



**220 Elgar Road South
Reading
RG2 0BW**

SuDS Operations & Maintenance Manual

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KNC2508/SUDS/A

CONTENTS

1.0	INTRODUCTION.....	3
2.0	ATTENUATION STORAGE, CHANNEL DRAINS & SILT TRAPS	6
3.0	FLOW CONTROL DEVICE.....	7

Table 1:	Operation and Maintenance Requirements - Channel Drains, Gullies, Manholes & Silt Traps.....	6
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Table 2:	Operation and Maintenance Requirements - Flow Control Device	7
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Appendix A	As built Information
Appendix B	Manufacturer's Information
Appendix C	Inspection Records
Appendix D	Maintenance Regime Monitoring and Amendments

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Revision	Description	Date	Initials
O	Initial issue	August 2025	KHN
A	Amended to revised drainage	December 2025	KHN

1.0 INTRODUCTION

1.1 The SuDS Philosophy

- 1.2 Sustainable Drainage Systems (SuDS) are a collection of water management practices that aim to align modern drainage systems with natural water processes. SuDS are designed to mimic the natural drainage regime of an area thus minimising impact on receiving watercourses and surface water drainage systems. To that end the total surface water discharge from the site should be no greater than the 'greenfield' run off from the undeveloped site. The SuDS philosophy has been applied to the proposed development to provide a natural approach to managing the surface water drainage from the site and preventing water pollution and flooding.
- 1.3 The FRA for the site produced by Paul Basham Associates to accompany the planning application identified the site to be in an area where significant constraints for infiltrating SuDS were present. The main constraint was the potential maximum depth of groundwater not being able to provide a 1.0m clearance to the invert level of any infiltration measures. Consequently, it was proposed that surface water discharge from the site will continue to discharge into the existing Thames Water sewer network but restrict the discharge rate close to the existing greenfield rate as practicable.
- 1.4 The existing greenfield rates from the 0.14 hectare site were calculated using MicroDrainage and after discussions with the Lead Local Flood authority (LLFA) it was agreed that the peak discharge rate would be restricted to 3.0lits/sec in line with with the requirements of the '*National standards for sustainable drainage systems*' (SuDS) updated 30 July 2025, this being the value as close to the greenfield rates as reasonably possible, whilst minimising the risk of blockage occurring in the network and ensuring the network would continue to operate efficiently.
- 1.5 The new development will mean that the total hardstanding area will be reduced and with it a reduction in the volume of surface water leaving the site and entering the public sewer system.

- 1.6 Discharge into the public surface water sewer will be subject to Section 106 Agreement with Thames Water, subject to the hierarchy of disposal methods being examined and proven to be impractical.

1.7 SuDS Maintenance

- 1.8 Regular inspection and maintenance is important for the effective operation of the SuDS drainage features across the development.

- 1.9 The following SuDS features have been designed into the development to control the surface water run-off created through the construction of areas such as roofs, parking areas, access roads and footways.

- Sub surface Attenuation Storage and Control Devices

- 1.10 In order to ensure the continued effective operation of the SuDS features maintenance regimes have been provided for the above features.

- 1.11 This document has been prepared at the design stage and should be considered as part of an evolving process. Following construction, 'as built' information and drawings should be included in the document. The post construction information should include drawings detailing the extent and location of SuDS features together with relevant manufacturer's details.

- 1.12 The following maintenance regimes should be amended/updated to suit specific manufacturer's requirements for the various components installed.

- 1.13 The following appendices have been included to allow for additional information and records to be included post construction.

- **Appendix A** As Built Information
- **Appendix B** Manufacturer's information
- **Appendix C** Inspection Records
- **Appendix D** Maintenance Regime Monitoring and Amendments

1.14 It should also be recognised that for a maintenance regime to continue to be appropriate and fit for purpose a constant monitoring ethos should be adopted and any corrective measures implemented to ensure that the correct maintenance regimes going forward are in place. Inspection records should be kept and used as a basis for the determining the suitability of the maintenance regimes and the areas of the development requiring attention.

1.15 As a social housing association Abri Housing have an in-house maintenance and management organisation which will undertake the requirements and obligations to ensure that the SuDS facilities are adequately maintained. The obligations of Abri management will be funded by an annual contribution from the residents of the development. This manual will form part of the brief provided to the Abri management, who will use it to calculate fees which will be paid by residents.

1.16 At the end of the manufacturer's recommended design life for all SUDs components they shall be replaced at Abri Housing's expense to the satisfaction of the Planning Authority.

2.0 ATTENUATION STORAGE, CHANNEL DRAINS & SILT TRAPS

- 2.1 Attenuation storage is provided in the underground cellular storage tank located under the play area and public open space at the southern end of the parking court. All surface water drainage from the access road, parking areas and roof passes through silt traps before being discharged into the cellular storage tank.
- 2.2 Maintenance of the silt traps, gullies and channel drains are particularly important as these control the risk of pollution entering the storage tank. A maintenance regime has been prepared for the gullies, channel drains and silt traps as indicated in Table 1 below and maintenance of the channel drains can be found in the Polypipe Maintenance Guide found in **Appendix B**
- 2.3 The cellular attenuation storage will be wrapped in an impermeable membrane to contain discharged water prior to discharging through the flow control device into the Thames Water public sewer, through an existing pipe connection to the sewer west of the development site.

Table 1: Operation and Maintenance Requirements – Channel Drains, Gullies Manholes and Silt Traps

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance.	Inspect and remove sediment from all channel drains, silt traps manholes and gullies	At six monthly intervals, Autumn and Spring
Remedial actions.	Inspect and clean out all channel drains, pipework, silt trap, gullies and manholes	At six monthly intervals, Autumn and Spring.
Monitoring.	Inspect/check all inlets, outlets and overflows to ensure that they are in good condition and operating as designed.	Annually

3.0 FLOW CONTROL DEVICE

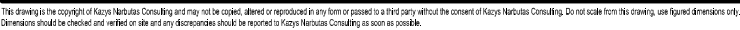
- 3.1 Outflow from the attenuation storage tank will pass through the Vortex Flow Control device which will discharge at a maximum rate of 3.0 lits/sec. The flow control is a 'Hydro-Brake' unit which is fitted into a Polypipe 'RidgiStorm' manhole.
- 3.2 A maintenance regime has been prepared for the flow control device as indicated in Table 2 below and should be read in conjunction with Hydro International maintenance recommendations contained in **Appendix B'**

Table 2: Operation and Maintenance Requirements – Flow Control Device

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance -In conjunction with Hydro International maintenance recommendations in Appendix B	Inspect and identify any areas that are not operating correctly, take remedial action.	Monthly for 3 months, then half-yearly.
	Remove any sediment and debris from flow control devices	As required
Remedial actions.	Repair/rehabilitate inlets, outlet, overflows and vents.	As required.
Monitoring.	Inspect/check all inlets, outlet, and overflows to ensure that they are in good condition and operating as designed.	Monthly for 3 months, then half-yearly.

Appendix A

As Built Information



H	10.12.25	Permissible paving replaced, permavold removed	KN	
G	04.12.25	Drainage levels/details added	KN	
F	25.11.25	Drainage design and outfall amended	KN	
E	21.08.25	Drainage channels amended to Polypipe 'Permestreet-Ea'	KN	
D	11.08.25	SI105 roles added, entrance construction identified	KN	
C	07.08.25	Building level and cover levels adjusted	KN	
B	07.08.25	Proposed external levels removed	KN	
A	01.08.25	First issue	KN	
Rev.	Date	Details	Initials	
Drawing Status				
PRELIMINARY				
Project				
ELGAR ROAD				
DRAINAGE				
Client				
				
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Drawing Title				
Engineering Details				
Drainage Layout				
Drawn	Checked	Scales	Paper Size	Date
KN		1:250	A1	08.25
Job No.	Drawing No.		Revision	
KNC2508	502-01		H	

Appendix B

Manufacturer's Information

Hydro International Warranty, Maintenance and COSHH Statement

This statement covers all Hydro International Hydro-Brake® Optimum, Hydro-Brake® and S-Type Vortex Flow Control units (hereafter referred to as "Flow Control").

Defects Liability Period Warranty

The standard Hydro International warranty covers products for one year from date of purchase and will only be considered for those defects or faults reported directly to Hydro International in writing. Warranties will not be considered for defects or faults caused by accident, acts of vandalism or unauthorised repair/rectification. Please Contact Hydro International for product specific details.

Maintenance

Normally, little maintenance is required as there are no moving parts within the Flow Control. Experience has shown that if blockages occur they do so at the intake, and the cause on such occasions has been due to a lack of attention to engineering detail such as approach velocities being too low, inadequate benching, or the use of units below the minimum recommended size. The Flow Control (where applicable) is fitted with a pivoting bypass door, which allows the manhole chamber to be drained down should blockage occur. The smaller conical units, below the minimum recommended size, are also supplied with rodding facilities or vortex suppressor pipes as standard.

Following installation of the Flow Control it is vitally important that any extraneous material ie. building materials are removed from the unit and the chamber. After the system is made live, and assuming that the chamber design is satisfactory, it is recommended that each unit be inspected monthly for three months and thereafter at six monthly intervals with hose down if required. If problems are experienced, please do not hesitate to contact the company so that an investigation may be made.

All Flow Control units are typically manufactured from grade 304 Stainless Steel, and if required they can also be manufactured in grade 316 Stainless Steel. Both materials have an estimated life span in excess of the design life of drainage systems.

COSHH

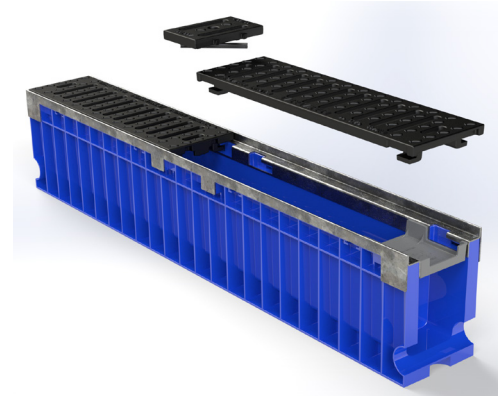
Flow Control units are manufactured from Stainless Steel, which is not regarded as hazardous to health and exhibits no chemical hazard when used under normal circumstances for the stated applications.

Manual Handling

The handling of Flow Control units should be in accordance with the current legislation and regulations:

- The Health and Safety at Work Act 1972
- The Management of Health and Safety at Work Regulations 1999
- The Manual Handling Operations Regulations 1992. All published and printed by the Health and Safety Executive.

The Permatreat-S and Permatreat-EA treatment devices rely on the quality of their installation to achieve C250 load classification to BS EN 1433. Therefore, it is important this guide is followed to ensure the required specification is met.



Delivery

- Permatreat will be delivered to site on pallets. Palletised load measurements are approx. 1.0m x 1.2m x 1.0m high and each pallet will contain 35 Permatreat units
- Pallet weight is circa 397kg for the Permatreat-S, and 439kg for Permatreat-EA
- Permatreat is delivered with gratings in position and fastened
- Deliveries shall be unloaded using mechanical handling equipment

Storage

- Position pallets on stable, even level ground
- Stacking of pallets is not recommended
- Store away from direct source of heat or ignition
- Transit banding not to be removed until point of installation

Excavation and Bedding Preparation

- Prepared formation: to be trimmed smooth and free from sharp objects and projections. For optimum capacity Permatreat should be installed level but it can be installed to shallow gradients should the drainage design require
- Permatreat should be laid on a 150mm deep concrete bed with a minimum 150mm thick haunch to both sides. A 30N/mm² concrete mix is required
- Tolerance: prepared formation/local subgrade below concrete bed tolerance of $\pm 5\text{mm}$ within any 3m direction
- Permatreat should be bedded in to the concrete
- The commensurate level for the Permatreat installation should allow for the height of the Permatreat and the depth of the concrete bedding plus a further 3-5mm below the finished level to protect the Permatreat and prevent ponding
- Ensure the membrane encapsulation from the Pemavoid tanks (if required) spans below the Permatreat installation (including concrete bedding and haunching) with sufficient length to return up the rear of the Permatreat run. See General Design Details within the Pemavoid System Technical Manual for further guidance

Figure 1: Permatreat Concrete Requirements

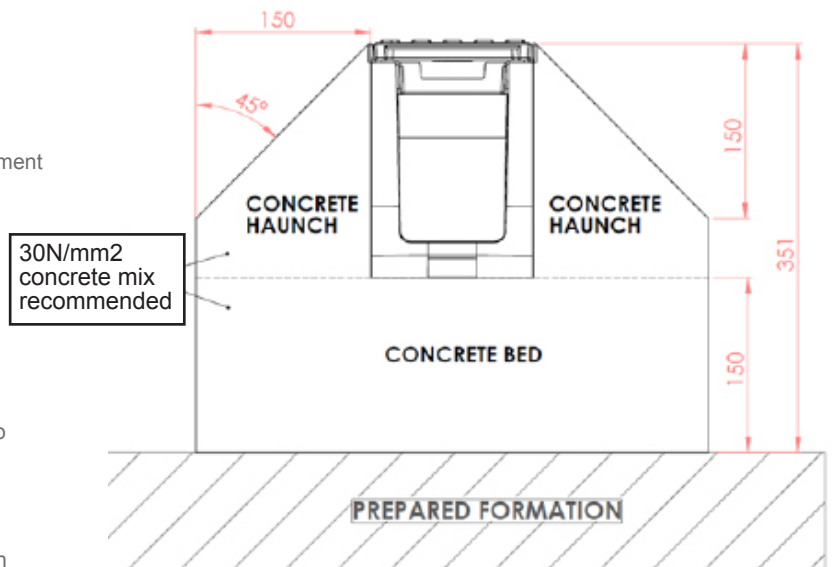
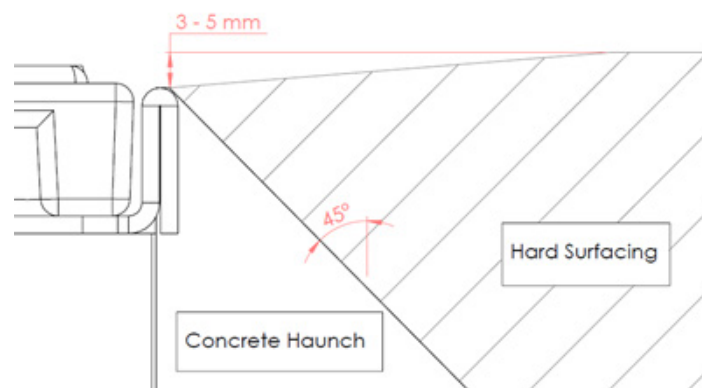


Figure 2: Height below finished level



Installation of Permatreat

- Installation to be carried by a suitably qualified installer
- Check installation plan / details to confirm Permatreat orientation in relation to geocellular tank(s)
- Permatreat must be laid in line, aligned using a builder's line or suitable laser alignment equipment
- Install the Universal Permatreat Connector (product code: PV06305) along the length of the Permatreat run, with 1 connector required per linear metre of Permatreat. The connector is installed where adjacent Permatreat units butt against each other to form a 40mm diameter outlet
- Install the Permatreat Connector by firstly removing the fresh concrete bed (before hardening) in immediate area and inserting 'o' ring (supplied with connection unit) into the rebate of the 40mm diameter outlet from the Permatreat and then insert the 40mm diameter spigot into the Permatreat aperture
- Ensure the Permatreat Connector is seated in a vertical position if installing Permatreat ahead of the Permavoid tank or is butted against the Permavoid tank if installing the Permatreat after the Permavoid tanks, (see Figure 5)
- Redundant Permatreat outlet, if not used must be blanked prior to placing concrete haunch. 40mm blanking plugs are available if required
- Place the concrete haunch to the front and rear of the Permatreat
- The linear elements must be kept clean during installation
- Trafficking over the newly laid channel to be kept to a minimum
- To terminate the end of a unit a Permatreat end cap (PV03002) is used. The end cap will need to be trimmed down to suit the finished level of the Permatreat (see Figure 6)
- It is essential the grating is left installed in the Permatreat during construction of the pavement

Figure 3 - Linear run

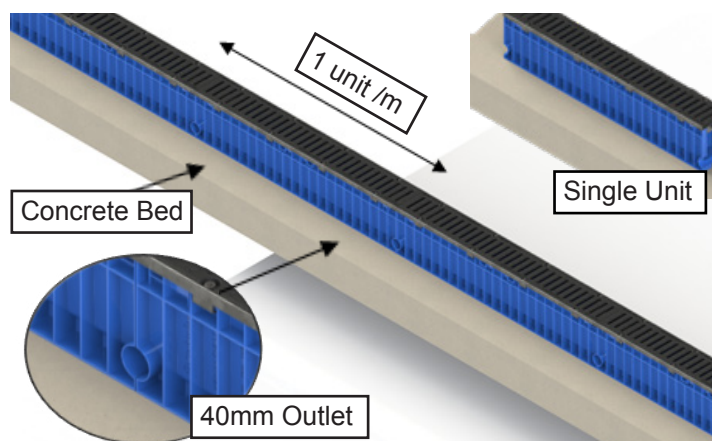


Figure 4 - Installation of connection spigot

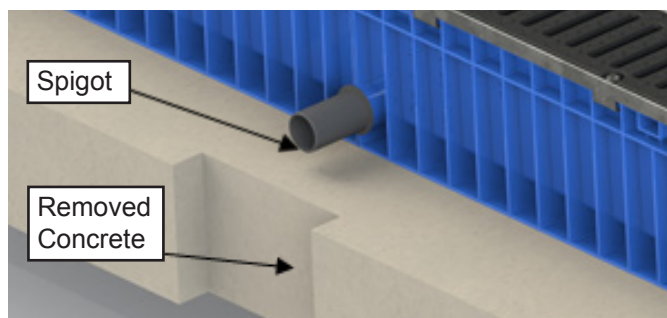
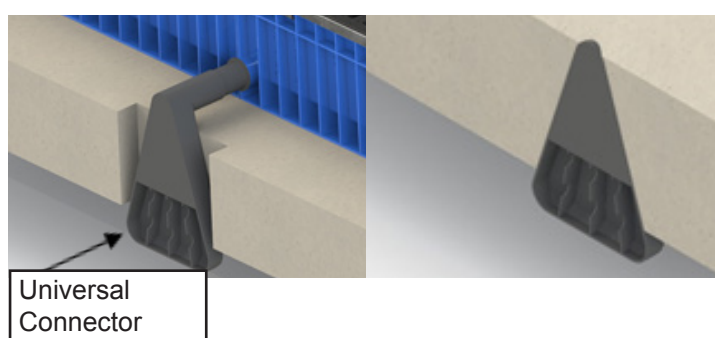


Figure 5 – Installation of connection unit



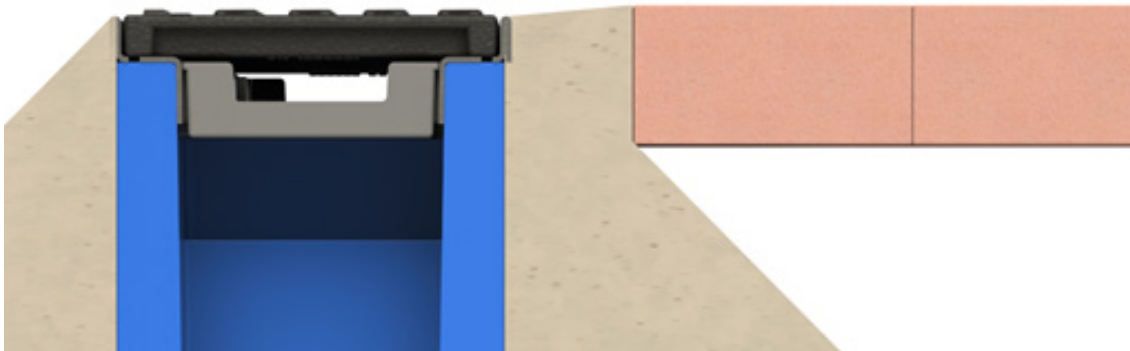
Surface Finish Options

- Concrete: between the minimum 150mm concrete haunch and the concrete slab, an expansion joint must be inserted, to a structural engineer's specification
- Bituminous Bound: to avoid damaging the Permatreat units during compaction of the surfacing the concrete surround must be haunched as high as possible (45 degrees back to the Permatreat). The bituminous bound surfacing can be installed against the side of the channel. The finished level following compacting must be 3 to 5mm above the height of the grating (see Figure 2)
- Modular Paving: the concrete surround is critical to the strength of the Permatreat unit and cannot be reduced. Either the paving will need to be modified to fit (i.e. cutting the blocks / flags), or the concrete terminated at ground level ensuring the paving does not interfere with the 45° concrete haunch (see Figure 7).

Figure 6 - Installation of end cap



Figure 7- Modular paving example



Maintenance Plan

This should be initiated by the drafting of routine maintenance plans to suit the site installation. A pre-handover inspection should be carried out and the Permatreat system cleaned prior to final handover.

Routine inspection and maintenance should include:

- Inspection of systems
- Removal of silts
- Decanting of oils and hydrocarbons
- Water sampling and testing at point of discharge (if required)

Excess silts/debris held within Permatreat should be cleared manually or with a vacuum tank. We do not recommend pressure led cleaning.

Routine maintenance procedures:

- 3 monthly inspections of units for signs of blockages and oil spillage
- Removal of litter and blockages as required
- Every 12 months inspect all chambers for silt and oil build up and sweep external surfaces
- Remove silt as required but at least every year
- Records of inspections and maintenance undertaken should be kept by the client

Accidental spillages:

If accidental spillages occur or if oil or other substances that can cause water pollution, they must be dealt with immediately. An example of this is if a car sump falls and there is large spillage of oil on the car park or road surfaces. A spillage kit appropriate to the size of the car park should be kept by the site caretaker. This should include absorbent pads, socks and rain seals.

As soon as a spillage is identified, the drain inlets in that area should be covered to prevent pollution entering the system. The pollution should then be cleared from the road or car park surface. The Permatreat system receiving the spillage should be emptied of all pollution that has entered.

Permatreat should prevent any significant pollution from entering the rest of the drainage system. The Environment Agency should be informed of the spillage and the appropriate actions should be taken.

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Appendix C

Inspection Records

Inspection & Maintenance Associated with Section 2.0
See Schedule in Table 1 for Operations

Permatreat-EA Channel Drains

Permatreat-EA Drain Reference	Date Inspected & Cleaned	Operation & Comments
CH1		
CH2		
CH3		

Inspection & Maintenance Associated with Section 2.0
See Schedule in Table 1 for Operations

Silt Traps

Silt Trap Reference	Date Inspected & Cleaned	Comments
ST1		
ST2		

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Inspection & Maintenance Associated with Section 2.0
See Schedule in Table 1 for Operations

Gullies

Silt Trap Reference	Date Emptied	Comments
G1		
G2		
G3		
G4		

Inspection & Maintenance Associated with Section 2.0
See Schedule in Table 1 for Operations

Manholes

Silt Trap Reference	Date Emptied	Comments
S1		
S2		
S3		
S4		
S5		
S6		

Inspection & Maintenance Associated with Section 3.0
See Schedule in Table 2 for Operations

Flow Control Device

Flow control Reference	Date Inspected & Cleaned	Comments
HB1		

Appendix D

Maintenance Regime Monitoring & Amendments

Monitoring and Review Table

Revision	Revision Description	Date	Initials