

**RESIDENTIAL DEVELOPMENT
LAND SOUTH OF ORCHARD BUSINESS PARK
CHURCH LANE
YAPTON
BN18 0GA**

**SuDS MAINTENANCE &
MANAGEMENT PLAN**

For:

MERLIN HOMES

Cowan Consultancy Ltd
3 Turnberry House
4400 Parkway
Whiteley
Fareham
Hampshire
PO15 7FJ

**TB/424927/eg
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Landguard Manor
Landguard Manor Road
Shanklin
Isle of Wight
PO37 7JB

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1. Introduction

- 1.1. This document has been prepared by Cowan Consultancy Limited (CCL) on behalf of Merlin Homes for the development at Land South of Orchard Business Park, Yapton, 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 424927/201P3, 424927/202P3 and 424927/203P3.
- 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.
- 1.13. All SuDS located within the curtilage of each property will be the responsibility of the property owner. Only SuDS located within communal areas will be managed and maintained by the management company. Appendix A shows the aspects of the SuDS system which are to fall within the management company's responsibility.

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 Land South of Orchard Business Park, Yapton 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 in order 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. There are two main SuDS components incorporated within the surface water drainage strategy:

1. Soakaway
2. Permeable Paving

2.1. Located at a minimum 5 metres away from foundations, the soakaways are placed at various locations on site and will be used as the main SuDS system catering for the surface water of all five houses and both garages. In combination with the soils below having good contamination attenuation potential, this stormwater systems provides effective treatment of surface water runoff from the roofs.

2.2. The **Permeable Paving** is to be provided within the access road and parking areas. This SuDS system will be used to cater for the surface water of the roads and allow for the interception of pollutants, whilst storing and conveying the runoff from the roads to its adequate treatment. The design allows for a 1 in 100 years plus 40% climate change allowance.

3. SuDS Maintenance and Management

3.1. Pit Soakaway

- 3.1.1. Regular inspection and maintenance are required to ensure the effective long-term operation of belowground storage systems. Infiltration systems will require regular maintenance to ensure continuing operation to design performance standards.
- 3.1.2. Manholes preceding soakaway inlets to be monitored, inspected and maintained frequently.
- 3.1.3. Treatment to remove coarse sediment should be carried out quarterly at the beginning of each season and as necessary after long period of storms.
- 3.1.4. Regular inspection of silt traps, manholes and pipework as well as removal of sediment and debris is required.
- 3.1.5. Table 3.1 provides guidance on the type of operational and maintenance requirements. The list of actions is not exhaustive and some actions may not always be required.
- 3.1.6. Maintenance responsibility for systems should be placed with a responsible organisation such as a management company.
- 3.1.7. Residents should be made aware of all SuDS systems that serve their property, the location of the device and the maintenance requirements and responsibilities.

<i>Maintenance schedule</i>	<i>Required action</i>	<i>Typical frequency</i>
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Inspect manholes for silt accumulation, establish appropriate silt removal frequencies	Quarterly, or as required
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment or other matter; remove and/or replace surface infiltration medium as necessary.	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 or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	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
	Check soakaway to ensure emptying is occurring	Annually

3.2. Permeable Paving

- 3.2.1.Regular inspection and maintenance are required to maintain the effective operation permeable paving require and to ensure continuing operation to design performance standards.
- 3.2.2.After construction, before hand over to the client, the pavement should be inspected for clogging, litter, weeds and water ponding.
- 3.2.3.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.
- 3.2.4.Silt and sediments removal should be carried out regularly to preserve and maintain pavement infiltration capacity.
- 3.2.5.Brushing and suction cleaning should be used for regular sweeping. Care should be taken whilst vacuuming to avoid the removal of jointing material.
- 3.2.6.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.
- 3.2.7.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.
- 3.2.8.Specific maintenance needs for block permeable paving should be monitored, and maintenance schedules adjusted to suit site requirements.
- 3.2.9.Maintenance responsibility for systems should be placed with a responsible organisation such as a management company.

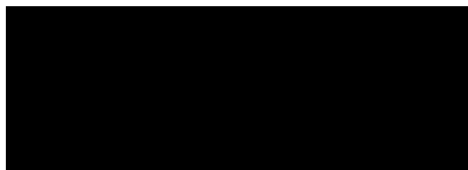
Table 3.2 -- Permeable Paving Key operation and Maintenance Requirements

<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. 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

