

Caulmert Limited

**Engineering, Environmental & Planning
Consultancy Services**

Purbrook Park School

Foul and Surface Water Drainage Specification

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CONTENTS

1.0	SCOPE.....	3
2.0	DEFINITIONS	3
3.0	INTRODUCTION	3
4.0	GENERAL REQUIREMENTS	3
5.0	STANDARD OF MATERIALS AND FINISHES.....	4
6.0	PROTECTION OF MATERIALS AND FINISHES	4
7.0	PROTECTION OF WORK	4
8.0	PREVENTION OF DIRT ENTERING PIPES, MANHOLES, ACCESS CHAMBERS, GULLIES ETC.	4
9.0	TESTS CARRIED OUT ON SITE	5
10.0	EXCAVATIONS FOR DRAINS, CONNECTIONS AND MANHOLES.....	5
11.0	SUPPORTS FOR TRENCHES AND EXCAVATIONS	6
12.0	WATER IN EXCAVATION	6
13.0	CONCRETE BEDS AND SURROUNDS TO DRAINS.....	6
14.0	METHOD OF FORMING CONCRETE BEDS AND SURROUNDS.....	6
15.0	BACKFILLING	6
16.0	BACKFILLING AROUND MANHOLES.....	7
17.0	SUPPORTING OF DRAINS.....	7
18.0	SETTING OUT	7
19.0	CLEAN SITE	7
20.0	WATER TABLE / GROUND CONDITIONS.	7
21.0	FLEXIBILITY IN CONCRETE	8
22.0	FLEXIBLE JOINTED PIPES IN GRANULAR BEDDING.....	8
23.0	FLEXIBLE JOINTS.....	8
24.0	PERMEABLE PAVING	9
25.0	PROGRESS DRAWINGS	9
26.0	MATERIALS	9
26.1	Cement Mortar	9
26.2	Sand	9
26.3	Cement.....	9
26.4	Step Irons and Ladders	9
26.5	Concrete.....	9

26.6	uPVC Pipes and Fittings.....	10
26.7	Type A Granular Fill.....	10
26.8	Type B Granular Fill.....	10
26.9	Bricks.....	10
26.10	Manhole Covers.....	10
26.11	Laying and jointing of uPVC pipe work.....	11
26.12	Manholes, Inspection Chambers.....	11
26.13	Connection to Existing Southern Water Sewer Manhole.....	12
26.14	Testing of Manholes	12
26.15	Class (1) Oil Interceptor	12
26.16	Stormcell Underground Storage.....	13
26.17	Hydrobrake	13
26.18	Soakaway.....	14

Appendices

Appendix A Permeable Paving Specification

Appendix B Section 106 Approval Letters

1.0 SCOPE

1.1.1 This document is the Specification for the Foul and Surface Water Drainage at Purbrook Park School. The Scope of Work is summarised as follows:

- Surface water drainage runoff from roofs and car parking areas.
- Installation of permeable paving, oil interceptor, stormcell underground attenuation storage and hydrobrakes.
- Foul drainage from personnel facilities in the new buildings.

2.0 DEFINITIONS

2.1.1 The Engineer is Caulmert Ltd.

2.1.2 The Works is all of the work described in this Specification.

3.0 INTRODUCTION

3.1.1 The Civil Engineering (drainage) element of construction Purbrook Park School extensions includes the following elements:

- Permeable paving to collect surface water runoff from the surface of permeable paved area and the roof of Block 'A'. Buried surface water drainage pipework to convey the runoff via a hydrobrake control chamber discharging into the existing Southern Water manhole on Park Avenue.
- Buried surface water drainage pipework to convey the runoff from Block 'B' and Amphitheatre roofs, a permeable paved car park and impermeable paved car park area through an oil interceptor, an underground Stormcell storage tank and a hydrobrake control structure discharging into the existing Southern Water manhole on Dale Road.
- Buried foul water drainage pipe work to convey the foul water from Block 'A' and Block 'B' to the existing Southern Water foul water manholes, near block 'A' and on Dale Road.

4.0 GENERAL REQUIREMENTS

4.1.1 The Contractor should refer to the subsequent sections in this specification for the description of workmanship, fittings, supports, trench widths and beddings for each specified material.

4.1.2 All works shall be carried out strictly in accordance with BS EN 752, The Building Regulations, Sewers for Adoption 7th edition and in line with the requirements and recommendations of supplying manufacturers.

5.0 STANDARD OF MATERIALS AND FINISHES

- 5.1.1 Materials and equipment are specifically described and named in this specification or detailed on the drawings to establish a standard of materials and workmanship.
- 5.1.2 Materials required for performance of work shall be new and of the best of the respective kind and of uniform pattern throughout the work.
- 5.1.3 Items of materials and equipment not specifically mentioned in the contract drawings but which are necessary to make the complete and operating installation shall be included.

6.0 PROTECTION OF MATERIALS AND FINISHES

- 6.1.1 All materials and equipment including manhole cover, pipes and fittings required to complete the installation shall be thoroughly inspected on arrival at the site.
- 6.1.2 Those materials and equipment that are inferior in quality or those that have been damaged in transit shall be set aside and removed from the site.
- 6.1.3 Materials and equipment found to be sound in all respects shall be stored in accordance with the manufacturer's requirements and recommendations where applicable. They shall be protected at all times from damage or deterioration whilst in storage. A final inspection shall be made prior to use or installation.

7.0 PROTECTION OF WORK

- 7.1.1 Drains shall be laid to suit the general progress of the building work and at such a time and in such a manner as to be adequately protected against damage and deterioration.
- 7.1.2 Drains laid prior to the completion of heavy earth moving operations and/or liable to be subjected to abnormal loads shall be suitably protected.
- 7.1.3 All works installed shall be maintained throughout the contract period and shall be handed over in a clean and sound condition on completion of the project.

8.0 PREVENTION OF DIRT ENTERING PIPES, MANHOLES, ACCESS CHAMBERS, GULLIES ETC.

- 8.1.1 The contractor shall protect the finished surface of permeable paved areas free from all materials that would impede their efficiency during installation of other permanent works.
- 8.1.2 The Contractor shall ensure that all pipes, manholes access chambers, gullies etc are free from corrosion and internal obstruction. Pipes fittings and covers showing signs of internal or surface corrosion shall not be used.
- 8.1.3 The Contractor shall protect the open ends of all pipes, gullies and fittings. Proprietary caps or plugs only shall be used.
- 8.1.4 Wood, rag or paper plugs shall not be used.

8.1.5 Manholes shall be provided with temporary boarded covers prior to the installation of permanent covers.

8.1.6 If requested by the Engineer, the Contractor shall, when handing over the installation, carry out a CCTV inspection of all pipe work and fittings and provide a report and video recording demonstrating that all the pipes, gullies and manholes etc. are clear from internal obstruction.

9.0 TESTS CARRIED OUT ON SITE

9.1.1 The Contractor shall ensure that the testing is carried out continuously during the process of construction as the systems are complete to demonstrate their proper operation. Number of tests and time of test (i.e. before backfill, after backfill or prior to handover) shall be agreed with the Engineer.

9.1.2 The Contractor shall ensure that tests carried out meet the standard requirements and all such tests contained within this specification.

9.1.3 Where it is necessary to test sections of the system before the system is complete, successive test must overlap so that no joint or section of pipe is missed to the testing.

9.1.4 All buried carrier drainage pipe work shall be air tested. Air shall be pumped in by suitable means until a pressure of 100mm head of water. The pipeline shall be accepted if the air pressure remains above 75mm head of water after a period of five minutes without further pumping following a period of requisite stabilisation.

9.1.5 In the event of the failure of any test, or the occurrence of infiltration, the Contractor shall locate and repair the defect(s) and re-test in accordance with the specification.

10.0 EXCAVATIONS FOR DRAINS, CONNECTIONS AND MANHOLES

10.1.1 The Contractor shall carry out excavation to the lines and levels shown on the drawings or as varied or directed by the Engineer. He shall excavate to at least a minimum width sufficient to allow the lowering and efficient jointing of the pipe and to a minimum depth of 150mm below the barrel of the pipe. The excavation should also satisfy the requirement for encasing concrete or backfill as specified by the Engineer.

10.1.2 The width of excavations is to allow the timbering of the trenches, where required, but at no time will the width be permitted to exceed the maximum permissible values as specified on the drawings or where maximum widths are not specified then the manufacturer's recommendations shall be followed.

10.1.3 Special care shall be taken to ensure a solid and even bed to the required gradients for drain construction, where this applies.

10.1.4 Soft spots, obstructions etc., shall be cut out and any irregularities in excavation filled with concrete, as specified by the Engineer, to the required level.

11.0 SUPPORTS FOR TRENCHES AND EXCAVATIONS

- 11.1.1 The Contractor shall include for all necessary supports, timbering and shuttering for supporting the sides of the pits, trenches, headings or other excavations. All such excavations shall be of a sufficient size to enable pipes, bedding, protection etc. to be laid accurately and backfilling and compacting to be carried out satisfactorily.

12.0 WATER IN EXCAVATION

- 12.1.1 The Contractor shall ensure that all excavations are kept free from water until any concrete or other works are sufficiently set or complete

13.0 CONCRETE BEDS AND SURROUNDS TO DRAINS.

- 13.1.1 Where not indicated, pipes shall be surrounded in a minimum of 150mm thick concrete, grade as specified by the Engineer.

14.0 METHOD OF FORMING CONCRETE BEDS AND SURROUNDS

- 14.1.1 All concrete beds shall be laid to correct falls and formed in the following manner unless directed otherwise.
- 14.1.2 A concrete bed, minimum 75mm thick, shall be laid on the trench bottom. The pipes shall be firmly blocked up and supported in concrete behind each socket/coupling to a height of 75mm above the bed, unless detailed differently on the drawings or in accordance with the manufacturer's requirements.
- 14.1.3 After passing the test as described in this specification, the existing concrete shall be thoroughly cleaned and the remainder of the beds and haunching or casing shall be filled in and properly compacted up to a minimum of 150mm above the pipe barrel.

15.0 BACKFILLING

- 15.1.1 No backfilling shall commence until after the work has been tested and approved.
- 15.1.2 Against or over the new work, the first 300mm of fill must be type 'A' granular fill carefully placed by hand in 2No layers and rammed by hand.
- 15.1.3 Subsequent fill shall be type 'B' in layers not exceeding 225mm loose depth each of which shall be thoroughly rammed by hand or mechanical rammers.
- 15.1.4 Earthwork support shall be withdrawn ahead of the layer to be compacted, care being taken to keep the sides of the trenches solid and to fill spaces left by the withdrawn support.

16.0 BACKFILLING AROUND MANHOLES

- 16.1.1 The method of backfilling around manholes shall be generally as for trenches and should be carried out as part of the same operation. Care to be taken to raise the fill equally all around the manhole shaft and so to avoid unbalanced lateral loading.

17.0 SUPPORTING OF DRAINS

- 17.1.1 The Contractor shall ensure that all drains and fittings are adequately supported to correct lines, positions and levels at all times during the construction period.

18.0 SETTING OUT

- 18.1.1 The Contractor shall be responsible for all setting out in accordance with the drawings unless agreed to the contrary, in writing, with the Engineer.

19.0 CLEAN SITE

- 19.1.1 The school could be in use during construction, the construction area shall be cordoned off the Contractor shall maintain the site in as clean and tidy a condition as possible, removing all debris, rubbish and surplus material as it accumulates during the progress of the works and on completion.
- 19.1.2 Existing drainage pipes, channels and gullies must at all times be kept free of all materials that would impede their efficiency.
- 19.1.3 On completion of the works, the Contractor shall leave the site in a clean and tidy condition.

20.0 WATER TABLE / GROUND CONDITIONS.

- 20.1.1 The Contractor shall take notice of the report on site investigation and trial pit details with particular attention being drawn to ground conditions.
- 20.1.2 The general water table is low. However, there might be perched groundwater within the superficial deposit.
- 20.1.3 The Contractor shall include for all pumps, steel shuttering, specialised equipment and additional materials that are required to ensure the satisfactory excavation, bedding, laying, surrounding, back filling and water proofing of all pipes and manholes that may be installed in the areas effected by trapped water.
- 20.1.4 Allowance shall be made for the anticipated ground settlement. Line, level and gradient of pipework to be maintained.

21.0 FLEXIBILITY IN CONCRETE

- 21.1.1 Where there is a requirement of this specification and/or where indicated on the drawings that the pipes are bedded and surrounded in concrete, flexible jointed pipe systems shall retain their flexibility by the insertion of flexible joints within the concrete.
- 21.1.2 These joints shall occur at a maximum of 5m intervals at socket/coupling positions, the flexible material shall be pre-cut to pipe diameter and be equal in height and width of the cross-sectional area of the concrete bed surround.

22.0 FLEXIBLE JOINTED PIPES IN GRANULAR BEDDING

- 22.1.1 The trench bottom shall be trimmed true to gradient **before** placing of granular material is commenced. Type 'A' granular fill, as specified, shall be laid and carefully compacted by plate vibrators or other approved method to give a minimum thickness of 150mm. After thorough compaction, a bed shall be carefully levelled so that the whole of the barrel of the pipe is uniformly supported throughout its length. Socket hole shall be left in the bedding to enable the proper making of the joint.
- 22.1.2 Care shall be taken to ensure that pipe collars do not rest on any hard objects.
- 22.1.3 Pipes shall be laid true to line and gradient, each pipe being boned between sight rails and cleaned out before the next is laid.
- 22.1.4 After laying and testing the pipe, type 'A' granular fill shall be carefully compacted in layers not exceeding 150mm up to 300mm above the barrel of the pipe. If the granular bed is damaged by water, sewage or collapse of the trench sides it must be removed from the trench and replaced with new material before any pipes are laid or re-laid.
- 22.1.5 Trench formations, bedding, compaction, pipe laying and jointing must follow consecutively.
- 22.1.6 On completion of the pipe surround, backfilling shall be carried out as specified. The first 300mm of selected fill type 'B' being hand rammed in 2No 150mm layers.
- 22.1.7 In exceptionally wet trenches, the Engineer may require a temporary drain to be incorporated in the granular fill.

23.0 FLEXIBLE JOINTS

- 23.1.1 The first joint shall be located immediately outside the manhole and the second joint shall be positioned within the same drain line at a maximum distance up to 600mm away from the first. The pipe between these joints shall be laid at a predetermined gradient and to be bedded in such a manner that shall accommodate settlement/movement without fracture, distortion or damage of the pipe work or joints occurring.
- 23.1.2 The Contractor shall, prior to the installation of these joints, obtain from the Engineer, confirmation of the degree of building movement/settlement to be accommodated.

24.0 PERMEABLE PAVING

24.1.1 Permeable paving specification is included in Appendix 'A'

25.0 PROGRESS DRAWINGS

25.1.1 The Contractor shall retain on site at all times one complete set of progress drawings marked up in colour to indicate the current progress and variation of the works. Immediately upon completion of the installation, the Contractor shall prepare a set of 'As Installed' drawings for the installation.

26.0 MATERIALS

26.1 Cement Mortar

26.1.1 All mortar shall be mixed in small quantities and used fresh. No mortar shall be used which has been mixed for thirty minutes or longer, nor shall any mortar be re-mixed or re-used.

26.2 Sand

26.2.1 Sand for cement mortar shall be natural blend, complying with the requirements of BS 1199 and 1200 'Building Sands from Natural Sources'.

26.3 Cement

26.3.1 All cement used for cement mortar, concrete beds and surrounds shall be sulphate resisting complying with the requirements of BS 12 and BS 4027.

26.3.2 Super-sulphated cement shall comply with the requirements of BS 4027.

26.3.3 Cement shall be stored in a dry weather proof shed with a raised wooden floor or in a silo.

26.3.4 Cement packages shall be delivered with an unbroken seal fixed by the manufacturer, clearly marked with their name and brand. Any cement which has become injuriously affected by damp or other causes shall be removed from the site immediately.

26.4 Step Irons and Ladders

26.4.1 Polypropylene encapsulated step irons with a non-slip design to BS 1247 Pt 2: 1990 and WIS 4-33-01: 1990 shall be installed in manhole access chambers less than 3 meters deep from ground/cover level to the invert of the drain

26.5 Concrete

26.5.1 Concrete grade 20N/mm², used for pipe bedding, surrounds, backfill and blinding etc., shall comply with the requirements of BS EN 1992-1-1:2004.

26.6 uPVC Pipes and Fittings

- 26.6.1 uPVC pipes and fittings shall comply with the requirements of BS 4660:2000, BS EN 1401-1:1998 and BS EN 681:1996
- 26.6.2 During transportation to site, pipes should not overhang the delivery vehicles by more than 1m and shall have side supports at a minimum of 2m spacing.
- 26.6.3 With mixed loads, larger pipes shall be at the bottom and web or rope slings shall be used when mechanically lifting.
- 26.6.4 Pipes should be stored on transverse bearers and stack heights should not exceed 7 layers or 2m in height.

26.7 Type A Granular Fill

- 26.7.1 Type 'A' granular fill shall consist of broken stone or gravel 20mm – 5mm in accordance with Table 1, BS 882. The Contractor may be required to show either by supplier's certificate or regular batch sieve testing on site that the material complies with this specification of grading and that uniformity is maintained.

26.8 Type B Granular Fill

- 26.8.1 Type 'B' shall be a uniform, readily compactable, material free from tree roots, vegetable matter, chemical waste or frozen lumps and stones that will be retained by a 25 sieve or clay lumps that will be retained by a 75 sieve.

26.9 Bricks

- 26.9.1 All bricks shall be clay engineering bricks, Class 'B', and comply in all respects with BS 3921. They shall be hard, well burnt and true to shape, without firecrackers and clinkered portions.
- 26.9.2 Bricks shall be carefully unloaded and stacked by hand, bricks that are chipped or cracked shall not be used.
- 26.9.3 All stacks of bricks shall be protected against undue saturation due to weather conditions by suitable covering.

26.10 Manhole Covers

- 26.10.1 Manhole covers shall be of cast or ductile iron to grade D400 unless shown differently on the drawings and schedules and shall comply with the requirements of BS EN 124.
- 26.10.2 Recessed for infill covers shall be mild steel, galvanised to BS EN ISO 1461 as detailed on the drawings.
- 26.10.3 All cast or ductile iron covers and frames shall be coated with black bituminous based compound prior to delivery to site.

26.10.4 On completion of the works, all manhole covers shall be raised, cleaned and where applicable, correctly bedded and sealed with approved manhole grease. All manhole covers shall be bedded on a minimum of 225mm thick class 'B' engineering bricks, unless detailed otherwise.

26.10.5 Double seal manhole covers and frames are to be provided on internal foul water chambers. Finish type to be confirmed with the Architect.

26.11 Laying and jointing of uPVC pipe work

26.11.1 All uPVC pipework shall be installed as instructed in the manufacturers instructions and comply with BS 5955:Pt6:1980.

26.11.2 The pipe and sealing rings shall be kept clean prior to lubrication and push-fit.

26.11.3 If expansion is required, the spigot may be withdrawn to the manufacturer's limit. This is not necessary with the use of polypropylene couplings.

26.12 Manholes, Inspection Chambers

26.12.1 Concrete manholes and Inspection Chambers shall be constructed in accordance with the drawings and 'Sewers for Adoption 7th Edition' in the locations shown on the drawing or as instructed by the Engineer.

26.12.2 Invert channels shall form a transition between the gradients of the incoming and outgoing sewers and where there is a change in the direction of the sewers the channel shall be accurately finished with 25mm granolithic rendering in two courses. The sides of the main channels above half diameter shall be vertical up to the level of the soffit of the inlet pipe.

26.12.3 The invert levels shown are to the centre of the manhole and the as-constructed levels shall be within the tolerance given in the pipe laying clauses.

26.12.4 All benching within concrete manholes shall have a fall of 1 in 12 from back to front and a 25mm radius nosing to the channel and the whole of the benching and vertical side of the in situ channel work shall be finished in 25mm granolithic rendering in two courses.

26.12.5 Concrete surround to manholes shall be 20N/mm concrete of the minimum thickness of 150mm unless shown differently on the drawings or as instructed by the Engineer.

26.12.6 Manhole covers and frames shall be Grade D400, sealed and locking type, or as shown on the drawings if different, and compliant with the requirements of this specification. Manhole frames shall be securely bedded in 1:3 cement mortar.

26.12.7 During and after construction the manholes shall be covered for safety reasons and to prevent the ingress of debris.

26.12.8 All manholes, when completed, shall be water tight as specified under 'Testing of Manholes'.

26.12.9 For manhole access ladder or step-iron requirements, see Para. 25.4

26.13 Connection to Existing Southern Water Sewer Manhole

26.13.1 Applications to connect to the public sewerage system (Section 106 Water Industry Act 1991) have been approved by Southern Water. Copies are included in Appendix B. The Connections will be made to the existing Manhole 7050 on Dale Road (Southern Water Ref No. S106-006326) and Manhole 5151 on Park Avenue (Southern Water Ref No. S106-006334).

26.13.2 Before entering or breaking into the existing Southern Water manholes, the Contractor shall give notice of his intention and obtain approval to do so to Southern Water for the Manhole to which the connection is to be made.

26.13.3 Type and method of construction shall be agreed in writing with Southern Water, a copy shall be provided to the Engineer.

26.14 Testing of Manholes

26.14.1 Manholes to be tested shall be cleaned internally. All outlet pipes shall be closed by means of expanding stoppers. The Manhole shall then be filled with water to a depth of 1.5m or if less to the top of the cover and frame. After time has been allowed for absorption to take place, the manhole shall be refilled to the level of the top of the cover. For two hours no more water shall be added to the manhole and if at the end of this time the water has not dropped in level by more than 25mm, the manhole shall be regarded as satisfactory.

26.14.2 Should the drop in level be more than 25mm, the leakages shall be located, the manhole rectified and re-tested until satisfactory results are achieved.

26.14.3 Where a manhole fails the testing procedure, the defect shall be rectified and the manhole re-tested at the Contractors own expense.

26.15 Class (1) Oil Interceptor

26.15.1 Class 1 By-pass interceptor is to be installed to protect the existing sewer runoff from pollution. It is the responsibility of the Contractor to obtain the specific dispensation, from Southern Water.

26.15.2 The interceptor shall be constructed under southern/eastern corner of car park as shown on the construction drawing. The interceptor shall be no closer than 1.0m to the carriageway construction. The interceptor should be positioned to facilitate easy access for maintenance.

26.15.3 The interceptor installation, including automatic alarm monitoring system probe and air vents shall be carried out in accordance with manufacturer's specification.

26.15.4 The location of the automatic alarm monitoring system probe control unit shall be agreed with the Engineer. The control unit should wall mounted and positioned in a non hazardous area such that the LED display and push switches on the front panel can be readily seen and

accessed. The electrical specification shall be in accordance with manufacturer's specification.

26.15.5 Air Vents shall be constructed on both the inlet and outlet side of the interceptor. The location of the Air Vent outlets shall be agreed with the Engineer.

26.16 Stormcell Underground Storage

26.16.1 Stormcell underground unit is to be installed to provide attenuation volume of surface water runoff. The Stormcell installation shall be carried out in accordance with manufacturer's specification.

26.16.2 The Stormcell shall be constructed under southern/eastern corner of car park as shown on the construction drawing. The Stormcell units shall be no closer than 1.0m to the carriageway construction.

26.16.3 Whilst assembling the Stormcell units, it may be necessary to walk on top of previously laid cell units. Care shall be taken not to damage the edges of the units.

26.16.4 Backfill with suitable material, first layer shall be 300mm thick before using any compaction plant. Only light compaction shall be applied to the cell units. Compaction plant shall not exceed 2300kg per metre width

26.16.5 Machines placing the material shall be located off the units. Installed Cell units shall be protected from construction heavy traffic.

26.16.6 One 110mm diameter vent pipe shall be provided. The location of the Air Vent outlet shall be agreed with the Engineer.

26.17 Hydrobrake

26.17.1 The Hydrobrake control structure manhole is to be installed downstream of the Stormcell underground attenuation unit. The purpose of the Hydrobrake control structure is to protect the downstream part of the drainage system against overloading and flooding. This is accomplished by allowing a certain defined flow to pass, regardless of the variation of the upstream conditions, i.e. inflow and the water level.

26.17.2 The Hydrobrake flow controls shall be selected such that the duty/design flow is not exceeded 5 l/sec.

26.17.3 The Hydrobrake manhole shall be no closer than 1.0m to the carriageway construction. The Hydrobrake shall be positioned at the outlet on the inside face of the manhole. The mounting plate is fastened to the wall of the manhole opposite the outlet opening using bored-in or cast-in bolts. The gap between the mounting plate and the wall of the manhole shall be tightened with water resisting sealing compound or sealing strip.

26.17.4 The Hydrobrake installation shall be carried out in accordance with manufacturer's specification.

26.18 Soakaway

- 26.18.1 Two soakaways are constructed to provide attenuation volume and outfall for surface water runoff from part of the new roof area (Soakaway A1) and proposed landscaping area and new paved area to the main building (Soakaway A2).
- 26.18.2 Each location considered for the installation of a soakaway should be investigated by means of constant or falling head soakage tests prior to construction.
- 26.18.3 The soakaway rings shall be supported on a concrete base not less than 500mm wide and 225mm thick with a diameter of not less than the external diameter of the rings themselves.
- 26.18.4 In the excavation of the soakaway the contractor shall allow for hand cleaning of exposed faces to remove all smearing of joints, fissures to the satisfaction of the Engineer.
- 26.18.5 Suitable measures should be employed to prevent direct contact to the based of the soakaway during constriction.
- 26.18.6 Ladders shall be installed not step iron shall not be used.
- 26.18.7 Except where the Engineer permits, the granular backfill to the chamber shall be 50mm nominal single sized hard, clean, crushed rock or gravel complying to BS 882 lightly and compacted.
- 26.18.8 The granular backfill shall be sealed at the level of the highest perforated ring by a layer of 500 gauge polythene. This shall be abutted and extended 450mm up the sides of the chamber and excavation.
- 26.18.9 A safety sign shall be anchored below the manhole cover comprising a 650mm long by 10mm thick safety chain with a 250mm by 125mm by 2mm thick plate attached to the chain with 2No 6mm thick links. The writing stamped onto the plate in 25mm letters shall indicate the soakaway depth i.e. "Soakaway XX metres deep".

Appendix A
Permeable Paving Specification

Laying Course

2-6mm Laying Course (Clean crushed stone)

1. SCOPE

This specification defines the 2-6mm laying course.

2. REFERENCE SPECIFICATIONS

BS EN 13242:2002

3. MATERIAL SPECIFICATION

Material supplied shall be referred to as 2-6mm Clean crushed stone and conform to the following sieve analysis and aggregate testing.

SIEVE SIZE	% PASSING
10 mm	98-100
6.3mm	80-100
2mm	0-20
1	0-5

Aggregate Testing

Los Angeles Coefficient (LA) – Determination of resistance to fragmentation = 20
BS EN 1097-2:1998

Aggregate Abrasion Value- Determination of resistance to abrasion = 5
BS EN 1091-8:2000- Annex A

Note: Lower values than those specified signifies better resistance to fragmentation and abrasion and is therefore acceptable.

4. APPROVED SUPPLIER LIST

Where possible suppliers should be registered to BS EN ISO 9000.

Scotland	North	Central	South West	South West	South East
Pavilion 1 Castle Craig Business Park Stirling FK7 7SH	Clifford House York Road Wetherby Yorkshire LS22 7NS	Ashby Road East Shepshed Loughborough Leicestershire LE12 9BU	The Ridge Chipping Sodbury Bristol BS37 6AY	South Wales Canal Road Cwmbach Aberdare Mid Glamorgan CF44 0AG	St Laurence Avenue 20/20 Industrial Estate Allington Maidstone Kent ME10 0LQ
Tel: 0845 451 0771	Tel: 0845 223 3117	Tel: 0845 845 6699	Tel: 0845 120 6310	Tel: 01685 880 300	Tel: 0845 601 6642

Upper Sub-base

5-20mm Upper Sub-base (Clean crushed stone)

1. SCOPE

This specification defines the 5-20 Upper Sub-base.

2. REFERENCE SPECIFICATIONS

BS EN 13242:2002

3. MATERIAL SPECIFICATION

Material supplied shall be referred to as 5-20mm Clean crushed stone and conform to the following sieve analysis and aggregate testing.

SIEVE SIZE	% PASSING
40mm	100
20mm	90-100
10mm	25-70
4mm	0-15
2mm	0-5

Aggregate Testing

Los Angeles Coefficient (LA) – Determination of resistance to fragmentation = 20
BS EN 1097-2:1998

Aggregate Abrasion Value- Determination of resistance to abrasion = 5
BS EN 1091-8:2000- Annex A

Note: Lower values than those specified signifies better resistance to fragmentation and abrasion and is therefore acceptable.

4. APPROVED SUPPLIER LIST

Where possible suppliers should be registered to BS EN ISO 9000.

Scotland	North	Central	South West	South West	South East
Pavilion 1 Castle Craig Business Park Stirling FK7 7SH	Clifford House York Road Wetherby Yorkshire LS22 7NS	Ashby Road East Shepshed Loughborough Leicestershire LE12 9BU	The Ridge Chipping Sodbury Bristol BS37 6AY Tel: 0845 120 6310	South Wales Canal Road Cwmbach Aberdare Mid Glamorgan CF44 0AG Tel: 01685 880 300	St Laurence Avenue 20/20 Industrial Estate Allington Maidstone Kent ME10 0LQ Tel: 0845 601 6642
Tel: 0845 451 0771	Tel: 0845 223 3117	Tel: 0845 845 6699			

Lower Sub-base

10-63 Lower Sub-base (Clean crushed stone)

1. SCOPE

This specification defines the 10-63 Lower Sub-base.

2. REFERENCE SPECIFICATIONS

BS EN 13242:2002

3. MATERIAL SPECIFICATION

Material supplied shall be referred to as 10-63mm Clean crushed stone and conform to the following sieve analysis and aggregate testing.

SIEVE SIZE	% PASSING
100mm	100
63mm	90-100
40mm	60-80
20mm	15-30
10mm	0-5

Aggregate Testing

Los Angeles Coefficient (LA) – Determination of resistance to fragmentation = 20
BS EN 1097-2:1998

Aggregate Abrasion Value- Determination of resistance to abrasion = 5
BS EN 1091-8:2000- Annex A

Note: Lower values than those specified signifies better resistance to fragmentation and abrasion and is therefore acceptable.

4. APPROVED SUPPLIER LIST

Where possible suppliers should be registered to BS EN ISO 9000.

Scotland	North	Central	South West	South West	South East
Pavilion 1 Castle Craig Business Park Stirling FK7 7SH Tel: 0845 451 0771	Clifford House York Road Wetherby Yorkshire LS22 7NS Tel: 0845 223 3117	Ashby Road East Shepshed Loughborough Leicestershire LE12 9BU Tel: 0845 845 6699	The Ridge Chipping Sodbury Bristol BS37 6AY Tel: 0845 120 6310	South Wales Canal Road Cwmbach Aberdare Mid Glamorgan CF44 0AG Tel: 01685 880 300	St Laurence Avenue 20/20 Industrial Estate Allington Maidstone Kent ME10 0LQ Tel: 0845 601 6642

Sub-Base Stone

Sub-base Stone specification



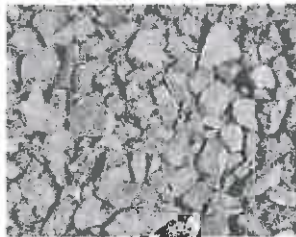
Surface dressing grit

Surface dressing grit 2-4mm clean Quartzite



Laying Course

50mm depth of 2-6mm. single size clean crushed stone to BS EN 13242: 2002



Upper layer

100mm depth 5mm-20mm clean, crushed with well defined edges BS EN 13242:2002



Lower Layer

250mm depth 10 –63mm clean crushed stone with well defined edges. Clean crush stone 10:63

Specification

Storm water source control system*
AQUAFLOW® permeable paving

Method of Construction

Laying generally

All construction work on pavements should be carried out following completion of general site works and after topsoiling of adjacent areas to prevent wash down of fine materials. Where a temporary running surface is required the construction should be in accordance with diagram on page 11.

Subgrade

Excavate subgrade to appropriate levels shown on plan drawings. The subgrade should be compacted with a vibrating plate or roller to the requirements of Clause 613 of the Highways Agency specification. Prior to compaction all soft areas should be removed and filled with suitable replacement material to provide a stable subgrade.

Kerbs

The paved areas must be firmly restrained. Where the pavement is designed for heavy use the concrete kerb haunching must extend to a minimum depth of 150mm below the base of the kerb.

SC MEMBRANE® Geosynthetic

Lay SC MembraneE® Geosynthetic taking care to overlap the joints by 300mm using double sided tape. Where methane or a high water table is present a specialist heavy duty membrane may be required and the joints should be welded. If it is proposed to drain by infiltration to the sub-grade, the SC Membrane® should be replaced with a geotextile to stop the ingress of subgrade material into the sub-base. The fin drain will not be required.

Sub-base

The lower layer of sub-base (63-10mm) should be placed in 2 separate layers, each layer being compacted with a vibrating roller or heavy duty vibrating plate to the requirements of Clause 802 of the Highways Agency specification. Compaction should continue until 95% of the compacted bulk density achievable under laboratory conditions has been reached. This can be measured with a nuclear density gauge. The specified 350mm depth of sub-base may be varied by the Engineer to suit site requirements.

SC INTERGRID® Geogrid

The SC Intergrid® Geogrid should be incorporated at the interface between the two layers of sub-base. The SC Intergrid® Geogrid should be laid on the sub-base and joints should be overlapped by 300mm. The upper subbase layer (20mm-5mm) should then be laid on top of the SC Intergrid® Geogrid and compacted as before.

A second SC Intergrid® Geogrid can be incorporated underneath or within the sub-base at the engineer's discretion. This should be laid in the same way as the first SC Intergrid® Geogrid.

INBITEX® Geotextile

Lay Inbitex® Geotextile on top of the sub-base overlapping joints by 300mm.

Laying course

Lay and loose screed to level approximately 50mm depth of 2-6mm crushed stone to BS882. It is important that the final level of the 5mm stone is accurate as the stone will compact down much less than sand when the surface blocks are vibrated. The particle shape of the 2-6mm stone will

also affect the degree of compaction. It is recommended that a small trial area should be laid prior to construction to determine the accuracy of final levels.

Block laying

The blocks and slabs must be tightly butt jointed to ensure that a tight fit is achieved. A single or double stretcher course of Aquaflow blocks must be used around the periphery of the paved areas and also at the edges of any separately restrained areas, such as tree pits. It is recommended that lateral restraints (such as forest edging) should be installed in areas where vehicles turn and /or brake, such as bends and junctions. The lateral restraints should be properly constructed. They should also be considered at regular intervals on large areas of paving. Where blocks need cutting, they should be cut to a tight fit and none are to be smaller than 30% of the unit block size. Where Aquaflow blocks are cut they must be cut across the 100mm and not the 200mm dimension. Blocks should be cut vertically and not underscored. All block cutting should be carried out with a disc cutter.

Surface Finish

The blocks should be vibrated with a vibrating plate Type DVP75/22" or similar. Following the first pass with a vibrating plate a light dressing of 2-4mm single size clean stone should be applied to the surface and brushed in, approximately 2 kg per m². (Available from Formpave in 25 kg bags). Blocks should again be vibrated and any debris brushed off.

Hanson Formpave Tufthorn Avenue Coleford Gloucestershire GL16 8PR telephone 01594 836999 fax 01594 810577
e-mail designservices@formpave.co.uk web-site www.formpave.co.uk

* Patents: The systems and products described in this brochure are covered by patents and patent applications in Great Britain and other countries; see inside back cover for further information.

Specification
Storm water source control system

Distribution Tanks

Technical Specification

Material	Polypropylene, Polyethylene, PVC (connector)		
Volumetric void:	92 %		
Effective perforated surface area:	59 %		
Compressive strength (1):	715 kN/m ² (unconfined)		
Compressive strength (2):	1650 kN/m ² (confined in typical pavement, 130mm cover)		
	Single	Double	Triple
Nominal size: <i>LxWxD</i>	354 x 708 x 150mm	708 x 708 x 150mm	1062 x 708 x 150mm
Nominal volume:	0.0375 m ³	0.075m ³	0.1125m ³
Weight:	3kg	6kg	9kg



Hydraway - the ultimate groundwater drainage system

What is Hydraway?

Hydraway is an innovative product specifically designed for effective drainage of groundwater. It has been widely used and tested throughout the world.

The drain consists of a geotextile fusion bonded to an integral core, thus eliminating the risk of soil intrusion common on other fin drain systems. It has excellent clog resistance and high flow rates whilst maintaining optimum filtration. The polythene core is designed to give maximum support to the geotextile.



Hydraway

- Up to 50% cheaper as an installed cost over traditional filter drains

The Hydraway drain has a minimum permeable surface area of 75% which compares with 5% common in perforated plastic pipe systems. This allows rapid removal of water through all faces and the clog resistance of the geotextile ensures the system remains silt free, again a common problem with other pipe systems.

Hydraway has crushing strengths in excess of 600KN/m² and is manufactured from polymers resistant to degradation by common chemicals, acids, alkalis and bacteria.

Hydraway may be considered as a column of air that allows water the shortest, easiest and most effective passage from the surrounding ground to a dedicated outlet.



Hydraway - the ultimate groundwater drainage system

Why Hydraway?

- No imported pipe surround needed
- Small excavation volume
- Little or no 'cart away' costs - landfill tipping is expensive
- Up to 100m long - no need for jointing every 6 metres
- High construction speed and ease of installation
- Backfill with 'as dug' material
- Trench support costs reduced
- Expensive manhole construction greatly reduced by use of Hydraway fittings

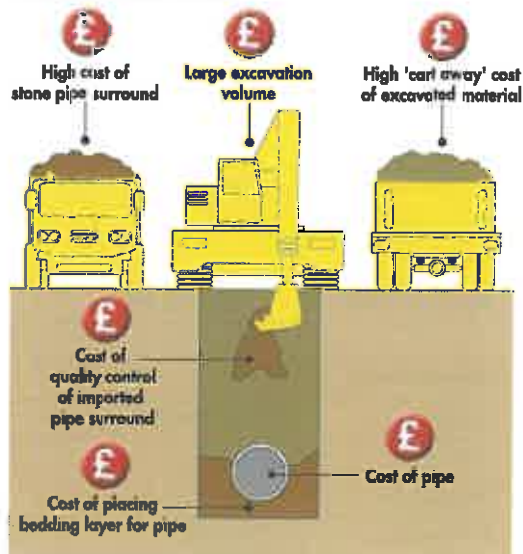
Don't take our word for it,
analyse the economic argument for yourself

Approximate cost comparison

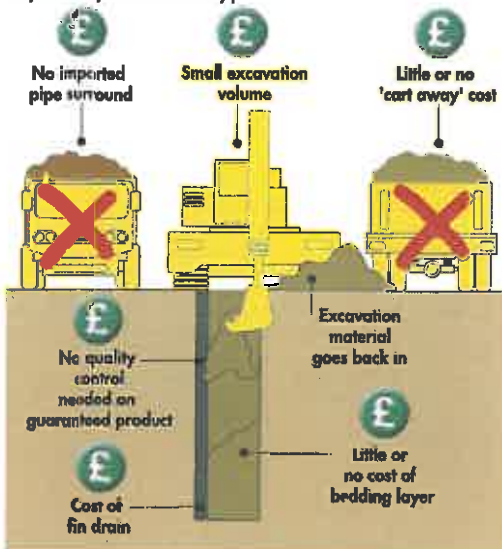
	Traditional filter drain	Hydraway drain
Drain	£	£
Imported pipe surround	£	£ NIL
Excavation	£	£
'Cart off site'	£	£ NIL
Geotextile wrap	£	£ NIL
Laying costs	£	£
Total:	£	£

Material cost benefits

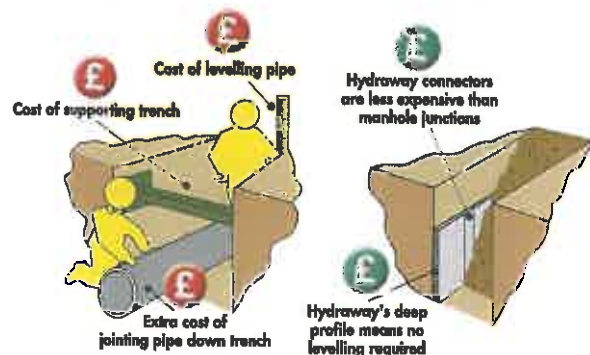
Traditional Filter Drain



Hydraway Fin Drain Type 5



Saving cost through speed and ease of laying

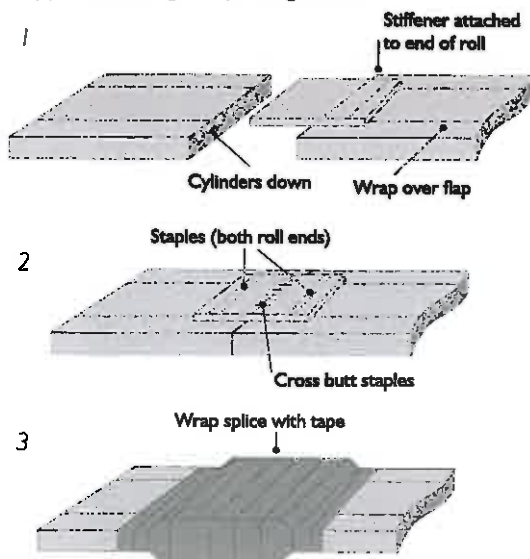


Hydraway - the ultimate groundwater drainage system

Property	Test method	B.B.A target for Hydraway	Achieved value	
FABRIC		BS6906 Pt.1 1987		
Tensile strength			4.5 oz fabric	5.5 oz fabric
Machine direction		>5KN/m	11.16KN/m	12.45KN/m
Cross direction		>5KN/m	9.20KN/m	16.39KN/m
ELONGATION		BS6906 Pt.1 1987		
Machine direction		>10%	54.1%	61.0%
Cross direction		>10%	82.1%	54.6%
PUNCTURE RESISTANCE		BS6906 Pt.4 1989		
		>1200N	1863N	2326N
TEAR RESISTANCE				
Machine direction	ASTMD4533-85	>200N	300N	392N
Cross direction		>200N	252N	272N
PORE SIZE: 090				
(Wet sieving)	Cen draft	No target	146 microns	120 microns
Water flow	BS6906 Pt.3 1989	No target	135.7 l/m ² /sec	128 l/m ² /sec
Breakthrough head	BS6906 Pt.3 1989	No target	0	0
Resistance to UV light		Must have short term resistance to UV light	Unaffected by short term UV light exposure	
Resistance to common acids, alkalis, chemicals, moulds, bacteria & fungi		Must be resistant	Resistant	
COMPOSITE				
Short term crushing strength	ASTM D1621 M	No target	660KN/m ²	
Short term equivalent load	MCHW Vol. I 514.14 (STM 100)	No target	140KN/m ²	
Compression under shear & normal load	MCHW Vol. I 514.14 (STM 100)	No target	75%	
Flow rate through composite (@100mm head)	BS6906 Pt.3 1989 (modified)	No target	105.3 l/m ² /sec (+0.5oz face) 139.5 l/m ² /sec (-5.5oz face)	
In plane flow rate (@ 200KN/m ²) (Confining pressure)	BS6906 Pt. 7 1990	No target	Hard Platens 15.83 l/m ² /sec @ 1.0 gradient 3.35 l/m ² /sec @ 0.1 gradient Soft Platens 2.02 l/m ² /sec @ 1.0 gradient 0.86 l/m ² /sec @ 0.1 gradient	
Peel strength	ASTM D 1876	No target	Geotextile permanently bonded to at least 90% of core nodes with minimum peel strength of 0.5KN/m	
Water in flow of core	Direct measurement	No target	>75% from both sides of core	
Percentage of in plane flow rate transmitted through each face of drain	Direct measurement	No target	100% both sides	

Notes: Hydraway utilises two weights of geotextile in its construction. Both sets of values are given above as certified by BBA.

Approved fitting and jointing detail



1. Stiffener attachment

Bring the adjacent ends of the roll together. Inspect the end of each roll, making sure the end is square, trimmed next to the cylinders and fabric is securely attached to the cylinders. The roll end should be trimmed with a utility knife to ensure the above conditions.

2. Stapling

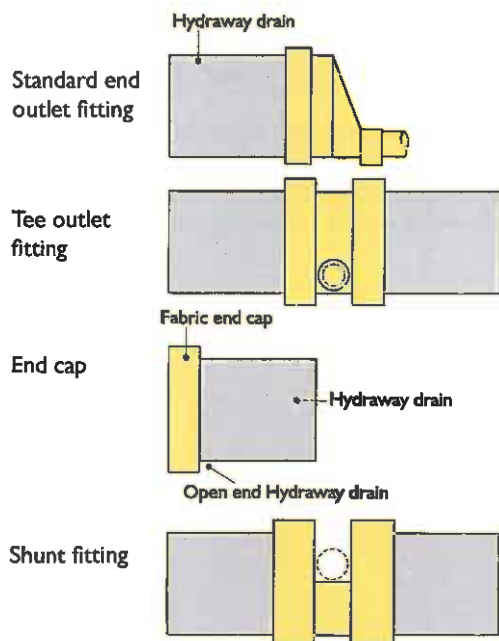
Carefully align both pieces of the Hydraway drain, butting the ends together and stapling them together through the stiffener. Experience has shown that 15 to 20 staples are required per splice to ensure the splice does not pull apart. The staples should be as supplied by WTB Geotechnics. Position the staples along the edges of the stiffener as well as cross butting.

3. Wrapping

Wrap the splice with tape. The tape should extend a minimum of 50mm beyond each edge of the stiffener to ensure a sealed system. When wrapping the splice with the tape, care should be taken not to wrap the tape too tightly, or too loosely around the splice.

Standard outlet fitting

1. Cut Hydraway drain if required to a clean straight edge.
2. Slide the standard outlet fitting over the open end of the Hydraway drain.
3. Fully extend the fabric sleeve attached to the outlet fitting over the Hydraway drain. Note: the fittings must be flush against the pavement wall. Do not bend or crimp the Hydraway.



Tee outlet fitting

1. Cut out 100mm of the Hydraway drain. (Care should be taken to ensure a straight vertical cut).
2. Insert the Hydraway drain into both sides of the tee. (The outlet pipe of the tee should be centred around the cut out).
3. Fully extend the fabric sleeves attached to the tee over both ends of the Hydraway drain. The fitting is now ready to be attached to the outlet pipe.

Note: The back of the tee fitting must be flush against the pavement wall.

End cap

Slide the end cap over the open end of the Hydraway drain and pull tightly against the open end.

Shunt fitting

When other services have to cross a line of Hydraway, a shunt fitting should be used. At no time must the service be laid through the Hydraway drain. Follow instructions for fitting tee outlet. If several services or a very large diameter service have to be accommodated, two end outlets and a length of pipe will also make a shunt fitting.

Standard roll sizes

Nominal roll width (mm)	150	300	450	600	750	900
Standard roll length (m)	30	100	100	100	50	50
Approx weight (kg)	9	60	90	120	75	90

SC Intergrid Product Information

Technical Data:

Polymer	Polypropylene
Minimum carbon black content	2%
Weight kg/m²	0.24
Roll Dimensions	50m x 4m
Roll Weight kg	48.5

Product Information Notes:

1. The mechanical stabilisation element shall be a polypropylene geogrid manufactured in accordance with a management system which complies with the requirement of BS EN ISO 9001:2008. If required by the Engineer, the Contractor shall provide evidence of the manufacturer's certification of its Quality Assurance System.
2. The geogrid class shall be 'punched and stretched' to create ribs having orientations in three equilateral directions. The resulting triangular-shaped apertures are defined by ribs having a high degree of molecular orientation which is continuous through the node.
3. The reinforcing grid shall be inert to all chemicals naturally found in soils and shall have no solvents at ambient temperature. It shall not be susceptible to hydrolysis, shall be resistant to aqueous solutions of salts, acids and alkalis, and shall be non-biodegradable. The reinforcing grid shall have a minimum of 2% finely divided carbon black, as determined by BS 2782:Part 4:Method 452B:1993, well dispersed in the polymer matrix to inhibit attack by ultra violet light.

The information in this document is of an illustrative nature and is supplied without charge. It does not form part of any contract or intended contract with the user. Final determination of the suitability of any information or material for the use contemplated and the manner of use is the sole responsibility of the user and the user must assume all risk and liability in connection therewith.

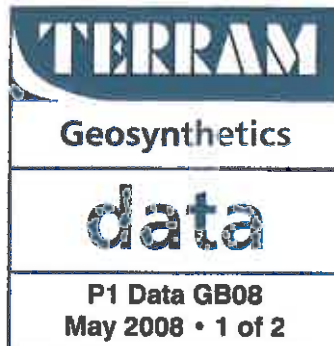
Tensar is a registered trade mark

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E-mail: sales@tensar.co.uk
www.tensar-international.com

UK Head Office
Cunningham Court
Shadsworth Business Park
Blackburn
BB1 2QX
United Kingdom



Thermally Bonded Nonwoven Inbitex®



Product Grade

Inbitex®

Composition

PP / PE

Mechanical Properties

Wide width strip tensile	EN ISO 10319		
- Mean peak strength		kN/m	8.50
- Elongation at peak strength		%	28
CBR puncture resistance	EN ISO 12236		
- Mean peak strength		N	1575

Hydraulic Properties

Pore size	EN ISO 12956		
- Mean AOS O ₉₀		mm	0.145
Water flow	EN ISO 11058		
- Mean flow V _{H50}		10 ⁻³ m.s (l/m ² .s)	80
Water breakthrough	BS 6906: Part 3		
- Mean head		mm	50
Air permeability	ISO 9237		
- Mean flow		l/m ² .s	2875

Physical Properties - typical

Mass	EN 965	g/m ²	130
Roll width		m	4.5 & 2.25
Roll length		m	100

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Gwent NP4 0YR, United Kingdom
Tel: +44 (0) 1495 757 722
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Certificate No: FM 22730

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Property Description

TERRAM**Geosynthetics****data****P1 Data GB08
May 2008 • 2 of 2**

Control Properties

Control properties are those properties that are statistically controlled during manufacture of the product. The results quoted are the family means of the appropriate tests derived over periods of time. Other statistical parameters are available on request.

Consequential Properties

Consequential properties are those properties which arise as a consequence of the manufacturing process. Furthermore, the test methods used to evaluate these properties do not have the required level of reproducibility to be used as control tests. The result quoted are the family means of the appropriate tests derived over periods of time.

Typical Properties

Typical properties are family means of the appropriate tests derived over periods of time.

Composition and Environmental Behaviour

Composition

70% polypropylene / 30% polyethylene.

Chemical Resistance

Alkali - Resistant to all naturally occurring soil alkalis.

Acid - Resistant to all naturally occurring soil acids, (i.e. to acids of pH 2).

Biological Resistance

Terram is unaffected by bacteria, fungi, etc. Since it is not a source of nourishment, rats and termites will not eat the product as food.

Reaction to Temperature

The tensile strength of Terram decreases with increase in temperature, but recovers fully when the geotextile is returned to normal ambient temperature.

Exposure to Sunlight

Terram is delivered in coloured polyethylene wrappers to protect it from the harmful effects of ultra-violet rays: it is recommended that it remains wrapped until it is to be used.

In most applications geotextiles are exposed to direct sunlight for only short periods during installation; the degree to which they resist the effects of UV light is, therefore, of no significance.

For projects where prolonged exposure is inevitable Terram Ltd offers special Terram grades with UV resistance to match the requirement. In these grades the UV light resistance is enhanced by appropriate stabilisers in the polymers, so that they retain over 50% of their original strength after exposure to 70,000 Langleys of solar radiation. All other properties are identical to the corresponding standard series Terram presented in the data sheet. Terram products with enhanced UV resistance carry the suffix UV (e.g. Terram 1000 UV).

Notes

- 1 The mean tensile strength and tear resistance values quoted are the mean values of either the length or cross directions, whichever is the lower.
- 2 For a full description of the test procedures quoted please refer to the specific methods of test.
- 3 Where widths or lengths greater than those supplied on one roll are required, jointing is normally effected by simple overlapping. However, depending upon application, subgrade conditions, material loading, convenience and cost, alternative methods (pegging, sewing, stapling or gluing) may be used. Please refer to the Terram Jointing Methods leaflet for more details.
- 4 As part of its continual improvement process Terram Ltd reserve the right to change the properties listed on this data sheet without prior notice.

Method of accessing services and reinstatement

General

It is important that **access** to services in or underneath the Formpave Sustainable urban drainage system is undertaken in a disciplined and progressive way.

Procedure

- Uplift Aquaflo blocks 1m either side of the line of relevant underground services.
- Take up the laying course stone and cut the underlying geotextile membrane along either side of the line of services and parallel with them. Dispose of the laying course stone and geotextile.
- Excavate sub-base stone and place adjacent to the excavation on plastic membrane. The subbase stone can be re-used.
- Cut intergrid(s) in the same way as the geotextile and dispose of it.
- Cut layer of geotextile or waterproof membrane at reduced level along the line of the services in the same way as the higher layer of geotextile and dispose of it.
- Excavate material over and around services and put on plastic membrane ready for re-use.
- Carry out repair on services.
- Once repairs have been completed replace and fully compact the excavated material around the services.
- Cut fresh geotextile or waterproof membrane to size allowing additional 300mm extra width either side of the remaining geotextile membrane. Tape new geotextile/membrane in place.
- If a heavy duty welded waterproof membrane is installed due to a high water table or the presence of methane the replacement membrane will need to be rewelded to the existing membrane.
- Replace the first 250mm depth of sub-base and thoroughly compact, cut and install fresh intergrid(s) allowing 300mm of extra width either side.
- Spread and compact final 100mm depth of sub-base.
- Cut fresh geotextile membrane to size again allowing 300mm overlap using double sided tape.
- Lay and loose screed to level approximately 50mm depth of 2-6mm crushed stone to BS EN 13242: 2002.
- Replace surface blocks, vibrate surface blocks to level and dress the surface with 2-4mm clean gritstone and vibrate again.
- Brush off and dispose of any debris before final vibration.

Visqueen Top Hat Unit

Page 1 of 2



- **Provides an effective seal around service pipe penetrations**

Description

Visqueen Top Hat Units are used to provide an effective seal around service pipe penetrations. They are available in a range of sizes, the typical size being 110mm in diameter.

Application

Airtight seals should be formed around all service entry points. Visqueen Pre-formed Top Hat Units are available for sealing around pipe entries. The base of the pre-formed unit should be sealed using Visqueen Double-sided Jointing Tape and Visqueen Girth Jointing Tape.

Please Note:

When ordering your Top Hat Units, please provide the outside diameter of your pipe for the correct Top Hat fitting.

Visqueen Top Hat Unit

Page 2 of 2

Installation

Procedure

Cut a circular hole in the membrane as close as possible to the pipe, or pipe socket. Ensure that pipe penetrations do not occur at joints in the membrane.

With the pipe in position, slide the Visqueen Pre-formed Top Hat Unit over the pipe (various diameters are available – 110mm being the most common).

Mark the extent of the square horizontal skirt over the membrane and also mark the line of the top of the top hat unit around the pipe.

Raise the top hat unit and cut four lengths of Visqueen Double Sided Jointing Tape, one for each side of the horizontal skirt, allowing for an overlap at each corner. Cut one length to go round the pipe.

Start to remove the protective paper from the double-sided tape around the pipe and raise it up at an angle so that it will project above the top hat unit when it is stuck to the membrane.

Release the protective paper from each of the four lengths of double-sided tape. Lower the top hat unit, ensuring that the free end of the protective paper around the pipe is reachable, and seal the horizontal skirt to the membrane.

Gradually remove the remainder of the protective film from the double-sided tape around the pipe.

Seal the junction of the horizontal skirt and the membrane with Visqueen Girth Jointing Tape and secure the top hat unit to the pipe with a jubilee clip.

SPECIFICATION SUPPORT

The following items are available to view online or to download from www.visqueenbuilding.co.uk

- . Technical Datasheets
- . Typical installation CAD details
- . Health and Safety data

Register online for access to NBS Clauses and for information about our CPD Seminars



TECHNICAL SUPPORT

For advice on detailing or installation call Visqueen Building Products Technical Help Line 0845 302 4758. Pricing & Availability may be obtained from our UK Network of merchant stockists. For details of these call our Sales Office on 0845 302 4758.

TYPICAL PROPERTIES

Technical Data

Inside Collar Diameter

100mm-160mm

The information given in this datasheet is based on data and knowledge correct at the time of printing. Statements made are of a general nature and are not intended to apply to any use or application outside any referred to in the datasheet. As conditions of usage and installation are beyond our control we do not warrant performance obtained but strongly recommend that our installation guidelines and the relevant British Standard Codes of Practice are adhered to. Please contact us if you are in any doubt as to the suitability of application.



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T: 0845 302 4758 F: 0845 017 8863

enquiries@visqueenbuilding.co.uk

www.visqueenbuilding.co.uk

VISQUEEN BUILDING PRODUCTS IS A TRADING NAME OF BRITISH POLYTHENE LIMITED, COMPANY NUMBER: 350729, REGISTERED OFFICE: ONE LONDON WALL, LONDON, EC2Y 5AB

Appendix B
Section 106 Approval Letters



Faraj Arfa-Zangeneh
Caulmert Ltd
Cattermole Building
Market Place
Codnor
Derbyshire
DE5 9QA

Developer Services
Southern Water
Sparrowgrove House
Sparrowgrove
Otterbourne
Hampshire
SO21 2SW

Tel: 0330 303 0119

Email: developerservices@southernwater.co.uk

10/10/2014

Our Ref: SWS-HANTS-S106-006334

Application to Connect to the Public Sewerage System - Section 106 Water Industry Act 1991

Location: Purbrook Park School, Park Avenue, Purbrook, Waterlooville, Hampshire, PO7 5DS.

Dear Mr. Zangeneh,

Further to your recent application to connect to the public sewerage system at the above location. I am pleased to inform you that your proposal to connect to the surface water sewers via an existing manhole has been approved subject to the following provision:-

Connections to existing manholes and arrangement of pipe junctions within the manhole should be in accordance with Sewers for Adoption 7th edition and Southern Water guidance documentation.

Please contact Mick Vince our Clerk of works for this area on 07803 259227 giving at least 2 full working days notice, in order that a mutually convenient date and time for the inspection of the works can be arranged.

If connection is to be made through the lands of another, the works may not proceed until the Landowners consent has been obtained.

In approving this application it is assumed that you have obtained any necessary Building Regulations Approval and /or Highway Authority Road Opening License.

Yours sincerely,

Developer Services



Faraj Arfa-Zangeneh
Caulmert Ltd
Cattermole Building
Market Place
Codnor
Derbyshire
DE5 9QA

Developer Services
Southern Water
Sparrowgrove House
Sparrowgrove
Otterbourne
Hampshire
SO21 2SW

Tel: 0330-303-0119

Email: developerservices@southernwater.co.uk

10/10/2014

Our Ref: SWS-HANTS-S106-006326

Application to Connect to the Public Sewerage System - Section 106 Water Industry Act 1991

Location: Purbrook Park School, Park Avenue, Purbrook, Waterlooville, Hampshire, PO7 5DS.

Dear Mr. Zangeneh,

Further to your recent application to connect to the public sewerage system at the above location. I am pleased to inform you that your proposal to connect to the surface water sewers via an existing manhole has been approved subject to the following provision:-

Connections to existing manholes and arrangement of pipe junctions within the manhole should be in accordance with Sewers for Adoption 7th edition and Southern Water guidance documentation.

Please contact Mick Vince our Clerk of works for this area on 07803 259227 giving at least 2 full working days notice, in order that a mutually convenient date and time for the inspection of the works can be arranged.

If connection is to be made through the lands of another, the works may not proceed until the Landowners consent has been obtained.

In approving this application it is assumed that you have obtained any necessary Building Regulations Approval and /or Highway Authority Road Opening License.

Yours sincerely,

 Developer Services



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