PUNCH
consulting engineers

Residential Development at Lehaunstown Land, Cherrywood

Stormwater Drainage Maintenance Plan

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Document Control

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Table of Contents

1 Introduction

This report was prepared to accompany a Section 179A planning application for the proposed development on the site located at Lehaunstown Land, Cherrywood, Co. Dublin.

This document sets out the maintenance requirements for the different surface water/ SuDS features proposed as part of the surface water management strategy for the development. Those responsible for maintenance of the site should refer to the safety file for information on the specific products and materials used within the stormwater drainage components on site. There would be varying persons and organisations that would be responsible for different parts of the site, as listed below:

- Dún Laoghaire-Rathdown County Council would maintain all shared areas
- Private residents would maintain any private areas in consultation with Dún Laoghaire-Rathdown County Council.

The specifics of who is responsible for which specific area is not part of the scope of this report.

This document accompanies engineering design and SUDs design documentation. Please refer to the below documentation provided separately:

- 232250-PUNCH-XX-XX-RP-C-0003-Engineering Planning Report

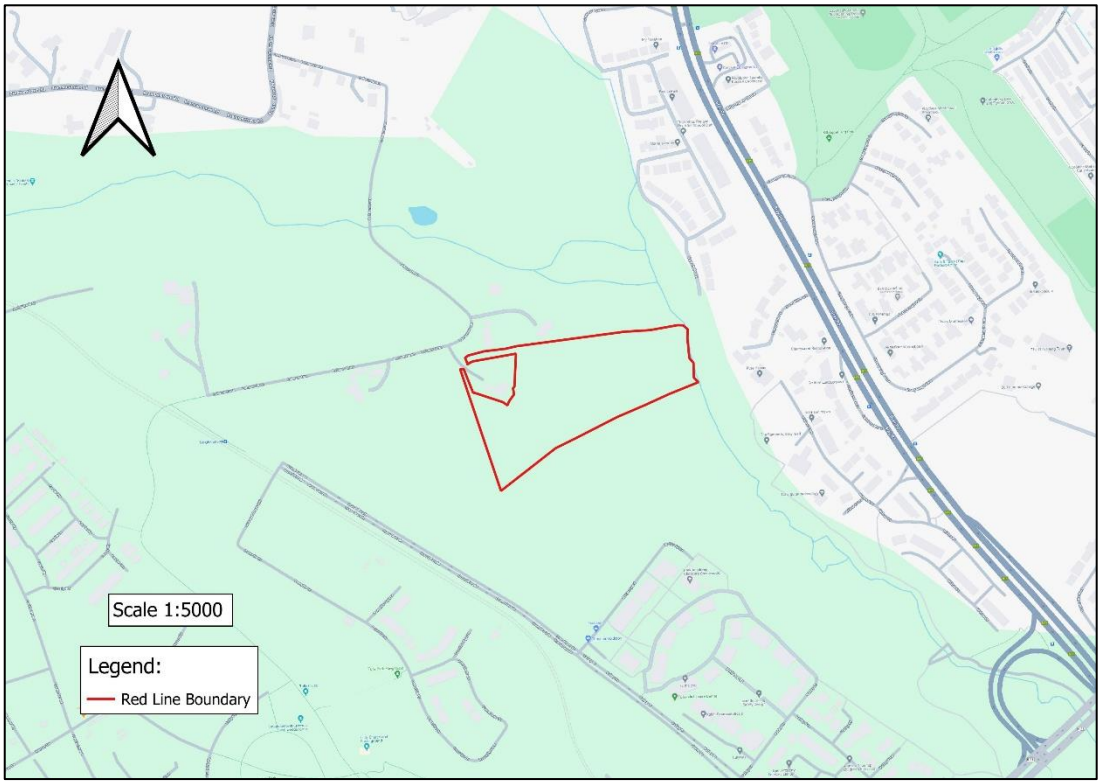

Figure 1-1: Site Location Plan.

2 Bioretention Systems

Bioretention areas will require regular maintenance to ensure continuing operation to design performance standards. The treatment performance of bioretention areas is dependent on maintenance, and robust management plans will be required to ensure that maintenance is carried out in the long term. Different designs will have different operation and maintenance requirements. Ease of access for maintenance and inspection is essential.

The main cause of failure is clogging of the surface, which is easily visible. Underdrains and drainage layers are beneath the ground, and malfunctioning is not so easy to detect and therefore could potentially be ignored. However, the results of any malfunction are likely to cause surface ponding.

Table 2-1 provides guidance on the type of operation and maintenance schedule that may be appropriate. The list of actions is not exhaustive, and some actions may not always be required.

Where bioretention systems are to be provided in private areas, including rear gardens, residents are to be provided with specific maintenance advice for their bioretention areas.

Table 2-1: Operation and Maintenance Requirements of Bioretention Systems - Tree Pit/Rain Gardens

Maintenance schedule	Required action	Typical Frequency
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 planting density	As required
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually
Occasional maintenance	Infill any holes 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 but likely to be > 20 years

3 Green Roofs

Green roofs should normally only require biannual or annual visits to remove litter, check fire breaks and drains and, in some cases, remove unwanted invasive plants. The most maintenance is generally required during the establishment stage (12 to 15months), and this should usually be made the responsibility of the green roof provider. Maintenance contractors with specialist training in green roof care should be used, where possible.

Table 3-1 provides guidance on the type of operational and maintenance requirements that may be appropriate for green roofs. The list of actions is not exhaustive, and some actions may not always be required. Actual requirements will depend on the planting, the desired aesthetic and visual effect and the biodiversity objectives for the system.

Table 3-1: Operation and Maintenance Requirements of Green Roofs.

Maintenance schedule	Required Action	Typical frequency
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 or as required
	During establishment (i.e., 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 like the original material, and sources of erosion damage should be identified and controlled	As required
	If drain inlet has settled, cracked, or moved, investigate and repair as appropriate	As required

4 Petrol/ Oil Interceptor

Proprietary treatment systems will require routine maintenance to ensure continuing operation to design performance standards. Because of the wide range of different designs and performance, all manufacturers should provide detailed specifications and frequencies for the required maintenance activities along with likely machinery requirements and typical annual costs for any given site. The treatment performance of proprietary systems is strongly dependent on maintenance, and robust management plans will be required to ensure that maintenance is carried out in the long term.

Table 4-1 provides guidance on the type of operation and maintenance schedule that may be appropriate for a proprietary treatment system. The list of actions is not exhaustive, and some actions may not always be required.

The petrol interceptor supplier would also advise specific maintenance requirement for the system proposed.

Table 4-1: Operation and Maintenance Requirements of Bypass Interceptors.

Maintenance schedule	Required action	Typical frequency
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

5 Pipes, Road Gullies, and Manholes

Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be draining correctly, thus exposing the development to a greater level of flood risk. Maintenance responsibility for the pipes should be placed with the building occupier.

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols, as run-off is taken from potentially contaminated areas such as car parks/service yards.

Table 5-1 provides guidance on the type of operation and maintenance schedule that may be appropriate for pipe, gully, and manholes.

Table 5-1: Pipe, Gully and manhole Maintenance Recommendation.

Maintenance Schedule	Required Action	Frequency
Monitoring – First Year	Initial inspection should be provided as post construction CCTV survey. Refer below for remedial actions.	
	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action. Refer below for remedial actions.	Every 2 months, 48 hours after large storms.
Monitoring - After First year	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action. Refer below for remedial actions.	Every 4 months, 48 hours after large storms.
Occasional maintenance\inspection	Check and remove large vegetation growth near pipe runs. Check gullies for any standing water that would be evidence of blockage.	6-monthly.
Remedial actions - Drainage generally	Rod through poorly performing runs as initial remediation. Clean out gullies pipe outlets by jet cleaning or rodding. Clean out gully chambers by jet cleaning or by manual extraction of debris.	As required.
	If poor performance persists, jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If the above does not improve performance.
Remedial actions - Duckbill valve removal	The duckbill valve is to be manually removed and replaced. This work to be undertaken by a specialist contractor.	As required if duckbill valves cannot be cleared by jet cleaning or remote CCTV works

6 Infiltration Attenuation Storage Tank – Soakaway

Regular inspection and maintenance are required to ensure the effective long-term operation of below-ground storage systems. Maintenance responsibility for systems should be placed with a responsible organisation. Table 6-1 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. Specific maintenance needs of the system should be monitored, and maintenance schedules adjusted to suit requirements.

The attenuation system would be managed by alarms following the below process:

- When water level rises above a certain level, alarm is sent to management organisation to address
- Water levels are left to subside
- Cause of excess water is investigated.
- Blockages cleared from system
- All debris cleared

Table 6-1: Operation and Maintenance Requirements of Attenuation Systems.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae, or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/ or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, 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
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required