LANDSCAPE ECOLOGY MANAGEMENT PLAN

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Note that the recommendations within this report should be reviewed (and reassessed if necessary) should there be any changes to the red line boundary or development proposals upon which this report was based on.

Report Reference & History: Document 1, V1.		
Issue Status	**Prepared by:**	**Approved / Date**
Version 1	Charlotte Mercer M.Sc, B.Sc (Hons) Dr Caroline Hiller MCIEEM	09/06/2022
Client issue	Gary Tudor CBiol, MRSB, MCIEEM,	10/06/2022

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1.0 INTRODUCTION

INTRODUCTION

1.1 Applied Ecological Services Ltd. was commissioned to produce a Landscape Ecology Management Plan (LEMP) relating to the reserved matters application for the residential development (202 dwellings), associated open space, road and drainage infrastructure at Wakefield Road, Smithies. The LEMP was commissioned to discharge condition 13 of the outline planning permission (2017/1451) as set out below.

Condition 13

A detailed scheme of ecological mitigation and enhancement and maintenance shall be submitted with the reserved matters application. The scheme shall broadly follow but not be limited to the measures set out in, Section 6.5 of Bat Survey Report by Applied Ecological Services Ltd, and Section 5.5 of Breeding Bird Surveys by Applied Ecological Services Ltd The scheme shall identify a timetable for implementation and maintenance for 5 years. The scheme shall be accompanied by a plan which clearly identifies what ecological features are proposed to be retained, mitigated and enhanced. Thereafter the development shall be carried out in accordance with the approved measures.

Reason: In the interests of biodiversity and in accordance with CSP 36.

1.2 This document provides a LEMP, often referred to as a Habitat or Biodiversity Management Plan, complete with a programme of implementation. The detailed biodiversity management plan will be a 10-year management programme which will be undertaken during the 5 year aftercare period and for a further 5 year period afterwards.

1.3 Its format follows guidelines in BS42020:2013 for post-development management of habitats and species, and is structured as follows:

a) Description and evaluation of features to be managed.

b) Ecological trends and constraints on site that could influence management.

c) Aims and objectives of management.

d) Appropriate management options for achieving aims and objectives.

e) Prescriptions for management actions.

f) Preparation of a work schedule (including an annual work plan capable of being rolled forward over a 5-year period).

1.4 The management plan is designed to cover a 10-year period, set out in the form of two 5-year programmes to cover the establishment period followed by regular operations thereafter. The last five-year plan is designed to be 'rolled over' into subsequent years, subject to any further review and modification.

1.5 The evidence base for the Management Plan includes plans produced by Rosetta Landscape Design showing the detailed landscape proposals and species specification, the Arboricultural Impact Assessment undertaken by The Environment Partnership (2017), the Extended Phase 1 Habitat Survey of the site undertaken by AES-LTD in 2017 updated in 2021 and a walkover survey to verify the habitats 26th May 2022, also undertaken by AES-LTD.

2.0 DESCRIPTION AND EVALUATION OF FEATURES

COMPONENT HABITATS

2.1 The management plan is concerned with the creation of habitats of conservation interest within the site, which are set out on the planting plan proposals and the habitats retained within the survey area shown on the extended phase 1 habitat plan. In accordance with this plan they will comprise the following habitats.

Table 2.1: Habitats

Habitat	Key component species	Area(m^2), no. or length (m)
Existing trees retained (individual specimens)	T4 – Rowan T5 – Goat willow T6 – Silver birch T14 - Hawthorn	4 no.
Proposed trees- Standard and Standard Light	Field maple – 35 No. Norway maple – 5 no. Snowy Mespilus – 14 no. Silver birch – 18 no. Hawthorn – 1 no. Crab apple – 19 no. Wild cherry – 25 no Bird cherry – 14 no. Common whitebeam – 23 no. Rowan – 27 no. Rowan 'Joseph Rock' – 20 no.	201 no.
Proposed shrub bed (ornamental)	Purple compact barberry – 96 no Daisy bush – 131 no. Mexican orange 'Sundance' – 195 no. Spindle 'Emerald 'n' gold' – 155 no. Spindle 'Emerald gaiety' – 533 no. Shrubby veronica – 93 no Rose of Sharon – 85 no. Lavender Hidcote – 158 no. Golden honeysuckle – 152 no. Boxwood honeysuckle – 156 no. David viburnum – 44 no. Laurustinus - 39 no. Lesser periwinkle - 255 no. *Total = 2072 no.*	TBC m^2
Proposed wildflower / grass mix (flowering lawn)	Emorsgate EL1 – Flowering lawn mixture. Wild Flowers 20% % 1.0 *Betonica officinalis* – Betony 2.4 *Centurea nigra* – Common Knapweed 1.2 *Galium verum* – Lady's Bedstraw 0.8 *Leontedon Hispidus* – Rough Hawkbit 2.4 *Lotus corniculatus* – Bird's-foot -trefoil	TBC m^2

	2.8 *Plantago lanceolata* – Ribwort Plantain 0.8 *Primula veris* – Cowslip 1.2 Ranunculus acris – Meadow Buttercup 0.4 *Salium silaus* – Pepper Saxifrage 0.4 *Vicia cracca* – Tufted Vetch 5.0 *Medicago lupulina* – Black Medic (Ag) *5.0 Trifolium repens* – Small Leaved White Clover (Ag) Grasses 80% % 8.0 *Agrostis capillaris* – Common Bent (Ag) 1.0 *Carex flacca* – Glaucous Sedge 39.0 *Cynosurus cristatus* – Crested Dogstail (Ag) 28.0 *Festuca rubra* – Red Fescue (Ag) 4.0 *Phleum bertolonii* – Smaller Cat's-tail (Ag)	
Proposed wildflower / grass mix (wet meadow associated with attenuation basins)	Emorsgate EG8 – Meadow grass mix for wet soils. 100% grasses % 4.8 *Agrostis capillaris* – Common Bent 4.8 *Anthoxanthum odoratum* – Sweet Vernal-grass 4.8 *Briza media* – Quaking Grass 62.8 *Cynosurus cristatus* – Crested Dog's-tail 4.8 *Deschampsia cespitosa* – Tufted Hair-grass (w) 18.0 *Festuca rubra* – Red Fescue	TBC m^2
Proposed tussocky grassland	Emorsgate EM10 – Tussock mixture Wild Flowers 20% % 1.5 *Agrimonia eupatoria* – Agrimony 0.2 *Arctium minus* – Lesser Burdock 2.4 *Centaurea nigra* – Common Knapweed 0.1 *Centaurea scabiosa* – Greater Knapweed 0.5 *Chaerophyllum temulum* – Rough Chervil 0.1 *Cirsium eriophorum* – Wooly Thistle 0.1 *Cruciata laevipes* – Crosswort 3.0 *Dipsacus fullonum* – Wild Teasel 1.5 *Filipendula ulmaria* – Meadowsweet 1.0 *Galium album* – Hedge Bedstraw 1.0 *Leucanthemum vulgare* – Oxeye Daisy 1.0 *Malva moschata* – Musk Mallow 1.0 *Ranunculus acris* – Meadow Buttercup 0.1 *Silene dioica* – Red Campion 1.5 *Silene latifolia* – White Campion 1.5 *Silene vulgaris* – Bladder Campion 0.5 *Torilis japonica* – Upright hedge-parsley 3.0 *Vicia cracca* – Tufted Vetch Grasses 80% % 1.0 *Alopecurus pratensis* – Meadow Foxtail 16.0 *Cynosurus cristatus* – Crested dog's-tail 16.0 *Dactylis glomerata* – Cock's-foot 4.0 *Deschampsia cespitosa* – Tufted hair-grass 24.0 *Festuca rubra* – Strong-creeping red-fescue 1.0 *Holcus lanatus* – Yorkshire Fog	TBC m^2

	10.0 *Schedonorus arundinaceus* – Tall Fescue 8.0 *Schedonorus pratensis* – Meadow Fescue	
Proposed amenity grass	??	TBC m^2
Proposed native shrub mix	Hazel – 152 no. Hawthorn – 102 no. Holly – 51 no. Blackthorn – 102 no. Goat willow – 51 no. Guelder rose – 51 no *Total = 509 no.*	TBC m^2
Proposed native woodland mix	Field maple – 35 no. Common alder – 71 no. Silver birch – 71 no. Hazel – 35 no. Holly – 35 no. Scots pine – 18 no. Wild cherry – 18 no. Sessile oak – 18 no. Rowan – 35 Small-leaved lime – 18 no. *Total = 354 no.*	TBC m^2
Proposed native hedgerow mix	Field maple – 81 no. Hazel – 319 no. Hawthorn – 480 no. Holly – 150 no. Blackthorn – 319 no. Goat willow – 150 no. Guelder rose – 81 no. *Total = 1520*	TBC m^2
Retained native hedgerow	G5 – Hawthorn hedgerow (defunct)	48m
Retained scrub / woodland (self-set)	G14 – Outgrown hawthorn hedgerow, mature hawthorn with occasional elder and dog-rose and dense bramble scrub. G17 – Self-set group of hawthorn, grey willow, ash and sycamore.	TBC m^2 TBC m^2
Third Party Trees W1, G19, G20, G21 and T18	W1 – Mixed broadleaved woodland G19 – Goat willow G20 – Blackthorn, hawthorn and goat willow G21 – Mixed broadleaved woodland T18 – Common ash (1 no.)	TBCm^2

2.2 The development will result in the loss of the semi-improved grassland and will require the felling of three individual trees (T3, T7, T10) and existing tree groups in line with the recommendations in the arboricultural survey, this includes the majority of G14, an outgrown hawthorn hedgerow running approximately through the centre of the site and groups G7, G8, G9 , G10, G11, G12, G14, G16 and part of Group 17. Third party trees (W1, G19, G20, G21 and T18) are outwith the site, but may require some light pruning as crowns extend over and into the site. Protection of these features was detailed in the supporting documents and protection measures will be implemented during the works.

2.3 Individual trees to be planted in the proposed planting plan are to complement the existing retained tree cover.

2.4 All other features will be developed in the proposed planting plan.

EVALUATION OF FEATURES

Existing habitats and features identified as key features

2.5 The following habitats and species are identified as interest features of the site or wider landscape in ecology survey, monitoring and assessment work carried out at Athersley.

Table 2.2: Key Features

Features (habitat / species)	Representation on site	Current Importance	Target for EcMP?
Bats	Common pipistrelle, soprano pipistrelle, noctule, *Myotis sp*. and brown long-eared bat.	European protected species (Annex IV Habitats Directive). Scrub and woodland edges provide suitable habitat for foraging and commuting bats.	Yes
Nesting birds/ground nesting birds	40 bird species recorded. Habitats support ground nesting / nesting birds including priority species such as bullfinch, dunnock, house sparrow, mistle thrush, common whitethroat, linnet, song thrush and willow warbler.	The majority of bird species, with the exception of some species listed on Schedule 2, are protected under the WCA 1981 (as amended). Some are protected under Section 41 NERC Act (2006). Certain species are also listed as being of priority conservation importance on the UK and Local BAPs. Moderate conservation interest, within site importance.	Yes
Hedgerows (existing and created)	5 no.	Section 41 Natural Environment & Rural Communities Act 2006 Priority Habitat. Of local interest, moderate value.	Yes
Individual trees	18	No current protection through Tree Preservation Orders; None of the trees have potential to support roosting bats. Of moderate ecological interest, within site importance.	Yes

Features (habitat / species)	Representation on site	Current Importance	Target for EcMP?
Broadleaved plantation woodland	xxxxm^2	No current protection through Tree Preservation Orders; Provide flyways for bats. Of moderate ecological interest, local importance.	No
Made ground (access roads, infrastructure and pavements)	xxxxm2	Negligible conservation interest.	No

Potential new interest features

2.6 Based on the planting plan proposals the following new habitats will be developed within the site:

Table 2.3: New interest features

Feature (habitat/species)	Representation on/near site	Potential importance	Target for EcMP
Individual trees - standard & standard (light)	201 no.	Provides additional potential nesting and foraging habitat for birds and maintains connectivity across the site for foraging and commuting bats.	Yes
Shrub bed (ornamental)	TBCm2	Lower ecological interest, but does provide some cover for wildlife within the site. Contains species known to attract bees and butterflies (e.g. lavender, viburnum and spindle).	Yes
Wildflower / grass mix (flowering lawn)	TBCm2	Nectar source and foodplants for wildlife.	Yes
Wildflower / grass mix (wet meadow)	TBCm2	Nectar source and foodplants for wildlife.	Yes
Wildflower / grass mix (Tussocky grassland)	TBCm2	Nectar source and foodplants for wildlife.	Yes
Amenity grassland	TBCm2	Low ecological interest	Yes
Native scrub	TBCm2	Could be very important locally to maintain habitat continuity around the site for foraging and commuting bats. Provides habitat for breeding birds.	Yes
Native woodland	TBCm^2	Could be very important locally to maintain habitat continuity around the site for foraging and	Yes

Feature (habitat/species)	Representation on/near site	Potential importance	Target for EcMP
		commuting bats. Provides habitat for breeding birds.	
Native hedgerow	xxxxm	Provides habitat for breeding birds such as hedge sparrow. Contributes towards habitat continuity around the site for foraging and commuting bats	Yes

3.0 ECOLOGICAL TRENDS AND CONSTRAINTS ON SITE

ECOLOGICAL TRENDS

3.1 A number of changes would be likely to occur within the site in absence of any management intervention. It is important to recognise these, as they influence the need for management (e.g. where intervention is necessary to direct or reverse change, and where natural change reduces the need for planned intervention).

3.2 The key driver of change is the process of natural succession – the habitats within the site and areas of retained habitat will change in structure and species composition over time, mediated by environmental factors such as soil/water nutrient status, water table etc. It is helpful to consider what the natural outcome would be in each habitat compartment following seeding, planting or through natural succession, and how that would affect the success of target communities.

Table 3.1: Ecological trends in component habitats

Habitat	Short-term (1-2 years)	Medium-term (3-10 years)
Existing trees retained (individual specimens)	Growth maturing	Continued growth and potential for epicormic growth, growth of ivy, formation of deadwood, stem wounds, shading vegetation at base.
Proposed trees- Standard and Standard Light	Planted standard and standard (light) trees will have become established within landscaped areas	New trees will become established and will have grown in height.
Proposed shrub bed (ornamental)	Ornamental shrub species will become established within the landscaped area possibly in competition with ruderal species to the detriment of some ornamental species.	Ornamental planting beds could become gappy due to failures.
Proposed wildflower / grass mix (flowering lawn)	Grass and wildflower mix growing along with ruderal vegetation and annuals, grasses and herbaceous species with areas of bare ground remaining.	Tall grassland dominated by coarse grass species such as false oat-grass and cock's-foot. Wildflowers decline and species diversity is reduced. Possibility of encroaching scrub.
Proposed wildflower / grass mix (wet meadow associated with attenuation basins)	Grass and wildflower mix growing along with ruderal vegetation and annuals, grasses and herbaceous species with areas of bare ground remaining.	Tall grassland dominated by coarse grass species such as false oat-grass and cock's-foot. Wildflowers decline and species diversity is reduced. Possibility of encroaching scrub.

Habitat	Short-term (1-2 years)	Medium-term (3-10 years)
Proposed tussocky grassland	Grass and wildflower mix growing along with ruderal vegetation and annuals, grasses and herbaceous species with areas of bare ground remaining.	Tall grassland dominated by coarse grass species such as false oat-grass and cock's-foot. Wildflowers decline and species diversity is reduced. Possibility of encroaching scrub.
Proposed amenity grass	Grass mix growing along with ruderal vegetation and annual grasses with areas of bare ground remaining.	The grassland would be likely to be tall/rank and dominated by coarse grass species such s false oat-grass and cock's-foot with some bare patches. Possibility of encroaching scrub.
Proposed native shrub mix	Shrubs will start to become established within the landscaped areas possibly in competition with ruderal species to the detriment of some shrubs.	Shrub beds could become gappy with poor structural diversity or become overgrown. Some losses likely to occur.
Proposed native woodland mix	Trees and shrubs will start to become established within the landscaped areas possibly in competition with ruderal species to the detriment of some trees/shrubs.	Tree and shrub planting could become gappy with poor structural diversity or become overgrown. Some losses likely to occur.
Proposed native hedgerow mix	Shrubs establishing, but during establishment phase the saplings are likely to be outcompeted by tall ruderal vegetation	New hedgerows will be leggy, becoming outgrown and gappy and dominated by species such as false oat-grass, nettle and creeping thistle in the understorey.
Retained native hedgerow	Growth/maturing	Continued growth, potential for hedgerows to become overly tall and wide and for suckers to encroach surrounding habitats.
Retained scrub / woodland (self-set)	Growth/maturing	Continued growth and potential for epicormic growth, growth of ivy, formation of deadwood, stem wounds, shading vegetation at base, growth over roads, pavements or gardens restricting visibility or causing nuisance due to shading of gardens.
Third Party Trees / Woodland	Growth/maturing	Continued growth and potential for epicormic growth, growth of ivy, formation of deadwood, stem wounds, shading vegetation at base, growth over roads, pavements or gardens restricting visibility or causing nuisance due to shading of gardens.

Constraints

3.3 The following features within the site could act as constraints to achieving management objectives:

- Nutrient status of soils
- Isolation of habitats
- Risk of invasive species
- Tree diseases
- Habitat modification/remedial works

Nutrient status of soils

3.4 The majority of the site area comprised semi-improved grassland that was grazed by horses. There were localised areas which included species indicative of high nutrient status, such as nettle *Urtica dioica* and creeping thistle *Cirsium arvense*. A moderate soil nutrient status will make it slightly more difficult to achieve grassland habitats since a smaller number of more competitive species are likely to dominate. With respect to tree and scrub/shrub establishment, moderate soil nutrient status would aid growth and establishment, but would also increase the level of competition from weed species present in the soil seed bank, requiring active intervention until a closed canopy can be achieved. A moderate soil nutrient status can be offset by developing grassland vegetation on subsoil, removing cuttings and by weed control.

Isolation of habitats

3.5 Due to loss of habitat there is potential for isolation of habitats, however habitat creation including grassland / wildflower areas, attenuation basins, trees, woodland, native scrub and native hedgerow planting will enhance habitat continuity around the site by connecting the broadleaved woodland to the south with areas of native woodland planting on the north western boundary, and grassland and tree planting in the north and east of the site providing habitat continuity and stepping stones for movement of animals through the site. The hedgerows, woodland and linear native scrub will provide connectivity around the periphery of the site. This will provide habitat corridors throughout the site and provide flyways for bats and lengths of terrestrial and linear features suitable for hedgehogs, small mammals, birds and invertebrates whilst providing better habitat continuity across the landscape. Improving species diversity by providing wildflower grassland will provide food and shelter for invertebrates and will be particularly important in creating sheltered

conditions rich in flying insects likely to be more attractive to bats. A sensitive lighting regime is being implemented, which is a positive aspect. An insensitive lighting regime has the potential to impact on bats particularly along peripheral hedgerows and woodland edges, as lighting can create spatial avoidance and habitat fragmentation. Artificial illumination of a previously unlit area used by foraging bats is likely to be disturbing to their normal activities.

3.6 The activity of flying between a roost and a foraging area is known as commuting. Bats use set routes for commuting which are known as commuting corridors, flight paths or fly-ways. These routes tend to make use of linear features such as avenues of street trees, tree-lines along waterways, hedgerows, vegetated railway corridors, gardens and woodland edges as linkages in the landscape. These features are understood to be used by bats for navigation across the landscape, provide cover from inclement weather and predators and provide a foraging resource en-route to good quality foraging habitat. Different species of bat have varying degrees of dependency on such commuting features.

3.7 It is accepted that bats, in general, use the most efficient route across the landscape to maximise foraging time. Obstruction or removal/loss of a commuting feature can therefore result in bats having to find an alternative, less efficient route to their foraging grounds. The more time a bat spends commuting rather than foraging may negatively affect their energy reserves and thus overall fitness. Preserving/maintaining commuting routes across/around a development is therefore of upmost importance for bats.

Risk of invasive species

3.8 Invasive species have not been recorded within the site. Sheffield Biological Records Centre (SBRC) did not return any records of invasive non-native species with a 2km radius of the site.

Tree diseases

3.9 At the time of plan preparation, ash dieback disease, a chronic fungal disease of ash trees caused by the fungus *Hymenoscyphus pseudoalbidus* (formerly known as *Chalara fraxinea*), is of serious concern. There are ash trees within the site and within the broadleaved woodland, outwith the southern site boundary and these trees could succumb to the disease within the timescale of the management plan. No ash dieback disease has been recorded to

date. It is recommended that ash trees are not included in any landscaping schemes due to the potential to introduce the disease into areas that are currently not affected.

Habitat modification/remedial works

3.10 Some habitats within the site will need to be assessed and remediation works undertaken before they can be brought back into appropriate management e.g. replacing tree losses within the native woodland buffer.

4.0 AIMS AND OBJECTIVES OF MANAGEMENT

4.1 The over-arching aim of management should be to establish and maintain habitats which retain as much as possible of the site's current biodiversity, whilst creating and enhancing habitats for various species to provide a net biodiversity gain where possible.

Long-term objectives and vision for management

Individual trees (retained)

4.2 At the end of the 10-year management plan period, all standard individual trees and trees within the tree groups will continue to survive with no obvious signs of crown regression or disease. There should be no evidence of crown dieback, or damage to trunks caused by maintenance operations. Any arboricultural works such as crown-lifting operations should have been limited to the minimum needed for grass maintenance access and the trees should retain a natural form with full crowns. Any ash trees may have succumbed to ash dieback disease.

Standard trees

4.3 At the end of the 10-year management plan period, all of the standard and standard light trees planted will continue to survive with no obvious signs of crown regression or disease. There should be no evidence of crown dieback, or damage to trunks caused by maintenance operations. Any arboricultural works such as crown-lifting operations should have been limited to the minimum needed for grass maintenance access and the trees should retain a natural form with full crowns.

Ornamental shrub beds

4.4 At the end of the 10-year management period the ornamental shrub beds have established, the ornamental shrubs, flowers and grasses form a dense bed with varied structure with a mixture of low to medium height species.

Wildflower grassland, tussocky grassland

4.5 Species diversity will be maintained within the wildflower and tussocky grasslands and coarse grasses, tall ruderal species and scrub do not dominate.

4.6 The grasslands should not have scrub cover exceeding 5% and this should comprise scrub species characteristic of neutral soils including hawthorn, blackthorn, willows and birches.

4.7 Large stands of tall ruderal vegetation and/or bracken will not dominate and reduce biodiversity within grassland habitat compartments.

Amenity grassland

4.8 At the end of the 10-year management plan period the amenity grassland will retain a fine-leaved sward with a high proportion of the originally sown species. Coarser grasses such as cock's-foot, annual grasses such as annual meadow-grass, and tall weeds such as thistles will be rare or absent. A number of 'lawn weeds' may have colonised such as daisy *Bellis perennis*, ribwort plantain *Plantago lanceolata* and speedwells *Veronica spp*.

Native mixed woodland planting

4.9 At the end of the 10-year management plan period, the native mixed woodland planting and understorey mix will be becoming well established. The woody species within will be growing and starting to mature and the plantation woodland will have structural diversity. There should be no evidence of crown dieback or disease, or damage to trunks caused by maintenance operations.

Native Hedgerow

4.10 At the end of the 10-year management plan period the new native hedgerows will have no linear gaps and will support dense foliage from near ground level. Hedgerows will have a broad base (ca. 1.5m) wide, and be maintained at a height of at least 2m, in common with existing hedgerows in the surrounding landscape. Hedgerows will be cut in late winter so as to avoid impacting on breeding birds.

Native Hedgerow (retained)

4.11 At the end of the 10-year management plan period the retained hawthorn hedge will support dense foliage from near ground level. Hedgerows will have a broad base (ca. 1.5m) wide, and be maintained at a height of at least 2m, in common with existing hedgerows in the surrounding landscape. Hedgerows will be cut in late winter so as to avoid impacting on breeding birds.

Scrub and woodland – Self set (retained)

4.12 At the end of the 10-year management plan period, all scrub and standard trees within the tree groups will continue to survive with no obvious signs of crown regression or disease. There should be no evidence of crown dieback, or damage to trunks caused by maintenance operations. Any ash trees may have succumbed to ash dieback disease.

Third Party Trees

4.13 Trees outwith the site that belong to third parties may require some light pruning if crowns extend over and into the site but there will be no damage to trunks caused by maintenance operations. At the end of the 10-year management plan period third party trees will continue to be protected as detailed within the arboricultural impact assessment and method statement. Any ash trees may have succumbed to ash dieback disease.

5.0 APPROPRIATE MANAGEMENT OPTIONS FOR ACHEVING OBJECTIVES

Individual trees (retained)

Establishment maintenance years 1-5

5.1 The main actions for trees being retained will take place during the enabling works phase of the development. They will comprise tree and rooting zone protection works in accordance with BS 5837:2012, as detailed within the tree impact assessment within the arboricultural assessment.

5.2 Trees will be subject to periodic inspection by a qualified arboricultural consultant for damage and disease and maintenance carried out as appropriate.

Aftercare period years 6-10

5.3 Thereafter, a non-intervention strategy will be taken for mature trees, except for those which may pose a health and safety risk. Trees should be subjected to periodic inspection by a qualified arboricultural consultant.

Standard trees

Establishment maintenance years 1-5

5.4 Water twice monthly from April to October. Each tree to receive 40L of water at each scheduled watering operation to ensure roots are well irrigated, with additional watering operations as required (depending on soil moisture levels and prevailing weather conditions. Crown spraying will be undertaken during evening hours subject to requirement.

5.5 Check stability of trees, especially after severe winds and firm as necessary (at least 4 inspections per year)

- Replace loose, broken or decayed stakes to original specification.
- If longer than half of clear tree stem height, cut to this height in spring. Re-tie to tree firmly but not tightly with a single tie.
- Adjust, re-fix or replace loose or defective ties, allowing for growth and to prevent chafing. Where chafing has occurred, reposition or replace ties to prevent further chafing.

- Stakes and ties shall be removed during spring when no longer required to support the tree. Fill stake holes with lightly compacted soil.

5.6 Maintain a weed free area of 1m radius around each plant by spraying with glyphosate as scheduled. Remove dead vegetation 3 weeks after application.

5.7 Re-firm trees after strong winds, frost heave and other disturbances.

- Tread around the base until firmly bedded.
- Collars in soil at base of tree stems, created by tree movement shall be broken up by fork, avoiding damage to roots. Backfill with topsoil and re-firm.

5.8 Apply multi-purpose plant food and soil improver fertiliser each season in March or April.

- Spread evenly.
- Carefully lift and replace any mulch materials.
- Apply at manufacturer's recommended rate.

5.9 Replace any trees that have failed (between 15th November and 15th March).

5.10 Trees will be subject to an annual check for signs of disease and treatment will be undertaken as required.

5.11 Carry out pruning as and when necessary to maintain natural habit of the tree, in keeping with good horticultural practice.

5.12 Maintenance of mulch:

- Top up with same type of mulch to 75mm thickness
- Sweep and replace mulch spill on adjacent areas, if not contaminated with weeds and rubbish, return to planted area.

Aftercare period years 6-10

5.13 Trees will be subject to periodic inspection by a qualified arboricultural consultant (approximately once every 5 years) and maintenance carried out as per recommendations in the arboricultural assessment.

Ornamental shrub beds

Establishment maintenance years 1-5

5.14 Water twice monthly from April to October.

- Ensure full depth of topsoil is thoroughly wetted to aid plant establishment
- Soil moisture: to ensure plants are well irrigated in dry conditions, additional watering operations will be implemented as required. Scheduled watering operations may be omitted subject to assessment of prevailing weather conditions and soil moisture levels.

5.15 During the initial establishment period of newly planted shrubs, carry out maintenance operations as follows:

- Keep planting beds clear of weeds by use of hand weeding and by maintaining full depth of mulch.
- Maintain weed free planting beds, ensuring a weed free area around each shrub, minimum diameter the larger of 1m or the surface of the original planting pit.
- Fork over beds to keep soil loose, with gentle cambers and no hollows. Do not reduce depth or effect of mulch.
- Watering as outlined.

5.16 Apply multi-purpose plant food and soil improver fertiliser annually in March or April

- Spread evenly.
- Carefully lift and replace any mulch materials.
- Apply at manufacturer's recommended rate.

5.17 Re-firm plants after strong winds, frost heave and other disturbances.

- Tread around base until firmly bedded.
- Collars in soil at base of tree stems, created by tree movement shall be broken up by fork, avoiding damage to roots. Backfill with topsoil and re-firm.

5.18 Prune to encourage healthy and bushy growth and desirable ornamental features, e.g. flowers, fruit, autumn colour, stem colour. Remove suckers by cutting back level with source stem or root.

5.19 Remove dead plant material at the end of the growing season. Check all shrubs and remove dead foliage, deadwood, and broken and damaged branches and stems. Collect fallen leaves from ornamental planting beds and remove from site for recycling.

5.20 Reinstatement of shrubs and grasses that have failed.

- Remove dead and damaged plant by carefully moving mulch over to one side and dig over the soil, leaving it fit for re-planting. Do not disturb roots of adjacent plants.
- Replace plants as per the original specification or to match the size of adjacent or nearby plants of the same species, whichever is greater. Submit details and costs of plants for approval before ordering. Dress the soil with Soil Association certified organic granular slow-release fertiliser applied at manufacturer's recommended rate.

5.21 Thin ornamental planting beds by removal of surplus plants where applicable.

- Thin all plants except hedge planting using methods within BS 7370-4.
- Begin when foliage of adjacent plants has begun to touch.
- Minimise disturbance to adjacent plants.
- Refill holes with topsoil to leave an even graded surface.
- Maintain mulch as original specification.
- Make good any minor damage to adjacent plants immediately.
- Select plants for retention that have a strong healthy habit.
- Mature planting density to be agreed.

5.22 Hand weeding:

- Remove weeds entirely, including roots.
- Remove the minimum quantity of soil, and disturb plants, bulbs and mulched surfaces as little as possible.
- Upon completion, rake area to a neat, clean condition.
- Reinstate mulch to original depth.

5.23 Soil aeration:

- Prick up to aerate the soil of root areas and break surface crusts and reduce to crumb and level off. Do not damage plants and their roots.

5.24 Soil level adjustment:

- Reduce level of soil/mulch at edges of beds to 75mm below adjacent grass or hard surface. Spread arisings (if any) evenly over the bed.

5.25 Maintenance of mulch:

- Top up with same type of mulch to 75mm thickness.
- Sweep and replace mulch spill on adjacent areas, if not contaminated with weeds and rubbish, return to planted area.

5.26 Remove any growth annually, as outlined in maintenance schedules for shrubs encroaching onto grassed areas, paths, roads, signs, sight lines and light fittings.

Aftercare period years 6-10

5.27 Remove dead plant material at the end of the growing season. Check all shrubs and remove dead foliage, deadwood, and broken and damaged branches and stems. Collect fallen leaves from ornamental planting beds and remove from site for recycling.

5.28 Hand weeding:

- Remove weeds entirely, including roots.
- Remove the minimum quantity of soil, and disturb plants, bulbs and mulched surfaces as little as possible.
- Upon completion, rake area to a neat, clean condition.
- Reinstate mulch to original depth.

5.29 Apply multi-purpose plant food and soil improver fertiliser annually in March or April

- Spread evenly.
- Carefully lift and replace any mulch materials.
- Apply at manufacturer's recommended rate.

5.30 Soil aeration:

- Prick up to aerate the soil of root areas and break surface crusts and reduce to crumb and level off. Do not damage plants and their roots.

5.31 Remove dead flowers throughout the season to prolong flowering period and prune to encourage healthy and bushy growth and desirable ornamental features, e.g. flowers, fruit, autumn colour, stem colour. Remove suckers by cutting back level with source stem or root. This will include removal of any growth annually, as outlined in maintenance schedules for shrubs encroaching onto grassed areas, paths, roads, signs, sight lines and light fittings.

Wildflower grassland (flowering lawn)

Establishment maintenance years 1-5

5.32 Mow regularly as a lawn but not too short (40--60mm) by mower. To permit flowering, mowing can be relaxed from late June, cut again when the sward gets untidy (after 4-8 weeks). Mowing may be suspended earlier in the year to allow cowslips to flower. Arisings will be left for seven days to encourage seed dispersal and then removed from the site to be composted.

5.33 Collect fallen leaves from wildflower grassland areas and remove from site for recycling.

5.34 Control invasive weeds within meadows (ragwort, creeping thistle, rushes & bracken using mechanical means (hand pulling for ragwort and strimming for others). **The use of herbicides should be avoided due to its adverse impacts on invertebrates such as bees.**

Aftercare period years 6-10

5.35 Mow regularly as a lawn but not too short (40-60mm) by mower. To permit flowering, mowing can be relaxed from late June, cut again when the sward gets untidy (after 4-8 weeks). Mowing may be suspended earlier in the year to allow cowslips to flower. Arisings will be left for seven days to encourage seed dispersal and then removed from the site to be composted.

5.36 Collect fallen leaves from wildflower grassland areas and remove from site for recycling.

5.37 Control invasive weeds within meadows (ragwort, creeping thistle, rushes & bracken using mechanical means (hand pulling for ragwort and strimming for others). **The use of herbicides should be avoided due to its adverse impacts on invertebrates such as bees.**

Wildflower grassland (wet meadow)

Establishment maintenance years 1-5

5.38 The wildflower grassland will be cut to a height of 45mm – 70mm annually either by hand strimmer or mower. Arisings will be left for seven days to encourage seed dispersal and then removed from the site to be composted.

5.39 Collect fallen leaves from wildflower grassland areas and remove from site for recycling.

5.40 Control invasive weeds within meadows (ragwort, creeping thistle, rushes & bracken using mechanical means (hand pulling for ragwort and strimming for others). **The use of herbicides should be avoided due to its adverse impacts on invertebrates such as bees.**

Aftercare period years 6-10

5.41 The wildflower grassland will be cut to a height of 45mm – 70mm annually either by hand strimmer or mower. Arisings will be left for seven days to encourage seed dispersal and then removed from the site to be composted

5.42 Collect fallen leaves from wildflower grassland areas and remove from site for recycling.

5.43 Control invasive weeds within meadows (ragwort, creeping thistle, rushes & bracken using mechanical means (hand pulling for ragwort and strimming for others). **The use of herbicides should be avoided due to its adverse impacts on invertebrates such as bees.**

Wildflower grassland (tussocky grassland)

Establishment maintenance years 1-5

5.44 The tussocky grassland will be cut on a rotational basis so that no more than half the area is cut in any one year (leaving part as an undisturbed refuge) to a height of 45mm – 70mm every 2-3 years between October and February either by hand strimmer or mower. Remove arisings from the site to be composted.

5.45 Control invasive weeds (ragwort, creeping thistle, rushes & bracken) using mechanical means (hand pulling for ragwort and strimming for others). **The use of herbicides should be avoided due to its adverse impacts on invertebrates such as bees.**

Aftercare period years 6-10

5.46 The tussocky grassland will be cut on a rotational basis so that no more than half the area is cut in any one year (leaving part as an undisturbed refuge) to a height of 45mm – 70mm every 2-3 years between October and February either by hand strimmer or mower. Remove arisings from the site to be composted.

5.47 Control invasive weeds (ragwort, creeping thistle, rushes & bracken) using mechanical means (hand pulling for ragwort and strimming for others). **The use of herbicides should be avoided due to its adverse impacts on invertebrates such as bees.**

Amenity grassland

Establishment maintenance years 1-5

5.48 Protection of existing amenity grassland by protecting areas affected by enabling works and maintenance operations using boards/tarpaulins. Do not place excavated or imported materials directly on grass.

5.49 Grass cutting weekly between March and October to a height of between 25 and 50mm. Arisings to be removed.

5.50 Maintain grass areas so to be reasonably free from moss, excessive thatch, weeds, frost heave, worm casts and mole hills.

5.51 Do not use machinery closer than 100mm to tree stems. Use nylon filament rotary cutters and other hand held mechanical tools carefully to avoid damage to bark.

5.52 Edge the amenity grassland for all edges abutting paths, manhole covers, borders etc.

- Draw back soil and re-form edges to clean straight lines or smooth flowing curves, as applicable, sloping slightly back from vertical.

5.53 Apply approved lawn fertiliser each Spring and Autumn:

- Spread evenly.
- Apply at manufacturer's recommended rate.

5.54 Reinstate any damaged areas of lawn as follows:

- Remove damaged turf to a depth of 150mm.
- Cultivate substrate to a fine tilth.
- Reinstatement with either:
    - Re-turfing with turf of a quality and appearance to match existing. Or,
    - Topsoiling to BS 3882 multi-purpose class, free from stones, debris and weeds, and re-seed with a seed mix to match existing grass in quality and appearance.

Aftercare period years 6-10

5.55 Grass cutting weekly between March and October to a height of between 25 and 50mm. Arisings to be removed.

5.56 Maintain grass areas so to be reasonably free from moss, excessive thatch, weeds, frost heave, worm casts and mole hills.

5.57 Do not use machinery closer than 100mm to tree stems. Use nylon filament rotary cutters and other hand-held mechanical tools carefully to avoid damage to bark.

5.58 Edge the amenity grassland for all edges abutting paths, manhole covers, borders etc.

- Draw back soil and re-form edges to clean straight lines or smooth flowing curves, as applicable, sloping slightly back from vertical.

5.59 Apply approved lawn fertiliser each Spring and Autumn:

- Spread evenly.
- Apply at manufacturer's recommended rate.

Native shrub and native woodland planting

Establishment maintenance years 1-5

5.60 Water twice monthly from April to October.

- Ensure full depth of topsoil is thoroughly wetted to aid plant establishment
- Soil moisture: to ensure plants are well irrigated in dry conditions, additional watering operations will be implemented as required. Scheduled watering operations may be omitted subject to assessment of prevailing weather conditions and soil moisture levels.

5.61 Plant guards to be straightened and ties checked during each inspection (at least 4 inspections during the year) and adjust to avoid chaffing and other damage. Guards to be removed at the appropriate time, typically during the 4th or 5th year dependent on the mammal population.

5.62 Remove any weed growth within plant guards by hand and maintain entire planting area as free from vegetation by spraying with glyphosate as scheduled.

5.63 Re-firm plants after strong winds, frost heave and other disturbances.

- Tread around base until firmly bedded.
- Collars in soil at base of tree stems, created by tree movement shall be broken up by fork, avoiding damage to roots. Backfill with topsoil and re-firm.

5.64 Apply multi-purpose plant food and soil improver fertiliser annually in March or April

- Spread evenly.
- Carefully lift and replace any mulch materials.
- Apply at manufacturer's recommended rate.

5.65 Replace any trees that have failed (between 15th November and 15th March).

5.66 Trees will be subject to an annual check for signs of disease and treatment will be undertaken as required.

5.67 Maintenance of mulch:

- Top up with same type of mulch to 75mm thickness

- Sweep and replace mulch spill on adjacent areas, if not contaminated with weeds and rubbish, return to planted area.

5.68 Remove any growth annually, as outlined in maintenance schedules for shrubs/trees encroaching onto grassed areas, paths, roads, signs, sight lines and light fittings.

Aftercare period years 6-10

5.69 Trees will be subject to periodic inspection by a qualified arboricultural consultant (approximately once every 5 years) and maintenance carried out as per recommendations in the arboricultural assessment.

5.70 Remove any growth annually, as outlined in maintenance schedules for shrubs encroaching onto grassed areas, paths, roads, signs, sight lines and light fittings.

Hedgerow (new native)

Establishment maintenance years 1-5

5.71 Water twice monthly from April to October.

- Ensure full depth of topsoil is thoroughly wetted to aid plant establishment
- Soil moisture: to ensure plants are well irrigated in dry conditions, additional watering operations will be implemented as required. Scheduled watering operations may be omitted subject to assessment of prevailing weather conditions and soil moisture levels.

5.72 Plant guards to be straightened and ties checked during each inspection (at least 4 inspections during the year) and adjust to avoid chaffing and other damage. Guards to be removed at the appropriate time, typically during the 4th or 5th year dependent on the mammal population.

5.73 Remove any weed growth within plant guards by hand and maintain a 0.3m wide strip (on each side of the hedgerow) free from vegetation by spraying with glyphosate in late spring and early summer.

5.74 Re-firm plants after strong winds, frost heave and other disturbances.

- Tread around base until firmly bedded.

- Collars in soil at base of tree stems, created by tree movement shall be broken up by fork, avoiding damage to roots. Backfill with topsoil and re-firm.

5.75 Apply multi-purpose plant food and soil improver fertiliser annually in March or April

- Spread evenly.
- Carefully lift and replace any mulch materials.
- Apply at manufacturer's recommended rate.

5.76 Replace any plants that have failed (between 1st November and 31st March).

5.77 Trees will be subject to an annual check for signs of disease and treatment will be undertaken as required.

5.78 Hedgerow pruning will be undertaken on new hedgerows for the first 2-3 years to encourage dense bushy growth, in keeping with good horticultural practice.

- Allow to reach planned dimensions only by gradual degrees, depending on growth rate and habit.

Aftercare period years 6-10

5.79 Cut once every 2-3 years or alternatively cut one side or the top each year in late winter once the hedgerow attains sufficient dimensions.

5.80 Remove any growth annually, as outlined in maintenance schedules for shrubs encroaching onto grassed areas, paths, roads, signs, sight lines and light fittings.

Hedgerow (retained)

Establishment maintenance years 1-5

5.81 The main actions for the retained will take place during the enabling works phase of the development. They will comprise rooting zone protection works in accordance with BS 5837:2012, as detailed within the impact assessment within the arboricultural assessment.

5.82 Cut once every 2-3 years or alternatively cut one side or the top each year in late winter once the hedgerow attains sufficient dimensions.

5.83 Remove any growth annually, as outlined in maintenance schedules for shrubs encroaching onto grassed areas, paths, roads, signs, sight lines and light fittings.

Aftercare period years 6-10

5.84 Cut once every 2-3 years or alternatively cut one side or the top each year in late winter once the hedgerow attains sufficient dimensions.

5.85 Remove any growth annually, as outlined in maintenance schedules for shrubs encroaching onto grassed areas, paths, roads, signs, sight lines and light fittings.

Scrub / woodland self-set (retained)

Establishment m*aintenance years 1-5*

5.86 The main actions for trees being retained will take place during the enabling works phase of the development. They will comprise tree and rooting zone protection works in accordance with BS 5837:2012, as detailed within the tree impact assessment within the arboricultural assessment.

5.87 Trees will be subject to periodic inspection by a qualified arboricultural consultant for damage and disease and maintenance carried out as appropriate.

5.88 Understorey control will be undertaken twice per annum.

Aftercare period years 6-10

5. 89 Thereafter, a non-intervention strategy will be taken for mature trees, except for those which may pose a health and safety risk. Trees should be subjected to periodic inspection by a qualified arboricultural consultant.

5.90 Understorey control will be undertaken twice per annum

Third Party Trees

Establishment m*aintenance years 1-5*

5.91 The main actions for third party trees will take place during the enabling works phase of the development. They will comprise tree and rooting zone protection works in accordance with

BS 5837:2012, as detailed within the tree impact assessment within the arboricultural assessment.

5.92 Third party trees may require some light pruning as crowns extend over and into the site and third-party trees should be subjected to periodic inspection by a qualified arboricultural consultant for this purpose.

Aftercare period years 6-10

5. 93 Thereafter, a non-intervention strategy will be taken for mature third-party trees, except for those which may pose a health and safety risk. Trees should be subjected to periodic inspection by a qualified arboricultural consultant.

6 PRESCRIPTIONS FOR MANAGEMENT ACTIONS & WORK SCHEDULE

6.1 The appropriate management options set out above can be translated into the following actions:

Table 6.1: Establishment maintenance years 1-5

	Location	Management Prescription	Timing	Frequency / annum
A	**Individual trees (retained)**			
1	All retained trees	Root protection works as per BS 587:2012	Throughout enabling works	Until works are completed.
2	All retained trees	Tree inspection for damage and disease	July and November	Twice per annum
B	**Standard trees (specimen trees)**			
1	All specimen trees	Tree inspection for damage and disease	July	Annually
2	All specimen trees	Assessment of dead/missing trees	September	Annually
3	All specimen trees	Replace dead/missing trees	December (between November & March)	Annually
4	All specimen trees	Weed control to all tree surrounds	Monthly from March to October	Annually
5	All specimen trees	Watering	Twice monthly from April to October	Annually
6	All specimen trees	Spray crown	As instructed in spells of dry weather during the evening.	Years 1 & 2 only.
7	All specimen trees	Check tree stability and supports and re-firm and replace supports as necessary	Not critical	4 times per annum each year (years 1-5)
8	All specimen trees	Pest and disease control	Can be undertaken all year.	When required
9	All specimen trees	General pruning (subject to species)	November	As instructed
10	All specimen trees	Fertiliser application	March or April	Annually
11	All specimen trees	Remove tree guards	March or April	Year 4 or 5

12	All specimen trees	Mulch maintenance	March or September	Annually
C	**Ornamental shrub beds**			
1	Ornamental beds	Assessment of dead/missing plants	September	Annually
2	Ornamental beds	Replace dead/missing plants	October	Annually
3	Ornamental beds	Weed control to all plants	March to October	Monthly (Years 1-5)
4	Ornamental beds	Watering	April to October	Twice monthly (Years 1-5)
5	Ornamental beds	Re-firming	January to December	Monthly (Years 1-5)
6	Ornamental beds	Fertiliser	March or April	Annually
7	Ornamental beds	Soil aeration	March and October	Twice per annum
8	Ornamental beds	Remove dead/faded flowers throughout season (dependent on species) to prolong flowering period	January to December	Annually
9	Ornamental beds	Cut dead growth back to ground level (dependent on species)	February or March	Annually
10	Ornamental beds	Mulch maintenance	April and October	Twice per annum (Years 1-5)
D	**Wildflower grassland (species rich lawn)**			
1	Wildflower grassland	Weed control	April, July and October	Three times per annum
2	Wildflower grassland	Cutting	May to late June	Every 10 days to twice monthly
3	Wildflower grassland	Cutting	July to October	Monthly to every two months
3	Wildflower grassland	Collect fallen leaves and remove from site for recycling	November	Annually
E	**Wildflower grassland (wet meadow)**			
1	Wildflower grassland	Weed control	April, July and October	Three times per annum
2	Wildflower grassland	Cutting	October	Annually
3	Wildflower grassland	Collect fallen leaves and remove from site for recycling	November	Annually
F	**Wildflower grassland (tussocky grassland)**			
1	Wildflower grassland	Weed control	April, July and October	Three times per annum
2	Wildflower grassland	Cutting	October	Every 2-3 years
G	**Amenity grassland**			
1	Amenity grassland	Weed control	March and September	Twice per annum
2	Amenity grassland	Fertiliser application	April or September	Two applications per annum

3	Amenity grassland	Mowing	Weekly March to October	Annually (Years 1-5)
4	Amenity grassland	Trim/form edges	Monthly from March to October	Annually
5	Amenity grassland	Re-cultivation and seeding of any failed or worn areas	September	When required
6	Amenity grassland	Thatch/moss removal	March	Annually
H	**Native mixed shrub and woodland planting**			
1	Mixed woodland	Assessment of dead/missing plants	September	Annually
2	Mixed woodland	Replace dead/missing plants	December	Annually
3	Mixed woodland	Weed control to all plants	March to October	Annually
4	Mixed woodland	Watering	April to October	Annually
5	Mixed woodland	Re-firming	January to December	Monthly (Years 1-5)
6	Mixed woodland	Pest and disease control	January to December	When required
7	Mixed woodland	Check plant guards (adjust and replace as required)	February, March, August and November	Four times per annum
8	Mixed woodland	Fertiliser	March or April	Annually
9	Mixed woodland	Mulch maintenance	April and October	Twice per annum (Years 1-5)
I	**Hedgerow**			
1	Hedgerow	Assessment of dead/missing plants	September	Annually
2	Hedgerow	Replace dead/missing plants	December	Annually
3	Hedgerow	Weed control to all plants	March to October	Annually
4	Hedgerow	Watering	April to October	Twice monthly
5	Hedgerow	Re-firming	January to December	Monthly (Years 1-5)
6	Hedgerow	Pest and disease control	April to August	Once per annum
7	Hedgerow	Check plant guards (adjust and replace as required)	February, March, August and November	Four times per annum
8	Hedgerow	Formative pruning	August or November	When required
9	Hedgerow	Fertiliser application	March or April	Annually
J	**Hedgerow (retained)**			
1	Hedgerow	Root protection works as per BS 587:2012	Throughout enabling works	Until works are completed.
2	Hedgerow	Side / top cutting on rotation every 2-3 years in late winter	January to early February	Every 2-3 Years
K	**Scrub / woodland self-set (retained)**			

1	Scrub / woodland	Root protection works as per BS 587:2012	Throughout enabling works	Until works are completed.
2	Scrub / woodland	Tree inspection for damage and disease	July and November	Twice per annum
3	Scrub / woodland	Pruning (subject to site assessment)	December	Annually
4	Scrub / woodland	Understorey control	March and August	Twice per annum
L	**Third Party Trees (retained)**			
1	Third party trees	Root protection works as per BS 587:2012	Throughout enabling works	Until works are completed.
2	Third party trees	Pruning (subject to site assessment)	December	Annually

Table 6.2: Aftercare period years 6-10

	Location	Management Prescription	Timing	Frequency / annum
A	**Individual trees (retained)**			
1	All retained trees	Periodic inspection by a qualified arboricultural consultant (approximately once every 5 years) and maintenance carried out as per recommendations in the arboricultural assessment	November	1 year in 5 (Year 6)
B	**Standard trees (specimen trees)**			
1	All specimen trees	Periodic inspection by a qualified arboricultural consultant (approximately once every 5 years) and maintenance carried out as per recommendations in the arboricultural assessment	November	1 year in 5 (Year 6)
2	All specimen trees	General pruning (subject to species)	November	As instructed
C	**Ornamental shrub beds**			
1	Ornamental beds	Remove dead plant material at the end of the growing season. Check all shrubs and remove dead foliage, deadwood, and broken and damaged branches and stems. Collect fallen leaves from ornamental planting beds and remove from site for recycling.	September	Annually
2	Ornamental beds	Weed control to all plants	March to October	Monthly (Years 6-10)
3	Ornamental beds	Fertiliser	March or April	Annually
4	Ornamental beds	Soil aeration	March and October	Twice per annum
5	Ornamental beds	Remove dead/faded flowers throughout season (dependent on species) to prolong flowering period	January to December	Annually
6	Ornamental beds	Prune - Cut dead growth back to ground level (dependent on species)	February or March	Annually
D	**Wildflower grassland (species rich lawn)**			
1	Wildflower grassland	Cutting	April, July and October	Every 10 days to twice monthly
2	Wildflower grassland	Cutting	May to late June	Monthly to every two months
3	Wildflower grassland	Collect fallen leaves and remove from site for recycling	November	Annually
4	Wildflower grassland	Weed control	July	Annually
E	**Wildflower grassland (wet meadow)**			
1	Wildflower grassland	Cutting	October	Annually
2	Wildflower grassland	Collect fallen leaves and remove from site for recycling	November	Annually
3	Wildflower grassland	Weed control	July	Once per annum
F	**Wildflower grassland (Tussocky grassland)**			

1	Wildflower grassland	Cutting	October	Every 2-3 years
2	Wildflower grassland	Weed control	July	Once per annum
G	**Amenity grassland**			
1	Amenity grassland	Weed control	March and September	Twice per annum
2	Amenity grassland	Fertiliser application	April or September	Two applications per annum
3	Amenity grassland	Mowing	Weekly March to October	Annually (Years 1-5)
4	Amenity grassland	Trim/form edges	Monthly from March to October	Annually
5	Amenity grassland	Re-cultivation and seeding of any failed or worn areas	September	When required
6	Amenity grassland	Thatch/moss removal	March	Annually
H	**Native mixed shrub and woodland planting**			
1	Mixed woodland	Periodic inspection by a qualified arboricultural consultant (approximately once every 5 years) and maintenance carried out as per recommendations in the arboricultural assessment	November	1 year in 5 (Year 6)
2	Mixed woodland	General pruning (subject to species)	November	As instructed
I	**Hedgerow**			
1	Hedgerow	Side / top cutting on rotation every 2-3 years in late winter	January to early February	Every 2-3 Years
2	Hedgerow	General pruning (subject to species) as outlined in maintenance schedules for encroaching scrub.	November	As instructed
J	**Hedgerow (retained)**			
1	Hedgerow	Side / top cutting on rotation every 2-3 years in late winter	January to early February	Every 2-3 Years
2	Hedgerow	General pruning (subject to species) as outlined in maintenance schedules for encroaching scrub.	November	As instructed
K	**Scrub / woodland self-set (retained)**			
1	Scrub / woodland	Periodic inspection by a qualified arboricultural consultant (approximately once every 5 years) and maintenance carried out as per recommendations in the arboricultural assessment	November	1 year in 5 (Year 6)
2	Scrub / woodland	Pruning (subject to site assessment)	December	Annually
3	Scrub / woodland	Understorey control	March and August	Twice per annum
L	**Third Party Trees (retained)**			
1	Third party trees	Pruning (subject to site assessment)	December	Annually

7.0 ORGANISATION RESPONSIBLE FOR IMPLEMENTATION

7.1 All habitats within the site will be managed by Gleeson or sub-contractors employed by Gleeson and they will be responsible for the implementation of the management plan.

7.2 To discharge condition 13, habitat enhancement for faunal groups (roosting bats, house nesting birds and hedgehogs) will be delivered by Gleeson, or sub-contractors employed by Gleeson. The proposed location of bat boxes, house sparrow terraces, starling nest boxes and hedgehog highways is provided on **Drawing 1.**

8.0 MONITORING AND REMEDIAL MEASURES

Monitoring provisions

8.1 Measures have been built into the management prescriptions and work schedule set out above to monitor the success of the EcMP in achieving its habitat targets. These include:

- Checks on mature trees to assess safety and need for remedial works;
- Monitoring of wildflower and amenity grasslands to determine success of created grassland and need for remedial action (scrub removal, additional works to increase biodiversity), and
- Checks on young plantation woodlands. Native scrub planting and hedgerows too assess tree/scrub health and growth and to assess the need for maintenance or remedial action.

Remedial measures

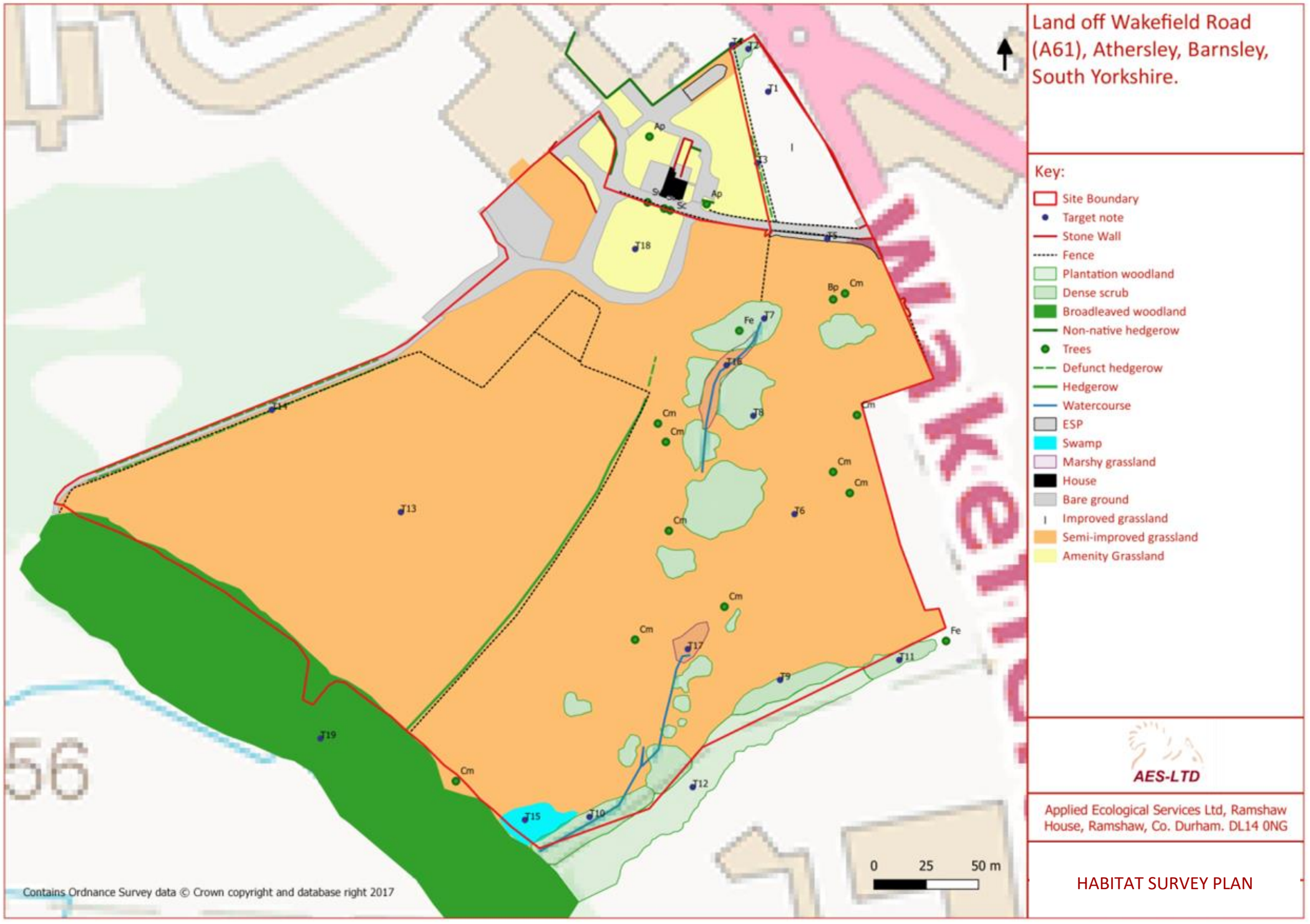
8.2 Remedial measures to address lack of attainment of habitat targets have been built into the management prescriptions and work programmes above. Additional measures may be required to address issues arising such as poor establishment of vegetation, tree diseases, spread of invasive species and storm damage etc.

8.3 The results of monitoring may also suggest changes to the management prescriptions, for example, if hedgerow growth is more vigorous than anticipated then cutting may need to be brought forward; if less vigorous it may not be needed until later in the management plan period. Implementation of the plan should be flexible enough to make these adjustments.

8.4 Examples of anticipated and potential remedial measures are summarised in the table below:

Table 8.1: Potential remedial measures

Habitat	Trigger	Action
Retained trees (mature) trees	Death or damage to trees	Assess risk of bat roost with survey as appropriate; prune to make safe
Individual trees - standard and standard (light).	Death of trees	Replacement planting
Ornamental shrub bed	Death of shrubs or shrubs growing leggy.	Replacement planting and pruning of shrubs to encourage new growth and an aesthetically pleasing shape
Native woodland planting	Failure of trees and shrubs	Replacement planting
Hedgerow	Failure of shrubs	Replacement planting
Wildflower /grass mix	Poor establishment of wildflower and grassland species	Harrowing of 20% of the habitat and additional oversowing.
Wildflower / grass mix (Flowering lawn)	Dominance of ruderal and pernicious weeds	Application of species-specific weed killer


Land off Wakefield Road (A61), Athersley, Barnsley, South Yorkshire.
Key:
Site Boundary
Target note
Stone Wall
Fence
Plantation woodland
Dense scrub
Broadleaved woodland
Non-native hedgerow
Trees
Defunct hedgerow
Hedgerow
Watercourse
ESP
Swamp
Marshy grassland
House
Bare ground
Improved grassland
Semi-improved grassland
Amenity Grassland
AES-LTD
Applied Ecological Services Ltd, Ramshaw House, Ramshaw, Co. Durham. DL14 0NG
HABITAT SURVEY PLAN
0 25 50 m
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This drawing has been prepared for the purpose of planning approval.
Planting Notes
Topsoil shall be a minimum of 400mm depth over existing bed and graded to fall. Imported topsoil must be BS4482:2001 compliant and existing topsoil must be cultivated in accordance with BS3882:2001. No cultivation should take place in wet/waterlogged conditions.
Herbicide and cultivation: Topsoil to be treated with two applications of herbicide prior to planting, where necessary, strictly in accordance with the Control of Pesticides Regulations 1986 (as amended 1997 or, otherwise, undesirable germinated vegetation and following cultivations to be controlled by qualified staff. The topsoil shall then be compacted to 150mm depth.
Planting: All planting and turfing shall conform to BS 4428: 1989 and BS 4043:1989.
Trees: Standard trees when planted in pits 900x900x900mm or dimensions of radial verti-mix to grade. Trees to be supplied by 'Hi' stakes (1800mm long) per tree, 900mm above ground, 75mm diameter, and 'Hi' tie (long possible tie. Alginure soil improver inc. 350g (12mg 'Sir equivalent) to be incorporated into the soil of all tree hot pits. Trees to be planted centrally within a tree pit. Trees planted within grass to have 1m diameter circle around their base, clear of vegetation, using mechanical or chemical means.
Container grown shrubs, transplants and sedge: Shrubs and transplants shall be planted in pits 300x300x450mm (depth) and the backfill shall include 3 litres of peat free 'tree and shrub compost' where two or more shrub species are indicated within a single bed each species shall be randomly mixed throughout the entire group of 5/5.
Herbicide: spot treat with herbicide throughout the maintenance period in accordance with the manufacturers instructions.
Mulch: Planting beds to receive 75mm depth wood chip bark mulch. Native woody shrubs/ edge plants to be planted with 900g fertilizer tablet mid period to soil. Native hedgerow to be planted through 600g tree shelter rail, edges tucked. Ensure the top of the mulch layer is a minimum of 50mm below adjacent pavements and drive surfaces, to prevent spillage.
Plant position: Final position of trees and shrubs subject to confirmation of service location and approval of statutory undertakers.
Protection to planting: Native trees and shrubs within areas to be grazed to be protected by shelter guards as supplied by Acorn Fencing Products Ltd (01606 526 467, or equivalent.
Grass: All turfed areas to be cultivated and levelled as required removing any stones, rubble, subsoil, general construction waste.
Planting Season: Bare root plants to be planted between mid November and mid March dependent upon the planting season
LEGEND
Site boundary
Existing tree to be retained
Existing tree to be removed
Proposed tree Standard
Proposed tree Standard (Light)
Proposed shrub bed
Proposed wildflower / grass mix Emorsgate EL1 'Flowering Lawn' Mixture' sown @ 4g/m² with EC21 'Fine Lawn Grass Mixture @ 4g/m²
Proposed wildflower / grass mix Emorsgate EM8 'Moscow Grass Mixture for 'Wet Soils' sown @ 4g/m²
Proposed grass mix emorsgate EMF0 'Amenity Grass Mixture' sown @ 4g/m²
Proposed native shrub mix
Proposed native woodland mix
Proposed grass
Contours
Services diversion
Proposed native hedge mix
Emorsgate Seeds, Limes Farm, Tilney All Saints, Kings Lynn, Norfolk, PE34 4RT
Tel: 01553 829028
email: enquiries@emorsgateseeds.com
Plant Codes (full schedules on Sheet 4)
Code Plant Name
Aa Acer campestre
Ap Acer platanoides
Ag Alnus glutinosa
Ai Amelanchier lamarckii
BP Betula pendula 'Fastigiata'
Tp Tilia platyphyllos
Bri Brachyglottis 'Sunshine'
Cs Choisya ternata 'Sundance'
Cow Cornus sanguinea
Cra Crataegus monogyna
EFG Euonymus fortunei 'Emerald 'n' Gold'
EE Euonymus fortunei 'Emerald Gaiety'
Hph Hosta plaginata 'Halcyon'
Ilx Ilex aquifolium
Lvd Lavandula angustifolia 'Hidcote'
LVG Lonicera nitida 'Baggesens Gold'
LNC Lonicera nitida 'Maygreen'
MP Miscanthus 'Purpurascens'
Psy Pinus sylvestris
Pa Prunus avium
Pp Prunus padus
Ps Prunus spinosa
Qr Quercus petraea
Sc Salix caprea
Sxr Salix x rubens
Sea Salix x sepulcralis
SerR Salix x sepulcralis 'Joseph Rock'
Tc Taxus baccata
Vd Viburnum davidii
Vo Viburnum opulus
Vt Viburnum tinus
Vm Vinca minor
Rev A: Revised to comments from Ecological Consultant 20/May/22 (MP)jc
Ref: HKA Architects 'Proposed Site Layout' 1705 DS Rev 4 received 11 May 22
PROJECT Wakefield Road, Smithies, Barnsley
TITLE Detailed Landscape Proposals (1 of 4)
CLIENT Gleeson Homes and Regeneration
DATE 25 Apr 22 SCALE 1 : 250 SHEET A0
DRAWN MPjc DRAWING 3839/1
CHECKED MP REVISION A
ROSETTA LANDSCAPE DESIGN
Chartered Landscape Architects
Scarlett Yard Vale Street
Pocklington York, YO42 2FJ
Telephone: +44 (0) 1904 625418
Email: design@rosettalandscape.co.uk
Web: www.rosettalandscape.co.uk

This drawing has been prepared for the purpose of planning approval.

Planting Notes

Topsoil: shall be a minimum of 300mm depth over planting beds and graded to fall. Imported topsoil must be BS3882:2007 compliant and existing topsoil shall be tested in accordance with BS3882:2007. No cultivation should take place in wet or waterlogged conditions.

Herbicide and maintenance: Ground to be treated with two applications of herbicide prior to planting, where necessary, strictly in accordance with the Control of Pesticides Regulations 1986 (as amended 1997 or, otherwise guidelines/recommendations applicable) and following manufacturers instructions by qualified staff. The topsoil shall then be cultivated to 150mm depth.

Planting: All planting and tubing shall conform to BS 3936: 1980 and BS 4428:1989.

Trees: Standard trees to be pit planted in 600x600x450mm or dimensions of pit shall, where trees is grassed. Tree to be supported by the stake (1200mm long, per tree 40/2mm native grown, 75mm diameter) and 3no tree ties graduated as 450mm soil removed and 150g Bonemeal mixed into the soil of all tree pits. Trees to be planted centrally within a tree pit. Trees planted within grass to have 1m diameter circle around base clear of vegetation, using maintenance chemical, spec's.

Container grown shrubs, transplants and whips: Shrubs and transplants shall be planted in pits 300x300x450mm deep(h) and the pit/dish shall include 3 litres of peat free mix and shrubs compost. Where two or more shrub species are established in a single bed each species shall be evenly and roughly arranged in groups of 3/5.

Herbicide: Spot treat with 'roundup' pre-planting and maintenance period in accordance with the manufacturer's instructions.

Mulch: Planting beds to receive 75mm depth bark and ornamental bark mulch, native woodland/hedge plants to be planted in 300g bio bark mulch mat (pierced) and native hedgerow to be planted through 450g bio fibre mulch mat, edges sown. Ensure the top of the mulch layer is a minimum of 50mm below adjacent pavements and other surfaces, to prevent spillage.

Plant position: Final position of trees and shrubs subject to confirmation of service location and approval of satisfactory conditions.

Protection to planting: Native trees and shrubs within fences to be protected by shelter guards as supplied by Acorn Tree Tubes, Hedera Ltd 01600 525 500, or equivalent.

Grass: All turfed/seed areas to be cultivated and levelled as required removing any stones, rocks, rubbish, general construction waste.

Planting Seasons: Bare root plants to be planted between mid-November and mid-March dependant upon the planting season.

LEGEND

- Site boundary
- Existing tree to be retained
- Existing tree to be removed
- Proposed tree Standard
- Proposed tree Standard (Light)
- Proposed shrub bed
- Proposed wildflower / grass mix Emorsgate EL1 "Flowering Lawn Mixture" sown @ 4g/m² with EG21 "Fine Lawn Grass Mixture" @ 1g/m²
- Proposed wildflower / grass mix Emorsgate WGM "Meadow Grass Mixture "for Wet Soils" sown @ 4g/m²
- Proposed grass mix Emorsgate EM10 "Tussock Mixture" sown @ 4g/m²
- Proposed native shrub mix
- Proposed native woodland mix
- Proposed grass
- Cobbles mix
- Service diversion
- Proposed native hedge mix

Ian Keogh Landscape Limited, Unit 4 Barn, Priory Farm, Priory Avenue, Kings Lynn, Norfolk, PE34 4HR
Tel: 07900 705628
email: enquiries@iankeoghlandscape.co.uk

Plant Codes (full schedules on Sheet 4)

Code	Plant Name
Ac	Acer campestre
As	Acer pseudoplatanus
Ag	Alnus glutinosa
Al	Amelanchier lamarckii
BM	Betula(s) nana gr. Microphylla
Bp	Betula pendula
BrS	Buddleja davidii 'Black Knight'
CS	Cornus sanguinea 'Midwinter Fire'
Cm	Corylus avellana
Cr	Crataegus monogyna
LMG	Lonicera nitida 'Lemon Spring Gold'
DE	Lonicera nitida 'Twiggy'
LnS	Lonicera periclymenum 'Serotina'
Ma	Malus sylvestris
Mr	Malus 'Rudolph'
LnM	Lonicera periclymenum 'Molesworth'
LMG	Lonicera nitida 'Baggesen's Gold'
LMG	Lonicera nitida 'Maygreen'
NLO	Viola 'Irish Clusters'
Prd	Prunus spinosa
Pp	Prunus avium
Po	Prunus padus
Ps	Prunus spinosa
Qr	Quercus robur
Sc	Salix caprea
Sal	Salix alba
Sa2	Salix x sepulcralis
SaR	Salix x sepulcralis 'Chrysocoma'
Ta	Tilia cordata
Vd	Viburnum davidii
Vo	Viburnum opulus
Vt	Viburnum tinus
Vtb	Viburnum tinus 'Eve Price'

Rev A: Revised to comments from Ecological Consultant - 20/Apr/22 (KP/dr)

Base: PRA Architects 'Proposed Site Layout, 1226 05 Rev H received 11 Apr 22

PROJECT	Wakefield Road, Smithies, Barnsley		
TITLE	Detailed Landscape Proposals (2 of 4)		
CLIENT	Gleeson Homes and Regeneration		
DATE	25 Apr 22	SCALE 1 : 250	SHEET A0
DRAWN	MP/jf	DRAWING NO	3836/2
CHECKED	MP	REVISION	A

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LEGEND
Site boundary
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Proposed grass mix Emorsgate EM10 'Tussock Mixture' sown @ 4g/m²
Proposed native shrub mix
Proposed native woodland mix
Proposed grass
Constraints
Service diversion
Proposed native hedge mix
Emorsgate Seeds, Limes Farm, Tilney All Saints, King's Lynn, Norfolk, PE34 4RT
Tel: 01553 829028, email: enquiries@emorsgateseeds.com
Plant Codes (full schedules on Sheet 4)
Rev A: Revised to comments from Ecological Consultant - 20May22 (MP/jr)
Base: PRA Architects 'Proposed Site Layout', 1225.05 Rev H received 11Apr22
PROJECT Wakefield Road, Smithies, Barnsley
TITLE Detailed Landscape Proposals (3 of 4)
CLIENT Gleeson Homes and Regeneration
DATE 25 Apr 22
SCALE 1 : 250
SHEET A0
DRAWN MP/jr
DRAWING NO 3836/3
CHECKED MP
REVISION A
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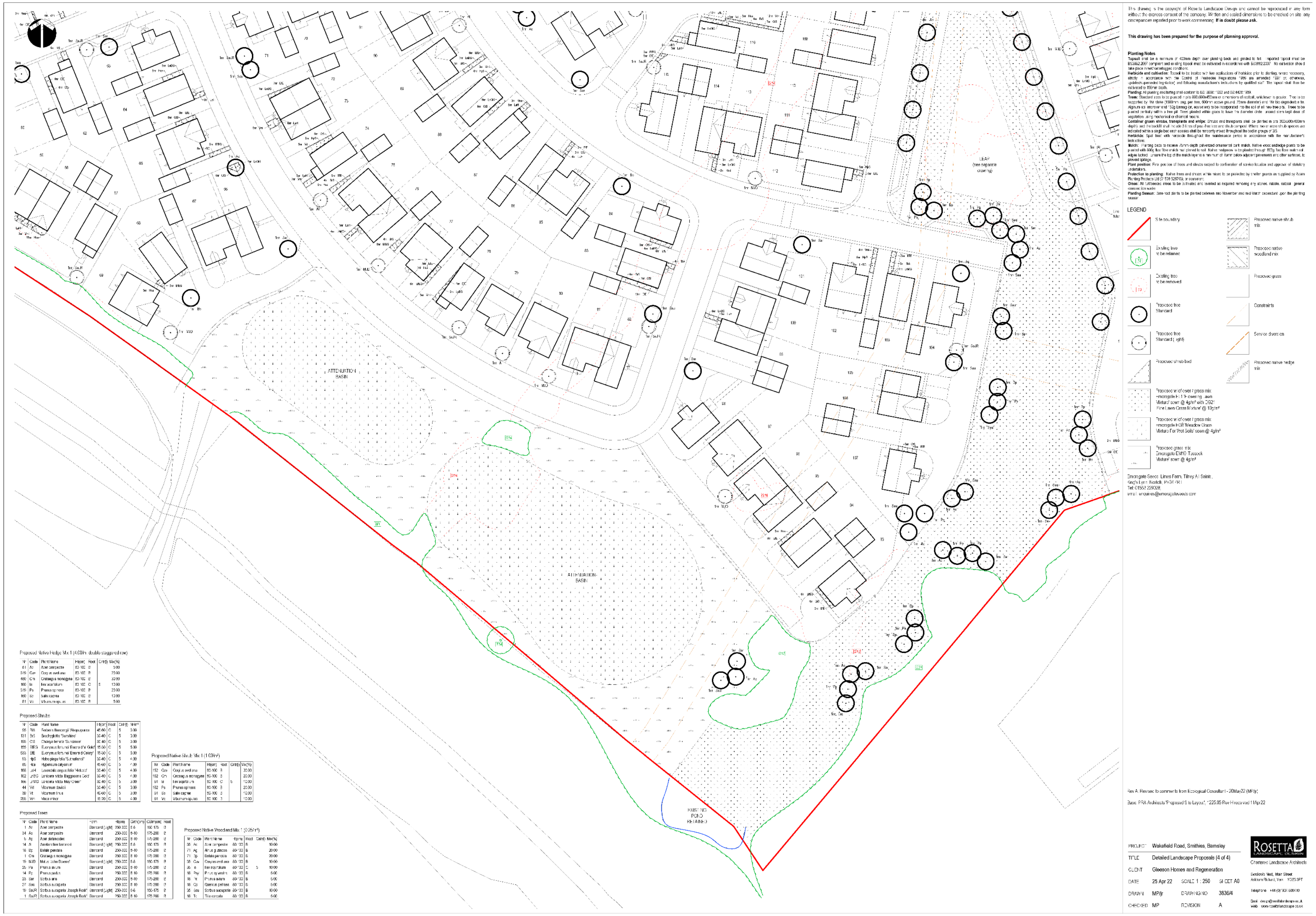

ATTENUATION BASIN
ATTENUATION BASIN
EXISTING POND RETAINED
Mulch: Planting beds to receive 75mm depth pulverized ornamental bark mulch. Native woodland/edge plants to be planted with 800g flax fibre mulch mat pinned to soil. Native hedgerow to be planted through 800g flax fibre mulch roll, edges tucked. Ensure the top of the mulch layer is a minimum of 15mm below adjacent pavements and other surfaces, to prevent spillage.
Plant position: Final position of trees and shrubs subject to confirmation of service location and approval of statutory undertakers.
Protection to planting: Native trees and shrubs within mixes to be protected by shelter guards as supplied by Acorn Planting Products Ltd (01508 528763), or equivalent.
Grass: All turf/seeded areas to be cultivated and levelled as required removing any stones, rubble, subsoil, general construction waste.
Planting Season: Bare-root plants to be planted between mid-November and mid-March dependant upon the planting season.
LEGEND
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TITLE Detailed Landscape Proposals (4 of 4)
CLIENT Gleeson Homes and Regeneration
DATE 25 Apr 22
SCALE 1 : 250
SHEET A0
DRAWN MP/jr
DRAWING NO 3836/4
CHECKED MP
REVISION A
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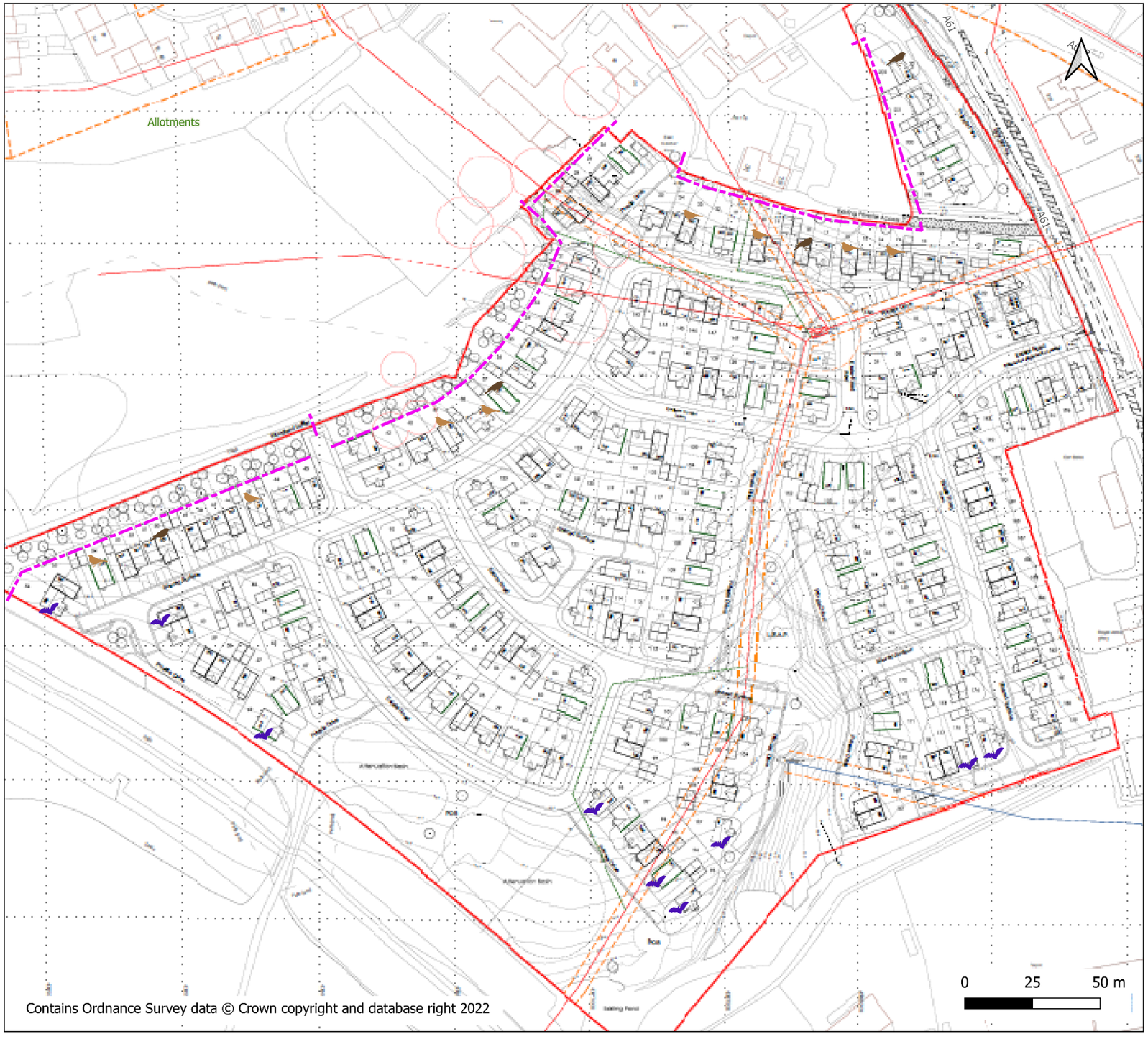

Key:

- Bat box
- Sparrow terrace
- Starling nest box
- Hedgehog highway

Land off Wakefield Road, Athersley, Barnsley.

Drawing 1: Habitat enhancement for fauna

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