



Landscape Management Plan

Green Infrastructure, One Horton Heath

FINAL

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1 Introduction

Background

- 1.1 This Landscape Management Plan (LMP) has been prepared for the One Horton Heath team on behalf of Eastleigh Borough Council to inform the on-going landscape management and maintenance operations for the construction of the Green Infrastructure (GI) including open space landscaping, bridleways, footpaths, SuDS, play areas and ecological and biodiversity enhancements at One Horton Heath (OHH).
- 1.2 The proposed development has been designed in full accordance with the Development Plan and Outline Planning Application (OPA) O/20/89498, which has a resolution to grant consent subject to S106 negotiations relating to education.
- 1.3 This LMP describes the range of proposed landscape mitigation, biodiversity planting and amenity planting, its objectives and post construction aftercare required to safeguard future establishment.

Green Infrastructure Application

- 1.4 The landscape proposals associated with this report relate to the Green Infrastructure application which is to be submitted as a Full Planning Application as consequence of the S106 delay set out in 1.2 above.
- 1.5 This will enable these important landscape works to be delivered earlier but in accordance with the design set out as part of the OPA. Therefore, this LMP is to inform the Full Detailed Planning Application of the GI and associated open space, footpaths / bridleways, SuDS, and ecological enhancements.
- 1.6 The Green Infrastructure consists of three separate parcels defined as Northern GI, Central GI, and Southern GI.

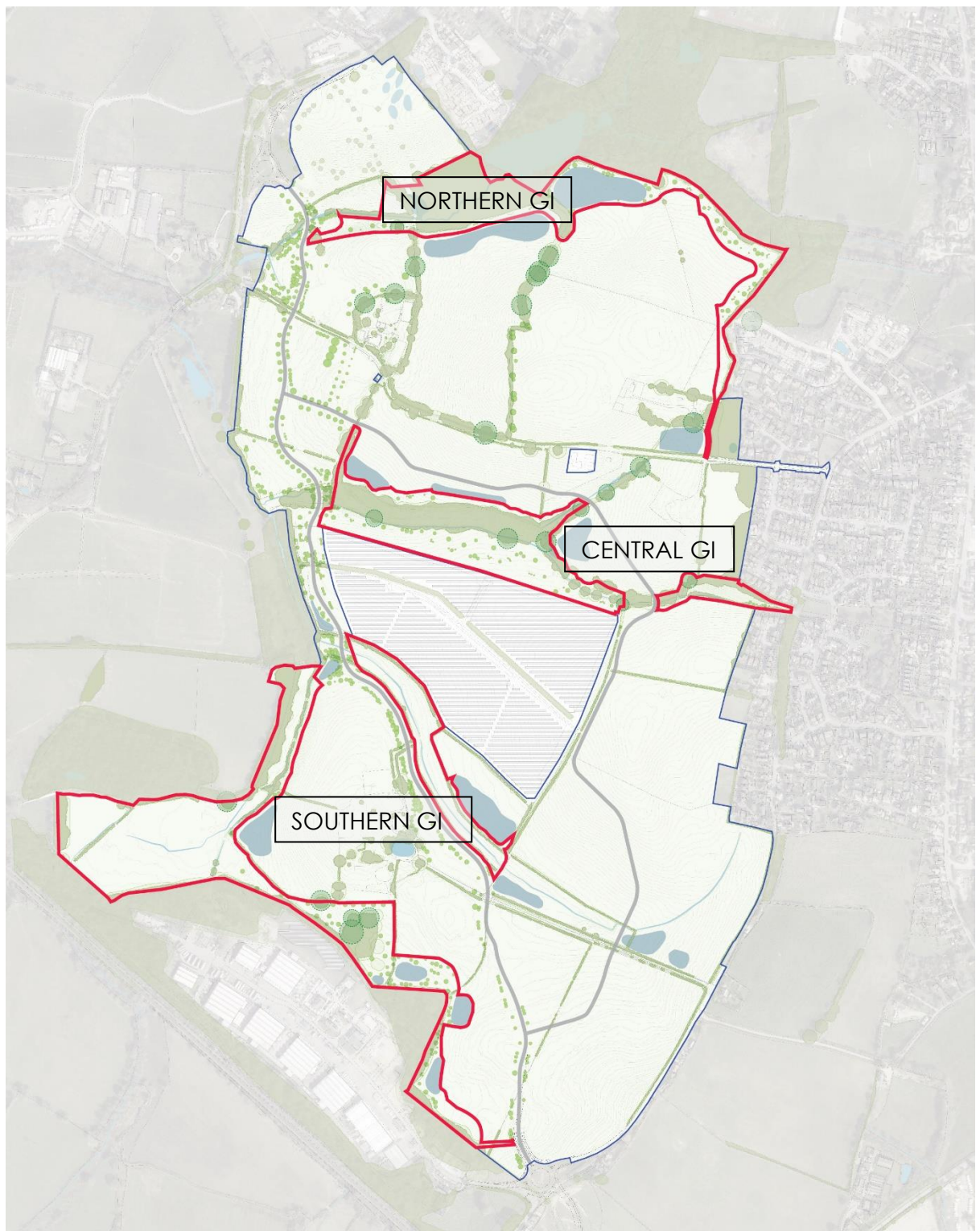


Figure 1 – Northern, Central and Southern Green Infrastructure Location Map

Aims and Objectives

- 1.7 This LMP provides a comprehensive programme of landscape and ecological management, enhancement and future monitoring. Proposals for on-going landscape management and maintenance operation will support the proposed site development to preserve and enhance assets of biodiversity value.
- 1.8 The landscape design and ecological mitigation proposals will reinforce the existing green infrastructure connectivity to be sufficiently robust so that it can withstand human activity nearby, when the site development is constructed, and also during day-to-day operation.
- 1.9 A carefully considered palette of pre-dominantly native species is intended to better immerse the existing site and proposed development into the landscape setting. The amenity prospects for One Horton Heath is key to delivering attractive and usable places, so that the community enjoy the attractive landscape setting and experience the wellbeing benefits of close contact with nature.
- 1.10 This LMP will ensure that the landscape vision is realised through a programme of regular maintenance that will deliver the following objectives:
 - The successful establishment of the planting design using best horticultural practices to maintain healthy growth and seasonal interest.
 - Protection, conservation and enhancement of existing trees, vegetation and associated habitats for enhanced site biodiversity and contact with nature.
 - To achieve and maintain a high standard of cleanliness, appearance and repair using sustainable management techniques.
- 1.11 This Plan is intended to cover the first five years of the site's establishment.
- 1.12 It should be noted that as the establishment of the new planting progresses, the operation and management maybe altered from that included within this document. However, this document provides minimum standards to be achieved and a 'benchmark' system, which is capable of adjustment and fine tuning in order to achieve the stated objectives and standards.

2 Preliminaries

- 2.1 This management plan should be read in conjunction with the supporting landscape plans appended to this report and the latest ecological reports and recommendations carried out by Johns Associates Ltd.
- 2.2 The landscape maintenance of the site will be the responsibility of the owners and will be managed and maintained by a dedicated on-site team of operatives.
- 2.3 The site owner and appointed Management Company shall be responsible for all periodic maintenance as set out in this document and replacements thereafter for all planted areas to which its management covers.
- 2.4 The maintenance of trees, shrubs, and other plants after the date of practical completion will be carried out by the appointed contractor for the duration of the agreed rectification / defects liability period. After this is completed, the responsibility will transfer to site owner responsibility for future site management.
- 2.5 In addition to the above, all planting must be carried out within the first planting season following occupation. Any tree and plant showing the following attributes must be replaced within a period of 5 years from the date of completion. These include those plants that:
 - Dead, diseased, or dying
 - Are missing or not in accordance with the specification
 - Lack any vigourReplacements must be carried out immediately, or in the next planting season, by the contractor at his own cost.
- 2.6 Any additional topsoil applied to the planting should be quality loam to BS 3882.
- 2.7 Inspection checks shall be carried out by a competent person, either a current member of BALI or the Landscape Institute, acting on behalf of the Management Company, at regular intervals and as appropriate work is carried out.
- 2.8 An Operation & Maintenance Manual will be required for identified site risks and made available to all site operatives.
- 2.9 No existing trees, shrubs or other plants shall be removed or cut without specific instructions from the Contract Administrator. Existing trees are to be retained, protected and undisturbed throughout the contract, according to latest Arboricultural Survey and Arboricultural Impact Assessment carried out by Tyler Grange.

3 Soft Landscape Specification

- 3.1 It is the contractor's responsibility to check for services in this area before groundworks commence. Please refer to Project H&S file for specific site risks.
- 3.2 All materials and installation to be undertaken in line with best horticultural practice and in accordance with guidance set out in British Standards specified relevant to this note and current at time of installation. All landscape works to be undertaken by competent persons, with appropriate training and equipment.
- 3.3 All plants should be grown and sourced in the UK (where feasible) and should be supplied from a nursery approved in advance by the landscape architect. Any substitutes to be agreed prior to ordering.
- 3.4 All arisings to be removed from site at contractor's expense unless noted otherwise.

Growing Medium / Soil Depths

- 3.5 All topsoil and subsoil used in planting areas to be accordance with the latest versions of BS3882 (Topsoil), BS8601 (Subsoil) and BS8545 (Tree from Nursery to Independence in the landscape). Soil analysis of all imported / onsite material to be approved by the landscape architect in advance of works.
- 3.6 Topsoil Heaps should be agreed with the site manager and stored no deeper than 2 metres to retain aeration and friable / dry properties prior to cultivation. Use a tracked machine to for heap and protect from wet weather once final height is achieved.
- 3.7 Ameliorants including all composts, mulches and soil conditioners used in planting should be peat-free. The use of pesticides (herbicides, insecticides, fungicides, and slug pellets) should be discouraged to prevent harm to wildlife. Any pesticides used should be non-residual.
- 3.8 Planting beds should be suitably cultivated and ripped to allow aeration and avoid waterlogging. Topsoil should be friable and be laid to a depth of 300mm for tree planting, 450mm shrub planting, 150mm for amenity grass/turf and 30-50mm for wildflower seeding to aid germination.

Planting

- 3.9 Trees and shrubs to be in accordance with NPS / BS 3936 British Standard BS 3936-1 1992, Nursery Stock Specification for Trees, and Shrubs. Avoid planting during period of hard frost and ensure all field grown (bare root / rootball) stock is planted inside the planting season typically November to March. Container Plants can be planted throughout the year subject to the right conditions and ensure all plants are suitably watered during dry periods.

Tree Selection and Location

- 3.10 Tree Species and locations should comply with the recommendations set out in NJUG Volume 4 Guidelines for the planning, installation, and maintenance of utility apparatus in proximity to trees (National Joint Utilities Group) and Buildings Near Trees - NHBC Standards Chapter 4.2 (National House Building Council). Tree planting should be coordinated with street lighting design to avoid canopy clashes once mature.

Planting Trees

- 3.11 All trees should be provided with adequate space for future root growth. Where possible this should be through natural soil conditions or by using a proprietary structural tree soil / root cell system. Refer to Tree Pit Details, where provided.
- 3.12 All trees, from saplings right through to semi-mature trees should be planted in accordance with nursery instructions and in accordance with good horticultural practice. Bio-degradable tree guards, stakes supports and ties shall be incorporated as appropriate for the tree size and species, so that they can provide protection during establishment. During establishment, grasses and tall herb species should be cut annually to reduce competition for resources – damage to bark must be avoided by use of strimmer guards or similar. Supports, ties, guards and stakes require regular checking and adjustment for effectiveness and to prevent chafing damage. Once trees are sufficiently established (at least 2 years post planting), tree support sundries should be removed, and annual cutting may cease.
- 3.13 Unless shown otherwise; tree pits to be 300mm larger than the rootball on all sides. Where necessary include a 100mm layer of horticultural grit to base of trench to aid free draining prior to backfilling with the approved subsoil / topsoil layer to the field grown/nursery height. Where the ground conditions result in the base of the tree pits being compacted or not free draining, pits and trenches will require positive drainage to all trees to thrive.

Tree Support and Accessories

- 3.14 Unless stated otherwise all tree should be provided with suitable supports and biodegradable tree tie as set out below:
- Standard Trees – Single Stake
 - Heavy – Extra Heavy - Double Staked
 - Extra Heavy to Semi Mature – Triple Staked
 - Semi Mature – Proprietary underground guying.
- 3.15 All trees to be planted with proprietary aeration/irrigation pipe installed to manufacturers recommendations. Trees planted in formal grass / lawn areas to include 1m diameter bare circle and bark mulched to a depth of 75mm to

avoid strimmer damage to trunk / water demand. Alternatively proprietary black strimmer guards should be fitted.

Root Barriers

- 3.16 Linear root barriers are to be installed in locations confirmed by the project engineer to protect services/surface treatments as required. Root barriers should be set min. 1.2m from the centre of the trunk and set as close to the surface as possible. Linear root barriers should be installed to the manufacturer's guidance, using a min. 600mm depth root barrier to protect adjacent surfaces. Where root barriers are for the protection of services or below ground attenuation, the root barrier should extend 300mm lower than the invert level of services. For details of services and any specific requirements, refer to engineer's drawings.
- 3.17 Planting Shrubs - to be planted in prepared beds, back filled, and firmed to nursery level. All plants to be set min 300mm from building/wall facades to enable access. Where turf abuts a building façade, a 300mm gravel strip should be provided (not drawn on the technical drawings).
- 3.18 Planting Formal Hedges - To be planted in double staggered rows (unless otherwise specified) along either side of a central timber post and 3 wire fences to aid establishment (unless adjacent to an alternative boundary treatment).
- 3.19 After planting, all trees and shrubs are to be well watered, lightly firmed, mulched with 75mm of medium grade FSC certified bark mulch ensuring no damage to the plants.
- 3.20 Rabbit proof fencing or spiral/canes maybe required to protect the establishment of the plants
- 3.21 Once planted all areas must be kept adequately watered to ensure establishment and all areas must be kept weed and litter free at all times.

Implementation Programme

- 3.22 Unless agreed otherwise all planting to be undertaken in the first available planting season following construction of the adjacent building.
- 3.23 Establishment - Trees and shrubs will be watered to ensure they thrive through dry weather and re-firmed after strong winds or frost heave.
- 3.24 Annual Maintenance - Trees and Shrubs - Tree ties to be adjusted, to be checked for damaged branches/stem and pruned in accordance with good horticultural practice, where they have died or failed to thrive, they will be replaced, incorporate a slow-release fertilizer as per manufactures rates, topping up mulch to ensure 75mm depth.
- 3.25 Native species-rich seeding - Once established, species-rich grassland requires less frequent management compared to amenity grass. Once the sward has

successfully established a consistent coverage of desirable native species, subsequent management will focus on reducing nutrient levels by an annual cut each autumn, which will include the collection and removal of arisings. Where the desired coverage is not achieved, a more varied and frequent cutting regime may require implementation to 'knock back' dominant grass growth and manage pernicious weed encroachment.

- 3.26 Defects period to be instructed for planting works to ensure replacement of dead/dying planting stock (with same sized specimens) within subsequent planting season. Defects periods recommended: min two-year defects period for tree planting, min one year defects period for shrub/herbaceous planting and min 6 months for wildflower/species-rich grassland areas.
- 3.27 All planting works to conform to BS 4428:1989; Code of Practice for General Landscape Operations (Excluding Hard Landscape Operations).
- 3.28 All maintenance operations to conform to BS 7030:1993 Part 4 1993; Recommendations for Maintenance of Soft Landscape (Except Amenity Turf).

4 Soft Landscape Maintenance – General Notes

All Planting

- 4.1 This Landscape Management Plan describes maintenance within the GI Parcels (see Figure 1). All planting will be maintained in perpetuity by the management company.

Ecological Enhancements / Habitat Creation

- Restoration of a strong native hedgerow and tree network through the site for enhanced ecological connectivity with surrounding woodland that will also reduce the massing of development for landscape character and visual amenity benefit;
- Proposed mitigation and enhancement measures to protect the existing habitats alongside the existing watercourses for particular benefit to Protected Species that includes Bats, Dormice and Great Crested Newts;
- Provision for enhanced management of existing grassland to benefit site biodiversity by variation of cutting regimes to encourage taller field margins alongside the existing hedgerows, with areas of informal meadow and more regularly cut species-rich lawns for benefit to a broader range of foraging invertebrates, birds and small mammals;
- Creation of opportunities for landscape recreation and amenity, so that the proposed and surrounding communities can enjoy healthy outside activities and the therapeutic benefit of contact with nature;
- Measures to create a comprehensive system of ecologically designed SuDS and watercourse enhancement measures to ensure that the development does not increase of nitrate, phosphate or sediment into the Itchen catchment, whilst providing increased habitat diversity;
- Protect existing and create suitable ecological buffers throughout the masterplan, designed to preserve and extend the existing valuable habitats, with additional green infrastructure enhancements to absorb the future development.

Existing Trees

- 4.2 Management of existing trees will require periodic management.
- 4.3 During construction, all existing trees to be retained shall be protected by root protection fencing in accordance with 'British Standards 5837:2012 Trees in relation to design, demolition, and construction – Recommendations'.
- 4.4 Refer to the accompanying Arboricultural report for full details of which trees are to be retained and protected during construction.

- 4.5 Managed thinning, significant pruning works and / or felling should be undertaken by an Arboricultural Association Approved Contractor to British Standard 3998 Tree Work specifications.
- 4.6 Any works to trees protected by a Tree Preservation Order or within a Conservation Area will need to obtain the necessary approval from the Local Planning Authority prior to any works. Refer to general note 2.9 above.
- 4.7 All tree surgery works to be carried out between September and February. No works should be carried out between start of March and Mid-September to avoid the bird nesting season.
- 4.8 Deadwood within tree canopies and fallen deadwood should be retained in-situ to provide habitat for deadwood invertebrates.
- 4.9 Healthy trees should not be pruned or have their crowns lifted unnecessarily.
- 4.10 Veteran trees may require supplementary monitoring and a means to limit or control public access beneath vulnerable canopies, where risk of limb / branch drops may be deemed more likely.
- 4.11 Tree health monitoring visits should be considered after periods of excessively windy or stormy weather to check for damage and structural defects that may require remedial action to protect the public using landscape spaces.
- 4.12 Field layer / ground level vegetation beneath tree canopies should not be mown once established (at least 2 years post planting). The encouragement of native ground flora by protection of these areas from trampling / trafficking is recommended.

Existing hedgerows

- 4.13 Existing hedgerows will require periodic management.
- 4.14 During construction, the existing hedgerow vegetation to be retained shall also be protected in accordance with the measures described in 'British Standards 5837:2012 Trees in relation to design, demolition and construction – Recommendations' will be followed.
- 4.15 Pruning operations should take place between November and February to avoid harm to Protected Species (dormice), nesting birds and plant health during the spring / summer growing period. During this period, no cutting of the hedgerow bases should take place to avoid harm to small mammals and hibernating reptiles. If bases require cutting this should occur in April after an appropriate check for Protected Species.
- 4.16 The hedgerows should be managed in rotation, cutting only one side annually to ensure that there is a continuous supply of fruit during the winter months for species such as redwing, song thrush and starling. The hedgerows maintenance should follow the Ecologist recommendations to ensure the retainment and enhancement works are successfully achieved – such as maintaining the hedgerows at >1.5m in height and width and more.

- 4.17 Hedgerows next to pedestrian footpaths should be trimmed regularly to avoid causing obstructions – management works should follow Ecologist recommendations.
- 4.18 If necessary, managed thinning, significant pruning works and / or felling should be undertaken by an Arboricultural Association Approved Contractor to British Standard 3998 Tree Work specifications.

Existing Grassland Areas

- 4.19 Areas of rough and modified grassland will be retained and are not required for site user recreation, should be subject to a reduced mowing regime to create a longer sward height and a gradual increase of structural/species diversity – refer to Ecologist BNG Assessment for target conditions and specific maintenance details.
- 4.20 Reinstatement sowing for areas of subsequent ground disturbance or excavation shall be prepared for overseeding by cutting to knock back aggressive weed-growth. Subsequent scarification of the ground after mowing will 'open up' the ground to optimise the important need for seed to soil contact.
- 4.21 Overseed reinstatement areas soon after scarification with an appropriate species-rich mix during Autumn, potentially incorporating species such as Yellow Rattle to support species diversity. Note that alternative spring-sowing will require vernalisation of the seed mixture to stimulate germination prior to seeding. Initial establishment maintenance will require a modified cutting regime to help keep dominant or aggressive grass or weed growth from outcompeting the desirable sward species – likely to comprise a more regular topping cuts to discourage excessive growth and overshadowing.

Invasive Species

Where necessary, annual monitoring of the site for invasive species will be carried out each summer by a qualified ecologist or site manager. Non-native invasive species listed on Schedule 9 of the Wildlife and Countryside Act (1981) may become established within the site during the lifetime of the development. In such an event, appropriate action will be required to eradicate invasive species from the site.

Soft Landscape Maintenance Activities

4.22 The following maintenance activities should be carried out for all areas of soft landscaping under management control:

Item	Activities	Suggested Frequency
Watering	Water all areas of grass, perennials, shrub and tree planting to ensure healthy development and survival	As required during periods of dry weather
Plant replacements	All plant deaths should be replaced as soon as practical Remove dead plants within one week and replace within the next planting season, with originally specified species at a size to match maturity of established planting or as soon as practical	As required
Clearing of services	All plant material is to be kept clear of the following structural elements where present: ventilation ducts and openings, drainage channels and gullies, service access points, and light fittings	Once a month
Debris and Litter	Keep planting beds clear of litter, leaves and debris	Total 18 visits. Twice a month from May to October. Once a month from November to April.
Weed Control	Keep planting beds free from weeds at all times Remove weeds entirely, including roots Remove the minimum quantity of soil, and disturb plants, bulbs and mulch as little as possible Rake area to a neat and tidy condition Where present reinstate mulch. Do not mulch where ground cover planting has established, and no bare ground is visible	Total 18 visits.
	Treat all planting beds with a winter herbicide to control weed growth	Once a year before March

Soil Aeration	All areas of planting suffering compaction by pedestrian or vehicular movements should be lightly forked over Prick surface to a depth of 75mm Reduce soil to crumbs and level off Do not damage plant roots	Once every 2 months
Digging Over	All planting beds, should be lightly forked over to maintain health soil condition to a depth of 75mm	Once a year in Spring

5 Proposed Tree Planting

Tree planting

- 5.1 Native tree planting has been proposed on site where possible. Specimen trees are proposed alongside the new roads and footpaths to complement and integrate with the wooded site edges and existing field boundary hedgerows.
- 5.2 Management operations will include thinning to remove any deadwood and promote growth.
- 5.3 All tree works to be undertaken by an Arboricultural Association Approved Contractor to British Standard 3998 Tree Work specifications.
- 5.4 Any thinning works are to be carried out outside of the nesting season to avoid disturbance to birdlife; active nests will be left with a suitable buffer until nesting ends.
- 5.5 Trees planted within amenity grass areas to have a weed free circle of 1 metre diameter maintained for the first three years.
- 5.6 A strimmer guard should be fitted to all standard sized trees upwards within grass areas to protect the trunk from potential strimmer damage.
- 5.7 Tree stakes should be removed after 18-24 months. Any trees not able to support themselves after this period should be replaced in agreement with the landscape architect or local planning authority.

Watering

- 5.8 Watering should be applied to the base of the tree during the growing season (bud burst through to full leaf fall) and evenly distributed over the entirety of the root-ball and/or the irrigation pipe (where specified) to encourage even root development.
- 5.9 Newly planted trees will need watering dependant on the size of tree planted, soil type and species. Below is a guide estimation as to how much water is required in the first year of planting¹.

Size of Tree	Volume of Water per week
12-14 CMG	25 litres: 6 Gallons
14-16 CMG	35 litres: 9 Gallons

16-18 CMG	80 litres: 20 Gallons
18-20 CMG	80 litres: 20 Gallons
20-25 CMG	100 litres: 25 Gallons
25-40 CMG	120 litres: 30 Gallons
40-60 CMG	150 litres: 32 Gallons
60-80 CMG	200 litres: 43 Gallons
80-100 CMG	250 litres: 54 Gallons

¹Hillier Trees Tree Aftercare Maintenance Checklist

6 Southern Green Infrastructure



Figure 2 – Southern Green Infrastructure Location Map

Existing Planting

- 6.1 The Southern GI parcel is made up of a series of native hedgerows and trees that split the site into narrow corridors between the contained and open areas of the Southern GI.
- 6.2 Within the centre of this parcel, is an area of veteran oak trees designated The Platt SINC. Along the peripheries of the site is a number of mature English Oak, Goat Willow and Alder trees that frame the surrounding hedgerow boundaries. For wider existing tree maintenance refer to Section 4.
- 6.3 The Southern GI is surrounded by a series of field hedgerows along many of the site boundaries. These are in general in good condition but will be reinforced with infill planting to close the existing gaps within the hedgerow to provide a cohesive field hedgerow boundary along the eastern boundaries. For existing hedgerow maintenance refer to Section 4.

SuDS Features

- 6.4 Within this parcel, there are proposed two new retention ponds and an existing basin to be enhanced with wetland planting – for SuDS maintenance refer to Section 10 and Engineers SuDS Strategy report.

- 6.5 To the western part of the GI parcel predominantly within the flood zone, the existing grassland area is to be retained and maintained as its current state. To be maintained in accordance with the Ecologist recommendations. This area is reserved for future wetland creation.
- 6.6 The proposed retention ponds and existing one are to be seeded with an appropriate seed mix that will provide enhancement and habitat opportunities to the banks; as well as include marginal and fully aquatic planting to the median water level areas in accordance with the proposals and engineer's information.

Proposed Planting

- 6.7 The proposed tree planting stems from the purpose to increase the biodiversity and wider native species found within the Southern GI, this includes the introduction of River Birch and Willow tree planting to enhance the existing and proposed ponds with a focus on fruit and flowering native species such as Hawthorn, Wild Cherry and Bird Cherry. For more detailed information on proposed tree planting maintenance refer to Section 5.
- 6.8 Scrub planting is proposed to the north of the Southern GI adjacent to the connection to Phase 3 SuDS feature. This buffer mix will consist of a number of native fruit bearing shrub planting to provide food and sheltering habitats for the surrounding protected species. This will be maintained through coppice plant management methods, this includes a three year rotational cut to allow a consistent maintenance of shelter and consistent fruit bearing annually.
- 6.9 The scrub planting will be trimmed to a maximum height of 2-3 metres using mechanical cutting methods. This should be checked at least once annually to assess the scrub for diseased/ dying plants removal, damaged limbs and replanting of gaps within the scrub. For further information refer to Section 11.4 for detailed annual maintenance regime.
- 6.10 Existing Native Hedgerow is to be infilled with at least 5 woody species in accordance with Ecologist recommendations. This is to close up existing gaps within the hedgerow allowing habitat corridors between the Southern GI to be established. These should be maintained by adopting the management principles of a field hedgerow, similar to the existing hedgerow maintenance described in Section 4.
- 6.11 Hedges should be trimmed on three-yearly rotations to ensure a consistent screen and suitable nesting habitats for surrounding birdlife. This includes occasional 'coppicing' to remove deadwood and promote new dense growth whilst creating increased air flow. Refer to Section 11.2 for detailed annual management.

Proposed Grassland Areas

- 6.12 The majority of the Southern GI will be fenced off to create protected grassland areas (retained and proposed new areas).

- 6.13 Towards the central area of the Southern GI moving towards The Platt SINC the area is accessible to the public to allow the residents to interact with the surrounding habitat and provide informal play opportunities. This is indicated through a more rigid mowing regime, in which these unfenced areas are seeded with a flowering lawn mix to provide a consistent sward. For further information refer to Section 9.
- 6.14 Within the fence off areas, there will be a more relaxed mowing regime to allow for islands of longer grass swards to create refuge for surrounding invertebrates - refer to Ecologist BNG Assessment for target conditions and specific maintenance details.
- 6.15 This includes reinstating existing grassland areas through the enhancement of an 80:20 wildflower mix, in line with ecologist recommendations. For detailed information refer to Section 9.

7 Central Green Infrastructure



Figure 3 –Central Green Infrastructure Location Map

Existing Planting

- 7.1 The existing planting is surveyed as being dominated by the English Oak and Ash species towards the peripheries of Foxholes Wood. Foxholes Wood is a woodland area comprised by English Oak, Ash, Goat Willow, Beech, Field Maple and understorey planting.
- 7.2 Foxholes Wood follows the Foxwood Stream running east to west to the north of the existing solar farm. This green corridor represents the North-South split in the two existing landscape typologies.
- 7.3 The existing woodland and woodland edge should be maintained in accordance with Section 4 and Ecologist BNG Assessment maintenance details.
- 7.4 Near the southern boundary of the Central GI there is a linear hedgerow following the boundary to the existing solar farm. This is to be retained and managed following Section 4.

Proposed Planting

- 7.5 To enhance the existing woodland planting, the proposed tree species have been chosen to reflect the Foxholes Woodland whilst also providing a transition from the woodland edge to the grassland open areas with some parkland tree specimens.
- 7.6 The proposed trees include the introduction of Elm, Rowan, Sweet Cherry and Hawthorn, chosen for their fruit and flowering qualities that provide food for surrounding wildlife. The tree planting should follow the management of Section 5.
- 7.7 Scrub planting was introduced in both fenced and unfenced areas to provide a native transitory buffer between the rich grassland habitat and the footpath

beyond. This scrub planting will be maintained at a very low level to allow for natural surveillance along the footpath, in particular within the seating area to allow for users to be seen across the footway.

- 7.8 On this scrub planting, in particular the dogwood and the hazel will be managed through coppice scrub management. This includes periodic thinning of the scrub planting to remove deadwood using mechanical cutters. Refer to Section 11.4 for more detailed annual management.
- 7.9 To improve the eastern edge of the Central GI close to Burnetts Lane, a consistent native mix hedgerow along the northern boundary to the existing settlement has been proposed. This hedgerow will consist of several woody species to provide refuge for birds as well as reinforce associated scrub habitats and provide connectivity throughout the site.
- 7.10 This native hedgerow should adopt the maintenance of a field hedgerow regime, with the aim to increase flowering, nectar and berrying fruits. These hedges should be trimmed on a three year rotation instead of annually.
- 7.11 Native hedgerow should be trimmed alternately on either side for the first two years with a top cut on the third season. Trimming should ensure a consistent screen from the ground level and provide habitat for nesting birds. For detailed information refer to Section 11.2.

Proposed Grassland Areas

- 7.12 Within fenced areas, the grassland will contain a species rich grassland habitat consisting of 80:20 grass to wildflower mix, in accordance with ecologist recommendations. This should have a relaxed mowing regime to allow for the mix to establish with annual hay cuts to give the mix opportunities to flower. Certain areas should be cut back to allow for areas of high and low grassland to be maintained, in accordance with ecology recommendations, this creates a healthy sward as well as providing refuge for invertebrates. Refer to Section 9 for more details.
- 7.13 Within unfenced areas, a more formal mowing regime should be maintained to allow for informal play and recreational use. These accessible areas will be seeded with a flowering lawn and be mown regularly (between 7-10 days during the growing season). Refer to Section 9 for more detailed information.
- 7.14 To the eastern edge of the Central GI close to Burnetts Lane, as this area is prone for seasonal wetland, the ground will be seeded with a wetland mixture. This will allow these areas to be seeded with species that are suitable for seasonally waterlogging as well as periods of drought. This area will be maintained through traditional meadow management whilst being seeded in early autumn or spring to allow for the meadow to be well- established prior to seasonally flooding. Refer to Section 9 for further information.

8 Northern Green Infrastructure



Figure 4 – Northern Green Infrastructure Location Map

Existing Planting

- 8.1 The Northern GI parcel is part of the Quobleigh Woods SINC and Ancient Woodland consists of clumps of existing tree planting to the northern edge with species such as English Oak and Field Maple being prevalent. This creates a narrowing effect to the Northern GI, running along the edge of the footpath and funnelling users through the space.
- 8.2 The existing woodland and woodland edge should be maintained in accordance with Section 4 and Ecologist BNG Assessment maintenance details; and any maintenance within the SINC should be undertaken under careful supervision to be carried out with a suitably and qualified ecologist present.

SuDS Features

- 8.3 Quobleigh Woods SINC is associated with the Quobleigh Stream that runs through the middle of the SINC and continues to Quobleigh Pond to the east of the site. This area is also defined by flood zone and will be fenced and retained under ecologist recommendations.
- 8.4 To the northeastern corner of the site near the footpath connection to Lapstone Playing Fields includes a new proposed SuDS Pond – for SuDS maintenance refer to Section 10 and Engineers SuDS Strategy report.
- 8.5 The proposed retention ponds and existing one are to be seeded with an appropriate seed mix that will provide enhancement and habitat opportunities to the banks; as well as include marginal and fully aquatic planting to the

median water level areas in accordance with the proposals and engineer's information.

Proposed Planting

- 8.6 In keeping with the nature of the surrounding of Quobleigh Woods SINC, the proposed tree planting species have been chosen based on native tree planting species with fruit and flowering qualities, whilst also being chosen for their waterlogging properties in areas near the flood zone and adjacent the proposed retention pond. These areas should be maintained in accordance with the maintenance programme set out in Section 5 and 11.1.
- 8.7 Proposed Scrub planting is to be planted around the proposed retention pond. This is to provide a naturalistic transition between the existing woodland edge and the proposed SuDS feature. This scrub planting will be in particular of dogwood and hazel and will be managed through coppice scrub management. This includes periodic thinning of the scrub planting to remove deadwood using mechanical cutters. Refer to Section 11.4 for more detailed annual management.
- 8.8 The scrub planting will also be present near the footpath connection to Lapstone Playing Fields. This buffer mix will consist of a number of native fruit bearing shrub planting to provide food and sheltering habitats for the surrounding protected species. This will be maintained through coppice plant management methods, and includes a three year rotational cut to allow a consistent maintenance of shelter and consistent fruit bearing annually.
- 8.9 This will be trimmed to a maximum height of 2-3 metres using mechanical cutting methods. The scrub planting should be checked at least once annually to assess the scrub for diseased/ dying plants removal, damaged limbs and replanting of gaps within the scrub. For further information refer to Section 11.4 for detailed annual maintenance regime.
- 8.10 Proposed Native Hedgerow will be introduced near the western boundary to complement the Phase 3 Road proposals. This mix has been chosen to be cohesive with the roadside hedgerow application whilst creating a transition between the native woodland of the Northern GI and the Phase 3 Road.
- 8.11 This native hedgerow should adopt the maintenance of a field hedgerow regime, with the aim to increase flowering, nectar and berrying fruits. These hedges should be trimmed on a three year rotation instead of annually.
- 8.12 Towards the north of the Northern GI runs a proposed hedgerow with standard tree planting within close proximity to the existing stream and proposed wetland habitat. This mix consists of more waterlog tolerant species with the introduction of Common Alder and Goat Willow, both species are found in close proximity to water meadows promoting the character of the woodland wetland character of the Northern GI.

- 8.13 This proposed hedgerow will also be planted with smaller proposed Common Alder and Common Oak tree planting, this is to reinforce the hedgerow for woodland habitats. This proposed hedgerow is to adopt a field hedgerow maintenance with the aim to increase flowering and should be trimmed on a three year rotation. This hedge is to be planted on a 0.5m bank, in accordance with Arboriculturalist recommendations. Refer to Section 11.4 for more detailed information.

Proposed Grassland Areas

- 8.14 The majority of the Northern GI will be fenced off to retain the existing habitats and protect the enhanced areas in accordance with ecologist recommendations. This includes the reinstatement of existing grassland to the north of the Northern GI.
- 8.15 In fenced areas closer to the south, these should be seeded with a species rich grassland mix consisting of 80:20 grass to wildflower mix, in accordance with ecologist recommendations. This should have a relaxed mowing regime to allow for the mix to establish with annual hay cuts to give the mix opportunities to flower. Certain areas should be cut back to allow for areas of high and low grassland to be maintained, in accordance with ecology recommendations, this creates a healthy sward as well as providing refuge for invertebrates. Refer to Section 9 for more details.
- 8.16 Within unfenced areas – adjacent to the footpath edges - a more formal mowing regime should be maintained to allow for recreational use. These areas should be seeded with a flowering lawn and be mown regularly (between 7-10 days during the growing season). Refer to Section 9 for more detailed information.

9 Grassland / Meadow

Protected Species Rich Grassland

- 9.1 Areas of rough and species-rich grassland meadow that will be retained and are not required for site user recreation, should be subject to a reduced mowing regime to create a longer sward height and a gradual increase of structural/species diversity.
- 9.2 Post-construction, new areas of grassland will be created through the sowing of a grassland / wildflower seed mix, incorporating locally prevalent species from the surrounding locality. Upon preparation of a weed-free tilth, the seed will be sown at 5gm per m² and then lightly raked into the surface.
- 9.3 During the first year after sowing, the sward will be topped every 1-2 months (depending on growth rate), so that persistent weeds and dominant grass can be knocked back for benefit to meadow species. Pernicious weeds such as Dock, Thistle and Nettle can be dug up using hand tools or spot treated with an appropriate herbicide before they flower and set-seed or establish in large stands.
- 9.4 Established rough grassland should be mown twice a year; once in September to give wildflowers time to set seed, and once in March/April as a topping cut to knock back dominant grass. Arisings from mowing should be composted or removed off-site. Removing the arisings will lower the nutrient content of the soil over time, favouring a range of wildflowers and reducing competition from grasses which may otherwise come to dominate the sward.
- 9.5 The sowing of wildflowers will ensure flower-rich habitats that provide foraging opportunities for a range of birds and insects.
- 9.6 Annual mowing will also prevent the encroachment of scrub into the site and will maintain current management in areas that may have increased ecological sensitivity and value.
- 9.7 Reinstatement sowing for areas that have failed to establish and thrive, or for areas of subsequent ground disturbance or excavation shall be prepared for overseeding by cutting to knock back aggressive weed-growth. Subsequent scarification of the ground after mowing will 'open up' the ground to optimise the important need for seed to soil contact. Overseed reinstatement areas soon after scarification with an appropriate species-rich mix during Autumn, potentially incorporating species such as Yellow Rattle to support species diversity. Note that alternative spring-sowing will require vernalisation of the seed mixture to stimulate germination prior to seeding. Initial establishment maintenance will require a modified cutting regime to help keep dominant or aggressive grass or weed growth from outcompeting the desirable sward species – likely to comprise a more regular topping cuts to discourage excessive growth and overshadowing.

- 9.8 The sward height must be varied with at least 20% of the sward >7cm in height, and 20% <7cm to maximise the microhabitats for invertebrates and other small fauna – refer to Ecologist report for further information.
- 9.9 Species rich grassland proposed should be Wildflower & Grass Seed Mix: EM2 or EM4 80:20 grass to wildflower mix, as supplied by Emorsgate Seeds or equivalent and approved, sown at 4g/m².

Regularly Mown Areas – Flowering Lawn Mix

- 9.10 To provide a sense of order and legibility to site circulation routes, a mown grassland strip of a minimum of 1m either side of footpaths.
- 9.11 The extent of mowing should approximately follow the organic design as shown on the landscape detailed proposals and to be adapted seasonally to balance the use of the space for amenity value with biodiversity protection.
- 9.12 These areas should be sown with a flowering lawn as per ecologist recommendations. This is due to the selection of perennial grasses with wildflower that respond well to short and regular mowing.
- 9.13 Seeding is best done in autumn or spring; however this can be done throughout the year so long as there is sufficient warmth and moisture. This should be done in overlapping sections and tread or rolled into to give good soil contact.
- 9.14 Newly sown flowering lawns will need regular mowing throughout the first growing season (frequency every 7-10 days) and should be cut to a height between 40-60mm with cutting removed if dense. This is to allow the mown areas to develop a good sward structure and maintain a balance between the faster growing grasses and slower wildflowers, as well as control annual weeds.
- 9.15 Any residual weeds should be removed such as docks.
- 9.16 The lawn should be mown around 25-40mm, and mowing regimes can be relaxed from late June. The lawn should be cut when it becomes untidy (after 4-8 weeks) and may be suspended earlier in the year to allow cowslip to flower.
- 9.17 Heavy quantities of cutting should be collected and removed from site.
- 9.18 Grassed edges to planted areas to be trimmed to maintain a clear smooth edge to planted beds; strim edges elsewhere but not against trees; spike annually in October.
- 9.19 Nylon Line Grass Cutters. This specification refers to the hand-held machines which utilise horizontally revolving strips of nylon to cut grass and other herbage obstacles.

- 9.20 Care must be exercised when cutting grass and weed growth close to trees and shrubs. No damage is to be caused to the bark of such trees and shrubs by the nylon cutting line.
- 9.21 The nylon line is not to be allowed to touch the ground, thereby creating the danger of throwing soil and stones into the air.
- 9.22 The Contractor shall submit for Employer's approval a method statement for mowing and maintaining grass and planting on steep banks.

Flowering Lawn Mix: [EL1 Flowering Lawn Mixture - Emorsgate Seeds \(wildseed.co.uk\)](#) or similar and approved.

Wetland Meadow Mix

- 9.23 For seasonally wet areas and areas designated for wetlands, this should be seeded with a seed mix that's suitable for seasonal flooding and times of drought. This mix is proposed to the Central GI parcel.
- 9.24 This mix should be sown either in early autumn or spring once the land is well-drained, most of the planting within this mix will need some time to mature to withstand seasonally flooding.
- 9.25 This seed can be sown by hand or by machine, and should be evenly distributed through overlapping sections, then treaded into the soil.
- 9.26 Most of this mix is slow to establish, annual weeds will arise from the seed bank shortly after sowing, however these protect the seedlings and provide habitat for insects. The weeds will die before the end of the year.
- 9.27 Resist cutting these annual weeds, especially if sown with Yellow Rattle or a nurse of cornfield annuals. This can be cut, removed and composted in early August to reveal the young meadow underneath. This should be kept short through grazing or mowing until the end of March the following year.
- 9.28 Following mowing or grazing, ensure that residual perennial weeds such as docks have been removed.
- 9.29 This mix should be managed by following traditional meadow management methods. This is based on a summer hay cut combined with autumn mowing and the option of spring mowing or grazing.
- 9.30 Meadow grassland should not be cut or grazed from end of March to late July/ early August to give sown species the opportunity to flower. Following flowering, a hay cut should be done in August using a scythe, petrol strimmer or tractor mower to around 50mm. This hay-cut should be left on site, to dry and shed seed for 1-7 days before being removed from site. Mow or graze the re-growth through the late autumn/ winter to circa 50mm and again in spring if needed.

Wetland Meadow Mix: [EM8 Meadow Mixture for Wetlands - Emorsgate Seeds \(wildseed.co.uk\)](#)

10 Wetland Areas / SuDS Strategy

- 10.1 This section summarises the sustainable drainage maintenance requirements for the SuDS features such as the 4 no. retention ponds (proposed and existing) and filter drains integrated within the landscape spaces and combined with ecological planting.
- 10.2 Supporting the hydrology filtration systems, will be the adjoining margins of native grass / species-rich marginal sowing that will also contribute beneficial filtration and biodiversity benefit. Forebay areas of permanent water and basin areas prone to more frequent inundation may be planted up with native aquatic and marginal plug plants or pre-established coir matting pallets.
- 10.3 The ponds identified have been detailed by the project Drainage Engineer to understand the amount of water flow (filtration improvement opportunities) and capability to support suitable wetland plants that contribute to the filtration capture process.
- 10.4 Proposed marginal planting are selected to tolerate intermittent flows and periodic dry periods fluctuations in water levels caused by adverse weather conditions. The marginal nitrate mitigation planting enhancement will be in accordance with planting species set out in table 1 and illustrated in the drawings included in this report as appendices.
- 10.5 In accordance with NE guidance, landscape character and ecological guidance we have sought to propose a mix of wildflowers and native marginal aquatic planting that will enhance the SuDS strategy.

Existing Watercourses

- 10.6 Existing watercourses, ditch lines and all proposed retention ponds will be monitored for non-native invasive species such as: Canadian pondweed or waterweed (*Elodea canadensis*), floating pennywort (*Hydrocotyle ranunculoides*), and New Zealand pigmyweed (*Crassula helmsii*).
- 10.7 Should undesirable plant species be identified, these should be removed with hand tools avoiding damage to other vegetation. Works timing between October to January (inclusive) will help to avoid the amphibian breeding season and whilst reptiles are active. Vegetation removal should be stockpiled for 24 hours to allow trapped invertebrates / amphibians time to egress and return to the habitat.
- 10.8 It is proposed to monitor the existing ditch lines for vegetation encroachment and manage for effective run-off capacity by maintaining as 1/3 of it is free of tall vegetation. Clearance to sections of the ditches may only be undertaken on rotation and completed between October and January (inclusive). Periodic inspections by a suitably qualified ecologist will help identify the presence of

invasive species or recommendations to adapt management regime for biodiversity benefit.

SuDS Features

- 10.9 There are 4 SuDS Features within the Site – 3 in Southern GI, 1 in the Northern GI. These are to be seeded along the banks with suitable pond edge mix. Wider maintenance obligations should be carried out in accordance with Engineers SuDS Strategy report.
- 10.10 The proposed SuDS Features are to be managed for optimised Biodiversity Net Gain, so fenced off from casual access by open space users, residents and their pets. The proposed timber post & rail fencing will incorporate a stock-proof mesh to discourage access by dogs and small children. To minimise climbing, the posts will face outside the SuDS, with stock-proof mesh between, so that the horizontal rails are affixed on the inside. Access maintenance gates are required for each basin, with positions coordinated for safe access and good natural surveillance. Fencing, gates and any life-saving flotation devices will need to be regularly inspected and maintained.
- 10.11 Wildflower Mix & Native Wetland Planting: For slope of SuDS ponds, EP1 Pond Edge Mixture, supplied by Emorsgate Seeds or equivalent, sown at 4g/m². Native plug planting or coir mats with pre-established native marginal species will supplement seeding for water quality treatment & to trap sediment by early establishment.
- 10.12 Refer to Engineers SuDS report for further information and maintenance recommendations.

Marginal / Aquatic Planting

- 10.13 In areas where the median water level is higher than the base of the pond, semi-aquatic and aquatic marginal planting will be planted within smaller clumps.
- 10.14 The proposed marginal planting will form an integral feature and is able to tolerate intermittent flows and periodic dry periods whilst still providing effective filtration. See figure 5 below.

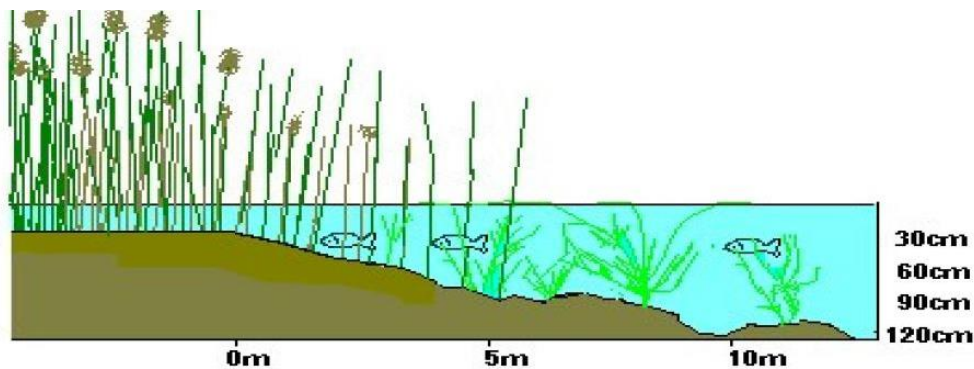


Figure 5 - Natural Marginal Planting (RSPB Reedbed Design Guidance Version 4 July 2004)

Planting Seedlings

10.15 Planting plug grown seedlings by hand using a dibber is the most widely used method of establishing marginal planting and can compete and survive adverse weather conditions.

10.16 Whilst the anticipated water levels will sustain the plants once established, it is advisable that during any drought periods the seedlings should be regularly irrigated.

10.17 Once established, management of the marginal planting should be limited and allowed to spread naturally to allow enough balance between reed bed establishment and open water. Key maintenance requirements /operations should include:

- Checks for debris or litter build-up;
- Checks for invasive non-native species;
- Annual vegetation cutting and maintenance;
- Removal of unwanted self-sown trees, scrub or other such plants that could damage the hydraulic design;
- As required de-silting operations; and
- Periodic checks for any compromise of the hydraulic / filtration integrity

10.18 Consideration of the long-term security of facilities and their adoption at an early stage is advisable.

10.19 Pond maintenance will be carried out, including dredging to be undertaken on a cyclic basis, to control the accumulation of silt, to prevent succession and improve water quality. Removal of rubbish will also be undertaken. Management of the pond habitat will occur during the winter, after the amphibian breeding season. Monitoring of the pond by a suitably qualified hydrologist and ecologist will inform the management required for the wetland areas.

10.20 Dredged material will be removed from the pond and left to one side for a period of 48 hours so that fauna may return to the water body. A waste management licence may be required to dredge plant material from the pond.

10.21 The grassland in the vicinity of the attenuation pond will be managed in a traditional manner, without artificial fertiliser, to maintain and enhance its nature conservation interest. This will include an autumn cut after the herbs and grasses have seeded. A carefully controlled cut, i.e. using light machinery and cutting the sward to no less than 6 inches, is unlikely to harm reptiles, and should benefit them by maintaining the grassland in an open condition and preventing scrub encroachment. Additionally, cutting a rotational basis i.e. leaving selected areas unmown for an entire season, should assist in providing structural diversity to the sward, and provide suitable basking, foraging and refuge areas for reptiles, as well as enhancing its invertebrates' diversity.

10.22 Based on the proposed pond a list of mitigation planting, set out below, will inform the mixes that will be applied to the proposed ponds. This includes:

Mitigation Planting	
Wildflowers	
Botanical Name	Common Name
Carex acutiformis	Lesser Pond Sedge
Mentha aquatica	Water Mint
Ranunculus flammula	Lesser Spearwort
Schoenoplectus lacustris	Common Club-rush
Veronica beccabunga	Brooklime
Marginal / Aquatics	
Caltha palustris	Marsh-marigold
Iris pseudacorus	Yellow Flag Iris
Juncus effusus	Common rush
Lythrum salicaria	Purple Loosestrife
Myosotis scorpioides	water forget-me-not
Scrophularia auriculata	Water Figwort

Stachys palustris

Marsh Woundwort

Table 1 – Proposed Marginal Planting

Overall Operation and Maintenance Requirements for SUDS

MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
Regular maintenance	Remove litter and debris	Monthly, or as required
	Maintain fencing, gates & safety flotation devices	Monthly
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets, and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for silt accumulation or similar, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
	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% or more of the swale treatment area
Occasional maintenance	Repair erosion or other damage by re-turfing, planting or reseeded	As required
Remedial actions	Relevel uneven surfaces and reinstate design levels	As required
	Scarify 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
	Damage to fencing, gates or safety devices	As required

Marginal / Tall Emergent Planting

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Watering	During establishment of wildflower plug germination During periods of prolonged dry weather	
Cutting	Cutting needed to provide diverse, scrub free marginal areas. First year cut: Annual weed growth to be cut back to encourage perennial ground coverage	Once during March
	Subsequent cuts Work in 2/3 years' rotation, work on one bank each year.	Between September / November

Newly Sown Meadow Areas to Attenuation Pond

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Watering	During establishment of wildflower plug germination During periods of prolonged dry weather	As required
Cutting Emorsgate EP1 – Pond Edge Mixture	Cutting needed to provide diverse, scrub free areas. First year cut: Annual weed growth to be cut back to encourage perennial ground coverage	Once during March
	Subsequent cuts Work in 2/3 years rotation.	Between September / November
Assessment		Once every 5 Years

	- Arrange for all wildflower meadow areas / ponds / swales to be inspected by a qualified ecologist to ascertain the establishment of the meadow areas and associated habitat enhancements. Make recommendations as necessary to address any health problems or necessary remedial works. - Hydrologist to check Attenuation areas periodically to ensure functioning requirements are being achieved. - Make recommendations as necessary	Once a year
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Pond Mix

- 10.23 The pond mixture contains wildflowers and grasses suitable for sowing along the wet margins of the existing and proposed basins.
- 10.24 The basin edges should have weeds removed using repeated cultivation, and then bury the surface vegetation and harrow or rake to produce medium tilth.
- 10.25 Sowing on ground prone to waterflooding is safest during late summer or in spring once the land has drained, as most of these plants need time to mature to withstand flooding.
- 10.26 The seeds must be surface sown and can be applied by machine or by hand, to sow evenly divide the seed and sow in overlapping sections. Do not cover the seed.
- 10.27 During the first year, the annual weeds must be cut back to encourage the development of a good perennial ground cover. Establishment may be patchy and take several years to fully colonise.
- 10.28 The habitat value of pond edge sowing is enhanced if there is a variety of vegetation, and therefore management should aim to create variation with minimal disturbance to local habitat populations. Variation can be achieved by cutting back and removing small sections of the vegetation every 2-3 years in rotation.
- 10.29 In attenuation basins, remove vegetation as a wedge. Dense stands of single species (such as yellow irises) may benefit from selection thinning. Vegetation removal should be carried out between September and November when removal causes least disruption to wildlife.
- 10.30 Machines and heavy equipment should be used with care on wet sites to avoid damage to soil and vegetation. Wet grassland which is occasionally or seasonally flooded can be managed as a meadow or grassland.

10.31 In marginal wetland zones the water levels in the soil are never more than 50cm below the surface, but only occasionally submerge the plants growing there.

Attenuation Basin Mix: [EP1 Pond Edge Mixture - Emorsgate Seeds](#)
(wildseed.co.uk)

11 Maintenance Schedule – Specific Activities to Plant Typologies

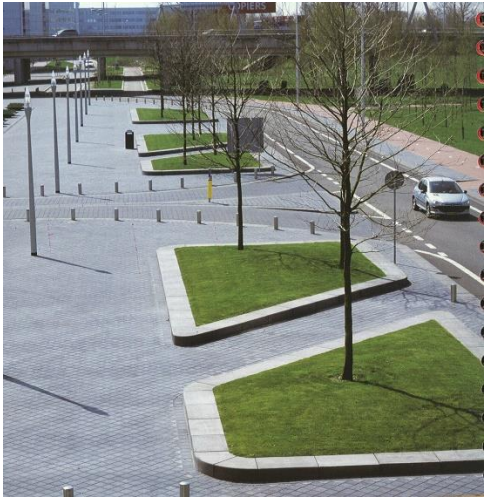
11.1. Management of New Specimen Trees				
Area Type	Aims & Objectives	Post Construction Years 1-5	Maintenance Years 5-10	Maintenance Years 10-15
Specimen Trees 	To ensure the successful establishment of new standard trees Establish tree canopy and good root system quickly. Control competition from weeds. Provide conditions that will ensure survival of trees. Provide visual variety and wildlife benefits.	2 visits per annum: Check for dead or dying trees and replace with like for like (species/ specification). Water regularly using the irrigation pipe during establishment (first 24 months) and in drought conditions in first 5 years to ensure establishment and continued thriving of planting. Check tree and remove dead or damaged branches. Formative prune Years 3 & 5 Check stakes to ensure that they are secure and are not causing damage to the tree. Check tree ties & adjust if required annually. Check tree guards and maintain tree integrity. Maintain weed free 1m diameter area at base of tree using suitable translocated herbicide. Apply during growing season in favourable weather conditions as per manufacturer's instructions. Note: Avoid spray drift. Apply mulch on planting and top up as required thereafter. During spring apply fertiliser and top up bark mulch ring to tree to maintain a max of 50mm depth.	Remove stakes and ties after five years. 2 visits per annum: Pruning where required to ensure appropriate habit and form. Check for failing or dangerous trees and remove/ replace with like for like (species/ specification). Remove all crossing branches. Check tree for damaged limbs and remove and treat wounds where necessary. Check for leaning trees and re-straighten. Replace/ Top up with bark mulch to 75mm depth.	2 visits per annum: Pruning where required to ensure appropriate habit and form. Check for failing or dangerous trees and remove/ replace with like for like (species/ specification). Remove all crossing branches. Check tree for damaged limbs and remove and treat wounds where necessary. Check for leaning trees and re-straighten. Replace/ Top up with bark mulch to 75mm depth. Maintain as safe trees with adequate clearance to crown and without obstruction to vehicles or pedestrians/cyclists.

11.2. Management of Hedging				
Area Type	Aims & Objectives	Post Construction Years 1-5	Maintenance Years 5-10	Maintenance Years 10-15
Proposed Hedging 	To maintain healthy and safe hedge To define boundaries and offer privacy / screening Provide conditions that will ensure survival, persistence and spread of plants. To ensure vigorous growth and effective screening Provide an attractive boundary feature. Increase opportunities for biodiversity	2 visits per annum: Check for dead or dying hedging plants and replace with like for like (species / specification). Check hedging support fencing and repair if damaged. Trim hedge to height and shape as per original design (0.5-1.5m height for ornamental & 1.5-2.0m for native) after bird nesting season. Cut back to previous seasons growth. 12 visits per annum: Maintain weed free area 500mm width to each side of hedge centreline using non-chemical control. If herbicide use is required: use suitable translocated herbicide. Apply during growing season in favourable weather conditions as per manufacturer's instructions. Note: Avoid spray drift. After the first 2 years only apply herbicide and fertilisation upon ecologist approval and if weeding is not controlled by non-chemical control. Fertilisation should only be required on an infrequent basis and only if the specimens are failing to mature as they should. Top up bark mulch to maintain a max of 75mm depth. Remove litter off site after every site visit.	2 visits per annum: Check hedge for damaged limbs and remove and treat wounds where necessary. Trim hedge to height and shape as per original design (0.5-1.5m height for ornamental after bird nesting season & 1.5-2.0m for native during October) Cut back to previous seasons growth. 12 visits per annum: Maintain weed free area 500mm width to each side of hedge centreline using non-chemical control. Only apply herbicide upon ecologist approval and if weeding is not controlled by non-chemical control. Fertilisation should only be required on an infrequent basis and only if the specimens are failing to mature as they should. Top up bark mulch to maintain a max of 75mm depth. Remove litter off site after every site visit.	2 visits per annum: Check hedge for damaged limbs and remove and treat wounds where necessary. Trim hedge to height and shape as per original design (0.5-1.5m height for ornamental after bird nesting season & 1.5-2.0m for native during October) Cut back to previous seasons growth. 12 visits per annum: Maintain weed free area 500mm width to each side of hedge centreline using non-chemical control. Only apply herbicide upon ecologist approval and if weeding is not controlled by non-chemical control. Fertilisation should only be required on an infrequent basis and only if the specimens are failing to mature as they should. Top up bark mulch to maintain a max of 75mm depth. Remove litter off site after every site visit. Ensure all Health & Safety considerations are taken into account.

11.3. Management of Species-rich grassland and marginal swards				
Area Type	Aims & Objectives	Post Construction Years 1-5	Maintenance Years 5-10	Maintenance Years 10-15
Species-rich grassland 	To establish attractive, diverse and locally appropriate swards that enhance character and biodiversity. Control competition from pernicious weeds and invasive species. To benefit biodiversity. Final selection of species seed mix to be taken following soil testing of site won material. The maintenance regime adopted will be in accordance with the supplier's recommendations. Typical activities may include those identified in this schedule. To establish an even sward quickly, that will provide a visual contrast to the adjacent amenity grass and hard surfaced areas.	Throughout year and as/ when required: Water with a fine spray during prolonged periods of drought to ensure survival and maintain thriving grass sward. Annually: After flowering in July or August take a hay cut to reduce fertility and clear vegetation mass. Cut back with petrol strimmers or tractor mower down to 50mm. Leave the 'hay' to dry and shed seed for 7-14 days then remove from site. A second cut shall be carried out in October. Mow the re-growth through to late autumn/winter to 50mm and again in spring if required. Trim edges to footpaths/ hard landscape Remove litter & debris off site after every site visit.	Throughout year and as/ when required: Water with a fine spray during prolonged periods of drought to ensure survival and maintain thriving grass sward. Annually: After flowering in July or August take a 'hay cut'. Cut back with petrol strimmers or tractor mower to 50mm. Leave the 'hay' to dry and shed seed for 7-14 days then remove from site. A second cut shall be carried out in October. Mow the re-growth through to late autumn/winter to 50mm and again in spring if required. Trim edges to footpaths/ hard landscape Remove litter & debris off site after every site visit.	Throughout year and as/ when required: Water with a fine spray during prolonged periods of drought to ensure survival and maintain thriving grass sward. Annually: After flowering in July or August take a 'hay cut'. Cut back with petrol strimmers or tractor mower to 50mm. Leave the 'hay' to dry and shed seed for 7-14 days then remove from site. A second cut shall be carried out in October. Mow the re-growth through to late autumn/winter to 50mm and again in spring if required. Trim edges to footpaths/ hard landscape Remove litter & debris off site after every site visit.

11.4. Management of Native Scrub Planting				
Area Type	Aims & Objectives	Post Construction Years 1-5	Maintenance Years 5-10	Maintenance Years 10-15
Woodland Edge 	To maintain appropriate, healthy and safe wooded edge To define boundaries and offer privacy/ screening Provide conditions that will ensure survival, persistence and spread of plants. To reinforce boundary and define screening edge. Ensure appropriate layers of planting establish and thrive. To promote biodiversity To support local character	4 visits per annum: Check for dead or dying plants and replace with like for like (species/ specification) in the next planting season. Water during drought conditions in years 1-2. Check for damaged limbs. Remove and treat wounds where necessary. Remove litter off-site after every site visit.	Remove stakes and ties after five years. 2 visits per annum: Pruning where required to ensure appropriate habit and form. Check for failing or dangerous trees and remove/ replace with like for like (species/ specification). Remove all crossing branches. Check tree for damaged limbs and remove and treat wounds where necessary. Check for leaning trees and re-straighten. Remove litter & debris off site after every site visit.	1 visit per annum: Pruning where required to ensure appropriate habit and form. Check for failing or dangerous trees and remove/ replace with like for like (species/ specification). Remove all crossing branches. Check tree for damaged limbs and remove and treat wounds where necessary. Thin tree planting to approved horticultural standards, firstly removing misshapen and / or weak trees. Ensure all Health & Safety considerations are taken into account. Remove litter & debris off site after every site visit

11.5. Management of Fences and Gates				
Area Type	Aims & Objectives	Post Construction Years 1-5	Maintenance Years 5-10	Maintenance Years 10-15
Railings, Fences and Gates 	To provide robust and secure perimeters to prevent unwanted access and egress for safety and security reasons. Provide visually attractive fencing and gates, that are in keeping with local character. Ensure all gates are robust, effective and fit for purpose. Ensure screening and privacy is maintained.	12 visits per annum: Inspect for structural integrity on a monthly basis and repair to maintain protection against intruders. Inspect gates and fencing for damage on a monthly basis and repair as necessary. Ensure all gate mechanisms work correctly and that all locking facilities are in working order on a monthly basis. Check for abuse of intended operation and report/repair as required (safety gates being propped or tied open, animal holes under playground railings etc).	6 visits per annum: Inspect gates and fencing for structural integrity on a 2 monthly basis and repair to maintain protection against intruders. Inspect gates and fencing for damage and repair as necessary. Ensure all gate mechanisms work correctly and that all locking facilities are in working order. 1 visit per annum: Inspect condition of paintwork annually and touch up as required. Repaint railings (if applicable) every 5 years. Check for abuse of intended operation and report/repair as required (safety gates being propped or tied open, animal holes under playground railings etc).	6 visits per annum: Inspect gate and fencing for structural integrity on a 2 monthly basis and repair to maintain protection against intruders. Inspect gates and fencing for damage and repair as necessary. Ensure all gate mechanisms work correctly and that all locking facilities are in working order. 1 visit per annum: Inspect condition of paintwork annually and touch up as required. Repaint railings (if applicable) every 5 years. Check for abuse of intended operation and report/repair as required (safety gates being propped or tied open, animal holes under playground railings etc).

11.6. Management of Paved Surfaces				
Area Type	Aims & Objectives	Post Construction Years 1-5	Maintenance Years 5-10	Maintenance Years 10-15
All hard surfaced areas within development 	To provide clean, safe and attractive hard surfaced areas for pedestrian use Provide even surfaces free from trip hazards. Provide clean surfaces free from debris or slip hazards. Ensure surfaces are adequately drained. Ensure all defects are dealt with promptly	Minimum 12 visits per annum: Inspect hard surfaced areas monthly for broken elements or uneven areas, dips and ponding and repair as necessary. Clean surfaces monthly by brushing, removing all litter, leaves, chewing gum etc. Carry out weed control as necessary using a selected spot herbicide treatment. Wash surfaces annually as required. (Using high pressure wash) Carry out de-icing (spreading/ application of salt rock or similar) and snow clearance as and when required.	1 visit per annum: Inspect hard surfaced areas monthly for broken elements or uneven areas, dips and ponding and repair. Clean surfaces monthly by brushing, removal of chewing gum, litter and leaf etc. Annually: Wash surfaces annually as required. (Using high pressure wash) Carry out de-icing (spreading/ application of salt rock or similar) and snow clearance as and when required during winter months. Maintenance to be carried out in accordance with BS7370	1 visit per annum: Inspect hard surfaced areas monthly for broken elements or uneven areas, dips and ponding and repair. Clean surfaces monthly by brushing, removal of chewing gum, litter and leaf etc. Annually: Wash surfaces annually as required. (Using high pressure wash) Carry out de-icing (spreading/ application of salt rock or similar) and snow clearance as and when required during winter months. Maintenance to be carried out in accordance with BS7370

11.7. Management of Asphalt and Concrete Road Surfaces and Footpaths				
Area Type	Aims & Objectives	Post Construction Years 1-5	Maintenance Years 5-10	Maintenance Years 10-15
All road surfaces within development - asphalt and concrete. 	To provide clean, safe and attractive hard surfaced area for vehicular use. Provide even surfaces for vehicular movement. Provide clean surfaces free from debris or hazards. Ensure surfaces are adequately drained - inspect gully traps	Inspect surfaced areas once per annum for broken elements or uneven areas, dips and ponding and repair as per original specification. Remove litter and debris from surfaces monthly or as necessary. Carry out de-icing (spreading/ application of salt rock or similar) and snow clearance as and when required during winter months. In spring remove with cold water pressure washer. Apply proprietary moss and weed killer as and when required.	Inspect surfaced areas once per annum for broken elements or uneven areas, dips and ponding and repair as per original specification. Remove litter and debris from surfaces monthly or as necessary. Carry out de-icing (spreading/ application of salt rock or similar) and snow clearance as and when required during winter months. In spring remove with cold water pressure washer. Apply proprietary moss and weed killer as and when required.	Inspect surfaced areas once per annum for broken elements or uneven areas, dips and ponding and repair as per original specification. Remove litter and debris from surfaces monthly or as necessary. Carry out de-icing (spreading/ application of salt rock or similar) and snow clearance as and when required during winter months. In spring remove with cold water pressure washer. Apply proprietary moss and weed killer as and when required.

11.8. Management of Street Lighting				
Area Type	Aims & Objectives	Post Construction Years 1-5	Maintenance Years 5-10	Maintenance Years 10-15
All external lighting fixtures, poles and bollards. 	To provide a safe environment for residents and visitors without compromising privacy and ecological aims. Provide lighting infrastructure that is sustainable and of appropriate character. Ensure lighting remains functional Ensure lighting infrastructure is kept in a manner that contributes positively to the street-scene and local character	4 visits per annum: Repair any damage Replace bulbs as required Annually: Clear away any vegetation hindering the effectiveness of the light. As required: React promptly to any reports of broken or flickering bulb and 'day burners' and repair as required.	4 visits per annum: Repair any damage Replace bulbs as required Annually: Clear away any vegetation hindering the effectiveness of the light. As required: React promptly to any reports of broken or flickering bulb and 'day burners' and repair as required.	4 visits per annum: Repair any damage Replace bulbs as required Annually: Clear away any vegetation hindering the effectiveness of the light. As required: React promptly to any reports of broken or flickering bulb and 'day burners' and repair as required.

12 Maintenance Operations Matrices

12.1. Tree Planting														
#	Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Notes
1.	Watering				X	X	X	X	X	X				Weekly if required in summer.
2.	Check ties, staking and strimmer guard			X						X				Replace if damaged. Consider removal after 5yrs
3.	Weed control (by hand)	X	X	X	X	X	X	X	X	X	X	X	X	As specified
4.	Application of mulch					X					X			To 75mm as required
5.	Apply fertiliser			X										
6.	Pest and disease control			X	X	X	X	X	X	X	X			As required
7.	Replacement planting (trees)	X	X	X								X	X	By agreement as schedule

12.2. Habitat Area / Native Scrub Planting														
#	Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Notes
1.	Invasive Weed control (by hand)	X	X	X	X	X	X	X	X	X	X	X	X	As specified
2.	Watering				X	X	X	X	X	X				Weekly, if required in summer
3.	Firm up plants			X						X				As required
4.	Pest & disease control			X	X	X	X	X	X	X	X			As required
5.	Pruning (to maintain height no greater than 5 metres (Three Year Rotation))	X	X							X	X	X	X	As required (outside bird nesting season)
6.	Coppicing to maintain balance between woody plants and ground flora	X	X							X	X			As required (outside bird nesting season)
7.	Replacement Planting	X	X								X	X	X	By agreement as schedule

12.3. Shrub Planting														
#	Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Notes
1.	Litter collection and removal from site	X	X	X	X	X	X	X	X	X	X	X	X	Keep litter free at all times
2.	Weed control (by hand)	X	X	X	X	X	X	X	X	X	X	X	X	As specified
3.	Weed control (Biodegradable Weedkiller only)					X		X						As necessary
4.	Watering				X	X	X	X	X	X				Daily if required in summer
5.	Top up mulch					X					X			To 75mm as required
6.	Firm up plants			X						X				
7.	Pest and disease control			X	X	X	X	X	X	X	X			As required
8.	Trimming out and trimming planting		X							X				As required
9.	Replacement planting (all plant types)	X	X	X	X						X	X	X	By agreement as schedule (avoid frost periods)

12.4. Species-rich grassland														
First Year Establishment														
#	Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Notes
1	Litter collection and removal from site	X	X	X	X	X	X	X	X	X	X	X	X	Keep litter free at all times
2	Carry out first Mow to a height of 40-60 mm during dry weather, remove arisings.					X	X	X	X					Avoid compacting the ground - don't mow in wet conditions. Carry out first mow in August.
3	Maintain 'Short cut' to a height of 150 mm, remove arisings	X	X	X						X	X	X	X	Avoid compacting the ground - don't mow in wet conditions

12.5. Species-rich grassland														
Subsequent Years														
#	Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Notes
	Litter collection and removal from site	X	X	X	X	X	X	X	X	X	X	X	X	Keep litter free at all times
	Sectional Mowing – To maximise habitat enhancements mow Mow to a height of 100mm (minimum) during dry weather, remove arisings.							X	X	X				Traditional Mowing - Leave to dry for 1-7 days before removing off site or to approved compost area.
	Mow or graze the re-growth through to late autumn/winter to 50mm and again in spring if needed.	X	X	X							X	X	X	Avoid compacting the ground - don't mow in wet conditions
	Hand removal of persistent perennial weeds					X	X	X	X	X	X			As required

13 Monitoring and Ongoing Review

- 13.1 During the construction period a suitably qualified Landscape Architect and Ecologist - as Ecological Clerk of Works appointed to monitor the success of the scheme implementation and ongoing maintenance of the works during Year 1. Thereafter an EBC Landscape Manager will manage the ongoing operations. This will ensure compliance and appropriate development of the scheme and remedial action is taken with regards to plant replacements and habitat creation.
- 13.2 Close monitoring of the environmental indicators, watering requirements and species identification will provide a clearer view of the actual performance of the landscape planting and will form a closer indicator of possible changes in management focus to respond to climate change.
- 13.3 Before the end of this Plan period the management objectives and maintenance prescriptions should be reviewed, and any refinements incorporated into an updated management plan for on-going medium and long-term management.
- 13.4 Methods and techniques identified in these documents will be updated where relevant to respond to updated best practices in landscape and ecological management.
- 13.5 The results of all any monitoring surveys/reports will feed back into the general management of the site, and management strategies will be altered where necessary to ensure the long-term objectives for the landscape and ecological planting is achieved.

14 Appendices (refer to latest revision)

14.1 DD579L05-10_Southern GI (Deacon Design Ltd)

14.2 DD579L13-15_Central GI (Deacon Design Ltd)

14.3 DD579L16-18_Northern GI (Deacon Design Ltd)

Appendix 14.1

DD579L05-10_Southern GI Proposals (Deacon Design Ltd)

Appendix 14.2

DD579L13-15_Central GI Proposals (Deacon Design Ltd)

Appendix 14.3

DD579L16-18_Northern GI Proposals (Deacon Design Ltd)