



Peverill Securities

Bicester Arc

Landscape and Ecological Management Plan

December 2023

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1.0 INTRODUCTION

- 1.1 The following report has been prepared on behalf of Peverill Securities and provides details of the proposed ecological protection, mitigation, and enhancement measures for retained and newly created habitats within a site known as Bicester Arc (hereafter referred to as the 'Site').
- 1.2 The Site was subject to an outline planning permission in 2020 (Ref 17/02534/OUT) for the erection of a business park of up to 60,000 sq. m (GEA) of flexible Class B1(a) office / Class B1(b) research & development floorspace; associated vehicle parking, landscaping, highways, infrastructure, and earthworks.
- 1.3 This Landscape and Ecology Management Plan (LEMP) is to fulfil Condition 25 of the above consent which states:

25. No development shall take place until a scheme of landscaping and ecological mitigation/enhancement measures as well as a long-term management plan (to include a timetable and who is responsible for the management/ maintenance) in relation to all of the land edged blue to the east of the Superstore as shown on drawing no. 1105_P_004 Rev. A. has been submitted to and approved in writing by the Local Planning Authority. The approved landscaping and ecological mitigation/enhancement measures shall deliver a net biodiversity gain which shall be provided/created within the blue edged land prior to the first occupation of any development on the application site and shall thereafter be maintained in accordance with the approved long-term management plan.

Reason - To ensure that the development responds appropriately to the whole of the land allocated through Policy Bicester 4 in order to create a sustainable new business park and to ensure that the development leads to a net gain for biodiversity generally as well as preserves protected and priority species in accordance with the requirements of Policies ESD10 and Bicester 4 of the Cherwell Local Plan 2011-2031 Part 1 as well as Government guidance contained in the National Planning Policy Framework. This information is required prior to commencement of any development on the appropriate phase as it is fundamental to the acceptability of the scheme.

- 1.4 An 'eco park' will be created in phases (as shown in **Appendix A**) within the Site which, along with limited landscaping across the rest of the development area, will serve to provide the necessary biodiversity net gain for the entire development site and thus any additional landscaping delivered within each plot, for each forthcoming reserved matters application, will only serve to provide additional net gain over and above this provision.
- 1.5 The biodiversity net gain calculations for the 'eco park' have been submitted separately and are discussed in an accompanying Technical Note¹.
- 1.6 This LEMP accompanies the BNG calculations and details the establishment and management procedures necessary for the proposed habitats to reach and be maintained in the proposed conditions. This will fulfil the remainder of Condition 25.

¹ FPCR 2023. *Bicester Arc, Ecology Technical Note – Overall Biodiversity Net Gain Calculations*. Produced for Peveril Securities.

2.0 SITE BASELINE CONDITIONS

Habitats

- 2.1 The habitats on the Site were initially assessed in March 2021 and an update assessment was conducted in April 2023.
- 2.2 The Site is approximately 17 hectares (ha) in extent. It is located between a large Tesco superstore to the north and Bicester Garden Centre and sewage treatment plant to the south. To the west is the A41 and urban development and to the east is a railway line and beyond this arable farmland.
- 2.3 The habitats within the Site are shown on **Figure 1**. The site predominantly comprises a temporary grass ley bounded by hedgerows, mixed scrub and an urban bioswale. An area of mixed scrub and a ditch divide the grass ley into two areas.
- 2.4 Details of the baseline habitats within the Site are provided in the Ecological Appraisal². The values of the baseline habitats and hedgerows are detailed in the Biodiversity Net Gain Technical Note¹.

Fauna

- 2.5 Fauna relevant to the context of this site are as follows:
- A bat assemblage typical of the habitats present on site and within the surrounding landscape has been recorded, with bat foraging and commuting activity predominantly associated with the perimeter vegetation;
 - Notable mammals including hedgehog *Erinaceus europaeus* and polecat *Mustela putorius* are present in the wider area.
 - There is the low potential for otter *Lutra lutra* to use Langford Brook as part of a larger foraging territory; and
 - Habitats suitable to support foraging and breeding farmland birds occur within and at the perimeter of the Site.

² FPCR 2023. *Bicester Arc Ecological Appraisal Report*. Produced for Peveril Securities

3.0 ECOLOGICAL PROTECTION OF RETAINED FEATURES

Habitats

- 3.1 The landscape design for the 'eco park' is shown in **Appendix B**.
- 3.2 The habitats of higher ecological value within the Site, namely the scrub and ditch and those bounding the Site, namely the hedgerows, scrub and bioswale, are to be retained. A small amount of the temporary grass ley will be retained. The loss of a majority of this habitat is not considered to represent a significant loss to biodiversity.
- 3.3 Retained hedgerows bounding the Site, outside of the 'eco park' will be protected throughout the construction period for the relevant phase via the use of Heras fencing erected prior to construction works commencing. This will be detailed within a Construction Ecological Management Plan (CEMP) produced for the relevant phase.
- 3.4 As no construction works will be taking place within the 'eco park', protection of the retained habitats in this manner is not considered necessary.
- 3.5 The retained and created habitats will be subject to ecologically sensitive management in the long-term as set out in Section 5.

Fauna

- 3.6 Precautionary methods of working to protect breeding birds during vegetation removal, and any additional measures to protect fauna during construction will be presented within the relevant CEMP for each phase of the Bicester Arc development.
- 3.7 There is no removal of woody vegetation required for the establishment of the 'eco park' and thus no precautionary methods for breeding birds are considered necessary. There is a small chance that skylark *Alauda arvensis* could be present on the grassland within the 'eco park' area and thus a check should be conducted prior to the first habitat works being carried out and works delayed until chicks have fledged.
- 3.8 The 'eco park' design will provide habitats that will continue to allow fauna to travel through the Site and utilise the foraging opportunities that shall be retained and created.
- 3.9 A sensitive lighting scheme will be implemented with regard to the Bat Conservation Trust and Institute of Lighting Professionals guidance³ to ensure there is no light spill onto the 'eco park' habitats.
- 3.10 The lack of lighting in the 'eco park' will ensure no disturbance due to lighting of nocturnal fauna including otter, badger, hedgehog, and bats.
- 3.11 The remainder of the Bicester Arc development will have a relevant lighting plan that will ensure that lighting on all retained boundary trees, scrub and continuous perimeter hedgerows is minimal (less than 1 lux) in accordance with the BCT/ILP guidance to minimise the potential effects of light spill to light sensitive bat and other wildlife due to artificial lighting.
- 3.12 Further enhancements for fauna relevant to the context of the site are detailed below in Section 4.

³ Bat Conservation Trust (BCT) and Institute of Lighting Professionals (ILP) 2023. *Guidance Note 8: Bats and artificial lighting*. Guidance Note GN08/23.

4.0 CREATION OF NEW ECOLOGICAL FEATURES

Habitats

- 4.1 The following new habitats will be created within the 'eco park' as shown in **Appendix B**:
- 33 small trees, maintained to reach moderate condition.
 - 183m of native species rich hedgerow, maintained to reach moderate condition.
 - 1.07 ha mixed native scrub, maintained to reach moderate condition.
 - 0.17 ha pond with marginal vegetation in moderate condition (as per **Appendix C**); and
 - 2.73 ha species rich wildflower grassland in moderate condition.
- 4.2 The retained scrub and areas of retained grass ley will be put into management to maintain (scrub) or enhance (grass ley) their biodiversity value.

Other Ecological Features

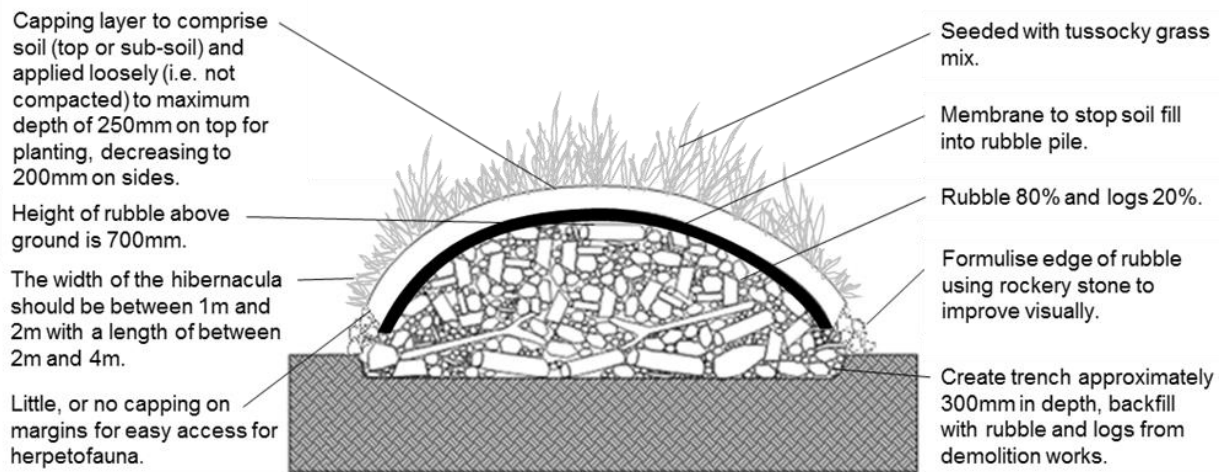
- 4.3 The following new species-specific opportunities will be installed within the 'eco park' as shown in **Appendix B**. These will be installed in Phase 1.
- 2 x reptile and amphibian hibernacula
 - 4 x small open fronted bird nest boxes
- 4.4 Additional nest boxes will be installed within the retained boundary trees and hedgerows outside of the 'eco park' during the construction of the relevant phase. Numbers are to be decided at the Reserved Matters stage for each phase.
- 4.5 The inclusion within the built environment of species-specific nest boxes for house sparrow *Passer domesticus* and swift *Apus apus* will encourage these urban species which have both undergone significant local and national declines to breed on Site. This will be detailed within a CEMP for each phase.

Open Front Bird Boxes

- 4.6 Four small open front bird nest boxes will be installed on the retained scrub within the 'eco park' to provide additional nesting opportunities for scrub breeding species. A suitable box would be the Vivara Pro Barcelona WoodStone open nest boxes (suitable for various species including spotted flycatcher *Muscicapa striata*, robin *Erithacus rubecula*, wren *Troglodytes troglodytes*, song thrush *Turdus philomelos* and blackbird *Turdus merula*).
- 4.7 The bird boxes will be installed in accordance with standard best practice, such that the boxes are positioned with the entrances to the boxes facing between north and east, and where possible adjacent to areas of continuous green infrastructure. Exact bird box locations will be finalised during the installation process, as it is difficult to specify these remotely. Indicative locations are given in **Appendix B**.
- 4.8 Bird boxes will have a non-invasive inspection in autumn or winter to check for damage and lost or damaged boxes will be replaced.

Hibernacula / Refugia

- 4.9 Two artificial hibernacula will be created, each within 200m of a pond to provide a mix of refuge and wintering habitat for amphibians (see **Appendix B** for locations).
- 4.10 The hibernacula will be constructed out of loosely piled rubble and logs, such that small crevices will be created between material that will allow refuge for amphibians, invertebrates and small mammals. Mulch, consisting of composted bark, should be incorporated into the construction of the hibernacula to provide a deep litter layer of at least 100mm that holds moisture. Ideally, on sites with free-draining soils, the hibernacula should be constructed and built up within a pit, whereas sites with impermeable soils or high flood risk, hibernacula should be constructed as a pile on a gentle slope for drainage.



- 4.11 The hibernacula will each be positioned within marginal habitat and surrounded by tussocky grassland or scrub (particularly to the north) that receives both sun and shade. Additional habitat features could be added around the hibernacula, such as log piles which supply a source of food and shelter.

Biodiversity Net Gain

- 4.12 As detailed within the Biodiversity Net Gain Technical Note¹, the 'eco park' area will result in a 7.76% net gain in habitat units and a 16.18% net gain in hedgerow units. The Bicester Arc development area will provide further biodiversity benefits in addition to these.

5.0 ECOLOGICAL MANAGEMENT

- 5.1 The overarching objective for the Site is to maintain and enhance the nature conservation value of the retained habitats, particularly NERC habitats, such as hedgerows, whilst contributing to objectives of national, regional, and local biodiversity strategies and providing new biodiverse habitats and opportunities for species foraging and breeding.
- 5.2 The following tables (**Tables 1** and **2**) provide the objectives and management details for habitat creation and subsequent management.
- 5.3 Section 6 describes the monitoring regime and success indicators for each retained and created habitat across the Site.

Habitat Objectives

- 5.4 Paragraph 4.1 lists the areas of each habitat type proposed. The objectives for each habitat are described in **Table 1**, and management prescriptions to achieve these objectives are detailed in **Table 2**.

Table 1: Habitat Objectives

Feature	Objective	Indicator that objective has been achieved
Creation of 2.73 ha grassland - other neutral grassland (1.617 created in phase 1 as shown on Appendix B)	To create grassland that meets the definition of 'Other Neutral Grassland' with a condition of ' Moderate ' targeted within five years	The following four bold criteria are met: <ol style="list-style-type: none"> 1. The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). Wildflowers, sedges, and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward. 2. Sward height is varied (at least 20% of the sward is less than 7cm and at least 20% is more than 7cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed. 3. Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens. 4. Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%. 5. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of undesirable species and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.
Creation of 33 urban trees (planted in phase 2)	To create urban trees with a condition of ' Moderate ' targeted, within 27 years	The following four bold criteria are met: <ol style="list-style-type: none"> 1. More than 70% of trees are native species. 2. Tree canopy is predominantly continuous with gaps in canopy cover making up less than 10% of total area and no individual gap being greater than 5m wide. 3. More than 50% of trees are mature or veteran. 4. There is little or no evidence of an adverse impact on tree health by anthropogenic activities such as vandalism or herbicide use. There is no current regular pruning regime, so the trees retain over 75% of expected canopy for their age range and height.

Feature	Objective	Indicator that objective has been achieved
		5. Management regime has encouraged micro habitat sites for birds, mammals, and insects e.g., presence of deadwood, cavities or loose bark etc. 6. Trees are immediately adjacent to other vegetation, and tree canopies are oversailing vegetation beneath.
Creation of 1.07 ha Heathland and shrub - Mixed Scrub (planted in Phase 2)	To create mixed scrub with a condition of 'Good' targeted, within 10 years	All the following criteria are met: 1. Habitat is representative of UKHab description (where in its natural range). There are at least three woody species, with no one species comprising more than 75% of the cover (except common juniper, sea buckthorn or box, which can be up to 100% cover). 2. There is a good age range – all of the following are present: seedlings, young shrubs and mature shrubs. 3. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species¹ make up less than 5% of ground cover. 4. The scrub has a well-developed edge with scattered scrub and tall grassland and/or herbs present between the scrub and adjacent habitat(s). 5. There are clearings, glades or rides present within the scrub, providing sheltered edges.
Creation of 0.17 ha pond (non-priority) (created in Phase 1)	To create a non-priority non woodland pond with a condition of 'Moderate' targeted, within three years	The following seven bold criteria are met: 1. The pond is of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution. Turbidity is acceptable if the pond is grazed by livestock. 2. There is semi-natural habitat (i.e., moderate distinctiveness or above) for at least 10m from the pond edge. 3. Less than 10% of the pond is covered with duckweed or filamentous algae. 4. The pond is not artificially connected to other waterbodies, either via streams, ditches, or artificial pipework. 5. Pond water levels should be able to fluctuate naturally throughout the year. No obvious dams, pumps, or pipework. 6. There is an absence of non-native plant and animal species. 7. The pond is not artificially stocked with fish. If the pond naturally contains fish, it is a native fish assemblage at low densities. 8. In non-woodland ponds, plants, be they emergent, submerged, or floating (excluding duckweeds), should cover at least 50% of the pond area that is less than 3m deep. 9. The surface of non-woodland ponds is no more than 50% shaded by woody bankside species.
Creation of 183m of species rich hedgerow (planted in phase 2)	To create a hedgerow with a condition of 'Moderate' targeted within 5 years	The following six bold criteria are met: A1. >1.5m average along length A2. >1.5m average along length B1. No hedge base gap between ground and base of canopy for 90% of length (unless 'line of trees') B2. Hedge canopy continuity. Gaps make up <5m.

Feature	Objective	Indicator that objective has been achieved
		<p>C1. Over 1m width of undisturbed ground with perennial herbaceous vegetation for over 90% of length measured from outer edge of hedgerow and is present on one side of the hedge (at least).</p> <p>C2. Plant species indicative of nutrient enrichment of soils do not dominate.</p> <p>D1. Over 90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species.</p> <p>D2. Over 90% of the hedgerow or undisturbed ground is free of damage caused by human activities.</p>
Retain 1 ha of temporary grass ley and enhance to modified grassland (phase 2)	Retain 1 ha of temporary grass ley and enhance to modified grassland with a condition of 'Moderate' targeted within 5 years	<p>The following five bold criteria are met:</p> <ol style="list-style-type: none"> 1 There must be 6-8 species per m². Note - if a grassland has 9 or more species per m² it should be classified as a moderate distinctiveness grassland habitat type. 2 Sward height is varied (at least 20% of the sward is less than 7cm and at least 20% is more than 7cm) creating microclimates which provide opportunities for insects, birds, and small mammals to live and breed. 3 Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type. 4 Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities. 5 Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens. 6 Cover of bracken less than 20%. 7 There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species¹ make up less than 5% of ground cover.

Table 2: Habitat Management Plans

Feature	Outline habitat creation & management
<p>Creation of 2.73ha grassland - other neutral grassland</p> <p>(1.617 created in phase 1 as shown on Appendix B)</p>	<p>Creation</p> <ul style="list-style-type: none"> • Creation of an herb rich neutral grassland community achieved through scarification of the existing ground and seeding with an appropriate species rich seed mix. Seed mix areas shall be sown with Emorsgate EM2 mix. • Moderate condition achieved through management in the long term through 1-2 cuts per year, with the grassland left un-mown during the summer and any arisings removed. <p>First year management</p> <ul style="list-style-type: none"> • Resist cutting annual weeds until mid to late summer, especially if the mixture contains yellow rattle. Then cut, remove, and compost in early August ideally. • The grassland can then be kept short by mowing through to the end of March of the following year. • Dig out any residual perennial weeds such as docks to keep cover of undesirables below 5% coverage. <p>Ongoing Management</p> <ul style="list-style-type: none"> • Meadow grassland is not cut or grazed from spring through to late July/August to give the sown species an opportunity to flower. • After flowering in July or August take a 'hay cut': cut back with a petrol strimmer or tractor mower to c.50mm. Leave the 'hay' to dry and shed seed for 1-7 days then remove from site. • Mow the re-growth through to late Autumn/winter to c.50mm and again in spring if needed.
<p>Creation of 33 urban trees</p> <p>(planted in phase 2)</p>	<p>Creation and Establishment</p> <ul style="list-style-type: none"> • Planting will be between end of October and March with periods of inundation or prolonged ground frost should be avoided. • Species planted as specified in GL1914 01E Infrastructure Proposals Plan. • Suitable rabbit guards, fencing, or shelters will be used to protect plants from damage until established. Tree guards will be removed once the trees and shrubs are established. • Water as necessary during establishment. • Mixed planting of native tree species and cultivars. <p>Ongoing Management</p> <ul style="list-style-type: none"> • Subject to two visits annually, once in growing season (April – September) and once in dormant season (October – March). • Water during prolonged dry weather during the growing season (April – September). • For the first three years after planting, maintain a weed free area of at least 1m diameter around each tree/plant. Carefully apply a suitable translocated herbicide such as “Round-up” glyphosate herbicide during summer visit. Dead weed material shall be removed during the following visit to site. • Check and tighten tree support / firm up in ground if necessary. • Once established well, remove all stakes, ties, spacers, tubes etc. and make good surfaces disturbed, filling any holes with suitable topsoil. • For the first five years all dead and dying specimens are to be replaced with a tree/plant of a different native species as those existing. This is to allow some flexibility and to avoid problems encountered with ‘Same Tree Disease’. • Prune back any diseased or rotten wood (including the removal of main stems and limbs) back to sound wood. A suitably skilled

Feature	Outline habitat creation & management																								
	<p>and qualified arboriculturist shall carry out such pruning.</p> <ul style="list-style-type: none"> Maintain free of litter and self-seeded non-native plants. 																								
<p>Creation of 1.07 ha Heathland and shrub - Mixed Scrub (created in phase 2)</p>	<p>Creation</p> <ul style="list-style-type: none"> Planting will be done in stages, the initial round of planting will be completed during Year 1, with a further round of complimentary planting to be introduced in Year 5. This staged approach will contribute significantly to achieving the objective of a mixed age range by Year 10 and will allow for fine tuning of planting groups to ensure there is a good diversity of complimentary species. There will be a minimum of five native shrub species used, with the different species planted at varying frequencies across the offsite compensation area. Native scrub comprising whips (60-80cm) are to be planted at an average density of 1m centres, between November and March covering 100% of area and protected from rabbits with spiral guards, as conditions on site require. It is recommended species diversity is increased by incorporating the scrub planting mix detailed below. <p><u>Scrub Planting Mix (suggested TBC)</u></p> <table border="1" data-bbox="544 647 1182 1066"> <thead> <tr> <th>Common name</th> <th>Latin name</th> <th>Comments</th> </tr> </thead> <tbody> <tr> <td>Common dogwood</td> <td><i>Cornus sanguinea</i></td> <td>15% whip</td> </tr> <tr> <td>Hazel</td> <td><i>Corylus avellana</i></td> <td>15% whip</td> </tr> <tr> <td>Hawthorn</td> <td><i>Crataegus monogyna</i></td> <td>35% whip</td> </tr> <tr> <td>Holly</td> <td><i>Ilex aquifolium</i></td> <td>5% 3 cl</td> </tr> <tr> <td>Crab apple</td> <td><i>Malus sylvestris</i></td> <td>10% whip</td> </tr> <tr> <td>Blackthorn</td> <td><i>Prunus spinosa</i></td> <td>10% whip</td> </tr> <tr> <td>Bird cherry</td> <td><i>Prunus padus</i></td> <td>10% whip</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Plant in groups of 3, 5 or 7, with clusters of the same species planted together and designed to create a naturalistic pattern with 10-15% open space in the form of glades and clearings within the scrub, in order to create significant areas of edge habitats and structural diversity. Mulch new plants where required to aid long-term soil improvement and avoid water loss. <p>First year management</p> <ul style="list-style-type: none"> Scrub should be monitored with infill planting in gaps to replace any dead or diseased specimens (Years 1 to 2). <p>Ongoing Management</p> <ul style="list-style-type: none"> Yearly mowing / strimming of glades and clearings in July (with late June- August acceptable) to around 50mm, removing arisings 	Common name	Latin name	Comments	Common dogwood	<i>Cornus sanguinea</i>	15% whip	Hazel	<i>Corylus avellana</i>	15% whip	Hawthorn	<i>Crataegus monogyna</i>	35% whip	Holly	<i>Ilex aquifolium</i>	5% 3 cl	Crab apple	<i>Malus sylvestris</i>	10% whip	Blackthorn	<i>Prunus spinosa</i>	10% whip	Bird cherry	<i>Prunus padus</i>	10% whip
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	<p>after they have dried (minimum 48 hours) to reduce soil nutrients. Once every four years cut the grassland in September to allow late flowering species to set seed.</p> <ul style="list-style-type: none"> • Trimming following establishment period (from Year 5) including maintenance of a sinuous edge with a graded margin down to field layer (tapering edge from canopy height to 20cm). Trimming to take place outside of bird nesting season (March to August/early September), ideally during late winter but avoiding periods of frost. • Selective thinning / coppicing (from Year 5) to promote regeneration of seedlings and saplings and increase structural diversity. 10-15% open space should be targeted within the habitat. • Selective clearing / coppicing of scrub edge (roughly 1/3 to 1/5 every 2-3 years) down to ground to reduce dominance of species such as blackthorn and hawthorn and promote regeneration of young shrubs/herb edge (if and where required). • Felled wood should be used to create additional deadwood piles. Where required, it is recommended that mechanical pulling/cutting methods be employed. The use of fertiliser and herbicide usage should be avoided. <p>Trimming/thinning to take place outside of bird nesting season (i.e., avoiding March to August/early September), ideally during late winter but avoiding periods of frost.</p>																																																							
<p>Creation of 0.17 ha pond (non-priority) (created in phase 1)</p>	<p>Creation</p> <ul style="list-style-type: none"> • Earthworks will be undertaken to create a small-contoured earth mound to encourage water retention. The pond will be designed to include a central area approximately 1.5-2m deep, and marginal shelves for aquatic planting (see Appendix C). New marginal aquatic planting will be undertaken (see suggested mix below). • Planting should be completed subsequent to the pond filling with water • Plant marginal/emergent plants at an average density of 4 plants/m² around the pond in same-species clusters of between 5 and 9 plants. <p>Suggested Planting Mix (suggested TBC)</p> <table border="1" data-bbox="546 943 1570 1423"> <thead> <tr> <th>Common Name</th> <th>Scientific Name</th> <th>Root Zone</th> <th>Specification</th> <th>% in Mix</th> </tr> </thead> <tbody> <tr> <td colspan="5">Planted in groups of 5-9 at 0.5m centres</td> </tr> <tr> <td>Water mint</td> <td><i>Mentha aquatica</i></td> <td>0.5L</td> <td>Full pot; Sept to April planting; British native origin</td> <td>25</td> </tr> <tr> <td>Water forget-me-not</td> <td><i>Myosotis scorpiodes</i></td> <td>0.5L</td> <td>Full pot; Sept to April planting; British native origin</td> <td>20</td> </tr> <tr> <td>Water-plantain</td> <td><i>Alisma plantago-aquatica</i></td> <td>0.5L</td> <td>Full pot</td> <td>10</td> </tr> <tr> <td>Soft rush</td> <td><i>Juncus effusus</i></td> <td>P9</td> <td>Full pot</td> <td>10</td> </tr> <tr> <td>Hard rush</td> <td><i>Juncus inflexus</i></td> <td>P9</td> <td>Full pot</td> <td>10</td> </tr> <tr> <td>Yellow iris</td> <td><i>Iris pseudacorus</i></td> <td>0.5L</td> <td>Full pot</td> <td>10</td> </tr> <tr> <td>Marsh marigold</td> <td><i>Caltha palustris</i></td> <td>0.5L</td> <td>Full pot</td> <td>5</td> </tr> <tr> <td>Greater tussock-sedge</td> <td><i>Carex paniculate</i></td> <td>0.5L</td> <td>Full pot; Sept to April planting; British native origin</td> <td>5</td> </tr> <tr> <td>Cuckooflower</td> <td><i>Cardamine pratensis</i></td> <td>P9</td> <td>Full pot</td> <td>1</td> </tr> </tbody> </table>	Common Name	Scientific Name	Root Zone	Specification	% in Mix	Planted in groups of 5-9 at 0.5m centres					Water mint	<i>Mentha aquatica</i>	0.5L	Full pot; Sept to April planting; British native origin	25	Water forget-me-not	<i>Myosotis scorpiodes</i>	0.5L	Full pot; Sept to April planting; British native origin	20	Water-plantain	<i>Alisma plantago-aquatica</i>	0.5L	Full pot	10	Soft rush	<i>Juncus effusus</i>	P9	Full pot	10	Hard rush	<i>Juncus inflexus</i>	P9	Full pot	10	Yellow iris	<i>Iris pseudacorus</i>	0.5L	Full pot	10	Marsh marigold	<i>Caltha palustris</i>	0.5L	Full pot	5	Greater tussock-sedge	<i>Carex paniculate</i>	0.5L	Full pot; Sept to April planting; British native origin	5	Cuckooflower	<i>Cardamine pratensis</i>	P9	Full pot	1
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Feature	Outline habitat creation & management				
	Water horsetail	<i>Equisetum fluviatile</i>	P9	Full pot	1
	Marsh horsetail	<i>Equisetum palustre</i>	P9	Full pot	1
	Marsh cinquefoil	<i>Comarum palustre</i>	P9	Full pot	1
	Yellow pimpernel	<i>Lysimachia nemorum</i>	P9	Full pot	1
	Total				100
	<p>First year management</p> <ul style="list-style-type: none"> • Monitor and if necessary, manage water levels within the pond. • Manage vegetation within the pond, ensuring 50% of open water by hand. All risings to be left on the pond edge for 48hrs before moving to a designated composting area. <p>Ongoing Management</p> <ul style="list-style-type: none"> • Remove any encroaching scrub and oversailing branches from surrounding habitats that are deemed to be causing excessive shading of the pond surfaces. • Limit the surface coverage of duckweed and/or filamentous algae to a maximum of 10%. • Remove invasive or non-native flora and fauna. 				
<p>Creation of 183m of species rich hedgerow</p> <p>(Planted in phase 2)</p>	<p>Establishment</p> <ul style="list-style-type: none"> • Use at least seven native species. Suggested species: <ul style="list-style-type: none"> - Common dogwood <i>Cornus sanguinea</i> - Hazel <i>Corylus avellana</i> - Hawthorn <i>Crataegus monogyna</i> - Holly <i>Ilex aquifolium</i> - Crab apple <i>Malus sylvestris</i> - Blackthorn <i>Prunus spinosa</i> - English elm <i>Ulmus procera</i> • Planting to be undertaken between the end of October and March, avoiding periods of inundation or prolonged ground frost. • Ground preparation will include the strimming and spraying of a planting strip with glyphosate herbicide at least three weeks prior to planting. • Until the new planting is established, formative pruning will be undertaken once annually to keep the hedgerow tidy and encourage a dense growth form. Weeding by hand or using glyphosate as appropriate should be undertaken around the base of the plants, three times per year. • Suitable rabbit guards, fencing, or shelters will be used to protect plants from damage until established. • Water as necessary during establishment. 				

Feature	Outline habitat creation & management
	<p>Ongoing Management</p> <ul style="list-style-type: none"> • Subject to two visits annually, once in growing season (April – September) and once in dormant season (October – March). • Water during prolonged dry weather during the growing season (April – September). • Tree guards and stakes will be reviewed and removed as necessary after 3-5 years. • For the first five years all dead and dying specimens, including both planted tree and hedgerow species specimens, are to be replaced with a tree/plant of either the same species or similar species as those existing. This is to allow some flexibility and to avoid problems encountered with 'Same Tree Disease. • Urban trees adjacent to the hedgerow will be left uncut unless damaged/diseased limbs or hedgerow sections require removal to promote overall tree health or removal is required for health and safety reasons. • Prune back any diseased or rotten wood (including the removal of main stems and limbs) back to sound wood. A suitably skilled and qualified arboriculturist shall carry out such pruning. • Trimming/cutting will be undertaken between October and February to avoid the nesting bird season. • All cut material will be removed from the site. No burning on site will occur. • Hedgerows will achieve height and width more than 1.5m. • Gap to ground and canopy will be less than 0.5m for 90% of the length. • Gaps will be less than 10% in length and no canopy gaps more than 5m. • More than 90% of the hedgerow and base will be free of non-native species. • Maintain free of litter
<p>Retain 1ha of temporary grass ley and enhance to modified grassland</p>	<p>Grassland to be brought into the same ongoing management as the created 'other neutral grassland' management. This will encourage biodiversity and seeds from the created 'other neutral grassland' to colonise and increase overall species diversity.</p>
<p>Hibernacula (Established in phase 1)</p>	<p>Establish as specified</p>
<p>Open front bird boxes (installed in phase 1)</p>	<p>Non-invasive inspection in autumn or winter to check for damage and lost or damaged boxes will be replaced.</p>

6.0 ROLES AND RESPONSIBILITIES

- 6.1 In order to appropriately monitor the success of the proposed habitat enhancement, the Site will be assessed against the habitat objectives set out in **Tables 2** and **3**, and the proposed UKHab habitat definition at the time of this report.
- 6.2 Monitoring will cover the pond, scrub, grassland, trees and hedgerow habitats.
- 6.3 The monitoring of the project will be carried out in Years 2, 5, 10, 20 and 30.
- 6.4 The monitoring will be completed by an appropriately qualified and experienced ecologist (a suitably qualified person is a person who is sufficiently qualified to confidently identify the features required in the monitoring criteria), with results submitted to the monitoring authority in accordance with the legal agreement used to secure the scheme.
- 6.5 Monitoring visits will be undertaken at an appropriate time of year (May to August inclusive) and will involve a detailed UKHab survey of the site and condition assessment as specified within Defra 3.1 technical supplement. For each community, as a minimum, the following information will be collected:
- A comprehensive species list, along with a measure of abundance using DAFOR.
 - For the grassland habitats representative quadrat data should be recorded (to a maximum of 10 quadrats);
 - Representative photos of each habitat and feature.
 - Habitat condition assessment tables should be completed, with detailed notes on each criterion and potential constraints and opportunities, and
 - A detailed description of the habitat, noting abiotic factors such as structure, slope, aspect, management, and recreational use, and how this may influence the habitat community.
- 6.6 Results of this monitoring will be used to inform changes to this management plan. The detailed management prescriptions set out in the management plan will be altered if required following monitoring and in agreement with the management contractor, the Local Planning Authority (LPA) and any other stakeholders.
- 6.7 A report will be produced to identify compliance with the binding objectives and recommendations which will be sent to the LPA and the landowner following each monitoring period. When a recommendation is made to the landowner to ensure objectives compliance, the following monitoring survey will assess if that recommendation was followed, and the objective met.
- 6.8 Where objectives are not being adequately met, appropriate action will be put in place (such as the corrective measures detailed in **Table 3** for each habitat) to amend management prescriptions, with any refinements incorporated into the updated management plan and annual work programme.
- 6.9 Modifications made to the management plan as part of adaptive management should be added to the relevant habitat management table and included within an updated version of this document. The changes must be circulated to the land manager and monitoring authority.

Table 3: Monitoring Triggers and Corrective Actions

Habitat Type	Monitoring Triggers
Scrub	<p><u>a) Increase shrub species diversity</u> Where monitoring shows a minimum of three shrub species are not present throughout each discrete stand, or that single species comprise over 75% of cover:</p> <ul style="list-style-type: none"> • Selective clearance of scrub edge to reduce dominance of species such as blackthorn, hawthorn and bramble. • Selective thinning of some dense stands to allow light to reach the ground and promote regeneration of seedlings and saplings. • Planting of additional shrub species as necessary. <p><u>b) Control of any undesirable or non-native invasive species</u></p> <ul style="list-style-type: none"> • Where periodic monitoring records presence of undesirable or non-native invasive species undertake mechanical removal/use herbicide as appropriate and remove all cut material from site. • Seek advice from specialist contractor as necessary.
Other neutral grassland	<p><u>a) Increase wildflower germination</u> Where monitoring shows cover of wildflowers remains below 30% by Year 7:</p> <ul style="list-style-type: none"> • Year 8, immediately after a September/October cut, rake or harrow the grassland to expose >50% bare earth. • Broadcast Emorsgate EM3F Special General-Purpose Wildflowers (or equivalent, approved native mix) at a rate of 40kg/ha, 4g/m² (or as specified by the seed supplier). The above is a 100% wildflower mix suitable for sowing into existing grass. Where required, yellow rattle can be added at up to 1g/m² into this mix to improve results. Before sowing, prepare ground and manage during first year as per Table 2. From second year onwards manage as per Table 2.
Pond	<p><u>a) Monitor habitat conditions</u></p> <ul style="list-style-type: none"> • Monitor and if necessary, manage water levels within the pond to ensure some level of standing water year-round. • Manage vegetation within the pond, ensuring 50% of open water, with clearance undertaken using hand tools. All risings to be left on the pond edge for 48hrs before moving to a designated composting area. <p><u>b) Encroachment control</u></p> <ul style="list-style-type: none"> • Remove any encroaching scrub and oversailing branches from surrounding wet woodland deemed to be causing excessive shading of the pond surfaces. <p><u>c) Invasive/undesirable species management</u></p> <ul style="list-style-type: none"> • Limit the surface coverage of duckweed and/or filamentous algae to a maximum of 10% using hand tools. • Removal of invasive or non-native flora and fauna.
Hedgerows	<p><u>a) Increase species diversity</u></p> <ul style="list-style-type: none"> • Where monitoring shows seven species are not present throughout each discrete 30m section, plant additional native hedgerow species as necessary. <p><u>b) Control of any undesirable or non-native invasive species</u></p> <ul style="list-style-type: none"> • Where periodic monitoring records presence of undesirable or non-native invasive species undertake mechanical removal/use herbicide as appropriate and remove all cut material from site. • Seek advice from specialist contractor as necessary.
Trees	<p><u>a) Prevent damaging activities</u></p> <ul style="list-style-type: none"> • If the tree is showing evidence of damaging activities – consider fencing or signage to prevent this.

















7.0 REVIEW OF MANAGEMENT PLAN

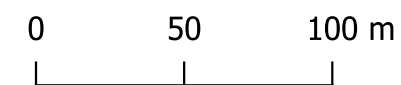
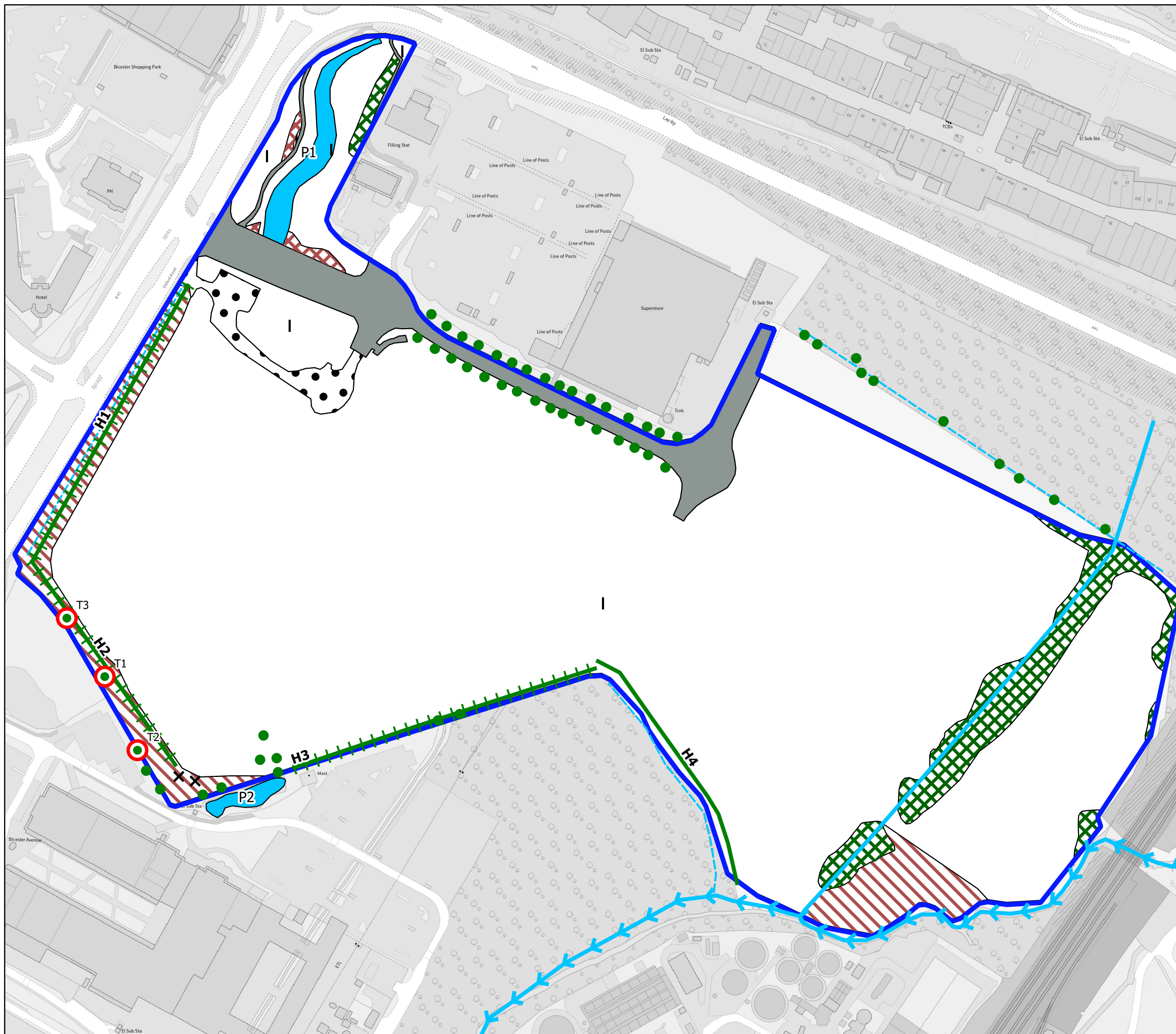
- 7.1 The management plan should run in perpetuity but for a minimum of 30 years, with the work programme fully reviewed at the end of the initial five-year period by a suitably qualified and experienced ecologist and arboriculturist.
- 7.2 Results of this review should be used to inform changes to the management plan and work programme. The management and monitoring schedule provided here should not be set in stone and will be altered if required to ensure that the habitats created within the site reach and maintain their success indicators to maximum value to nature conservation of the site in the long term.

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Key

-  Land in Client Ownership
-  Bare ground
-  Built Environment: Buildings/hardstanding
-  Improved grassland
-  Introduced shrub
-  Other tall herb and fern - ruderal
-  Scrub - dense/continuous
-  Standing water
-  Standing water
-  Running water
-  Intact hedge - species-poor
-  Hedge with trees - species-poor
-  Dry ditch
-  Scrub - scattered
-  Tree with bat potential
-  Broadleaved tree



client
Sladen Estates
project
Bicester Arc,
Bicester
drawing title
PHASE ONE HABITAT PLAN

scale
1:2,550

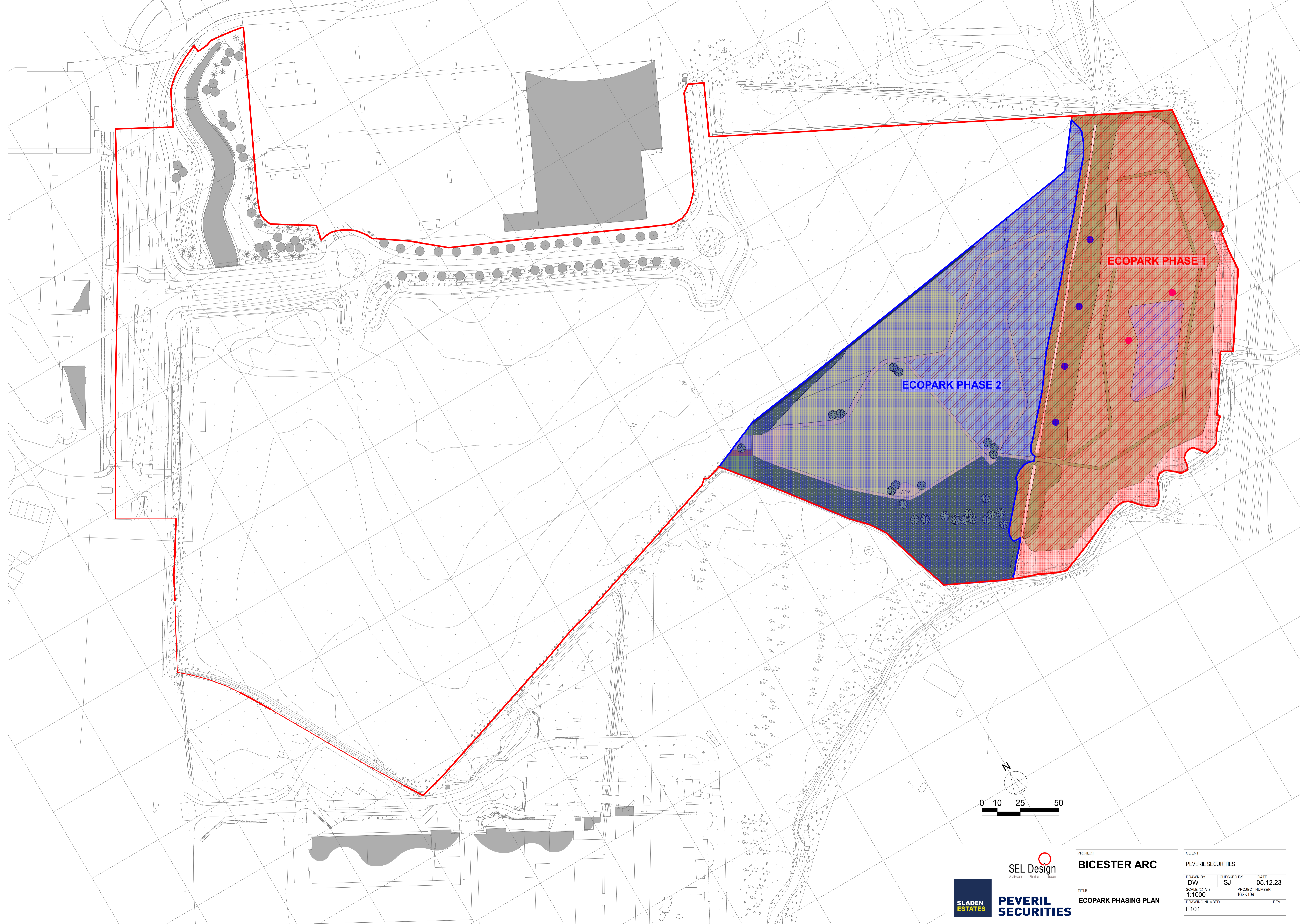
drawn
FMH/VF

issue date
17/8/2023



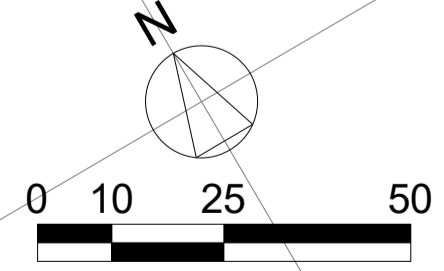
drawing / figure number
Figure 1


rev
10048-E-02














ECOPARK PHASE 1

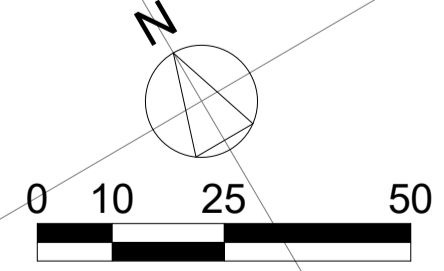
ECOPARK PHASE 2





 	 Architects Planning Towns	PROJECT BICESTER ARC	CLIENT PEVERIL SECURITIES
	TITLE ECOPARK PHASING PLAN	DRAWN BY DW	CHECKED BY SJ
	SCALE @ A1 1:1000	PROJECT NUMBER 16SK109	REV
	DRAWING NUMBER F101		



- KEY:**
-  NEW CLEAR STEM TREE PLANTING
 -  OPEN FRONTED BIRD BOXES MOUNTED TO EXISTING TREES
 -  HIBERNACULA LOCATIONS
 -  PONDS
 -  EXISTING RETAINED PLANTING / HEDGEROW TO BE PRUNED / MANAGED
 -  NEW WILDFLOWER PLANTING
 -  MOWN PATHWAY
 -  ORNAMENTAL PLANTING
 -  RETAINED EXISTING GRASSLAND
 -  FOOTPATHS
 -  HARD SURFACE PAVING



REV B: KEY SIMPLIFIED
 REV A: BIRD BOXES AND HIBERNACULA ADDED

 	PROJECT BICESTER ARC	CLIENT PEVERIL SECURITIES
	TITLE ECOPARK MASTERPLAN	DRAWN BY DW
	SCALE @ A1 1:1000	PROJECT NUMBER 16SK109
	DRAWING NUMBER F100	REV B

Appendix C: Pond Specification

- Shallow-edged ponds beneficial for many species
- Wide “drawdown” zones, slopes of about 1:20.

