Didsbury Point

Drainage Strategy - Maintenance

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PREPARED FOR

South Way Housing and City Branch

Drainage Strategy - Maintenance

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1. Maintenance

The following document outlines the maintenance requirements for the projected site's drainage components. The responsibility of the required maintenance falls to multiple authorities. This document sets out which organisations are responsible for the various maintenance regimes.

1.1. General

This section is intended to give an overview of the operation and maintenance of the drainage features that are included in the drainage strategy, in relation to typical drainage details. Where propriety products are specified, the manufacturer's instructions and recommendations should be followed in precedence to this document- unless otherwise stated.

The recommended operations and frequencies provided in this document are prototypical. To ensure that there are no unforeseen issues with the operation of the drainage strategy, initially, more frequent observations should be undertaken so adjustments can be made to suit the site requirements.

The surface water network has been designed to accommodate a 1 in 100-year storm rainfall event, plus the allowance for climate change, to the requirements of Manchester City Council, which is 45%. Periodically, the flow may exceed flows above a 1 in 30-year storm event. If said event should occur, the stormwater will be stored on-site in the proposed attenuation tank. As the surface water is being attenuated, there will be a period in which the surface water network is partially or fully surcharged. If surcharging is still present after 48 hours, appropriate action must be taken. Refer to the specific component in this document for the required maintenance action(s) to take.

1.2. Components

The following components have been included in the drainage strategy:

- Inspection chambers
- Manholes
- Pipes
- Drainage channels
- Gullies
- Filter drain
- Vortex flow control
- Attenuation tank

The locations of all the drainage components are shown on Civic Engineers' Proposed Drainage General Arrangement Ref, 1215-05-CIV-XX-ZZ-DR-C-30001.

Table 1 below shows the maintenance responsibilities of the various components.

Table 1 - Maintenance Responsibilities

Component Responsibility		
Component	**Drawing No.**	**Maintenance Responsibility**
Private inspection chambers and manholes	1215-05-CIV-XX-ZZ-DR-C-30001	Asset owner
Manhole SW19	1215-05-CIV-XX-ZZ-DR-C-30001	United Utilities
Vortex Flow	1215-05-CIV-XX-ZZ-DR-C-30001	Asset owner
Attenuation Tank	1215-05-CIV-XX-ZZ-DR-C-30001	Asset owner

Filter drain	1215-05-CIV-XX-ZZ-DR-C-30001	Asset owner
Drainage Channel	1215-05-CIV-XX-ZZ-DR-C-30001	Asset owner

A suitable maintenance strategy should be adopted to ensure that the drainage network is cleaned regularly. The routine maintenance and cleaning regime should also be documented.

A copy of the finalised constructed drainage layout should be included in the finalised Operations and Maintenance Manual.

It is recommended that the drainage system is inspected a minimum of twice a year, with the system also being inspected after any major storm event.

Significant sediment deposits are likely in areas used for storage. A post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects. All should be disposed of appropriately.

Long term management practices include monthly sweeping of external paved areas. The sweeping programme will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system. Sand and silt deposits must not be disposed of into the drainage network.

During the winter months, drainage features such as channels should be cleared of ice, snow, debris and litter.

Sediment and material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the upstream or downstream catchpits.

1.3. Inspection and Manhole Chambers

The access points have been positioned at the head of each run, at a change in direction, at a change of pipe size and where the maximum distance between access is required in accordance with Building Regulations Part H.

The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole. The appropriate permits should also be obtained from the Maintenance Manager prior to any access being carried out. Subsequently, after a maintenance access, manholes must be locked and sealed securely, in the correct manner.

1.4. Pipes

Pipes are proprietary products. The materials can vary across the site thus where applicable the manufacturer’s recommendations should be followed. In addition, regardless of product, all pipes used should also be fully compliant with Civic Engineers’ drainage specification.

Pipes are intended to be the main conveyance across the development hence where oversized they form the attenuation volume required by the limitation of drainage rate. Pipes are intended to be kept dry in rainfall events and simply to convey water around the site have been diagnosed such that they are considered self-cleansing. For larger diameter pipes, the risk is reduced due to the overall pipe size- though, these pipes should still be inspected for sediment build up.

Access for pipe maintenance is provided through inspection chambers and manholes.

Regular inspection and maintenance are important to identify areas which may have been clogged or obstructed. These areas may not be draining correctly thus exposing the development to a higher flood risk.

Table 2 presents the maintenance schedule for pipes, the actions required and the frequency to which these actions should be undertaken.

Table 2 - Pipes Maintenance Schedule

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Initial inspection should be provided as a post-construction CCTV survey.	N/A
Regular maintenance/inspection	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	Every three months and 48 hours after every storm
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
Remedial action	Rod through poorly performing runs as initial remediation.	Half-yearly and after large storms
	If poor performance continues, jet vacuum (where required) and CCTV survey poorly performing runs.	Monthly or as required
	Seek advice on remediation techniques suitable for the type of performance issue and location.	Monthly or as required

1.5. Drainage Channel and Gullies

Drainage channels and Gullies should be inspected and cleaned following the manufacturer's instructions. Channel units can be cleaned using a high-pressure hose, which can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should always be kept clear to ensure uninterrupted flow of surface water into the drainage channel, and any debris within the throat should be removed.

Locking bolts should be replaced and tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers can move within their frame, this may cause damage to the frame or seating.

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas.

Table 3 shows the maintenance schedule for drainage channels and gullies, the actions required, and the frequency to which these actions need to be undertaken.

Table 3 - Maintenance Schedule for Channel Drains and Gullies

Maintenance Schedule	Required Action	Frequency
Monitoring (to be carried out more regularly within the first year of operation and adjusted as required)	Initial inspection, including channel outlet boxes.	Every 6 months and after large storms
Regular inspection and maintenance	Check and remove large vegetation growth near the channel runs.	Monthly or as required
	Inspect for evidence of poor operation and/or weed growth. When required, take remedial action.	Monthly or as required

	Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	Every 3 months and 48 hours after a storm.
Remedial Action	Inspect access and outlet boxes. Rod through poorly performing channels and outlets as initial remediation.	As required.

1.6. Filter Drain

Filter drains are a sustainable urban design, SuDS, feature. They are essentially a trench filled with aggregate and a filter pipe, surrounded by a geotextile membrane. The membrane keeps out debris and the membrane and aggregate act as a filter to clean the water that either infiltrates the ground or joins the surface water network via the perforated pipe when the system is full. The gravel over the geotextile membrane needs to be kept free of debris as this is the first filter of the system.

Hence, filter drains will require regular maintenance to ensure the treatment and drainage performance continue. Regular inspection and maintenance are necessary as well as always removing litter and debris when seen near the filter drain.

Table 4 below summarises the maintenance required, the actions needing to be taken, and the frequency of the task at hand for filter drain maintenance. For more information on filter drain maintenance, refer to The SuDS Manual.

Table 4 - Maintenance Schedule for Filter Drain from The SuDS Manual

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices.	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage.	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation and establish appropriate silt removal frequencies.	Every 6 months
	Remove sediment from pre-treatment devices.	Every 6 months or as required
Occasional Maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods e.g. NJUG, 2007 or BS 3998:2010).	As required
	At locations with high pollution loads, remove surface geotextile and replace and	Every 5 years or as required

	wash, or replace overlying filter medium.	
	Clear perforated pipework of blockages.	As required

1.7. Vortex Flow and Outlet Chamber

The vortex and outlet chamber included within the drainage strategy is a propriety product thus information regarding operations and maintenance shall be provided within the manufacturer's specification and included in the handover documentation.

Regular inspection and maintenance are important to identify if the vortex flow control device has become obstructed or clogged as these could lead to the device malfunctioning. If the vortex flow and outlet chamber are not working as designed, this can expose the development to a greater risk of flood.

As stated, the manufacturer's recommendations should be followed for inspecting and maintaining the vortex flow control due to the products differing based on manufacturer. However, generally:

- Broadly, vortex flow controls tend to have no moving parts so tend to require little maintenance.
- Following the installation of the vortex control it is imperative that any extraneous material i.e. building materials are removed from the unit and the chamber.
- After the system is made live, it is recommended that each unit be inspected monthly for the first three months.
- After the first three months have progressed, inspections are recommended every six months with a hose down when required.
- The units should also be inspected within 48 hours of a large storm.
- If blockages occur, they tend to do so at the intake of the vortex flow control device.
- Vortex flow control devices commonly are fitted with a pivoting by-pass door which allows the manhole chamber to be drained down such that blockages occur.
- The smaller-type conical units, below the minimum recommended size, are also supplied with rodding facilities or vortex suppressor pipes as standard.

1.8. Attenuation Tank

Attenuation tanks are proprietary products thus the manufacture's guidance thus information regarding operations and maintenance shall be provided within the manufacturer's specification and included in the handover documentation.

Attenuation tanks are below ground, so blockages and failures can easily go unnoticed resulting in increasing the risk of flooding to the site. Geocellular systems tend to be hard to access so it is crucial that inspection and maintenance is carried out adequately upstream to prevent sediment and debris from reaching the attenuation tank. Some tanks are fitted with access for jet washing and CCTV, but both tend to be difficult to manoeuvre in an attenuation tank thus to reiterate the importance of the maintenance of the other drainage components to help maintain the full function of the attenuation tank.

Table 5 below summarises the maintenance schedule that should be adhered to for an attenuation tank.

Table 5 - Maintenance Schedule for Attenuation Tanks

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly.	Monthly for the first three months and then annually

	If required, take remedial action.	
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check the surface of the filter for blockage by sediment, algae, or other matter; remove and replace the surface infiltration medium as necessary.	Annually
	Remove sediment from the pre-treatment structures and/or internal forebays.	Annually, or as required
Remedial Actions	Repair/ rehabilitate inlets, outlets, 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
	Survey the inside of the tank for sediment build-up and remove if necessary.	Every 5 years, or as required

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