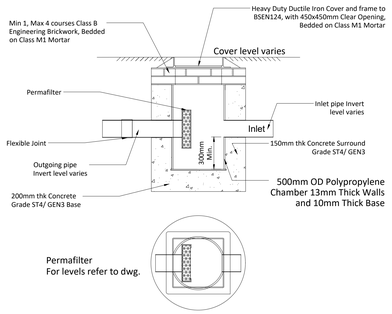


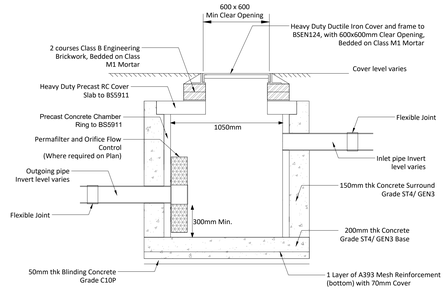
Material Type	Binding layer below Permavoid Material to BS EN 13242: 2002	SubAgg Permeable Sub-base to BS EN 13242 and BS 7533 Pt 13
Properties	**Category to BS EN 13242**	**Category to BS EN 13242**
Grading	Grading 4/10, 4/20, 6/10, 10/20 or 2/14 (as specified for pipe bedding, haunching and surrounding material in Table 5/3 of the Specification for Highway Works) $G_C 85 - 20$, GT_{20}	Specific Proprietary Grading to achieve minimum 30% Void ratio
Fines content	f_4	f_4
Shape	FI_{20}	FI_{20}
Resistance to fragmentation	LA_{30}	LA_{30}
Durability: — Water absorption to BS EN 1097-6:2000, Clause 7	$WA_{24}2$	$WA_{24}2$
— For WA > 2 %, magnesium sulfate soundness	MS_{18}	MS_{18}
Resistance to wear	$M_{DE}20$	$M_{DE}20$
Acid-soluble sulfate content: — aggregates other than air-cooled blast-furnace slag	$AS_{0.2}$	$AS_{0.2}$
— air-cooled blast-furnace slag	$AS_{1.2}$	$AS_{1.2}$
Total sulfur: — aggregates other than air-cooled blast-furnace slag	< / = 1 % by mass	< / = 1 % by mass
— air-cooled blast-furnace slag	< / = 2 % by mass	< / = 2 % by mass
Volume stability of blast-furnace and steel slags: — air-cooled blast-furnace slag	Free from dicalcium silicate and iron disintegration in accordance BS EN 13242:2002, **6.4.2.2** V_1	Free from dicalcium silicate and iron disintegration in accordance BS EN 13242:2002, **6.4.2.2** V_1
— steel slag	V_2	V_2
Leaching of contaminants	Blast furnace slag and other recycles materials should meet the requirements of the Environment Agency Waste Acceptance Criteria for inert waste when tested in accordance with BS EN 12457-3.	Blast furnace slag and other recycles materials should meet the requirements of the Environment Agency Waste Acceptance Criteria for inert waste when tested in accordance with BS EN 12457-3.

CAR PARK PAVEMENT DETAILS TO BELL MUNRO CONSULTING LTD DETAILS AND SPECIFICATION

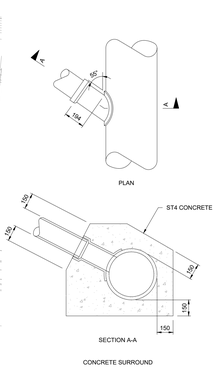
PROPOSED LEVELS TO ARCHITECTS SPECIFICATION

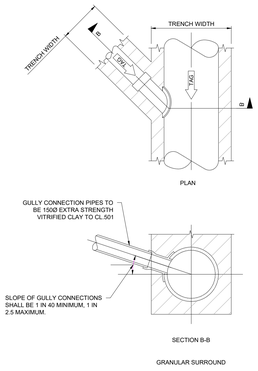


750Ø CATCHPIT INSPECTION CHAMBER
INCORPORATING DEBRIS DEVICE

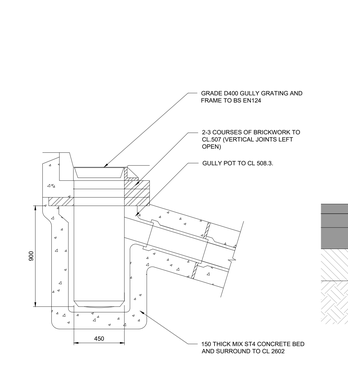


1050Ø PERMAVOID CATCHPIT
INSPECTION CHAMBER INCORPORATING
FLOW CONTROL AND DEBRIS DEVICE

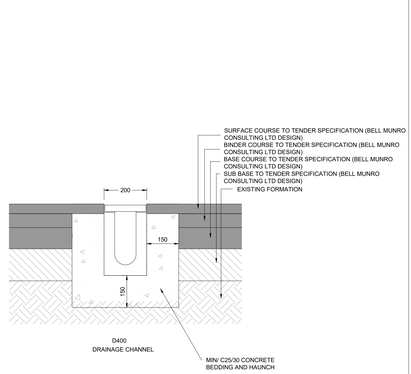




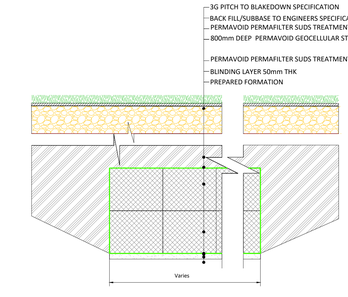
SADDLE CONNECTION DETAILS



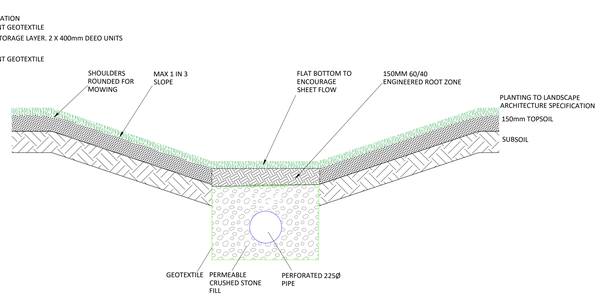
UNTRAPPED CONCRETE GULLY
WITH SPIGOT OUTLET (450x900)



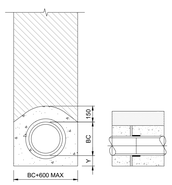
LINEAR DRAINAGE CHANNEL SECTION
SCALE - 1:10



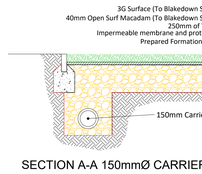
SECTION D-D THROUGH 800 THK PERMAVOID ATTENUATION TANK



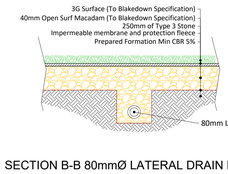
SECTION E-E THROUGH UNDER DRAINED SWALE
LANDSCAPE ARCHITECT TO CONFIRM



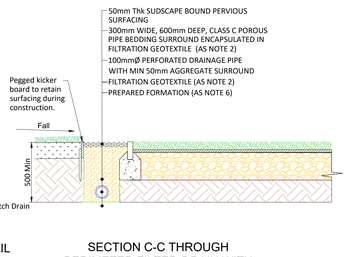
CONCRETE BED AND SURROUND
CLASS 'Z' PIPES LESS THAN 1.2m DEEP



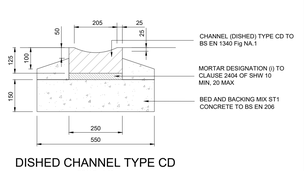
SECTION A-A 150mmØ CARRIER DRAIN DETAIL



SECTION B-B 80mmØ LATERAL DRAIN DETAIL



SECTION C-C THROUGH
PERIMETER FILTER-DRAIN WITH
CONVEYANCE PIPE



DISHED CHANNEL TYPE CD
SCALE - 1:10

Legend.

- Surface Water Drainage Pipework 150mm dia U.N.O
- 1050mm dia manhole
- 750mm dia catchpit inspection chamber
- Filter trench
- 250mm thick 30% void Sub-Base
- 800mm deep geocellular tank
- ACO gully
- Dished channel road gully
- ACO channel
- Dished channel
- 5m impermeable membrane lining to prevent infiltration adjacent to retaining wall or back.

Notes.

1. Roadway and footpath surfacing design and construction to Engineer's Specification (by others).

2. Heavy duty geotextile fleece to be non-woven needle-punched polypropylene as per Specification. Geotextile to be laid with minimum 300mm overlaps and to be applied to all external surfaces of Polypipe-Permavoid drainage units. To be installed in accordance with the manufacturer's recommendations.

3. Waterproof geomembrane to be single layer cold applied robust welded flexible membrane as per Specification suitable for waterproofing to structures and for water containment. Membrane to be nominal 1mm thick laid with minimum 120mm laps and welded seams. To be installed in accordance with the manufacturer's recommendations under and approved CQA protocol that includes testing of the welds.

4. Stormwater attenuation/infiltration system shall be Polypipe Permavoid pre-formed modular geocellular sub-base replacement with minimum 95% volumetric void ratio and minimum 52% effective perforated surface area. Units shall be manufactured with integral interlocking ties (Polypipe-Permaties) to maintain rigidity and minimise deflection. Geocellular units to be fully encapsulated with Heavy duty geotextile fleece (as Note 2) and impermeable membrane (as Note 3). Geocellular layer to be in accordance with the Specification and BS7533:2009 Pt13. All to be installed in accordance with the manufacturer's recommendations.

5. Multi-layered Polypipe-Permavoid tank configurations shall be fixed with proprietary shear connectors between each vertical layer to maintain rigidity and minimise lateral displacement in accordance with BS7533:2009 Pt13. Shear connectors shall to be fitted in accordance with the manufacturer's recommendations.

6. Polypipe Permavoid units to be laid on a prepared even formation that shall be free from undulations, sharp steps or protruding stones/rocks. The formation shall be graded to achieve a maximum deviation of 5mm in 3.0m in any direction. The formation shall have an equilibrium CBR value greater than 5%. Where the Polypipe-Permavoid discharges via infiltration to the ground the formation shall be granular and the equilibrium CBR value shall be greater than 10%. A 50mm thick blinding layer of crushed clean rock in accordance with the specification may be used to achieve a suitable bedding surface. The blinding layer shall be placed to give a smooth, even and firm formation. The formation and blinding shall be inspected by the Engineer and Contractor to ensure that they are acceptable for the construction of Polypipe-Permavoid.

7. Where appropriate, the constructed tanks, associated pipe work and connections shall be air and water tested in line with manufacturer's instructions to demonstrate air and watertightness of the impermeable membrane, where attenuation tanks are specified.

8. Polypipe-Permavoid units shall generally be laid with zero falls unless noted otherwise.

9. Where the design permits Polypipe-Permavoid tanks may be backfilled with selected as-dug materials. This material shall not contain pieces of rock, gravel, clay lumps, etc greater than 75mm in diameter, nor should it contain any other sharp materials such as metals that could pierce the units or membranes or cause uneven loading. The selected backfill material shall be compacted to 90% maximum dry density using plate mechanical compaction equipment. The materials and method of compaction shall be approved by the Engineer and Contractor.

10. Polypipe-Permachannel units are nominal 1000mm long. All continuous lengths of Polypipe-Permachannel shall have an outlet at 1000mm centres. All 'Hit and Miss' lengths of Polypipe-Permachannel shall have one outlet per 1000mm channel unit.

11. All dimensions are in millimetres unless otherwise stated.

12. Pre-cast concrete products shall comply with the relevant provisions of BS 5911 and be 'Kite Marked'.

13. All pipes and pipe fittings shall be HDPE twinwall and have current British Board of Agreement Certification.

14. Manhole covers and frames, grids and frames shall comply with the relevant provisions of BS EN 124.

15. Do not scale from this drawing. If in doubt ask.

16. This drawing to be read in conjunction with all relevant EPG, Architects & Engineers drawings.

17. Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.

18. At all times the works are to be executed in accordance with the requirements of the Health And Safety at Work Act 1974 and CDM Regulations 2015.

STATUS	REV	DATE	REVISION HISTORY	DSG | DRW | CHK | APP
CR	AB1	05.06.23	As-built Issue	JR | GH | SW | PW
S3	P03	11.08.22	Swales labelled	JR | GH | SW | PW
S3	P02	07.04.22	Impermeable membrane lining added.	JR | JR | RG| RG
S3	P01	18.03.22	First issue	JR | JR | RG| RG

ALL REVISIONS

CLIENT

50 Celebrating Fifty Years blakedown sport &play.

KEY PLAN

ORIGINATOR

Part of the STRI Group
epg
The Environmental Protection Group Ltd

Warrington Business Park
Long Lane
Warrington
T: 01925 652 980
F: 01925 652 983
W: www.epg-ltd.co.uk
E: consultantrequest@epg-ltd.co.uk
© The Environmental Protection Group Ltd

DRAWING TITLE

OPENSHAW COLLEGE
SURFACE WATER DRAINAGE DESIGN

	Name	Signature	Date
Designed by	JR		05.06.2023
Drawn by	GH		05.06.2023
Checked	SW		05.06.2023
Approved	PW		05.06.2023

EPG REF	SCALE @ A0	BIM FILE NAME - REVISION
9705	1:250, 1:20	-
	CR - As construction record document	

PROJECT	ISSUER	VOLUME	LEVEL	TYPE	ROLE	NUMBER	REV
9705	EPG	XX	XX	DR	Y	0001	AB1