
**Land at Johnson Drive
Finchampstead**

Report for:
Palatine Homes Limited
Ospreys
Scotswood Close
Beaconsfield
Buckinghamshire
HP9 2LJ

INTRODUCTION

Overview

AA Environmental Limited (AAe) has been commissioned by Palatine Homes Limited to produce a Landscape and Ecological Management Plan (LEMP) for the above site. This LEMP has been produced using the Nature Conservancy Council document¹ as a guide, with the intention to enhance the value of the site by creating a range of new habitats/opportunities for wildlife. The Plan also details the sympathetic management of these features to maximise their ecological value in the long term. In addition, this report will provide the information to assist with discharging Condition 9 attached to planning (Wokingham Borough Council application ref: 223592) which states:

Landscape and Ecological Management Plan

A long-term landscape and ecological management plan (LEMP) including long term design objectives, management responsibilities, timescales and maintenance shall be submitted to and approved in writing by the local planning authority prior to the commencement of the development. The content of the LEMP shall include schedules for Landscape Wildlife Area and Landscape Wildlife Corridor and any other area other than privately owned domestic gardens, the following.

- a) Description and evaluation of features to be managed.*
- b) Ecological trends and constraints on site that might influence management.*
- c) Aims and objectives of management.*
- d) Appropriate management options for achieving aims and objectives.*
- e) Prescriptions for management actions.*
- f) Boundary treatments and measures to avoid garden grab and dumping of garden waste.*
- g) Preparation of a work schedule (including an annual work plan capable of being rolled forward over a five-year period).*
- h) Details of the body or organization responsible for implementation of the plan.*
- i) Ongoing monitoring and remedial measures.*

The LEMP shall also include details of the legal and funding mechanism(s) by which the long-term implementation of the plan will be secured by the Owner with the management body responsible for its delivery. The plan shall also set out (where the results from monitoring show that conservation aims and objectives of the LEMP are not being met and how contingencies and/or remedial action will be identified, agreed, and implemented so that the development still delivers the fully functioning biodiversity objectives of the originally approved scheme. The approved plan will be implemented in accordance with the approved details.

Reason: Reason: To ensure that provision is made to allow satisfactory maintenance of the landscaping and biodiversity measures hereby approved. Relevant policy: Core Strategy Policy CP3 and CP7 and Managing Development Delivery Local Plan policies TB21 and TB23.

An Annotated Site Plan (Figure 1) showing the various enhancement measures has been attached for reference.

¹ Nature Conservancy Council 1988 (reprinted 1991). Site management plans for nature conservation, a working guide.

Site Description and Proposals

The site is located off Johnson Drive in Finchampstead, centred at National Grid Reference: SU 805651 and covers approximately 1.3 hectares. The site comprised the existing buildings, associated hardstanding and grassland areas. The site was bordered by woodland to the north and east and by residential properties and associated gardens to the south and west.

The consented scheme is for the erection of five residential dwellings with double garages. This will require the demolition of the existing outbuildings and the clearance of some vegetation. The majority of the established boundary vegetation will be retained, protected and enhanced as part of the works.

EVALUATION AND OBJECTIVES

The key enhancement measure will be the introduction of new, wildlife friendly planting, including trees, hedging and wildflower areas, which will provide a range of habitats for local wildlife. Additional measures will be to install a series of wildlife boxes at suitable locations on the site in order to enhance roosting/nesting/sheltering opportunities along with some log piles and hibernacula.

PRESCRIPTIONS

Overview

A range of generic and site-specific measures have been provided below and a summary table and checklist of the various prescriptions are attached at Appendices A and B. It is the intention for these tables to be used on an annual basis during management operations.

General Principles

Litter - rubbish or debris in any form conveys a lack of respect, which can encourage further casual disposal. Some litter can also present a safety risk or be lethal to small mammals and some invertebrates and it must be cleared on a regular and systematic basis. This will reflect the responsibilities and requirements placed on landowners and managers under the Environmental Protection Act 1990.

Deadwood - deadwood is an essential habitat for many species, especially invertebrates, bryophytes and fungi. Removal of deadwood and 'tidying-up' leads to relatively sterile conditions and takes away an essential habitat. Where possible, all wood from windblow, or arising from management operations, should be left on-site in suitable locations as low brash or added to the log piles.

Use of chemicals - there will be a general presumption against the use of herbicides, pesticides and fertilisers. By their very nature all such chemicals are potentially damaging to the environment to a greater or lesser extent, can lead to impoverishment of habitats and may be a danger to the public. Consequently, such use will be restricted to essential tasks when other management methods are inappropriate or have failed. Application of chemicals must be undertaken by staff or contractors with current certification of competence.

Boundary treatment - where possible, existing boundary vegetation will be retained and protected, with any new boundary treatment designed to promote permeability of the site to minimise fragmentation, allowing free movement of wildlife throughout the site. These measures will aim to strengthen habitat connectivity and provide additional foraging habitat, cover and nesting opportunities for local wildlife. If close boarded fences are required for security reasons, these should be minimised and raised slightly off the ground (c. 150-200 mm) to allow animals to pass underneath, or installed with strategically placed gaps, to permit the free movement of hedgehogs and other wildlife.

Garden waste – garden waste of any description can introduce additional nutrients and other elements to the soil. It upsets the natural balance of habitats into which it is introduced, can introduce non-native invasive species, can smother important wildflowers and can encourage pests, such as rats. Any vegetation deposited within the existing or newly created habitats by adjacent properties or from management operations must be cleared on a regular and systematic basis. Any non-native plant material will be deposited off-site in accordance with the waste regulatory regime or retained on-site in designated compost areas.

Bat Boxes

In order to provide roosting opportunities for bats, five bat tubes (Ibstock Enclosed Bat Box B, or equivalent) will be installed onto the new builds. The boxes will be positioned in accordance with best practice, indicative locations are shown on Figure 1, and a guidance document is attached at Appendix C. Although, bat boxes do not require regular cleaning periodic maintenance checks should be carried out with any damaged boxes replaced as necessary (**Note: any works/checks to bat boxes might require a licensed bat worker**).

Bird Boxes

In order to enhance nesting opportunities for birds, five bird boxes (x5 Habibat Swift Box, or equivalent) will be installed onto the new builds. The boxes will be positioned in accordance with best practice, indicative locations are shown on Figure 1, and a guidance document is attached at Appendix C. The nest boxes should be cleaned out once a year during the winter months, and, in the event that any become damaged, replaced as necessary.

Hibernacula

In order to enhance the sheltering opportunities for reptiles on the site two hibernacula will be created within the on-site wildlife area (a copy of generic reptile hibernacula specification has been attached at Appendix D for reference). The hibernacula created will also be monitored, with any remedial works carried out as necessary, such as addition of material, indicative locations are shown on Figure 1.

Log Piles

Log piles will be created to provide enhanced shelter and overwintering for invertebrates and other species. Any larger material arising from on-site management operations will be added to the log piles so that the log piles are maintained and contain wood in a varying state of decay, indicative locations are shown on Figure 1.

New Planting

As part of the overall landscape treatment of the site, planting will be carried out, details provided in the Soft Landscaping Plan by Treetop Landscapes Ltd (Drawing No. TTL-SM-PHJD181024 attached at Figure 2 for reference). Such planting will include a variety of native and ornamental species of value to wildlife. In particular, flowering plants will be of benefit to invertebrate species and shrubs, hedgerows and trees may provide nesting opportunities for birds once they become established.

Formal Lawns

In order to provide areas of open space for the residents areas of formal lawn created on the site. These areas will be well-maintained and regularly mown and, as such, will provide limited wildlife value, although certain species will forage on this type of habitat.

Management - regular mowing to maintain a short sward suitable for amenity use, with all arisings removed off site or deposited in dedicated composting areas.

Wildflower Meadow Planting

Wildflowers will be sown within the 'Wildlife Corridor', 'Wildlife Area' and 'Perennial Wildlife Border' areas in the north, east and west of the site. Further details are shown on the Soft Landscaping Plan (Figure 2). This type of habitat will provide opportunities for a range of wildlife, including invertebrates.

Management - first-year cutting may not be necessary but will be dependent upon site conditions and sward height. Initially aiming to keep the sward height shorter than 100 mm to encourage tillering and reduce competition from rank species (species such as yellow rattle could be sown to assist with reducing the dominance of grasses). After mowing, cuttings should be removed from the area. The grassland should be cut on an annual basis in year 2 and 3 in late summer/autumn, which will allow flowers to set seed and certain invertebrates to complete their life cycle, with all arisings left on site for a few days to allow the seed bank to disperse, before being collected and disposed of either in designated composting areas or disposed off-site. It is important to remove arisings from the area to maintain low nutrient status, favourable to wildflowers. Periodic clearance of weeds and any scrub encroachment will be required to maintain the open nature of the grassland, with all arisings retained removed from site or used as chippings to act as a mulch in suitable locations on the site. Spot control of invasive/over dominate species (e.g. common nettles, ragwort and spear thistle) may need to be carried out.

Hedge Planting

As part of the landscaping, new native hedgerows will be planted, with species including hawthorn (*Crataegus monogyna*), hazel (*Corylus avellana*), field maple (*Acer campestre*), wild privet (*Ligustrum vulgare*), blackthorn (*Prunus spinosa*) and hornbeam (*Carpinus betulus*). Further details are shown on the Soft Landscaping Plan (Figure 2). The hedgerows will be of benefit to wildlife, providing a nectar source for insects when in flower, as well as enhancing habitat connectivity.

Management – annual checks of the new planting will be completed, with replacement planting carried out where necessary. Cutting of hedgerows will be carried out on a rotational basis with only a third cut in any one year, where practicable to do so. Any cutting/pruning will be timed during the late winter months. Late January/early February is ideal as the majority of the berries have been eaten but before the onset of the main bird nesting season. All arisings will be retained on site either as low brash or as chippings to act as a mulch, where practicable to do so.

Trees

A number of new trees will be planted on the site to complement the established trees to be retained, with species including field maple, silver birch (*Betula pendula*), hornbeam, cherry apple (*Malus domestica*), wild cherry (*Prunus avium*), bird cherry (*prunus padus*), whitebeam (*sorbus aria*), rowan (*Sorbus aucuparia*), wild service tree (*Sorbus torminalis*), large-leaved lime (*Tilia platyphyllos*) and other tree species. Further details are shown on the Soft Landscaping Plan (Figure 2). Once established, the new trees will provide a food source for a variety of wildlife, including insects and birds, and bird nesting opportunities.

Management – annual check of new planting will be carried out, with replacement planting carried out where necessary. Once established, the trees may need periodic pruning and or pollarding, with any arisings retained on site either as low brash or as chippings to act as a mulch, where practicable to do so. Weeding will be carried out where necessary to ensure new planting establishes. The timing of any management should be carried out during the late winter months. January is ideal as the majority of the berries have been eaten, but before the onset of the main bird nesting season

RESPONSIBILITIES

The developer (Palatine Homes Limited) will be responsible for the initial implementation of the measures as set out in this LEMP, although contractors may be appointed for certain tasks as necessary. When the plots are sold then ongoing management/maintenance checks will be the responsibility of a private management company appointed by Palatine Homes Limited and the residents.

A brief annual report will be produced to confirm management prescriptions have been implemented and detail any remedial actions that are required for the following year (example sheet has been attached at Appendix B).

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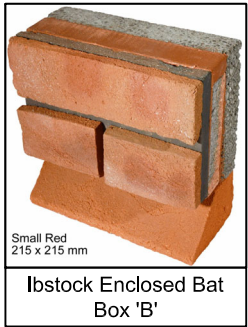
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Figure 1
Annotated Site Plan

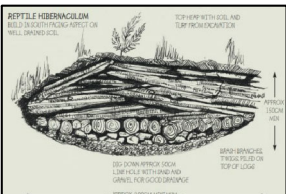


Small Red
215 x 215 mm

Istock Enclosed Bat
Box 'B'



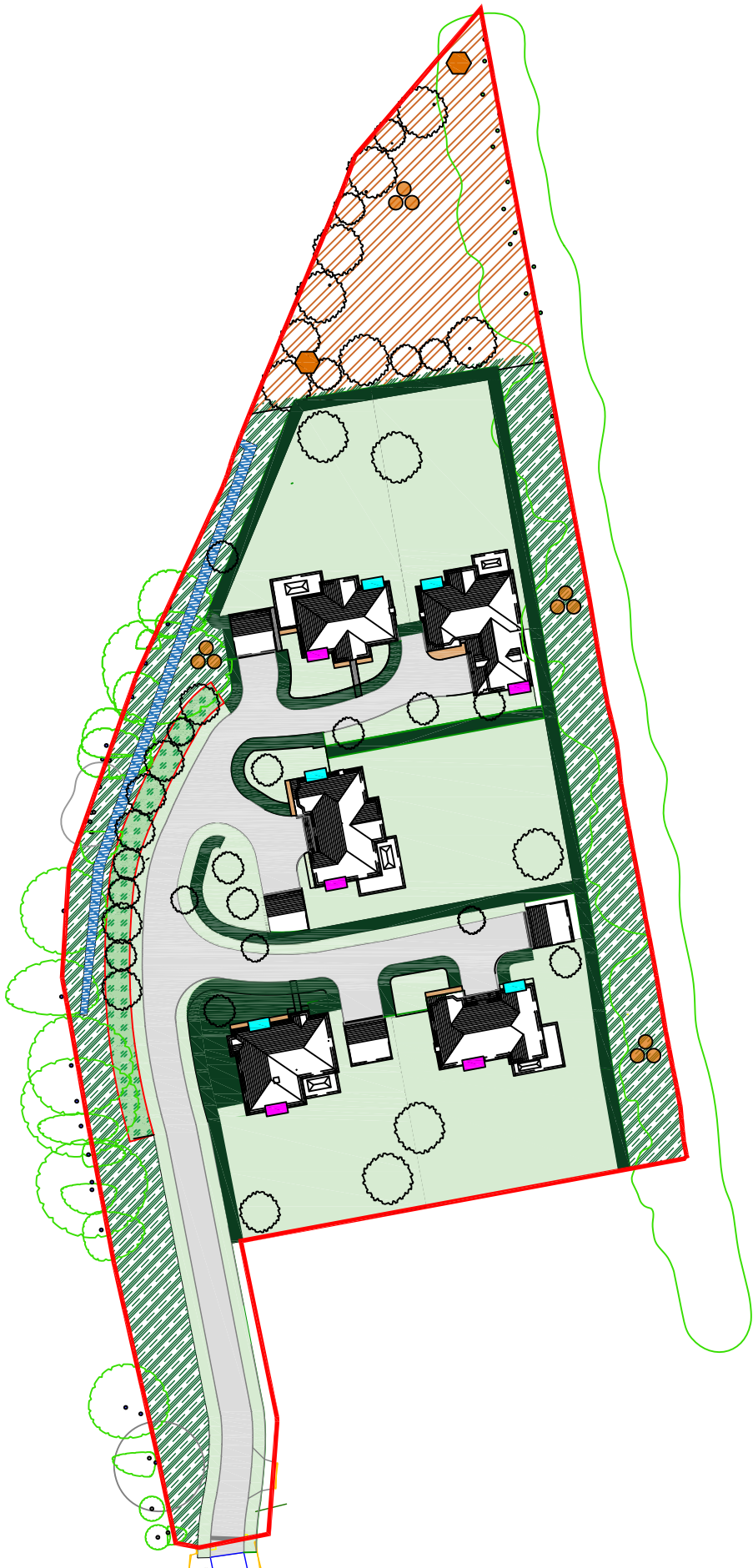
Habitat Swift Box



Hibernacula



Log Pile



Notes

Bat Tubes
x5 Istock's Enclosed Bat Box B (or equivalent)

Bird Boxes
x5 Habitat Swift Boxes (or equivalent)

Hibernacula
x2 Hibernacula

Log Piles
x4 Log Piles

A sensitive lighting scheme will be adopted for the proposals and no lighting will be directed onto any bat boxes installed.

KEY

- Site Boundary *
- Individual Tree (Topographed)
- Bat Tube *
- Bird Box *
- Hibernacula *
- Log Pile *

* Indicative Location

Rev.	Details	Drawn Chkd.	Date
Project 233292 Land at Johnson Drive Finchampstead			
Title Annotated Site Plan			
 AA Environmental Ltd Units 4-8 Cholswell Court Shippon Abingdon Oxon OX13 6HX T:(01235) 536042 F:(01235) 523849 info@aae-ltd.co.uk www.aae-ltd.co.uk			
Scale As shown	Date 18.11.24	Drg. No. Figure 1	Rev.

Figure 2
Soft Landscaping Plan
Treetop Landscapes Ltd – Drawing No. TTL-SM-PHJD181024

Perennial Wildflower / Pollinator Friendly Ornamental Border

To be supplied and planted as plug plants. 75 of each of the following 20 species planted in same species groups of 15 plants per group throughout:

- Primula vulgaris
- Primula veris
- Digitalis purpurea
- Geranium pratense
- Campanula latifolia
- Succisa pratensis
- Filipendula vulgaris
- Knautia arvensis
- Achillea millefolium
- Centaurea nigre
- Silene flos-cuculis vulgaris
- Stachys officinalis
- Agrimonia eupatoria
- Cichorium intybus
- Linaria purpurea
- Verbena bonariensis
- Eupatorium cannabinum
- Malva sylvestris moschata
- Leucanthemum vulgare
- Prunella vulgaris

- Bulbs - 500 of each
- Crocus tomassianus
 - Galanthus nivalis
 - Muscari armanicum

- Plot 1 Planting
- 2 Taxus baccata Ball 60cm
 - 6 Euonymous Emerald Gaiety 10L
 - 6 x Hebe sutherlandii 5L
 - 2 x Photinia fraseri Red Robin 0.8-1m
 - 6 x Cistus Silver Pink 5L
 - 2 x Pittosporum Silver Ball 10L
 - 3 x Daphne odora Aureomarginata
 - 1 Choisya ternata 10L
 - 2 Lavandula hidcote 5L

Perennial Wildflower Border

- Plot 5 Planting
- 2 x Taxus baccata Cone 80cm
 - 3 x Taxus baccata Ball 30cm
 - 6 x Hebe sutherlandii 5L
 - 3 x Photinia fraseri Red Robin 0.8-1m
 - 6 x Cistus Silver Pink 5L
 - 3 x Lavandula hidcote 5L
 - 2 x Pittosporum Silver Ball 10L
 - 6 x Hebe fran. Blue Gem 5L
 - 3 x Euonymous Silver Queen 5L
 - 6 x Ceanothus Blue Mound 2L

- Wildlife Corridor
- Bare root plants to be planted 45-60cm tall in 5m centres and grown on as shrubs to provide shelter, habitat and food for a wide range of wildlife
- 10% Corylus avellana
 - 10% Sambucus nigra
 - 5% Salix caprea
 - 10% Crataegus monogyna
 - 2.5% Rosa canina
 - 2.5% Ilex aquifolium
 - 10% Viburnum opulus
 - 10% Viburnum lantana
 - 10% Ligustrum vulgare
 - 10% Prunus spinosa
 - 10% Cornus sanguinea
 - 10% Euonymous europaeus

- Plot 2 Planting
- 1 x Taxus baccata Ball 80cm
 - 2 x Taxus baccata Ball 30cm
 - 6 x Hebe sutherlandii 5L
 - 3 x Photinia fraseri Red Robin 0.8-1m
 - 6 x Cistus Silver Pink 5L
 - 3 x Lavandula hidcote 5L

- Plot 3 Planting
- 4 x Taxus baccata Cone 80cm
 - 6 x Pittosporum Golf Ball 10L
 - 4 x Choisya ternata 5L
 - 6 x Hebe sutherlandii 5L
 - 3 x Photinia fraseri Red Robin 5L
 - 6 x Cistus Silver Pink 5L
 - 3 x Lavandula hidcote 5L
 - 6 x Daphne odora Aureomarginata 5L

- Plot 4 Planting
- 4 x Taxus baccata Ball 30cm
 - 6 x Hebe sutherlandii 5L
 - 6 x Viburnum tinus 5L
 - 4 x Photinia fraseri Red Robin 0.8-1m
 - 6 x Cistus Silver Pink 5L
 - 3 x Lavandula hidcote 5L
 - 4 x Abelia grandiflora Confetti 5L
 - 6 x Salvia in variety 5L

All plant material to be compatible with British Standard 3936 part 1. 1992 specifications - 'Nursery Stock'

All soft landscaping work/planting to be compatible with British Standard 4428 specifications 1989 - Landscape Operations

All planting areas to be completely cleared of grass, weeds, debris and stones/concrete etc exceeding 50mm dia.

Soil in all scheduled planting areas outside existing canopy spreads of trees that has compacted/denatured/contaminated during work on the site, to be excavated to a minimum depth of 50mm.

All planting areas to be cultivated to a minimum depth of 500mm and topdressed with an organic slow release fertilizer such as sterilised bonemeal.

No peat products used.

All planting areas around trees and shrubs to receive a 70mm layer (minimum) of seasoned medium grade chipped bark mulch, upon completion of planting.

Tree pits shall be of a diameter 600mm greater than the rootball. The depth of the pit shall be 225mm deeper than the rootball and not less than 600mm deep. The top soil shall be stripped from the area of the pit and stascked for re-use; the sub-soil is to be excavated and removed from the site. the base of the put shall be forked over to a depth of 225mm and left with a slightly higher centre to permit drainage.

All trees to be single staked and tied including the use of 1 spacer block per tree. Trees of 14-16cm girth and above should be double staked, one on either side of the trunk. Stakes not to extend more than 600mm above ground level. Stakes should be positioned on the windward side of the tree.

An area of 1.5m wide (minimum) to be left free of all grass turf, weed growth, scrub vegetation, etc. around the bases of all newly planted trees situated within grassed areas and mulched as specified above.

All non-specified areas to be turfed with good quality seed grown turf.

New Trees to be planted

All size 12-14cmg. container grown or RB depending on availability

- | | | |
|---|------------------------|-----|
| 1 | Acer campestre | Ac |
| 4 | Acer campestre Elsrijk | AcE |
| 4 | Betula pendula | Bp |
| 3 | Carpinus betulus | Cb |
| 5 | Malus domestica | Md |
| 4 | Prunus avium | Pa |
| 3 | Prunus avium Plena | PaP |
| 4 | Prunus padus | Pp |
| 2 | Sorbus aria | Sa |
| 2 | Sorbus aucuparia | Sau |
| 4 | Sorbus terminalis | St |
| 3 | Tilia platyphyllos | Tp |

Planting to front of houses

- | | | |
|----|-----------------------------|--------|
| 4 | Abelia grandiflora Confetti | 5L |
| 6 | Ceanothus Blue Mound | 2L |
| 5 | Choisya ternata | 10L |
| 30 | Cistus Silver Pink | 5L |
| 9 | Daphne odora Aureomarginata | 5L |
| 6 | Euonymous Emerald Gaiety | 10L |
| 3 | Euonymous Silver Queen | 5L |
| 6 | Hebe fran. Blue Gem | 5L |
| 30 | Hebe sutherlandii | 5L |
| 14 | Lavandula hidcote | 5L |
| 12 | Photinia fraseri Red Robin | 0.8-1m |
| 3 | Photinia Red Robin | 5L |
| 6 | Pittosporum Golf Ball | 10L |
| 4 | Pittosporum Silver Ball | 10L |
| 6 | Salvia in variety | 5L |
| 2 | Taxus baccata Ball | 60cm |
| 1 | Taxus baccata Ball | 80cm |
| 9 | Taxus baccata Ball | 30cm |
| 6 | Taxus baccata Cone | 80cm |
| 6 | Viburnum tinus | 5L |

Native hedge mix - approx 390m

- 50% Crataegus monogyna
- 10% Corylus avellana
- 10% Acer campestre
- 10% Ligustrum vulgare
- 10% Prunus spinosa
- 10% Carpinus betulus

Wildlife Area - approx 2100sqm - to be seeded with EW1F Wild Flowers for Woodland - Supplied by Emorsgate

Wildlife Corridor - approx 3200sqm - to be seeded with EH1 Hedgrow Mixture (contains grasses and wildflowers) - Supplied by Emorsgate

Perennial wildflower / Pollinator friendly ornamental border

Mown Lawn Areas

Existing Trees

Dry Ditch



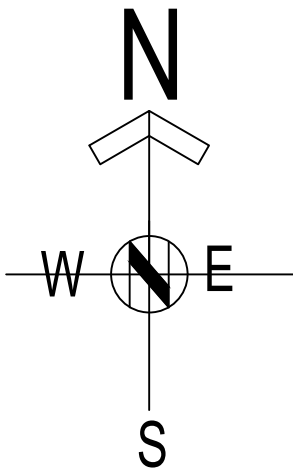
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Palatine Homes - Land at Johnsons Drive, Finchamstead (5)

Date: 24/10/2024

Scale: 1:500 @ A1

Drawing No: TTL-SM-PHJD181024



Appendix A Management Prescriptions and Checklist

Management Prescriptions and Checklist

Overall Management Objectives		Enhance nesting/roosting opportunities for birds, bats, reptiles and invertebrates. Protect, maintain and enhance the retained habitats and newly planted-up areas. Introduce new native and wildlife-friendly planting within the site to provide a connected range of habitats for local wildlife. Provide enhanced habitats and features of value for a range of species. Sympathetic management of the site to take into account the continued presence of protected species and other wildlife																	
General Management Operations		To clear away any litter on a regular and systematic basis and ensure minimal use of chemicals. Allow all wood from windblow or arising from management operations to be left on-site in suitable locations as hibernacula, log piles or as low brash. Annual inspection of all planting with replacement planting as necessary. Annual check of wildlife boxes (during the winter months) with cleaning and repairs completed as necessary (Note: any works/checks to bat boxes might require suitably licensed individuals).																	
Specific Habitat Operations		<table><tr><th colspan="2" rowspan="2"></th><th colspan="5">Management Operations</th><th colspan="5">Year from Start</th></tr><tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr></table>			Management Operations					Year from Start					1	2	3	4	5
		Management Operations					Year from Start												
		1	2	3	4	5													
1	Hibernacula and Log Piles	Construct a series of hibernacula and log piles on the site and any larger material arising from on-site management operations will be added to the hibernacula and log piles so that they are maintained and contain wood in a varying state of decay.	✓	✓	✓	✓	✓												
2	Formal Lawns	Regular mowing to maintain a short sward suitable for amenity use, with all arisings removed off site or deposited in dedicated composting areas.	✓	✓	✓	✓	✓												
3	Wildflower Meadow	Once established single cut at the end of September/October. Arisings/mowings removed after left in-situ for a few days to allow seed to drop to the ground. Spot control of invasive/over dominate species, as necessary.	✓	✓	✓	✓	✓												
4	Trees and Hedgerows	Trees may need periodic pruning and or pollarding. Cutting of hedgerows will be carried out on a rotational basis with only a third cut in any one year, where practicable to do so. Any cutting/pruning will be timed during the late winter months. All arisings will be retained on site either as low brash or as chippings to act as a mulch.	✓	✓	✓	✓	✓												
		Remove redundant tree support systems once trees are fully established.					✓												
LEMP Review		Review of the LEMP and take into consideration any other objectives/initiatives in consultation with interested parties. Amend as necessary.	✓	✓	✓	✓	✓												
Management work completed. Any amendments/comments should be provided on the separate Monitoring Sheet.																			
Work completed by (add company details):																			
Initials of Manager:																			

Appendix B
Annual Monitoring Sheet

Annual Monitoring Sheet

Date:	Completed by:	
Habitat	Issue	Solution
e.g. New planting	Areas becoming colonised by non-target species.	Remove weeds by hand before they set seed.

Appendix C
Bird and Bat Box Guidance Document

BIRD AND BAT BOX/TUBE GUIDANCE DOCUMENT

Overview

The boxes/tubes used should be made of woodcrete material¹ (or equivalent) wherever possible and be positioned in accordance with good practice. All of the boxes can be obtained from the following suppliers:

Jacobi Jayne www.jacobijayne.co.uk

Wildcare www.wildcare.co.uk

NHBS www.nhbs.com

Bird Box Installation Guidance

The requirements for nest boxes vary between species. However there are some general rules to follow:

- Boxes should be located in a sheltered position out of strong sunlight, wind and rain. Generally this means that the box should be positioned somewhere between the north east and south east side of a structure.
- For extra shelter, smaller boxes should be positioned at a slight forward angle.
- Large open boxes should be angled upwards when mounted to allow the nest to rest naturally at the back of the box.
- Boxes should be positioned out of the reach of predators where possible (e.g. cats).
- A density of around 10 bird boxes per hectare is acceptable.
- Position boxes away from bird tables and other feeding areas where possible.

Bat Box/tube Installation Guidance

- Boxes should be located in a sheltered position, out of strong wind, but exposed to sunlight for part of the day to provide solar warming.
- When installed on trees, where possible boxes should be put up in groups of two or three, facing in different directions to allow bats access to a range of temperature conditions. Furthermore, it is recommended that, to avoid competition for bat boxes, bird boxes should also be installed on the same trees².
- It should be ensured that the entrance hole to the box is kept clear, so that bats can access it freely.
- Ideally bat boxes should be positioned near linear vegetation (e.g. a hedgerow).
- When installing boxes on trees, the ideal position is at around 5 metres or more.
- On buildings, boxes should be positioned high up by the eaves to avoid bats being predated by cats and other predators.
- Boxes should be installed out of the direct line of artificial lighting, both current and to be installed.

References

1. Du Feu, C. (1993). *Nestboxes BTO Guide No. 23*. BTO, Thetford.
2. The Bat Conservation Trust (2003). *Bat Boxes - Your Questions Answered*.
3. Meddings, A., Taylor, S., Batty, L., Green, R., Knowles, M., Latham, D. (2011). Managing competition between birds and bats for roost boxes in small woodlands, north-east England. *Conservation Evidence*, 8, pg. 74-80.

¹ Woodcrete is a blend of cement and sawdust. This material is found to be as successful as wooden bat boxes/tubes with greater durability and longevity. Schwegler bat boxes/tubes are constructed from this material.

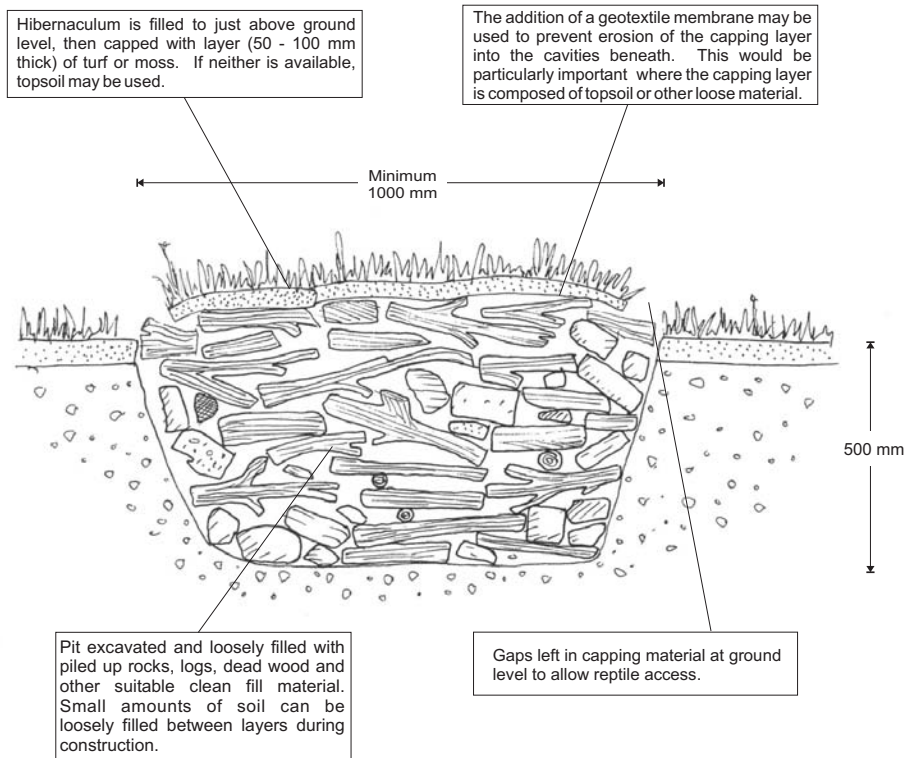
² Research carried out by Meddings *et al.* (2011) suggests that installing bird and bat boxes on the same tree will reduce the likelihood of birds nesting in bat boxes and thus preventing a reduction in roosting opportunities for bats.

Appendix D

Hibernacula Design

Hibernaculum on free-draining ground

Where ground conditions allow, the hibernaculum should be incorporated into a shallow pit. This design is more likely to remain frost-free, and will be less obtrusive and thus unlikely to be subject to interference.



Hibernaculum on impermeable ground

Where ground conditions are impermeable, then an 'above-ground' or mounded design should be utilised in order to prevent the hibernaculum from flooding. This design should also be used if it is not possible to excavate a pit for any other reason.

