

**DRAINAGE NOTES.**

- 1) THE BASE SPECIFICATION FOR ALL ADOPTABLE DRAINAGE WORKS SHALL BE THE WATER AUTHORITIES ASSOCIATION SEWERS FOR ADOPTION (LATEST EDITION). FOR PRIVATE (NON-ADOPTABLE) DRAINAGE WORKS, THE BASE SPECIFICATION SHALL BE THE WATER INDUSTRY RESEARCH LTD. CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY (LATEST EDITION) SUPPLEMENTED BY ANY PROJECT SPECIFIC NBS DRAINAGE SPECIFICATION.
- 2) THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DETAILS.
- 3) ALL EXTERNAL BUILDING AND CAR PARK DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH THE ABOVE RELEVANT SPECIFICATION(S) AND APPROVED DOCUMENT PART H OF THE BUILDING REGULATIONS (LATEST EDITION).
- 4) PIPES UP TO AND INCLUDING 150mm DIA TO BE CLAYWARE TO BS EN 295 (28kN/m CRUSHING STRENGTH).
- 5) ALL PIPE RUNS TO BE LAID WITH FLEXIBLE JOINTS.
- 6) ALL PIPES ENTERING AND EXITING MANHOLES ARE TO BE CONNECTED WITH PIPE SOFFITS LEVEL UNLESS NOTED OTHERWISE.
- 7) BEDDING AND SURROUND TO BE AS FOLLOWS :-

LOCATION	COVER TO SOFFIT	BEDDING
ROADS	>1.2m	CLASS 'S' GRANULAR BED AND SURROUND.
	<1.2m	CLASS 'Z' CONCRETE SURROUND.
NON-ADOPTABLE SEWERS BELOW CAR PARKING.	>0.9m	CLASS 'S' GRANULAR BED AND SURROUND.
	<0.9m	CLASS 'Z' CONCRETE SURROUND.
HARD AND SOFT LANDSCAPING.	>0.6m	CLASS 'S' GRANULAR BED AND SURROUND.
	<0.6m	CLASS 'Z' CONCRETE SURROUND.

8) THE FOLLOWING CONCRETE MIXES ARE TO BE USED (ALL IN ACCORDANCE WITH BS5328) :-

STANDARD MIX REFERENCE.	APPLICATIONS
GEN 1 (10N/mm <sup>2</sup> )	FILLINGS, BLINDINGS, SOFT SPOTS AND DRAINAGE SUMPS.
GEN 3 (20N/mm <sup>2</sup> ) SULPHATE CLASS DS-2, AEC CLASS 1	ALL OTHER APPLICATIONS

THE ABOVE CONCRETE MIXES HAVE BEEN SELECTED IN ACCORDANCE WITH BRE SPECIAL DIGEST 1 - CONCRETE IN AGGRESSIVE GROUND.

9) ALL PRECAST CONCRETE PRODUCTS (E PIPES, MANHOLES RINGS ETC.) SHALL BE OF SUITABLE CONCRETE MIX TO CATER FOR SULPHATE CLASS DS-1.

10) PRE-FORMED CHANNELS ARE TO BE USED IN MANHOLES WHERE APPLICABLE.

11) GRANULITHIC CONCRETE BENCHING TO BE STEEL TROWELLED TO A DENSE SMOOTH FACE NEATLY SHAPED AND FINISHED TO ALL BRANCH CONNECTIONS AND LAID IN ACCORDANCE WITH THE SPECIFICATION.

12) ALL CONNECTIONS TO BE TURNED IN DIRECTION OF FLOW USING PIPE BENDS.

13) MANHOLE COVERS AND FRAMES SHALL BE DUCTILE IRON GROUP 4 CLASS D400 DOUBLE TRIANGULAR TO BS EN124 IN VEHICULAR TRAFFICKED AREAS.

14) MANHOLE COVERS AND FRAMES SHALL BE DUCTILE IRON GROUP 2 CLASS B125 CIRCULAR OR RECTANGULAR TO BS EN124 POSITIONS OUTSIDE VEHICULAR TRAFFICKED AREAS.

15) DRAINAGE CHANNEL GRATINGS SHALL BE DUCTILE IRON GROUP 4 CLASS D400-E600 TO BS EN124

16) FIRST FLEXIBLE JOINT IN PIPES ADJACENT TO A MANHOLE SHALL BE A MAXIMUM OF 600mm FROM INSIDE FACE OF MANHOLE, CONNECTING TO A ROCKER PIPE. THE LENGTH OF ROCKER PIPE SHALL BE AS FOLLOWS:-

PIPE DIAMETER	LENGTH OF ROCKER PIPE.
150mm-600mm	600mm
675mm-750mm	1000mm
825mm & over	1250mm

17) MANHOLES WITH OUTGOING PIPES GREATER THAN 600mm DIAMETER SHALL BE FITTED WITH GUARD BARS, SAFETY CHAINS OR OTHER SAFETY DEVICES.

18) THE PRINCIPAL CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING THE EXISTING LINE AND INVERT LEVELS OF ANY CONNECTION POINTS FOR BOTH THE FOUL AND SURFACE WATER SYSTEMS, PRIOR TO UNDERTAKING INSTALLATION OF ANY NEW DRAINAGE WORKS. ANY DEVIATION TO THE LEVELS AND POSITIONS INDICATED ON THE DRAWING SHOULD BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE PROJECT ENGINEER.

19) ALL INVERTS SPECIFIED ARE OUTGOING (EXCEPT BACKDROP)

20) ROAD GULLY CONNECTIONS TO BE 150mm DIA. LAID AT A MINIMUM GRADIENT OF 1:150 UNLESS NOTED OTHERWISE.

21) R/W CONNECTIONS TO BE 100/110mm DIA. LAID AT MINIMUM GRADIENT OF 1:80 UNLESS NOTED OTHERWISE.

22) ALL FOUL CONNECTIONS TO BE 100mm DIA. MIN LAID AT A MINIMUM GRADIENT AS SPECIFIED IN THE BUILDING REGS PART H.

23) ALL CONNECTIONS TO BE MADE BY PURPOSE MADE JUNCTIONS AS FAR AS PRACTICABLE.

24) INTERNAL INSPECTION CHAMBERS & ACCESS FITTINGS TO BE PROVIDED WITH LOCKABLE DOUBLE SEALED MANHOLE COVER & FRAMES GRADE A15, B125 OR D400 TO BS EN 124 TO SUIT LOADING CONDITIONS.

25) ALL DRAINS TO BE TESTED PRIOR TO BACKFILLING, AFTER BACKFILLING AND UPON COMPLETION OF HARD LANDSCAPING. IN ADDITION ALL DRAINS TO BE INSPECTED BY CCTV METHODS PRIOR TO HARD LANDSCAPING WHERE REQUIRED BY THE SPECIFICATION.

26) ALL DRAINAGE WORKS WITHIN THE ZONE OF INFLUENCE OF TREES ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE NHBC STANDARDS AND TREE PRESERVATION OFFICERS REQUIREMENTS.

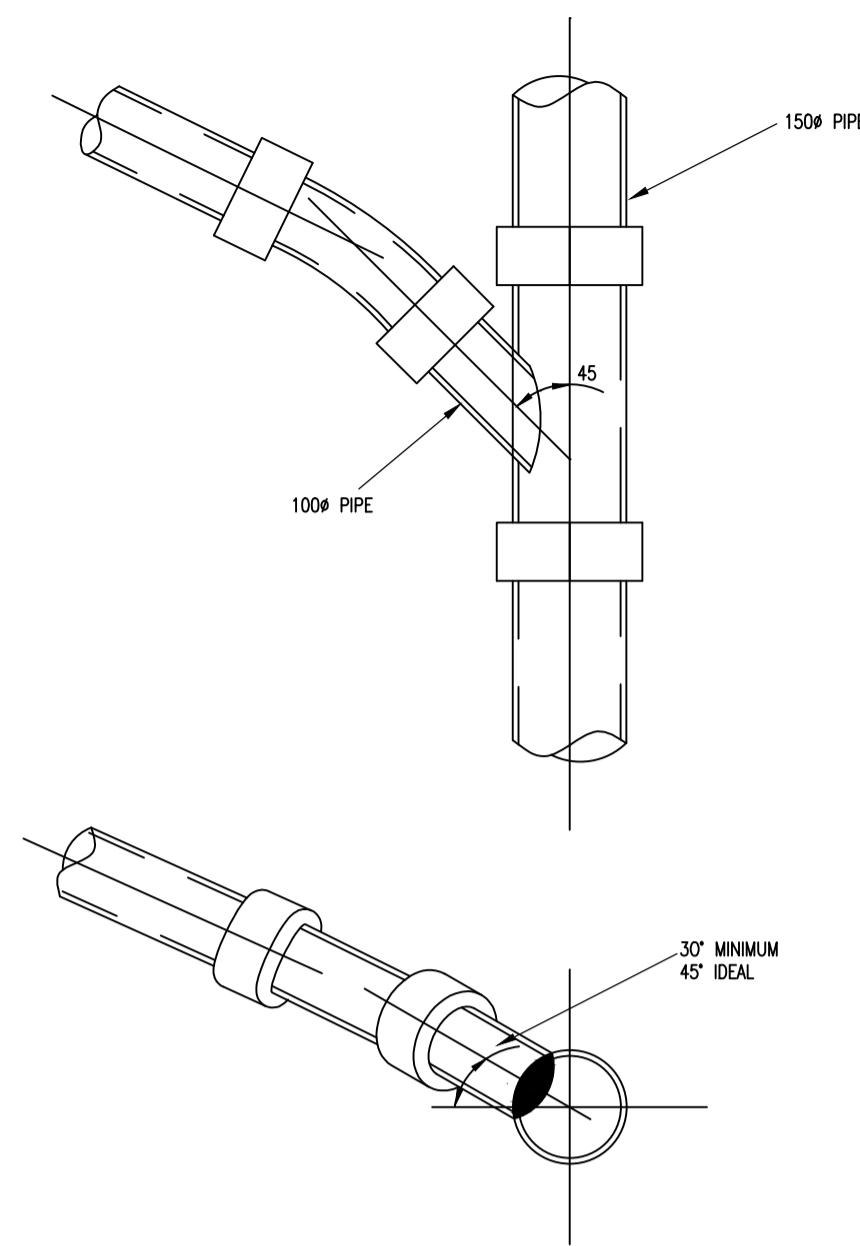
27) ALL CONTRACTOR-DESIGNED RAINWATER DRAINAGE SYSTEMS ARE TO BE CHECKED BY THE M&E CONSULTANT PRIOR TO INSTALLATION.

28) DO NOT SCALE THIS DRAWING. ALL DIMENSIONS MUST BE CHECKED/ VERIFIED ON SITE. IF IN DOUBT ASK.

29) ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE. ALL LEVELS IN METRES UNLESS NOTED OTHERWISE.

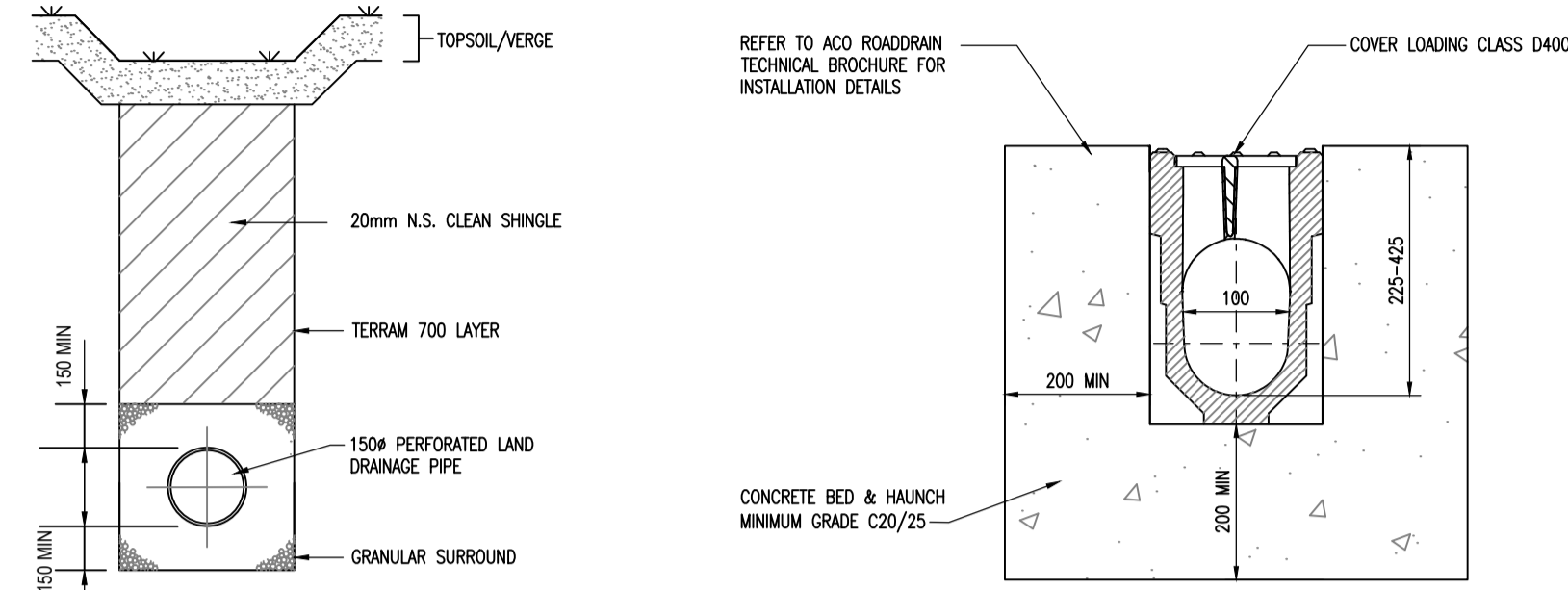
30) ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.

31) PIPE RUNS UNDER BUILDINGS TO BE AIR AND CCTV TESTED PRIOR TO BACKFILL/SLAB CASTING.



**TYPICAL BRANCH DETAIL**

(1:10)



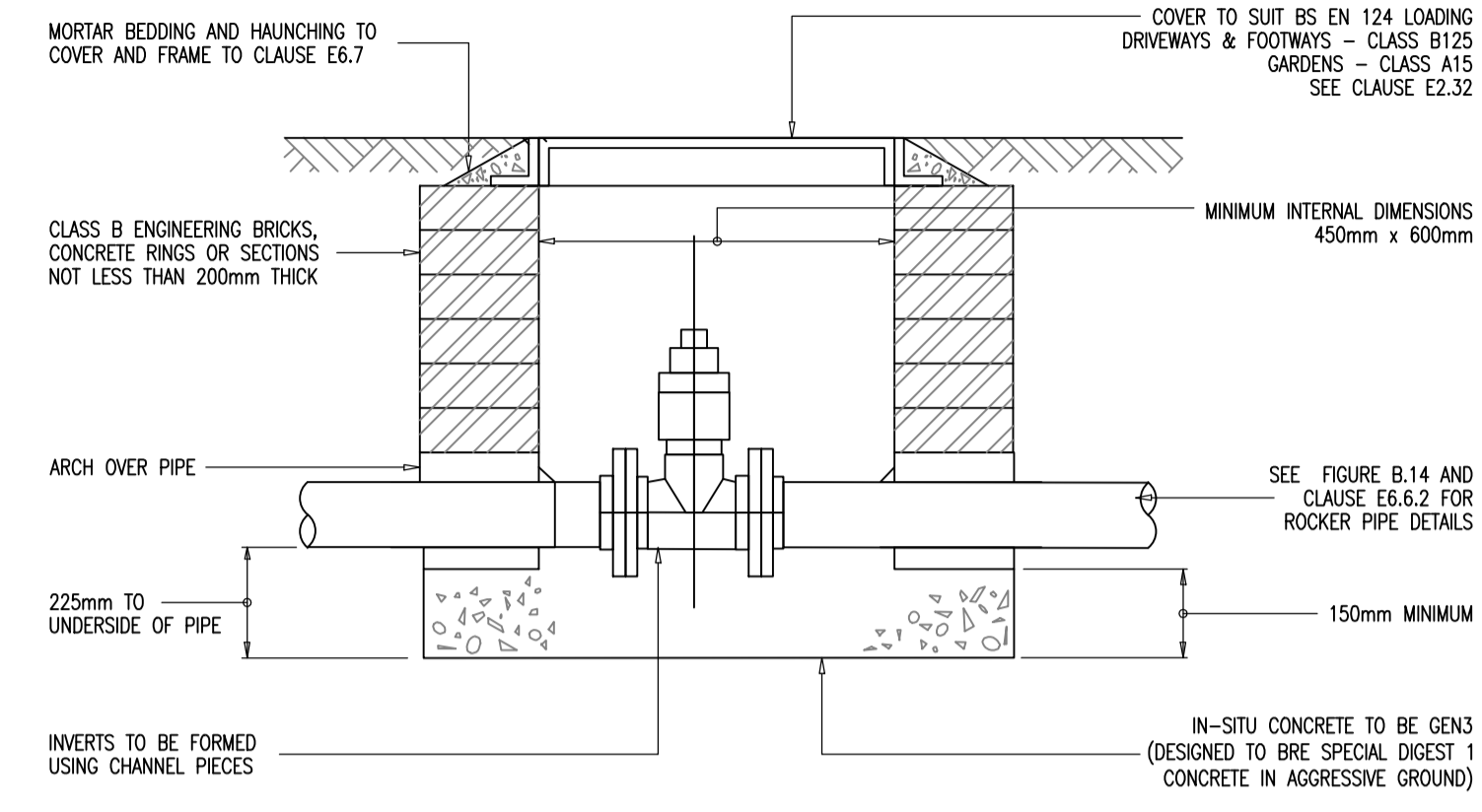
**ACO ROADRAIN DETAIL**

(PD100F CHANNEL)

(NTS)

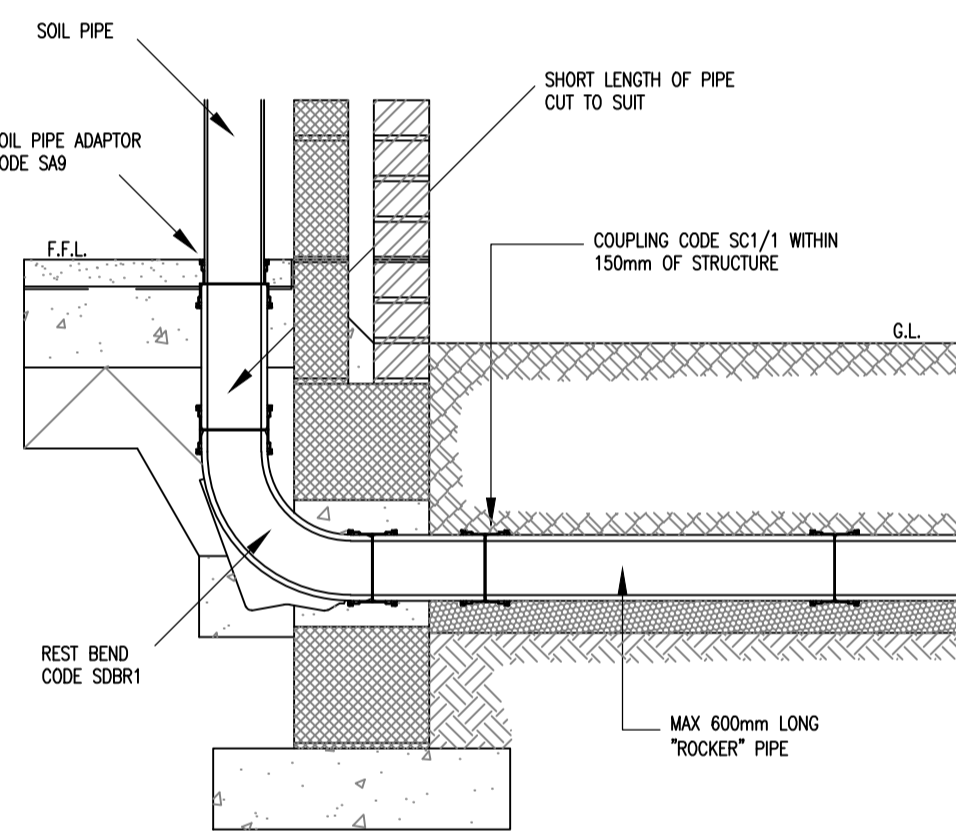
**LAND DRAIN (FRENCH DRAIN) DETAIL**  
(TEMPORARY INTERCEPT AND AROUND YARD EDGES)

(1:25)



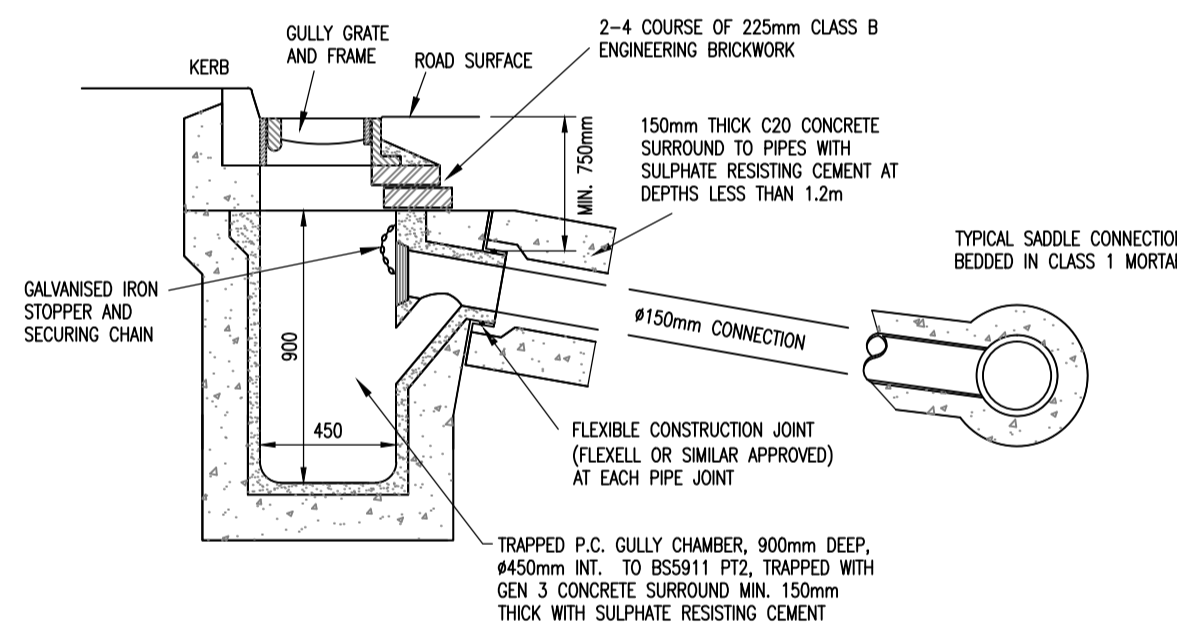
**VALVE CHAMBER**

(NTS)



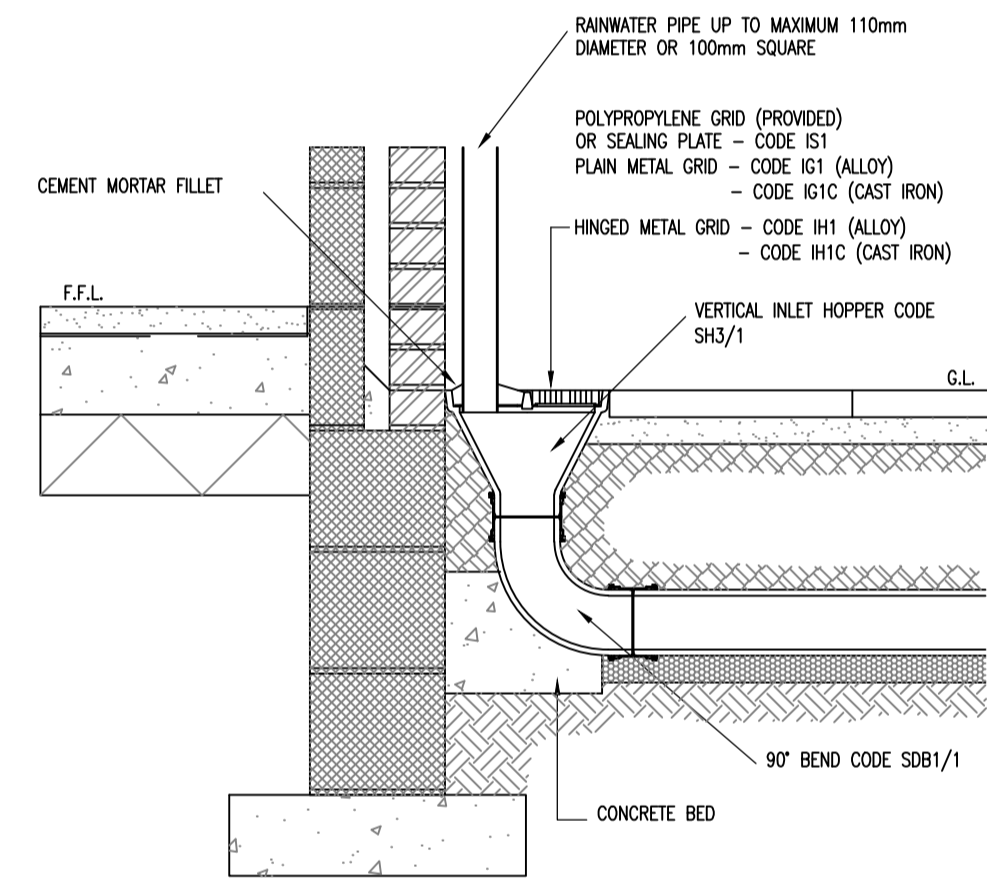
**SOIL & VENT PIPE/STUB STACK/W.C. CONNECTION DETAIL**

(NTS)



**ROAD GULLY DETAIL**

(1:25)

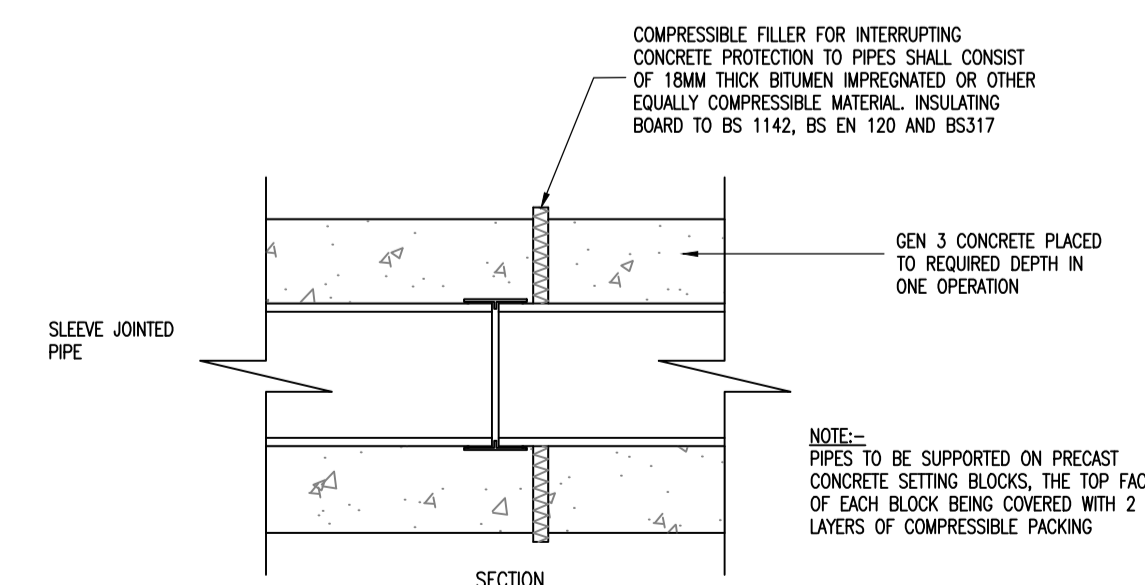


**EXTERNAL RAINWATER PIPE CONNECTION DETAIL**

(OR TO RAINWATER HARVESTING SYSTEM AS INDICATED)

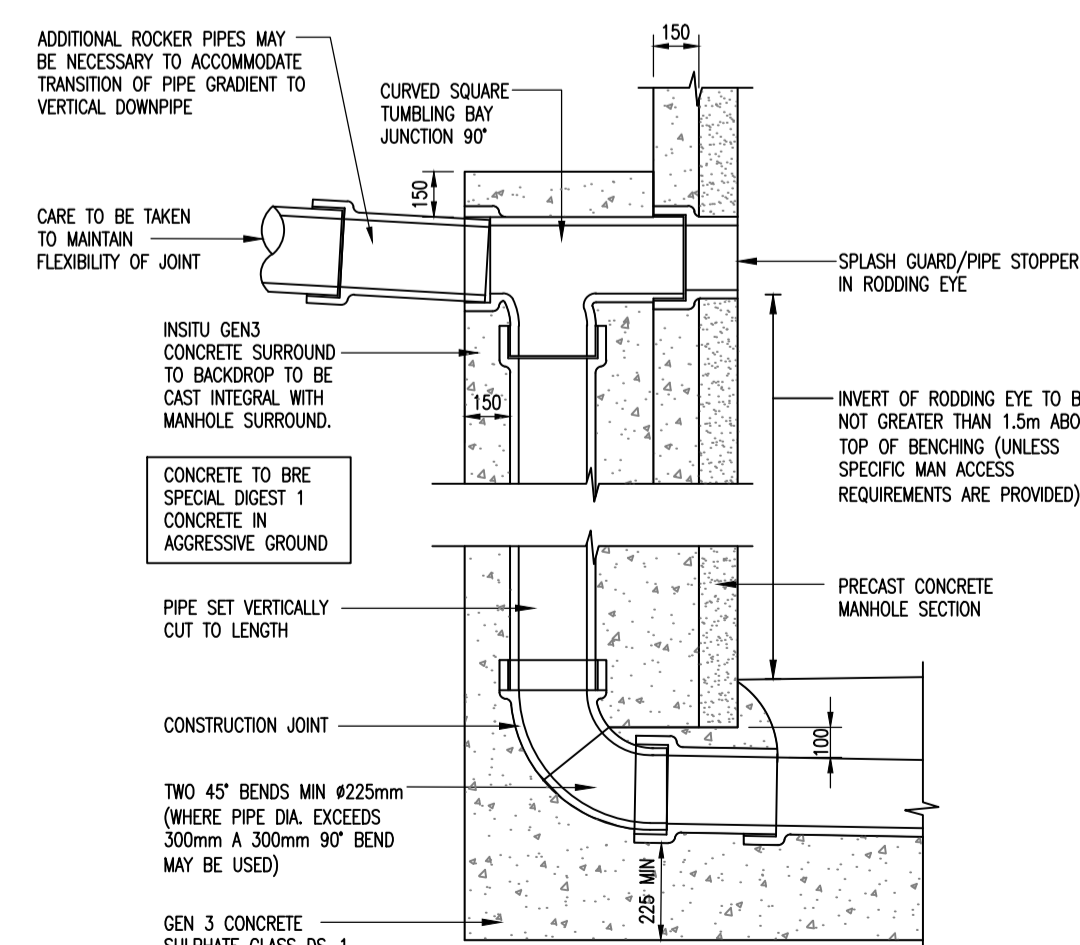
(NTS)

NOMINAL DIAMETER OF PIPE (mm)	THICKNESS OF COMPRESSIBLE FILLER (mm)
LESS THAN 450	18
450 - 1200	36
GREATER THAN 1200	54



**PROTECTION OF A SHALLOW PIPELINE & PIPES UNDER BUILDINGS USING CONCRETE SURROUND**

(1:25)

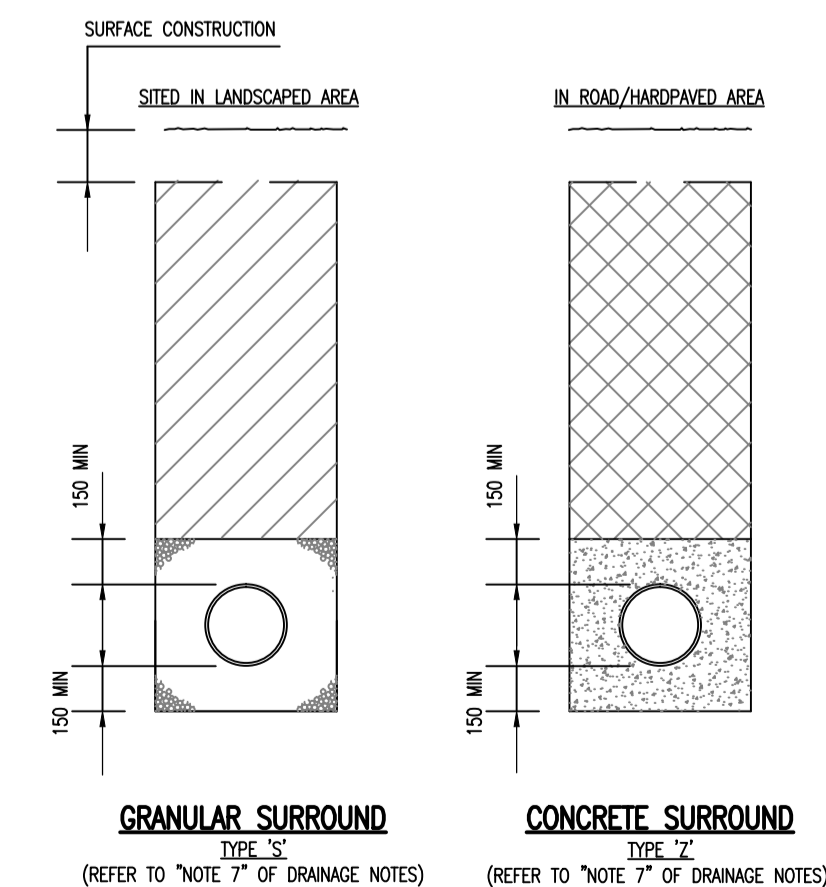


**TYPICAL VERTICAL BACKDROP DETAIL**

(1:25)

TRENCH WIDTHS	
DIA OF DRAIN	WIDTH
100	550
150	600
225	700
300	750
375	1050
450	1150
525	1200
600	1350
675	1450
750	1500
825	1600
900	1900
975	2000
1050	2300
1200	2300
OVER 1200	DIAMETER + 1000
GRANULAR MATERIAL	
DIA OF DRAIN	AGGREGATE
100	10mm SINGLE SIZE
150	10 OR 14mm SINGLE SIZE OR 14-5mm GRADED *
150-500	10, 14 OR 20mm SINGLE SIZE OR 20-5mm GRADED *
OVER 500	10, 14, 20 OR 40mm SINGLE SIZE OR 40-5mm GRADED *

\* NON PREFERRED



**TYPICAL PIPE BEDDING AND TRENCH DETAILS**

(1:25)

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**GENERAL NOTES**

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEER'S, ARCHITECT'S OR OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.
2. ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO PREPARING ANY WORKING DRAWINGS OR COMMENCING ON SITE.
3. THE CONTRACTOR MUST ENSURE AND WILL BE HELD RESPONSIBLE FOR THE OVERALL STABILITY OF THE BUILDING/STRUCTURE/EXCAVATION AT ALL STAGES OF THE WORK.
4. ALL WORK BY THE CONTRACTOR MUST BE CARRIED OUT IN SUCH A WAY THAT ALL REQUIREMENTS UNDER THE HEALTH AND SAFETY AT WORK ACT ARE SATISFIED.
5. ALL WORK IS TO BE CARRIED OUT IN COMPLIANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES AND REGULATIONS.
6. DESIGN BASED ON MADE GROUND CBR <2%.

Rev	Date	Description	By
A06	08.04.15	ISSUED FOR PLANNING	ROS
A05	15.10.13	VALVE CHAMBER DETAIL ADDED.	SJ
A04	02.10.13	MANHOLE DETAILS AND INTERNAL WASHDOWN GULLY REMOVED, RAINWATER PIPE DETAIL AMENDED AND SOIL PIPE DETAIL ADDED. LAND DRAIN DETAIL AMENDED, BRANCH CONNECTION DETAIL AND NOTE 31 ADDED.	SJ
A03	01.10.13	ACCESS CHAMBER DETAIL REMOVED; CHARCON DETAIL ADDED	AW
A02	26.09.13	DRAWING TITLE AND NOTES AMENDED.	SJ
A01	18.09.13	FIRST ISSUE	SJ

Amendments

Project **ENVIROPARKS, HIRWAUN**

Title **CONSTRUCTION DETAILS (SHEET 2 OF 4)**

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Drawing Status **PLANNING**

Designed by **AS** Checked by **AS** Project No **14979-**

Drawn by **SJ** Date **AUGUST 2013** Computer File No **CI-14979-SA-90-004-A06.dwg**

Scales @ A1 work to figured dimensions only **AS SHOWN**

Publisher	Zone	Category	Number	Revision
<b>CIV</b>	<b>SA</b>	<b>90</b>	<b>0004</b>	<b>A06</b>