



SuDS Maintenance Manual

Oldcourt LRD

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Prepared for:

Capami LTD

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CONTENT

1	INTRODUCTION.....	1
2	SURFACE WATER DRAINAGE NETWORK DETAILS.....	2
	2.1 Surface Water Drainage Network Proposal Summary	2
	2.2 Surface Water Drainage Components	2
3	MAINTENANCE PHILOSOPHY	3
4	CONVENTIONAL DRAINAGE COMPONENTS - INLETS, OUTLETS AND INSPECTION CHAMBERS	4
	4.1 Additional Requirements for Headwalls	4
5	MAINTAINING PROPRIETARY TREATMENT SYSTEMS	5
6	MAINTAINING ATTENUATION BASINS	6
7	MAINTAINING LAND DRAINS	7
8	MAINTAINING PERVIOUS PAVEMENTS.....	8
9	MAINTAINING BIORETENTION SYSTEMS (RAIN GARDENS AND TREE PITS)	9
10	MAINTAINING SWALES.....	10
11	MAINTAINING GREEN ROOFS	11
12	FLOW CONTROL SYSTEMS	12

1 INTRODUCTION

Pinnacle Consulting Engineers Ltd has been commissioned by Capami LTD to prepare a SuDS Maintenance Manual (SMM) for the proposed development in Oldcourt, Dublin. This SMM should be read alongside the Engineering Planning Report prepared for the proposed development.

The production of this SMM has been informed by the recommendations included within the CIRIA SuDS Manual (C753) and the SDCC sustainable drainage explanatory design and evaluation guide 2022. Furthermore, the maintenance tables within this SMM are extracted from the CIRIA SuDS Manual (C753).

Whilst this document makes recommendations for SuDS maintenance, the maintenance guidelines produced by any SuDS product manufacturers used within the development should also be considered. Where there is a conflict between the maintenance recommendations outlined in this SMM and the maintenance recommendations provided by the product manufacturer, the maintenance recommendations of the product manufacturer take precedence.

2 SURFACE WATER DRAINAGE NETWORK DETAILS

2.1 Surface Water Drainage Network Proposal Summary

The following section summarises the surface water drainage strategy for the site. This should be read in conjunction with the Proposed Drainage Layout drawings. Full details of the Drainage Strategy are given in the Engineering Planning Report.

Surface water on the site will be managed by a Sustainable Drainage Network (SuDS) alongside traditional below ground piped components and manholes.

- Runoff from roof areas will primarily discharge into SuDS components, where they will be captured and treated as close to source as possible.
- Where not possible or as an overflow to SuDS components, a conventional piped surface water network shall convey runoff to an attenuation basin prior to discharge from the site at a restricted rate, in line with pre-development discharge rates (Q_{bar}).
- Online petrol interceptors shall be located prior to attenuation basins.
- As discussed and agreed with SDCC drainage, SuDS shall be prioritized as drainage collection from road surfaces, but road drainage gullies will be provided in area where it is not feasible to drain directly into a SuDS component. In an instance where SuDS are provided as the drainage capture device/mechanism for a road surface, gullies may be located downstream of the kerb opening inlets as a redundancy to ensure that any surface water potentially bypassing kerb opening inlets is adequately captured. This shall prevent a building up of surface water in higher order storms and ensure that surface water is adequately conveyed to attenuation systems.

2.2 Surface Water Drainage Components

The surface water drainage network utilises SuDS components to manage surface water associated with the development. The SuDS elements associated with the surface water drainage network are as follows:

- Permeable Paving;
- Proprietary Treatment Systems (hydrocarbon interceptors);
- Attenuation Basins;
- Land Drains;
- Bioretention Systems (Rain Gardens & Tree pits);
- Swales;
- Green Roofs;
- Flow Control Systems;
- Gullies (with silt trap sumps);
- Manholes;

3 MAINTENANCE PHILOSOPHY

In line with the SDCC sustainable drainage explanatory design and evaluation guide 2022, Section 11.1 “The principles of SuDS management”, is proposed that a passive maintenance approach is taken for the SuDS elements. This doesn’t mean that no maintenance is required, but rather that much of the care for SuDS falls under general site management rather than specific SuDS maintenance.

Hydrocarbons and other organic pollutants that wash off hard surfaces are naturally broken down within many SuDS components, preventing long-term accumulation of organic pollution. Heavy metals and inorganic pollutants are captured at low concentrations within source controls, posing no threat to amenity features or aquatic environments.

This contrasts with the ‘intervention’ maintenance needed for conventional drainage systems, which involves removing toxic liquids from gully sumps or oil and grit from interceptors and separators—tasks that can be costly and often neglected, rendering the treatment ineffective. While SuDS may also require intervention maintenance to remove silt, the use of source controls minimizes this need.

Crucially, when SuDS are integrated into a landscape (which would exist regardless of SuDS), the minimal attention required should be viewed as general site care rather than specific SuDS maintenance. This eliminates the need for cleaning gullies and pipework, thereby reducing overall management costs.

In regions where conventional drainage elements are unutilized, standard maintenance is required as per SDCC standard practice.

The maintenance requirements for each elements of the, as contained within this report, are for the instances in which intervention maintenance is require, even for SuDS elements.

4 CONVENTIONAL DRAINAGE COMPONENTS - INLETS, OUTLETS AND INSPECTION CHAMBERS

This section outlines the typical requirements of conventional drainage components including;

- Gullies
- Pipes
- Manholes
- Inspection Chambers
- Headwalls

All proprietary systems including vortex flow controls should be maintained strictly in accordance with the manufacturers requirements.

Table 4.1 below provides a summary of the typical maintenance requirements for conventional drainage components.

Table 4.1 – Operation and maintenance requirements for Conventional Drainage Components

<u>Maintenance Schedule</u>	<u>Required Action</u>	<u>Typical Frequency</u>
Routine maintenance	Inspect surface structures removing obstructions and silt as necessary. Check there is no physical damage	Monthly
	Strim vegetation 1m min. surround to structures and keep hard aprons free from silt and debris	Monthly
	Remove cover and inspect ensuring water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn	Annually
	Product specific requirements	As recommended by manufacturer
Occasional Maintenance	Check topsoil levels are 20mm above edges of baskets and chambers to avoid mower damage	As necessary
Remedial actions	Replace malfunctioning parts or structures	As required
Monitoring	Inspect sediment accumulation rates within silt traps, pipes, manholes and channels and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months or more frequently if excessive build up is identified accumulating.

4.1 Additional Requirements for Headwalls

All headwalls are to be fitted with trash screens. These should be inspected after a large storm event to check for sediment or other trash build up against the screens. Any trash should be removed.

5 MAINTAINING PROPRIETARY TREATMENT SYSTEMS

This section outlines the typical operation and maintenance requirements for proprietary treatment systems. All propriety systems should be maintained strictly in accordance with the manufacturers requirements. Table 5.1 below includes summary of this information, extracted from the CIRIA SuDS Manual (C753).

Table 5.1 – Operation and maintenance requirements for Proprietary Treatment Systems (extract from CIRIA SuDS Manual (C753))

<u>Maintenance Schedule</u>	<u>Required Action</u>	<u>Typical Frequency</u>
Routine maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	Six monthly
	Change the filter media	As recommended by manufacturer
	Remove sediment, oil, grease and floatables	As necessary – indicated by system inspections or immediately following significant spill
Remedial actions	Replace malfunctioning parts or structures	As required
Monitoring	Inspect for evidence of poor operation	Six monthly
	Inspect filter media and establish appropriate replacement frequencies	Six monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months

6 MAINTAINING ATTENUATION BASINS

Algae growth is not expected to occur if the basins are maintained in accordance with the requirements and standing water is not allowed to accumulate. All upstream treatment devices should also be fully maintained to prevent pollutants entering the water.

This section outlines the operation and maintenance requirements for ponds. Table 6.1 below includes summary of this information, extracted from the CIRIA SuDS Manual (C753).

Table 6.1 – Operation and maintenance requirements for Attenuation Basins (extract from CIRIA SuDS Manual (C753))

<u>Maintenance Schedule</u>	<u>Required Action</u>	<u>Typical Frequency</u>
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season)
	Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May-October)
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1m above water level	Annually
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually
	Remove sediment from any forebay/inlet area.	Every 1-5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays.	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, e.g. every 25-50 years
Remedial actions	Repair erosion or other damage	As required
	Replant, where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair / rehabilitate inlets, outlets and overflows.	As required

7 MAINTAINING LAND DRAINS

This section outlines the operation and maintenance requirements for land drains. Table 7.1 below includes summary of this information, extracted from the CIRIA SuDS Manual (C753).

Table 7.1 – Operation and maintenance requirements for Land Drains (extract from CIRIA SuDS Manual (C753))

<u>Maintenance Schedule</u>	<u>Required Action</u>	<u>Typical Frequency</u>
Regular maintenance	Remove litter (including leaf litter) and debris from land drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect land drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment	Six monthly, or as required
Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the land drain.	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium.	Fire yearly, or as required
	Clear perforated pipework of blockages	As required

8 MAINTAINING PERVIOUS PAVEMENTS

This section outlines the operation and maintenance requirements for Pervious Pavements. Table 8.1 below includes summary of this information, extracted from the CIRIA SuDS Manual (C753).

Table 8.1 – Operation and maintenance requirements for Pervious Pavements (extract from CIRIA SuDS Manual (C753))

<u>Maintenance Schedule</u>	<u>Required Action</u>	<u>Typical Frequency</u>
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 not likely to collect the most sediment
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	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 works 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

9 MAINTAINING BIORETENTION SYSTEMS (RAIN GARDENS AND TREE PITS)

This section outlines the operation and maintenance requirements for bioretention systems. Table 9.1 below includes summary of this information, extracted from the CIRIA SuDS Manual (C753).

Table 9.1 – Operation and maintenance requirements for Bioretention Systems (extract from CIRIA SuDS Manual (C753))

<u>Maintenance Schedule</u>	<u>Required Action</u>	<u>Typical Frequency</u>
Regular inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	Quarterly
Regular maintenance	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)
	Replace any plants, to maintain planning density	As required
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually
Occasional maintenance	Infill any hole or scour in the filter medium, improve erosion protection if required	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
Remedial actions	Remove and replace filter medium and vegetation above	As required by likely to be >20 years

10 MAINTAINING SWALES

This section outlines the operation and maintenance requirements for Swales. Table 10.1 below includes summary of this information, extracted from the CIRIA SuDS Manual (C753).

Table 10.1 – Operation and maintenance requirements for swales (extract from CIRIA SuDS Manual (C753))

<u>Maintenance schedule</u>	<u>Required action</u>	<u>Typical frequency</u>
Regular maintenance	Remove litter and debris	Monthly.
	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 infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	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 reseed	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 on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of Oils Or petrol residues using safe standard practices	As required

11 MAINTAINING GREEN ROOFS

This section outlines the operation and maintenance requirements for Green Roofs. Table 11.1 below includes summary of this information, extracted from the CIRIA SuDS Manual (C753).

Table 11.1 – Operation and maintenance requirements for Green Roofs (extract from CIRIA SuDS Manual (C753))

<u>Maintenance schedule</u>	<u>Required action</u>	<u>Typical frequency</u>
Regular inspections	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural stability	Annually and after severe storms
	Inspect Soil substrate for evidence Of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually as required
	During establishment (ie year one), replace dead plants as required	Monthly (but usually responsibility of manufacturer)
	post establishment, replace dead plants as required (where > 5% of coverage)	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting (if appropriate) as required — clippings should be removed and not allowed to accumulate	Six monthly or as required
Remedial actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources of eros on damage should be identified and controlled	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

12 FLOW CONTROL SYSTEMS

The maintenance requirements of flow control systems is going to vary depending on the specific flow control system that is selected during the detailed design stage therefore, for the purposes of this maintenance manual, it is proposed that all flow control systems be maintained in accordance with the requirements and recommendations of the manufacturer.

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