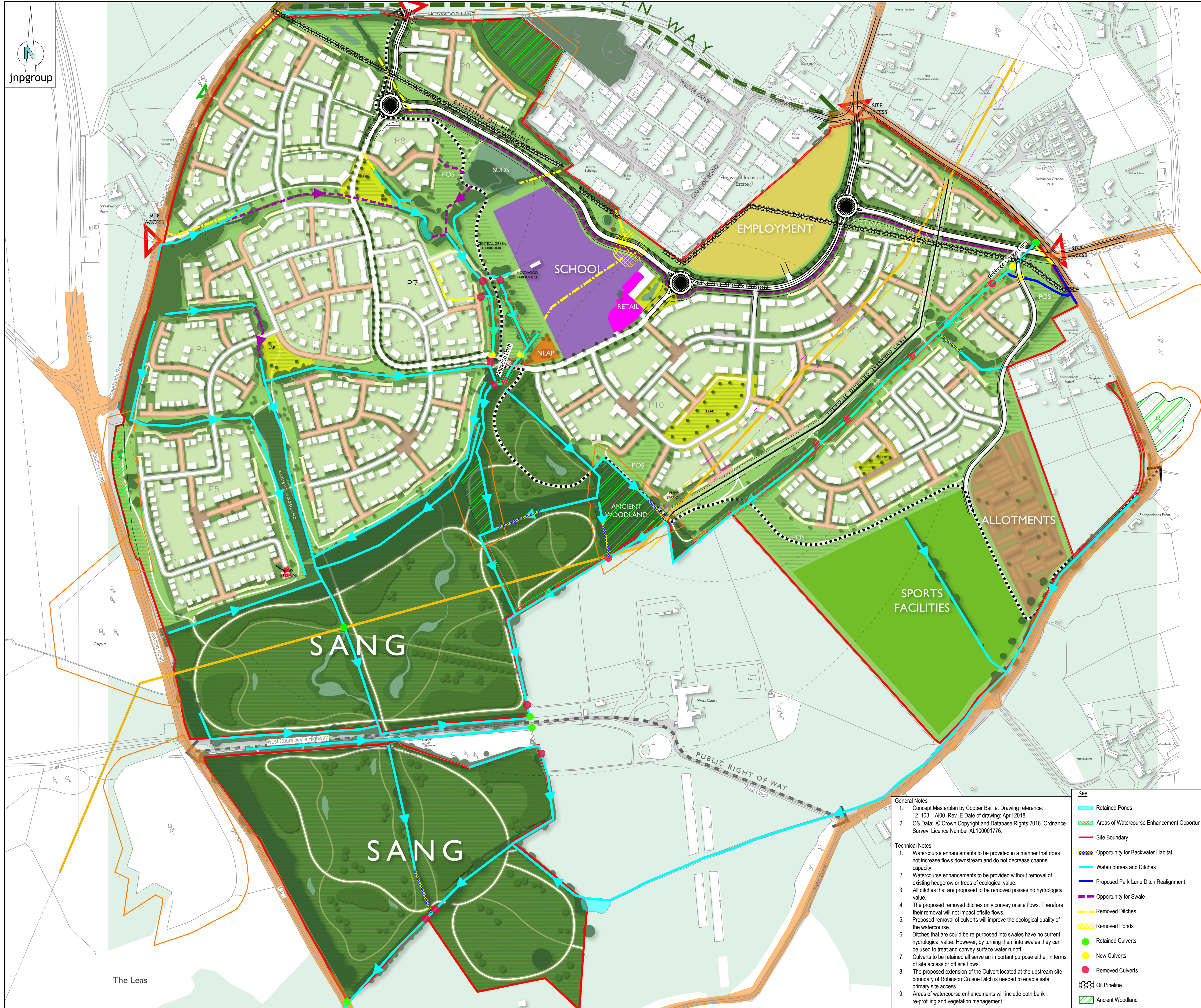




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| A      | 04.2018 | Removal of meandering | JC |    |
| Rev.   | Date    | Amendment             | By | Ch |
| Status |         |                       |    |    |

| State |
|-------|
|-------|



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Tel: 01494 771221 E-mail: [chesham@inpgroup.co.uk](mailto:chesham@inpgroup.co.uk)

|        |                       |
|--------|-----------------------|
| Client | Legal & General Homes |
|--------|-----------------------|

|     |                             |
|-----|-----------------------------|
| Job | Hogwood Farm, Finchampstead |
|-----|-----------------------------|

|       |                                                                      |
|-------|----------------------------------------------------------------------|
| Title | Proposed Ditch Plan<br>With<br>Watercourse Enhancement Opportunities |
|-------|----------------------------------------------------------------------|

|              |      |                 |
|--------------|------|-----------------|
| Scale 1:2500 | © A1 | Date April 2018 |
|--------------|------|-----------------|

|             |                |                 |
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| Drawn By JC | Eng. Check POF | Tech. Check POF |
|-------------|----------------|-----------------|



Drawing No. C85672-SK-024

|     |
|-----|
| Rev |
| A   |



john newton & partners

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## **APPENDIX G: GREENFIELD RUNOFF RATE**

Calculated by:Anthony Scoones

Site name:Neighbourhood Centre

Site location:Hogwood

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:51.37521° N

Longitude:0.89208° W

Reference:3084541281

Date:Jun 27 2024 14:52

Runoff estimation  
approach

FEH Statistical

Site characteristics

Total site area (ha):1

Methodology

QMED estimation method:Calculate from BFI and SAAR

BFI and SPR method:Specify BFI manually

HOST class:N/A

BFI / BFIHOST:0.494

QMED (l/s):

QBAR / QMED factor:1.14

Hydrological  
characteristics

|                                | Default | Edited |
|--------------------------------|---------|--------|
| SAAR (mm):                     | 659     | 659    |
| Hydrological region:           | 6       | 6      |
| Growth curve factor 1 year:    | 0.85    | 0.85   |
| Growth curve factor 30 years:  | 2.3     | 2.3    |
| Growth curve factor 100 years: | 3.19    | 3.19   |
| Growth curve factor 200 years: | 3.74    | 3.74   |

Notes

(1) Is  $Q_{BAR} < 2.0$  l/s/ha?

When  $Q_{BAR}$  is  $< 2.0$  l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates  $< 5.0$  l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is  $SPR/SPRHOST \leq 0.3$ ?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

## Greenfield runoff rates

|                               | Default | Edited |
|-------------------------------|---------|--------|
| <b>Q<sub>BAR</sub> (l/s):</b> |         | 2.88   |
| <b>1 in 1 year (l/s):</b>     |         | 2.44   |
| <b>1 in 30 years (l/s):</b>   |         | 6.61   |
| <b>1 in 100 year (l/s):</b>   |         | 9.17   |
| <b>1 in 200 years (l/s):</b>  |         | 10.75  |

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at [www.uksuds.com](http://www.uksuds.com). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at [www.uksuds.com/terms-and-conditions.htm](http://www.uksuds.com/terms-and-conditions.htm). The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

## **APPENDIX H: SUDS MANAGEMENT AND MAINTENANCE PLAN**



**J N P   G R O U P**  
CONSULTING ENGINEERS

## **SuDS Management and Maintenance Plan**

**Project:**           Neighbourhood Centre  
                          Hogwood Farm

**Client:**            CALA Homes Thames Ltd

**Reference:**        C86557-JNP-92-XX-RP-D-1202

**Date:**             July 2024

## DOCUMENT CONTROL SHEET

Prepared by  
**Matthew Rudd**  
Placement Engineer

Approved by  
**Karl Malik**  
Principal Civil Engineer

FOR AND ON BEHALF OF JNP GROUP  
**Date:** July 2024

### Document Issue Record

| Rev | Date       | Description                         | Prepared | Checked | Approved |
|-----|------------|-------------------------------------|----------|---------|----------|
| P01 | 05/07/2024 | First Issue                         | MCR      | AS      | KM       |
| P02 | 16/07/2024 | Number of commercial units amended. | DH       | AS      | KM       |
|     |            |                                     |          |         |          |
|     |            |                                     |          |         |          |

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## **1 INTRODUCTION**

### **1.1 Terms of Reference**

- 1.1.1 JNP Group was commissioned by CALA Homes Thames Ltd to create a SuDS Maintenance and Management Plan for the proposed development of the neighbourhood centre at Hogwood Farm.
- 1.1.2 The purpose of this management plan is to demonstrate how SuDS, which have been implemented at this development, will be maintained in compliance with various requirements and best practice guidance, including but not limited to, the National Planning Policy Framework (NPPF) and SuDS Manual (CIRIA 2015).
- 1.1.3 This management plan aims to:
- Summarise the various SuDS features used within the site;
  - Ensure that all those involved in the maintenance and operation of the SuDS understand their functionality and maintenance requirements in terms of supporting long-term performance.
- 1.1.4 Maintenance inspections should be recorded in Appendix A of this report to ensure that the document stays up to date.

### **1.2 Site Description**

- 1.2.1 The development proposes a neighbourhood centre, comprising of two retail units with apartments above. Associated car parks are proposed for the commercial development and future school site to the west.
- 1.2.2 The development site is located north of the Southern Bus Loop. The 0.44ha site will be bounded by residential developments to the south and east. The proposed school will border the north and west of the site.

### **1.3 Surface Water Drainage Strategy**

- 1.3.1 Surface water is collected around the site by rainwater pipes, gullies, permeable paving and raingardens before being attenuated underground in oversized pipes. Discharge leaving the site has been restricted to 5l/s, this will join the wider site's drainage network eventually discharging into SANG Basin 3.
- 1.3.2 Raingardens and pervious paving are used across the site to treat surface water.

### **1.4 Responsibility for Maintenance**

- 1.4.1 All drainage shall be the responsibility of the property owner. They must fully understand the maintenance responsibilities outlined in this plan and be aware of any legally binding agreement.
- 1.4.2 Where the property owner appoints a management company to maintain SuDS features, only trained personnel will be permitted to undertake maintenance works. This work must be carried out in accordance with the Confined Space Regulations (where appropriate).

## **2 SUDS MANAGEMENT AND MAINTENANCE REGIME**

### **2.1 Permeable Paving**

- 2.1.1 Before permeable paving is handed over to the property owner, it should be inspected for clogging, litter, weeds and water ponding, these inspections will be the responsibility of the developer and all failures should be rectified by the developer. After the permeable paving is handed over to the property owner, the pavement should be inspected regularly, particularly after heavy rainfall.
- 2.1.2 It should be noted that weeds are to be removed by hand and not with a chemical weed killer. The chemical could enter the surface water run-off within the permeable paving and have determinantal impacts upon the environment/other aspects of the drainage system.
- 2.1.3 Materials removed from the voids or the layers below the surface may contain heavy metals and hydrocarbons and may need to be disposed of as controlled waste. Waste disposal will be carried out by a competent contractor, who must hold the relevant permits to transport and dispose of the waste. The property owner will be made aware of this requirement.
- 2.1.4 The recommended maintenance activities for permeable paving are outlined in Table 1 below.

**Table 1: Permeable Paving Maintenance**

| Maintenance Schedule   | Required Action                                                                                                                                                                       | Recommended Frequency                                                                                                                                                                                                                       |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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. Particular attention should be paid to areas where water runs onto pervious surface from adjacent impermeable areas. |
| Occasional Maintenance | Stabilise and mow contributing and adjacent areas.                                                                                                                                    | As required.                                                                                                                                                                                                                                |
|                        | Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying.                                                                | As required once per year on 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.                                                                                                                                                                                                                                |
|                        | Rehabilitation of surface and upper substructure by remedial sweeping                                                                                                                 | Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)                                                                                                                                    |
| Monitoring             | Initial inspection                                                                                                                                                                    | Monthly for three months after installation                                                                                                                                                                                                 |
|                        | Inspect for evidence of poor operation and/or weed growth if required, take remedial action                                                                                           | Three-monthly, 48 h after large storms in first 6 months                                                                                                                                                                                    |
|                        | Inspect silt accumulation rates and establish appropriate brushing frequencies                                                                                                        | Annually                                                                                                                                                                                                                                    |
|                        | Monitor inspection chambers                                                                                                                                                           | Annually                                                                                                                                                                                                                                    |

## 2.2 Private Pipe Networks

2.2.1 Whilst the drainage system has been designed to operate with as little maintenance as possible, there are key operations that must regularly be undertaken to ensure that the pipe networks remain in optimal condition. The majority of these actions are routine and should be carried out upon all drainage systems.

2.2.2 The recommended maintenance requirements are outlined below in Table 2.

**Table 2: Pipe Network Maintenance**

| Maintenance Schedule   | Required Action                                                                | Recommended Frequency                                                |
|------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Regular Maintenance    | Check the drains for blockages and damage. Clean and repair if required        | Monthly for the first 3 months of installation. Then every 6 months. |
| Occasional Maintenance | Desilting gullies.                                                             | As required.                                                         |
|                        | Grating on gullies to be kept clear of debris.                                 | As required or after large storm events.                             |
| Remedial Actions       | Jetting of pipework to clear blockages.                                        | As required.                                                         |
| Monitoring             | Inspect for evidence of poor operation and/or damage at manholes, gullies etc. | Monthly for the first 3 months and then annually.                    |
|                        | Inspect inlets and outlets for the blockages, and clear as required.           | Annually.                                                            |

## 2.3 Oversized Pipes

2.3.1 Regular inspection and maintenance is required to ensure the effective long-term operation of below-ground storage systems. Specific maintenance needs of the system should be monitored, and maintenance schedules adjusted to suit requirements.

2.3.2 The recommended maintenance requirements are outlined below in Table 3.

**Table 3: Oversized Pipe Maintenance**

| Maintenance Schedule | Required Action                                                                                                             | Recommended Frequency                                                |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Regular Maintenance  | Inspect and identify any areas that are not operating correctly. If required, take remedial action                          | Monthly for the first 3 months of installation. Then every 6 months. |
|                      | Remove debris from the catchment surface (where it may cause risks to performance)                                          | Monthly                                                              |
|                      | 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 pipe for sediment build-up and remove if necessary                                                         | Every 5 years or as required                                         |

## **2.4 Raingardens**

- 2.4.1 Bioretention systems will typically require approximately 2.5 times more maintenance than typical landscape designs. The most intensive maintenance is required during the establishment period. Herbicides and pesticides (such as Roundup) and fertilisers should not be used on bioretention systems. This is because these pollutants will wash through the system quite easily.
- 2.4.2 The main cause of failure of bioretention systems is clogging of the surface, which is easily visible. Underdrains and drainage layers are beneath the ground, and malfunctioning is not so easy to detect and therefore could potentially be ignored. During the first few months after installation, the system should be visually inspected after rainfall events, and the amount of deposition measured, to give the operator an idea of the expected rate of sediment deposition. After this initial period, systems should be inspected each quarter, to verify the appropriate level of maintenance.
- 2.4.3 The recommended maintenance requirements are outlined below in Table 4.

**Table 4: Raingarden Maintenance**

| Maintenance Schedule | Required Action                                                                                                                                                                                          | Recommended Frequency                                            |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Regular Maintenance  | 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                                                        |
| Remedial Actions     | 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                                          |
|                      | Remove and replace filter medium and vegetation above                                                                                                                                                    | As required but likely to be > 20 years                          |
| Monitoring           | 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                                                      |

### **3 RECORD OF MAINTENANCE**

#### **3.1 Record of Maintenance and Photographic evidence**

- 3.1.1 Please provide a record of all inspections (including all photographic evidence) in Appendix A.

## APPENDIX A: RECORD OF INSPECTIONS

## **APPENDIX B: DRAINAGE LAYOUT DRAWINGS**

**Refer to Appendix C of the main report**



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