

**Management and Maintenance Plan for
Sustainable Drainage (SuDS):**
Proposed Commercial Units Development,
Plot E, Felindre Meadows,
Pencoed Technology Park, Pencoed

Prepared for:

FABCO Holdings Ltd

REF: 14908 – DSR – R03

Document Control

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1. INTRODUCTION

- 1.1. This SuDS Management and Maintenance Plan has been prepared by Vale Consultancy on behalf of the client; Fabco Holdings Ltd, in support of a SuDS scheme for the proposed development at Plot E Pencoed Technology Park, Bridgend, CF35 5PZ.
- 1.2. The proposed development consists of the construction of three blocks of commercial units.
- 1.3. The scheme incorporates a sustainable drainage system for surface water runoff, which consists of permeable tarmac and raingardens.
- 1.4. The purpose of this document is to set out the overall management and maintenance objectives for the proposed SuDS components and to describe the long-term maintenance required to allow the system to continue operating as is it intended.
- 1.5. All references to SuDS components are based on the SAB submission drawings:

- ***14908_C500: Drainage Layout***
- ***14908_C501: Drainage Details Sheet***
- ***14908_C502: Proposed Catchment Area Plan***
- ***14908_C503: Flow Exceedance Plan***

2. MANAGEMENT RESPONSIBILITIES

- 2.1. The site owner and appointed contractor shall be responsible for the implementation of the Management and Maintenance Plan, as part of the overall maintenance of the existing wider site. If deemed necessary, all maintenance operations shall be undertaken by suitable and qualified contractor appointed by the site owner, for the design life of the development.
- 2.2. All inspections and maintenance work must be recorded. This allows for future assessment of the maintenance activities and their response to the system. It can also provide protection against legal claims should the system be exceeded in a storm event leading to flooding elsewhere.

3. MANAGEMENT OBJECTIVES

- 3.1 The site shall be managed and maintained as an attractive, tidy, and safe finish to all landscape elements.
- 3.2 The site owner shall ensure establishment and long-term health of all landscape elements for the benefit of the tenants and visual amenity of the area.
- 3.3 Best Health & Safety practices shall always be understood and followed.
- 3.4 To monitor standards and make amendments where required, it is expected that the site owner will review the management work (with reference to this document) at least quarterly for the first year and annually thereafter.

4 INSPECTION AND MAINTENANCE ACCESS

- 4.1 Access for inspection and maintenance can be gained from the car park and garden accesses, with all SuDS features maintainable from within the site boundary. Maintenance vehicles will be able to park on the proposed car park with direct access to the SuDS features within the car park. Drainage features within the proposed dwelling's rear gardens will accessible via garden access to the sides of the properties.

5 MAINTENANCE VISITS OR INSPECTIONS

- 5.1 Site owner appointed maintenance contractor shall carry out a minimum of 2 maintenance visits (Spring and Autumn) or inspections per year to check drainage SuDS components. Additional visits may be needed to deal with extreme weather conditions or specific horticultural requirements.

6 GENERAL

- 6.1 All materials and workmanship are to be to the highest possible standards and shall be in accordance with relevant British Standards, good horticultural and arboricultural practices, and the landscape specification.
- 6.2 Site owner shall employ suitably qualified staff for all work and when using sprays and mechanical equipment.
- 6.3 Site owner and their appointed contractors shall comply with all relevant Health and Safety regulations and good working practices.
- 6.4 Site owner shall take care when work is beside any structure or paved area and will, at their own cost, be responsible for making good any damage caused.
- 6.5 Weeds, pruning's, leaves, rubbish and other arisings shall be removed from site for composting, where possible. No material shall be left on site, and the area shall be left in a neat and tidy condition after each visit.

7 ORNAMENTAL PLANTING

7.1 Specific objectives:

- To ensure early establishment and healthy growth
- To maintain a dense canopy cover
- To maintain year-round appearance and visual interest

7.2 Maintenance Operations:

- 7.2.1 All planting in the raingarden areas shall be maintained substantially free of weeds. Work shall be done either manually or with appropriate selective weed killer in accordance with manufacturer's recommendations. If weed killer is used, the dead weeds shall be removed at the next maintenance visit. Care must be taken to avoid damage to adjacent planting and grass and replaced immediately if affected by weed killer.
- 7.1.2 Once established, shrubs shall be selectively thinned or reduced in height as appropriate by removal or pruning to allow room for growth and avoid overcrowding/overshadowing and create a natural form rather than cube or cloud shapes. Care shall be taken to avoid over pruning and so creating obvious gaps in the shrub beds.
- 7.1.3 Ground cover plants shall be clipped or pruned, if necessary, to give a neat and tidy finish and contained within the planting bed. Work to remove dead vegetation shall be carried out during the winter months.
- 7.1.4 Pruning of herbaceous planting:
In spring cut stems close to the 'crown' or 'dormant' top of the plant, avoiding the removal of new

shoots.

- Tidy up the base of the plant, removing dead foliage and debris
- Remove all material from site
- Apply a 50mm layer of fine horticultural mulch. This will help moisture retention in the soil, contribute to weed suppression and allow delicate stems to grow
- Leave dried flower head over winter for relevant species e.g., ornamental grasses

7.1.5 Fertilising:

- One application, just before or at the time of spring growth
- A balanced fertiliser is required, one high in Phosphorus (which encourages blooming as well as strong roots and disease resistance). Fertilisers high in nitrogen should not be used as nitrogen promotes excess foliage at the expense of flowers and roots which can result in weak stems

8 LITTER COLLECTION

- 8.1 All hard surfacing shall be swept as necessary, and all rubbish removed from site.
- 8.2 Litter picking/clearance shall take place during each maintenance visit and all waste shall be removed from site.
- 8.3 During autumn maintenance visits all fallen leaves shall be collected and removed from site.

9 FENCING/WALLS/RAILING

- 9.1 All fencing, walls and railings shall be checked for damage/wear and when necessary, shall be replaced/repainted/ re-stained or painted as appropriate.

10 TRADITIONAL DRAINAGE

- 10.1 A monthly site inspection should be carried out, checking for any areas that are not operating correctly and collecting/removing litter and debris
- 10.2 All rainwater pipes, linear drains, catch pits and inspection chambers should be inspected biannually, typically spring and autumn
- 10.3 Any excessive sediment build-up in rainwater pipes, linear drains, gullies or inspection chambers causing blockage or poor performance shall be cleared and cleaned as required

11 SUMMARY OF INSPECTION AND MAINTENANCE

- 11.1 The following briefly summarises the type of inspections and maintenance required for the SuDS components and drainage system used in this scheme:

11.2 General

- General inspections of SuDS areas (Rain gardens, conveyance pipes, and, inlets and outlets) and shall include litter collection
- Biannual check of traditional drainage including rainwater pipes, linear drains, kerb outlets, and inspection chambers

11.3 Rain Gardens

TABLE 18.3 Operation and maintenance requirements for bioretention systems

Maintenance schedule	Required action	Typical frequency
Regular inspections	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
Regular maintenance	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
Occasional maintenance	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
Remedial actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years

11.4 Gravel Filter Drains

The below extract from the CIRIA SuDs Manual shows the recommended operation and maintenance schedule for gravel filter drain:

TABLE 16.1 Operation and maintenance requirements for filter drains

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (eg NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

11.5 Infiltration basin

The below extract from the CIRIA SuDs Manual shows the recommended operation and maintenance schedule 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

12 LIFETIME MANAGEMENT AND MAINTENANCE COSTS

12.1 The costs associated with the management and maintenance of the SuDS system over the 60-year design life of the scheme has been estimated based on the inspection and maintenance activities in Section 12, as follows:

12.2 General

- General monthly inspection (incl. litter removal) – included in general maintenance undertaken
- Biannual check of traditional drainage including rainwater pipes, linear drains, gullies and inspection chambers
- Maintenance costs are based on a 60-year design life of the development and SuDS

12.3 Rain Gardens

- Annual Weeding = £100 x 60 yr = £6,000
- Replacement planting annually £100 x 60 yr = £6,000

- Annual Fertiliser /feeding $\text{£}75 \times 60 \text{ yr} = \text{£}4,500$
- Litter picking 2/year $\text{£}35 \times 60 \text{ yr} = \text{£}2,100$

12.4 Infiltration Basin

- Annual Weeding = $\text{£}100 \times 60 \text{ yr} = \text{£}6,000$
- Replacement planting annually $\text{£}100 \times 60 \text{ yr} = \text{£}6,000$
- Litter picking 2/year $\text{£}35 \times 60 \text{ yr} = \text{£}2,100$

12.5 Gravel Filter Drain

- Litter picking monthly $\text{£}20 \times 60 \text{ yr} = \text{£}1,200$

12.6 The total sum of management and maintenance costs for the proposed SuDS over a 60-year design life: **£33,900.00** and **£565 a year (average)**.