

Mayfield Park

Sustainable Drainage Operation and Management Plan

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Glossary

Term	Definition
Attenuation	A method to reduce a flood peak to prevent flooding, often utilising temporary storage to increase the duration of the flow and reduce the discharge rate.
Brownfield	Land previously developed that has potential to be regenerated.
Catchment	A surface water catchment is the area from which surface water drains into a watercourse. A groundwater catchment is the area from which groundwater contributes to river flow.
Design Flood Level	This is the level of flooding that flood defences or mitigation measures are designed to protect against. This is typically the 1% (1 in 100 year) flood level.
Discharge	The rate of flow of water measured in terms of volume per unit time.
EA	Environment Agency.
Flood Defence	A natural or man-made infrastructure used to prevent certain areas from inundation from flooding, and / or the provision of flood warning systems.
Floodplain	An area of land adjacent to a watercourse over which water flows or is stored during a flood event, or would otherwise be flooded in the absence of flood defences.
Flood Resilience	Improving resistance to flooding, e.g. reducing the risk of properties flooding.
Flood Risk	The level of risk to personal safety and damage to property resulting from flooding due to the frequency or likelihood of flood events.
Flood Risk Assessment (FRA)	An assessment of the flood risks to the proposed development over its expected lifetime and the possible flood risks to the surrounding areas, assessing flood flows, flood storage capacity and run-off.
Flood Risk Management (FRM)	Managing and/or reducing flood risk to people, property and the environment.
Flood Zones	The statistical chance of a flood event occurring in any one year, stated as a percentage. PPS25 identifies three flood zones (Lower to Higher Risk – Zone 1, Zone 2, Zone 3a and Zone 3b).
Fluvial Flooding	Flooding arising from, related or connected to a watercourse (river or stream).
Greenfield	Land which has not been previously developed.
Groundwater	Water present within underground strata known as aquifers.
Inundation	Flooding of land with water.
m AOD	Metres Above Ordnance Datum.
Mitigation	Actions taken to reduce either the probability of flooding or the consequences of flooding or a combination of the two.
Previously Developed Land	Land which is or was occupied by a permanent structure (excluding agricultural or forestry buildings) and associated fixed surface infrastructure.
Red line boundary	Boundary drawn to indicate the site area on which a planning application is made.
Residual Risk	The risk that remains after risk management and mitigation measures have been implemented
Risk	Risk is the probability that an event will occur and the impact/consequences associated with that event.
Run-off	Water flow over surfaces to the drainage system. Run-off occurs if the ground is impermeable or if permeable ground is saturated.
Strategic Flood Risk Assessment (SFRA)	An SFRA is the assessment and 'categorisation' of flood risk on an area-wide basis in accordance with PPS25.
Surface Water Flooding	Surface water flooding occurs when the volume of water is unable to filtrate through the ground or enter drainage systems, and therefore quickly runs off land and results in localised flooding. This type of flooding is usually associated with intense rainfall events.
Sustainable Drainage Systems (SuDS)	SuDS are used as a strategy to manage surface water in a sustainable manner or least damaging solution through management practices and physical structures.
Sustainable Development	Development which meets the needs of the present without compromising the ability of future generations to meet their own needs.
Water Table	The top surface of the saturated zone within the aquifer.
Watershed	A boundary or dividing line which separates surface water flows into different water catchment areas (watercourses or seas). Surface water typically flows in opposite directions either side of a watershed.

1 Executive Summary

This Sustainable Drainage Operation and Management Plan has been prepared for the Mayfield Park scheme.

Based on the constraints of the Site, management of surface water flows and contribution towards water quality, suitable SuDS that are considered appropriate for the scheme include below ground attenuation tanks and pervious paving. The systems used, locations and layouts are detailed on the Mayfield Park drawings, specifications and associated documentation which should be read in conjunction with this report – a key drawing register is included in Appendix A. This report includes the operation and management strategy for the drainage systems and features which are included on the site.

2 Introduction

This Sustainable Drainage Operation and Management Plan has been prepared for PPO as supplementary documentation to support the Mayfield Park scheme. The Mayfield Park drawings, specifications and associated documentation which should be read in conjunction with this report (Appendix A refers). Mayfield Park has a number of SuDS features including:

- Attenuation tank
- Filter Drains
- Rain gardens

2.1 Limitations

It should be noted that the detailed design of the drainage and associated SuDS features for the Site includes proprietary systems for which the manufacturers' information, guidance and requirements should be relied upon. Operation and maintenance of all SuDS (including proprietary systems) will need to be considered by those responsible for the maintenance of the facility.

3 SuDS Operation and Maintenance Plan

An operation and maintenance is outlined in the following sections for each key element of the drainage network/system.

3.1 General Maintenance Requirements

Maintenance activities for SuDS as defined in CIRIA C753, The SuDS Manual (2015) are as the below:

- Regular maintenance (including inspections) – basic tasks which are to be carried out frequently and to a schedule.
- Occasional maintenance – less frequent tasks which will likely be periodic and less predictable.
- Remedial maintenance – intermittent tasks that are usually required to fix faults which are considered irregular and unpredictable.

Figure 1 below shows the SuDS component and the type of maintenance activities associated. Further detail relating to the types of maintenance that may occur can be found in CIRIA C753, The SuDS Manual (2015).

Operation and maintenance activity	SuDS component											
	Pond	Wetland	Detention basin	Infiltration basin	Soakaway	Infiltration trench	Filter drain	Modular storage	Pervious pavement	Swale/bioretention/trees	Filter strip	Green roofs
Regular maintenance												
Inspection	■	■	■	■	■	■	■	■	■	■	■	■
Litter and debris removal	■	■	■	■	□	■	■	□	■	■	■	□
Grass cutting	■	■	■	■	□	■	■	□	□	■	■	
Weed and invasive plant control	□	□	□	□		□	□		□		□	■
Shrub management (including pruning)	□	□	□	□					□	□	□	
Shoreline vegetation management	■	■	□									
Aquatic vegetation management	■	■	□									
Occasional maintenance												
Sediment management ¹	■	■	■	■	■	■	■	■	■	■	■	■
Vegetation replacement	□	□	□	□						□	□	■
Vacuum sweeping and brushing									■			
Remedial maintenance												
Structure rehabilitation /repair	□	□	□	□	□	□	□	□	□	□	□	□
Infiltration surface reconditioning				□	□	□	□		□	□	□	

Key
 ■ will be required
 □ may be required

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

Figure 1 Table excerpt from CIRIA C753, The SuDS Manual (2015) highlighting the SuDS component and the associated maintenance activity.

3.1.1 Regular Maintenance

Regular maintenance activities, relating to the SuDS features, required for this site include the following:

- Litter and debris removal- regular litter and debris removal helps to reduce the risk of inlet and outlet blockages and minimises pollution risks.
- Grass cutting- the frequency of cutting will tend to depend on surrounding land uses, and public requirements.
- Weed and invasive plant control – weeding of alien and invasive species which are generally undesirable and negatively affect the technical performance of the system.
- Shrub management – shrubs will grow rapidly in the first year and therefore will require weeding at the base.
- Sweeping pervious pavements - pervious surfaces need to be regularly cleaned of silt and other sediments to preserve their infiltration capacity.

For further information relating to the above general maintenance activities refer to CIRIA C753, The SuDS Manual (2015).

3.1.2 Occasional Maintenance

Occasional maintenance includes the sediment removal of the SuDS system. This ensures the long-term performance of SuDS, by periodically removing the sediment that accumulates in treatment components (whether landscaped or proprietary systems). The details of the task included for sediment removal differs dependant on the SuDS component. For most small features, sediment can be removed either by hand or using small excavators and for proprietary treatment systems a suction tanker will be needed to remove the sediment. Sediment shall be removed from the following:

- Catchpits – removal of sediment from sump.
- Control chambers - removal of sediment from sump.
- Attenuation tank – removal of sediment from tank as per manufacturers' maintenance guidance.

3.1.3 Remedial Maintenance

Remedial maintenance activities include the following:

- Structure rehabilitation and repair.
- Infiltration surface rehabilitation.

Type and extent of repair work to be assessed in each case, refer to CIRIA C753, The SuDS Manual (2015) for further guidance.

3.2 Attenuation Systems

Maintenance required for attenuation systems differ dependant on the manufacture. The Mayfield Park scheme includes the Aquacell Core-R or similar approved and specific maintenance related to this product should be obtained directly from the manufacturer's guidance. General maintenance for attenuation systems is provided below.

3.2.1 General Attenuation Maintenance

Regular inspection and maintenance is required to ensure long term effectiveness of attenuation systems. They should also be inspected after every major storm event. Catchpits and interceptors should be emptied regularly to prevent them from becoming full. The frequency of this being necessary will be determined on the basis of the regular inspections. Paved surfaces above any attenuation system should be inspected at the same time to ensure the units continue to provide the required structural support.

The activities associated with the maintenance of attenuation storage tanks as defined by CIRIA C753, The SuDS Manual (2015) can be found in Figure 2. This table explains the type of maintenance, the actions or activities to be undertaken and the frequency required for each action. Details of Each individual action can be found in CIRIA C753, The SuDS Manual (2015).

Operation and maintenance requirements for attenuation storage tanks		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	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 tank for sediment build-up and remove if necessary	Every 5 years or as required

Figure 2 Table excerpt from CIRIA C753, The SuDS Manual (2015) detailing the action and frequency required for attenuation systems.

3.3 Filter Trenches

The Mayfield Park scheme includes filter trenches which are located at the base of the slope adjacent to the Depot. The maintenance required for filter trenches is relatively straight forward and is mainly included in the general landscape maintenance of the site. However regular inspection and maintenance is important for the effective operation of filter trenches.

The activities associated with the maintenance of filter trenches can be found in Figure 3. The table explains the type of maintenance, the actions or activities to be undertaken and the frequency required for each action. Details of each individual action can be found in CIRIA C753, The SuDS Manual (2015).

TABLE 15.1 Operation and maintenance requirements for filter strips		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect filter strip surface to identify evidence of erosion, poor vegetation growth, compaction, ponding, sedimentation and contamination (eg oils)	Monthly (at start, then half yearly)
	Check flow spreader and filter strip surface for even gradients	Monthly (at start, then half yearly)
	Inspect gravel flow spreader upstream of filter strip for clogging	Monthly (at start, then half yearly)
	Inspect silt accumulation rates and establish appropriate removal frequencies	Monthly (at start, then half yearly)
Occasional maintenance	Reseed areas of poor vegetation growth; alter plant types to better suit conditions, if required	As required or if bare soil is exposed over > 10% of the filter strip area.
Remedial actions	Repair erosion or other damage by re-turfing or reseeded	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

Figure 3 Table excerpt from CIRIA C753, The SuDS Manual (2015) detailing the action and frequency required for filter trenches.

3.4 Rain Gardens

The Mayfield Park scheme includes four rain gardens which are located throughout the scheme. The activities associated with the maintenance of rain gardens can be found in Figure 4. The table explains the type of maintenance, the actions or activities to be undertaken and the frequency required for each action. Details of each individual action can be found in CIRIA C753, The SuDS Manual (2015).

TABLE 13.2 Operation and maintenance requirements for infiltration basins

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter, debris and trash	Monthly
	Cut grass – for landscaped areas and access routes	Monthly (during growing season) or as required
	Cut grass – 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
Occasional maintenance	Reseed areas of poor vegetation growth	Annually, or as required
	Prune and trim trees and remove cuttings	As required
	Remove sediment from pre-treatment system when 50% full	As required
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realign the rip-rap	As required
	Repair or rehabilitate inlets, outlets and overflows	As required
	Rehabilitate infiltration surface using scarifying and spiking techniques if performance deteriorates	As required
	Relevel uneven surfaces and reinstate design levels	As required
Monitoring	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and pre-treatment systems for silt accumulation; establish appropriate silt removal frequencies	Half yearly
	Inspect infiltration surfaces for compaction and ponding	Monthly

Figure 4 Table excerpt from CIRIA C753, The SuDS Manual (2015) detailing the action and frequency required for rain gardens.

3.5 Safety and Access

Due consideration of safety in design (Safe by Design) and appropriate consideration of access strategy has been undertaken during the design of the drainage network and SuDS features.

Due consideration and application of the CDM Regulations 2015 to the planning, design, construction and long term maintenance of the drainage network and SuDS as best practice.

Appendix A

DRAWING REGISTER AND DOCUMENT ISSUE SHEET	
Project	Mayfield Park - Stage 5
Project No.	0046688

Discipline Civil
Approved by  (Signature)
Sheet No. 1 of 1

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