# Daniel Close and Gravelly Crescent SuDS Maintenance Plan

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**Limitations**

Building Design Consultants Limited ("BDC") has prepared this report in accordance with the instruction on Niki Fisher's email on the 02/11/2023.

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# Daniel Close and Gravelly Crescent - SuDS Maintenance Plan

## Content

1. Introduction ..... 1
2. Surface Water Management & Maintenance ..... 2
3. Construction Phase Surface Water Management ..... 7
4. Health and Safety ..... 8
5. Conclusion ..... 9

## Tables

Table 1: Operation and maintenance requirements for pervious pavements ..... 2
Table 2: Operation and maintenance requirements for pervious pavements ..... **Error! Bookmark not defined.**
Table 3: Operation and maintenance requirements for conventional drainage systems ..... 6

# 1. Introduction

## 1.1 Brief

Building Design Consultants (BDC) have been commissioned by Boutique Modern ('the applicant') to prepare a SuDS Maintenance Plan to discharge planning condition 8 of the Gravellly Crescent Planning application no AWDM/2068/21 and condition 9 of the Daniel Close site application no. AWDM/0827/22. These conditions are to ensure adequate maintenance and management of the surface water drainage systems for both sites.

Planning condition: "*Development shall not commence until full details of the maintenance and management of the surface water drainage system is set out in a site-specific maintenance manual and submitted to, and approved in writing, by the Local Planning Authority. The manual is to include details of financial management and arrangements for the replacement of major components at the end of the manufacturer's recommended design life. Upon completed construction of the surface water drainage system, the owner or management company shall strictly adhere to and implement the recommendations contained within the manual.*

# 2. Surface Water Management & Maintenance

## 2.1 Introduction

The maintenance of SuDS features is vital ensuring that they work as efficiently as they set out to do. Maintenance activities can be broadly defined as:

- Regular maintenance – basic tasks carried out regularly.
- Occasional maintenance – tasks that are required periodically but on a much less frequent basis.
- Remedial maintenance – tasks required when a fault needs rectifying and often includes unforeseen events.

The surface water systems will remain in private ownership to the curtilages of the individual plots. From here, it will be managed by the adopting authority/Management Company who will be responsible to maintain all the on-site road, foul and surface drainage including any landscaped communal areas.

Regular inspection will be the responsibility of the appointed Water Authority/Management Company. During construction, it is the responsibility of the Principal Contractor to ensure the relevant management and maintenance requirements outlined below are implemented. The principal contractor will retain responsibility during construction up to the handing over.

Maintenance of the system will include for frequent inspections and regular intervals of cleansing.

## 2.2 Permeable Pavement

Preventing soil, mud and other contaminants from entering the pavement surface, sub-base and subgrade is imperative to ensure that the pavement remains permeable throughout its design life. Excavations for the pervious pavement installation should aim to be undertaken in times of dry weather, when possible, to prevent mobilisation of sediments from exposed surfaces during rainfall events. Surfaces exposed as part of the pervious paving installation works should be stabilised as soon as possible. Permeable pavements should not be used by construction traffic.

The maintenance schedule for the aforementioned SuDS feature have been adopted from the SuDS Manual C753 and are summarised in Table 1 below.

**Table 1: Operation and maintenance requirements for pervious pavements**

| Maintenance Schedule | Required Action | Typical Frequency |
|---|---|---|
| Regular maintenance | Brushing and vacuuming (standard cosmetic sweep over whole surface) | Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations - pay particular attention to areas where water runs onto pervious surfaces from adjacent impervious areas as these areas are most likely to collect the most sediment |
| Occasional maintenance | Stabilize and mow contributing and adjacent areas | As required |

| | | |
|---|---|---|
| | Removal of weeds or management using glyphosate applied directly onto the weeds by an applicator rather than spraying | As required - once per year on less frequently used pavements |
| Remedial Actions | Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving | As required |
| | Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material | As required |
| | Rehabilitation of surface and upper substructure by remedial sweeping | Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging) |
| Monitoring | Initial inspection | Monthly for three months after installation |
| | Inspect for evidence of poor operation and/or weed growth -if required, take remedial action | Three-monthly, 48 hrs. after large storms in first six months |
| | Assess silt accumulation rates and establish appropriate brushing frequencies | Annually |
| | Monitor inspection chambers | Annually |

## 2.3 Attenuation Tank

Regular inspection and maintenance is required to ensure the effective long-term operation of below-ground storage systems.

The maintenance schedule for the aforementioned SuDS feature have been adopted from the SuDS Manual C753 and are summarised in Table 2 below.

**Table 2: Operation and maintenance requirements for attenuation storage tanks**

| 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 |
| | Remove sediment from pre-treatment structures and/ or internal forebays | Annually, or as required |
| Occasional maintenance | Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of manholes. | As required based on inspections. |
| 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 or after every large storm. |
| | Survey inside of tank for sediment build-up and remove if necessary | Every 5 years or as required |

## 2.4 Infiltration Attenuation Tank Maintenance Schedule

Infiltration attenuation tanks are designed to provide below-ground stormwater attenuation, prior to release into the natural bedrock at it natural rate.

Regular inspection and maintenance of the infiltration attenuation tanks is required to ensure the effective long-term operation and performance. Specific maintenance needs of the system should be monitored, and maintenance schedules adjusted to suit requirements. Typical maintenance generally involves the removal of sediment that has accumulated over time within the network and tanks. Infiltration Attenuation tanks should be cleaned out when necessary to prevent blockage of water seeping into underlying layers.

Other regular maintenance activities that could typically be expected for geo-cellular attenuation tanks include visual inspections and the possible the removal of litter and debris.

Visual inspection should be aimed to identify the following items:

- Blockages of inlets or outlets
- Leakage in any part of the system
- Evidence of sediment build-up
- Evidence of oil accumulation
- Evidence of structural damage that requires repair

Structural rehabilitation or repair to the infiltration attenuation tank will require the use of construction machinery and will likely involve the reconstruction of the above the tank. Any works should be in accordance with the manufacturer’s instructions, and care should be taken to ensure construction activities during rehabilitation/repair and backfilling do not cause further damage to the attenuation tank.

The Table 3 below shows the operation and maintenance requirements that may be appropriate. The list of actions is not exhaustive and some actions may not always be required.

**Table 3: Operation and maintenance requirements for infiltration attenuation storage tanks**

| 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 |
| | Remove sediment from pre-treatment structures and/ or internal forebays | Annually, or as required |
| | Trimming any roots that may be causing blockages. | Annually, or as required. |
| Occasional maintenance | Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of manholes. | As required based on inspections. |
| Remedial actions | Repair/rehabilitate inlets, outlet, overflows and vents | As required |
| | Replacement of clogged geotextile (will required reconstruction of the soakaway) | As required |
| | Reconstruction of infiltration attenuation tanks and/ or replace or clean void fil if performance deteriorates or failure occurs. | As required. |
| Monitoring | Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed | Annually or after every large storm. |
| | Survey inside of tank for sediment build-up and remove if necessary | Every 5 years or as required |

Maintenance will usually be carried out manually, although a suction tanker can be used for sediment/debris removal for large systems. If maintenance is not undertaken for long periods, deposits can become hard packed and require considerable effort to remove.

Replacement of the aggregate of geocellular units will be necessary if the system becomes blocked with silt. Effective monitoring will give information on changes in infiltration rate and provide a warning of the potential failure in the long term.

Roads and/or parking areas drainage to infiltration components should be regularly swept to prevent silt being washed off the surface. This will minimise the need for maintenance .

## 2.5 Gullies, Catchpits, Manholes, Sewers, Grated Linear Channels, Flow Control Devices

Regular maintenance should be undertaken to ensure the performance of the system remains at a satisfactory level and operates as intended/designed.

All litter and debris should be removed from the stormwater infrastructure and should be undertaken as part of general landscape maintenance. Removal of litter and debris should be undertaken from the surface without the requirement for entry into confined spaces. If entry into confined spaces is required, a suitably qualified specialist should be engaged to undertake the works.

Monthly inspections/monitoring of stormwater infrastructure should be undertaken to determine silt accumulation rates and establish appropriate removal frequencies. Removal of silt build up from inlets/sumps should be undertaken as necessary.

Occasional maintenance of stormwater devices generally involves the removal of sediment that has accumulated over time within the device. Gullies, Catchpits, Linear channel sumps, and other collection points should be cleaned out when necessary to prevent the re-entry of sediments into the downstream system and maintain the overall long-term performance of the drainage system. Cleaning can be undertaken by vacuum pumping, whereby sediment is vacuumed from the device and transferred to a tanker to be carried offsite to an approved disposal location. Most suppliers recommend that cleaning operations be undertaken every annually or as required.

If defects are found in the drainage infrastructure which are affecting or may affect the performance of the system, the defects should be remedied immediately. Remedial maintenance to manholes, catch pits headwalls, sewer or other drainage infrastructure may be able to be undertaken using hand tools, but depending upon the nature and severity of the maintenance required, light machinery and hydraulic excavating machinery may be required.

The maintenance schedule for traditional drainage systems is summarised in Table 3.

**Table 2: Operation and maintenance requirements for conventional drainage systems**

| Maintenance Schedule | Required Action | Typical Frequency |
|---|---|---|
| **Regular maintenance** | Remove litter and debris | Monthly (or as required) |
| | Monitoring | Inspect monthly (and after large storms) |
| **Occasional maintenance** | Sediment management. Removal of accumulated silt from system. | Annually or as required |
| **Remedial maintenance** | Structure rehabilitation/repair | As required |

# 3. Construction Phase Surface Water Management

It is important to prevent construction silt and contamination from entering the drainage network. Full details of the mitigation measures will be outlined within a Construction Environment Management Plan (CEMP) or equivalent method statement (MS) at Planning Condition stage. The CEMP/MS will be developed by the Principal Contractor and agreed with the Local Authority, prior to the commencement of the construction activities.

The aim is to demonstrate how the surface water will be managed for quantity and quality during the construction phase so as not to cause increased flood risk or pollution of watercourses or have a significant impact on the groundwater or neighbouring sites.

The philosophy is to effectively use the existing site features and incorporate the final construction into a surface water management scheme that minimises the impact on cost, programme, water quality and flooding on and offsite.

The construction of the development will alter the geomorphology of the Site which could, without mitigation measures in place, have an impact on the surface water quality and the surface water runoff in terms of increase in water pollution and sediment laden run-off at various stages of the construction process. A number of land-based activities associated with the enabling works and construction stages could potentially impact on surface waters in and around the Site, including:

- Site Setup/Clearance.
- Drainage works.
- Demolition activities.
- Construction materials handling, including the storage and use of fuels and oils and other potentially construction material.
- Handling of potentially polluting silt-laden run-off and excavation dewatering from construction activities and site compounds.
- Spillage or uncontrolled release of potentially polluting material such as cement, concrete, diesel, hydraulic fluid or paint.

# 4. Health and Safety

The planning, design, construction and management of sustainable drainage systems falls under the requirements of Construction Design Management (CDM) Regulations 2015. The asset owner or occupier is ultimately responsible for conducting a suitable and sufficient assessment of the SuDS for the use, inspection and maintenance of the system.

Accessing the below ground drainage system components presents of a risk of entry into confined spaces. Safe working practices for those undertaking inspection and maintenance should be employed to decrease risks as far as reasonably practicable. This includes personal protective equipment (PPE) provision and policy implementation based on a risk assessment.

The depth of the proposed manhole chambers is not envisaged to be excessive and all below ground drainage will be designed in accordance with best practice and Building Regulations to ensure the risk to the end user is reduced as far as reasonably practicable.

# 5. Conclusion

Building Design Consultants (BDC) have been commissioned by Boutique Modern ('the applicant') to prepare a SuDS Maintenance Plan to discharge planning condition 8 of the Gravellly Crescent site with planning application No. AWDM/2068/21 and condition 9 of the Daniel Close site with planning application No. AWDM/0827/22. These conditions are to ensure adequate maintenance and management of the surface water drainage systems for both sites.

The maintenance of SuDS features is vital ensuring that they work as efficiently as they set out to do. The below ground drainage and SuDS components will be maintained throughout the lifetime of the development by a third-party management and maintenance company.

A Construction Environment Management Plan or equivalent method statement will be developed by the Principal Contractor and agreed with the Local Authority prior to the commencement of the construction activities to safeguard receiving receptors and mitigate flood risk during construction.

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