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New Park House, Manchester

Verification Report & Maintenance Strategy

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Client Name: Greater Manchester Mental Health NHS Foundation Trust

Site Address: Delunays Road, Crumpsall, Manchester, M8 5RB.

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Attenuation Tank

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1 Introduction

1.1 Project Background

Curtins have been appointed by Greater Manchester Mental Health NHS Foundation Trust to provide a verification and maintenance plan for the proposed below ground drainage design for New Park House.

The report is based on currently available information and best practice guidance.

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

The surface water network has been designed to accommodate the 1 in 100-year storm rainfall event plus 40% for climate change. As the flows are generally being attenuated on site 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.

1.2 Planning Condition

This report has been produced in order to satisfy the discharge requirements of Condition 13 which is as follows:

'The development hereby approved shall not be occupied until details of the implementation, maintenance and management of the sustainable drainage scheme have been submitted to and approved by the City Council as Local Planning Authority. The scheme shall be implemented and thereafter managed and maintained in accordance with the approved details. Those details shall include:

- Verification report providing photographic evidence of construction as per design drawings.

- As built construction drawings if different from design construction drawings.

- Management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime.

Reason- To manage flooding and pollution and to ensure that a managing body is in place for the sustainable drainage system and there is funding and maintenance mechanism for the lifetime of the development, pursuant to policy EN17 of the Manchester Core Strategy.'

1.3 Scope of the Maintenance Strategy

This report demonstrates the below ground drainage which has been installed for the development site and provides product information to inform future maintenance requirements.

This manual is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details only. Where proprietary products are specified the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.

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.

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2 Drainage Strategy

2.1 General

The drainage network on site is a private drainage network.

The drainage network is a separate foul and surface water system within the development. The surface water netwrok has 3 outfalls, 1 in the north of the site and two in the south. The foul water network has 2 outfalls located in the south of the site.

2.2 Foul Drainage

The private foul water drainage is split into 2 runs, one in the east of the site and one in the west. Both networks connect to a proposed combined network which discharges into the existing public sewer.

The current peak foul flow rate has been estimated at 35.9 l/s based on the Discharge Units.

The Final Construction Drainage Drawings are enclosed in Appendix A.

2.3 Surface Water Drainage

Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood for the critical 1 in 30-year storm event and flood water generated for up to the critical 1 in 100-year plus climate change storm event shall be constrained within the areas on site so not to cause damage to buildings, essential services or adjoining developments and services.

Based on the nature of the development, a lifespan in excess of up to 60 years is anticipated. Therefore, the potential climate change allowance for 2070-2115 ranges between 20% for the central allowance and 40% for the upper end allowance. As such, an allowance of 40% for climate change on peak rainfall intensity has been included in the design.

Assessment was completed at preliminary design stage to confirm the most viable method of discharge was connection to the combined public sewer at a restricted rate.

The on-site surface water network is based on a pipe system serving the site with a flow restriction.

The Surface water drainage is split into 3 runs, one in the west of the site (outfall 1), one in the east of the site (outfall 2) and one in the northwest (outfall 3). The site wide drainage system has been ristricted to varous discharge rates (based on 1:100 + 40% storm) achieved by a hydro-brake flow control device. The dischage flow rates are as follows:

- Outfall 1 – 120 l/s via flow control located in manhole SA8
- Outfall 2 – 95 l/s via flow control located in manhole SB24
- Outfall 3 – 5 l/s via flow control located in manhole N10

The proposed network on site requires attenuation to provide capacity to accommodate the volumes generated during the 1 in 100 year +40% design event whilst maintaining the maximum flow restriction.

There are three below ground cellular attenuation tanks located on site. Attenuation Tank 1 located in the southwest of the site provides approximately 75m^3, Attenuation Tank 2 located in the southeast of the site provides approximately 152m^3 and attenuation tank 3 located in the north of the site provides approximately 167m^3.

A petrol interceptor has been installed prior to outfall 2 to manage any pollution discharging to the public sewer system.

The Final Construction Drainage Drawings are enclosed in Appendix A.

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2.4 Approvals

The connection to the public sewer in Crescent Drive has been approved under a Section 106 Agreement referenced EC5673.

The connection to the private drain central Drive has been approved under a Section 106 Agreement referenced 03202214.

The correspondence is enclosed in Appendix B.

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3 Verification

3.1 Introduction

The Verification section has been developed with reference to the drainage design details and philosophy provided in section 2 of this report. Manchester City Council requirements are to verify the installation of the Drainage and SuDS to confirm by Photographic record that this has been installed.

The following elements have been recorded to date:

- Attenuation Tanks (3 No.)
- Petrol Interceptor
- Flow Control Chambers (3 No)
- Filter Drains
- Permeable Paving

A CCTV Survey has also been provided along with as built record information.

3.2 Photographic Information

Figure 1 - Attenuation Tank 1 installation





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Figure 2 - Attenuation Tank 2 installation



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Figure 3 - Attenuation Tank 3 installation



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Figure 4 – Flow control N10 installation





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Figure 5 – Flow control SA8 installation



Figure 6 – Flow control SB24 installation



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Figure 7 – Filter Strip installation



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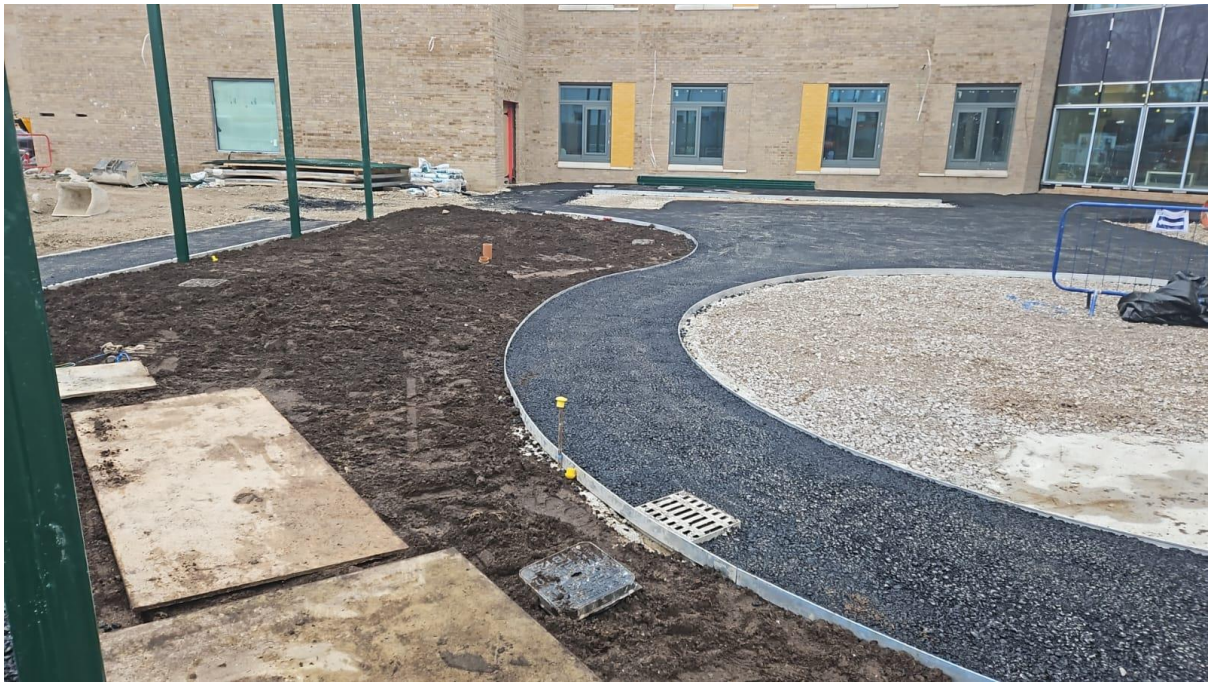




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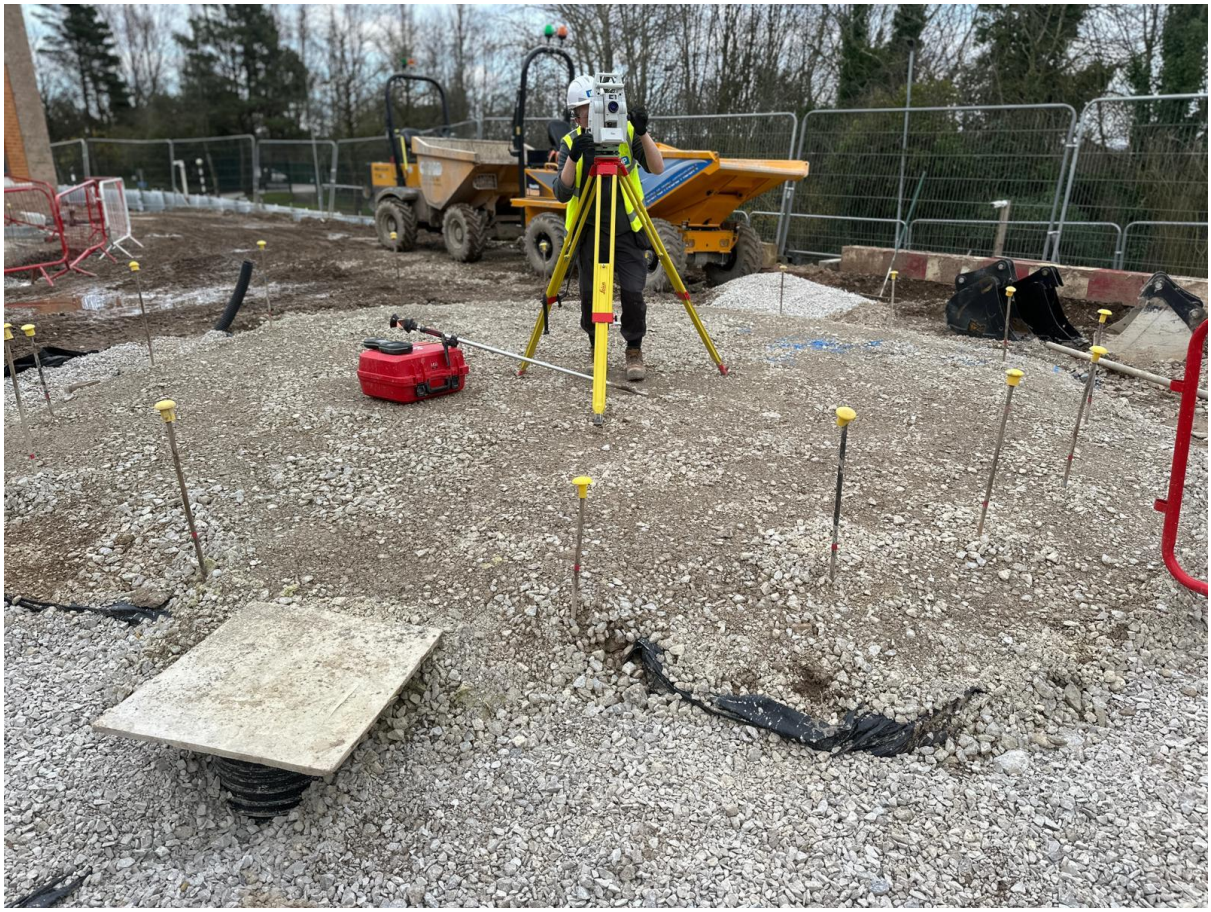
Figure 8 – Permeable Paving installation





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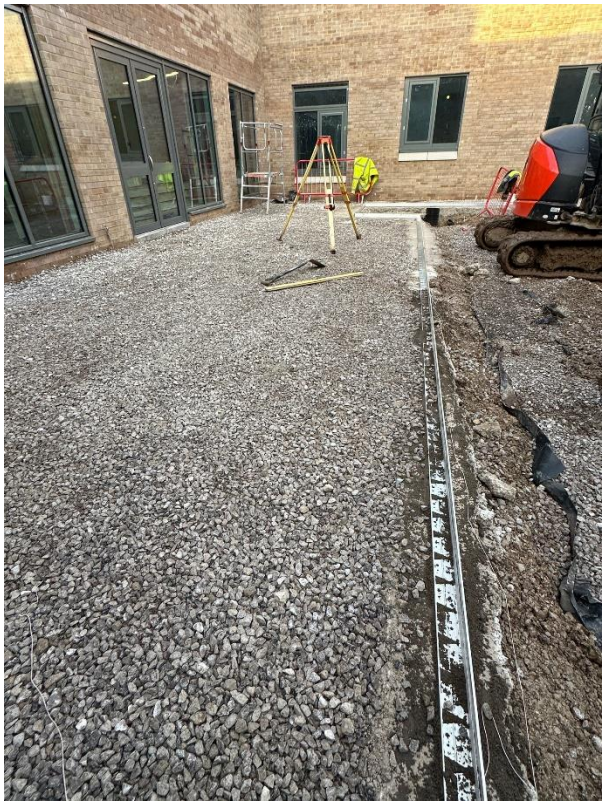




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Figure 9 – Petrol Interceptor installation



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Further Photographs to be provided

3.3 CCTV Survey and As Built information

As Built Information has been provided and reflected on eth Final Construction drawings enclosed in Appendix A.

A CCTV Survey was completed on the installed drainage network in April 2024.

The survey confirms at this time, the drainage network was in general good condition, and no defects were noted in the report. There were, however, a number of the drain runs not included in the CCTV report.

A list of the drainage runs not included in the report has been issued back to the contractor. It is recommended that a survey of the outstanding runs is completed prior to handover.

4 General Maintenance

4.1 Components

This section is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.

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.

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

- Inspection, Manhole and Catchpit Chambers
- Pipes
- Drainage Channels and Gullies
- Permeable Paving
- Attenuation Tank
- Flow Control Unit – Hydrobrake
- Petrol Interceptor

The location of all drainage is indicated on Curtins drainage drawings enclosed in Appendix A.

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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.

It is assumed that the maintenance of the private drainage network will be the responsibility of an on-site facilities management team.

The surface water network has been designed to accommodate the 1 in 100 year storm rainfall event plus an allowance for 40% climate change particular to the requirements of the site. 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.

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.

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.

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.

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

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.

4.2 Inspection, Manhole and Catchpit Chambers

The locations of the chambers are indicated on Curtins drainage drawings NMGNPH-CUR-VV-XX-DR-C-9251 TO 9253 Proposed Drainage Layout

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.

The appropriate barriers and signage should be installed during any opening of manholes to warn site users/pedestrians.

When accessing chambers, the latest Health and Safety legislation should be adhered to.

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 Facilities Maintenance Manager prior to any access.

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.

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 post construction CCTV survey.	N/A
	Inspect for evidence of poor operation via water level in	3-monthly, 48 hours after large storms.

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	chambers. If required take remedial action.	
Occasional maintenance	Check and remove large vegetation growth near pipe runs.	6 monthly
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 and location.	As required If above does not improve performance.

4.3 Pipes

The locations of the pipes are indicated on Curtins drainage drawings NMGNPH-CUR-VV-XX-DR-C-9251 TO 9253 Proposed Drainage Layout

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 are fully compliant with the Curtins drainage specification.

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-cleansing where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.

Access for maintenance is provided through access chambers and manholes.

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.

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 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

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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.

4.4 Drainage Channels and Gullies

The locations of the drainage channels and gullies are indicated on Curtins drainage drawings NMGNPH-CUR-VV-XX-DR-C-9251 TO 9253 Proposed Drainage Layout

Channels and gullies should be inspected and cleaned in accordance with the manufacturer's details.

Channel Units are Hauraton Recyfix hicap units.

Channels and gullies installed have removable covers to allow cleaning and clearing of debris and silt.

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.

The appropriate barriers and signage should be installed during any opening of gullies/channel outlet boxes to warn site users/pedestrians.

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.

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 car park drainage.

Manufacturers information is enclosed in Appendix C.

Maintenance Schedule	**Required Action**	**Frequency**
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection.	Half yearly and after large storms.

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Regular maintenance\ inspection	Litter and debris removal	Monthly or as required.
	Check and remove large vegetation growth near gully gratings.	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. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	3-monthly, 48 hours after large storms.
Remedial Action	Inspect sumps and outlet pipes and rod through poorly performing channels and outlets as initial remediation.	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. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	3-monthly, 48 hours after large storms.
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 weeds	As required.

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Remedial Action	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.	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).

4.5 Permeable pavements

The location of the permeable pavements are indicated on Curtin's drainage drawings NMGNPH-CUR-VV-XX-DR-C-9251 TO 9253 Proposed Drainage Layout

The pavement should be inspected regularly for clogging, litter, weeds and water ponding, preferably during and after heavy rainfall to check effective operation. Permeable pavements need to be regularly cleaned of silt and other sediments to preserve their infiltration capacity. The SuDS Manual indicates that sweeping once per year is sufficient for most sites, however the sweeping frequency should be adjusted to suit site specific conditions and should also be informed by annual inspection reports.

The below table outlines the proposed operation and maintenance regime for permeable pavements. This is adapted from The SuDS Manual (C753).

Maintenance Schedule	Required Action	Frequency

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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 - pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediments
Occasional maintenance	Stabilise and mow contributing and advancement areas	As required
	Removal of weeds or management using glyphosphate applied directly into 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

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4.6 Attenuation Tanks

The location of the attenuation tanks are indicated on Curtin's drainage drawings NMGNPH-CUR-VV-XX-DR-C-9251 TO 9253 Proposed Drainage Layout

The attenuation tanks are geocellular units and are intended for storage of surface water run-off from the site up to and including the 1 in 100 year plus 40% climate change event to reduce the rate of run-off into the downstream network and to minimise flood risk.

The geocellular units are proprietary products and therefore manufacturer's recommendations should also be taken into consideration.

The tanks are SDS Geocellular Units.

Access for maintenance has been provided by catchpit manhole chambers upstream and downstream of the tank. Vents are also provided to the upstream manholes.

Manufacturers information is enclosed in Appendix C.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets, outlets and overflows for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets, outlets and overflows.	As required.

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4.7 Flow Control Units

The location of the Flow Control Chambers is indicated on Curtin's drainage drawings NMGNPH-CUR-VV-XX-DR-C-9251 TO 9253 Proposed Drainage Layout

The flow control units are intended for flood control and flow restriction.

The flow control is a Hydro-brake Optimum unit and is a proprietary product; therefore, manufacturer's recommendations should also be taken into consideration.

Access for maintenance has been provided by locating within a manhole chamber.

Manufacturers information is enclosed in Appendix C.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures and flow control chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets.	As required.

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4.8 Petrol Interceptor

The location of the Petrol Interceptor is indicated on Curtin's drainage drawing NMGNPH-CUR-VV-XX-DR-C-9253 Proposed Drainage Layout.

The petrol interceptor units are intended for oil pollution control.

The Petrol Interceptor is specified as a KLARGESTER NSFA030 Class 1 with venting and alarm and are proprietary products; therefore, manufacturer's recommendations should also be taken into consideration.

Manufacturers information is enclosed in Appendix C.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures and flow control chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets.	As required.

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Appendix A

Drainage Layout Drawings

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