



NEW VICTORIA RESIDENTIAL DEVELOPMENT

DRAINAGE MAINTENANCE STRATEGY REPORT

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Drainage Maintenance Strategy Report



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Contents

1.0 INTRODUCTION.....	3
2.0 SITE DESCRIPTION	3
3.0 PROPOSED DEVELOPMENT	3
4.0 FUTURE MANAGEMENT & MAINTENANCE	3
4.1 General Maintenance & Inspection Requirements	4
4.2 Inspection Chambers, Manholes and Catchpits.....	4
4.3 Pipes.....	5
4.4 Drainage Channels and Gullies	5
4.5 Vortex Flow Control Device	6
4.6 Cellular Attenuation Tank	7
4.7 Rain Garden/Tree Pit Bioretention Areas	8
4.8 Oil Separator	8
4.9 Foul Pump Station.....	8



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1.0 INTRODUCTION

This drainage maintenance strategy report has been prepared on behalf of Vinci Building in connection with the planning application ref 111777/FO/2016/C1 and pre commencement condition 28. It is to be read in conjunction with the manufacturers recommendations and the project specific drainage drawings and reports.

2.0 SITE DESCRIPTION

The proposed development site is located to the west of Corporation Street, Manchester, adjacent to Manchester Victoria Railway Station at National Grid reference SJ 84103 99017. The site is fairly flat with levels sloping slightly from east to west, from approximately 34.45mAOD in the east to approximately 33.90mAOD in the west.

3.0 PROPOSED DEVELOPMENT

The proposed development includes two residential buildings and one amenity link bridge with associated landscape and external works.

4.0 FUTURE MANAGEMENT & MAINTENANCE

The proposed drainage solution uses SUDS techniques in accordance with the CIRIA SUDS Manual C753. The surface water run-off from the proposed development is restricted using a vortex flow control device and the attenuated run-off is stored using a below ground cellular attenuation tank.

The following components have been included within the drainage strategy for the proposed development:

- ◆ Inspection chambers, manholes and catchpits.
- ◆ Pipes.
- ◆ Drainage channels and gullies.
- ◆ Tree pit bioretention areas
- ◆ Vortex flow control device.
- ◆ Cellular attenuation tank.
- ◆ Oil Separator
- ◆ Foul Pump Station

A suitable maintenance regime should be adopted to ensure the drainage network is cleaned and inspected regularly and the routine maintenance and cleansing regime should be documented.

The surface water drainage system within the site boundary will remain private and therefore maintenance of the surface water drainage system will be the responsibility the development owner. A copy of the final construction drainage information will be provided in the Operations and Maintenance Manual.

As such, the maintenance of the specified SuDS should be included within the developments Operation and Maintenance Manual and should be detailed in accordance with the CIRIA SuDS Manual C753, as per the operation and maintenance guidance outlined below.

4.1 General Maintenance & Inspection Requirements

- ◆ No work shall be carried out on the drainage system without permission from a nominated person, who has access to information/a working knowledge of the system.
- ◆ Maintenance/inspection work shall be carried out in a safe/planned manner.
- ◆ All work is to be carried out by competent persons suitably trained and equipped in accordance with current statutory safe working policies.
- ◆ Entry into confined spaces shall be kept to a minimum and be restricted to suitably qualified/equipped persons working in accordance with current statutory safe working policies.
- ◆ Drainage systems shall be inspected on a regular basis or should any problems be suspected. Any debris/defects discovered shall be recorded and a programme of cleaning/ repair initiated. Urgent repairs/cleaning shall be actioned as soon as practicable.
- ◆ It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.
- ◆ Clearing of the drainage system can be achieved by a number of methods depending on the nature of the work;
 - Rodding - Manual/Mechanical with flexible rods.
 - Jetting - High pressure water jetting.
 - Plunging.

4.2 Inspection Chambers, Manholes and Catchpits

The appropriate health and safety equipment must be used when accessing manholes/catchpits. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access. The following operations should be carried out annually.

- ◆ Covers of inspection chambers and manholes shall be removed and the sides, benchings and channels cleared.

- ◆ Accumulated deposits of silt in inspection chambers, catchpits and manholes shall be removed. Any traps shall then be plunged and thoroughly flushed out with clean water. This should be completed in Autumn, after leaf fall.
- ◆ Main and branch drains shall be cleared as required and afterwards be flushed with clean water. Any obstructions found shall be removed and not flushed down the system.
- ◆ Covers of inspection chambers, manholes and catchpits shall be replaced, bedded in suitable grease or other sealing material as required and bolted/locked down as appropriate. Missing bolts and broken items shall be replaced in accordance with the manufacturer's details.

4.3 Pipes

Regular inspection and maintenance are important to identify areas which may have become obstructed/clogged and may not be draining correctly, as failure to do so would expose the development to a greater level of flood risk.

Pipes are proprietary products and therefore the materials used can vary across the site. As such, where used the manufacturer's recommendations should be followed. Access for maintenance of the pipes is provided through inspection chambers and manholes. The below table sets out the maintenance schedule for the pipe components of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect for evidence of poor operation via water levels. If required take remedial action.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.
	Check and remove large debris and/or vegetation growth near pipe runs.	Monthly or as required.
Remedial Actions	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.	As required, if above actions do not improve performance.
Monitoring	Initial Inspection should be provided as post construction CCTV survey.	N/A
	Inspect/check all inlets, outlets and overflows to ensure they are in good condition and operating as designed.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.

4.4 Drainage Channels and Gullies

Channels and gullies should be inspected and cleaned in accordance with the manufacturer's details. Channel units can be cleaned through the use of a high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should be kept clear at all times 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 sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating. The below table sets out the maintenance schedule for the drainage channel and gullies components of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Litter and debris removal.	Monthly or as required.
	Check and remove large debris and/or vegetation growth near pipe runs.	Monthly or as required.
	Inspect for evidence of poor operation and/or weed growth. If required take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.
Remedial Actions	Inspect access/outlet boxes and rod through poorly performing channels and outlets as initial remediation.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue.	As required, if above actions do not improve performance.
Monitoring	Initial Inspection including channel outlet boxes and gully sumps.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.

4.5 Vortex Flow Control Device

Regular inspection and maintenance is important to identify if the vortex flow control device has become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a greater level of flood risk.

Vortex flow control devices are proprietary products and therefore can vary from manufacturer to manufacturer. As such, where used the manufacturer's recommendations should be followed.

- ◆ Normally, little maintenance is required as there are generally a vortex flow control device has no moving parts.
- ◆ If blockages occur they tend to do so at the intake of the vortex flow control device.
- ◆ Vortex flow control devices are generally fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur.
- ◆ The smaller type conical units, below the minimum recommended size, are also supplied with rodding facilities or vortex suppressor pipes as standard.
- ◆ Following installation of the vortex flow control device it is vitally important 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 three months and thereafter at six monthly intervals with hose down if required. Units should also be inspected within 48 hours after large storms.

4.6 Cellular Attenuation Tank

Regular inspection and maintenance is important to identify if the inlets/outlets have become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a greater level of flood risk.

The maintenance requirements for cellular attenuation tanks are outlined within Table 21.3 of the CIRIA SUDS Manual C753. An extract of that table is given below to set out the maintenance schedule for the cellular attenuation tank component of the proposed drainage systems.

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
	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
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
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
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

4.7 Rain Garden/Tree Pit Bioretention Areas

Regular inspection and maintenance is important to identify if the inlets/outlets have become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a greater level of flood risk.

The maintenance requirements for bioretention systems are outlined within Table 18.3 of the CIRIA SUDS Manual C753. An extract of that table is given below to set out the maintenance schedule for the cellular attenuation tank component of the proposed drainage systems.

TABLE 18.3 Operation and maintenance requirements for bioretention systems		
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

4.8 Oil Separator

This is located between manhole references SW32 and SW34, the product is a Kingspan Klargestar NSBE010 Class 1 by-pass separator with alarm system as the M&E designers information. The full information of the installed products will be contained within the O&M information but the manufacturers maintenance specific information is contained below.

4.9 Foul Pump Station

This is located at manhole reference FW09, the product is from Solid Links. The full information of the installed products will be contained within the O&M information but the manufacturers maintenance specific information is contained below.

4 Maintenance

4.1 Waste Removal and Servicing

- 4.1.1 Separated light liquid **must** be removed from separator when the oil capacity has been reached.
- 4.1.2 An oil level alarm system is available for purchase which gives warning when the separated light liquid/water interface level reaches 90% of the maximum recommended oil storage volume.
- 4.1.3 Separators should be inspected at least every six months or more frequently if experience dictates. A log should be maintained detailing the depth of oil found, any oil volume removed and any silt removal or cleaning carried out. A specimen maintenance log is included in the appendices.
- 4.1.4 Every site is different, in respect to the amount and type of silt generated by the drain design and installation. Frequently, the construction programme itself generates large and perhaps unusual quantities of silt and grit. We do recommend that following the initial installation, an inspection of the separator contents be made to check that building rubble has not entered the unit. Further inspections at 3 and 6 months should be made so as to be able to assess the volumes of silt and oil accumulated. The inspection and emptying programme can then be defined following the first 6 months site experience. We recommend leaving a maximum interval between inspections of 6 months.
- 4.1.5 Alarm probes should be removed and cleaned with water whenever waste material is removed from the separator. Please note the alarm may alert until the liquid level is replaced.
- 4.1.6 **Separator waste is a “special waste” under the terms of The Waste Management Code of Practice. The Code imposes a duty of care on the waste producer to ensure that the Cleansing contractor is registered with the Environment Agency and that the final disposal of the waste is to a licensed facility.**
- 4.1.7 You should consider the purchase of a maintenance service, which includes bi-annual inspections, removal of oil and silt, cleaning of the alarm probe and cleaning or replacement of the coalescer (where appropriate).

4.2 Waste Removal Procedure – Oil & Silt

- 4.2.1 **Oil can only be effectively removed when there is no flow entering the unit. Isolate the unit and prevent flow from entering. Always remove the oil before attempting to remove the coalescer. If this is not done, when the coalescer is withdrawn the oil can coat the media surface and when replaced the oil may be forced through the media, contaminating the effluent.**
- 4.2.2 Remove the access cover and lower the desludging hose in to the separation chamber. Draw off the surface oil.
- 4.2.3 If removing the silt, lower the desludge hose to the base of the tank and empty the contents of the chamber. Ensure that you access and clean both the inlet and the separation compartments.
- 4.2.4 Remove the alarm probe, if fitted, clean with water and replace.
- 4.2.5 Consider the period of time that the coalescer has been installed and consider removing and inspecting (cleaning or replacing) the coalescer media. If removed, ensure that it is correctly replaced into position. Replace the access covers. It is best to lower the water level to aid re-fitting.
- 4.2.6 Re-fill the separator with clean water up to the outlet level.
- 4.2.7 If an alarm is fitted, it will display an alarm condition until the separator is re-filled. Check alarm operation when unit full.

4.3 Checking the Coalescer Assembly

- 4.3.1 Coalescers, where fitted, may be cleaned periodically to maintain efficiency. Coalescers should be checked following a major incident and replaced if necessary. Please contact us if you wish to purchase the coalescer media.
- 4.3.2 Identify the type and size of separator (shown on labels inside the access neck).

- 4.3.3 Assemblies weighing less than 25 Kg may be removed by hand. Heavier assemblies should be lifted by mechanical means. Any lifting device employed must be capable of lifting:
- 4.3.3.a In excess of the maximum assembly weight.
 - 4.3.3.b The assembly completely out of the access shaft.
 - 4.3.3.c Giving a smooth and controlled lift.
 - 4.3.3.d Swinging the assembly to one side clear of the access shaft.

Unit	Dry Weight (Kg)	Wet Weight (Kg)	Silted Weight (Kg)	Number Within unit	Replacement Media Part No.
NSBE010	5.7 kg	≈50 kg	≈60 kg	1	402862
NSBE015	6.2 kg	≈55 kg	≈65 kg	1	402864
NSBE020	6.2 kg	≈55 kg	≈65 kg	1	402864
NSBE025	12.0 kg	≈65 kg	≈75 kg	1	402866
NSBE030	12.0 kg	≈65 kg	≈75 kg	1	402866
NSBE040	21.0 kg	≈100 kg	≈200 kg	1	402885
NSBE050	21.0 kg	≈100 kg	≈200 kg	1	402885
NSBE075	21.0 kg	≈100 kg	≈200 kg	2	402885
NSBE100	21.0 kg	≈100 kg	≈200 kg	2	402885
NSBE125	21.0 kg	≈100 kg	≈200 kg	3	402885

- 4.3.4 Ensure that the area around the access shaft is clear and that there is space to place the assembly once removed. If space is not available it will be necessary to support the assembly over the access shaft. e.g. by scaffold poles and platform.
- 4.3.5 Only remove the access cover when necessary to remove the assembly. Do not leave the access shaft uncovered and unattended.
- 4.4 Removing the coalescer assembly.**
- 4.4.1 Undo and remove the bracket which secures the coalescer to the access shaft.
 - 4.4.2 Lift the assembly with a smooth and steady motion. Coalescers will become lighter as water drains from the exposed media. Allow the water to drain completely. Assemblies blocked with fine silt may be very heavy.
 - 4.4.3 Fully extract the assembly and set it down adjacent to the access shaft.
- 4.5 Cleaning the coalescer assembly/ Media Replacement.**
- 4.5.1 Hose down the assembly using clean water at normal pressure. If the media is heavily contaminated with oil and silt, it may not be possible to clean it effectively by hosing. Do not allow untreated cleaning water to pass out of the unit. Continue hosing until the water runs clear.
 - 4.5.2 To replace the media, undo the banding. Slide media off the core tube and slide new media on. Ensure all the apertures on the core tube are covered by the media. Re-secure or replace banding. Consider replacing media and banding every two years.
- 4.6 Replacing the coalescer assembly.**
- 4.6.1 Position it over the access shaft.
 - 4.6.2 Lower the assembly steadily into the access shaft ensuring that the end locates within the sump at the bottom of the tank.
 - 4.6.3 Replace the access cover.

(“Water goes down but pump keeps running”)

- The STOP level float switch is set too low. Check the setting level and adjust if necessary.
- The pump selector switch is set to MANUAL. Set switch to AUTO (for control panels with AUTO – OFF – MANUAL switch)

MANUAL OPERATION

The pump(s) can be set to run continuously by setting the control panel selector to manual. This setting is for maintenance and testing purposes only and should not be left on unattended. You should take care to ensure that the pumps are not allowed to run dry for any extended period.

COMMISSIONING

If you have ordered commissioning we will ask you to complete our “pre-commissioning” checklist. We ask that a suitable power supply is provided and terminated using a suitable rotary isolator located next to the intended control panel location (this could be in a kiosk or the building). We will fit the control panel, install the pumps/floats and connect to your rotary isolator, as well as commission the pump station. The pump station will be fully tested and left in the operational mode.

OPERATING INSTRUCTIONS

The packaged pumping station has a fully automatic operation and once setup it should need no further adjustment. The working parts of the pumping chamber comprise of the pump(s), the level regulating float switches and control panel.

MAINTENANCE

No routine maintenance is necessary on the pump itself, as the motor bearings are generally permanently lubricated. It is however recommended that the pump(s) are checked every six to twelve months to ensure that the oil chamber is free from contamination (as per the pumps instructions), and to check the pump(s) for any blockages and to clean away any build-up of fat/dirt.

ROUTINE MAINTENANCE

1. Lift manhole cover and secure the site for Health & Safety reasons.
2. Check the pumps are operational by switching each pump to manual from AUTO.
3. Check the start level float switch is operational by lifting the float switch on each pump.
4. Check they are not contaminated with grease or other debris.
5. Check pumps are secure visually.
6. Ensure high-level alarm is operational by lifting the float switch.
7. Remove any large objects which may have found their way into the chamber.
8. Check panel is secure.
9. Ensure the pump(s) control panel is switched on and both switches are restarted on auto.
10. Close manhole and electrical cabinet.

WIRING DIAGRAM(S)

The wiring diagram(s) for the control panel or alarm unit (if applicable) are usually contained within the panel or alarm unit for the convenience of your installer. A copy of this wiring diagram should be placed with this manual for future reference.

PUMP HANDBOOK

Each pump is supplied with its own handbook, which will normally be found within the pump pack- aging. A copy of this handbook should be placed with this manual for future reference

PACKAGED PUMPING STATION USER GUIDE

By following a few simple guidelines your packaged pumping station will provide many years of reliable service.

This Pumping Station is designed to handle surface water, or domestic waste water/sewage only.

The following items should be disposed of in a waste bin and should not be flushed down a toilet or sink and into the system:

- Glass or metal
- Nappies
- Sanitary towels, tampons or similar
- Facial wipes, antibacterial wipes or similar
- Any material such as rags or cloth
- Plastic objects
- Sand, rock, stones, or other debris

Failure to follow these guidelines may invalidate your warranty, in which case any service visits and replacement pumps/parts because of misuse would be chargeable.

In addition to the items listed above you must never introduce the following into ANY sewer system:

- Explosives
- Flammable material
- Lubricating oil or grease
- Strong chemicals
- Petrol, diesel or similar
- Cooking Oils or Fats

POWER FAILURE

In the event of power failure, the system will not be able to pump anything out of the tank, in this instance try to minimise the use of toilets, sinks and showers/baths until electrical power is restored.