 1. i), ii), iii) & iv)
>1.5m TO SOFFIT	225 300 375–450 >450	1200x1000 1200x1075 1350x1225 1800x(DN+775)	1200 1200 1200 THE LARGER OF 1800 OR (DN+775)	600x600	N/A	SEE NOTE 1. i) & ii)
MANHOLE SHAFT.4 >3.0m DEEP TO SOFFIT OF PIPE	STEPS.5	1050x800	1050	600x600	600	SEE NOTE 1. i) & ii)
	LADDER.5	1050x800	1200			
	WINCH.6	900x800	900	600x600	600	

NOTES
1. LARGER SIZES MAY BE REQUIRED FOR MANHOLES ON BENDS OR WHERE THERE ARE JUNCTIONS.
2. MAY BE REDUCED TO 600x600 WHERE REQUIRED BY HIGHWAY LOADING CONSIDERATIONS, SUBJECT TO SAFE SYSTEM OF WORK BEING SPECIFIED.
3. NOT APPLICABLE DUE TO WORKING SPACE NEEDED.
4. MINIMUM HEIGHT OF CHAMBER IN SHAFTED MANHOLE 2.0m FROM BENCHING TO UNDERSIDE OF REDUCING SLAB.
5. MIN. 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 1200x675mm RECTANGULAR OR 1200mm dia.

LOCATION	GARDENS (NO TRAFFIC LOADING)		PAVED OR HARD SURFACES (LIGHT TRAFFIC LOADING)		ROADS (CARRIAGEWAYS & FOOTWAYS)	
COVER (mm) [FROM BARREL OF PIPE]	LESS THAN 600	MORE THAN 600	LESS THAN 900	MORE THAN 900	LESS THAN 900	MORE THAN 900
TYPE OF PROTECTION REQUIRED	REINFORCED CONC. OR PAVING SLAB BRIDGING	NONE	REINFORCED CONC. OR PAVING SLAB BRIDGING	NONE	CONCRETE SURROUND	NONE

NOTWITHSTANDING THESE REQUIREMENTS THE CONTRACTOR IS TO GIVE FURTHER CONSIDERATION TO THE PROTECTION OF DRAINAGE ITEMS FROM CONSTRUCTION TRAFFIC AND BUILDING WORKS.

TABLE OF PROTECTION REQUIREMENTS RELATIVE TO COVER

MINIMUM DIMENSIONS FOR ACCESS FITTINGS AND INSPECTION CHAMBERS

TYPE	DEPTH TO INVERT FROM COVER LEVEL (m)	INTERNAL DIMENSIONS		COVER DIMENSIONS	
		LENGTH (mm) x WIDTH (mm)	CIRCULAR dia. (mm)	LENGTH (mm) x WIDTH (mm)	CIRCULAR dia. (mm)
RODDING EYE		AS DRAIN BUT 100 MIN.			SAME SIZE AS PIPEWORK.1
ACCESS FITTING SMALL 150 dia. 150x100 LARGE 225x100	0.6 OR LESS, EXCEPT WHERE SITUATED IN A CHAMBER	150x100 225x100	150 225	150x100.1 225x100.1	SAME SIZE AS ACCESS FITTING
INSPECTION CHAMBER SHALLOW DEEP	0.6 OR LESS 1.2 OR LESS >1.2	225x100 450x450 450x450	190.2 450 450	– MIN. 430x430 MAX 300x300.3	190.1 430 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 UP TO 150mm.
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.

MATERIALS FOR ACCESS POINTS

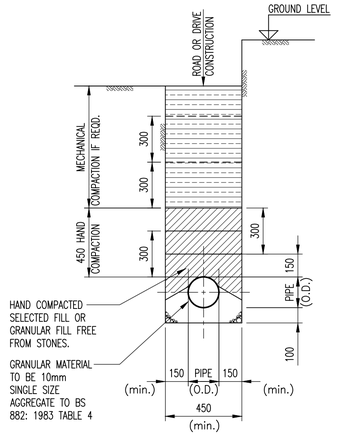
MATERIAL	BRITISH STANDARD
1. INSPECTION CHAMBERS AND MANHOLES. CLAY BRICK & BLOCKS VITRIFIED CLAY CONCRETE–PRECAST CONCRETE–IN SITU PLASTICS	 BS 3921 BS EN 295, BS 65 BS 5911 BS 8110 BS 7158
2. RODDING EYES AND ACCESS FITTINGS (EXCLUDES COVERS AND FRAMES).	AS PIPES REFER TO MATERIALS FOR BELOW GROUND DRAINAGE

MATERIALS FOR BELOW GROUND DRAINAGE

MATERIAL	BRITISH STANDARD
1. RIGID PIES VITRIFIED CLAY CONCRETE GREY IRON DUCTILE IRON	 BS 65, BS EN 295 BS 5911 BS 437 BS EN 598
2. FLEXIBLE PIPES UPVC PP STRUCTURE WALLED PLASTIC PIPES	 BS EN 1401+ BS EN 1852+ BS EN 13476

+APPLICATION AREA CODE UD SHOULD NORMALLY BE SPECIFIED
NOTE
SOME OF THESE MATERIALS MAY NOT BE SUITABLE FOR CONVEYING TRADE EFFLUENT.

PIPE PROTECTION IS REQUIRED BY ONE OF THE THREE METHODS SHOWN WHERE COVER IS <600mm IN UNTRAFFICKED AREAS AND <900mm ELSEWHERE.



GENERAL FILL MATERIAL
MAY BE OF SELECTED LOCALLY EXCAVATED MATERIAL OR IMPORTED. IT SHALL BE UNIFORM READILY COMPACTED MATERIAL FREE FROM STONES LARGER THAN 40mm dia. LUMPS OF CLAY OVER 100mm, TIMBER, FROZEN MATERIAL, VEGETABLE MATTER, TREE ROOTS AND BUILDING RUBBISH. THE MATERIAL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 300mm LOOSE DEPTH. MECHANICAL COMPACTION EQUIPMENT SHALL NOT BE USED UNTIL THERE IS A MINIMUM OF 450mm OF COMPACTED MATERIAL ABOVE THE CROWN OF THE PIPE.

SELECTED FILL MATERIAL
TO BE FREE FROM STONES LARGER THAN 40mm dia. LUMPS OF CLAY OVER 100mm, TIMBER, FROZEN MATERIAL, VEGETABLE MATTER, TREE ROOTS AND BUILDING RUBBISH. THE MATERIAL SHALL BE PLACED UNIFORMLY ON EACH SIDE OF THE PIPE IN LAYERS NOT EXCEEDING 100mm. EACH LAYER BEING COMPACTED BY HAND TAMPING. CARE TO BE TAKEN NOT TO DISPLACE THE PIPE FROM ITS CORRECT LINE AND LEVEL.

NORMAL BEDDING
SCALE 1:20

NOTES:

1. FORMATION OF TRENCH BEDS AND INSPECTION CHAMBERS

i) EXCAVATE IMMEDIATELY BEFORE LAYING BEDS AND PIPES OR BASE SLABS FOR INSPECTION CHAMBERS.

ii) REMOVE ALL MUD, ROCK PROJECTIONS, BOULDERS AND HARD SPOTS AND REPLACE WITH WELL COMPACTED SELECTED FILL. LOCALISED SOFT SPOTS ARE TO BE HARDENED BY TAMPING IN GRANULAR BEDDING MATERIAL.

iii) IF OIL CONTAMINATION IS FOUND ADJACENT TO TRENCH, THE TRENCH PROFILE IS TO BE CUT BACK BY 150mm FROM THE FACE OF BEDDING MATERIAL AND REPLACED WITH CRUSHED CONCRETE.

2. CONCRETE AND MORTAR

i) THE CONCRETE USED TO SURROUND PIPES AND IN THE CONSTRUCTION OF GULLIES AND INSPECTION CHAMBERS IS TO BE GRADE C20P (UNLESS NOTED OTHERWISE) AND MIXED USING SRPC UNLESS DIRECTED OTHERWISE BY THE ENGINEER OR LOCAL AUTHORITY. SULPHATE RESISTING CEMENT IS TO BE USED FOR INSITU OR PRECAST CONCRETE AND MORTARS TO FOUL DRAINS.

3. COVERS AND FRAMES

ALL INSPECTION CHAMBER COVER AND FRAMES ARE TO BE LAID TO HAVE THE TOP SURFACE IN ALIGNMENT WITH BOTH THE LONGITUDINAL AND TRANSVERSE GRADIENTS OF ADJACENT ROADS, DRIVES, FOOTWAYS AND VERGES. THEY ARE OTHERWISE TO BE LAID LEVEL. ALL COVER LEVELS AS SHOWN ON THE DRAINAGE LAYOUT/LONGSECTION ARE APPROXIMATE. ACTUAL COVER LEVELS ARE TO BE DETERMINED ON SITE FROM THE POSITION IN THE ROAD, DRIVE, FOOTPATH OR OTHERWISE.

4. PIPES TO AS FOLLOWS:

PIPE dia. (mm)	TYPE	REMARKS
100 INTERNAL (110 NOM. dia.)	uPVC	BS EN 1401
150 INTERNAL (160 NOM. dia.)	uPVC	BS EN 1401

5. THE CONTRACTOR/DEVLOPER IS TO ENSURE THAT ALL OF THE WORKS COMPLY WITH THE FOLLOWING:

i) BS 8301: 1985 (CODE OF PRACTICE FOR BUILDING DRAINAGE)

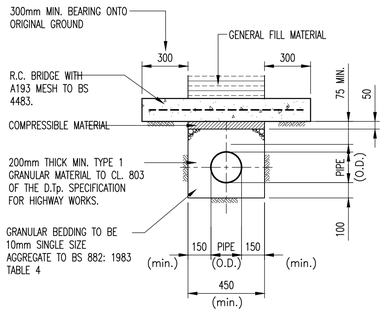
ii) THE BUILDING REGULATIONS: APPROVED DOCUMENT H 2002

iii) NHBC TECHNICAL REQUIREMENTS

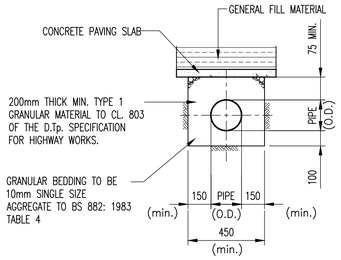
iv) BRE DIGEST No. 363

6. THE STORAGE AND INSTALLATION OF ALL PROPRIETARY DRAINAGE ITEMS USED ARE TO BE STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.

7. ALL uPVC ITEMS AS SPECIFIED ON THIS DRAWING ARE TO COMPLY WITH BS EN 1401



REINFORCED CONCRETE BRIDGING
SCALE 1:20



CONCRETE PAVING SLAB BRIDGING
SCALE 1:20

NOTES (contd.):

MORTAR
1. MORTAR SHALL BE MIXED ONLY AS AND WHEN REQUIRED, THE RELEVANT PROPORTIONS INDICATED IN THE FOLLOWING TABLE, UNTIL ITS COLOUR AND CONSISTENCY ARE UNIFORM. THE CONSTITUENT MATERIALS SHALL BE ACCURATELY GAUGED, ALLOWANCE BEING MADE FOR BULKING OF SAND.

ALTERNATIVE NOMINAL MIXES BY VOLUME		
CEMENT:LIME:SAND	CEMENT:SAND	CEMENT:SAND WITH PLASTICISER
1 : ¼ : 3	1 : 3	1 : 2 ½ TO 3

2. READY–MIXED LIME:SAND FOR MORTAR AND READY–TO–USE RETARDED MORTAR SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS 4721 AND TO BE OF CATEGORY 1.12 AND DESIGNATION (i) RESPECTIVELY.

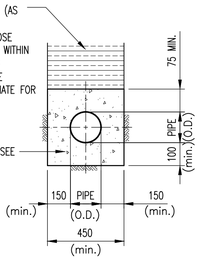
3. ALL MORTAR SHALL BE CONVEYED FRESH TO THE WORKS AS REQUIRED FOR USE. MORTAR WHICH HAS BEGUN TO SET OR WHICH HAS BEEN SITE–MIXED FOR A PERIOD OF MORE THAN 1 HOUR SHALL NOT BE USED. PLASTICISING AND SET RETARDING MORTAR ADMIXTURES SHALL COMPLY WITH BS 4887: PART 1 AND 2, RESPECTIVELY AND SHALL BE SUPPLIED WITH INSTRUCTIONS FOR USE.

4. FINE AGGREGATE FOR MORTAR SHALL BE WASHED NATURAL SAND OR CRUSHED NATURAL STONE AND SHALL COMPLY IN ALL RESPECTS WITH BS 1200.

NOTES:

A. 20mm THICK FLEXCELL, OR SIMILAR APPROVED FILLER TO BE USED TO FORM A FLEXIBLE JOINT TO THE CONCRETE SURROUND AT THE LEADING EDGE OF A SLEEVED COUPLING. DIMENSIONS SHOWN ARE IRRESPECTIVE OF TYPE OR DIAMETER OF PIPE. THE SURROUNDS MUST TERMINATE AT A PIPE JOINT.

B. IF PIPES ARE SURROUNDED IN CONCRETE, THE JOINTS ARE TO BE PROTECTED FROM THE THE INGRESS OF CONCRETE BY WRAPPING THEM IN POLYTHENE SHEET OR BUILDING PAPER.



CONCRETE SURROUND
SCALE 1:20

PRELIMINARY

Rev	Amendments	Drawn	Approved	Date

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Project
11A CRESCENT PARADE
HILLINGDON

Drawing Title
DRAINAGE DETAILS
(SHEET 2 OF 2)

Client
HIGHGRADE PROPERTIES LTD

Drawn by	Designed by
JB	JB
Approved by	Checked by
BN	BN
Scale	Date
AS SHOWN	NOVEMBER 2017
Drawing No.	Rev.
L17_139_08_003	–

ORIGINAL SHEET SIZE A1