

Havant Phase 2

Langstone Technology
Park

SUDS Maintenance Plan

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Client

XLB Limited / Havant Sarl

SUSTAINABLE DRAINAGE AND LANDSCAPE MANAGEMENT PLAN FOR HAVANT PHASE 2.

An introduction to sustainable drainage systems or SuDS

- SuDS are a new environmentally friendly approach to managing rainfall that use landscape features to deal with surface water. SuDS aim 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
 - Create opportunities for wildlife

1 SuDS Drainage Strategy

The proposed SuDS are designed to prevent flooding and control the flow of surface water using attractive landscape features.

It is proposed that drainage strategy incorporates cellular storage within service yard areas. This feature is the primary source of surface water storage for the site.

In addition to the cellular, storage is also provided by the use of porous car parking.

2 SuDS Management

The proposed SuDS measures, have been designed with easy maintenance in mind. Maintenance will generally fall into one of the three following categories:

- **Regular day to day care** - litter collection, grass cutting and checking the inlets and outlets where water enters or leaves a SuDS feature
- **Occasional tasks** - managing vegetation and removing any silt that builds up in the SuDS features also after flooding events.
- **Remedial work** - repairing damage where necessary

3 SuDS Maintenance – Summary

		Frequency	Unit Rate	Total
	REGULAR MAINTENANCE			
1.	LITTER MANAGEMENT			
1.1	Pick up all litter in SuDs and Landscape areas and removed from	12 visits monthly		
2	GRASS MAINTENANCE – all cutting to wildlife piles			
2.1	Mow all grass verges, paths and amenity at 35-60mm with 75mm max. Leaving grass in situ	As required or monthly		
4	HARD SERVICES			
4.1	Sweep all paving regularly. Sweep and suction brush. Permeable paving in autumn after leaf fall	1 visit		
	OCCASIONAL TASKS			
6	SILT MANAGEMENT			
6.1	Remove / clear out silt from silt collection traps in linear drainage channels	As required / after flood event.		
7	REMEDIAL WORK			
7.1	Inspect SuDs system regularly to check for damage or failure.	As required / after flood event.		

SuDS Features:

SuDS techniques include attenuation structures which assist in managing discharge of water from the site.

Cellular Tanks / Soakaways are used to manage and control surface runoff. Also, they are used to store surface water on site under the ground to slow discharge before it is discharge offsite.

Permeable surfaces as permeable asphalt, gravel or free draining soils that allow rain to percolate through the surface into underlying drainage layers. They must be protected from silt, sand, compost, mulch, etc.

Petrol / Oil interceptors are used as part of the underground drainage network to stop petrol and oil leaving the site if there are spillages within service yard areas.

Inspection Chambers and rodding eyes are used on bends or where pipes come together. They allow cleaning of the system if necessary.

Overflows can be below ground through gratings and chambers or over grass weirs in the open. They must be kept clear at all times to protect areas from flooding.

Flood routes (exceedance routes) allow water volumes exceeding the capacity of the SUDS system to escape from the site without causing damage to property. This route must be clear of obstructions at all times.

Vortex Flow Control units are installed up-stream of the surface water outfall to control the amount of water discharging from the site to ensure only a safe amount of water entering the downstream drainage network and any given moment.

Green Roofs comprise a multi-layered system that covers the roof of a building or podium structure with vegetation cover, over a drainage layer. They are designed to intercept and retain precipitation, reducing the volume of run-off and attenuation peak flows.

Sustainable Drainage Maintenance Specification

1.0 GENERAL REQUIREMENTS

Maintenance activities comprise: • Regular Maintenance • Occasional Task • Remedial Work	Frequency
Generally Litter Collect all litter or other debris and remove from site at each site visit	Monthly

- **Avoid** use of weed killers and pesticides to prevent chemical pollution
- **Avoid** de-icing agents wherever possible to allow bio-remediation of pollutants in permeable surfaces.
- **Protect** all permeable, porous and infiltration surfaces from silt, sand, mulch and other fine particles.

Exclusions:

- Maintenance of rainwater harvesting chambers, pumps, etc.

2.0 INLETS, OUTLETS, CONTROLS, AND INSPECTION CHAMBERS

- **Inlets and outlets structures** may be surface structures or conveyance pipes with guards or headwalls. They must be free from obstruction at all times.
- **SuDS flow control structures** can be protected orifices, slots weirs or other controls at or near the surface to be accessible and easy to maintain. They may be in baskets, in small chambers or in the open.
- **Inspection Chambers** and rodding eyes are used on bends or where pipes come together and allow cleaning of the system if necessary. They should be designed out of the system where possible.

INLETS, OUTLETS, CONTROLS AND INSPECTION CHAMBERS	
Regular Maintenance	Frequency
Inlets, outlets and surface control structures Inspect surface structures removing obstructions and silt as necessary. Check there is no physical damage. Strim vegetation 1m min. surround to structures and keep hard aprons free from silt and debris	Monthly Monthly
Inspection chambers and below ground control chambers	

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
Occasional Maintenance	
Check topsoil levels are 20mm above edges of baskets and chambers to avoid mower damage	As necessary
Remedial work	Frequency
Unpack stone in basket features and unblock or repair and repack stone as design detail as necessary.	As required
Repair physical damage if necessary.	As required

3.0 OVERFLOWS AND FLOOD ROUTES

- **Overflows** are overland across weirs, through gratings or within chambers and must be kept clear at all times to protect areas from flooding. They allow onward flow when part of the SuDS system is blocked.
- **Flood routes (exceedance routes)** allow water volumes that exceed the capacity of the SuDS system to pass through or round the site without causing damage to property. These routes must be clear of obstructions at all times.

OVERFLOWS AND FLOOD ROUTES	
Regular Maintenance	Frequency
Overflows. Jet pipes leading from overflow structures annually and check by running water through the overflow. Check free flow at next SUDS feature – inlet to basin or chamber.	Annually
Overflows. Remove any accumulated grass cuttings or other debris on top of grass weirs or stone filled baskets overflows.	Monthly
Flood Routes. Make visual inspection. Check route is not blocked by new fences, walls, soil or other rubbish. Remove as necessary.	Monthly
Remedial	Frequency
Overflows. If overflow is not clear then dismantle structure and reassemble to design detail.	As required

4.0 Cellular Storage

Cellular Storage	
Regular Maintenance	Frequency
Inspect inlets, outlets and control structures and remove obstructions and silt as necessary.	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
Occasional Maintenance	
Remove silt from catchpits and cellular storage	As necessary
Remedial work	Frequency
Repair inlet/outlet, if necessary, removal of silt build up	As required
Repair physical damage if necessary.	As required

5.0 PERMEABLE SURFACES

- **Permeable surfaces** including permeable block paving, porous asphalt, gravel or free draining soils that allow rain to percolate through the surface into underlying drainage layers. They must be protected from silt, sand, compost, mulch, etc. Permeable block paving can be cleaned by suction brushing.

PERMEABLE AND POROUS SURFACES	
Regular Maintenance	Frequency
Cleaning Brush regularly and remove sweeping from all hard surface	Monthly
Occasional Tasks	Frequency
Permeable Tasks Brush and vacuum surface once and year to prevent still blockage and enhance design life	Annually
Remedial Work	Frequency
Monitor effectiveness of permeable pavement and when water does not infiltrate immediately advise client of possible need for reinstatement of top layers or specialist cleaning. Recent experience suggest jet washing and suction cleaning will substantially reinstate pavement to 90% efficiently	As required
After Flood Event	Frequency
Brush and vacuum surface to remove silt / debris. If water still does not infiltrate immediately advise client of possible need of reinstatement of top layers or specialist cleaning. Check perforated pipework and outlet sumps.	After the flooding has subsided and is safe to undertake.

6.0 GREEN ROOFS

The amount of maintenance required will depend on the type of green roof installed.

GREEN ROOF	
Regular Inspection	Frequency
Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural ability	Annually and after severe storms
Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
Inspect drains 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	Frequency
Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or 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
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
Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
Remedial Actions	Frequency
If erosion channels are evident, these should be established with extra soil substrate similar to 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.

7.0 MANHOLES AND INSPECTION CHAMBERS

- **Manholes and Inspection Chambers** and rodding eyes are used on bends or where pipes come together and allow cleaning of the system if necessary. They should be designed out of the system where possible.

INLETS, OUTLETS, CONTROLS AND INSPECTION CHAMBERS	
Regular Maintenance	Frequency
Manholes and Inspection chambers and below ground control chambers	
Remove cover and inspect ensuring water is flowing freely and that the exit route for water is obstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn.	Annually
Occasional Maintenance	Frequency
Check topsoil levels are 20mm above edges of baskets and chambers to avoid mower damage	As necessary
Remedial Work	Frequency
Unpack stone in basket features and unblock or repair and repack stone as design detail as necessary. Repair physical damage if necessary	As required

8.0 DOWNSTREAM DEFENDER

- **Downstream Defender** is an advanced hydrodynamic vortex separator that reliably captures and retains sediments, oil, trash and floatables from the surface.

Downstream Defender	
	Frequency
Inspection	- Regularly during the first year of installation. - Every 6 months after the first year if installation
	Frequency
Oil and Floatables Removal	- Once per year, with sediment removal - Following a spill in the drainage area
	Frequency
Sediment Removal	- Once per year or as needed. - Following a spill in the drainage area

9.0 Full Retention Separators

For full details of maintenance of petrol/oil separators, the manufacturers guidelines **must** be followed. The Kingspan documents below are the relevant maintenance plan for the development.

- 011259 - NSFA020-NSFA065 Full Retention Separators Installation & Maintenance Guidelines
- 015050 - NSFA080-NSFA285 Full Retention Separators Installation & Maintenance Guidelines

Full Retention Interceptors	
	Frequency
Inspection	- Regularly during the first year of installation. - Every 6 months after the first year if installation
	Frequency
Light liquid removal	- Must be carried out when oil has reached capacity, oil level alarm will indicate when 90% capacity is reached.
	Frequency
Sediment Removal	- Regular inspections to be made following construction. - Post construction, and inspection should be made in 3 months and then another at 6 months. - Following the above, a regular emptying plan can be made when the required emptying frequency is understood. This should be at intervals no longer than 6 months.

10.0 Vortex Flow control

The vortex flow control unit required no regular manual intervention or maintenance. If the unit gets blocked, the item blocking it should be removed. The chamber the units sits within should be maintained as per regular practice. Please refer to crown industries 'Flow Control (Radial and Conical) Operation and Maintenance Instructions' for confirmation of the above.

11.0 SPILLAGE – EMERGENCY ACTION

Most spillages on development sites are of compounds that do not pose a serious risk to the environment if they enter the drainage in a slow and controlled manner with time available for natural breakdown in a treatment system. Therefore, small spillages of oil, milk or other known organic substances should be removed where possible using soak mats as recommended by the Environment Agency with residual spillage allowed to bio-remediate in the drainage system.

In the event of a serious spillage, either by volume or of unknown or toxic compounds, then isolate the spillage with soil, turf or fabric and block outlet pipes from chamber(s) downstream of the spillage with a bung(s). (A bung for blocking pipes may be made by wrapping soil or turf in a plastic sheet or close woven fabric.)

Contact the Environment Agency immediately.

12.0 QUERIES REGARDING A DESIGN FEATURE.

In the event of a concern or failure of a SuDs design feature contact The Baynham Meikle Partnership.

8th Floor, Lyndon House, 62 Hagley Rd, Birmingham, B16 8PE

Tel: (0121) 434 4100

Email admin@baynhammeikle.co.uk

13.0 RESPONSIBILITIES

The new on-site drainage will not be adopted; it is to remain under the private ownership of Havant Sarl. Havant Sarl has overall responsibility, with general day-to-day maintenance and upkeep secured through the Tenant by way of their Tenancy agreements with Havant Sarl.