

SUDS MAINTENANCE MANUAL FOR ROSEBOURNE SITE, YACHT HAVEN, HAYLING ISLAND

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1. Introduction

- 1.1. This document has been prepared by Cowan Consultancy Limited (CCL) on behalf of Alpine Homse for the Land Yachthaven, Hayling Island.
- 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 commercial development.
- 1.3. The purpose of this document is to ensure that the site user / management company 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 drawing '393579/100 and 101: Drainage scheme layout for the location of all SuDS on this site.

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.

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 at Yacht haven were designed to prevent flooding of Land on the site itself and adjacent areas and control discharge via underground drainage systems. There are four main SuDS components incorporated within the surface water drainage strategy:

1. Road Gullies
2. Aco Channels
3. AquaCell Stormwater units (Attenuation tanking)
4. Permeable driveways and parking spaces
5. Rainwater Harvesting tank and pumps if required

2.1. The *Road Gullies* constructed alongside the road at the Lower level of the site are to be incorporated with silt trap units. This SuDS system will be used to cater for the surface water of the road at the lower level of the site and surface runoff from some driveways.

- Drainage will be carried via traditional gully system connected to manholes and subsequently to the soakaways;
- Storage will be provided through the incorporated AquaCell Stormwater units and discharge via infiltration with time.

2.2. The *Aco Channels* constructed at the lower level of some driveways and sales areas will be used to cater for and self-contain the surface water of the driveways, preventing added surface runoff to the road.

- Drainage will be carried via drain pipe connected to manholes and subsequently to the soakaways;
- Storage will be provided through the incorporated AquaCell Stormwater units and discharge via infiltration with time.

2.3. The *AquaCell Stormwater attenuation tanks*, positioned within the boat yard area will be used as the main SuDS system catering for the surface water of the building roofs and driveway hard

standing. Stormwater systems do not provide direct treatment of surface water runoff, therefore, the system will be combined in a Management Train with other methods to provide suitable treatment.

- Drainage will be carried via drain pipe connected to manholes and subsequently to the soakaways;
- Storage will be provided by AquaCell Stormwater units (or similar approved voided units) and discharge via a discharge control device along time;
- Surface water treatment will be carried out on the manhole preceding the soakaway;
- All manholes preceding a soakaway will incorporate a silt trap;
- The system has been designed for the 1 in 100 years, including extra 40% allowance for climate change + urban creep, design storm as required by current regulations.

2.4. The permeable surfacing on the site will be constructed using a permeable gravel system incorporating Bodpave retention grids or permeable block paving system such as formpave. These permeable areas will be utilised to drainage the access roads into the site and between the permeable gravel surfaced parking bays. The attenuation of this system including the calculated depth of voided storage will provide adequate surface water treatment levels as detailed within the drainage assessment report.

2.5. The rainwater harvesting tank will be a proprietary tank and rainwater harvesting system. It will take the form of an above ground tank with a pumped system to collect the storm water and to pump to the harvested water usage positions.

3. SuDS Maintenance and Management

3.1. Road Gullies

3.1.1. Road Gullies will require regular maintenance to ensure continuing operation to design performance standards.

3.1.2. Rubbish, debris and gravel removal should be undertaken as part of general pavement maintenance for the site.

3.1.3. Sweeping and regular gully cleaning should be carried.

3.1.4. Regular inspection and maintenance is important for the effective operation of road gullies and subsequently the pavements. Gullies should be inspected regularly,

preferably during and after heavy rainfall to check effective operation and to identify any areas of debris and/or blockages.

- 3.1.5. A visual inspection of the Road gullies can be carried out on a regular basis to establish the effectiveness of the maintenance, and attain possible risks to performance.
- 3.1.6. Silt will need to be removed from road gullies at least twice a year to minimise the amount of sediments migrating to manholes.
- 3.1.7. Replacement of the aggregate or geocellular units will be necessary if the system becomes blocked with silt, monitoring will give information on possible changes.
- 3.1.8. Table 3.2 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.
- 3.1.9. Specific maintenance needs of the road gullies should be monitored, and maintenance schedules adjusted to best suit site requirements.
- 3.1.10. Maintenance responsibility for systems should be placed with either a responsible organisation such as a management company or property owners served by the soakaway.

Table 3.2 - Road Gullies Key operation and Maintenance Requirements

Maintenance Schedule	Required action	Typical frequency
Regular maintenance	Remove rubbish, debris and gravel	Fortnightly for 6 months then monthly, or as required
	Remove debris from the grating surface (where it may cause risks to performance)	Fortnightly for 6 months then monthly, or as required
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Biannual, or as required
Occasional maintenance	Brush and suction cleaner, which can be a lorry-mounted device or a smaller precinct sweeper, should be used	Quarterly at end/beginning of each season, or as required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

3.2. Aco Channels

- 3.2.1. Aco Channels will require regular maintenance to ensure continuing operation to design performance standards.

3.2.2. Rubbish and debris removal should be undertaken as part of general pavement maintenance for the site.

3.2.3. Sweeping and regular channel cleaning should be carried.

3.2.4. Regular inspection and maintenance should be carried out to drainage channels outlets, preferably at the beginning of each season. A visual inspection may also be carried out on a regular basis to establish the effectiveness of the maintenance of the drainage.

3.2.5. Occasionally silt will need to be removed from drainage channels to minimise the amount of sediments migrating to manholes.

3.2.6. Driveways should be agitated (e.g. brushed, vacuumed, etc.) at least twice a year to ensure no vegetation of any sort is allowed to grow and develop in the joints. Ideally, this activity should be carried out in the spring and autumn seasons.

3.2.7. Table 3.3 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.

Table 3.3 – Aco Channels Key operation and Maintenance Requirements

Maintenance Schedule	Required action	Typical frequency
Regular maintenance	Remove rubbish, debris and gravel	Monthly, or as required
	Remove debris from the grating surface (where it may cause risks to performance)	Fortnightly for 6 months then monthly, or as required
	Inspect outlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Biannual, or as required
Occasional maintenance	Brush and suction cleaner, which can be a lorry-mounted device or a smaller precinct sweeper, should be used	Quarterly at end/beginning of each season, or as required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

3.3. AquaCell Stormwater units (Attenuation tank)

3.3.1. Regular inspection and maintenance is 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.

- 3.3.2. Manholes preceding soakaway inlets to be monitored, inspected and maintained frequently.
- 3.3.3. Treatment to remove coarse sediment should be carried out quarterly at the beginning of each season and as necessary after long periods of storms.
- 3.3.4. Regular inspection of silt traps, manholes and pipework as well as removal of sediment and debris is required.
- 3.3.5. Table 3.4 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.
- 3.3.6. Maintenance responsibility for systems should be placed with either a responsible organisation such as a management company.
- 3.3.7. Site users should be made aware of all SuDS systems that serve their property, the location of the device and the maintenance requirements and responsibilities.

3.4 Permeable drives / car parking areas

- 3.4.1 Car park permeable surfaced areas will require regular maintenance to ensure continuing operation to design performance standards.
- 3.4.2 Rubbish and debris removal should be undertaken as part of general landscape maintenance for the site and before any other SuDS management task.
- 3.4.3 Weed and invasive plant control. Any vegetation growth that establishes itself should be removed on regular intervals.
- 3.4.4 Occasionally sediment will need to be removed (e.g. once deposits exceed 25 mm in depth), although this can be minimised by ensuring that upstream areas are stabilised and by incorporating effective pre-treatment devices.
- 3.4.5 Table 3.1 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.

- 3.4.6 Specific maintenance needs of the permeable surfaces should be monitored, and maintenance schedules adjusted to suit site requirements.
- 3.4.7 Maintenance responsibility for systems should be placed with either a responsible organisation such as a management company or property owners served by the soakaway.
- 3.4.8 Site users should be made aware of all SuDS systems that serve their property, the location of the device, maintenance requirements and responsibilities.

Table 3.1 – Permeable Pavement operation and Maintenance Requirements

Maintenance Schedule	Required action	Typical frequency
Regular maintenance	Remove rubbish and debris	Monthly, or as required
	Remove any vegetation growth	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	Biannual
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	As required
	Remove build-up of sediment on areas running off into permeable areas	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

3.5 Rainwater Harvesting Tank and pump system

- 3.5.1 Regular inspection and maintenance is required to ensure the effective long-term operation of the rain water harvesting and supplying / distribution pumping system to ensure continuing operation to design performance standards.
- 3.5.2 Manholes preceding rainwater harvesting tank inlets to be monitored, inspect and maintained frequently.
- 3.5.3 Pumps should be regularly services to suppliers requirements and any filters / systems maintained / replaced as required.
- 3.5.4 Treatment to remove coarse sediment should carried out quarterly at the beginning of each season and as necessary after long period of storms within supplying chambers and pipework.
- 3.5.5 Regular inspection of silt traps, manholes and pipework as well as removal of sediment and debris is required.
- 3.5.6 Table 3.5 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.
- 3.5.7 Maintenance responsibility for systems should be placed with either a responsible organisation such as a management company.
- 3.5.8 Site users should be made aware of all SuDS systems that serve their property, the location of the device and the maintenance requirements and responsibilities.

Table 3.5 – Rainwater harvesting and pump system operation and Maintenance Requirements

Maintenance Schedule	Required action	Typical frequency
Regular maintenance	Remove rubbish and debris	Monthly, or as required
	Remove any vegetation growth	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 infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspection of the tank for debris and sediment buildup, inlets/outlets/withdrawal devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank, inlets, outlets, gutters, withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/or replacement of any filters	Three monthly or as required
Remedial actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

4. References

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

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