LandStudio

Greenbrow Road Redevelopment, Wythenshawe
Foul and Surface Water Drainage Maintenance Plan

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LandStudio

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1.0 Introduction

Land Studio have been appointed by Wythenshawe Community Housing Group to produce a Foul and Surface Water Drainage Management and Maintenance Plan towards discharge of planning condition 17 under application number 139537/FO/2024 and for use by the maintenance team from the WCHG team who will take on the future maintenance of the drainage systems.

This report is intended to give an overview of the operation and maintenance plan for the drainage features.

The recommended operation and maintenance frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the system in the first year of service.

The aim of the Management and Maintenance Plan is to ensure the below ground drainage system installed continues to perform in accordance with the intended design. It is intended that the system operates safely, is environmentally acceptable, economically efficient and provides the client with a functional and easily operated asset.

In preparation of the report and performance of any other services, Land Studio has relied upon publicly available information, information provided by the client and information provided by third parties. Accordingly, the conclusions reached in this report are valid only to the extent that the information provided was accurate and complete. Land Studio cannot accept liability for the accuracy or otherwise of any information derived from third party sources.

1.1 Site Location

The development is located at the former Clever Clowns Nursery, Greenbrow Road, Wythenshaw. The grid reference for the centre of the development is SJ 81063 86980.

1.2 Development Proposal

The proposed development consists of the construction a three-storey apartment block with 20 apartments, access, parking and landscaping.

2.0 Associated Information

This document should be read in conjunction with the following drawings.

- 382-LST-XX-XX-DR-D-0100 Drainage General Arrangement
- 382-LST-XX-XX-DR-D-0200 Drainage Schedule
- 382-LST-XX-XX-DR-D-0400 Drainage Details Sheet 1
- 382-LST-XX-XX-DR-D-0401 Drainage Details Sheet 2

3.0 Maintenance Responsibility

The funding and on-going maintenance of the drainage network will be private and the responsibility of the Wythenshawe Community Housing Group.

4.0 Surface Water Maintenance and Operation

4.1 Surface Water Design Standards

The following British Standards and design guides have been used for storm water design purposes.

- BS EN 752 Drain and Sewer Systems Outside Buildings
- BS EN 16933-2 Drain and Sewer Systems Outside Buildings – Part 2: Design
- CIRIA C635 The SuDS Manual
- Building Regulations Part H

4.2 Surface Water Design Philosophy

Surface water which falls onto the roofs or hard landscaped areas will be collected and drained into surface water attenuation before discharge at a restricted rate into the combined sewer adjacent to the development boundary.

4.3 Surface Water Drainage Maintenance

A strategy for the maintenance of the drainage has been developed, incorporating normal regular maintenance requirements, any potential long-term maintenance work and any monitoring required. Any parties involved with the disposal of any waste materials from the underground drainage system should hold appropriate management licenses to undertake any such activities.

Disposal of any site materials is required to be made in accordance with current legislation and guidance.

4.3.1 Surface Water Manholes, Inspection Chambers and Catchpits

It is proposed that both concrete and polypropylene chambers will be used. Access points have been located at the head of any new pipework for rodding purposes.

The appropriate health and safety equipment must be used when accessing manholes and inspection chambers. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained prior to access being permitted.

Regular inspections and maintenance are important to identify areas which may have been obstructed/clogged and may not drain correctly thus exposing the development to a greater level of flood risk. Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Table 1 indicates the typical maintenance recommendations required.

Action	Details	Frequency
Monitoring and Inspection /Testing	Check condition of inlets, outlets, vents, overflows, flow controls, covers and chambers	Monthly for the first three months following commission. Six-monthly thereafter or 48 hours after major storm event
	Inspect all manholes and catch-pit sumps for any sediment, trash, debris, and any other pollutants	Monthly for the first three months following commission. Six-monthly thereafter or 48 hours after major storm event
Regular Maintenance	Repair inlets, outlets, vents, overflows, flow controls, covers and chambers	Monthly for the first three months following commission. Six-monthly thereafter or 48 hours after major storm event
	Remove sediment, trash, debris and any other pollutants from manholes and catchpit sumps to ensure correct performance	Monthly for the first three months following commission. Six-monthly thereafter or 48 hours after major storm event
Occasional Maintenance	Replace covers and frames as necessary	As required
	Repair exposed concrete and surfacing as necessary	As required
Remediation	Replace malfunctioning parts or structures	As required

Table 1: Surface Water Manholes and Chambers

4.3.2 Surface Water Pipework

The surface water pipes are intended to be dry except for during rainfall events. New pipework has been designed to be self-cleansing where possible. Access for maintenance is provided through access chambers.

Regular inspections and maintenance are important to identify areas which may have been obstructed or clogged and may not drain correctly thus exposing the development to a greater level of flood risk.

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols. If continued poor performance, jet the system as required.

A CCTV survey of poorly performing runs should be undertaken as required.

If the above does not improve performance, seek advice for remediation techniques suitable for the type of performance issue and location.

Table 2 indicates the typical maintenance recommendations required.

Action	Details	Frequency
Monitoring and Inspection /Testing	Initial water test to be done prior to CCTV survey	Once, upon completion of development
	Initial inspection should be provided as post construction CCTV survey	Once, upon completion of development
	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action	Monthly for the first three months following commission. Three-monthly thereafter or 48 hours after major storm event
Occasional Maintenance	Check and remove large vegetation growth near pipe runs	Six-monthly
Remediation	Rod through poorly performing runs as initial remediation	As required
	If continued poor performance, jet and CCTV survey poorly performing runs	As required
	Seek advice as to remediation techniques suitable for the type of performance issue and location	As required, if above does not improve performance

Table 2: Surface Water Pipework

4.3.3 Permeable Paving

Permeable paving / porous asphalt is a proprietary product and as such the manufacturer's recommendations should be followed as a priority.

Permeable paving / porous asphalt is intended to provide a pavement suitable for pedestrians and vehicular traffic, while allowing rainwater to infiltrate through the surface and into the below ground drainage system. Overall, permeable paving needs to be able to effectively capture the design storm water event and discharge it in a controlled manner to the subgrade and then into the downstream drainage system, while maintaining resistance to withstand the loadings imposed. Thus, it is important to ensure the permeable paving / porous asphalt is maintained and inspected regularly so as to ensure it fulfils its functions.

Regular inspections and maintenance are important to identify areas which may have been obstructed or clogged and may not drain correctly thus exposing the development to a greater level of flood risk.

Permeable paving / porous asphalt should be swept frequently to maintain sufficient infiltration. A brush and suction cleaner or lightweight rotating brush cleaners combined with power spraying with hot water should be used for regular sweeping. Care should be taken to avoid removal of jointing material. Any loss in material should be replaced. Specialist sweepers with water jetting and oscillating and rotating brushes may be required for clogged surfaces.

Generally, permeable paving / porous asphalt requires less frequent gritting in the winter months, however, a slight frost may occur, and this can be delt with by the application of salt.

Table 3 indicates the maintenance recommendations required if no information is available from the manufacturers.

Action	Details	Frequency
Monitoring and Inspection /Testing	Initial inspection	Monthly for the first three months following commission.
	Inspect for evidence of poor operation and/or weed growth- if required, take remedial action	Three-monthly or 48 hours after major storm event
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over entire surface)	Once a year after autumn leaf fall, or reduced frequency as required, based on site specific observations of clogging. Attention to be paid to areas where water runs onto permeable surface from adjacent impermeable areas as this area is the most likely to collect the most sediment.
Occasional Maintenance	Stabilise and mow contributary adjacent areas	As required
	Removal or management of weeds using glyphosate applied directly onto weeds	Annually or as required
Remediation	Remediate any landscaping, which, through vegetation maintenance or soil slip, has been raised to within 50mm 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. 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 is reduced due to clogging)

Table 3: Permeable Paving

4.3.4 Surface Water Channels and Gullies

Drainage channels and gullies are proprietary products and where used the manufacturer's recommendations should be followed.

Channel drains and gullies can get clogged up by dirt and debris over time which can lead to them becoming ineffective and not performing as efficiently as they should. Drainage channels and gullies require regular maintenance to ensure continual performance to the design intent.

Litter, leaf-litter, and debris removal should be undertaken as part of the general landscape maintenance.

Regular inspection and maintenance is important to identify areas which may have been obstructed or clogged and may not drain correctly thus exposing the development to a greater level of flood risk.

Sediment / material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Table 4 indicates the maintenance recommendations required if no information is available from the manufacturers.

Action	Details	Frequency
Monitoring and Inspection /Testing	Initial inspection including channel outlet boxes and locking parts	Monthly for the first three months following commission; Six-monthly thereafter or 48 hours after major storm event
	Inspect for evidence of poor operation and/or weed growth and sediment accumulation. If required, take remedial action.	Three-monthly or 48 hours after major storm event
Regular Maintenance	Remove litter, leaf-litter, large vegetation and debris	Monthly or as required
	Clean channels as per manufacturers recommendations	Monthly for the first three months following commission; Six-monthly thereafter (in spring and after the summer) or 48 hours after major storm event
	Check and repair channel surfaces, joints; tighten locking parts that the bolt heads do not stand above the top surface of the cover or grate	Monthly for the first three months following commission; Six-monthly thereafter or 48 hours after major storm event
	Remove sediment	Six-monthly until required frequency is established
Occasional Maintenance	Remove and replace surface gratings and quick cleaning buckets	Every five years or as required (refer to manufacturer's recommendations)
	Clear perforated pipework	As required
Remediation	Inspect access and outlet boxes and rod through, replace if required	As required

Table 4: Surface water channels and gullies

4.3.5 Flow Control

A hydrobrake flow control will be required to restrict flow into the public sewer network and fitted within the traditional catchpit chamber.

The flow control is intended for flood control and flow restriction therefore their maintenance is essential to ensuring long-term performance as intended. Access for maintenance is provided through the inspection chamber.

Regular inspection and maintenance is important to identify areas which may have been obstructed or clogged and may not drain correctly thus exposing the development to a greater level of flood risk.

Table 5 indicates the maintenance recommendations required if no information is available from the manufacturers.

Action	Details	Frequency
Monitoring and Inspection /Testing	Inspect for evidence of poor operation	Six-monthly
	Inspect inlet for blockages and clogging. Jetting and CCTV survey may be required	Monthly for the first three months following commission; Six-monthly thereafter or 48 hours after major storm event
	Inspect for accumulation of sediment	Monthly for the first three months following commission; Six-monthly thereafter or 48 hours after major storm event
Regular Maintenance	Remove debris and sediment	Monthly or as required
	Clean out of unit as per the manufacturer's recommendations	Annually or as required
Remediation	Repair or replace malfunctioning parts	As required

Table 5: Flow Control

4.3.6 Attenuation Tank

Attenuation storage tanks are used to create a below-ground void space for the temporary storage of surface water from some of the roof drainage before controlled release into the below ground drainage system. The storage structure is formed using a geocellular storage systems.

Below ground geocellular attenuation tanks are a proprietary product and as such the manufacturer's recommendations should be followed.

The attenuation tanks are intended to be the surface water storage feature to attenuate the discharge from the roof drainage up to and including the 1 in 100 year plus 45% climate change event.

Regular inspection and maintenance are important to identify areas which may have been obstructed or clogged and may not drain correctly thus exposing the development to a greater level of flood risk.

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols. The table below provides guidance on the type of operational and maintenance requirements that may be appropriate. The list of actions is not exhaustive, and some actions may not always be required.

Table 6 indicates the maintenance recommendations required if no information is available from the manufacturers.

Action	Details	Frequency
Monitoring and Inspection /Testing	Inspect inlets, outlets, and overflows for blockages and sediment, and clear if required. If faults persist jetting and CCTV survey may be required	Monthly for the first three months following commission; Six-monthly thereafter or 48 hours after major storm event
	Survey inside of tank via the low flow channel for sediment build-up and remove if necessary	Annually or as required
Regular Maintenance	Remove debris from catchment surface	Monthly or as required
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary	Annually
	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
Remediation	Repair and/or of inlets, outlet, overflows and vents	As required

Table 6: Geocellular Attenuation Tanks

5.0 Foul Strategy

5.1 Foul Water Design Standards

The following British Standards and design guides have been used in the design of any new foul drainage.

- BS EN 752 Drain and Sewer Systems Outside Buildings
- BS EN 16933-2 Drain and Sewer Systems Outside Buildings – Part 2: Design

5.2 Foul Water Design Philosophy

The proposed foul drainage is proposed to connect into a new foul drainage private network within the site and connect into the public sewer either via the existing connection or proposed new connection to the public combined sewer adjacent to the site.

Any new below ground foul drainage has been designed to achieve a minimum self-cleansing velocity of 0.70m/s. Separate foul and surface water systems have been designed for.

5.3 Foul Water Drainage Maintenance

A strategy for the maintenance of the underground foul drainage elements has been developed, incorporating normal regular maintenance requirements, any potential long-term maintenance work and any monitoring required.

Any parties involved with the disposal of any waste materials from the underground drainage system should hold appropriate management licenses to undertake any such activities. Disposal of any site materials is required to be made in accordance with current legislation and guidance.

5.3.1 Foul Water Chambers

Foul inspection chambers are proprietary products and therefore the manufacturer's recommendations should be followed. Access points have been located at the head of each run, at each change in direction and at each change of pipe size for ease of maintenance.

The appropriate health and safety equipment must be used when accessing inspection chambers. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained prior to access being permitted.

Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not drain correctly thus exposing the development to a greater level of flood risk. Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols.

Table 7 indicates the maintenance recommendations required if no information is available from the manufacturers.

Action	Details	Frequency
Monitoring and Inspection /Testing	Check condition of inlets, outlets, vents, overflows, flow controls, covers and chambers	Monthly for the first three months following commission; Six-monthly thereafter or 48 hours after major storm event
	Inspect all manholes and catch-pit sumps for any sediment, trash, debris, and any other pollutants	Monthly for the first three months following commission; Six-monthly thereafter or 48 hours after major storm event
Regular Maintenance	Repair inlets, outlets, vents, overflows, flow controls, covers and chambers	Monthly for the first three months following commission; Six-monthly thereafter or 48 hours after major storm event
	Remove sediment, trash, debris and any other pollutants from manholes and catchpit sumps to ensure correct performance	Monthly for the first three months following commission; Six-monthly thereafter or 48 hours after major storm event
Occasional Maintenance	Replace covers and frames as necessary	As required
	Repair exposed concrete and surfacing as necessary	As required
Remediation	Replace malfunctioning parts or structures	As required

Table 7: Foul chambers

5.3.2 Foul Water Pipework

Any new domestic foul pipework has been designed to be self-cleansing. Access for maintenance is provided through inspection chambers.

Regular inspection and maintenance is important to identify areas which may have been obstructed or clogged and may not drain correctly thus exposing the development to a greater level of flood risk. This is especially the case in the existing pipework to be retained which may not meet current self-cleansing design requirements.

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols. If continued poor performance, jet the system as required. A CCTV survey of poorly performing runs should be undertaken as required. If the above does not improve performance, seek advice for remediation techniques suitable for the type of performance issue and location.

Table 8 indicates the maintenance recommendations required.

Action	Details	Frequency
Monitoring and Inspection /Testing	Initial water test to be done prior to CCTV survey	Once, upon completion of development
	Initial inspection should be provided as post construction CCTV survey	Once, upon completion of development
	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action	Monthly for the first three months following commission. Three-monthly thereafter or 48 hours after major storm event
Occasional Maintenance	Check and remove large vegetation growth near pipe runs externally to the building	Six-monthly
Remediation	Rod through poorly performing runs as initial remediation	As required
	If continued poor performance, jet and CCTV survey poorly performing runs	As required
	Seek advice as to remediation techniques suitable for the type of performance issue and location	As required, if above does not improve performance

Table 8: Foul pipework