GeoSmart Information

SuDSmart Plus

Management and Maintenance Plan

Site Address

Gethceln House
Dawley Road
Hayes
UB3 1EH

Grid Reference

509018, 179593

Report Prepared for

ASB UK Ltd
Unit 1d
Chailey Industrial Estate
Pump Lane
Hayes
UB3 3NB

Date

2023-02-24

Report Status

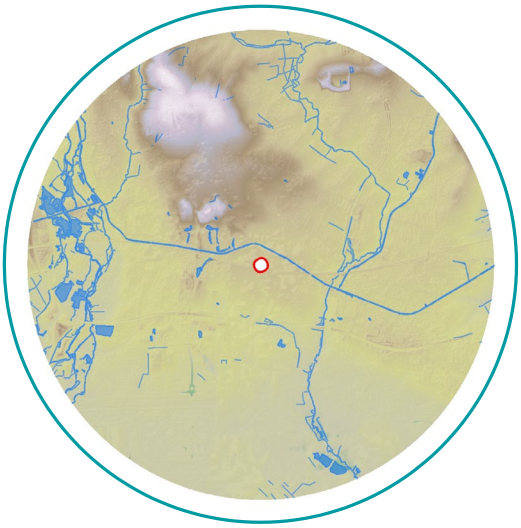
FINAL

Site Area

0.2 ha

Report Reference

70850.02R1



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1 Executive summary

This report should be considered in conjunction with the Surface Water Drainage Strategy (SWDS) prepared by Ambiental (ref: 3972 SWDS) and provides a management and maintenance plan for the proposed SuDS features. This will ensure that surface water runoff can be managed effectively over the lifetime of the development through the continual function of the proposed measures.

Summary of existing and proposed development

The Site is currently used within a commercial capacity comprising of warehouses/workshops. Development proposals comprise the demolition of the existing buildings and the construction three new industrial units.

SuDS Features

Table 1. Proposed SuDS type, features, discharge location and rate restriction

SuDS type	Source control (interception) and attenuation SuDS.
SuDS features	Rainwater harvesting tank, permeable paving and geo-cellular storage crates.
Discharge location	Public surface water sewer manhole 9601.
Discharge rate	2 l/s via hydrobrake.

The SuDS sequence begins where the rainwater pipes (guttering) collect rainwater from the proposed development roofs and discharge into the proposed rainwater harvesting tank and into the permeable paving (underlain by aggregate material or geo-cellular crates).

Overland exceedance routes would be directed into non-essential areas of the Site, in the event of a blockage in the SuDS system.

2 Managing SuDS Features

The proposed SuDS features at the Site have been designed for easy maintenance to comprise of:

- Regular day to day care - litter collection, grass cutting and checking any inlets and outlets where water enters or leaves a SuDS feature;
- Occasional tasks - removing any silt that builds up in the SuDS features which may cause ponding; and
- Remedial work - repairing damage where necessary.

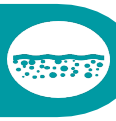
The management and maintenance of the SuDS features, in line with the details and schedules outlined within this report, will be undertaken by contractors appointed by the owners and occupiers of the Site, where payments for the works will form part of the property deeds and / or rental agreements.

3 Landscape Maintenance Summary

	Regular maintenance	Frequency	Unit Rate	Total
1	Litter Management			
1.1	Remove any litter within the paving, tank and, any water butts plus landscaped areas and remove from Site.	Monthly		
2	Inlets and Outlets			
2.1	Inspect monthly, remove silt and debris from paving, tank and any water butts.	As required		
3	Grass Maintenance			
3.1	Mow all grass verges, paths 35-50mm with 75mm max.	As required or monthly		
3.2	Any wildflower areas strimmed to 50mm on 3 year rotation - 30% each year.	Annual basis		
4	Hard Surfaces			
4.1	Sweep all paving regularly. Sweep and suction brush permeable paving in autumn after any leaf fall.	As required		
	Occasional Tasks			
3	Inspection and Control Chambers			
3.1	Annual inspection, remove silt and check free flow.	Annually		
4	Silt Management			
4.1	Inspect paving, tank and any low points within garden areas for silt accumulation.	Annually		
4.2	Excavate silt, stack and dry within 10 m of the SuDS feature, but outside the design profile where water flows, spread, rake and overseed.	As required		

5	Remedial Work			
5.1	Inspect SuDS system regularly to check for damage or failure. Undertake remedial work as required.	As required		

4 Sustainable Drainage features checklist



SuDS techniques in general include landscape features and control structures to manage runoff as it flows to site outfalls (if these are present). The following lists the features which may be found on a site:

- Permeable surfaces as 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.
- 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 the properties. This route must be clear of obstructions at all times.

Water may be conveyed in landscaped surface features like open garden spaces and planted areas. These soft landscape features require standard landscape maintenance.

5 Maintenance Specification

6.1- General Requirements

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

6.2- Rainwater harvesting tanks

A rainwater harvesting tank is proposed for the site to capture water for later use. The storage volume from the tank has been excluded and any overflow will drain into the wider drainage network.

Rainwater harvesting tank	
Maintenance	Frequency
Inspection of tank for debris and sediment build up.	Annually or as required
Clean gutters, filters, downpipes. Trim roots prevent blockages.	As required
Remove litter and debris from inlets and outlets.	Monthly
Remedial Work	Frequency
Repair or overflow erosion damage or damage to tank and associated components.	As required
Monitoring Work	Frequency
Inspect inlets/outlets, overflows and silt traps for blockages – note rate of accumulation.	Monthly / Bi-annually

6.3- 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 and porous asphalt can be cleaned by suction brushing.

Permeable and Porous Surfaces	
Regular Maintenance	Frequency
Brush regularly and remove sweepings from all hard surfaces.	Monthly
Occasional Tasks	Frequency
Brush and vacuum surface once a year to prevent silt blockage and enhance design life.	Annually
Remedial Work	Frequency
Monitor effectiveness of permeable pavement and when water does not infiltrate immediately there is a possible need for reinstatement of top layers or specialist cleaning. Recent experience suggests jet washing and suction cleaning will substantially reinstate pavement to 90% efficiency.	As required

6.4- Geo-cellular storage crates

Part of the proposed permeable paving will be underlain by geo-cellular storage crates to provide additional storage. Geo-cellular storage crates are modular plastic units with a high void ratio (95%) that can be used to efficiently create a below-ground structure for temporary storage of surface water. The storage system is formed by assembling the required number of individual units (sometimes in several layers) and wrapping them in a geotextile or geomembrane.

Geo-cellular storage crates	
Regular Maintenance	Frequency
Remove litter and debris from inlets and outlets.	Monthly
Trimming any roots and surrounding grass blockages.	As required
Monitoring Work	Frequency
Inspect inlets, outlets and overflows for blockages.	Monthly
Inspect inlets and outlets for silt accumulation.	Bi-annually

6.5- Inlets, Outlets, Controls, and Inspection Chambers

- Inlet and outlet 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 1 m 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	Frequency
Check topsoil levels are 20 mm above edges of intercepting baskets and chambers to avoid mower damage.	As necessary
Remedial work	Frequency
Unpack intercepting basket features and unblock or repair and repack as design detail as necessary. Repair physical damage if necessary.	As required As required

6.6- Rainwater pipes

Rainwater pipes from the proposed buildings will be directed into the rainwater harvesting butt or spill onto the proposed permeable paving.

Rainwater pipes	
Regular Maintenance	Frequency
Clear gutters and rainwater pipes at roof level on an annual basis to clear moss, leaves and carefully remove any nesting habitats	Annually

(contact Council / Environment Agency if protected species are located prior to removal).	
Remove sediment and debris from pre-treatment devices and floor of inspection tube or chamber.	As required
Cleaning of gutters and any filters on downpipes.	Annually
Trimming any roots that may be causing blockages.	Annually or as required
Monitoring Work	Frequency
Inspect silt traps and note rate of sediment accumulation.	Monthly in first year then annually

6.7- ACO drains/linear drains

ACO drains/linear drains may be used to pick up surface water runoff and prevent it from flooding buildings or highways. Captured runoff will be conveyed into the drainage network.

ACO drains/linear drains	
Regular Maintenance	Frequency
Remove sediment and debris from grating, channel and sump.	Monthly
Trimming any roots and surrounding grass blockages.	As required
Monitoring Work	Frequency
Inspect inlets, outlets and overflows for blockages.	Monthly
Inspect inlets and outlets for silt accumulation.	Bi-annually

6.8- Overflows and Flood Routes

Overflows are overland across permeable surfaces 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.	Annually

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.	
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

6.9- 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 organic substances should be removed where possible using absorbent mats as recommended by the Environment Agency (EA) with residual spillage allowed to dilute and 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 EA immediately if a spillage occurs.

6 References and glossary

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Glossary

General terms

Attenuation	Reduction of peak flow and increased duration of a flow event.
Combined sewer	A sewer designed to carry foul sewage and surface water in the same pipe.
Detention basin	A vegetated depression, normally is dry except after storm events, constructed to store water temporarily to attenuate flows. May allow infiltration of water to the ground.
Evapotranspiration	The process by which the Earth's surface or soil loses moisture by evaporation of water and by uptake and then transpiration from plants.
FEH	Flood Estimation Handbook, produced by Centre for Ecology and Hydrology, Wallingford (formerly the Institute of Hydrology).
Filter drain or trench	A linear drain consisting of a trench filled with a permeable material, often with a perforated pipe in the base of the trench to assist drainage, to store and conduct water, but may also be designed to permit infiltration.
First flush	The initial runoff from a site or catchment following the start of a rainfall event. As runoff travels over a catchment it will collect or dissolve pollutants, and the "first flush" portion of the flow may be the most contaminated as a result. This is especially the case for intense storms and in small or more uniform catchments. In larger or more complex catchments pollution.
Flood plain	Land adjacent to a watercourse that would be subject to repeated flooding under natural conditions (see Environment Agency's Policy and practice for the protection of flood plains for a fuller definition).
Greenfield runoff	This is the surface water runoff regime from a site before development, or the existing site conditions for brownfield redevelopment sites.
Impermeable surface	An artificial non-porous surface that generates a surface water runoff after rainfall.
Permeability	A measure of the ease with which a fluid can flow through a porous medium. It depends on the physical properties of the medium, for example grain size, porosity and pore shape.

Runoff	Water flow over the ground surface to the drainage system. This occurs if the ground is impermeable, is saturated or if rainfall is particularly intense.
Sewerage undertaker	This is a collective term relating to the statutory undertaking of water companies that are responsible for sewerage and sewage disposal including surface water from roofs and yards of premises.
Soakaway	A subsurface structure into which surface water is conveyed to allow infiltration into the ground.
Treatment	Improving the quality of water by physical, chemical and/or biological means.

The terms included in this glossary have been taken from CIRIA (2015) guidance.

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The Property Ombudsman scheme

Milford House

43-55 Milford Street

Salisbury

Wiltshire SP1 2BP

Tel: 01722 333306

Fax: 01722 332296

Email: admin@tpos.co.uk

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Martin Lucass

Commercial Director

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