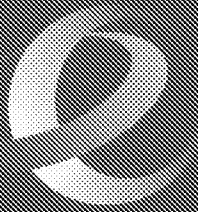


Linden Homes South



ecology solutions ltd

LAND WEST OF
NEW BARN LANE,
NORTH BERSTED,
WEST SUSSEX

**Ecological
Enhancement Scheme**

ecology solutions for
planners and developers

August 2017
6767.EES.vf1

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1. INTRODUCTION

- 1.1 This Ecological Enhancement Scheme (EES) has been prepared by Ecology Solutions Ltd on behalf of Linden Homes South in respect to Land at New Barn Lane, North Bersted, West Sussex, hereafter referred to as the Site.
- 1.2 This EES has been produced with reference to the Development Proposals relating to new residential properties together with access, landscaping and open space. The outline application, with some matters reserved (BE/142/15/OUT) was approved, subject to conditions and Section 106 Agreement in February 2016. Variation of conditions 3 and 23 (BE/18/17/PL) was approved subject to conditions and Section 106 Agreement, in May 2017.

Condition 15 of the Decision Notice regarding BE/18/17/PL states:

Prior to the commencement of construction works on each phase of the development of any preparatory works a detailed ecological enhancement scheme (which shall include the installation of bat boxes throughout the site) shall be submitted to the LPA for approval and will be based on the recommendations within the supporting ecological statement and as appropriate. All approved details shall then be implemented in full and in accordance with the agreed timings and details.

- 1.3 This EES has been written with reference to published guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM) and in accordance with Natural England and relevant third party guidelines in relation to protected species.
- 1.4 Other technical reports have also been referenced including the landscape strategy produced by ACD environmental (drawing no. LIN21257) and lighting strategy layout produced by MJA consulting (drawing no. 5529:P05).
- 1.5 This EES is set out as follows:
 - Summary ecological baseline;
 - Summary of impacts to species / habitat;
 - Specific mitigation / enhancement strategies; and
 - Monitoring prescriptions.

2. SUMMARY ECOLOGICAL BASELINE

- 2.1 An initial habitat survey was undertaken by Ecology Solutions in June 2015 to ascertain the general ecological value of the land contained within the boundaries of the site and to identify the main habitats and associated plant species. Notes on fauna utilising the site were also made during the course of these surveys. Additional notes on habitat features were made during the course of further detailed, species-specific survey work undertaken during the course of June and July 2015.
- 2.2 Habitat surveys were based upon an extended Phase 1 survey technique as recommended by Natural England. The habitats and dominant plant species were recorded and presented within the Ecological Assessment produced by Ecology Solutions in August 2015 (6767.EcoAss.vf) and later updated (6767.EcoAss.updated).
- 2.3 The habitats identified are listed below:
- Semi-improved grassland;
 - Ruderal vegetation;
 - Hedgerows;
 - Amenity grassland;
 - Trees and scrub; and
 - Treeline (off-site).
- 2.4 During the course of the habitat survey conspicuous faunal activity, evidence of the presence or potential presence, of protected species was noted. In addition, detailed surveys were undertaken for the following:
- Bats;
 - Badgers; and
 - Reptiles.
- 2.5 The surveys and assessment identified the need for specific mitigation strategies for the following habitats and species / groups:
- Semi-improved grassland;
 - Ruderal vegetation;
 - Hedgerows;
 - Trees and scrub;
 - Treeline (off-site)
 - Bats; and
 - Birds.
- 2.6 The following section details the mitigation / enhancement measures relevant to each of the above.

3. MITIGATION AND ENHANCEMENT STRATEGIES

- 3.1 The Development Proposals will affect the habitats and species / groups within the Site. Suitable mitigation and enhancement strategies will be employed to safeguard the ecological value of the Site. These strategies are outlined below.

Habitat Mitigation Strategies

3.2 **Semi-improved grassland**

- 3.3 Semi-improved grassland is present across the Site. This habitat will be lost to the Development Proposals.

Impacts: The existing area of grassland will be removed during site preparation works ahead of the construction phase of the Development Proposals.

Mitigation / Enhancement: Species-rich wildflower grassland will be sown (including WFG5 seed mix supplied by Germinal seeds and Emorsgate EM5F seed mix or similar) within the open space to be provided in the east of the Site. This will provide an enhancement in terms of the species composition of the grassland habitat.

Swales will be created within the open space that will provide new species-rich habitats. These areas will be sown with a species-rich wet grassland mixture (Emorsgate EM8 seed mix or similar), providing further botanical diversity within the Site.

- 3.4 It is considered the above provisions will compensate for the losses to semi-improved grassland and provide an enhancement over the current situation due to the proposed species composition and diversity of substrates.

3.5 **Ruderal vegetation**

- 3.6 Areas of ruderal vegetation are present along the margins of the field and exist in patches in the west and north of the Site. Ruderal vegetation along the hedgerows will be retained, with other patches lost to the Development Proposals.

Impacts: Some of the ruderal vegetation will be lost during site preparation works ahead of the construction phase of the Development Proposals.

Mitigation / Enhancement: No specific mitigation is considered necessary in relation to the losses described above.

3.7 Hedgerow

- 3.8 Hedgerows are present along the southern and western boundaries of the field. They are to be fully retained and enhanced as part of the Development Proposals.

Impacts: Potential dust suppression impacts during the construction phase on retained hedgerow habitat.

Potential encroachment of machinery and personnel during the construction phase.

*Mitigation /
Enhancement:*

Potential dust impacts would be temporary and reversible over time. However, standard construction site mitigation measures such as damping down techniques and wheel washes will be employed during construction operations.

Temporary protective fencing will be installed and remain in place throughout the construction period to prevent any potential encroachment.

*The ecological value and structure of the hedgerow running along the western boundary of the site will be enhanced through bolster planting. Native species will be used such as Hornbeams (*Carpinus Betulus*) will be planted in the southern section of the hedgerow.*

- 3.9 It is considered the above provisions will maintain and enhance hedgerow habitat within the Site.

3.10 Trees and scrub

- 3.11 Areas of dense scrub are present in a number of areas within the Site, notably in the north east and towards the southern boundary of the Site. The east of the Site contains multiple immature scattered Sycamore *Acer pseudoplatanus* trees.

Impacts: The areas of scrub will be lost during site preparation works ahead of the construction phase of the Development Proposals.

A single tree on the eastern boundary will be lost.

*Mitigation /
Enhancement:*

No specific mitigation is considered necessary in relation to the minor losses described above.

However, the baseline situation will be enhanced through new tree and shrub planting after the construction phase of the Development

Proposals, including in the northern area and along the eastern boundary of the Site. The shrub planting will mitigate for any losses of scrub habitat within the Site.

- 3.12 It is considered the above provisions will more than offset any impact on biodiversity within the Site associated with the loss of trees and scrub.

3.13 **Treeline (off-site)**

- 3.14 A tree-line is located adjacent to the northern boundary of the Site.

Impacts: Potential encroachment of machinery and personnel during the construction phase.

Mitigation / Enhancement: Temporary protective fencing shall be installed outside the root protection area of each tree and will remain in place throughout the construction period.

It is considered the above provisions will prevent any impacts to the treeline located adjacent to the Site.

Species / group mitigation strategy

- 3.15 The mitigation strategies for each species / group accord with current legislative requirements and relevant guidance.

3.16 **Bats**

- 3.17 The Site is considered to be of some limited value to foraging / navigating bats. The level of activity is consistent with regular use by a low number of individual bats of common and widespread species.

Impacts The Development Proposals will not result in any impacts to bat roosting sites.

The most valuable features for bats within the context of the site are the treelines and hedgerows alongside the southern and western boundaries. These are to be retained and enhanced as part of the Development Proposals.

Mitigation / Enhancement Mitigation will be focussed upon the avoidance of increased lighting on the hedgerows and treelines wherever possible.

Within the development proposals low pressure sodium lamps (or equivalent) should be used in preference to high pressure sodium or mercury lamps for external lighting. The brightness of the lights should be as low as practicable, with the times during which the lighting is used limited to

provide some dark periods. The lighting should be directed to where it is needed thereby avoiding light spillage onto nearby habitat features. Where necessary hoods and cowls should be fitted to lights, directing the light below the horizontal plane to where it is required, thus reducing the potential for light spill into adjacent ecologically sensitive features.

Bolster planting will enhance the hedgerow along the western boundary of the Site, while new species-rich grassland and wet grassland habitats are to be created in the eastern part of the Site. Both measures will help create additional foraging opportunities for bats.

The Development Proposals also provide the opportunity to incorporate new roosting provisions for bats in the form of bat boxes located on mature trees. Schwegler 1FF bat boxes (see Appendix 1) will be utilised, as these are suitable for a range of bat species, including those species recorded within the Site. Six bat boxes will be provided within suitable retained trees along the Site's southern boundary. The proposed indicative locations of these bat boxes are illustrated in PLAN ECO1.

- 3.18 It is considered the above provisions will maintain the status of the bat population within the local area and potentially result in a net benefit for this faunal group, providing an enhancement over the current situation and contributing towards the conservation aims for this group within the UK.

3.19 **Birds**

- 3.20 The Site provides some limited opportunities for foraging and nesting birds in the form of hedgerows/treelines and scrub.

Impacts

The Development Proposals may result in impacts on birds, through the removal of suitable nesting habitat.

Features of value to foraging and nesting birds within the site are the hedgerows, treelines and scrub. Of which, the hedgerow and treelines are to be retained within the Development Proposals.

Mitigation

All species of birds receive general protection whilst nesting, it is recommended that in order to avoid a possible offence, vegetation clearance (if required) be undertaken outside of the main breeding season (March – July inclusive). However, should this not be possible, it is

recommended that any vegetation scheduled to be cleared be checked for the presence of nesting birds immediately prior to removal by a suitably qualified ecologist.

New planting associated with the Development Proposals will help address losses to existing scrub habitat and the provision of nest boxes on retained trees or other features would provide further nesting opportunities. A variety of bird boxes will be utilised to encourage a variety of species. Examples are provided in Appendix 2. Six bird boxes will be provided. The proposed indicative locations of these bird boxes is illustrated in PLAN ECO1.

- 3.21 It is considered that the above provisions will maintain the status of birds within the local area and potentially result in a net benefit for this faunal group, providing an enhancement over the current situation and contributing towards the conservation aims for this group locally and nationally.

4. MANAGEMENT AND MONITORING PRESCRIPTIONS

- 4.1 The aims and objectives of the mitigation and enhancement strategies put forward are to maintain and enhance habitats of ecological interest retained within the Site in addition to conserving populations of protected species, while providing for biodiversity enhancements wherever possible. In order to maintain these features it is necessary to set out suitable management and monitoring prescriptions.
- 4.2 The following objectives have been identified:
- Objective 1: Maintain and enhance retained and newly created habitats within the Site;
 - Objective 2: Maintain and where possible enhance populations of protected / notable species identified within the Site;
 - Objective 3: Biological recording to monitor efficacy of the Management Plan.
- 4.3 Management prescriptions and monitoring requirements have been described below, in relation to each of the above objectives.

Objective 1: Maintain and Enhance Retained and Created Habitats

- 4.4 The ecological aims for the Site are to improve the diversity of habitats present and improve the quality / species diversity of these habitats.
- 4.5 The Development Proposals provide the opportunity to deliver a net gain in the ecological value of the Site. Habitats to be provided within the completed development include:
- Species-rich grassland;
 - Swale / species-rich wet grassland;
 - Hedgerows; and
 - Trees and shrub.

Species-rich Grassland

- 4.6 Areas seeded with wildflower grassland mixes should be managed in line with the supplier's recommendations. Where appropriate, areas of grassland within the site should be cut on a rotational basis to enhance the variation and diversity of meadow habitats, which will maximise the biodiversity value of the habitat. Cuttings should be left on site to dry for approximately seven days prior to removal in order to allow for flower seeds to disperse.

Swale / Species-rich Wet Grassland

- 4.7 Attenuation features planted with a wet wildflower grassland mixture will be managed, in line with other species-rich grassland, wherever possible, to provide an increase in biodiversity value of the site whilst retaining their primary function of providing drainage to the new

development. Any areas of standing water will provide new opportunities for fauna species including amphibians and reptiles.

Hedgerows

- 4.8 Management will be undertaken to achieve a dense, tall structure with structural complexity, and to avoid any gaps from being present. Any required cutting of these features will be undertaken with due regard for constraints associated with protected species, primarily breeding birds, as outlined below.

Shrub

- 4.9 Management of newly planted shrubs will initially aim to ensure the successful establishment of these habitats and the provision of an appropriate structure.
- 4.10 Whilst some minor trimming may be undertaken at the boundaries of the shrub planting, it is not envisaged that any specific management would be required within these areas for the first 5 years, beyond monitoring of new planting and replacement where necessary.
- 4.11 Following this, any further management including cutting or thinning of this vegetation will be undertaken with due regard for constraints associated with protected species, primarily breeding birds, as outlined below.

Objective 2: Maintain populations of protected / notable species identified within the Site

- 4.12 The implementation of an appropriate management regime, in association with the proposals, will secure significant ecological enhancement of the habitats present and will furthermore provide increased opportunities for a range of protected species within the Site.
- 4.13 Specific management requirements in respect of each of these identified species/groups is detailed below.

Badgers

- 4.14 No specific management measures are required beyond the habitat management strategies discussed above.
- 4.15 Immediately ahead of any management works the area should be checked for the presence of Badger setts. This would include a walkover survey of grassland to be mown (for example). In the event that a sett or suspected sett is recorded, a 20m buffer to the sett entrances should be adhered to within which no machinery should be used, until advice has been sought from a suitably experienced ecologist.
- 4.16 Management proposed in relation to retained habitats will ensure connectivity through the Site and wider area providing foraging and shelter resources for the local Badger population.

Bats

- 4.17 Habitat management principles in relation to bats will ensure that foraging and commuting resources are maintained within the Site.
- 4.18 The hedgerows and treelines will be managed to maintain a tall and unbroken structure. This will ensure flight lines within the Site and wider vicinity are connected, allowing bats to navigate throughout the area. Any works to trees will be limited to works required on health and safety grounds.

Birds

- 4.19 All British birds are legally protected whilst actively nesting (typically March to July inclusive). Management of shrubs and trees should therefore (in preference) be undertaken outside of the bird-breeding season, or under the guidance of an appropriately experienced ecologist to avoid an offence being committed.
- 4.20 Management of fruit bearing trees and shrubs, such as hedge trimming, within the Site will be undertaken after fruiting to ensure this food resource is made available for foraging birds, as well as other wildlife.

Objective 3: Monitor efficacy of the Management Plan

- 4.21 Habitat condition surveys will be undertaken in respect of all retained and newly created habitats within the Site as part of ongoing management at the Site.
- 4.22 While new planting is being established, a health monitoring assessment will be implemented with any failed specimens removed and replaced. During periods of dry weather newly planted hedgerow shrubs will be checked for effects from drought. This monitoring would be linked to a defects liability period associated with the provision of the new planting and health checks will be undertaken for a minimum of one year following planting.
- 4.23 Artificial bat and bird boxes will be monitored on an annual basis to ensure they remain in good condition. Any boxes noted as damaged or out of working order will be replaced or repaired as necessary.

PLANS AND APPENDICES

PLANS

PLAN ECO1

Location of Bat and Bird Boxes



APPENDICES

APPENDIX 1

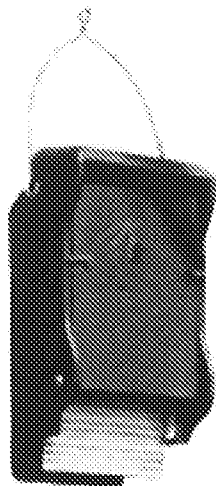
Bat Box Specification

Bat Boxes

Schwegler bat boxes are made from 'woodcrete' and have the highest rates of occupation of all types of box.

The 75% wood sawdust, clay and concrete mixture is ideal, being durable whilst allowing natural respiration and temperature stability. These boxes are rot and predator proof and extremely long lasting.

Boxes can be hung from a branch near the tree trunk or fixed using 'tree-friendly' aluminum nails.



1FF Bat Box

The rectangular shape makes the 1FF suitable for attaching to the sides of buildings or in sites such as bridges, though it may also be used on trees. It has a narrow crevice-like internal space to attract Pipistrelle and Noctule bats.

Woodcrete (75% wood sawdust, concrete and clay mixture)

Width: 27cm

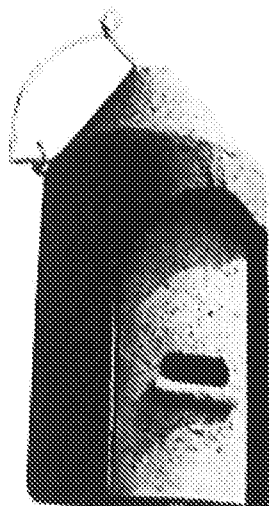
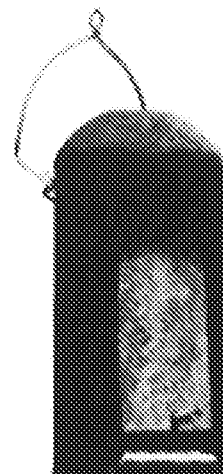
Height: 43cm

Weight: 8.3kg

2FN Bat Box

A large bat box featuring a wide access slit at the base as well as an access hole on the underside. Particularly successful in attracting Noctule and Bechstein's bats.

Woodcrete construction, 16cm diameter, height 36cm.



2F Bat Box

A standard bat box, attractive to the smaller British bat species. Simple design with a narrow entrance slit on the front.

Woodcrete construction, 16cm diameter, height 33cm.



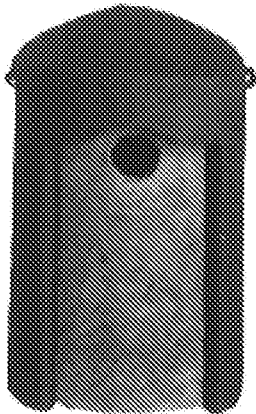
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APPENDIX 2

Examples of Bird Boxes

Bird Boxes

Schwegler bird boxes have the highest rates of occupation of all types of box. They are designed to mimic natural nest sites and provide a stable environment with the right thermal properties for chick rearing and winter roosting. Boxes are made from 'Woodcrete'. This 75% wood sawdust, clay and concrete mixture is breathable and very durable making these bird boxes extremely long lasting.



1B Bird Box

This is the most popular box for garden birds and appeals to a wide range of species. The box can be hung from a branch or nailed to the trunk of a tree with a 'tree-friendly' aluminium nail.

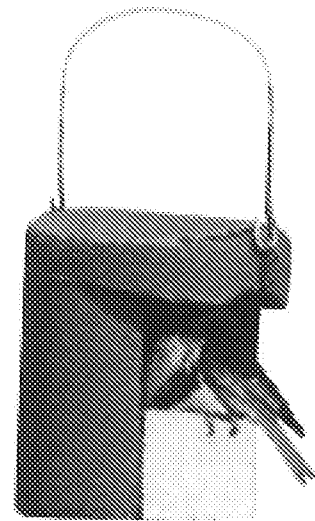
Available in four colours and three entrance hole sizes. 26mm for small tits, 32mm standard size and oval, for redstarts.

2H Bird Box

This box is attractive to robins, pied wagtails, spotted flycatcher, wrens and **black redstarts**.

Best sited on the walls of buildings with the entrance on one side.

Schwegler boxes have the highest occupation rates of all box types. They are carefully designed to mimic natural nest sites and provide a stable environment for chick rearing and winter roosting. They can be expected to last 25 years or more without maintenance.



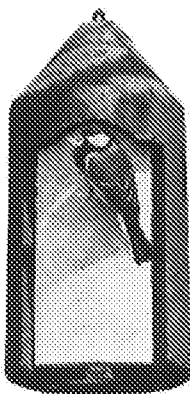
2M Bird Box

A free-hanging box offering greater protection from predators.

Supplied complete with hanger which loops and fastens around a branch.

With standard general-purpose 32mm diameter entrance hole.

Schwegler boxes have the highest occupation rates of all box types. They are carefully designed to mimic natural nest sites and provide a stable environment for chick rearing and winter roosting. They can be expected to last 25 years or more without maintenance.



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