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Landscape and SUDS Management and Maintenance Plan

Llanwern Leisure Hub

Miller Homes

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LANDSCAPE MANAGEMENT PLAN TO BE READ IN CONJUNCTION WITH:

DRAWING: 1562A11-LLA-ZZ-XX-D-L-0201 Detailed Soft Landscape Proposals

APPENDIX A: SCHEDULE OF IMPLEMENTATION

1 INTRODUCTION

1.1 Background and Context

1.1.1 This report presents a Management Plan for the communal areas associated with southern area of the Llanwern Leisure Hub. The area of open space is to be managed to provide an attractive setting to the new properties.

1.1.2 The management responsibility will be with the appointed Management Company set up on behalf of the residents by the client. Areas are to be managed in accordance with this Management Plan for a minimum five-year period, commencing at the time of completion of the contractor's defects liability period. For the duration of the contractor's defects liability period (12 months after completion of works) the maintenance liability of all areas will lie with the developer.

1.1.3 This report has been designed to provide a steering manual for the day-to-day management of the site at ground level and one which can be updated as required. It sets out in broad terms the landscape aspirations for the site, both in the short and longer term and provides practical means by which these aims may be translated to well managed results on the ground. It relates directly to the landscape proposals in **Appendix A**.

1.2 Works Programme

1.2.1 The provisions within the establishment maintenance specification should be adopted by the landscape contractor for all planting areas from time of planting until the agreed handover to ensure successful establishment.

1.2.2 It may be likely that the completion and handover of the landscape works by the contractor will be phased. This management plan covers both pre and post-handover periods for continuity.

1.2.3 All public areas are to be maintained in accordance with this management plan for a minimum five-year period.

- 1.2.4 It should be noted that the proposed annual timing of operations in the following Works Programme are flexible and it is anticipated that the exact programme of works will be influenced by seasonal weather conditions and factors such as variability in growth rates.

1.3 **Legal Constraints**

- 1.3.1 Any inhabitation by statutorily protected species will need to be given due consideration with respect to management operations in the affected areas.

- 1.3.2 In the management schedules set out below, the timing of operations (by season or month) is given, either in terms of achieving optimum results or minimising potential disturbance to wildlife. In general terms, pruning or other works to established hedgerows, shrubs and trees, which may contain breeding birds, should avoid the bird breeding season. In most years this is typically but not exclusively from the end of February to August as the nesting period may start before and extend beyond these dates.
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2 MANAGEMENT AIMS AND OBJECTIVES

2.1 General Aims and Objectives

2.1.1 The primary landscape objective for the site is to create and maintain a landscape framework to help emphasise the site's characteristics, whilst integrating the development within the wider community.

2.1.2 The main aim of the management plan is to set mechanisms in place which ensure that the open spaces are well managed in perpetuity both for the benefit of the new residents and the existing surrounding residents so that they do not become degraded. This report aims to:

- define the management aims, objectives and maintenance practises for the different areas of public open space and public realm landscape, in the short and longer term
- ensure that these practises can be efficiently carried out and that they are environmentally sustainable
- provide a readily understandable manual for those involved in the management of the site
- set out an integrated yet flexible approach to the management of the site and to provide written documentation of the project, with scope for updating and adapting operations if necessary.

2.1.3 The principle aims for managing the landscaped areas are as follows:

- to introduce strong management policies which will enhance the visual appeal of the site and the landscape setting of the development
- to maximise the ecological potential of the existing and new habitats associated with the development
- to ensure that the long-term health and vigour of the new planting is optimised in the future.

- to encourage appropriate recreational use of the site by local residents, whilst strongly discouraging inappropriate and indiscriminate use of the site by, for example, fly tipping.
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3 MANAGEMENT PLAN FOR NEW PLANTING

3.1 Operation 1: New Trees

- 3.1.1 **Objective:** to promote early establishment and vigour in all newly planted trees within the development area. Longer-term management to include replacement as required and formative pruning to create a healthy, strategic landscape component and to perpetuate the original design aims.

Establishment Maintenance of New Trees

- 3.1.2 Establishment maintenance of newly planted trees will be required for the first three years after planting to ensure rapid early growth. Visits shall be undertaken at least monthly between April and September in the first year, with two visits during the dormant season. In the second and third years the frequency of visits can be reduced to bi-monthly. Maintenance visits are required to ensure that the following maintenance requirements are satisfactorily undertaken:

- Watering as required to ensure healthy growth, particularly in the trees first two years after planting. All trees to be visited weekly in periods of dry weather and sufficient water to be applied to eliminate drought related stress.
- All trees to be treated with an annual application of an approved slow-release fertiliser used as a top dressing at the manufacturer's recommended rates in April of Years 1 and 3. Slow release fertiliser to be applied no further from the tree than the first metre and to be placed under mulch and covered to ensure a hazard is not presented on the ground surface. Chemicals are not to be used within 3 metres of, or within areas that drain directly into, attenuation basins, swales and watercourses to avoid nutrient pollution.

- Trees that have become loosened, are leaning or have lifted out of the ground to be set upright and re-firmed by treading. Tree supports (including underground guys) to be regularly checked, adjusted, repaired and replaced as necessary and irrigation tubes to be kept free of blockages.
- Tree stake ties to be adjusted (loosened or tightened) regularly to avoid asphyxiation of the tree trunk and to ensure rubbing does not occur owing to wind rock.
- Weed control is required to keep all planting areas free of grass and weed growth. This weed control must be by hand in Year 1, with chemical control as appropriate and in line with current regulations, permitted only in 1.0m squares around clear-stemmed trees in Years 2 and 3. Chemical weed controls are not to be used within 3 metres of, or within areas that drain directly into, attenuation basins, swales and watercourses to avoid nutrient pollution.
- Trees to be kept free of pests and diseases; regular monitoring to be undertaken.
- General pruning to be carried out to remove straggling stems, over-vigorous shoots, suckers and dead, misshapen, broken or otherwise unhealthy branches. The overall form of the tree is to remain balanced following pruning work.
- Planting areas to be kept free of litter and leaf fall and grass edges to be kept regularly trimmed and tidy.
- Where mulch is used as a top dressing, this to be regularly topped up to 100mm, to ensure a minimum depth of 75mm. Mulch to be kept clear off adjacent grass, paved areas etc. Mulch used shall be a coarse composted bark. Application shall be even across the extent of the planting area and there should be no mounding of bark mulch around the base of the tree (known as volcano mulching).
- General autumn tidy.
- All arisings to be removed from site and the site to be left clean and tidy at all times.

3.1.3

An inspection is to be made in August each year. Any losses of planted trees, whether by natural means or vandalism and any other plants that have failed to thrive are to

be replaced in the planting season following the loss. Replacement trees are to be of the same specification and size as the original plants and of the best quality obtainable.

- 3.1.4 New tree planting within the Public Open Space should be regarded in a different light to those within the immediate residential area. As such, in the longer term these trees may be subject to minimal management to allow the trees to develop into character trees of value to wildlife.

Longer Term Management of New Trees

- 3.1.5 Regular maintenance visits should be made at quarterly intervals each year. It will be necessary to undertake general inspection for pests and disease, 'tidying' e.g. pruning of any poor or damaged branches, removal and replacement of dead trees, litter and leaf fall clearance, topping up, raking and sweeping of mulch to provide a tidy appearance etc., as described above for the Establishment Period. All arisings to be removed from site and the site to be left clean and tidy at all times.
- 3.1.6 An inspection to be made in August up to and including Year 5. Any losses of planted trees, whether by natural means, wear and tear or vandalism and any other trees that have failed to thrive, to be noted and the trees replaced in the planting season following the loss. Replacement trees to be of the same specification, location and size as the original trees, unless the LPA gives its written consent to any variation.
- 3.1.7 Tree guards, grilles and any other supports to be checked and when necessary adjusted, repaired, removed or replaced, to ensure healthy unrestricted growth. If a tree support is no longer required as the tree is supporting itself, remove the tree support entirely. The tree support is generally removed around year 3, however this judgement shall depend on how well the tree has established before tree support removal is considered. Tree guards / grilles of street trees are likely to require removal in the long term as the tree base / trunk expands.
- 3.1.8 Following completion of the Establishment Period, the need for both watering and weed control is likely to be reduced but must still be undertaken as necessary to ensure healthy growth and maintain the mulched tree beds in a weed free condition. At this stage it will be possible to use an approved residual soil acting herbicide, to

minimise the need for physical removal of weeds. Tree surroundings to be maintained in a weed free state, with trimmed edges and mulch material to be kept topped up to a depth of 75mm. In dry summers trees will require watering using the irrigation system to ensure healthy growth. Chemical weed controls are not to be used within 3 metres of, or within areas that drain directly into, attenuation basins, swales and watercourses to avoid nutrient pollution.

- 3.1.9 Regular monitoring for pests and diseases will also be needed on an on-going basis and any necessary control measures undertaken as soon as possible.
- 3.1.10 General, corrective pruning to trees to remove die back, straggling stems, over-vigorous shoots, suckers, epicormic growth and dead, misshapen, discoloured, thin, weak, over-crowded, old, broken or dangerous branches from trees by pruning back with a clean cut to the main stem, or to a sound and healthy outward growing lateral. Any removal of dead, diseased or ill formed trees is also to be undertaken at this time and any required replacements undertaken.
- 3.1.11 Trees to be subject to formative pruning, crown thinning and crown raising / reduction, on an annual basis in the autumn, and at other additional times as necessary, to improve the shape of the crowns and to remove any die back and weak or dangerous branches. The trees that are planted in single species rows and formal groups should be pruned as necessary to form a uniform and balanced arboricultural feature.

3.2 Operation 2: New Native Hedgerow

Objectives: Promote early growth of new hedge plants to create well-structured and healthy, dense hedges of value to local wildlife.

Initial Establishment Maintenance of New Native Hedgerow

- 3.2.1 Establishment Maintenance of new hedgerow planting will be required for the first three years after adoption to ensure rapid early growth. Monthly visits to be undertaken between April and September, with two visits during the dormant season, to ensure that the following maintenance requirements are satisfactorily undertaken:

- Watering as required to ensure healthy growth, particularly in Years 1, 2 and 3. All planting to be visited weekly in periods of dry weather and sufficient water to be applied to eliminate drought related stress.
- Hedge plants to be treated with an annual application of an approved slow-release fertiliser, at the manufacturer's recommended rates in April of Years 1, 2 and 3. Chemical weed controls are not to be used within 3 metres of, or within areas that drain directly into, attenuation basins, swales and watercourses to avoid nutrient pollution.
- Plants, which have become loosened, lifted up or out of the ground to be set upright and re-firmed by treading.
- The need for weed control will be minimised through the use of mulch in planting areas. The mulch is to be regularly topped up to 75mm, ensuring that the lower branches and foliage of plants are not smothered. Mulch to be kept clear of adjacent grass, paved areas etc. This will generally suppress weeds but there may be some localised ingress of weeds. Any additional weed control required to keep the hedge trench free of grass and weed growth must be by hand.
- Plants to be kept free of pests and diseases, regular monitoring to be undertaken.
- General pruning to be carried out to trim laterals, remove straggling stems, over-vigorous shoots, suckers and dead, misshapen, broken or otherwise unhealthy branches. Leading shoots to be left untrimmed during the Establishment Period.
- Planting areas to be kept free of litter and leaf fall.
- General autumn tidy.
- All arisings to be removed from site and the site to be left clean and tidy at all times.

3.2.2

An inspection to be made in August each year. Any losses of hedge plants, whether by natural means or vandalism and any other plants that have failed to thrive, to be replaced in the planting season following the loss. Replacement plants to be of the same specification and size as the original plants.

- 3.2.3 It may be necessary to reinforce the integrity of the new hedgerows by installing a framework of posts and wire, to be kept intact and in good repair during the Establishment Period.

Longer term Management of New Native Hedgerow

- 3.2.4 Following completion of the Establishment Period, the need for both watering and weed control is likely to be reduced.
- 3.2.5 As a minimum, maintenance visits should be made in spring and late autumn between (April and October) with a visit during the dormant season each year.
- 3.2.6 Planting and cutting will be carried out between October and March. Hard pruning may be required if the planting is likely to cause an impediment in the following growing season to adjacent to paths, roads or other features if left. Where possible to ensure that birds are not nesting and ideally in January and February to ensure that the fruiting berries are not lost. If a hedge must be trimmed during the fruiting season it is essential to only cut one side so that plenty of food remains. A healthy hedge can normally recover well from severe cutting, but repeated cutting at the same height can gradually cause whole hedges to die off. One major problem associated with mechanised hedge cutting is the decline in the number of saplings left in hedges to grow into mature trees.
- 3.2.7 Mature hedgerows will need cutting to prevent the native hedge becoming 'leggy' and to encourage dense growth. Cutting on a three-year cycle (one side, top, other side) will allow time for flowering and fruiting shrubs to develop throughout the length of the hedge and is the most beneficial for wildlife.
- 3.2.8 Gaps will either be planted with new plants, which are an opportunity to increase the botanical diversity of the hedge, add trees to the hedge line or be left to regenerate naturally if possible. Any new planting will need to be protected from stock, rabbits and deer for approximately 3-4 years. Initially the surrounding hedge may need cutting back to ensure the new plants receive sufficient light. Regular trimming in the early years of a hedgerow's life will help make it dense

- 3.2.9 An inspection to be made in August each year. Any losses of planted plants, whether by natural means, wear and tear or vandalism and any other plants that have failed to thrive, will be replaced in the planting season following the loss. This to include any plants that are relatively short lived, and which will require routine replacement during the period of the management plan. Replacement plants to be of the same specification and size as the original plants.
- 3.2.10 Recommended cutting machinery for hedging operations will be by use of a handheld mechanical hedge trimmer or a tractor-mounted flail/cutting bar/circular saw attachment for bigger material. All cut faces should be left neat and clean with no jagged ends or tears.
- 3.2.11 Hedge margins are an important habitat for all wildlife and a buffer zone of at least 1m will be maintained on both sides being cut no more frequently than every three years.
- 3.2.12 Regular monitoring for pests and diseases will be undertaken on an ongoing basis and any necessary control measures will be undertaken as soon as possible. It will be necessary to undertake general 'tidying' e.g. removal of litter, as described above for the Establishment Period. All arisings to be removed from site.

3.3 Operation 3: Short Amenity Grass

- 3.3.1 **Objective:** Areas of short mown grass are to be maintained as a high-quality sward, for informal recreational use.

Establishment Maintenance of New Areas of Short Grass

- 3.3.2 Areas of newly seeded/turfed grass to be subject to establishment maintenance during the first year after seeding.
- 3.3.3 Once the grass has established sufficiently to be stable and well rooted, the first cut is to be made when the grass has reached 50mm in height and the grass shall not be cut lower than 25mm. All subsequent cutting; the frequency and number of cuts within a growing season will be undertaken as required to keep grass below 50mm. Operations to be carried out in suitable dry weather conditions. Cuttings to be removed or distributed lightly and evenly over the sward.

- 3.3.4 Mowing method is to be determined by the contractor in terms of hand mowing or ride on mowers etc. The selected method must be suitable for any gradients, undulations, access, context and required finish of the grass areas. The mowing method should not undermine soil structure or damage any surface areas.
- 3.3.5 Any failed areas of grass are to be seeded at the correct season. Any ingress of pernicious perennial weeds to be hand pulled. Any stones or litter on the surface to be removed.

Longer Term Short Grass Management

- 3.3.6 Areas of short grass once established for twelve months are to be cut to keep grass below 50mm. The frequency and number of cuts within the growing season, likely between March and October to maintain the grass between 25 - 50mm. However, it will be weather permitting and should be reviewed to suit extreme weather i.e. extremely dry arid conditions it may be necessary to reduce the cut leaving the grass slightly longer. The height of grass shall not exceed 50mm before cutting, topped to a height of 25mm. Any short grass that abuts a vertical obstacle to be strimmed at the same time as each grass cut to achieve a neat edge. Swathes of arisings to be collected up and removed from site.
- 3.3.7 Mowing method is to be determined by the contractor in terms of hand mowing or ride on mowers etc. The selected method must be suitable for the gradients, undulations, access, context and required finish of the grass areas. The mowing method should not undermine soil structure or damage any surface areas.
- 3.3.8 All grass edges against paved areas, kerbs or other hard surfaces to be edged regularly to maintain a 10-20mm clear gap between the two surfaces.
- 3.3.9 In March and September of each year, all grass edges to be trimmed in accordance with the above paragraph, to be re-cut to a straight line or smooth curve as appropriate using a half moon edging tool or similar.
- 3.3.10 The sward is to be treated with an approved selective herbicide, at the recommended rate of application on an annual basis in May of each year, to control broad-leaved weeds.

- 3.3.11 Any damage to the sward caused by pests (moles, rabbits etc.) or by vehicles or general wear and tear is to be reinstated by top dressing, re-cultivation, re-seeding and watering at the correct season as necessary. Any reinstated areas to be protected and subject to establishment maintenance as itemised above. If grass growth is poor it may be necessary to apply a spring and / or autumn fertiliser to the sward, to encourage vigour. Similarly, turf aeration and scarification may also be necessary, to alleviate compaction and control the development of thatch. Fertilising and aeration maintenance tasks are not to be undertaken during the establishment period of the lawn and this would be detrimental to the health of the lawn.
- 3.3.12 Any leaf material, broken branches, litter, stones or other debris which occur on the grass, to be removed as necessary, to maintain a clear grass surface.
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3.4 Operation 4: Native Wildflower Meadows and Grassland

- 3.4.1 Most meadow wildflower and grass species are perennial and are slow to germinate, often not flowering in the first growing season. There will likely be significant weed growth in the first growing seasons which can obscure the meadow seedlings beneath. This annual weed growth is to be controlled by topping or mowing.
- 3.4.2 Strim / mow to height of 40-60mm, once in late August, once again in mid-October and in once again in mid-March. Rake off all cut material at once, except for the August cut which shall be left for 3-5 days after cutting to allow to dry, for re-dispersal of seeds. NB. It will be necessary for the company maintaining the wildflowers to have an understanding of the principles of wildflower management, which is different from normal amenity grass management. This should ideally be demonstrated before the contract for the ground's maintenance is let. Rake off cut material to set the seed and then remove from site, to an approved composting facility or to approved site facility to be set up with residents associated.
- 3.4.3 Use of any chemical herbicides is to be minimised, and no chemicals are to be used around the balancing pond.

Longer Term Native Wildflower Meadows and Grassland Management

- 3.4.4 Areas of meadow/grass mixtures to be cut back to approximately 50mm after flowering/seeding (July / August), as a 'hay cut'. 'Hay' to be left to dry and shed seed for 1-7 days and then be removed from site. Growth during later autumn/winter to be mowed to approximately 50mm once in November and once in February if required. Additional mowing in late autumn and winter to be conducted if meadow grass grows too long. Areas of meadow mixture growth may vary within balancing pond based on waterlogged conditions; maintenance should be adapted to reflect this as appropriate.
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4 SITE SPECIFIC AREAS

5 SUDS MANAGEMENT AND MAINTENANCE PLAN

5.1 SuDS Network Overview

5.1.1 The development benefits from an extensive SuDS network to manage the surface water drainage requirements of the site. SuDS are environmentally friendly approach to managing runoff from development sites in a way that;

- minimizes negative impacts on the natural environment
- reduces the risk of flooding, both on the site and downstream
- supports the adaptability of the development to the effects of climate change

5.1.2 The primary aim of SuDS management on the site is to ensure that the drainage functions of the system are maintained to perform as expected, to prevent flooding of the development and to control the quality, rate and frequency of runoff discharged from the site to downstream drainage features. Beyond this, the SuDS network for Llanwern, leisure hub has been designed to positively contribute to the overall wildlife, biodiversity and amenity value of the development through ecologically sensitive planting within the drainage features which tie-in to the wider existing and proposed landscape.

SuDS Features at Llanwern, leisure hub Development

5.1.3 The following SuDS feature form part of the network on the site;

- **Attenuation Basin:** Created in the southern basin within the larger network of basins within the development. This will be predominantly dry, fed from the inflows from the Swale features. The pond will be planted with wetland grassland to maximise its wildlife and biodiversity potential. Water levels within the pond will rise following rainfall events, returning to normal designed level as the excess is released via a controlled flow outfall.

Refer to the SuDS drainage strategy plans and Quad Consult Limited SuDS design information for further detail on the locations of the above feature and its connections.

5.2 SuDS Management Arrangements

- 5.2.1 Responsibility for the ongoing management of the SuDS network is the appointed Management Company (Glan Llyn Management Company) who will be responsible for all SuDS features.
 - 5.2.2 A consistent approach to monitoring and undertaking the required maintenance tasks will help identify any potential issues in a timely manner and allow for changes to management or maintenance practices to be implemented in a coordinated manner, ensuring the effective future performance of the system.
 - 5.2.3 The residents of the development are to be made aware of the system's components and their functions through information provided at purchase and, where necessary, signage. This will ensure the performance of the system is not compromised by potential changes on private land that would impact upon its function. Residents may also be likely to be the first to see when issues such as blockages, erosion or excessive sedimentation begin occurring, it is therefore important that emergency contact details are provided within any documentation provided.
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5.3 SuDS Management Objectives

- 5.3.1 The component features of the SuDS network provide a number of different habitats and amenity functions as well as functional differences. As such each component has unique management objectives;

Attenuation Basin (Glan Llyn Management Company):

- 5.3.2 The Attenuation basin provides, retaining site runoff in a predominantly dry basin, discharging at a controlled rate into the wider drainage network during storm events. The basin should be managed to retain visible wetland grassland mix to provide a balance between wildlife and biodiversity benefits and visual amenity.

Required Actions:

- Removal of litter at regular intervals
- Strim or mow wildflower grassland within upper bank profile annually at 100mm in September-November with all arising removed to wildlife piles on site
- Wildflower wetland meadow to be maintained to a maximum height of 600mm on development side to ensure clear views into and over the basin are maintained. Cutting as required with all arisings removed to wildlife piles on site
- Short mown grass to the periphery of the pond to be managed as per the general Landscape Management requirements in the previous section of this report
- Regularly check all inlets and outlets for blockages

5.4 SuDS Maintenance Plan

5.4.1 The following Maintenance Plan covers only the functional SuDS features of the designed site. Wider landscape maintenance is covered in the previous sections of this report.

5.4.2 It is anticipated that in both adopted and privately managed areas, those responsible for undertaking SuDS maintenance will be the same as those undertaking the wider landscape maintenance. Whilst many of the requirements for maintaining the SuDS system are similar to general landscape areas, staff carrying out maintenance activities should have experience of SuDS systems or have received specialist training to be able to assess the function and condition of the components of the system and be able to identify signs of apparent or developing issues that need addressing.

5.4.3 Maintenance Operations for SuDS components can be broadly broken down into the following categories;

- Regular Maintenance and Inspections
- Occasional Maintenance
- Remedial Maintenance

Initial establishment maintenance tasks, such as watering or weeding may also be required within the first year of operation

5.4.4 Regular maintenance activities are basic tasks carried out to a pre-planned programme/schedule, including inspections and monitoring, vegetation management, litter and debris removal and any other operations which require more frequent action.

5.4.5 Occasional maintenance comprises tasks that are likely to be required periodically on a less predictable basis as informed by the regular monitoring and inspection activities. This could include the removal of silt, vegetation management or other cumulative issues.

- 5.4.6 Remedial maintenance tasks are those required intermittently to rectify faults with the system. This can include repairs to engineered components that have been damaged such as inlet, outlets and headwalls, repairs due to excessive erosion, infiltration surface rehabilitation and system rehabilitation following a major pollution event

Table 1: SuDS Maintenance Categories and Activities:

		Frequency	Rate	Total
Regular Maintenance				
1	Monitoring Inspections			
1.1	Site walkover to all SuDS areas to inspect and record general condition items including; - Blockages to inlets/outlets - Potential leaks from the system - Vegetation health - Water quality (algal blooms, oils, froth, odours, unusual colouring) - Sediment build up beyond the designed limits - Ponding over permeable surfaces - Structural damage - Evidence of erosion / channeling - Unplanned overtopping of banks	12 visits annually / monthly		
2	Litter Removal			
2.1	Pick up all litter from SuDS areas and remove from site	12 visits annually / monthly		
3	Grass and Wildflower Meadow Maintenance			
3.1	Strim or mow all grass/meadow verges, filter strips/ level perimeter areas to swales and areas within highway visibility splays at 50-75mm removing arisings from site	As required or monthly		
3.2	Strim or mow all wetland meadow areas at 100mm once annually in September-November. All arising removed to wildlife piles on site	1 visit annually		
3.3	Strim or mow grass sward at 50-75mm if greater than 150mm height within reinforced grass paving areas	12 visits annually / monthly or as required if wear levels are high		
Occasional Maintenance				
4	Marginal Planting Maintenance			
4.1	Wetland vegetation to be cut at 100mm on 3-5yr rotation with no more than 33% to be cut in any one year. Arisings to be removed to wildlife piles not more than 20m from top of pond bank	1 visit annually or as required		
4.2	Removal of all reeds establishing beyond the area of the forebay filter bed. All arisings to be removed from site to a composting facility	1 visit annually or as required		
4.3	Emergent planting harvesting of permanent pool once 50% of original open water surface area occurs. Arisings removed to wildlife piles on site.	1 visit annually or as required		
5	Vegetation Management			

5.1	Replace failed planting during initial establishment period and prior to handover of scheme to management bodies	Within 12 months of practical completion		
5.2	Inspect following storm events to assess damage to vegetation and any reduction in vegetative cover. Rehabilitate and replant any bare or damaged areas	As required		
5.3	Inspect for excessive vegetation impeding the performance of inlets/outlets and remove as necessary to wildlife piles on site.	1 visit annually or as required		
Remedial Maintenance				
6	Check SuDS network for signs of damage or failure as part of monthly inspection process. Undertake remedial maintenance works as required	As required		

5.5 SuDS Maintenance Specification

General Requirements

- 5.5.1 The following section provides further detail on the Frequent, Occasional and Remedial maintenance activities associates with each SuDS component on the site. Some activities are however common to all SuDS features;

Table 2: General SuDS Maintenance Requirements:

		Frequency
1	Monitoring Inspections	
1.1	Site walkover to all SuDS areas to inspect and record general condition items including; - Blockages to inlets/outlets - Potential leaks from the system - Vegetation health - Structural damage - Evidence of erosion / channeling - Unplanned overtopping of banks	12 visits annually / monthly
2	Litter Removal	
2.1	Pick up all litter from SuDS areas and remove from site	12 visits annually / monthly

5.5.2 Whilst the majority of maintenance associated with the SuDS network will only vary slightly from more typical landscape maintenance operations, to protect the performance of the system and health of its vegetative cover the following departures from standard practices should be adhered to;

- **Avoid** the use of weed killers, pesticides which can cause chemical pollution to build up within the granular components in the system and in silt deposits
- **Avoid** the use of fertilizers in areas likely to be subject to overland flows into drainage features. Soluble fertilizer compounds can accumulate in permanent water bodies downstream causing algal blooms, deoxygenation of the water and associated reduction in water quality and overall performance of the system.
- **Avoid** the use of de-icing agents wherever possible to allow bioremediation of pollutants in permeable surfaces
- **Do not** temporarily store fine materials such as sand, silt or mulch on permeable surfaces without first covering with a protective layer. Ingress of fine material into permeable and porous surfacing can cause clogging and a reduction of system performance.

Exclusions

5.5.3 The following maintenance specifications relate solely to the SuDS components within the Adopted highway or areas of the site to be managed by Glan Llyn Management Company. Wider landscape management and maintenance is covered in the previous sections of this report.

Note: To prevent impacts on breeding birds, vegetation removal / weed control activities shall be undertaken outside of the nesting season. This is generally March-July (inclusive) but may extend beyond this period if seasonal conditions vary from the norm.

Maintenance Records

5.5.4 It is vital that a record of all maintenance inspections and activities that have been carried out are recorded. This allows the response of the system to different

management regimes to be assessed in the future and management practices adapted and improved as necessary (see below). It will also provide protection against future legal claims in instances where the system is exceeded by a rainfall event of flooding occurs elsewhere as a result.

5.6 SuDS Management and Maintenance Plan Review

5.6.1 It is possible that real world experiences in managing and maintaining the SuDS system on the site will differ from designed expectations. This will be partially managed through the programme of monthly monitoring inspection visits. Records kept from these visits should be reviewed on an annual basis to identify recurring maintenance issues and changes necessary to management practices to address these shall be planned and agreed between the client and the maintenance body.

5.6.2 Longer term, this plan should be reviewed at the end of each maintenance contract period. Performance of maintenance body and current functional, ecological and aesthetic performance of the system is to be assessed with any necessary changes to the management or maintenance specification should be made prior to entering into the next contract period.

5.7 Operation 6: Site Housekeeping and Open Spaces

Objective: Ensure that the site is respected and that the hard and soft landscape elements including high quality fixtures are maintained in good condition, without the risk of degradation through natural processes or abuse.

Routine Site Monitoring

5.7.1 Regular checks of the site will be required and any litter, other debris and / or fly tipping to be removed on a one/two weekly basis. Any litter bins to be regularly inspected and emptied, as necessary to avoid over-filling. Vigorous attention will be required with respect to control of dog fouling.

5.7.2 Site drainage issues also to be addressed on a routine basis to ensure that there are no problems relating to blockages or disrepair of main drains or laterals, dispersal of surface water etc. This will include regular checking and clearance of any drainage

gulleys and grated drainage channels and rodding of underground drainage pipes as necessary.

5.7.3 Gritting and snow clearance to be undertaken on an 'as required' basis to all paths and other hard surfaced areas.

5.7.4 Any unauthorised use of the areas or vandalism/graffiti/loitering/dens or other abuse or anti-social behaviour, to be reported immediately to the Local Authority/Police (as appropriate) for further action and/or removed as soon as possible. Similarly, any inappropriate use of the open space by residents e.g. installation of personal possessions/ children's play equipment etc, into the communal areas, dumping of shopping trolleys, storage of bikes etc, to be similarly reported and appropriate action/warnings issued.

LLANDWERN LEISURE HUB

LANDSCAPE MANAGEMENT PLAN

SCHEDULE OF IMPLEMENTATION

September 2025

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