



Land off Rectory Road, Hawkwell, Hockley

SuDS Management & Maintenance Plan

Prepared by SPD Studio on behalf of Milenna Homes.

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SPD Studio General Notes

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1. Introduction

- 1.1. SPD Studio has been appointed by Milenna Homes to produce a drainage and SuDS design associated with the proposed development site situated off Rectory Road, Hawkwell.
- 1.2. This report details the requirements for the management and maintenance of the surface water sustainable drainage system (SuDS) for the proposed development at Rectory Road, Hawkwell, Hockley.
- 1.3. This report is to be read in conjunction with SPD Studio Drainage Statement report and Drainage Strategy drawing SPD203-E-300.

2. Management & Maintenance Plan

- 2.1. The proposed surface water drainage and SuDS strategy is shown on SPD Studio drawing SPD203-E-300.
- 2.2. The aim of this report is to define the management and maintenance responsibilities for all proposed SuDS components within the development to ensure their effective operation for the lifetime of the development.
- 2.3. Following construction of the proposed SuDS components and connection of conveyed impermeable areas to these components, the drainage system will enter the operational phase of its design life. Periodic monitoring and maintenance will be required during the operational phase as outlined within this document.
- 2.4. Maintenance requirements for the drainage system will be summarised within the handover documentation provided to the operator(s) on completion of the development in the form of Health & Safety files and Operation & Maintenance manuals.
- 2.5. As indicated on the drainage strategy drawings, the drainage system comprises of various SuDS components for the effective interception, treatment, attenuation and conveyance of surface water run-off.
- 2.6. The management responsibilities for the SuDS components will be assigned to the landowner or asset owner in instances where components are dedicated to a Highway Authority or Water Authority by statutory or private adoption agreements.
- 2.7. For the purposes of this document the maintenance responsibilities for each SuDS component are defined by the following criteria:
 - Regular maintenance
 - Occasional maintenance
 - Remedial maintenance

OWNERSHIP & MANAGEMENT

- 2.8. For the lifetime of the development the responsibility for ongoing management and maintenance of the SuDS components will belong to the landowner or asset owner where ownership is transferred.
- 2.9. The following table summarises the SuDS components being proposed within the development and details each components general location, ownership and maintenance responsibility holder:

SuDS Component	Location	Owner	Maintenance Duty Holder
Below ground drainage (Private) <ul style="list-style-type: none"> • Pipes • Access & inspection chambers • Manholes • Silt traps/catchpits • Headwalls 	Private land	Landowner	Landowner/Management Company
Infiltration/Attenuation Structures <ul style="list-style-type: none"> • Detention Basin • Rain Gardens • Geo-cellular House Soakaway • Deep Bore Soakaway Chamber 	Private land	Landowner	Landowner/Management Company

TABLE 1 – SUDS OWNERSHIP & MAINTENANCE MATRIX

- 2.10. Where SuDS components are not to be adopted by a Water Authority or dedicated to the Highway Authority, it is anticipated that an appropriate organisation (a management company) will be appointed the responsibility for the monitoring and maintenance of the surface water drainage system during the operational phase.
- 2.11. The maintenance regimes developed by the appointed management organisation will incorporate the requirements of this document together with the specific/further requirements detailed within the handover documentation.

HEALTH & SAFETY REQUIREMENTS

- 2.12. The design of surface water drainage systems shall comply with the Construction (Design and Management) (CDM) Regulations 2015 to ensure that designers appropriately assess foreseeable risks during design, construction and maintenance to minimise risk by the following (in order of priority):
- Avoidance
 - Reduction
 - Identification and Mitigation of residual risk
- 2.13. Designer’s risk assessments and maintenance statements will be contained within the handover documentation to ensure that Contractors and other organisations/individuals are aware of the risks associated with the management and maintenance of surface water drainage and SuDS components.
- 2.14. The Health & Safety Act and Regulations within it apply to the maintenance and monitoring works required for the surface water drainage. These operations will always be subject to a risk assessment.
- 2.15. The organisation responsible for the maintenance and monitoring requirements detailed in this document shall ensure that the appropriate health and safety precautions and procedures are adhered to at all times.

OVERVIEW OF SUDS COMPONENT MAINTENANCE REQUIREMENTS

2.16. The below table provides an overview of the maintenance and management requirements of a range of commonly used SuDS components:

Operation and maintenance activity	SuDS Component																	
	Below ground drainage	Road gullies	Flow control devices	Rainwater harvesting systems	Green roofs	Proprietary treatment	Infiltration systems	Filter strips	Filter drains	Swales	Bioretention systems	Tree Pits	Pervious pavements	Attenuation tanks	Infiltration basins	Detention basins	Ponds	Wetlands
Monitoring																		
Inspection	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Regular maintenance																		
Litter & debris removal	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Grass cutting							■	■	■	■	■	■	■	■	■	■	■	■
Weed & invasive vegetation control					■		■	■	■	■	■	■	■	■	■	■	■	■
Tree & shrub management							■	■	■	■	■	■	■	■	■	■	■	■
Shoreline vegetation management															■	■	■	■
Aquatic vegetation management															■	■	■	■
Occasional maintenance																		
Sediment management ¹	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Vegetation replacement					■		■	■	■	■	■	■	■	■	■	■	■	■
Vacuum sweeping & brushing													■					
Remedial maintenance																		
Structure rehabilitation/repair	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Infiltration surface reconditioning						■	■	■	■	■	■	■	■	■	■	■	■	■

Key
 ■ will be required
 ■ may be required
 □ not required

1 Sediment should be collected and managed in pre-treatment systems, upstream of the main SuDS component.

3. SuDS Operation & Maintenance Requirements

3.1. The following section of this document provides a maintenance schedule for each of the surface water drainage and SuDS components being implemented on this development.

BELOW GROUND DRAINAGE NETWORK

3.2. On completion of construction, the internal surfaces of sewers and manholes shall be thoroughly cleaned by the Contractor, removing of all deleterious matter whilst ensuring such matter is not being allowed to pass through the system into downstream drainage and SuDS components.

Maintenance Schedule	Required Action	Required Frequency
Monitoring	Visually inspect manholes, silt traps, vortex separator inlet/outlet headwalls and attenuation basin for evidence of siltation, damage or blockage	Every 2 months first 12 months, then every 6 months
Occasional Maintenance	CCTV survey pipes to periodically record structural pipe condition. Undertake survey recommendations as required	Every 5 years; or as required by monitoring
Remedial Maintenance	Trimming of any roots that may be causing blockages	As required
	Removal of blockage by rodding, jetting, hydraulic rams, suction tanker etc.	As required
	Replacement of structurally damaged pipe sections	As required

MANHOLES, SILT TRAPS AND CATCHPITS

3.3. Manholes, silt traps and catchpit manholes should be regularly maintained to remove accumulation of sediment deposits from the structure to ensure that sediment is effectively intercepted prior to being conveyed to downstream SuDS features such as infiltration basins.

Maintenance Schedule	Required Action	Required Frequency
Monitoring	General inspection of chamber covers for signs of damage, wear and rocking covers	Every 6 months
	Structural inspection of chamber cover surrounds	Every 6 months
	Inspection of manhole chamber internals for evidence of pipe surcharging	Every 6 months
	Inspection of silt accumulation rates and establish appropriate removal frequencies	Monthly during first year of operation, then every 6 months thereafter
Regular Maintenance	Removal of accumulated deposits by suction tanker	Every 6 months; or as required by monitoring

Occasional Maintenance	Sides, benching and channels washed down with clean water jetting	Every 6 months; or as required by monitoring
	Removal of accumulated deposits by suction tanker following high return period storm or period of poor performance	As required
Remedial Maintenance	Replacement of damaged chamber covers and chamber cover bedding	As required
	Sealing repair of cracked/spalled concrete and benching	As required

DETENTION BASIN

- 3.4. Infiltration/Attenuation basins are landscaped depressions that are normally dry except during and immediately following storm events. These structures require ongoing regular maintenance to ensure continuing operation to design performance standards. Maintenance of basins is relatively straightforward for landscape contractors, and typically there should only be a small amount of extra work (if any) required for a SuDS detention basin over and above what is necessary for standard public open space. Litter and debris removal should be undertaken as part of general landscape maintenance for the site and before any other SuDS management task. All litter should be removed from site.
- 3.5. The major maintenance requirement for attenuation basins is mowing. Regular mowing in and around basins is only required along maintenance access routes, amenity areas (e.g. footpaths), across any embankment and across the main storage area. The remaining areas can be managed as "meadow" unless additional management is required for landscape/amenity/recreational or aesthetic reasons. Mowing should ideally retain grass lengths of 75-150mm across the main "treatment" surface to assist in filtering pollutants and retaining sediments and to reduce the risk of flattening during runoff events. Grass clippings should be disposed of off-site or outside the detention basin area to remove nutrients and pollutants. Occasionally sediment will need to be removed (e.g. once deposits exceed 25mm in depth). Sediments excavated from ponds or forebays that receive runoff from residential, road and roof areas should be safely disposed of in accordance with current waste management legislation. However, consultation should take place with the environmental regulator to confirm appropriate protocols. In most cases on low-risk sites with source control and a management train, it will be acceptable to distribute the sediment on site, if there is an appropriate safe and acceptable location to do so.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Litter and debris removal	Monthly
	Grass Cutting - for spillways and access routes	Monthly (during growth season), or as required
	Grass Cutting - meadow grass in and around basin	Half yearly (spring - before nesting season, and Autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Re-seed areas of poor vegetation	Annually or as required

Occasional Maintenance	Prune and trim trees and remove cuttings	2 years, or as required
	Remove sediment from forebay, when 50% full from micro pools if volume reduced by >25%	3-10 years (or as required)
Remedial Actions	Repair of erosion or other damage by re-seeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Rehabilitate infiltration surface using scarifying and spiking methods if performance deteriorates	As required
	Re-level uneven surfaces and reinstate design levels	As required
Monitoring	Inspect inlets, outlets and overflows for blockages and clear if required	Monthly/after large storms
	Inspect banksides, structures, pipework etc... for evidence of physical damage	Monthly/after large storms
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Half yearly
	Inspect infiltration surfaces for compaction and ponding	Monthly

PERMEABLE PAVING

- 3.6. Permeable pavements must 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. Care should be taken in adjusting vacuuming equipment to avoid removal of joining material. Any lost material should be replaced.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Brushing and vacuuming	3 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
	Removal of weed	As required
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil strip, has been raised to within 50mm of the level of paving	As required
	Remedial work to any depressions and rutting considered detrimental to the structural performance of the pavement or a hazard to users	As required
	Rehabilitation of surface and upper sub-structure	As required (if infiltration performance is reduced as a consequence of significant clogging)

HEADWALLS

3.7. The inspection and maintenance of headwall structures is as follows:

Maintenance Schedule	Required Action	Required Frequency
Monitoring	Inspect apron for debris or signs of blockage	Every 6 months
	Inspect condition of security grille	Every 6 months
	Inspect condition of inlet/outfall structure	Every 6 months
Regular Maintenance	Remove accumulated litter, debris or vegetation from headwall and grille	Every 6 months
Occasional Maintenance	Remove accumulated litter, debris or vegetation following high return period storm	As required
Remedial Maintenance	Sealing repair of cracked/spalled concrete	As required
	Repair or replacement of security grille components	As required

4. Construction Phase Maintenance

- 4.1. During construction, the Site Management Team will conduct the operation and maintenance programme up until the end of the construction period of the scheme. The Site Management Team will also ensure that inspections and record keeping are timely and accurate. Records of any maintenance works carried out will be kept on file at the site.
- 4.2. Concurrent with inspection and cleaning, all litter shall be collected and removed from the parking areas, external refuse stores and soft landscaping.
- 4.3. Regular maintenance should include but not be limited to;
 - Inspection of the channel and gully inlet grates and remove any debris every six-months or as determined to be reasonable based on experience with the installed systems to ensure that the gullies are working in their intended fashion and that they are free of debris; quarterly, inspect gully sumps and bottom of drain manholes; if depth of sediment in sumps exceeds 50% capacity, sediment must be removed. Excessive sediment shall be removed and properly disposed by a licensed drainage cleaning company.
 - Inspect all vegetated areas and remove litter and debris as necessary. Replant bare areas or areas with sparse growth.
 - Inspection of external bin store for spillage and scattered litter must be performed on a regular basis to prevent the spread of pollutants into the rainwater management system.
- 4.4. Once the site construction period has ended, the private shared road areas will be maintained by the appointed management company in accordance with the above instructions.
- 4.5. The off-site public sewer network is maintained by Anglian Water as the statutory adopting water authority and will be subject to their own maintenance regime.

5. Operation & Maintenance Manual Records

- 5.1. SPD Studio will provide this document to MilennaHomes, who will then provide the document to the appointed construction Contractor. Milenna Homes will also include this document as part of the Operation and Maintenance Manual for the development.
- 5.2. Milenna Homes will retain copies of the surface water drainage and SuDS design drawings and specifications which show the location and size of each SuDS and below ground drainage component, as well as any 'As-Built' record drawings provided by the construction Contractor.
- 5.3. Milenna Homes will be provided with the standard proforma taken from Appendix B of CIRIA 753 SuDS Manual to ensure the effective recording of maintenance and inspection outcomes.

6. Funding Arrangements

- 6.1. It is intended that the maintenance and management of the on-site SuDS and surface water drainage system will be the responsibility of a formally appointed private management company.
- 6.2. At the time of writing this report the management company has not been appointed, however, it will be the responsibility of the chosen management company to appropriately fund the maintenance for the lifespan of the development. Funding will be collected from the proposed residents in the form of ground rents or service charges which will be reviewed in accordance with sale / lease agreements.