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1 Introduction

1.1 Project Overview

Curtins Consulting Limited has been appointed by Equans to prepare a Drainage Operations and Maintenance (O&M) Manual to supplement the Drainage Strategy report produced by Curtins. Document reference: BFSF-CURT-XX-RP-C-9201.

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 or adopting authority 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 'Sewers for Adoption' standards.

This report is based on current best practice guidance as described in the SuDS Manual, CIRIA, C753.

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 derivation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

1.2 Scope of O&M Manual

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

2 Pipes

Pipes are the main conveyance across the site with the network as shown on drainage drawing 'BFSF-CURT-DR-C-9200, 9201, 9202, 9203'.

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

They are intended to be dry except for during rainfall events. These have been designed to be self-cleansing 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. Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be draining correctly thus exposing the development to a greater level of flood risk. Maintenance responsibility for the pipes should be placed with an appropriate maintenance company following installation.

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/service yards.

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
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.

3 Headwalls

Headwalls are proposed to be provided at the discharge locations into the existing ditches in the locations shown on drainage drawings 'BFSF-CURT-DR-C-9200, 9201, 9202, 9203'.

They are intended to be dry except for during rainfall events.

Access for maintenance is provided through the outfall to the ditch and upstream via access chambers, manholes, rodding plates and rodding eyes. Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be draining correctly thus exposing the development to a greater level of flood risk. Maintenance responsibility for the headwalls should be placed with an appropriate maintenance company following installation.

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

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 survey.	N/A
	Inspect for evidence of poor operation via water level at headwall. If required, take remedial action.	3-monthly, 48 hours after large storms.
Occasional maintenance	Check and remove large vegetation growth near headwall.	6 monthly
Remedial actions	Rod through from headwall or upstream access point.	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 Culverts

Culverts are proposed to be provided at the locations where the new road network crosses existing ditches in the locations shown on drainage drawings 'BFSF-CURT-DR-C-9200, 9201, 9202, 9203'.

Access for maintenance is provided either side of the culvert. Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be draining correctly thus exposing the development to a greater level of flood risk. Maintenance responsibility for the headwalls should be placed with an appropriate maintenance company following installation.

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

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 survey.	N/A
	Inspect for evidence of poor operation via water level at culvert. If required, take remedial action.	3-monthly, 48 hours after large storms.
Occasional maintenance	Check and remove large vegetation growth near culvert.	6 monthly
Remedial actions	Rod through from either side of the culvert.	As required.
	If continued poor performance jet and poorly performing culverts.	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.