

Management and Maintenance Plan for Sustainable Drainage (SuDS):

Proposed new commercial unit at Mardon
Park, Baglan, Neath Port Talbot, SA12 7AX

Prepared for:

**GBV Properties
Ltd**

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1. INTRODUCTION AND MANAGEMENT RESPONSIBILITIES

- 1.1. This SuDS Management and Maintenance Plan has been prepared by Vale Consultancy in support of a SuDS scheme for the proposed development of an industrial unit at Mardon Park, Baglan, Neath Port Talbot, SA12 7AX. The specification, planting regime and type of plants within the landscape features serving the development will be by specialists.
- 1.2. The proposal is for the development of a new commercial unit with associated parking and service yard within the 0.6ha curtilage of the site.
- 1.3. The scheme incorporates a sustainable drainage system for surface water runoff, which consists of infilled (stone) *CellWeb* and vegetated dry swales. The method for disposal of surface water runoff is infiltration.
- 1.4. The purpose of this document is to set out the overall management objectives for the common external areas and retained structural vegetation within the dry swales and to describe the long-term maintenance required to allow the planting to flourish and reach its design potential.
- 1.5. All references to planting treatments are based on the SAB submission drawings:
 - ***11250-500: Drainage Layout***
 - ***11250-501: Drainage Details***
- 1.6. Maintenance is to be carried out by Greenwise Construction.

2. MANAGEMENT RESPONSIBILITIES

- 2.1. Greenwise Construction shall be responsible for the implementation of the Landscape Management and Maintenance Plan. If deemed necessary, all landscape operations shall be undertaken by a suitable and qualified landscape contractor appointed by the Site Owner. The site will be owned by GreenWise Construction.
- 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

- 2.1. The site shall be managed and maintained as an attractive, tidy, and safe finish to all landscape elements. The proposed structure planting will give a cohesive site character, provide a visual buffer, and provide green framework to the newly built development.

- 2.2. The proposed planting shall enhance the biodiversity and nature conservation interests.
- 2.3. The Site Owner shall ensure establishment and long-term health of all landscape elements for the benefit of the site occupants and visual amenity of the area.
- 2.4. Best Health & Safety practices shall always be used.
- 2.5. 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.

3 INSPECTION AND MAINTENANCE ACCESS

- 3.1. Access for inspection and maintenance can be gained from Mardon Park, off Central Avenue. Parking and access are incorporated into the proposed development. This can be utilised and will provide parking and access for maintenance vehicles and any necessary machinery required for maintenance.

4 MAINTENANCE VISITS OR INSPECTIONS

- 4.1. The Site Owner or appointed maintenance contractor shall carry out a minimum of 20 maintenance visits or inspections per year to check drainage components and ensure plant establishment and health. Visits shall be twice monthly during March to October, and monthly during the rest of the year. Additional visits may be needed to deal with extreme weather conditions or specific horticultural requirements.

5 GENERAL

- 5.1. 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.
- 5.2. The Site Owner shall employ suitably qualified staff for all work and when using sprays and mechanical equipment. All equipment shall be kept in a sound condition, fit for use and purpose.
- 5.3. The Site Owner and their appointed contractors shall comply with all relevant Health and Safety regulations and good working practices.
- 5.4. The Site Owner / appointed contractor 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.
- 5.5. All work shall be carried out while soil and weather conditions are suitable.
- 5.6. 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.

- 5.7. Entomological or disease infestation shall be dealt with as required and shall be checked at each visit. Control shall be either by spraying with approved chemicals, pruning all dead wood by cutting back to an outward pointing bud or by removal of the affected plants.
- 5.8. Watering during the first two years after planting may be necessary during times of drought in summer months and, when watering is required, it shall be carried out on a regular basis to suit climatic conditions. If conditions are severe or soils are particularly free-draining, careful monitoring and more frequent watering may be necessary to maintain good plant health and avoid plant failure.
- 5.9. All shrubs / hedges shall be pruned to remove deadwood, overhanging / tangled and damaged branches. Winter flowering shrubs shall be pruned in spring. Shrubs flowering in March-July shall be pruned immediately after the flowering period and shrubs flowering in July-October shall be cut back to old wood in winter. Shrubs that require spring pruning to provide seasonal colour shall be pruned in March and shrubs that require seasonal pruning to promote continual flowering will be pruned appropriately.
- 5.10. Plants shall be re-firmed when necessary to ensure that plants are securely planted and upright.
- 5.11. Bark mulch levels shall be maintained, being topped up when necessary to a minimum depth of 50mm. Any spillages shall be swept back on to the bed from surrounding areas, ensuring no plants are smothered.
- 5.12. Edge valleys in beds shall be maintained to reduce mulch spillage and grass edges shall be cut at each maintenance visit.

6 ORNAMENTAL PLANTING

Specific objectives:

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

Maintenance Operations:

- 6.1. All bioretention 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.
- 6.2. 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.

- 6.3. 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.

- 6.4. 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.

- 6.5. 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

7 GRASSED AREAS

Specific objectives

- To create an attractive grass sward with height and colour
- To provide habitats for reptiles, insects, bees & butterflies

Maintenance Operations

- 7.1. Refer to the planting schedule for guidance on the proposed extent of grass/plants to be used in the swales.
- 7.2. Cutting to be carried out using appropriate large wheeled, rotary mower to avoid injury to reptiles unless specified otherwise.
- 7.3. Remove any litter, debris, stones, and earth clods larger than 25mm in any dimension prior to mowing.
- 7.4. Sward heights to be kept to minimum 5cm with two cuts per year in May and September after the first year.

- 7.5. No fertiliser or nutrients to be added.
- 7.6. Top dress if required with additional appropriate native origin seed if slow to establish.
- 7.7. When necessary grass areas shall be sprayed with a suitable approved selective herbicide in accordance with the manufacturer's recommendations to control injurious or invasive weeds. Alternatively, spot treatment weeding of isolated weed growth may be carried out by hand or herbicide application. All arisings shall be removed from site.
- 7.8. Reinstatement by re-seeding of damaged, defective, or bare areas shall be carried out as appropriate. Any dips or holes within the grass shall be filled as above to restore even falls and reseeded, as necessary.
- 7.9. Where necessary compacted areas shall be aerated with appropriate equipment in autumn.
- 7.10. Depressions to be filled in over time by adding a top dressing and over-seeding, using a sandy soil.
- 7.11. Year One

- First cut to 5cm March/April (Spring Seeding 1st cut in May)
- Cut every 2 months or when sward reaches 15cm
- Final cut September/October
- Allow cut grass to dry and disperse seed before removing arisings
- The requirements in the first year are to control weeds and reduce competition from grasses. Cut the sward to a height of 5 cm every two months or when the sward reaches 15 cm. Remove all cut material to avoid smothering the sward. Where persistent weeds are a problem, spot treat with Glyphosate or dig-out

7.12. Future years

- One cut in May and September to 5cm
- Remove all cuttings
- Allow cut grass to dry and disperse seed before removing arisings
- The requirements in future years is to maintain a species diverse sward of value to wildlife

- 7.13. The site may require further cuts in the autumn period to remove untidy growth in an extended growing season.

8 PLANT REPLACEMENT

- 8.1. An annual inspection of trees and shrubs shall be undertaken in September of each subsequent year after planting to assess the condition of stock and prepare a list of necessary remedial work and replacement planting. Replacement planting shall be implemented in

accordance with the planning requirements.

- 8.2. All work shall be carried out by appropriately qualified horticultural operatives with adequate insurance. All work shall be carried out in accordance with good horticultural practice and B.S. standards. All debris arising from the works shall be removed from site.
- 8.3. Any new replacement planting shall be tagged so the local SAB, the Site Owner are aware that these plants will have a further one year's defect liability period.
- 8.4. Replacement shrub planting shall take place in the following November-February, dormant winter period during suitable weather conditions. All stock shall be of the same size and species as originally specified.
- 8.5. Approval of all remedial and replacement work shall be obtained before commencing any remedial work.

9 LITTER COLLECTION

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

10 HARD SURFACES

- 11.1. A common-sense approach to the maintenance of the *CellWeb* will be adopted, the maintenance program as outlined as follows and is designed to ensure the structural and hydraulic performance of the *CellWeb* system.
- 11.2. The management company is to inspect each of the respective assigned areas of the hard landscape for which they have responsibility on a six-monthly basis to identify and repair any damaged areas.
- 11.3. Seasonal maintenance (leaf and snow clearance, de-icing). To be proactively managed with the checking of weather reports.
- 11.4. Surfaces to be always kept weed and litter free. Spray paved areas every 5 years or as required with herbicide to keep weed free.
- 11.5. Drainage systems associated with hard surfaces to be inspected annually and maintenance work undertaken, as necessary.
- 11.6. Visually inspect the surface on a regular basis typically 2 per year (Spring and Autumn). Ensure no displacement of any organic matter has occurred on the surface, particularly after heavy precipitation. The paving should be agitated (e.g. brushed, vacuumed, etc.) at least once a year, ideally in the spring to ensure no vegetation of any sort can grow and develop in the voids.

Note: If the infiltration rate of the paving becomes prolonged, allowing ponding to develop, the laying course material may require cleaning/replacing. This should happen every 35-50 years.

11.7. Repair any subsidence or breakages promptly in accordance with best practice, manufacturer's guidance and using matching materials.

11.8. Inspect and repair all edging on a regular basis making good any damage or wear promptly to maintain the good upkeep of the development.

11 TRADITIONAL DRAINAGE

12.1. A monthly site inspection should be carried out, checking for any areas that are not operating correctly and collecting/removing litter and debris.

12.2. All rainwater pipes, linear drains, gullies and inspection chambers should be inspected biannually, typically spring and autumn.

12.3. 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.

12 SUMMARY OF INSPECTION AND MAINTENANCE

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

14.2. General

- General inspections of SuDS areas (swales, **CellWeb** paving, inlets and outlets) – every 2 weeks between March to October and monthly for the rest of the year and shall include litter collection.
- Biannual check of traditional drainage including rainwater pipes, linear drains, gullies and inspection chambers.

14.3. Stone infilled **CellWeb**

- Initial inspection – within 3 months of completion
- Visual inspection - 2 times a year
- General brushing of surface - once a year
- Weed removal – as required
- Remediate areas of Rutting and depressions – as required
- Rehabilitate surface with brushing and water jetting when clogging becomes apparent – as required, typically every 10 - 15 years
- Replace surface and binder layers if rehabilitation fails due to significant clogging – expect every 50 years
- Inspection for performance and clogging and ancillary drainage components – once

a year

14.4. Bioretention areas (Swales)

- Inspect surfaces for silting and ponding, record de-watering time to determine if any remedial work is required – annually
- Pruning, weed removal and plant replacement, assess plants for disease infection, poor growth and invasive species – annually
- Inspect inlets for damage or blockage at general inspections
- Clear inlet/outlets of sediment build-up – as required

13 LIFETIME MANAGEMENT AND MAINTENANCE COSTS

15.1. 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 14 are as follows:

15.2. General

- General 2 weekly inspection (incl. litter removal) – 1 hour for each inspection – 1560 inspections over 60 years @ £15 each - £23,400
- Biannual check of traditional drainage including rainwater pipes, linear drains, gullies and inspection chambers @ £15 each - £1,800

15.3. Cell/Web

- Annual brush/sweep – 60 sweeps at £0.12 / m² x 186m² - £1340
- Weed kill every 5 years @ £0.90 / m² x 186m² - £2008
- Brush/water jetting rehabilitation every 15 years @ £2.50 / m² x 186m² - £1860

15.4. Bioretention Areas (swales)

- Annual pruning / fertilising and inspection for plant replacement over 60 years @ £70 / day - £8,400

15.5. The total sum of management and maintenance costs for the proposed SuDS over a 60-year design life - **£38, 808 or circa £646 a year**

Appendix A

Imported topsoil criteria

Reference documents BS 8545 2014
BS 3882 2015
BS 8601 2012
BS 3998 2010
BS 5837 2012
BS 4043 1989
BS 4428 1989
BS 3936-1 1992

Defra leaflet: *CONSTRUCTION CODE OF PRACTICE FOR THE
SUSTAINABLE USE OF SOILS ON CONSTRUCTION SITES*

Imported Topsoil shall not contain weed seeds in quantities that cause noticeable weed infestations in the final planting beds. Imported Topsoil shall meet the following physical and chemical criteria:

- Soil texture: loam, sandy clay loam or sandy loam with clay content between 15 and 25%. And a combined clay/silt content of no more than 55%.
- pH value shall be between 5.5 and 7.0.
- Percent organic matter (OM): 2.0-5.0%, by dry weight.
- Soluble salt level: Less than 2 mm ho/cm.
- Soil chemistry suitable for growing the plants specified.
- Imported Topsoil shall be a harvested soil from fields or development sites. The organic content and particle size distribution shall be the result of natural soil formation. Manufactured soils where Coarse Sand, composted organic material or chemical additives has been added to the soil to meet the requirements of this specification section shall not be acceptable. Retained soil peds shall be the same color on the inside as is visible on the outside. Imported soil must be supplied with Product data and certificates: For each type of manufactured product, submit data and certificates for the product.