

Hinckley CDC

SuDs Operations and Maintenance Manual

Revision P1

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1.0 Introduction

1.1 Project Background

Darwin Group have prepared a SuDS Drainage Operations and Maintenance Manual as supplementary to the SuDs Drainage Strategy for the proposed Hinckley CDC, Hinckley and District Hospital. Particular reference is paid to the inspection, aftercare and maintenance of SuDS drainage features as part of this manual in order to demonstrate to the LLFA the effectiveness and longevity of the SuDS features designed within the scheme as opposed to the standard Building Regulations local and domestic drainage and/or the main discharge drainage connections to 'Design and Construction Guidance' standards.

This report is based on current 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 and construction for this project. Where such adjustments are undertaken and are deemed a material derivation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

In accordance with the SuDs Drainage Strategy Report the surface water network has been designed to accommodate the 1 in 100 year storm rainfall event plus an allowance of 40% for climate change. 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.

1.2 SuDs for Hinckley Community Diagnostic Centre

The SuDs across the site is generally accommodated within the geocellular subbase replacements tanks under the car park to the North of the proposed building.

The SuDs also aim to:

- Control the flow, volume and frequency of water leaving the development,
- Prevent pollution by intercepting silt and cleaning runoff from hard surfaces,
- Provide attractive surroundings for the community,
- Create opportunities for wildlife.

1.3 Scope of O&M Manual

This manual is intended to give an overview of the operation and maintenance for the range of SuDs 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.

As the hospital a private single site the operations and maintenance will be the responsibility of the hospital. This can be outsourced to a third-party management company, but the ultimate responsibility will lie with the hospital for the correct operation and maintenance once the initial snagging period has been completed. During construction, the operations and maintenance will be the responsibility of the Main Contractor.

Maintenance has been separated into different categories for each type of feature as follows:

- Regular care – Inspection of key components (inlets, outlets etc.), litter collection, grass cutting
- Occasional tasks – managing vegetation and removing silt build-up in the SuDs features
- Remedial work – identifying failures in the SuDs network and how to repair them

1.4 Emergency Actions

Spillages on site may require emergency action. Most spillages on development sites are of compounds that do not pose a serious risk to the environment if they enter the drainage network in a slow and controlled manner with time available for natural breakdown in the rain garden. Therefore, small spillages of oil, milk or other known organic substances should be removed where possible using soak mats as recommended by the Environment Agency, with residual spillage allowed to bioremediate in the drainage system. The access road includes gullies with sumps which will intercept small volumes from spillages but should be emptied\cleaned with a gully sucker where a spillage occurs.

In the event of a serious spillage, either by volume or of unknown or toxic compounds, then isolate the spillage with soil, turf or fabric and block the outlet pipes from chamber(s) downstream of the spillage with a bung(s). This should only be undertaken where it will not cause a flood risk issue due to rainfall. (A bung for blocking pipes may be made by wrapping soil or turf in a plastic sheet or closely woven fabric.)

Contact the Environment Agency and Local Authority immediately.

1.5 Timetable for Implementation

The construction timetable is anticipated with a programmed start of construction in mid 2024 with approximately 12-month construction period.

During construction all responsibilities lay with the contractor until such time as snagging has been successfully completed.

4.0 Attenuation Tank (Geocellular Units)

4.1 Location and Description

The attenuation tank is located to the North of the proposed building under the car park to the front of the main entrance, as shown on drainage strategy drawing 19849-WIE-ZZ-XX-DR-D-92-001.

The tank has been designed in accordance with CIRIA C753 and C737.

A typical arrangement is shown on drawing 19849-WIE-ZZ-XX-DR-D-92-001.

Geocellular units are proprietary products and therefore manufacturer's recommendations should also be taken into consideration. Additionally, different manufacturers may have different connection types and arrangements which will need to be taken in to consideration, with the original design intent being Permavoid units as required for subbase replacement given the shallow construction.

4.2 Operation

The attenuation tank is intended to be the surface water storage feature to attenuate the discharge from the site up to and including the 1 in 100 year plus 40% climate change event. As such during rainfall events the tank will fill to full depth. The tank is intended to be empty between rainfall events.

Direct access for maintenance is accessible via the upstream and downstream chambers.

4.3 Inspection and Maintenance Regime

Regular inspection and maintenance is important for the effective operation of attenuation tanks as designed. As the feature is buried a regularly inspection regime is very important to ensure the correction functionality of the surface water drainage network.

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 car parks/service yards.

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.
	Inspect ventilation cowl (if present)	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, outlet, overflows and vents.	As required.

3.0 Pipes (*Including Oversized*), Linear Channels & Manholes

3.1 Location and Description

Pipes are the main conveyance across the site with the network as shown on drainage strategy drawing 19849-WIE-ZZ-XX-DR-D-92-001.

A typical details for pipe bedding and detailing are shown on drawing 19849-WIE-ZZ-XX-DR-D-92-006, 19849-WIE-ZZ-XX-DR-D-92-007, 19849-WIE-ZZ-XX-DR-D-92-008 & 19849-WIE-ZZ-XX-DR-D-92-009.

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 drainage specification.

3.2 Operation

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, manholes, rodding plates and rodding eyes.

3.3 Inspection and Maintenance Regime

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.

Sediment\material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols, as run-off is taken from potentially contaminated areas such as car parks.

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 chambers. If required take remedial action.	3-monthly, 48 hours after large storms.
Occasional maintenance	Check and remove large vegetation growth near pipe runs.	6 monthly
	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.

4.0 Permeable Paving

4.1 Location and Description

The permeable paving is located to the north of the site in all the car parking spaces. This is shown on the drainage strategy drawing 19849-WIE-ZZ-XX-DR-D-92-001.

The Build up of the permeable paving as shown on drawing 19849-WIE-ZZ-XX-DR-D-92-009 – Proposed drainage details Sheet 4 of 4. The minimum installed will be 350mm coarse graded aggregate/stone 4/20 as per BS EN 7533 Part 13 (30% void ratio), The build up will be larger where the drainage pipe runs through it.

4.2 Operation

The permeable paving is intended to provide an alternative surface finish to differentiate between the car park road surface and parking bays. They have been selected to allow the surface water to infiltrate between the paving joints into the sub-base beneath.

4.3 Inspection and Maintenance

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.

Sediment/weeds removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols, as run-off is taken from potentially contaminated areas such as car parks.

Maintenance Schedule	Required Action	Frequency
Routine Visual Inspection	Visually inspect the paving for ponding during heavy rainfall or following heavy rainfall.	Once a year
Remedial maintenance for ponding	Brush / Vacuum joints Replace any lost jointing material	As required
Structural Maintenance	Replace damaged blocks Repair any rutting	As required
Maintenance for aesthetics of the joints	Brush / vacuum joints as required Replace any lost jointing material	Recommended once a year
Maintenance for aesthetics of the paving blocks	Brush with soapy water Light pressure wash	As required
Weed Control	Treat with weedkiller	As required
Maintenance during winter months	De-icing salts	As required during winter
WARNING !	Do not replace the jointing grit with kiln dried sand as this will block the joints and prevent infiltration. Do not store materials which may clog up the permeable joints such as soil and mulch on top of the paving.	

Appendices

Appendix A – Design Drawings

19849-WIE-ZZ-XX-DR-D-92-001 Drainage Strategy

19849-WIE-ZZ-XX-DR-D-92-006 Drainage Details sheet 1 of 4

19849-WIE-ZZ-XX-DR-D-92-007 Drainage Details sheet 2 of 4

19849-WIE-ZZ-XX-DR-D-92-008 Drainage Details sheet 3 of 4

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