Arundel Gate, Ford Road:

Landscape and Ecological Management Plan

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1 INTRODUCTION

1.1 Engain has been instructed by Esquire Developments Ltd ('hereafter referred to as the 'client') to prepare a Landscape and Ecological Management Plan (LEMP) for Arundel Gate, Ford Road (hereafter referred to as the 'site'), to support the discharge of planning Condition 20 relating to the outline planning application (ref: AB/135/20/OUT) at the site. Condition 20 is as follows:

Prior to the commencement of construction works a Landscape and Ecological Management Plan (LEMP) shall be submitted to the Local Planning Authority for approval in writing and will be based on the recommendations within the submitted Ecological Assessment Report, the Outline Reptile Mitigation Strategy, the Landscape and Ecological Management Plan and the Further Response to Ecology Consultation document. All the approved details shall then be implemented in full and in accordance with the agreed timings and details. The LEMP shall include but not be restricted to:

- *timings for clearance of trees or scrub to avoid impacts on breeding birds;*
- *a 30 metre buffer is in place around the badger sett;*
- *the planting of 370 metres of new hedgerows;*
- *the creation of seasonal water bodies;*
- *the installation of bat boxes, bird boxes; barn owl boxes and dormouse boxes;*
- *the planting of species rich grassland and scrub areas;*
- *the retention of hedgerows and trees;*
- *any trees removed should be replaced at a ratio of 2:1;*
- *log piles provided onsite and wildflower grassland created*.

1.2 The proposed development comprises 90 dwellings and associated amenity land, including land allocated for a community building and for a community allotment. Hereafter referred to as the 'Proposed Development'.

Site location

1.3 The site measures approximately 10 hectares (ha) and is centred approximately at Ordnance Survey Grid Reference (OSGR) TQ 0110 0571. The site consists of

three agricultural fields at the southern urban boundary of Arundel, the centre of the settlement of Tortington is approx. 770m to the south of the site.

Aims and Objectives

1.4 This LEMP has been written in accordance with BS 42020:2013 Section 11.11. To achieve this, the following points have been addressed within this report:

- Actions and responsibilities of relevant individuals prior to handover;
- The ecological value and condition of the site at handover and how this is expected to develop and change over time;
- Description and evaluation of features to be managed;
- Aims and objectives of management;
- Appropriate management options for achieving aims and objectives;
- Prescriptions for management actions;
- Preparation of a work schedule (including an annual work plan capable of being rolled forward over a ten-year period)
- Body or organisation personnel responsible for implementation of the plan;
- Monitoring and remedial measures; and
- Funding resources and mechanisms to ensure sustainable long-term delivery of the proposed management.

2 EXISITING CONDITION

Ecological Assessments to Date

2.1 The site has been subject to ecological surveys undertaken by Engain to describe ecological features to support the outline planning permission.

Table 2-1: Summary of surveys undertaken at the site and the results

Ecology survey and year	Summary of results
'Extended' Phase 1 Habitat Survey in 2017 and 2020	Habitats recorded included: • Grassland; • Arable fields; • Trees • Native hedgerow; and • Scrub.
Badger (*Meles meles)* survey 2017, 2019 and 2020	One badger hole, likely an outlier sett was recorded along the eastern boundary of the arable field. An individual badger was observed near this location.
Bat activity survey 2019 and 2020	Most bat activity was recorded around the edges of the site, where bats foraged and flew alongside hedges and under trees. Very little activity was observed over the open fields. Noctules were sometimes seen hunting high over the grassland, but little other bat activity was observed in the open. The most recorded species during the transect surveys were common and soprano pipistrelles.
Bat Automated Static survey 2019 and 2020	Twelve species were recorded during the static detector surveys; barbastelle; serotine; Brandt's bat; Daubenton's bat; whiskered bat; Natterer's bat; Leisler's bat; noctule; Nathusius' pipistrelle; common pipistrelle; soprano pipistrelle; and brown long-eared bat. The vast majority (75%) of all registrations were of common pipistrelles. The next most frequently recorded species was

	soprano pipistrelles, which accounted for 17% of all registrations. The other ten species made up the remaining 8% of the registrations on the static detectors, with noctule calls being the most numerous.
Dormouse (*Muscardinus avellanarius*) survey 2019 - 2020	During the dormouse survey visit on the 20th November 2019 three individual nests were found within the western field at the south, west and northern boundaries.
Great crested newt (*Triturus cristatus*) HSI assessment 2020	Ponds 1 and 2 within 100m of the Site were both scored as providing 'good' habitat for great crested newts. The water samples for both ponds returned negative results for great crested newt eDNA.
Reptile survey 2019	During the reptile surveys slow worms, grass snakes and common lizard were observed under the reptile mats and basking in the open.
Winter birds survey 2019-2020	The bird assemblage recorded indicated that the site does not support any notable wintering bird species.

2.2 Based on the survey results to date and the habitats recorded on site. It is considered the site has the potential to support the following protected and/or notable species:

- Badgers;
- Bats (commuting and foraging);
- Birds (breeding);
- Dormice;
- Reptiles and amphibians; and
- Terrestrial invertebrates (common species).

Habitats

2.3 A summary of the Extended Phase 1 Habitat Surveys at the site can be found in **Table 2-1**.

2.4 Based on the survey results to date and the habitats recorded on site no habitats are considered to have ecological value except for the native hedgerows which are a Habitats of Principle Importance (HoPI) and a line of mature oak trees (some of which are veteran trees). Other habitats recorded comprise arable, grassland and unmanaged scrub.

Designated Sites

2.5 The nearest site is Arundel Park SSSI approximately 1.2km north east of the site. The site is not functionally linked to the ecological features for which the SSSI is designated, and the entire urban area of Arundel lies between the site and this designated area. Binsted Wood Complex LWS is approx. 200m to the west of the site however, it will not be impacted as a result of the development.

3 PROPOSED CONDITIONS

3.1 Arun District Local Plan 2011- 2031, this was adopted in 2018 the plan is used to guide decisions on planning, development and regeneration activity within Arun District. The following policies are relevant to this site:

- Policy ENV SP1: Natural Environment. This policy states that the District Council will "*encourage and promote the conservation and enhancement of biodiversity and the natural environment through the development process and particularly through policies for the protection of both designated and non-designated sites".*

- ENV DM5: Development Biodiversity. This reiterates the NPPF requirement for development to seek to achieve net gain in biodiversity.

3.2 Furthermore, the Arun Biodiversity Action Plan and Sussex Biodiversity Action Plan sets out species and habitats listed on Section 41 of the Natural and Rural Countryside Act 2006 found within the local area, including dormouse, bats (various species), water vole and house sparrow *Passer domesticus*.

3.3 At the site, this will be attained through sensitive and considerate design, ensuring the retention and protection of existing ecological features of value and creation of new green infrastructure.

3.4 Landscape plans for the site.

Habitats

3.5 The principal green spaces of the development design are divided into six typologies:

- Oak common parkland
- Castle view wetland
- Eco-corridor
- North-western buffer
- Woodland coppice

- Village green

3.6 These areas are illustrated in the landscape strategy document below.

3.7 The habitats within these zones comprise:

- Amenity grassland;
- Emergent/marginal planting (in ditches and ponds);
- Native hedgerows;
- Native / ornamental shrubs (as part of the buffer habitats and broadleaved woodland planting);
- Pond;
- Submerged planting (in ditches and ponds);
- Tree planting (scattered trees);
- Wetland wildflower meadow/marshy grassland; and
- Wildflower meadow.

3.8 Existing habitats to be retained comprise mature trees, grassland, native hedgerow and an area of habitat seasonally inundated habitats at the eastern edge of the site.

Protected/Notable Species

3.9 Whilst it is considered that the creation of the above habitats would enhance the site for biodiversity, there also exists the potential to enhance the ecological value of the site further through the appropriate management of these habitats. This, in addition to the creation of additional artificial habitats would provide opportunities for a range of species to use the site in the long-term. Proposed artificial habitats include:

- Bat boxes;
- Bird boxes;
- Dormouse boxes;
- Hedgehog (*Erinaceus europaeus)* boxes; and
- Log pile for amphibians and reptiles.

3.10 Furthermore, the soft landscaping provisions will also provide habitat for other protected / notable species such as badgers (*Meles meles*) and terrestrial invertebrates.

Prior to handover

3.11 Prior to site clearance and construction activities, measures in line with the Mitigation Hierarchy. It will also include the details of the contractor nominated to the Biodiversity Champion who will oversee and implement the measures detailed in Table 6-1 and Table 6-2.

Assumptions / Limitations

3.12 This LEMP has been based on the landscape proposals provided. Should the landscape proposals be altered this LEMP should be updated accordingly to reflect these changes.

3.13 In line with CDM Regulations, **Appendix 1** provides a risk assessment for the recommended designs,

4 ROLES AND REPOSNSIBILIES

4.1 The **Client** has overall responsibility for any the implementation of capital works included in the LEMP that are scheduled during both the construction works with the appointed Resident's Management Company (RMC) being responsible during the post-construction period. This section provides a summary of the key roles and responsibilities for implementation of the management plan.

Delivery of the Landscape and Ecological Management Plan

4.2 The management plan outlines the management recommendations and commitments relevant to the site and existing ecological features following completion of the construction works.

4.3 Homeowners will have a role in understanding and supporting the delivery of the management objectives. This will be communicated to them via the formation and administration of the Resident's Management Company, which will report back to residents annually.

4.4 The management will be implemented by a single contractor, to ensure consistency of application across the whole site.

Roles and Responsibilities of Staff

4.5 **The Client** will appoint an individual to function as a **Biodiversity Champion** (or equivalent) who will oversee the capital works and implementation. The RMC will appoint an individual to function as a **Biodiversity Champion** (or equivalent) who oversee the delivery and review works included in this management plan should also

4.6 The **Biodiversity Champion** will have the authority to influence site activities and ensure that detrimental impacts on site biodiversity and environmental features are minimised. The **Biodiversity Champion** will also have responsibility for managing the construction of the landscape and planting proposals within any environmental constraints in conjunction with all the necessary management processes.

4.7 The individual must have sufficient authority and time on-site and knowledge of ecology and construction to conduct the role. The **Biodiversity Champion** need not be an ecologist or ecological expert.

4.8 During the construction stage the **Client** and/or the **Principal Contractor** will continue to provide the **Biodiversity Champion** with updated versions of the construction programme (should updates occur) to ensure that changes that may affect ecology are not overlooked. The **Principal Contractor** will ensure all additional contractor(s) have been trained and are aware of their responsibilities (where appropriate) for implementation of this management plan, during construction.

Commitments and Resources

4.9 **The Client** is committed, including the funding the capital works to achieve ecological enhancement and environmental management of the site and this management plan will help achieve this.

4.10 RMC, funded by the new residents and administered by appointed representatives to ensure compliance during the long-term management.

Performance and Target Setting

4.11 Performance during construction and after handover will be monitored to adhere to the format as outlined in this management plan **Table 6-3 (Annual Works).** These tables provide the management actions that are required by key individuals responsible for managing the site at each stage of development.

Performance Monitoring

4.12 To assess compliance, the construction **Biodiversity Champion** will monitor performance during the construction works period.

4.13 The SQE will conduct annual site visits whilst construction works are on-going and conduct a post-construction, pre-occupation compliance check. All works identified in Capital Works will be checked for compliance by the site **SQE** and will be signed off on completion.

4.14 Corrective action will be taken if compliance is not achieved.

Record Keeping and Data Management

4.15 The **Biodiversity Champion** will document all records of monitoring that occur during the construction works period. The records will be stored securely and made available for review as necessary. These will be maintained to provide a resource for the client and if necessary, to regulatory and statutory authorities to inspect conformity and compliance.

Training

4.16 To ensure consistent and acceptable environmental performance during implementation of the management plan, the **Client** will ensure that all staff and sub-contractors are aware of good practice protocols through their **Principal Contractor** and the chosen **Biodiversity Champion**. Relevant information on ecological management will be passed to the work force in briefings or by other suitable means.

5 TRENDS AND CONSTRAINTS

Trends

5.1 The following are ecological trends which require consideration when implementing landscape and ecological management of the site:

- **Climate change** should be considered when selecting landscaping species which should remain viable into the future. For example, due consideration should be given to plant species which are tolerant of drought / flooding. Management schedules should also be mindful of water availability during drought, and how landscape features should be managed under such circumstances.

- **Spread of pests and diseases** should be considered in the sourcing of any plant stock bought into the site. Stock of British provenance is preferable, as well as those varieties which are known to be resistant to disease, for example Dutch elm disease. The management of established landscaping should consider the spread of disease such as ash die back. Future maintenance of the site should being aware of, for example, the origin of mulch taken on site and the dispersal of any arisings produced from maintenance work.

- **Increasing urbanisation of the site and surroundings** should be considered by ensuing that planting takes into consideration the ecological landscape and wider nature networks to ensure connectivity and allow the dispersal of species without causing island effects or dead ends.

- **Seasonal and long-term population trends of the wildlife that use the site** can be supported through the sensitive timings of works. For example delaying the trimming of hedges or trees so that food sources such as berries and nuts remain available for longer. Maintaining, and replacing when necessary, the mitigation designed for species longevity within the site will also support long term wildlife suitability within the site.

Constraints

5.2 The following highlights ecological constraints which required consideration when implementing landscape and ecological management of the site:

- **Presence of protected and notable species**, as described in paragraph 2.5 are known to inhabit the site, and measures have been designed to ensure their presence during and post construction. These species should be considered during any future site maintenance. For example hedge and tree works being avoided during the breeding bird season, and sensitive management of green spaces should consider reptiles. .

6 SCHEDULE OF WORKS

Protection of Wildlife

6.1 Measures to protect wildlife during construction are listed below, in Tables 6-1 and Table 6-2 and illustrated on the plan overleaf.

- A 30m buffer around the badger sett and measures to ensure badgers are not harmed during construction
- The protection of retained trees by fencing them in accordance with the arboriculture method statement, which will protect any tree roosting bats
- Vegetation clearance will be undertaken outside of the bird nesting season or, where this is not possible, after the area has been checked for nesting birds by an ecologist
- The installation of reptile exclusion fencing and the temporary removal of reptiles from the construction area
- Precautionary working methods during vegetation clearance to protect dormice

Table 6-1: Site clearance / construction works with timing constraints (orange shading indicates when task is advised to be scheduled)

Task	J	F	M	A	M	J	J	A	S	O	N	D
Hedgehog												
Above ground vegetation removal												
Breeding birds												
Clearance of vegetation that is suitable for nesting birds (no EcOW required)												
Reptiles												
Removal of refugia (e.g. rock piles)												
Habitat manipulation												
Tree removal												

Management Objectives

- Maintain areas of the site to maximise wildlife benefits;
- Create, protect and enhance features of ecological interest; and
- Implement on-going management regimes within the site, for a minimum of ten years.

6.2 In line with the proposals made in the Protected Species Report (eg27809.003) there is to be the installation of artificial habitats for protected species, including log piles, hedgehog houses, bat boxes and bird boxes. The exact designs, and locations have yet to be finalised however, the management principals of these features will remain the same.

Capital Works

6.3 In total 20 dormouse boxes, 30 bat boxes, 26 bird boxes, 2 hedgehog houses and 2 log piles will be installed within the site.

6.4 The artificial habitats and their siting requirements are recommended as follows:

- 20 dormouse boxes located within the retained hedgerows;
- 20 x bat tubes to be mounted on a building(s) on a southerly or western aspect, 2-7 m high and away from artificial lighting.
- 10 x bat box, to be mounted on a tree(s) on a southerly or western aspect, 2-7 m high and away from artificial lighting.
- 15 x swift bricks to be mounted on a building(s), north, north east or north western aspect, at least 5 m high
- 10 x bird box, 32mm hole. Mounted on tree(s), east facing.
- 2 x hedgehog houses, tucked away from public disturbance;
- 1 x owl box. Mounted on a tree, out of the prevailing wind and facing open countryside; and
- 2 x log piles, tucked away from public disturbance.

6.5 Soft landscaping will be implemented in accordance with the EDLA planting plan, and include the planting of 370m of native hedgerow as illustrated on the plan below.

Annual works:

- Maintenance of all soft landscaping; and
- Monitoring and maintenance of artificial habitats.

General Requirements

6.6 All landscape maintenance work is to be carried out to a high and consistent standard and undertaken by an experienced landscape maintenance Contractor. This section outlines the operations and timings for each landscape element for a ten-year period.

6.7 Maintenance visits shall typically be undertaken once monthly between November and March and twice monthly between April and October, or as required to fulfil the objectives of this schedule, with the requirements for additional maintenance

visits determined by the landscape contractor following regular on-site inspections. The Contractor shall:

- Avoid disturbing any breeding birds on the roof or trees;
- Keep planting areas neat and clean in appearance, weed and litter free, and allow specified species to develop free from unnecessary competition;
- Prevent damage to and protect as necessary existing paving, buildings, fitments, and utilities;
- Ensure all areas of hard surfacing are left in a clean condition, free from any soil, mud, leaves, cuttings and plant prunings; and
- Ensure that the works themselves do not cause inconvenience or danger to site users/visitors.

6.8 The use of any pesticides (insecticides, fungicides and slug pellets) is discouraged, and herbicides should be avoided during the as far as practicable during the operational phase. Any pesticides used shall be non-residual contact pesticides and chemical applications shall only be undertaken in suitable weather conditions as described by the manufacturers. No chemicals shall be used near water or drains. It should be noted that the management and maintenance operations prescribed below maybe subject to change following the findings of on-going monitoring.

Table 6-2 Precautions to Protect Wildlife During Construction

Activity	Risk	Control Measure(s)
Site Clearance	Spills of fuels & oils or other potential pollutants (e.g. whilst refuelling plant and machinery) leading to harm to wildlife or pollution of watercourses.	Pollution prevention measures: spill kits, bunds etc. for all tools and vehicles; avoidance of storage and works in or close to sensitive habitats. Precautions will include: • Materials with potential to cause harm to the environment will be securely stored in appropriate containers within the temporary construction compound. • Secondary containment will be provided where required: this will include bunds around storage areas designed to accommodate the potential incident with a suitable overage. • All plant and machinery will be inspected and maintained to the appropriate standards, repaired where necessary and wear and tear will be monitored to mitigate the risk of accidental spills. • Provision will be made for containing and recycling water (using settlement tanks) for washing out concrete mixing trucks and plant. • All deliveries to the site will be supervised. • Staff Welfare Facilities will be self-contained with all discharge of wastewater to sealed tanks which will be regularly emptied. All other waste will be sorted and collected in bins and removed from site at appropriate intervals.
	Damage to retained trees and habitats leading to permanent loss of habitat.	The following precautions will be taken: • In advance of construction work, the root protection zones of all retained trees and hedgerows will be plotted and fencing erected in accordance with the standards set out in BS5837:2012 as set out in the project's Arboricultural Impact Assessment.
	Noise and vibration causing disturbance to wildlife.	The following precautions will be taken during site work: • The selection of tools and machinery will take account of noise levels. • Vehicles and mechanical plant will be maintained in a good and effective working order and operated in a manner to minimise noise emissions. • The contractor will ensure that all plant complies with the relevant statutory requirements. • Deliveries of plant and materials by HGV to site will only take place by designated routes and within times agreed with the Council • HGV and site vehicles will be equipped with broadband, non-tonal reversing alarms. • Compressor, generator and engine compartment doors will be kept closed and plant turned off when not in use. • Any pneumatic tools will be fitted with silencers/mufflers. • Care will be taken when unloading vehicles to avoid un-necessary noise. • A site speed limit will be set. • Drop heights will be minimised when loading vehicles with materials.

Activity	Risk	Control Measure(s)
	Killing or injury of animals during vegetation clearance and ground works.	• Any excavations should be covered when not being worked on. • Excavations should include a ramp to allow any animals which fall in to escape. • Wheels should be checked on machinery before works to ensure no animals have refuged under them. • Any temporarily exposed pipe systems larger than 100mm in diameter should be capped overnight to prevent animals gaining access. • Any trees to be removed or managed should first be inspected by the ECoW for bat roost potential. • An ecologist to be contact at any point during works if uncertainty or concern arises, or evidence of animal activity is identified
Lighting	Site and task lighting illuminating vegetation corridors and bat roosting locations at night, which can hinder the movement of wildlife such as bats.	Construction stage lighting will be subject to the following controls: • Lights will be LED lights with a warm white colour temperature around 2,700 Kelvin. • Lights will be mounted on columns of the minimum suitable height. • Lights will be selected that have no upward light spill. • Lighting will be directed away from site boundaries. • Lighting will be motion activated (unless continuous light is required for a specific purpose). • Lighting will be switched off at night when not in use.
Dust	Dust falling onto vegetation and leading to reduced plant health or death.	Dust control measures will include: • Minimising the extent of topsoil removal to retain the binding effects of the existing vegetation. • Minimising the duration over which ground is left exposed and re-instating vegetation as soon as practicable after works are completed in that location. • Using water bowsers to provide a water source for the localised control of dust when required. • Precautions when handling and transporting materials e.g. when tipping and loading. • A site speed limit will be set. • Covering of loads or stockpiles of materials that may generate dust and appropriate storage of dusty materials (such as bags of concrete) within containers where appropriate. • Wheel washing facilities at the site entrance / exit. • Where possible, a buffer of at least 5m will be created between any construction activities and Dickens Heath Marsh LWS.
Storage of Materials	Materials such as topsoil piles can become inhabited by wildlife such as reptiles and amphibians, which are then at risk of harm when the topsoil is re-used. Construction materials (aggregate, building materials etc.) can damage retained habitats if stored in or close to retained habitat.	Storage control measures: • Topsoil piles will be stored within the construction area and away from retained vegetation. A buffer zone around topsoil piles, which is maintained free of vegetation, will reduce the risk of them being inhabited by wildlife. • The erection of protective fencing around retained vegetation will prevent the storage of materials in sensitive areas. • No materials will be stored within the 8m buffer zone around the pond.

Illustrated Construction-stage Wildlife Protection Measures

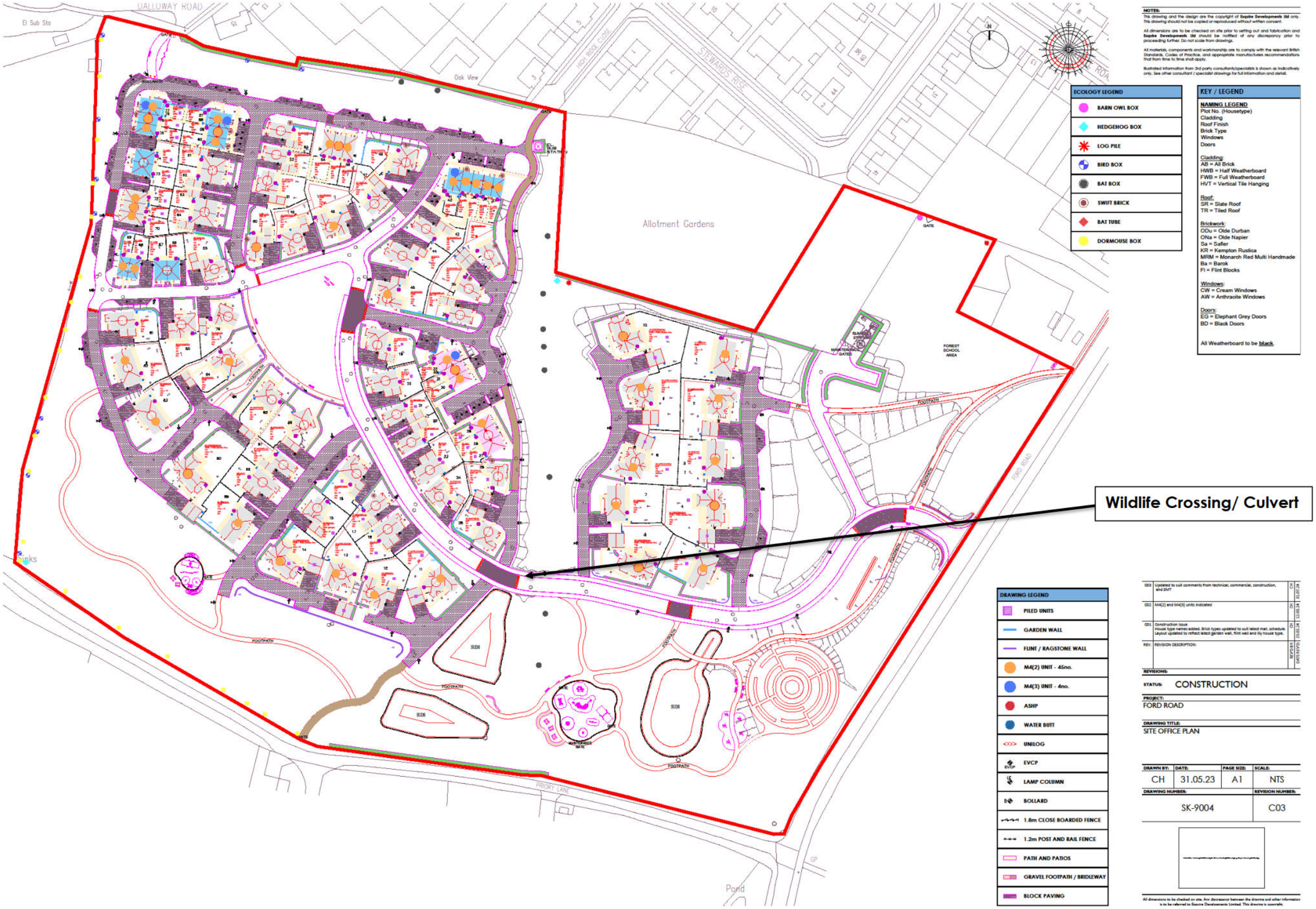
Table 6-3: Annual Management Plan

Management Component	Objective	Action	Month/Season	Year 1	Year 2	Year 3	Year 4	Year 5	Responsibility
Amenity grassland	Maintain a short sward for recreational and aesthetic purposes	Cut grass twice weekly – remove arisings In periods of drought, reduce the frequency of mowing. If areas of lawn are shaded, it may require less mowing. Do not mow wet or frosty grass.	March– late October	✓	✓	✓	✓	✓	Appointed Management Company
Emergent / marginal planting	See ponds below. Create opportunities for amphibians and birds,	Weed growth should be cut back regularly. Use hand tools. Avoid baring the toe of the bank	July – February inclusive	✓	✓	✓	✓	✓	Appointed Management Company
		Rotational cutting (on a 3-5 year rotation) to ensure that not all vegetation is cut at the same time. The regime should include for vegetation management of the different banks of the stream in different years to always maintain a marginal vegetation along one side of the ditch	July – February inclusive	✓	✓	✓	✓	✓	Appointed Management Company
		Arisings or dredged material should not be placed on the retained margins / habitats. Arisings should either be removed from the working area or placed in a specific place within the working area.	When required	✓	✓	✓	✓	✓	Appointed Management Company
		Weed raking	August – March inclusive	✓	✓	✓	✓	✓	Appointed Management Company
Hedgerow	Create 370m of new hedgerow in line with approved landscaping plans and maintain a green corridor providing refuge, foraging commuting habitats for wildlife, including reptiles, bats, birds and amphibians	Allow growth up to approximately 2-5 m high and 1.5 m in width.	Winter	✓	✓	✓	✓	✓	Appointed Management Company
		Prune each side of the hedgerow on an alternate basis, every three years.	Winter	✓			✓		Appointed Management Company
		Plug any gaps with suitable plants	When required	✓	✓	✓	✓	✓	Appointed Management Company
		Regular Irrigation	All year round	✓	✓	✓	✓	✓	Appointed Management Company

Management Component	Objective	Action	Month/Season	Year 1	Year 2	Year 3	Year 4	Year 5	Responsibility
Pond/ditches (general)	Establish, low growing wetland grass, emergent and marginal wetland herbs and rushes, submerged and floating vegetation which shows good growth structure and form and maintains a varied structure and composition of plant communities. Create a variety of water depths and opportunities. Consideration given to varied pond profile Promote the growth of plants to ensure the banks of the watercourse remain stable to help prevent erosion and siltation. Planting to be thinned / evenly spaced in order that they have sufficient room to develop. To develop habitats to support a range of species, including aquatic invertebrates, aquatic plants, amphibians and birds.	Weed growth should be cut back regularly. Use hand tools.	When required	✓					Appointed Management Company
		Keep at approx. 25% of open water available. When removing vegetation, do not focus on one plant community but evenly remove from all	When required	✓	✓	✓	✓	✓	Appointed Management Company
		Remove leaf litter	Autumn	✓	✓	✓	✓	✓	Appointed Management Company
		Remove non-native or other unwanted plants and dispose. Where possible rinse the removed plants and replace water in the pond	When required	✓	✓	✓	✓	✓	Appointed Management Company
		Create a hole in the ice should ice cover the pond longer than 2 days	Winter	✓	✓	✓	✓	✓	Appointed Management Company
		Removal of any rubbish	When required	✓	✓	✓	✓	✓	Appointed Management Company
Retained trees	Promote the continued development of healthy specimen trees; Ensure the British Standards for the protection of trees are followed Existing trees and shrubs to be healthy, free of disease and damaged or broken stems/branches; Retain dead wood where possible in accordance with public safety measures or tree preservation orders; and Maintain and enhance the value of the trees for roosting bats and nesting birds through the erection of bird, bat and insect boxes.	Retain old / dying / dead trees when they are not a hazard.	N/A	✓	✓	✓	✓	✓	Appointed Management Company
		Removal of trees when they are a hazard	When required	✓	✓	✓	✓	✓	Appointed Management Company
		All trees would also be subject to a safety survey by a suitably qualified arboriculturalist	Every 18 months and after high winds.	✓		✓		✓	Arboriculturalist
		Prune deciduous trees	When required	✓	✓	✓	✓	✓	Appointed Management Company
		Undertake pollarding when deemed appropriate	When required	✓	✓	✓	✓	✓	Appointed Management Company
Submerged vegetation (in	See ponds above and emergent/marginal vegetation	Removal of dead plants annually	Autumn	✓	✓	✓	✓	✓	Appointed Management Company

Management Component	Objective	Action	Month/Season	Year 1	Year 2	Year 3	Year 4	Year 5	Responsibility
ditches and ponds)		Weed growth should be cut back regularly. Use hand tools. Avoid baring the toe of the bank	July – February inclusive	✓	✓	✓	✓	✓	Appointed Management Company
		Weed raking	August – March inclusive	✓	✓	✓	✓	✓	Appointed Management Company
Tree planting (scattered trees and as part of the woodland planting)	Provision of wildlife habitat; and Ensure well-balanced crowns and natural shape.	Provision of stakes and biodegradable guards leave on for 5 – 7 years	N/A	✓	✓	✓	✓	✓	Appointed Management Company
		Stakes should be checked and any broken or damaged stakes during this time would be removed (as above) and replaced with ties re-fixed	Every 6 months (for 1 – 2 years if the tree has grown well)	✓	✓				Appointed Management Company
		Formative pruning to ensure vigorous growth and removal of damaged or diseased branches. It should be undertaken according to BS 5837:2010	When required (avoid nesting bird season)	✓	✓	✓	✓	✓	Appointed Management Company
		Where trees are felled, lopped, pollarded or coppiced, a proportion of the dead wood should be left on site	When required	✓	✓	✓	✓	✓	Appointed Management Company
		Regular Irrigation	All year round	✓	✓	✓	✓	✓	Appointed Management Company
Wildflower grassland / Wetland wildflower meadow/marshy grassland	The creation of a species diverse wildflower meadow via a suitable mowing regime.	In the first year: Mow newly sown meadows regularly throughout the first year of establishment to a height of 100-150mm, removing cuttings if dense. Dig out undesirable perennial plants e.g. broad-leaved dock (*Rumex obtusifolius*).	Spring to Autumn	✓					Appointed Management Company
		From second year: Cut meadow annually and remove arisings, recreating a hay cut. Leave the 'hay' to dry and shed seed for 1-7 days then remove from site.	July / August		✓	✓	✓	✓	Appointed Management Company
		Mow the re-growth through to c. 100-150mm and again in spring if required. Do not mow wet or frosty grass.	Autumn – Winter and Spring		✓	✓	✓	✓	Appointed Management Company

Management Component	Objective	Action	Month/Season	Year 1	Year 2	Year 3	Year 4	Year 5	Responsibility
Native shrubs / hazel scrub / perennial planting / scrub	To promote the development of healthy vigorous, well balanced plants in accordance with the growth characteristics of each species; To develop a continuous plant cover within planted beds to minimise weed growth; To provide opportunities for nesting birds and hibernating reptiles; Retain species which provide seed, pollen and nectar which are of value to wildlife; and Ensure cultural techniques are employed which use a variety of mulches and organic fertilisers and which minimise the use of chemicals and peat wherever possible.	Application of bark mulch at a depth of 50 mm	When required	✓	✓	✓	✓	✓	Appointed Management Company
		When using manure, use a light dressing and well-rotted.	When required	✓	✓	✓	✓	✓	Appointed Management Company
		Removal of spent flowers from perennial plants should be removed through 'deadheading'	When required	✓	✓	✓	✓	✓	Appointed Management Company
		Regular Irrigation	All year round	✓	✓	✓	✓	✓	Appointed Management Company
		Areas of hazel scrub should be rotationally cut	Every three years Between September and February	✓	✓	✓	✓	✓	Appointed Management Company
Bird box	To enhance the potential of the site for breeding birds by providing suitable nesting opportunities.	Bird boxes should be cleared out annually after the nesting season has finished. This is best cleared out in October to avoid the breeding period and to avoid disturbing birds wintering within the boxes	October	✓	✓	✓	✓	✓	Appointed Management Company
		Any damaged boxes should be repaired or changed as necessary and be replaced in their original positions.	When required	✓	✓	✓	✓	✓	Appointed Management Company
Bat box	To enhance the potential of the site for roosting bats by providing suitable roosting opportunities.	No maintenance is required for these bat boxes, however, replace if they become damaged.	When required	✓	✓	✓	✓	✓	Appointed Management Company
Log pile	To enhance the potential of the site for terrestrial invertebrates, reptiles and amphibians by providing suitable hibernation opportunities.	No maintenance is required, however, replace or replenish as required	When required	✓	✓	✓	✓	✓	Appointed Management Company
Wildlife crossing / culvert	To provide a safe crossing point and link under the road for wildlife, connecting the 'Eco corridor' and 'Oak Common Parkland'. The wildlife tunnel / culvert will be installed in accordance with the specification provided in Appendix 2.	Checks to ensure the tunnel is kept clear of debris build-up to allow free movement of wildlife and remains free-draining.	Monthly	✓	✓	✓	✓	✓	Appointed Management Company



Illustrated Wildlife Enhancement Measures

7 MONITORING AND REVIEW

7.1 The SQE will conduct a pre-commencement inspection for protected species immediately prior to the onset of construction works to ensure the ecological features previously recorded has not changed.

7.2 Whilst construction works are on-going, the SQE will undertake annual site visits and confirm that advised measures have been taken to protect biodiversity at the site. A letter report will be prepared suitable for submission to the council to demonstrate compliance.

7.3 The site will be monitored annually for the first five years, and the frequency of monitoring thereafter shall be reviewed against the site's condition. Compliance with each aspect of the capital and annual works (Table 5-1) and within the timescales identified will be assessed during this visit. This will include ensuring that biodiversity enhancement features, including bird and bat boxes have been correctly implemented at the site.

7.4 The monitoring will be carried out in June or early July of each year, during the peak growing season.

7.5 The SQE will produce a compliance report, confirming and demonstrating implementation of this management plan, which will be submitted by the ecologist to the Local Planning Authority.

APPENDICES

Appendix 1 CDM Risk Assessment

CDM Design Rationale	Hazard Control Mechanism	Residual Risk Level
Location for instalment	The locations of installation are provided in the illustrative wildlife enhancement measures plan above. The bird and bat boxes will be mounted at a height (3-4m) to deter vandalism and theft, located on a suitable aspect of the buildings and trees to ensure the features receive the desired optimal levels of solar radiation, as close to green infrastructure as possible and in an area where artificial lighting will not shine directly upon the feature). All artificial habitats will be installed as per manufacturers specifications and requirements. The locations have however will be selected to avoid potential hazards from ensuring ease of any future maintenance (see sections below) and ensuring the safety of the public in the extremely unlikely case that the bat and bird boxes be dislodged from where they have been installed. As such, the bat and bird boxes should not be located above any areas that would be heavily used by the public.	Negligible
Maintenance	The bat boxes selected are maintenance free in terms of their usage. However, the boxes may need to be replaced due to vandalism or wear and tear. The bird boxes (excluding the swift boxes) require emptying annually and also may need to be replaced due to vandalism or wear and tear.	Negligible

	Access to the boxes can be provided by ladders, towers or MEWPs as required by the contractor's own risk assessment.	
Monitoring	No monitoring will be undertaken of the bat and bird boxes other than a ground level visual maintenance check.	Negligible
Manual handling	The weight of the artificial habitats are as follows: • Dormouse box is 1.32kg; • Schwegler 1FR Bat Tube is 9.8kg; • Schwegler 1FF Bat Box is 9.5kg; • Ibstock Eco-habitat for Swifts is 4.5kg; • Schwegler 1B nest box us 3.6kg; and • Eco Barn Owl Nest Box is 9.5kg These boxes have been selected to minimise manual handling risks during installation and replacement (if required).	Negligible

Appendix 2 Wildlife Tunnel Specification

A wildlife tunnel will be installed beneath the internal estate road to maintain connectivity between habitats on either side of the development and to allow safe passage for mammals including badger and hedgehog.

The crossing will comprise a culvert with the following specification:

- **Minimum internal diameter:** 400 mm.
- **Material:** Precast concrete pipe.
- **Substrate:** Natural substrate base to allow accumulation of soil and leaf litter.
- **Drainage:** A soakaway will be installed on either side of the culvert to prevent standing water and ensure the structure remains free-draining.
- **Entrances:** Both ends will remain clear of vegetation and debris to maintain open access for wildlife.