

2336 – Harvey Crescent, Port Talbot

February 2024



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SuDS Maintenance Plan - Harvey Crescent

Introduction

This report shall serve as a maintenance plan of the surface water drainage components serving runoff of impermeable areas at the Coastal Housing development off Harvey Crescent, Port Talbot. The system has been designed around the principles and standards of SuDS (Sustainable Drainage System) and in line with the Statutory Standards for SuDS published by the Welsh Government. The system provides attenuation, filtration, interception, and pollution removal. If not managed, the surface water flood risk due to failure within the site is likely to increase. The principle of the SuDS is to manage surface water close to the source, reduce flow, volume (due to reduction in impermeable area pre-/post development) and frequency of runoff leaving the development, remove pollutants from site runoff and provide amenity and biodiversity benefits.

The majority of the site will be owned by Coastal Housing, the first 20m of access road will be adopted by NPT Highway Department through a Section 38 agreement. The access road, adopted by NPT Highways will be maintained by their maintenance team. Maintenance of all other areas is to be carried out in line with this document by Coastal Housing's Maintenance Team.

Access for maintenance

The site will be accessed off Harvey Crescent and allow for plant (including mini digger) necessary to carry out maintenance of the SuDS features on-site. Replacement will be possible as all the components can be manually handled. Maintenance vehicle can be parked temporarily at the rear of the site within the private parking area..

SuDS at Harvey Crescent, Port Talbot.

The roof areas will discharge through rainwater pipes and underground drains into planted raingarden areas and to the permeable paving. The new drive area will be constructed using permeable techniques.

- Surface Water Pipes
Surface water pipes are a type of drainage pipe used to collect and transport rainwater, as well as other types of surface water such as runoff from roads, parking lots, and other impervious surfaces.
- Permeable Parking Area
Reduces the rate of runoff and through percolation removes pollutants and suspended solids.
- Basin
Provides surface water attenuation during extreme storm events, the area provides amenity value during dry periods. The basin will remain wet only after heavy rainfall.
- Raingarden
Raingardens are shallow landscaped depressions that can reduce runoff rates, and volumes and treat pollution through the use of vegetation.
- Hydrobrake
Flow restriction limiting the rate surface water leaves the site.
- Catchpit
A small chamber incorporating a sediment collection sump that the runoff flows through

Managing the SuDS Features

The SuDS features have been designed so defects to be view from the surface and for easy maintenance comprise:

- Regular care Litter collection, grass cutting and checking the inlets and outlets where water enters or leaves a SuDS feature. Regular maintenance activities should be recorded and logged to optimise future maintenance.
- Occasional tasks Managing vegetation and removing any silt that builds up in the SuDS features.
- Remedial work Repairing damage where necessary.

Litter, debris and sediment entering the drainage network is normally greater during the construction period, therefore once construction is complete all SuDS features should be cleared of all litter, debris and sediment. Vegetated features should then be complete, the following is based removal of litter, debris and sediment after construction.

Surface Water Pipes maintenance.

Maintenance Schedule	Required Action	Typical Frequency
Inspect pipes and components	Conduct visual inspections of the pipes and other components of the drainage system to check for signs of damage, such as cracks or corrosion.	Annually
Clear debris and obstructions	Remove any debris or obstructions that may be blocking the flow of water, using methods such as hydro-jetting or manual removal.	As needed, typically after heavy rain events or when blockages are observed.
Repair or replace damaged pipes	Address any identified damages, such as cracks or corrosion, through repairs or replacement of damaged pipes or components.	As needed, depending on the severity of the damage.
Check inlet and outlet structures	Inspect catch basins, sumps, and other inlet and outlet structures for signs of damage or blockages.	Annually
Clean inlet and outlet structures	Remove any debris or obstructions from catch basins, sumps, and other inlet and outlet structures.	Twice a year or as needed, depending on the amount of debris accumulation.

Permeable Driveway/Parking Maintenance

Permeable Pavement Maintenance

Schedule	Action	Frequency
Inspection	Visually inspect the filter drain for ponding during heavy rainfall or following heavy rainfall.	Regular (Once every 30 days) and after heavy rainfall
Litter and debris removal	Inspect and remove all litter and debris	Regular (Once every 30 days)
Maintenance for aesthetics	Replace any lost stone	Occasional (Once per year)
Weed control	Treat with weedkiller	Remedial (when required base on visual inspection)
Replacement	Permeable Paving Replacement	Once every 40 years

*Note that the jointing grit must not be replaced with kiln dried sand as this will block the joints prevent infiltration. Materials which may clog up the permeable joints such as soil and mulch should not be stored on top of the paving. Full maintenance guidelines for the permeable paving systems is attached at **Appendix A**.*

Pond

Schedule	Action	Frequency
Inspection	Site walkover to inspect and record condition of basin and vegetation	Monthly (during growing season), or as required
Grass cutting	Cut grass within basin	Regular during summer months (Once every 30 days) less frequent during winter months (Once every 90 days) or as required to maintain a minimum height of 35mm and maximum height of 100mm
Sediment management	Remove any sediment build up in base of basin	Occasional (Once per year) using hand tools
Vegetation replacement	Remove any dead vegetation and replace with same	Remedial (when required base on failure of the outfall, the system appears to leak or evidence of poor water quality)
Structure repair	Remove and replace any connecting pipes of headwalls	Remedial (when required base on failure of the outfall, the system appears to leak or evidence of poor water quality)

Raingarden Maintenance

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

Hydrobrake Maintenance

Maintenance schedule	Required action	Typical frequency
Regular inspections	Inspect the sediment build-up in at the bottom of the catch pit	Quarterly
	Inspect inlets and outlets for blockages	Quarterly
Structural Repair	Remove and replace any connecting pipes and replace Hydrobrake if damaged.	As required

Catchpit Maintenance

Maintenance schedule	Required action	Typical frequency
Regular inspections	Inspect the sediment build-up in at the bottom of the catch pit	Quarterly
Remedial actions	Remove the sediments using a suction tanker.	As required
Structural Repair	Remove and replace any connecting pipes if damaged.	As required

APPENDIX A

Tobermore Permeable Paving Maintenance

A two-story house with a red tiled roof and a grey car parked on a permeable paving driveway. The house has a mix of red brick and white plaster walls. A blue garage door is visible on the left. The car is a Volkswagen Tiguan with a yellow license plate. The driveway is paved with interlocking bricks in various shades of red and brown. The sky is blue with a few wispy clouds.

Permeable Paving Maintenance Guidelines

Guidelines for the maintenance of Tobermore Hydropave Permeable Paving

To ensure optimum performance of Hydropave permeable paving, Tobermore provide the following maintenance guidelines.

These guidelines are provided as a general maintenance regime but may be altered if necessary depending on the specific paved area or any factors which may impact the paving.

Hydropave permeable paving relies upon its ability to infiltrate surface water through its joints into a sub-base beneath. Hydropave Permeable Paving requires much less maintenance than is perceived by many however maintenance of the pavement should be carried out when necessary to ensure the infiltration of the paving is maintained and the paving is kept looking at its best. During design, construction and after construction care should be taken to ensure that the paved area is protected and maintained to minimise clogging of the joints.

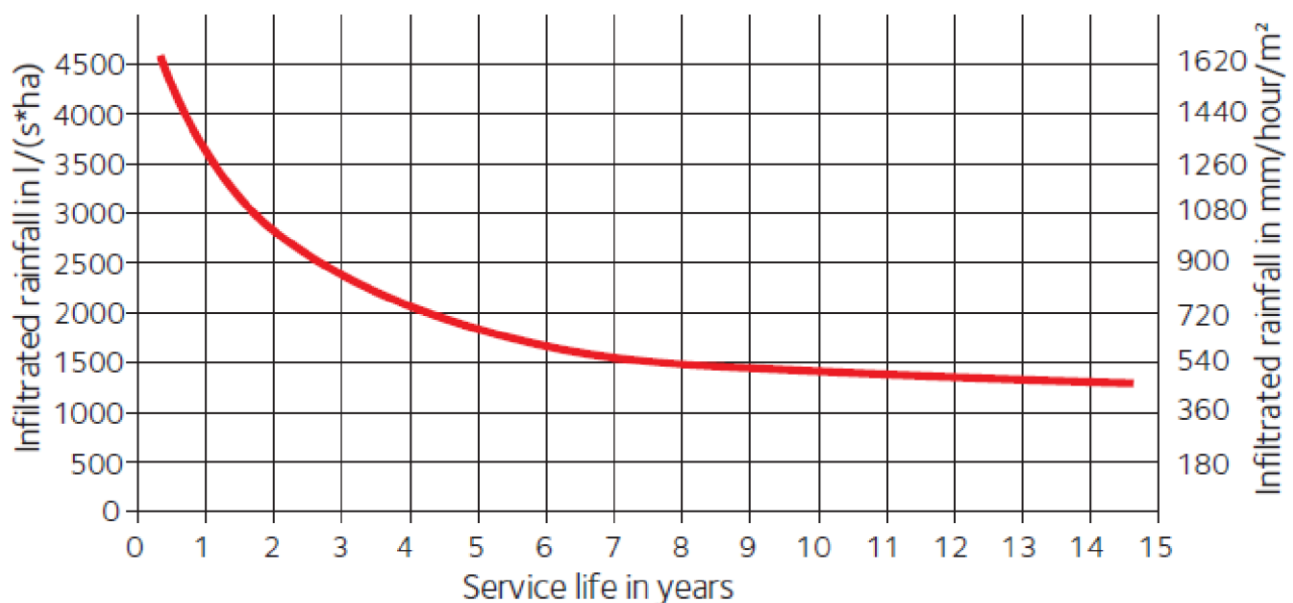
With age and use, detritus and silt collects in jointing material at the top of the joints. This forms a thin crust like layer over the joint however this does not severely impact the ability of the joints to infiltrate surface water. Research has demonstrated that whilst the infiltration rate of the joints does decrease over time it stabilises and still exceeds UK & Ireland hydrological requirements.

hour. Research has concluded that the infiltration capacity of a newly installed Hydropave Concrete Block pavement is over 4,000mm per hour. The bedding course and sub-base aggregates will have even higher infiltration capacity.

The UK guidelines require the infiltration rate of the surface joints to be 400mm and hour which is only 10% of the actual rate of newly installed permeable paving. Even allowing for clogging over the long term there is a large factor of safety built in.

See Figure 1.

Figure 1.
Rainfall experienced in the UK & Ireland is typically 20mm



per hour with an extreme rainfall event being 75mm per

General Guidelines

Routine visual inspections.

A major benefit of permeable paving over traditional drainage systems is the ability to quickly and cost effectively assess that it is working correctly. This can be done by visually inspecting the paving during heavy rainfall or following heavy rainfall.

In general, routine visual inspections are all that is required to determine whether or not remedial maintenance is required. Any infiltration issues are shown up by water ponding on the surface of the paving. If ponding is not visible then remedial action is not required. If ponding is visible see section on Remedial Action for ponding.

In the unlikely event that individual blocks are damaged these should be removed and replaced. See section on structural maintenance.

Frequency: Once a year during or following heavy rainfall.

Remedial maintenance for ponding.

If surface water ponding is visible the joints should be brushed and vacuumed.

Brushing and vacuuming should be carried out in a manner which ensures that the paving blocks are not damaged and that jointing material is not removed from the joints. Any jointing material which is removed must be replaced. The size of sweeper used will be dependent on the overall size of the paved area. A range of large mechanical sweepers are now available as well as smaller lightweight equipment. These are available from specialist companies. The structural integrity of Permeable paving will be compromised if the joints are not filled to the top with jointing aggregate.

It is good practice to complete a trial area first and then any adjustments to suction rates can be made if necessary. The effectiveness of Hydropave Permeable Paving is not significantly compromised by moss, leaves or weeds on the surface as these are not impenetrable barriers. **Frequency:** As and when required.

Maintenance for aesthetics of the joints.

To help maintain the overall appearance of the paving joints it is recommended that the surface of the paving including the joints is brushed and vacuumed at least once a year. Brushing the paving either mechanically or manually helps to agitate the jointing material and breaks up this thin layer of crust. Brushing also helps to prevent any vegetation growing in the joints.

Joints must be topped up with jointing material if any is removed during the brushing or vacuuming process.

Frequency: Recommended annually however maintenance for aesthetics of the joints can be carried out at the discretion of the developer/client.

Maintenance

Maintenance for aesthetics of the paving blocks. Brushing with soapy water and a stiff brush will revive the colour of concrete block permeable paving.

For a deeper clean of the block surface a pressure washer can be used to maintain the appearance and colour of the paving blocks. A pressure washer set to a light / medium pressure should be all that is required to remove general dirt and grime. **High pressure should not be used as this can damage the surface of the blocks.**

Tips:

- Hold the lance of the pressure washer at a 30 to 45 degree angle to the paved surface to avoid removal of the jointing material.
- After cleaning is finished ensure that any jointing material which has been removed is top up with the correct material.

Maintenance during the winter months. Hydropave Permeable Paving generally requires less deicing than conventional concrete block paving. The controlled use of conventional road de-icing techniques can be used without affecting the overall performance of the paving.

Some de-icing salts may leave temporary discoloration after the thaw. Normal weathering should soon remove this discoloration from the paving.

De-icing salts should be applied before snow or ice develops as this helps protect the concrete surface.

It is unlikely that the levels of chloride in the ground will increase significantly by employing conventional de-icing techniques.

Frequency: As required during winter.

Controlling weeds.

Weeds tend not to establish in areas which receive regular trafficking by vehicles. If weeds are an issue they can be dealt with by using a weed killer containing Glyphosate. The manufacturer's instructions should always be followed and adequate Health & Safety measures should also be put in place when handling chemicals.

Frequency: As required.

Structural Maintenance.

If a visual inspection has indicated that individual blocks have been damaged these blocks should be removed and replaced with new blocks.

If rutting of the surface has occurred the area needs to be lifted and reinstated immediately as it may be a hazard to users.

Any blocks which are removed need to be reinstated correctly ensuring that the correct sub-base, bedding and jointing aggregates are used. The installation method should be in accordance with BS 7533 Part 3. In particular, the joints should be filled to the top to ensure structural integrity. Any geotextiles or impermeable membranes

which are damaged during the reinstating process should be replaced. If the blocks are not damaged they can be lifted, cleaned and reused. **Frequency:** As required

Guidelines to minimise maintenance and ensure the long-term performance of Hydropave Permeable Paving.

Pre- construction (Design stage)

- It is essential that the system is designed correctly by a qualified engineer. Refer to BS 7533 Part 13
- The design and detailing of the project should ensure that soil from soft landscaping is prevented from spilling onto the paving.

During construction.

- It is essential that the paving is installed by an experienced contractor who is familiar with installing permeable paving and its components. Refer to BS7533

- Do not allow muddy construction traffic to use the paved area once completed.
- Do not allow soft landscaping to spill onto the paving surface.

See Figure 2.

After construction.

- Do not store materials which may clog up the permeable joints such as soil and mulch on top of the paving.
- The joints between to permeable paving should be filled to the top with the correct aggregate.

Figure 2.

Maintenance

SCHEDULE	ACTION	FREQUENCY
Routine visual inspection	Visually inspect the paving for ponding during heavy rainfall or following heavy rainfall.	Once a year
Remedial maintenance for ponding	Brush / vacuum joints Replace any lost jointing material	As required
Structural Maintenance	Replace damaged blocks Repair any rutting	As required
Maintenance for aesthetics of the joints	Brush / vacuum joints as required Replace any lost jointing material	Recommended once a year
Maintenance for aesthetics of the paving blocks	Brush with soapy water Light pressure wash	As required
Weed control	Treat with weedkiller	As required
Maintenance during the winter months	De-icing salts	As required during winter
WARNING !	Do not replace the jointing grit with kiln dried sand as this will block the joints prevent infiltration. Do not store materials which may clog up the permeable joints such as soil and mulch on top of the paving.	

overview Part 3

- Mud / soil and other contaminants should be prevented from entering the sub-base, bedding course and jointing aggregates.

