

TABLE (ii)	
Diameter of largest pipe in manhole (mm)	Internal diameter of manhole (mm)
Less than 375	1200 (1050 where depth to soffit is 1.35m to 1.5m)
375 - 450	1350
450 - 500	1500
500 - 750	1800
750 - 900	2100

TABLE (iii)	
Pipe Diameter (mm)	Rocker Pipe Length (mm)
150 - 450	500 - 750
450 - 750	750 - 1000
750 - 900	1000 - 1500
Refer to Engineer	
ALL PCC RINGS ARE TO BE SPOOT AND SOCKET BOND CONSTRUCTION	

PH Location	Cover Grade	Test Load
Non-trunked Pedestrian areas	A15	15
Private drives	B125	125
Parking courts	C250	250
Carriageway	D400	400
Airfields/Dockyards	E600	600
Airfields/Dockyards	F900	900

NRSWA Road Category	Description	Minimum Frame Depth (mm)
I	Trunk roads and 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

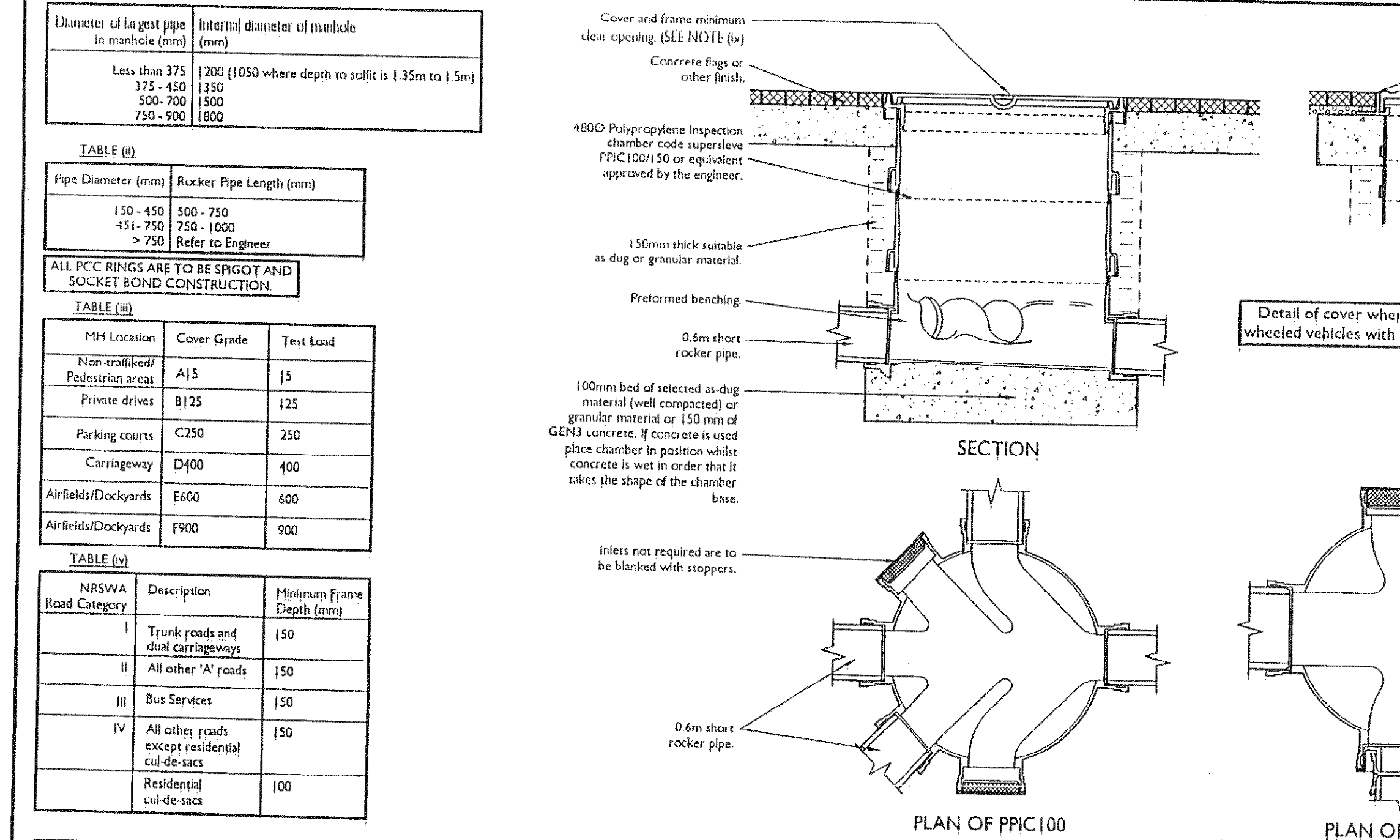
- STEP IRONS (iv)**
- Steps for manholes and other chambers shall be Type D Class 1, complying with the requirements of BS EN 13101:2002.
 - Precast concrete manhole pattern step irons at 300mm centres vertically and staggered 300mm horizontally between centres.
 - Ungrouted aluminium steps should not be permitted for adoptable applications.
 - Plastic encapsulated steps are subject to undertaker's requirements/approval.

- LADDERS (vi)**
- Mild steel ladders for vertical fixing shall comply with the relevant provision of BS 421, class A and PD 970.
 - After fabrication, mild steel ladders shall be hot dip galvanised in accordance with BS EN ISO 1460.
 - Stainless steel ladders for vertical fixing shall be fabricated from Grade 316S31 steel complying with BS 970: Part 1 and BS EN 10084, 10085, 10087, 10095, 10250, 10029, 10048, 10051, 10258, 10259.
 - GRP ladders shall be manufactured to the relevant requirements of BS EN 131, and from glass-reinforced polyester using an appropriate resin for the ladder location. Unidirectional reinforcement shall be provided in the GRP matrix to maximise the strength of the product.

- HIGH STRENGTH TOPPING (vi)**
- High-strength concrete topping shall be produced, laid and finished in accordance with the relevant provisions of BS 8204: Part 2 and the following approximate proportions by weight shall be used: 1 part cement, 1 part natural sand and 2 parts single sized coarse aggregate.

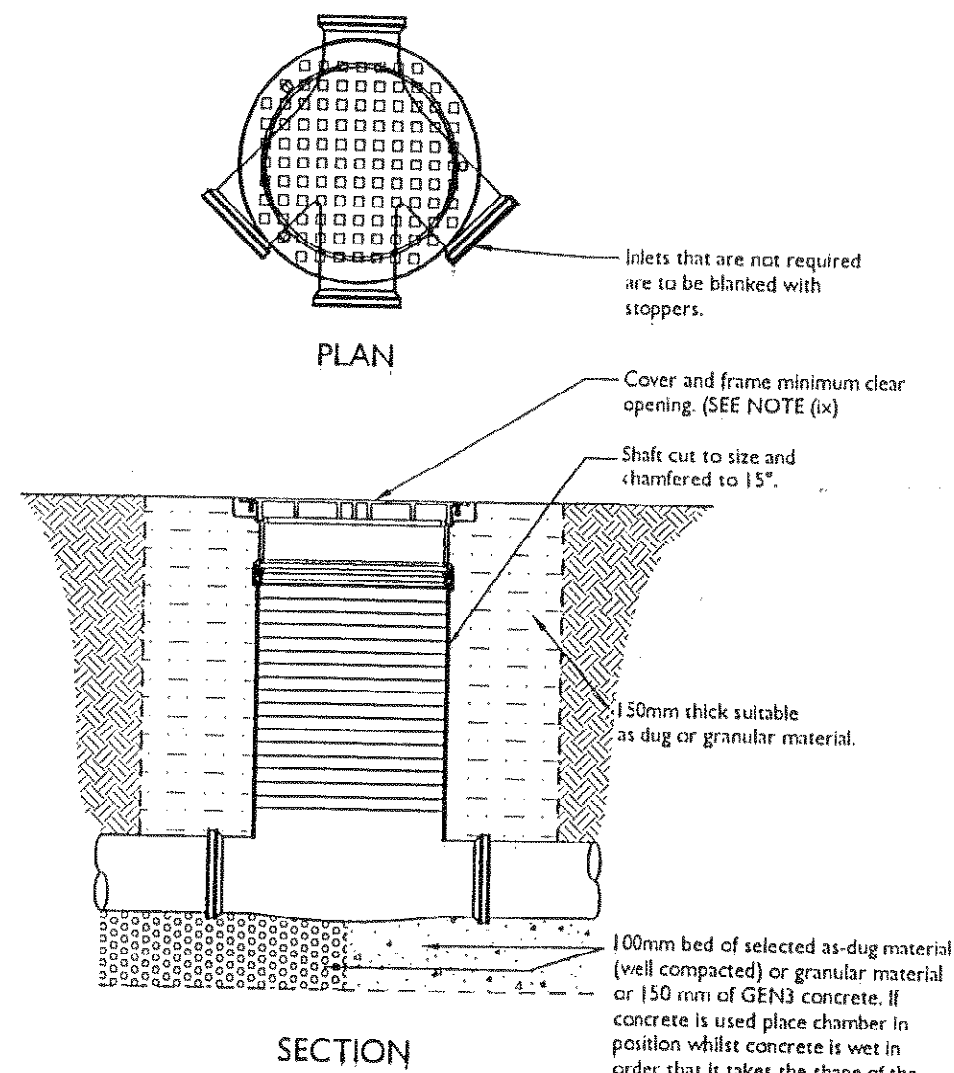
- RECESSED COVERS (vii)**
- Where inspection chamber is located in areas of black paving it shall be fitted with a recessed cover to accommodate paving blocks.

- MANHOLE COVERS & FRAMES (ix)**
- Manhole cover and frames shall comply with the relevant provisions of BS EN 124, BS 7903 and Highway Agency Guidance Document HA 104/02. They shall be of a non-rotting design which does not rely on the use of cushion inserts.
 - All manhole covers shall be the non-ventilating type and shall have closed keyways.
 - Refer to TABLE (iv) for frame depths.
 - Refer to Manhole Schedule/Drawings Drawing for cover grades.



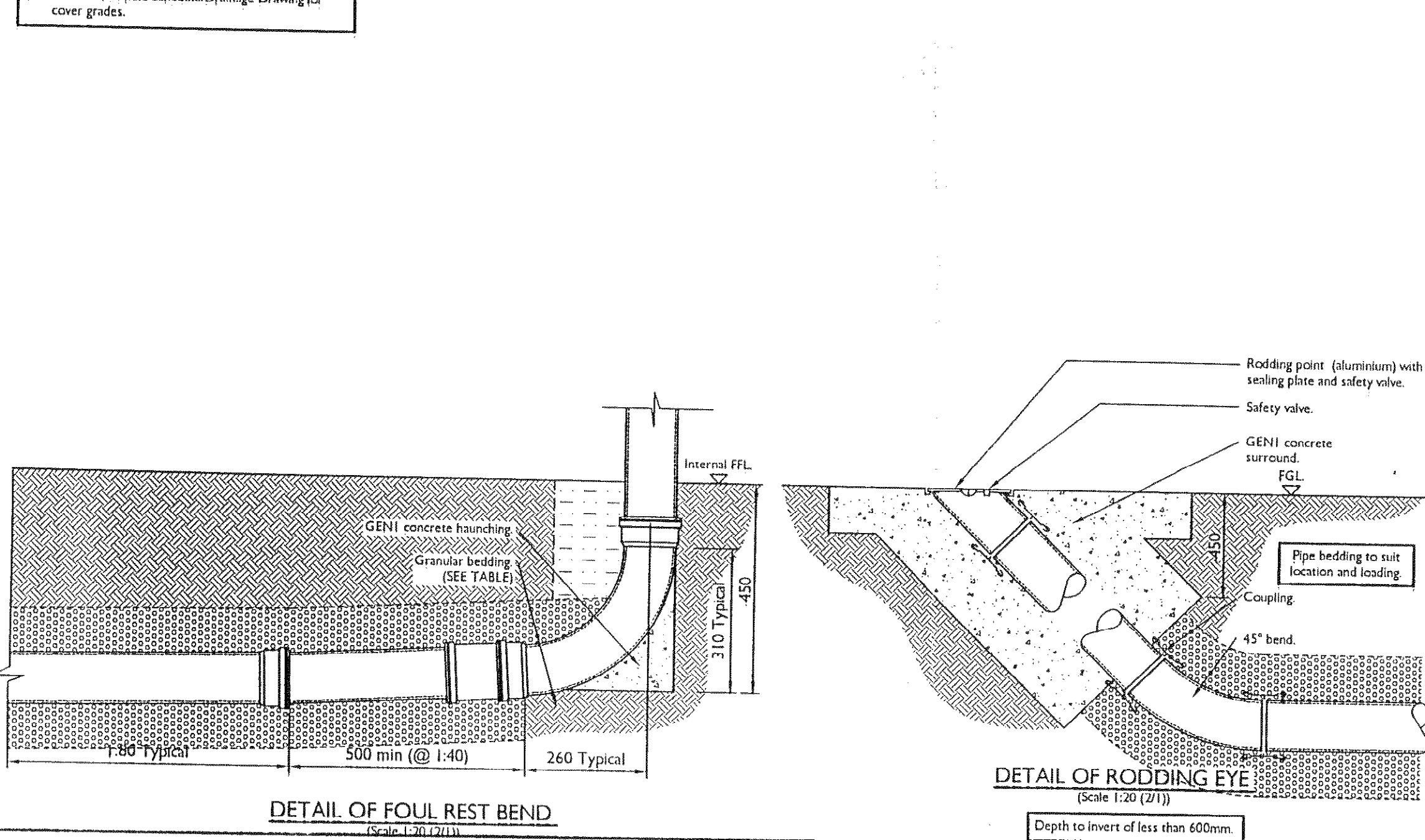
POLYPROPYLENE INSPECTION CHAMBER DETAIL (4800)
(Scale 1:20)

Depth to invert of less than 930mm.
Depth to invert with concrete collar of less than 1.0m.



POLYPROPYLENE SHALLOW INSPECTION CHAMBER DETAIL (2500)
(Scale 1:20)

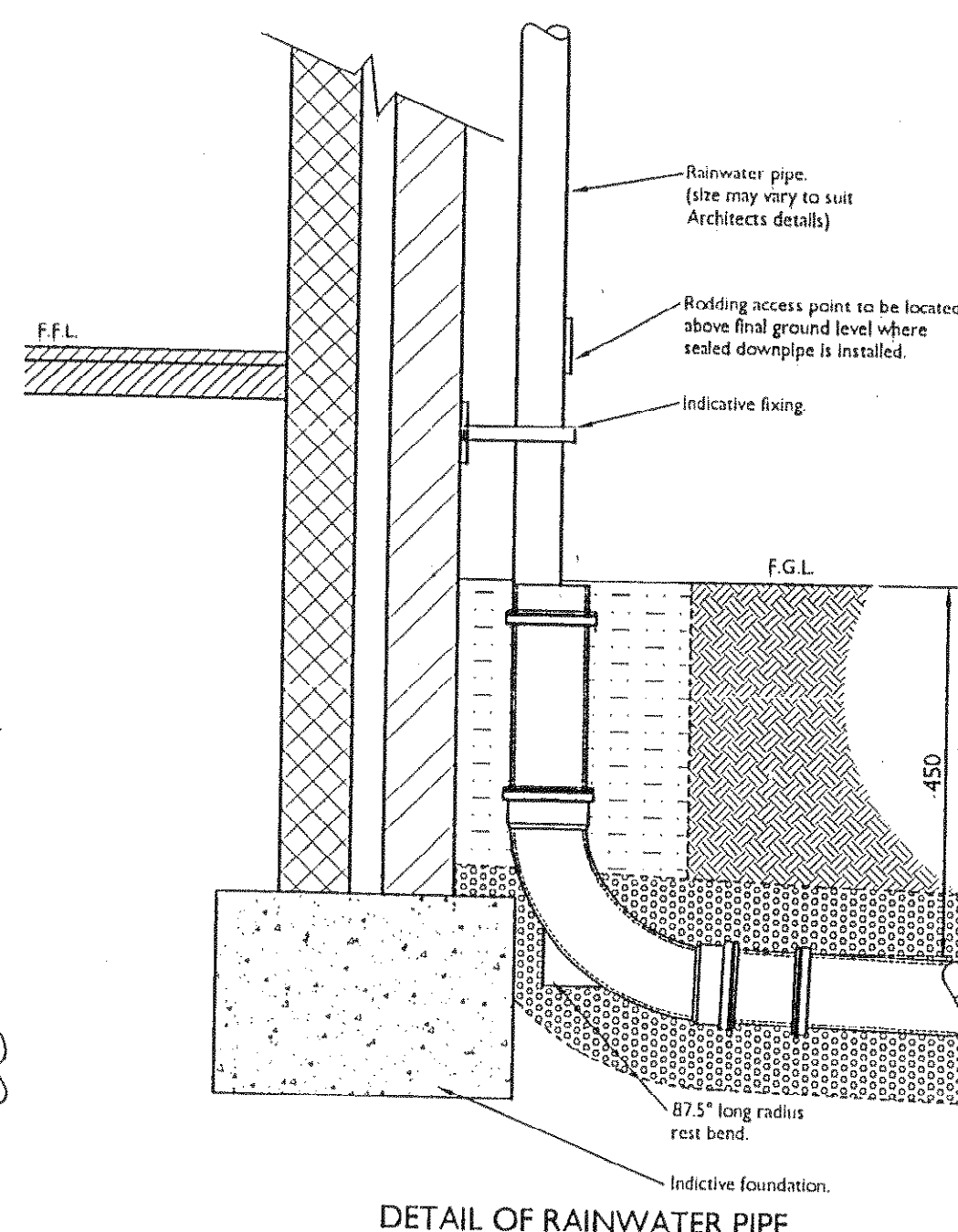
Depth to invert of less than 600mm.



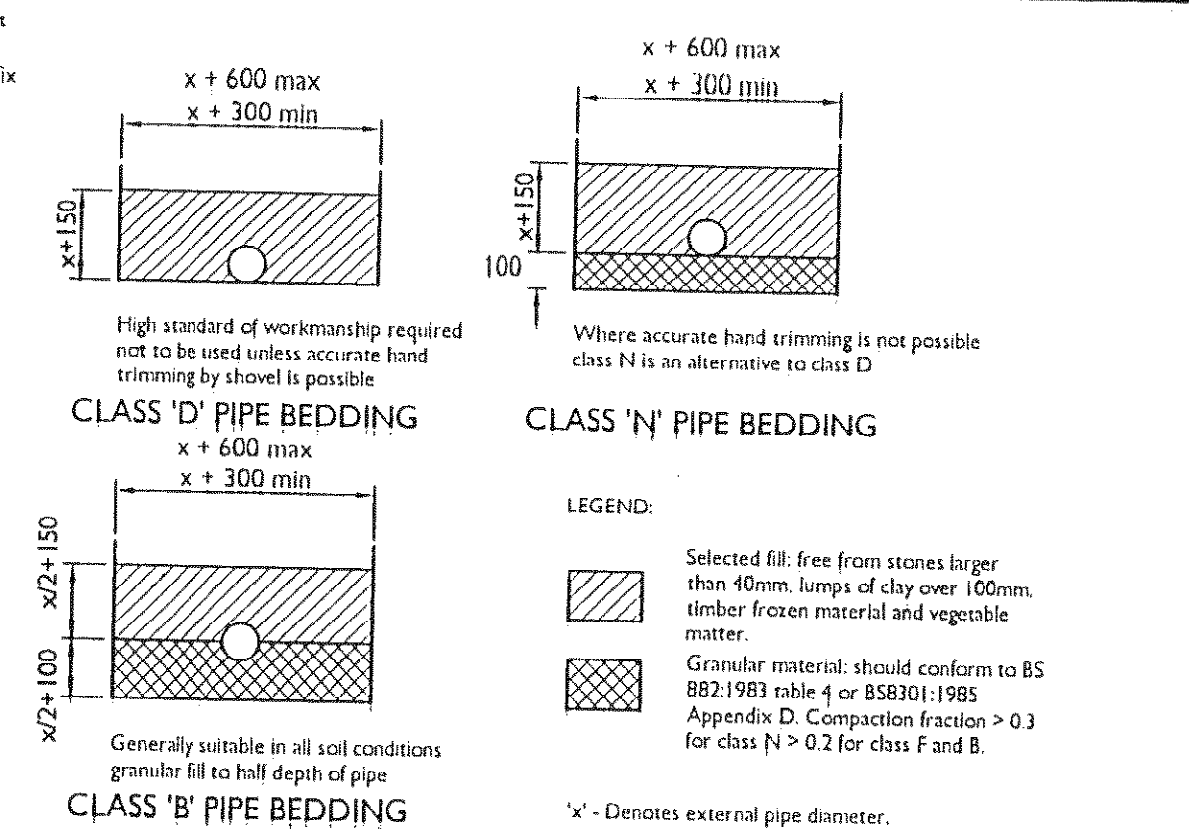
DETAIL OF FOUL REST BEND
(Scale 1:20 (2/1))

DETAIL OF RODDING EYE
(Scale 1:20 (2/1))

Depth to invert of less than 600mm.



DETAIL OF RAINWATER PIPE
(Scale 1:20 (2/1))



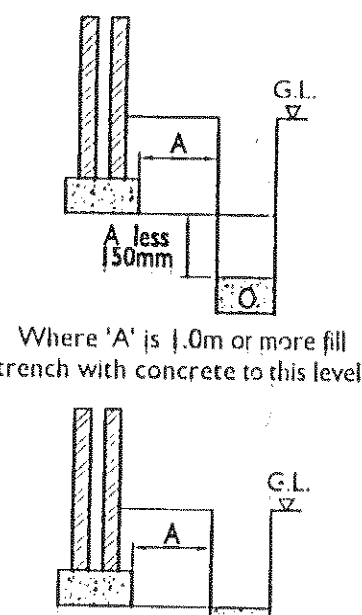
PIPE BEDDING DETAILS (PRIVATE DRAINS)
(Scale 1:20)

Minimum Dimensions for Access Fittings and Chambers					
Type	Internal Sizes			Cover Sizes	
	Depth to invert (m)	Length x Width (mm)	Circular (mm)	Length x Width (mm)	Circular (mm)
Rodding Eye					
Shallow Access					
Small	0.6 or less	150x100	150	150x100	150
Large	0.6 or less	225x100	190	225x100	190
Inspection Chamber	1.0 or less	450x450	450	450x450	450
Manhole	1.5 or less	1200x750	1050	600x600	600
Manhole Shaft	Over 1.5	1200x750	1200	600x600	600
Manhole Shaft	Over 2.7	900x840	900	600x600	600

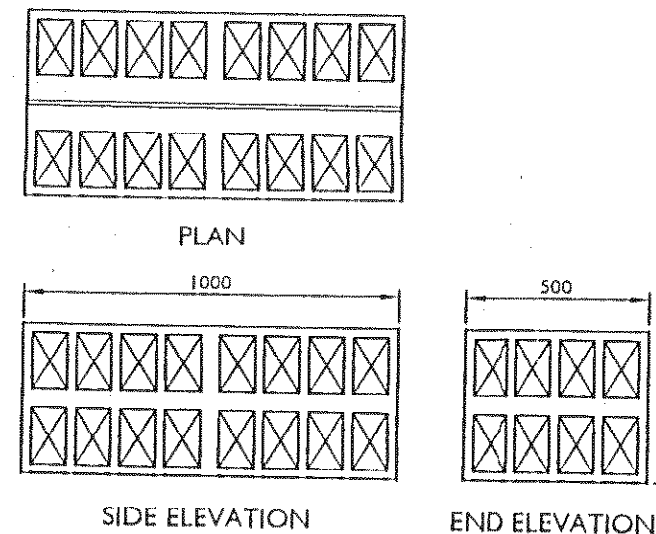
BUILDING REGULATIONS MINIMUM DIMENSIONS FOR MANHOLES
(Not to Scale)

This plan complies with the Building Regulations 2002 Section 'H' - Drainage & Waste Disposal.

LIMITS OF COVER FOR STANDARD STRENGTH RIGID PIPE IN ANY WIDTH OF TRENCH						
PIPE BORE BEDDING CLASS	Fields and gardens		Light traffic roads		Heavy traffic roads	
	MIN	MAX	MIN	MAX	MIN	MAX
100mm	0.4	0.7	0.4	0.7	0.7	3.7
D or N	0.3	0.8	0.5	0.8	0.5	5.5
F	0.3	0.7	0.4	0.7	0.4	7.2
150mm	0.4	0.7	0.4	0.7	0.7	3.7
D or N	0.4	0.8	0.5	0.8	0.5	5.5
F	0.4	0.7	0.4	0.7	0.4	7.2
225mm	0.4	0.7	0.4	0.7	0.7	3.7
D or N	0.4	0.8	0.5	0.8	0.5	5.5
F	0.4	0.7	0.4	0.7	0.4	7.2



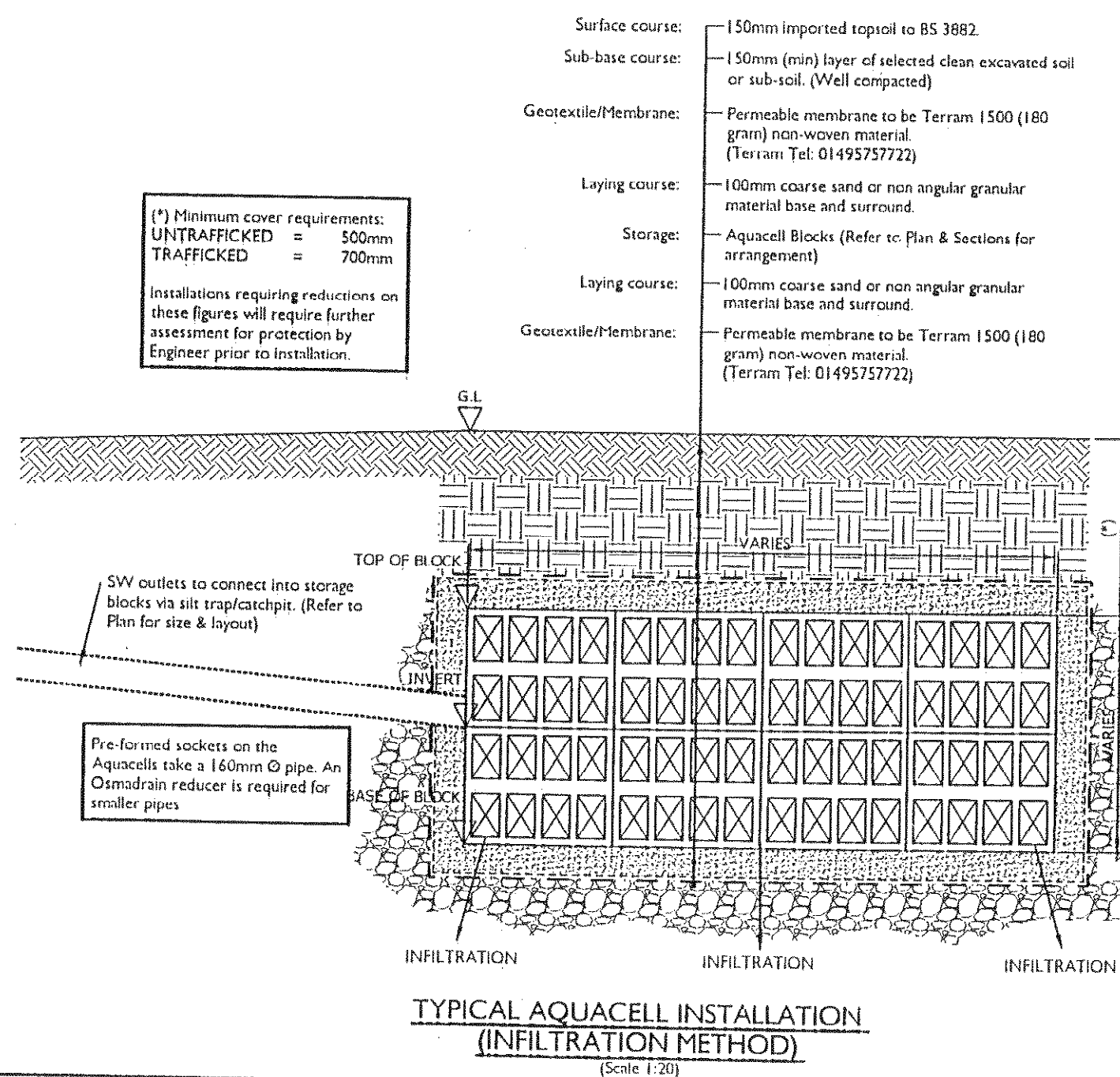
DETAIL OF PIPE RUNS NEAR BUILDINGS
(Not to Scale)



AQUACELL	LOAD RANGE	AREA USAGE
BLUE (Normal)	56 tonnes per sq. m	TRAFFICKED PAVEMENT
GREEN (Light)	17 1/2 tonnes per sq. m	UNTRAFFICKED VERGE

(Subject to minimum cover compliance)

AQUACELL SINGLE BLOCK
(Scale 1:20)



TYPICAL AQUACELL INSTALLATION (INFILTRATION METHOD)
(Scale 1:20)

STANDARD NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER OPUS DRAWINGS, AND WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DRAWINGS AND SPECIFICATION.
- NO DIMENSIONS ARE TO BE SCALED FROM THIS DRAWING. UNLESS NOTED OTHERWISE ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES FROM THE SITE DATUM.
- ALL DIMENSIONS TO BE CHECKED ON SITE. ALL DETAILS AND DIMENSIONS RELATING TO SUB-CONTRACTOR WORK MUST BE CHECKED AND AGREED BETWEEN THE SUB-CONTRACTOR OR SUPPLIER AND THE GENERAL CONTRACTOR.
- THE ELECTRONIC INFORMATION FROM THIS DRAWING CAN NOT BE GUARANTEED AS PRELIMINARY DRAWING. DIMENSIONS MUST BE USED FOR SETTING OUT AND DETAILING. OPUS LOGOS AND COMPANY INFORMATION MUST BE REMOVED FROM COPIES IF INFORMATION IS RE-USED.
- THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.
- THE MAIN CONTRACTOR IS RESPONSIBLE FOR ALL OCCURRENCES OF GROUND WATER DURING THE CONSTRUCTION PERIOD.
- ANY INFORMATION GIVEN REGARDING EXISTING UNDERGROUND SERVICES IS GIVEN IN GOOD FAITH AFTER CONSULTATION WITH THE RELEVANT AUTHORITY, HOWEVER ACCURACY IS NOT CERTAIN. THE MAIN CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL INFORMATION ON SITE PRIOR TO WORK COMMENCING AND TAKING DUE CARE AND ATTENTION WHILST UNDERTAKING THE WORKS.
- THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.

DRAINAGE NOTES:

- ALL WORKS TO BE CONSTRUCTED IN STRICT ACCORDANCE WITH SPECIFICATION OF THE LOCAL AUTHORITY, BS8301:1985 & BS EN 752-1.
- ALL PIPE RUNS NEAR BUILDINGS TO COMPLY WITH THE BUILDING REGULATIONS 2002 PART H. WHERE A PIPE IS WITHIN 1m OF A FOUNDATION THE TRENCH SHALL BE FILLED WITH CLASS GEN3 CONCRETE UP TO THE LOWEST LEVEL OF THE FOUNDATION. WHERE THE TRENCH IS FURTHER THAN 1m FROM THE FOUNDATION, THE TRENCH SHALL BE FILLED WITH CLASS GEN3 CONCRETE TO A LEVEL BELOW THE LOWEST LEVEL FOR THE FOUNDATION EQUAL TO THE DISTANCE FROM THE FOUNDATION LESS 150mm. IN BOTH CASES THE PIPE SHALL BE BEDDED AND SURROUNDED BY 150mm THICK CLASS GEN3 CONCRETE.
- WHERE PIPES, EXTERNAL TO THE STRUCTURES, HAVE A DEPTH TO SOFFIT FROM GROUND LEVEL OF LESS THAN 450mm THEY SHALL HAVE A CLASS GEN3 CONCRETE ENCASMENT (150mm THICK).
- WHERE A PIPE, UNDER A CARRIAGEWAY, HAS A DEPTH OF COVER OF LESS THAN 1.2m THE PIPE SHALL BE LAID IN A CLASS Z BEDDING.
- IN ANY CIRCUMSTANCES WHERE PIPES ARE BEDDED AND SURROUNDED IN CONCRETE FLEXIBLE JOINTS SHOULD BE PROVIDED. COMPRESSIBLE BOARDS (FIBREBOARD OR POLYSTYRENE) SHALL BE PROVIDED AT A MAXIMUM OF 8m CENTRES (COINCIDING WITH PIPE JOINTS). THE BOARDS SHALL BE PRE-CUT TO PIPE DIAMETER AND TO A HEIGHT AND WIDTH EQUAL TO THE CONCRETE CROSS SECTION. A BOARD THICKNESS OF 18mm FOR PIPES UP TO 450mm NOMINAL DIAMETER AND 24mm FOR PIPES OVER 450mm NOMINAL DIAMETER.
- ALL PRIVATE BUILDING DRAINAGE SHALL BE CONSTRUCTED IN STRICT ACCORDANCE WITH BS EN 752-1. UNLESS OTHERWISE SPECIFIED BUILDING DRAINAGE SHALL BE 100mm DIAMETER AND SHALL BE LAID AT A MINIMUM GRADIENT OF 1:100 (1% MIN). ALL BUILDING DRAINAGE SHALL BE LAID IN CONJUNCTION WITH THE MANUFACTURER'S SPECIFICATION. IF UPVC PIPES ARE TO BE USED THEN THE MANUFACTURER SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
- ALL PIPES, JOINTS AND JUNCTION MATERIALS SHALL BE VERIFIED EXACT, EXTRA STRENGTH OR SUPER STRENGTH TO BS EN 12201-1991, WITH FLEXIBLE JOINTS AND AFTERMARK CERTIFIED. ALTERNATIVELY ALL PIPES AND FITTINGS CAN BE UPVC CONFORMING TO BS4460 AND BS8418:1989 AS APPROPRIATE AND SHALL BE LAID IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION. IF UPVC PIPES ARE TO BE USED THEN THE MANUFACTURER SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
- ALL GULLIES TO BE RODDABLE OR CONNECTED TO INSPECTION CHAMBERS.
- ALL GULLY CONNECTIONS OTHER THAN AT MANHOLES TO BE 'Y' JUNCTIONS.
- GULLIES CONCURRENT WITH PEDESTRIAN/DRIVE CROSSINGS TO HAVE PEDESTRIAN TYPE GULLY COVERS.
- ALL ROAD GULLY CONNECTIONS TO BE 150mm DIAMETER.
- ALL SILEN STACKS TO BE FITTED WITH AIR ADMITTANCE VALVES WHERE BRANCH DRAIN EXCEEDS 12m EXCEPT AT THE HEAD OF THE RUN. SOIL VENT PIPES LOCATED AT THE HEAD OF A RUN TO BE INSTALLED WITH ROOF TILE VENT.
- ALL CONNECTIONS TO BE SUFFICIENT TO SOFFIT.
- TRENCH TEMPORARY FORMWORK IS REQUIRED TO ALL EXCAVATIONS EXCEEDING 1.2m DEPTH TO PROVIDE ADEQUATE SUPPORT AND STABILITY AT ALL TIMES.
- SEWERS EXCEEDING 1.2m DEPTH TO BE CONSTRUCTED IN SINGLE SECTIONS BETWEEN MANHOLES ONLY. TRENCHES TO BE BACKFILLED PRIOR TO EXCAVATING THE SUCCEEDING SEWER RUN.
- ALL CONCRETE AND CONCRETE PRODUCTS TO BE IN ACCORDANCE WITH BRE 365 FOR SUPPLIERS.
- WHERE SEWER OR DRAINS ARE TO BE ABANDONED THEY SHALL BE REMOVED OR FILLED BY GROUTING IN ACCORDANCE WITH THE CIVIL ENGINEER SPECIFICATION FOR THE WATER INDUSTRY 6TH EDITION, CLAUSE 5.23.

ADOPTABLE NOTES:

- ALL ADOPTABLE SEWERS SHALL BE IN STRICT ACCORDANCE WITH SEWERS FOR ADOPTION 6TH EDITION. UNLESS OTHERWISE STATED ADOPTABLE SEWERS SHALL BE 150mm DIAMETER AND SHALL BE LAID AT A MINIMUM GRADIENT OF 1:100 (1% MIN). ALL BUILDING DRAINAGE SHALL BE LAID IN CONJUNCTION WITH THE MANUFACTURER'S SPECIFICATION. IF UPVC PIPES ARE TO BE USED THEN THE MANUFACTURER SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
- ALL SOAKAWAY AND/OR INFILTRATION PITS TO SATISFY BUILDING CONTROL, OFFICE/ENVIRONMENT AGENCY.
- ALL ADOPTABLE ROADWORK SHALL BE IN STRICT ACCORDANCE WITH THE LOCAL AUTHORITY SPECIFICATIONS.
- ALL MATERIALS TO BE AGREED WITH THE LOCAL AUTHORITY PRIOR TO THE COMMENCEMENT OF WORKS.
- ALL FINISHED FLOOR LEVELS SHOWN ARE FOR GUIDANCE ONLY AND MAY NEED TO BE ADJUSTED ON SITE, SUBJECT TO APPROVAL.
- ANY DAMAGE CAUSED TO THE ADJACENT HIGHWAY AS A RESULT OF THE DEVELOPMENT WORK MUST BE REINSTATED AS NECESSARY FOLLOWING AGREEMENT WITH HANTS COUNTY COUNCIL HIGHWAY INSPECTOR.
- NO PRIVATE AREAS TO DRAIN ONTO AREAS ALREADY ADOPTED AND NO PRIVATE SURFACE WATER DRAINAGE TO BE DISCHARGED INTO ANY HIGHWAY GULLY, HIGHWAY SURFACE WATER DRAIN, MANHOLE OR SOAKAWAY MAINTAINED BY HANTS COUNTY COUNCIL.
- MANHOLE COVERS AND FRAMES SITUATED IN THE CARRIAGEWAY AND VEHICULAR ACCESSES SHALL BE CLASS D400 COVER AND FRAME 675x675mm CLEAR OPENING IN ACCORDANCE WITH EN 124.
- MANHOLE COVERS AND FRAMES SITUATED IN AREAS OTHER THAN THE CARRIAGEWAY AND VEHICULAR ACCESSES SHALL BE EN 125 CLASS B125 COVER AND FRAME 675x675mm CLEAR OPENING.

ARUN DISTRICT COUNCIL			
No.	AL	27	01 0X

PRELIMINARY

PI	INITIAL ISSUE	31.01.08	DF	HJA
Rev.	Description	Date	Drawn	Reviewed
<div> <div> </div> <div> Fareham Office Opus International Consultants (UK) Ltd Modulus House Salisbury Lane Fareham Hampshire PO16 0QS Telephone: 01329 825221 Facsimile: 01329 825274 website: www.opusinternational.co.uk email: Fareham@opusinternational.co.uk </div> </div>				
Client:	WILSON HOME DEVELOPMENTS			
Project:	REDEVELOPMENT AT THE HOMESTEAD WESTERGATE			
Org.Title:	CONSTRUCTION DETAILS (PRIVATE) SHEET 1			
Scale:	As Shown	Drawn:	DMF	Reviewed: MJA
Org.No:	6902(A1)300	Rev:	P1	Date: FEB 08
Status:	PRELIMINARY			