



**Cinders Nursery
Yapton**

SuDS Operations & Maintenance Manual

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Revision	Description	Date	Initials
O	Initial issue	October 2019	KHN
A	Additional information added	08.11.19	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. 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 SuDS Maintenance

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

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

- Permeable Pavements (block paving)
- Attenuation Storage and Flow Control Devices
- Discharge Soakaways
- Swales

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

1.7 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. The post construction information should include drawings detailing the extent and location of SuDS features together with relevant manufacturer's details.

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

1.9 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

1.10 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.

1.11 As a reputable developer Crayfern Homes will set up a Maintenance Management Company for the site which will undertake the requirements and obligations to ensure that the SuDS facilities are adequately maintained. The obligations of the Management Company will be funded by an annual contribution from the residents of the development. This manual will form part of the brief provided to the Management Company, who will use it to calculate fees which will be paid by residents.

- 1.12 At the end of the manufacturer's recommended design life for all SuDS components they shall be replaced at the Management Company expense.

2.0 PERMEABLE PAVEMENTS

- 2.1 Permeable pavements have been provided around the development to infiltrate water down through the sub base from the road/drive over and to act as a conduit for surface water run-off to be carried towards underground attenuation tanks prior to discharge off site.
- 2.2 Permeable pavements need to be regularly cleaned of silt and other sediments to preserve their infiltration capacity. Extensive experience suggests that sweeping once per year should be sufficient to maintain an acceptable infiltration rate on most sites.
- 2.3 A maintenance regime has been prepared for the development as indicated in Table 1 below.
- 2.4 Inspection reports should be kept and the maintenance regime for the permeable paving should be adjusted, if necessary, to suit ongoing site-specific circumstances as they arise.
- 2.5 A brush and suction cleaner (which can be a lorry-mounted device or a smaller precinct sweeper) should be used for regular sweeping. Care should be taken in adjusting vacuuming equipment to avoid removal of jointing material. Any lost material should be replaced. It is also possible to clean the surface using lightweight rotating brush cleaners combined with power spraying using hot water.
- 2.6 If the surface has clogged then a more specialist sweeper with water jetting and oscillating and rotating brushes may be required.

Table 1: Operation and Maintenance Requirements - Permeable Pavements

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance.	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment.
	Empty silt traps	Once a year at the same time as the pervious paving is being cleaned.
Occasional maintenance.	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying.	As required – once per year on less frequently used pavements.
Remedial Actions.	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving.	As required.
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material.	As required.
	Rehabilitation of surface and upper substructure by remedial sweeping.	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging).
Monitoring.	Initial inspection.	Monthly for three months after installation.
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action.	Three-monthly, 48 hours after large storms in the first six months.
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually.
	Monitor silt taps.	At same frequency of pervious paving inspections.

3.0 ATTENUATION STORAGE AND FLOW CONTROL DEVICES

- 3.1 Attenuation storage is provided in the underground cellular storage tank located under the access road and landscaped area. All discharge from roofs and drives pass through a silt/oil trap before being discharged into the cellular storage tank. Carriageway drainage is through trapped gullies which will discharge either directly into the storage network or the drainage networks serving the roofs/drives.
- 3.2 The cellular attenuation storage will be wrapped in an impermeable membrane to contain discharged water.
- 3.3 The flow control device being used is a Vortex Control, '*Hydro-Brake*' or similar, fitted within a concrete manhole.

Table 2: Operation and Maintenance Requirements – Attenuation Storage

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance.	Inspect all silt/oil traps and oil interceptors	At six monthly intervals, Autumn and Spring
Remedial actions.	Remove any sediment or deposits with vacuum suction.	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

Table 3: Operation and Maintenance Requirements - Flow Control Devices

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance.	Inspect and identify any areas that are not operating correctly, take remedial action.	Monthly for 3 months, then annually.
	Remove any sediment from flow control devices.	Annually (or 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.	Annually
	Where fitted check operation of by-pass door.	Annually

4.0 SOAKAWAYS

- 4.1 The soakaways installed on site have been installed to assist in the reduction in the discharge rate of surface water discharge from the site and catch overland flows.

Table 4: Operation and Maintenance Requirements - Soakaways

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance.	Inspect for sediment and debris in pre-treatment components and floor of inspection tube.	Annually.
	Trimming any roots that may be causing blockages.	Annually (or as required).
Occasional maintenance.	Remove sediment and debris from pre-treatment components and floor of inspection tube.	As required, based on inspections.
Remedial actions.	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates.	As required.
	Replacement of clogged geotextile (will require reconstruction of soakaway).	As required.
Monitoring.	Inspect silt traps and note rate of sediment accumulation.	Monthly in the first year and then annually.

5.0 SWALES

- 5.1 Swales have been provided to collect and divert overland flood flows from exceedance events or local network failures.
- 5.2 Maintenance of swales is relatively straight forward and typically require only a small amount of work.

Table 5: Operation and Maintenance Requirements for Swales

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance.	Remove litter and debris.	Monthly, or as requested.
	Cut grass – to retain grass height within specified design range.	Monthly (during growing season), or as required.
	Manage other vegetation and remove nuisance plants.	Monthly at start, then as required.
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly.
	Inspect vegetation coverage.	Monthly for 6 months, quarterly for 2 years, then half yearly.
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies.	Half yearly.
Occasional maintenance.	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required.	As required or if bare soil is exposed over 10% or more of the swale treatment area.
Remedial actions.	Repair erosion or other damage by re-turfing or reseeded.	As required.
	Relevel uneven surfaces and reinstate design levels.	As required.
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface.	As required.
	Remove build-up of sediment or upstream gravel trench, flow spreader or at top of filter strip.	As required.
	Remove and dispose of oils or petrol residue using safe standard practices.	As required.

Appendix A

Appendix B

Appendix C

Appendix D

Monitoring and Review Table

Revision	Revision Description	Date	Initials