

**SPRINGFIELDS
ALDINGBOURNE
WEST SUSSEX
P020 3TE**

SuDS MAINTENANCE & MANAGEMENT PLAN

For:

IMPERIAL HOMES

**TB/435050/eg
11 October 2021**

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1. Introduction

- 1.1. This document has been prepared by Cowan Consultancy Limited (CCL) on behalf of Imperial Homes for the development at Springfields, Aldingbourne, West Sussex.
- 1.2. This document sets out the principles for the long-term management and maintenance of the proposed surface water Sustainable Drainage Systems (SuDS) installed at the residential development.
- 1.3. The purpose of this document is to ensure that the management company and/or homeowner entrusted with the inspection and maintenance of the SuDS will adopt the measures and programme set in this document to ensure the optimum operation of the surface water drainage network. The SuDS are to be continuously maintained over the lifetime of the development to prevent the increased risk of flooding both on and off site.
- 1.4. The guidance notes here provided have been comprised of and are directly referenced from the latest technical SuDS guidance within the CIRIA C753 Report *The SuDS Manual* (2015) and other applicable guidance. This document sets out specific sections applicable to the relevant SuDS type itemising:
 1. A description of the SuDS component and its use;
 2. The maintenance requirements and frequencies; and
 3. The inspection requirements and frequencies.
- 1.5. The activities listed are generic to the relative SuDS types and represent the minimum maintenance and inspection requirements, however additional tasks or varied maintenance frequency may be instructed by the maintenance company as required. Rubbish and debris removal is also an integral part of SuDS maintenance, especially with regards to surface features and the reduction of the risks of inlet and outlet blockages.
- 1.6. Specific maintenance needs of the SuDS elements should be monitored, and maintenance schedules adjusted to suit requirements.
- 1.7. All those responsible for maintenance should follow relevant health and safety legislation for all activities listed within this report (including lone working, if relevant) and risk assessments should always be undertaken.
- 1.8. This report is to read in conjunction with CCL drawings 435050/201P3, 435050/202P5, 435050/203P4 and 435050/204P.
- 1.9. There are three categories of maintenance activities referred to in this report:

• **Regular maintenance** (including inspections and monitoring) – consisting of basic tasks done on a frequent and predictable schedule, including inspections and monitoring, silt or oil removal if required more frequently than once per year, vegetation management, rubbish and debris removal, and sweeping of surfaces. Regular maintenance/inspections of SuDS will help to:

- determine optimum future maintenance;
- establish ongoing hydraulic, water quality, amenity and biodiversity performance of the system; and
- allow for the identification of potential performance failures, such as blockage, reduced infiltration and poor water quality resulting from lack of maintenance.

• **Occasional maintenance** – comprising tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks such as sediment management/removal; and

• **Remedial maintenance** – comprising of intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by regular and adequate maintenance activities. Remedial maintenance is likely to comprise of activities such as:

- erosion repairs which can include inlets and outlets;
- reinstatement or realignment of edgings, barriers, rip-rap or other erosion control;
- infiltration surface rehabilitation;
- replacement of blocked filter materials/fabrics;
- construction stage sediment removal (although this activity should have been undertaken before the start of the maintenance contract); and
- system rehabilitation (although unlikely) immediately following a pollution event.

Remedial activities are not expected to be required for all systems, however, for the purpose of estimating whole life maintenance costs, a contingency sum of 15–20% should be added to the annual regular and occasional maintenance costs to cover the risk of these activities being required. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.

1.10. During the first year of operation inspections should usually be carried out at least monthly to all types of SuDS, and after significant storm events, to ensure that the system is functioning as designed and that no damage is evident.

1.11. Upon completion of the development, a management company will be formed, with residents of the development comprising the board of directors. The management company will appoint a managing agent (Oyster Estates) who will be responsible for maintaining all communal aspects of the development, including SuDS. 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 agents, 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's expense to the satisfaction of the Planning Authority.

2. SuDS Layout and Design

SuDS are an environmentally friendly approach to managing rainfall through the use of landscape features to conceal the surface water and its surroundings. The use of SuDS aims to: control the flow, volume and frequency of water leaving a development area; prevent pollution by intercepting silt and cleaning runoff from hard surfaces; provide attractive surroundings for the community, and; create, whenever possible, opportunities for wildlife.

The SuDS at Springfields, Aldingbourne were designed to prevent flooding within the proposed development and surrounding areas and control discharge via underground drainage systems. Due to the nature of the proposed development site, special attention must be paid to the proposed drainage strategy to manage the quality of the site runoff and prevent pollution as much as reasonably practicable.

Thus, the proposed drainage strategy allows for the attenuation and discharge of the runoff event of a 1 in 100 year storm for the full site (plus a 10% allowance for urban creep and a 40% allowance for climate change).

The access road and Plot 8 parking are to be of permeable tarmac with Permavoid shallow attenuation storage units beneath. The depth of the sub-base replacement build-up has been designed to provide attenuation storage of the surface water. The permeable paving build-up provides an acceptable level of treatment to the surface water within the access road & parking bays.

The private driveways and visitor parking are constructed of permeable block paving with 150mm depth tanked granular sub-base. A perforated pipe in a sump within the sub-base falls to the Permavoid attenuation tanks underneath the access road.

Run-off from the roofs is drained direct to the domestic drainage system within each curtilage and is piped into the access road sub-base replacement attenuation system. Proceeding each connection into the attenuation system is a silt trap inspection chamber with minimum 300mm sump.

The surface water is conveyed in the Permavoid attenuation tanks to the north east of the site where it discharges via a discharge control chamber into a ditch. The discharge control chamber is to limit flows to a maximum of 1.2l/s.

A 3m easement will be kept between the northern boundary fence of Plots 4 - 8 and the edge of the top of the bank of the ditch to allow a route for future maintenance. The fence here is to be built with demountable panels to allow for access to the easement strip.

There is to be a deed of easement included to allow the Management Company to cross the driveway of Plot 8 to reach the ditch for any maintenance works required.

All tanked permeable private driveways are to be maintained by the individual property owners. The permeable tarmac areas with attenuation beneath, to include the access road and Plot 8 driveway,

are to be maintained by the management company, this is also the case for the tanked permeable visitor parking bays, (refer to para 1.11).

All domestic drainage serving the roof run off, including silt traps are to be the responsibility of the individual property owners.

3. Riparian Rights & Responsibilities

The owner of any land abutting a watercourse has rights and responsibilities which have been established in common law.

- They have a right to receive the flow of water in its natural state without diminution or alteration.
- They have the right to protect their property from erosion and flooding.
- They can extract water for domestic purposes up to a stated amount. A licence is required from the Environment Agency for extraction over 20m³ per day.

As there could be riparian owners both above and below stream from the landowner, and possibly on the opposite side of the watercourse, any activities taking place must not affect their riparian rights.

Responsibilities as a riparian owner include:

- Allowing fish to pass freely.
- Not interfering with or affecting the quantity or quality of the flow of water.
- Regular maintenance of the watercourse, including keeping it free from major obstructions which may lead to an increased flood risk.
- Not diverting or polluting the water.

The Regular maintenance of the watercourse will be assigned to the management company upon completion of the development. Appendix A shows the section of the watercourse that the management company will have riparian responsibility for.

4. SuDS Maintenance and Management

4.1. Permeable Paving

4.1.1. Regular inspection and maintenance are required to maintain the effective operation permeable paving require and to ensure continuing operation to design performance standards.

4.1.2. After construction, before hand over to the client, the pavement should be inspected for clogging, litter, weeds and water ponding.

- 4.1.3. After the handover the pavement should be inspected on regular basis, particularly during and after heavy rainfall to ascertain the effective operation and to identify any performance issues.
- 4.1.4. Silt and sediments removal should be carried out regularly to preserve and maintain pavement infiltration capacity.
- 4.1.5. Brushing and suction cleaning should be used for regular sweeping. Care should be taken whilst vacuuming to avoid the removal of jointing material.
- 4.1.6. In case of any blockage or clogging of the paving surface a specialist sweeper with water jetting and oscillating and rotating brushes may be required.
- 4.1.7. Table 3.2 provides guidance on the type of operational and maintenance requirements that may be appropriate. The list of actions is not exhaustive and some actions may not always be required.
- 4.1.8. Specific maintenance needs for block permeable paving should be monitored, and maintenance schedules adjusted to suit site requirements.
- 4.1.9. Maintenance responsibility for systems should be placed with a responsible organisation such as a management company.

Table 3.2 – Permeable Paving Key operation and Maintenance Requirements

<i>Maintenance Schedule</i>	<i>Required action</i>	<i>Typical frequency</i>
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Annually, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	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	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 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually
Survey inside of tank for sediment build-up and remove if necessary		Every 5 years or as required

4.2. *Silt Traps & Catchpits*

- 4.2.1. Silt traps and catchpits are circular or rectangular manholes and /or chambers with a sump in them to collect suspended solids.
- 4.2.2. Some chambers have removeable silt buckets to assist with the removal of accumulated silt deposits. Catchpits are usually concrete ring or segment structures and silt traps preformed plastic chambers.
- 4.2.3. Regular inspection and maintenance is required to ensure the effective long-term operation of below ground silt traps and catchpits systems.
- 4.2.4. Maintenance responsibility for systems should be placed with a responsible organisation.
- 4.2.5. Maintenance requirements are described in the table below.
- 4.2.6. Specific maintenance needs of the system should be monitored, and maintenance schedules adjusted to suit requirements.

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Remove sediment and oil deposits from all trapped gullies.	Annually, or as required.
	Remove sediment structures upstream of the cellular storage tanks.	Annually, or as required.
Remedial actions	Repair/rehabilitation of inlets, outlets, overflows and vents.	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually and after large storms

4.3. *Permavoid Cellular Storage*

- 4.3.1. Modular plastic geocellular systems with a high void ratio, that can be used to create a below ground storage structure.
- 4.3.2. Regular inspection and maintenance is required to ensure the effective long-term operation of below ground modular storage systems.

4.3.3. Maintenance responsibility for systems should be placed with a responsible organisation.

4.3.4. Maintenance requirements for modular systems are described in the table below.

4.3.5. Specific maintenance needs of the system should be monitored, and maintenance schedules adjusted to suit requirements.

Maintenance Schedule	Required Action	Recommended Frequency
Regular	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
maintenance	Inspect catchpits and clear silt / debris as necessary	Monthly for 3 months, then six monthly.
Remedial actions	Repair/rehabilitation of inlets, outlets, overflows and vents.	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually and after large storms

4.4. Ditch

4.4.1. Regular inspection and maintenance is required to ensure the effective long-term discharge is possible.

4.4.2. Maintenance responsibility for systems should be placed with a responsible organisation.

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Litter and debris removal.	Monthly (or as required).
	Grass cutting – to retain grass height within specified design range. Close cut around outlet & structure. 100 – 150mm generally.	Monthly (during growing season), or as required.
	Manage other vegetation and remove nuisance plants.	Monthly (at start, then as required).
Occasional maintenance	Check for poor vegetation growth due to lack of sunlight or dropping of leaf litter, and cut back adjacent vegetation where possible.	Annually
	Re-seed areas of poor vegetation growth. Alter plant types to better suit conditions, if required.	Annually, 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
	Re-level uneven surfaces and reinstate design levels.	As required.
	Remove and dispose of oils or petrol residues using safe standard practices.	As required.
Monitoring	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation. Record areas where water is ponding for >48 hours.	Monthly, or when required.
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Half yearly.

4.5. Pipes & Flow Control

4.5.1. The Hydro-brake vortex flow control provides water quantity management for the surface water. The Hydro-brake has no moving parts and no power requirements and provides reliable, low-maintenance, engineered flood management as part of green infrastructure developments.

4.5.2. Periodic desilting of the Hydrobrake sump as well as checking the emergency drain down mechanism is in good working order. The sump should be emptied/checked at least as follows (but with an annual inspection and additional cleansing if required): On completion of drainage works, Year 1, Year 3, then every 5 years.

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Inspect chambers and manholes for evidence of pipes operating correctly and take remedial action if necessary, to include jetting of pipework.	Monthly for 3 months, then annually

4.6. Impermeable Membrane

4.6.1. The Design life of the impermeable membrane should, as a minimum, match that of the Permavoid crates. Given the road usage being limited to light traffic with very occasional HGV access then the design life can be expected to be in the region of 50 years.

4.6.2. The impermeable membrane should undergo a verification testing process once installation is complete. This is to determine that the membrane has been installed correctly and no leaks are present.

5 References

- CIRIA C753 Report *The SuDS Manual* (2015) RP992 ISBN: 978-0-86017-759-3



Signature.....

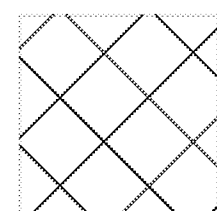
TIMOTHY BUTTON

For and on behalf of Cowan Consultancy Limited

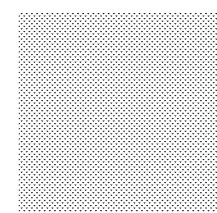
Appendix A



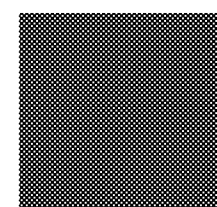
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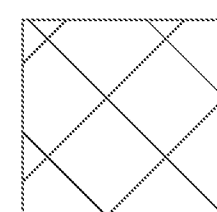
Watercourse subject to Riparian Responsibilities to be carried out by Management Company



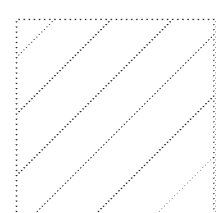
Access Road & Visitor Parking to be maintained by Management Company



Property Driveways to be maintained by property owners



Deed of easement to be included to allow a Management Company to have access through, in order to carry out maintenance works to ditch



Proposed 3m easement from top of bank of existing ditch. Plot 8 fence to terminate prior to easement strip

MANAGEMENT & MAINTENANCE PLAN

1:200

Date	By	Revision	QA'D	Chk'd	Ref
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