CONCRETE
BURIED CONCRETE, INCLUDING PRECAST CONCRETE TO BE DESIGNED TO BRE DIGEST 1, CONCRETE IN AGRESSIVE GROUND. SULPHATE RESISTING CEMENT SHALL BE USED UNLESS AN ALTERNATIVE IS AGREED WITH THE SUPERVISING OFFICER/ENGINEER

FOR DESIGNED, DESIGNATED OR STANDARDISED PRESCRIBED CONCRETE REFER TO BS EN 206-1 AND BS 8500. THEY SHALL HAVE A 20mm NOMINAL MAXIMUM SIZE OF AGGREGATE, AND A SLUMP CLASS S2 FOR TARGET 70mm AND NO ADMIXTURES

PIPES
CONCRETE PIPES TO BE TO BS EN 1916 & BS 5911-1, CLAYWARE PIPES TO BE TO BS EN 295. DUCTILE IRON PIPES TO BE TO BS EN 598

BACKFILL TO TRENCHES - WITHIN HIGHWAYS
ALL TRENCHES SITUATED WITHIN HIGHWAYS OR PROSPECTIVE HIGHWAYS TO BE BACKFILLED IN ACCORDANCE WITH THE LOCAL HIGHWAY AUTHORITY REQUIREMENTS OR IF NONE AVAILABLE IN ACCORDANCE WITH CLAUSE 3.6.4 OF CESWI, i.e. HAUC SPECIFICATION FOR THE REINSTATEMENT OF OPENINGS IN HIGHWAYS APPENDIX A1 CLASSES A,B,C,D..

BACKFILL TO TRENCHES - OUTSIDE HIGHWAYS BELOW HARD PAVED AREAS
BACKFILL TO BE SAME AS WITHIN HIGHWAYS

BACKFILL TO TRENCHES - OUTSIDE HIGHWAYS BELOW SOFT AREAS
BACKFILL TO BE SAME AS WITHIN HIGHWAYS

GRANULAR BEDDING AND SURROUND
GRANULAR BEDDING FOR PIPES AND BACKFILLING MATERIAL FOR TEMPORARY DRAINS (TRENCH SUB-DRAINS), SHALL COMPLY WITH CLAUSE 2.88 OF CESWI, SIZED IN ACCORDANCE WITH THE FOLLOWING TABLE:

NOMINAL BORE OF PIPE (mm)	ALTERNATIVE AGGREGATE SIZES (mm)		CF VALUE MAX
	SINGLE-SIZED	GRADED	
100 150	10	-	0.2
225-300	10 or 14	14 to 5	0.2
375-525	10, 14 or 20	14 to 5 or 20 to 5	0.2
EXCEEDING	14, 20 or 40	14 to 5 or 20 to 5	0.15
		14 to 5, 20 to 5 or 40 to 5	0.5

REFERENCE SHOULD BE MADE TO BS 882 TABLE 4.

TRENCH WIDTH
NOTE THE MAXIMUM TRENCH WIDTH MUST NOT BE EXCEEDED. IF THE WIDTH IS EXCEEDED THE CONTRACTOR MUST SUBMIT REVISED BEDDING PROPOSALS TO THE SUPERVISING OFFICER/ENGINEER.

SOFT SPOTS AND OVERDIG
SOFT SPOTS SHALL BE REMOVED FROM THE BOTTOM OF THE TRENCH AND OTHER EXCAVATIONS AND THEN BE REFILLED TO FORMATION LEVEL WITH THE SAME MATERIAL AS THE PERMANENT WORK WHICH IS TO REST ON THAT FORMATION. OVERDIG SHALL BE TREATED IN THE SAME MANNER AT CONTRACTORS EXPENSE AS INSTRUCTED BY THE SUPERVISING OFFICER/ENGINEER.

INVERT LEVELS
ALL CHANNELS IN CHAMBERS TO HAVE A SMOOTH TRANSITION BETWEEN INCOMING AND OUTGOING PIPE GRADIENTS ACROSS THE WIDTH OF THE CHAMBER.

SHORT PIPES AT CHAMBERS/ROCKER PIPES
NOT WITHSTANDING SPECIFIC REQUIREMENTS FOR INDIVIDUAL CHAMBER TYPES ALL PIPES LEADING TO AND FROM CHAMBERS MUST MEET THE REQUIREMENTS OF CLAUSE 5.19 OF CESWI.

MANHOLE CHAMBERS
ALL PIPES SHALL BE LAID SOFFIT TO SOFFIT UNLESS STATED OTHERWISE ON THE MANHOLE SCHEDULE.
MANHOLES, SOAKAWAYS & COVER SLABS TO BE BS EN 1917 AND BS 5911-3.
PREFORMED SWEPT CHANNELS SHALL BE USED AT JUNCTIONS AND NO BRANCH SHALL ENTER AT LESS THAN 90 DEGREES FROM THE OUTGOING SEWER.

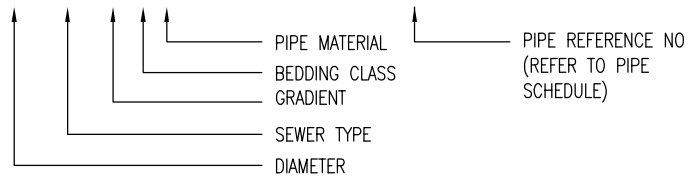
MANHOLE ACCESS SIZE
675mm x 675mm IS THE MINIMUM COVER SLAB OPENING. AN ADJUSTING UNIT TO BE USED OR CORBELLED BRICKWORK FOR 600mm x 600mm COVERS.

MANHOLE COVERS
ALL MANHOLE COVERS SHOULD BE IN ACCORDANCE WITH CLAUSE 5.2.32 OF SEWERS FOR ADOPTION AND BE BEDDED AND HAUNCHED IN MORTAR.
ALL COVERS TO ADOPTABLE MANHOLES SHALL BE MARKED FW OR SW IF ON A FOUL OR SURFACE WATER SEWER RESPECTIVELY.
THEY SHALL BE COATED WITH BLACK BITUMINOUS COMPOSITION IN ACCORDANCE WITH BS EN124.
WHERE THERE IS DOUBT AS TO WHICH COVER SHOULD BE USED, A STRONGER CLASS SHOULD BE SELECTED.
INFILL COVERS SHALL NOT BE USED FOR ADOPTABLE SEWERS. WHERE A COVER IS LOCATED IN BLOCK PAVING, THE FRAME SHALL BE 150 DEEP.
FRAMES FOR MANHOLES SHALL BE BEDDED IN POLYESTER RESIN BEDDING MORTAR IN NRSWA CATEGORIES I, II OR III.
ALL MANHOLE FRAMES TO BE SET PARALLEL TO ADJACENT KERBS OR NEAREST BUILDINGS.
MANHOLE COVERS AND FRAMES TO BE FLUSH WITH SURFACE ±5mm MAX.

CONCRETE PROTECTION TO PIPES
TO BE IN ACCORDANCE WITH CLAUSE 5.3 OF CESWI. AT THE DISCRETION OF THE ENGINEER, AWAY FROM CHAMBERS AND WHERE GROUND CONDITIONS PERMIT THE LENGTH OF UNINTERRUPTED CONCRETE PROTECTION MAY BE INCREASED TO 8m.

COMPRESSIBLE FILLER FOR PIPELINES.
TO BE USED TO INTERRUPT CONCRETE PROTECTION TO PIPELINES AND SHALL COMPLY WITH CLAUSE 2.19 OF CESWI.

PIPELINE ABBREVIATIONS ON DRAINAGE DRAWINGS
150ø FWS 1:43 N VC OR 12.003



PIPE MATERIAL
VC VITRIFIED CLAY
C CONCRETE
DI DUCTILE IRON

SEWER TYPE
FWS FOUL WATER SEWER
SWS SURFACE WATER SEWER

PROPRIETARY PRODUCTS
REFERENCE SHALL BE MADE TO THE MANUFACTURER'S INSTRUCTIONS. CONSIDERATION WILL BE GIVEN TO ALTERNATIVE PRODUCTS OF EQUAL QUALITY BUT THE CONTRACTOR MAY NOT USE A SUBSTITUTE MATERIAL WITHOUT PRIOR WRITTEN APPROVAL OF THE SUPERVISING OFFICER/ENGINEER.

DO NOT SCALE

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAINAGE LAYOUTS, SCHEDULES AND DETAILS.

2. ALL DRAINAGE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH SPECIFICATION FOR HIGHWAY WORKS SHW AND THE CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 6TH EDITION, PUBLISHED BY THE UK WATER INDUSTRY RESEARCH LTD. (CESWI)

3. SURFACE WATER DRAINAGE SYSTEMS ARE TO BE CONSTRUCTED TO THE SHW - FOR ADOPTION BY THE HIGHWAY AUTHORITY. FOUL WATER DRAINAGE SYSTEMS ARE TO BE CONSTRUCTED TO THE CESWI - FOR ADOPTION BY THAMES WATER.

4. ALL DRAINAGE DRAWINGS HAVE BEEN PRODUCED TO THE DESIGN RECOMMENDATIONS OF SEWERS FOR ADOPTION 6TH EDITION.

5. ALL PRIVATE DRAINAGE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE BUILDING REGULATIONS (2000) APPROVED DOCUMENT H.

REV	DATE	BY	DESCRIPTION	CHK	APD
C	03/12/08	JH	ISSUED FOR TECHNICAL APPROVAL	JAM	GH
B	28/05/08	DP	MINOR AMENDMENTS	LH	JM
A	17/09/07	DAH	FIRST ISSUE	JM	JDP

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COUNTRYSIDE PROPERTIES

ARCHITECT:

PROJECT:
SOUTH WEST BICESTER
BICESTER, OXFORDSHIRE

TITLE:
SECTION 278 WORKS
DRAINAGE NOTES

SCALE @ A3:	CHECKED:	APPROVED:
N.T.S.	JM	JDP
CAD FILE:	DESIGN-DRAWN:	DATE:
1903-SD-014.DWG	DAH	September 2007

PROJECT No:	DRAWING No:	REV:
11011903	1903/SD/014	C