Avie Consulting Ltd
6 Killingbeck Court
Killingbeck Office Village
Killingbeck Drive
Leeds, LS14 6FD

Newsome Bowling Club

Kirklees Housing

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Sustainable Drainage Operation and Maintenance Manual

P3932-RP02

T: 0113 249 7416 E: admin@avie-consulting.co.uk W: www.avie-consulting.co.uk
Registered in England and Wales No 8325892

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Prepared By:		Checked:
	Tony Cooper Senior Engineer	Steve Bowles Senior Engineer

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Contents

1.0 Introduction 4
1.1 Components 4
1.2 Manholes 5
1.3 Pipes 6
1.4 Permeable Pavements 8
1.5 Infiltration Trenches 10
1.6 Package Pump Station 12

1.0 Introduction

1.0.1 It is understood that the site is to comprise a 10 plot residential development at the former Newsome Bowling Club. Avie were appointed to monitor infiltration testing undertaken on site and prepare a report in support of discharging the planning conditions.

1.0.2 The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

1.0.3 The surface water network has been designed to accommodate the 1 in 100-year storm rainfall event plus an allowance for 30% climate change to the requirements of the site. It may be that the exceedance flows above the 1 in 30-year storm rainfall event are stored within the site partially above ground, on non-habitable external landscaping, parking or other space. As the flows are generally being attenuated on site and within SuDs features there will be a period of time after storm events where the network is still partially or fully surcharged and is draining down. Where this surcharging is still present after 48hrs appropriate action should be taken as noted in this section.

1.1 Components

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

- Manholes
- Pipes
- Soakaway (Infiltration Trench)
- Permeable Paving
- Submersible Pumps

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

1.1.3 It is assumed that the maintenance of the drainage network will be the responsibility of the landowner as a private network. The landowner may however appoint an on-site facilities management team to be responsible for maintenance.

1.1.4 A copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual.

1.1.5 The surface water network has been designed to accommodate the 1 in 100-year storm rainfall event plus an allowance for 30% climate change particular to the requirements of the site. It may be that the exceedance flows above the 1 in 30-year storm rainfall event are stored within the site partially above ground, on non-habitable external landscaping, parking or other space. As the flows are generally being attenuated on site and within SuDs features there will be a period of time after storm events where the network is still partially or fully surcharged and is draining down. Where this surcharging is still present after 48hrs appropriate action should be taken as noted below.

1.1.6 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.

1.1.7 Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.

1.1.8 Long-term management practices include monthly sweeping of external paved areas. The sweeping program will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system.

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

1.1.10 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 such as the filter drains and the upstream/downstream chambers.

1.2 Manholes

1.2.1 The locations of Manholes are indicated on Avie drainage drawing P3932-01 Rev A.

1.2.2 Access points have been located at the head of each run, at a change in direction and at a change of pipe size in accordance with Building Regulations Part H.

1.2.3 The appropriate health and safety equipment must be used when accessing manholes. 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.

1.3 Pipes

1.3.1 The locations of the drainage pipes are indicated on Avie drainage drawing P3932-01 Rev A.

1.3.2 Pipes are proprietary products, and the materials can vary across the site and as such where used the manufacture's recommendations should be followed. Regardless of the product used the pipes will be fully compliant with the Avie drainage specification.

1.3.3 Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except for during rainfall events. These have been designed to be self-cleaning where possible for smaller diameter pipes.

1.3.4 Access for maintenance is provided through access chambers, manholes and rodding eyes.

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

1.3.6 Inspection and Maintenance Regime

Maintenance Schedule **Pipes**	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 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.	3-monthly, 48 hours after large storms.
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
Remedial Action	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.

1.4 Permeable Pavements

1.4.1 The access road will be constructed with permeable pavement techniques as shown on drainage drawing P3932-01 Rev A.

The permeable pavements have been designed in accordance with CIRIA C697, CIRIA C735 – Table 20.5 and BS7533-13

A typical arrangement is shown on drawing P3932-02 Rev A.

1.4.2 The permeable pavements are intended to be water quality & water attenuation features. These features are intended to be dry except during rainfall events.

The surface has been designed to be porous or to contain gaps where rain can flow through the upper construction layers into the voided stone which makes up the subbase.

Access for maintenance is at surface only due to the nature of this feature.

1.4.3 Inspection and Maintenance Regime

Regular inspection and maintenance is important for the effective operation of the pervious pavement.

Sediment\material removal should be undertaken.

Maintenance Schedule **Permeable Pavement**	**Required Action**	**Frequency**
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Initial inspection.	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth. If required take remedial action.	3-monthly, 48 hours after large storms.
	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.	Annually.
	Monitor inspection chambers.	Annually.
Regular maintenance\inspection	Brushing and vacuuming.	Three times/year at end of winter, mid-summer, after autumn leaf fall, or as required based on site-specific observations of clogging or manufacturers' recommendations.

Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required and as per landscape architect's specification.
	Removal of weed.	As required.
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 drepressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users.	As required.
	Rehabilitation of surface and upper sub-structure. This could include replacement of the jointing and bedding material. The upper geotextiles layer may also need replacing if clogged and Terram 1000 has a life span of 25 years.	As required (if infiltration performance is reduced as a result of significant clogging.

1.5 Infiltration Trenches

1.5.1 An infiltration trench is to be in the rear gardens of plots 8 - 10 as shown on drainage drawing P3932-01 Rev A.

The infiltration trench has been designed in accordance with CIRIA C697 and BS EN 752-4.

A typical arrangement is shown on drawing P3932-02 Rev A.

1.5.2 The infiltration trench is intended to be water quality & water attenuation features. These features are intended to be dry except during rainfall events.

Infiltration trenches allow water to exfiltrate into the surrounding soils from the bottom and sides of the trench.

Adequate access will be provided to the trench surface and maintenance points for inspection and maintenance, including for appropriate equipment and vehicles.

1.5.3 Inspection and Maintenance Regime

Regular inspection and maintenance is important for the effective operation of the pervious pavement.

Sediment\material removal should be undertaken.

Maintenance Schedule Infiltration Trench	Required Action	Frequency
Regular maintenance	Litter and debris removal from trench surface, access chambers and pre-treatment devices.	Monthly (or as required).
	Removal and washing of exposed stones on the trench surface.	Annual (bi-annual the first year) or when silt is evident on the surface.
	Trimming of any roots that may be causing blockages.	Annual (semi-annual the first year)
	Remove weeds on the trench surface.	Monthly (at start, then as required)
Occasional maintenance	Removal of sediment from pre-treatment devices.	Six monthly.
	Remove tree roots or trees that grow close to the trench.	As required.
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace filter media.	Five yearly.
Remedial actions	Clear perforated pipework of blockages.	As required.
	Rehabilitate infiltration or filtration surfaces.	As required.
	Replace geotextiles and clean and replace filter media, if clogging occurs	As required.
	Excavate trench walls to expose clean soils if infiltration performance reduces to unacceptable levels.	As required.
	Inspect inlets, outlets and inspection points for blockages, clogging, standing water and structural damage.	Monthly.
Monitoring	Inspect pre-treatment systems, inlets, trench surfaces and perforated pipework for silt accumulation. Establish appropriate silt removal frequencies.	Half yearly.

1.6 Package Pump Station

1.6.1 A surface water package pump station and foul water package pump station are located within the carriageway at the eastern edge of the road. The pump stations will pump site flows via rising mains to MH S01 & MH F02, as indicated on drainage drawing P3932-01 Rev A.

1.6.2 The pump stations are intended to lift surface & foul water levels to provide a gravity outfall into the existing drainage network. The surface water pump feature is intended to be partially dry except during rainfall events.

Adequate access will be provided to the manhole housing the pumps surface and provide maintenance points for inspection and maintenance, including for appropriate equipment and vehicles.

1.6.3 Inspection and Maintenance Regime

Regular inspection and maintenance is important for the effective operation of surface water pumped drainage feature.

Sediment \ material removal should be undertaken.

Maintenance Schedule **Package Pump Station**	**Required Action**	**Frequency**
Monitoring to be (undertaken more regularly after a heavy storm)	Initial inspection.	Monthly for three months after installation
	Check the physical condition of the system to ensure it is secure and undamaged	3-monthly, 48 hours after large storms.
	Specifically examine the condition of the pump including its impeller, seals, bearings, valves and volute. Assess the condition of pipework for wear or damage	6-mothly.
	Monitor inspection chambers.	Annually.