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**YAPTON METAL COMPANY, BURDELL ROAD,
YAPTON**

MANAGEMENT AND MAINTENANCE MANUAL



YAPTON METAL COMPANY, BURDELL ROAD, YAPTON

MANAGEMENT AND MAINTENANCE MANUAL ON BEHALF OF CLIENT

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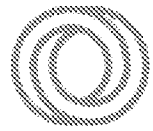
White Hart Lane

Basingstoke

RG21 4AF



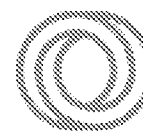
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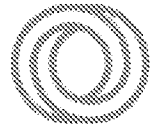
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1.0 INTRODUCTION

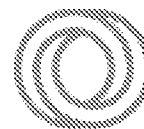
1.1.1 This document outlines the proposed management and maintenance regimes of the drainage systems for the 4-unit residential development at Burndell Road, Yapton.

1.1.2 The drainage features on site comprise mainly of permeable paving with some piped networks conveying garage and roof run off to the permeable paving via catchpits and cellular diffusers.

1.1.3 All surface water drainage pipe runs, inspection chambers, linear drainage/threshold channels, catchpits and permeable paving systems are to be privately maintained equally by the residents/homeowners. This is on the basis of a four-way (25%) ownership/responsibility split between the houses on this development and includes all areas such as the individual gardens and shared access road/courtyard. These drainage systems are to be managed and maintained in accordance with the following management and maintenance schedules.

1.1.4 The following text has been divided into sections which correspond to each relevant drainage type detailing:

- Description of feature
- Maintenance activities and frequency
- Inspection and frequency



2.0 MAINTENANCE OF PERMEABLE PAVING



2.1 Description

2.1.1 Permeable Block Paving allows water to pass through the gaps between the blocks into underlying sand and gravel layers allowing for the attenuation, conveyance and where possible infiltration, of surface water runoff.

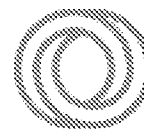
2.1.2 Permeable paving will cleanse surface water run-off. The initial cleansing occurs within the sand bedding layer where hydrocarbons are collected. The layer of geotextile below the sand acts as a secondary filter before infiltration through to the sub-base further filters the discharge before infiltrating into the soil strata below.

2.1.3 Cellular diffuser units are used within areas of permeable paving to filter and disperse flows.

2.1.4 Permeable paving is to be maintained in accordance with the following recommendations:

Permeable Paving Maintenance Activities & Frequency (continued overleaf)

Maintenance Category	Maintenance Activity	Comments	Frequency
Routine Maintenance	Visual inspection of paving.	Ensure joints are kept fully filled.	Monthly (depending on local environment).
	Paving should be agitated (e.g. brushed, vacuumed, etc.).	To ensure no vegetation of any sort is allowed to grow and develop in the joints.	Six monthly or as required (Spring and Autumn seasons).



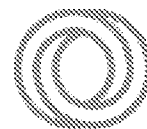
MANAGEMENT AND MAINTENANCE MANUAL

Maintenance Category	Maintenance Activity	Comments	Frequency
Corrective Maintenance	Paving should be inspected after any heavy precipitations.	Ensure no displacement of any organic matter into the surface of the pavement.	As required.
	Inspection of outfall should be undertaken.	Non-infiltration systems to have outfall checked for debris and blockages.	Six monthly or as required.
	Removal of weeds.	To ensure weeds are killed effectively they should be actively growing so that the glyphosate will go down to the roots. Glyphosate based weed killers include Roundup and Tumbleweed.	As required.
	Laying material may require cleaning and /or replacing.	Depending on the environment the permeable pavement has received and been exposed to.	25 to 30-year period.

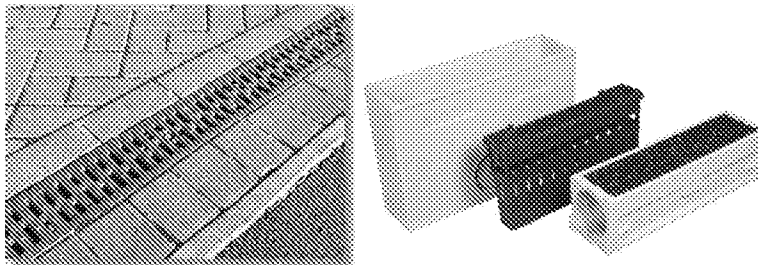
Permeable Paving Inspection & Frequency

Inspection Activity	Comments	Frequency
Visual inspection of permeable surface for poor operation.	Includes visual inspection of blocks, water ponding, weeds and to make sure joints are kept full.	Monthly.
Visual inspection of outfall.	Includes visual inspection of control structures and outfall to check for damage and blockages.	Monthly.

2.1.5 It is recommended that the surfaces should be regularly inspected and cleaned accordingly. Based on the results of full-scale trials carried out by Aggregate Industries, the most effective method is to use a cleaner with suction only. Even if the surface has become completely clogged, trials have shown that this method of cleaning can rehabilitate the surface to an acceptable level.



3.0 MAINTENANCE OF LINEAR DRAINS, PIPE SYSTEMS & INSPECTION CHAMBERS



3.1 *Description*

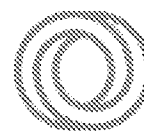
3.1.1 Drainage systems comprising of pipe runs and inspection chambers are a more conventional method of draining surface water run-off from roof and highway areas. Linear drains catch surface water runoff similar to gullies and discharge to the surface water network.

3.1.2 Surface water falling on impermeable surfaces, such as roof and footways areas, drain at surface level and convey the water below ground to the drainage network. Inspection chambers are also provided on the drainage system at regular intervals, changes in sewer direction, gradient or pipe diameter. This type of drainage system can be accessed from the inspection chambers for routine inspection and maintenance.

3.1.3 Linear drainage channels can have covers removed for routine inspection and maintenance and to remove leaves or debris.

3.1.4 Catchpits are also provided upstream of the infiltration soakaways in order to trap silt/sediment before the surface water discharges into soakaways, thus prolonging the life of the soakaway. These can be accessed and maintained in a similar way to inspection chambers.

3.1.5 Pipe runs, inspection chambers, catchpits and linear drains are to be maintained in accordance with the following recommendations:

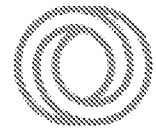


Linear Drains, Pipe Systems, Inspection Chambers and Catchpits Maintenance Activities & Frequency

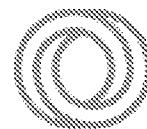
Maintenance Category	Maintenance Activity	Comments	Frequency
Routine Maintenance	Inspect and identify any areas that are not operating correctly.	Linear drains, inspection chambers and catchpits.	Monthly (for the first three months) then annually.
	Remove debris from gratings, sumps / silt traps.		Annually.
Infrequent Maintenance	Clear blockages.	Piped system.	As required.

Linear Drains, Pipe Systems, Inspection Chambers and Catchpits Inspection & Frequency

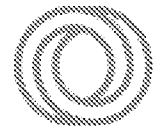
Inspection Activity	Comments	Frequency
Clearing of linear drains and catchpits	Linear drains and catchpits found to be non-functioning/blocked on annual inspection will be noted and cleared at six monthly intervals. Recurring blockages should be investigated.	Annually (or six monthly if blocked annually).
Cleaning / jetting	Pipes and inspection chambers.	When required.

**4.0 GLOSSARY**

Amenity grass	Close mown grass, cut 16 times per annum to a length of 50-65mm.
Attenuation	Storage of runoff; used with a flow control to control discharge.
Baseflow	Sustained (or constant) flow required for wetlands.
Barrier vegetation	Vegetation to deter access.
Berm	A mound of earth used to control flow (similar to a submerged dam or weir).
Check dam	Small dam used to control flow, common (for swales) where site slope exceeds 4%.
Conveyance	Movement of runoff from one point to another.
Diaphragm trench	Small trench (normally containing pea gravel) acting as a silt trap prior to sheet flow onto a filter strip.
Design level (or flood level)	Level of water storage within SUDS.
Emergent vegetation	Vegetation which grows in water but which pierces the surface, e.g. <i>Phragmites</i> .
Energy dissipation technique	A method to reduce energy of water flow to prevent damage / erosion to the structure.
Filter bed	A gravel filled base designed to ensure the base of a structure remains dry during small storm events. Similar in nature and construction to a filter trench.
Flow control	A device used to control the discharge from a structure, e.g. weir, orifice.
Flow spreading technique	A method to reduce intensity of flow, scattering across a wider area, reducing erosion and scour.
Forebay	Small basin designed to capture and retain sediment.
Gabion	Wire baskets filled with large boulders, offering reinforcement whilst allowing water to drain through.
Geocellular system	Plastic storage system used to attenuate runoff.
Geotextile	Synthetic permeable fabric commonly used in SUDS construction, e.g. filter trenches, helping to retain sediment.
Groundwater recharge	Where surface water moves downward to groundwater.



Half drain down	Time taken for the attenuated volume (in SUDS) to reduce to half of the storage volume by infiltration or use of flow control.
Hydro-Brake	Control device to regulate flow. Uses a vortex system to achieve design flow.
Infiltration	Process by which water on the ground surface enters the soil.
Inspection chamber	Open chamber used to assess level of sediment in the structure and assess half drain down time.
Long grass	Similar to meadow grass but without wildflower mix.
Meadow (or long) grass	Long grass with wildflower mix (sown or natural) cut 1-2 times per annum.
Modular system	See geocellular system.
Overflow weir	Type of weir (hard or soft engineered) to control flow when design level is exceeded.
Penstock	An adjustable vertical sliding plate to control flow.
Permeable paving	Paving designed to allow infiltration of runoff between blocks; can be designed to attenuate or allow infiltration into the ground.
Permanent water level	Static level of water within a pond. Storage capacity is the volume above this.
Point flow	Inflow from a specific source, i.e. a pipe.
Regional control	Management of runoff from a site or several sites, typically a pond or wetland.
Reno mattress	Type of gabion, typically wider and shallower (in depth) than normal gabions.
Rip-rap	Rock or other material used to prevent erosion, reduce velocity and dissipate flow.
Runoff	Surface runoff is water from rain, snow melt or other sources that flows over the land surface.
Safety bench	Shallow sloped margin areas normally used around pond edges to reduce risk of falling in and allows ease of exit from the water following an emergency.
Scarify	Method to break up silt deposits, remove dead grass and other organic deposits and relieves compaction of the soil surface.
Scour	Localised erosion usually as a result of high flows (or velocities of flow).
Sediment forebay	See forebay.



Sheet flow	Runoff that moves as overland flow in very shallow depths.
Site control	Management of runoff from a local area or site, typically detention basins or infiltration basins.
Slotted (or perforated) pipe	Pipe usually (UPVC) with holes or slots at regular intervals allowing water to drain out or in as required.
Source control	Control of runoff at or near its source, e.g. soakaway.
Spike	Method (usually mechanical) to open up soil, improving infiltration.
Spillway	Structure allowing the controlled release of water when design levels are exceeded. Can be soft or hard engineered.
Storage	See attenuation.
Stormwater	An interchangeable term for surface water runoff. See runoff.
Surface blinding	Blockage of the soil (normally by sediment) preventing infiltration.
Treatment	Improving water quality by physical, chemical and/or biological means.
Treatment train	Series of SUDS component used to provide incremental water quality improvement and storage.
Void space	The storage volume between gravel particles (usually for filter/infiltration trenches).
Weir	Horizontal structure designed to control flow.

Abbreviations

Ha	Hectare (1ha = 10,000 square metres)
SUDS	Sustainable Urban Drainage Systems