

Land at North End Road, Yapton, West Sussex

Ecological Design Strategy

July 2020

Land at North End Road, Yapton, West Sussex

Ecological Design Strategy

Client:	Dandara Ltd (Southern)	
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Author: Becci Bond BSc(Hons) MCIEEM	Proofed: Nick Pincombe BA(Hons) MSc CEnv MIEMA MCIEEM	Approved: Nick Pincombe BA(Hons) MSc CEnv MIEMA MCIEEM
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Abbreviations

ECoW	Ecological Clerk of Works
EDS	Ecological Design Strategy
EPS	European Protected Species
LNR	Local Nature Reserve
NERC	Natural Environment and Rural Communities Act 2006
NPPF	National Planning Policy Framework
PEA	Preliminary Ecological Assessment
RAM	Reasonable Avoidance Measure
UEEC	Urban Edge Environmental Consulting
WCA	Wildlife & Countryside Act 1981 (as amended)

0 Executive Summary

0.1 Introduction

- 0.1.1 An Ecological Design Strategy (EDS) was prepared for the site of a proposed residential development on Land at North End Road in Yapton, West Sussex (Grid Reference: 497671, 103689). The EDS has been produced to define measures for the protection of important ecological features and enhancement of the site to achieve an overall net gain in biodiversity.
- 0.1.2 The site is located to the west of North End Road and lies to the north west of Yapton Village Centre in the Arun district of West Sussex. The site comprises c.4.6ha of undeveloped land, currently dominated by improved grassland, with hedgerows, trees, tall ruderal vegetation, scrub, two agricultural buildings and hard-standing. The site is bounded to the east by Yapton Church of England Primary School, residential property, farm buildings and North End Road, and to the north, west and south by agricultural land. The wider landscape is dominated by open pasture and farmland with connecting hedgerows, and woodland to the north east and north west.
- 0.1.3 There is extant outline consent for the construction of c.108 dwellings, together with parking, access, landscaping, and associated facilities. Reserved matters applications and a detailed application for site access are now being submitted. The Ecological Design Strategy is applicable to the site as a whole.

0.2 Baseline Conditions

- 0.2.1 The report draws on the findings and recommendations detailed within the following reports:
- ✦ Urban Edge Environmental Ltd (July 2020): *Land at North End Road: Preliminary Ecological Appraisal*;
 - ✦ Urban Edge Environmental Ltd (July 2020): *Land at North End Road: Bat Activity Survey*;
 - ✦ PJC (October 2018): *Land at North End Road: Preliminary Ecological Appraisal*; and,
 - ✦ PJC (June 2017): *Stakers Farm North End Road: Preliminary Ecological Appraisal*.
- 0.2.2 The main ecological features of interest associated with the site are as follows (UEEC, 2020):
- ✦ **Priority habitats:** All the hedgerows on site (H1-H4) were classified as priority habitat. Approximately 46.5m of species-poor hedgerow H4 would be removed to facilitate construction of the new site access to the northern part of the site from North End Road, however, the remaining hedgerows will be retained and protected during construction. This hedgerow loss would be offset by native species-rich hedgerow creation and enhancement as part of the landscaping and ecological design strategy for the development as a whole.

- ❖ **Roosting bats:** The south-eastern part of the survey area will be kept as open space following development. Consequently it is unlikely that any bats roosting within B3 (offsite) would be affected either directly (through roost loss/damage) or indirectly (via increase artificial lighting) by the proposals for the site. Further survey for roosting bats would only be necessary should this situation change.
- ❖ **Foraging and commuting bats:** Based on the bat activity survey results, and the proposed retention of the majority of hedgerow habitats, the development is unlikely to result in significant impacts to foraging and commuting bats. Mitigation measures are recommended to reduce and offset residual impacts on a proportionate basis, including measures to avoid or minimise the use of the artificial lighting.
- ❖ **Mammals (excluding bats):** Badger is not considered to present a potential constraint to the development proposals, however general ecological protection measures for badger and other mammals are recommended.
- ❖ **Nesting Birds:** The survey area's hedgerows, scattered trees and scrub were considered to provide good nesting and foraging opportunities to a wide range of common bird species. Precautionary measures for nesting birds were recommended.
- ❖ **Reptiles:** The survey area contains predominantly sub-optimal habitat for reptiles, formed mainly of intensively grazed improved grassland fields with a short sward height and little structural diversity. However, there are small areas of suitable reptile habitat in the sheep grazed fields to the south and west of hedgerow H3 and along the boundaries of the site. Construction works would involve site clearance, creation of access tracks and materials storage compounds, vehicle movements and groundworks, which together could present a risk of killing or injury for reptiles if present within the survey area. A Precautionary Working Method Statement is provided to reduce the risk of killing/injury to reptiles.

0.3 Working Methods to Achieve Objectives: Avoidance and Mitigation

0.3.1 The following measures will be implemented in order to protect wildlife and habitats on site:

- ❖ Appointment of an Ecological Clerk of Works;
- ❖ Installation of fences;
- ❖ Protection of trees during construction;
- ❖ Protection of bats;
- ❖ Protection of mammals (excluding bats);
- ❖ Protection of birds;
- ❖ Protection of reptiles; and,
- ❖ Correct disposal of waste.

0.4 Working Methods to Achieve Objectives: Enhancement and Compensation

0.4.1 Section 40 of the NERC Act 2006 places a duty on public bodies to have regard to biodiversity conservation when carrying out their functions. In addition, the National Planning Policy Framework and the Yapton Neighbourhood Plan encourage ecological enhancements to be integrated into development projects in order to achieve an overall net-gain in biodiversity. The EDS includes the following enhancements:

- ❖ Wildflower meadow planting;
- ❖ Native species hedge planting and gap filling;
- ❖ Pond creation;
- ❖ Hibernacula / deadwood habitats; and,
- ❖ Bat and bird boxes.

0.5 Implementation of Site Enhancement Works

0.5.1 Section 5 sets out measures and timings to avoid, mitigate and/or compensate for predicted impacts, together with enhancement measures.

0.6 Maintenance and Monitoring

0.6.1 Section 6 sets out maintenance and monitoring required for:

- ❖ Wildflower meadow;
- ❖ Hedgerows;
- ❖ Eutrophic standing water; and,
- ❖ Bat and bird boxes.

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1 Introduction

1.1 Purpose of this Report

- 1.1.1 This report presents an Ecological Design Strategy (EDS) for the site of a proposed residential development on Land at North End Road in Yapton, West Sussex (Grid Reference: 497671, 103689). The EDS has been produced to define measures for the protection of important ecological features and enhancement of the site to achieve an overall net gain in biodiversity.
- 1.1.2 The Ecological Design Strategy follows the British Standards Institution's *Biodiversity code of practice for planning and development* (BS42020:2013, section D.4.3). Additionally, the National Planning Policy Framework (NPPF; MHCLG, 2019) identifies ways in which the planning system should contribute to and enhance the natural and local environment, including 'minimising impacts on and providing net gains for biodiversity' (paragraph 170). Opportunities for biodiversity enhancement are present within the proposed development and this EDS has been prepared to ensure that these opportunities are recognised and met.

1.2 Site Description

- 1.2.1 The site is located to the west of North End Road and lies to the north west of Yapton Village Centre in the Arun district of West Sussex. The site comprises c.4.6ha of undeveloped land, currently dominated by improved grassland, with hedgerows, trees, tall ruderal vegetation, scrub, two agricultural buildings and hard-standing. The site is bounded to the east by Yapton Church of England Primary School, residential property, farm buildings and North End Road, and to the north, west and south by agricultural land. The wider landscape is dominated by open pasture and farmland with connecting hedgerows, and woodland to the north east and north west.
- 1.2.2 The site location is outlined in red on Figure 1.1, the site proposals plan is shown on Figure 1.2 and the site access plan is shown on **Error! Reference source not found.**

1.3 Construction Activities and Planning Status

- 1.3.1 Outline planning consent has been obtained for a residential development (application references Y/44/17/OUT and Y/88/18/OUT). The proposals include demolition of existing buildings, and construction of c.108 dwellings, together with parking, access, landscaping, and associated facilities.
- 1.3.2 Application Y/44/17/OUT was permitted with the following condition in relation to ecology:

5. The development must be carried out in accordance with the recommendations and mitigation measures as set out within section 5.10 "Ecological Enhancements" of the

Preliminary Ecological Appraisal (June 2017) by PJC Consultancy and drawing LLD1136/01 Rev 01 "Ecological and Landscape Masterplan Strategy". The enhancements and mitigation measures shall be implemented as per the document and then permanently retained and thereafter maintained as fit for purpose.

1.3.3 Application Y/88/18/OUT was permitted with the following condition in relation to ecology:

4. The development must be carried out in accordance with the recommendations of the Preliminary Ecological Appraisal (26/10/18) by PJC Consultancy. The enhancements and mitigation measures shall be implemented as per the document and then the enhancements permanently retained and thereafter maintained as fit for purpose.

1.3.4 A detailed application was submitted earlier in 2020 for site access. Reserved matters applications are now being submitted for the remainder of the site and proposed layout plans are shown at Figure 1.2 and Figure 1.3. In 2020 Urban Edge Environmental Consulting produced an updated Preliminary Ecological Appraisal¹ (PEA) to inform the detailed access and reserved matters applications. The Phase 1 habitats map from this survey is included at Appendix I for reference.

1.3.5 The Ecological Design Strategy contained herein addresses the entire site, and hence addresses the above listed conditions of permissions Y/44/17/OUT and Y/88/18/OUT, as well as the detailed application for site access and reserved matters applications.

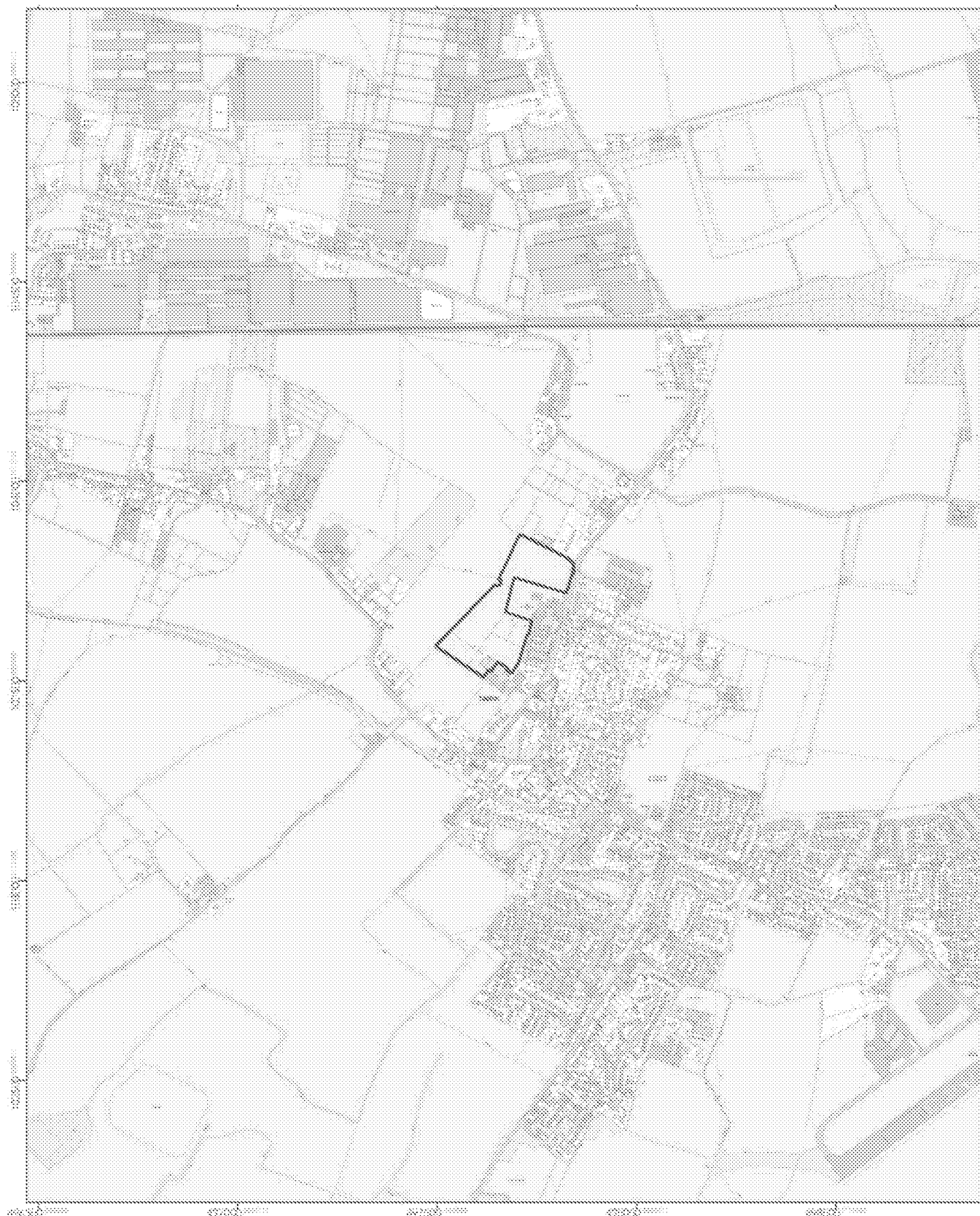
1.4 Conservation Objectives

1.4.1 The EDS has been produced in order to:

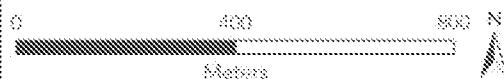
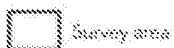
- ✧ Identify important ecological features present on the site or adjacent and which require specific measures to ensure their protection;
- ✧ Establish working methods to enable the protection of important ecological features;
- ✧ Specify enhancement measures to secure biodiversity net gain on site following construction; and
- ✧ Define an implementation, monitoring and maintenance schedule.

1.4.2 The Ecological Design Plan in Appendix II illustrates the layout of the site on completion of the development, and specifies the locations of ecological enhancement measures discussed in this report.

¹ Urban Edge Environmental Consulting (2020): *Land at North End Road, Yapton: Preliminary Ecological Appraisal Report*.



Land at North End Road, Yapton, West Sussex



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Ordnance Survey 0100031673

Scale: 1:10,000 Created by: AD

Date: Apr 2019 Reviewed by: NP

Drawing number:
UEUG/ECO-GWA_190402

URBAN EDGE Tel: 01273 666 766
ENVIRONMENTAL Email: hello@ueec.co.uk
CONSULTING Web: www.ueec.co.uk

Figure 1.1: Site location plan



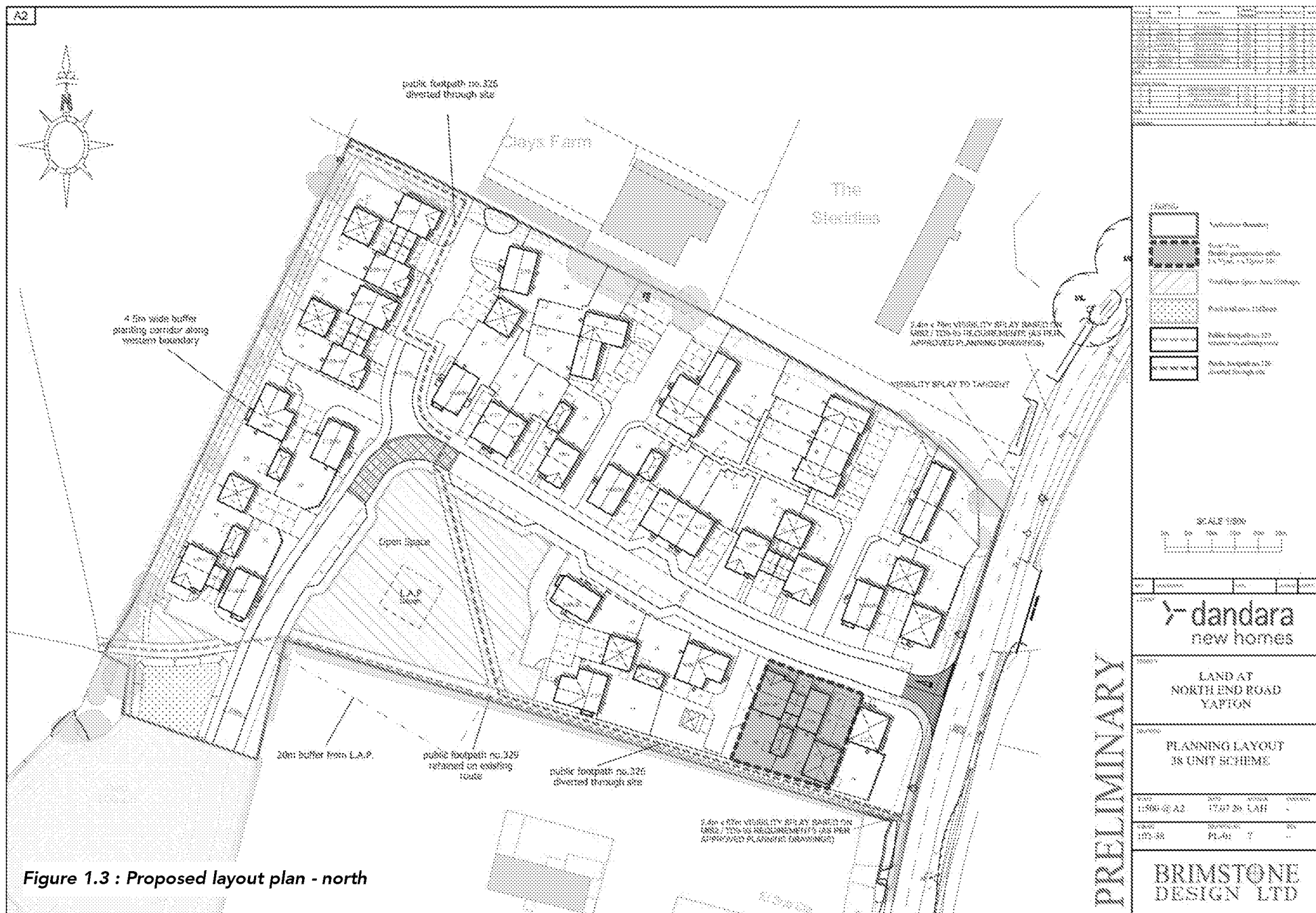


Figure 1.3 : Proposed layout plan - north

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2 Baseline Conditions

2.1 Surveys Undertaken

2.1.1 The EDS draws on the findings and recommendations detailed within the following reports:

- ❖ Urban Edge Environmental Ltd (July 2020): *Land at North End Road: Preliminary Ecological Appraisal*;
- ❖ Urban Edge Environmental Ltd (July 2020): *Land at North End Road: Bat Activity Survey – Interim Report*;
- ❖ PJC (October 2018): *Land at North End Road: Preliminary Ecological Appraisal*; and
- ❖ PJC (June 2017): *Stakers Farm North End Road: Preliminary Ecological Appraisal*.

2.1.2 See Appendix IV for a review of the legislation and planning context.

2.2 Summary of the Important Ecological Features of the Site and Constraints

2.2.1 The main ecological features of interest associated with the site are as follows (UEEC, 2020). Numbered features are shown on the Phase 1 habitats map at Appendix I.

- ❖ **Priority habitats:** All the hedgerows on site (H1-H4) were classified as priority habitat. Approximately 46.5m of species-poor hedgerow H4 would be removed to facilitate construction of the new site access to the northern part of the site from North End Road, however, the remaining hedgerows will be retained and protected during construction as described at sections 3.3 and 3.4. This hedgerow loss would be offset by native species-rich hedgerow creation and enhancement as part of the landscaping and ecological design strategy for the development as a whole, as describe at section 4.2.2.
- ❖ **Roosting bats:** The south-eastern part of the survey area will be kept as open space following development. Consequently it is unlikely that any bats roosting within B3 (offsite but adjacent to the east) would be affected either directly (through roost loss/damage) or indirectly (via increased artificial lighting) by the proposals for the site. Further survey for roosting bats would only be necessary should this situation change.
- ❖ **Foraging and commuting bats:** Based on the bat activity survey results, and the proposed retention of the majority of hedgerow habitats, the development is unlikely to result in significant impacts to foraging and commuting bats. Mitigation measures are recommended to reduce and offset residual impacts on a proportionate basis, including measures to avoid or minimise the use of the artificial lighting (see section 3.5 of this report) during the construction and operational phases of the proposed development.
- ❖ **Mammals (excluding bats):** Badger is not considered to present a potential constraint to the development proposals, however general ecological protection measures for badger and other mammals are recommended in Section 3.6.

- ✧ **Nesting Birds:** The survey area's hedgerows, scattered trees and scrub were considered to provide good nesting and foraging opportunities to a wide range of common bird species. Any habitat clearance on site could therefore result in direct adverse impacts on nesting birds. On this basis nesting birds are considered a potential ecological constraint. In order to comply with legislation protecting nesting birds the mitigation measures detailed in section 3.7 will be adhered to.
- ✧ **Reptiles:** The survey area contains predominantly sub-optimal habitat for reptiles, formed mainly of intensively grazed improved grassland fields with a short sward height and little structural diversity. However, there are small areas of suitable reptile habitat in the sheep grazed fields to the south and west of hedgerow H3 and along the boundaries of the site. Construction works would involve site clearance, creation of access tracks and materials storage compounds, vehicle movements and groundworks, which together could present a risk of killing or injury for reptiles if present within the survey area. The recommendations of the PEA (UEEC, 2020) advised that a reptile survey should be undertaken unless the current grazing regime can be maintained, and if so the small areas of better suitability habitat should be cleared in accordance with a Precautionary Working Method Statement to reduce the risk of killing/injury to reptiles. Mitigation measures in relation to reptiles are described in section 3.8 of this report to be implemented during the construction and operational phases of the proposed development.

3 Working Methods to Achieve Objectives: Avoidance and Mitigation

3.1 Introduction

- 3.1.1 The following measures will be implemented in order to protect wildlife and habitats on site.

3.2 Appointment of Ecological Clerk of Works

- 3.2.1 An Ecological Clerk of Works (ECoW) will be appointed to oversee any operations which could negatively affect important ecological features as described below.

3.3 Installation of Fences

- 3.3.1 The boundary hedgerows will be fenced off using herras fencing, or similar, which will enforce a 'no construction zone' to ensure their protection. In addition, site workers will not be permitted access into the wildflower meadow and pond areas to avoid trampling or destruction of any newly created habitats and minimise disturbance to wildlife.
- 3.3.2 Signage shall be installed on the fencing to identify hedgerows, wildflower meadows and pond as ecological features, and delineating areas where construction machinery, storage and personnel are not allowed.

3.4 Protection of Trees during Construction

- 3.4.1 The tree protection plan² will be implemented, and site contractors will adhere to the recommended protection measures (e.g. root protection areas).

3.5 Protection of Bats

Roost loss

- 3.5.1 No bat roosts will be affected by the current proposals.

Avoiding losses of foraging/commuting habitats

- 3.5.2 The improved grassland habitat which dominates the survey area is species-poor, unlikely to host an abundant invertebrate fauna and is considered to be of low suitability as foraging habitat for bats. The majority of the grassland resource within the site will be removed to make

² Brimstone Design (July 2020): *Land at North End Road, Yapton: Tree Influence Layout*.

way for construction. Wildflower meadows will be created in areas of open space to provide enhanced replacement habitats.

- 3.5.3 The boundary hedgerows to the north and east may serve as navigation routes or foraging features for bats but are also of low suitability due to their mainly tightly managed form and condition. Without mitigation, the boundary hedgerows may experience an increase in artificial lighting following development, which may render them less suitable for foraging/commuting in future.

Mitigation for artificial lighting

- 3.5.4 Negative impacts on foraging and commuting bats and other nocturnal species will be prevented, during both construction and operation of the proposed development, by avoiding light spill falling onto retained tree lines and hedgerows which are present at the north, east and west site boundaries.

- 3.5.5 The lighting design strategy will refer to guidance from the Institute of Lighting Professionals on bats and artificial lighting (ILP/BCT, 2018). It is recommended that the following lighting specifications are considered during the detailed design stage:

- ❖ Lighting should be appropriately located and directed to avoid illuminating any bat boxes and retained mature trees or hedgerows to the site boundaries;
- ❖ All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used;
- ❖ LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;
- ❖ A warm white spectrum (ideally <2700Kelvin) should be adopted to reduce blue light component;
- ❖ Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012);
- ❖ Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill;
- ❖ The use of specialist bollard or low-level downward directional luminaires to retain darkness above should be considered. However, this often comes at a cost of unacceptable glare, poor illumination efficiency, a high upward light component and poor facial recognition, and their use should only be as directed by the lighting professional;
- ❖ Column heights should be carefully considered to minimise light spill;
- ❖ Only luminaires with an upward light ratio of 0% and with good optical control should be used (refer to ILP guidance for the reduction of obtrusive light);
- ❖ Luminaires should always be mounted on the horizontal, i.e. no upward tilt;
- ❖ Any external security lighting should be set on motion-sensors and short (1min) timers; and,

- » As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

3.6 Protection of Mammals (excluding bats)

- 3.6.1 The mitigation for lighting within in section above will also mitigate for any potential disturbance to nocturnal mammals within the site.
- 3.6.2 All excavations left overnight will either be covered over, or provided with a ramp to enable easy escape of badgers, small mammals, amphibians and other fauna, and inspected each morning prior to recommencement by the ECoW of Site Environmental Manager. Open pipework greater than 150mm outside diameter will be blanked off at the end of each working day
- 3.6.3 To enable dispersal of hedgehogs (which require large territory sizes) and other small mammals across the site and within the local area following development, small access gaps to measure c.13x13cm are recommended to be provisioned at the base of all new fence boundaries. These will allow easy passage for small mammals to continue foraging in the area while still being small enough to contain pets.
- 3.6.4 Where rabbit warrens or fox dens are to be damaged or destroyed as part of the proposed works, this will be done in accordance with the Mammals Act 1996 by a registered pest control company.

3.7 Protection of Birds

- 3.7.1 Works associated with the development, including vegetation clearance and building demolitions, could result in direct adverse impacts on nesting birds. There is a risk of killing/injuring wild birds, or damaging/destroying an active nest or eggs, or disturbing adult birds and their young whilst in and around the nest (schedule 1 species only), which would be an offence under the Wildlife & Countryside Act 1981.

- 3.7.2 In order to mitigate for these impacts the following Reasonable Avoidance Measures will be implemented.

Timing of works

- 3.7.3 Negative impacts on breeding birds will be avoided by undertaking clearance and demolition works which would result in removal of potential nesting habitats (including vegetation and buildings) outside of the bird breeding season, which runs from 1 March to 31 August.

Nest searches

- 3.7.4 Construction works undertaken within the bird breeding season where suitable nesting habitat exists will require a site check for nesting birds by the Ecological Clerk of Works.
- 3.7.5 This site check will take place no more than two days prior to works commencing on the feature of interest, and its findings will be recorded in the ECoW's site log. If a nest is found it will be

cordoned off and works adjacent to this nest will be delayed until such time that the chicks have fledged from the nest. This is to ensure that no disturbance to active bird nests occurs.

Retained vegetation

- 3.7.6 Retained vegetation suitable for nesting birds will be protected for the duration of the development works by the fencing specification detailed in section 3.3 above.

3.8 Protection of Reptiles

- 3.8.1 Construction works will involve site clearance, creation of access tracks and materials storage compounds, vehicle movements and groundworks, which together could present a risk of killing or injury for reptiles if present within the site and would constitute an offence under the Wildlife & Countryside Act 1981. In order to mitigate for these impacts the following Reasonable Avoidance Measures will be implemented under a Precautionary Working Method Statement.

Precautionary Working Method Statement

- 3.8.2 The following methods will be adopted to reduce the risk of killing/injury to reptiles, and will be overseen by the Ecological Clerk of Works for the site.

Timing of works

- 3.8.3 Negative impacts on reptiles will be avoided by undertaking clearance works which would result in removal of potential reptile habitats (including hedgerow, scrub, grassland and log/brush/rubble piles) during the reptile active season, broadly March/April to September/October) and when daytime temperatures are consistently >8°C.

Toolbox talk

- 3.8.4 Prior to commencement of site clearance works, all site operatives will receive a briefing from the ECoW to explain the legal protection for reptiles, the precautionary methods to be followed, tips on identifying reptiles, and the procedure to be followed should a reptile be found at any stage during the works.

Procedure if reptiles are encountered

- 3.8.5 If a reptile is found within the construction zone during site clearance works, site operatives will be advised to cease activity in its vicinity while advice from the ECoW is sought. The ECoW will then assess the most appropriate course of action which may include removing the individual(s) from the site and moving it to a nearby area of suitable habitat outside of the construction zone.

Site check for nesting birds

- 3.8.6 As a result of the precautionary timing of site clearance stipulated above, the works may be carried out during the nesting bird season which runs from early March to late August. The ECoW will carry out a survey for active bird nests immediately prior to clearance and, if an active nest is found, it must be cordoned off and works adjacent to the nest must be delayed until such time that the chicks have fledged from the nest.

Removal of refuges

- 3.8.7 Sites of potential refuge within the construction zone will be searched for reptiles by the ECoW. Any reptiles found will be relocated to a nearby area of suitable habitat outside of the construction zone. Refuges will then be deconstructed by hand, overseen by the ECoW, and removed from the site prior to the end of the same working day.

Sequential strimming of vegetation

- 3.8.8 Areas of vegetation potentially suitable for shelter and foraging will be progressively reduced in height using the following methods, working towards the edges of the site to encourage any reptiles present to move into adjacent (off-site) habitats of their own volition, and to reduce the site's suitability for re-colonisation:
- ✧ Prior to each stage of vegetation removal, the ECoW will hand search areas of dense and tall vegetation to check for the presence of reptiles;
 - ✧ Once the ECoW is satisfied that the work area is clear of reptiles, tall vegetation within the work area will be progressively cut to a height of 15-20cm above ground level under the direction of the ECoW. Cutting will be directional, undertaken from the centre towards the edges of the site to encourage any animals present to move out of the construction zone into suitable adjacent habitats;
 - ✧ Cutting will be undertaken using hand tools (e.g. strimmer, brush cutter or chainsaw) rather than by tractor-drawn mower to minimise the risk of reptile casualties. Care will be taken not to allow the blade / strimmer-wire to make contact with the ground;
 - ✧ Once initial cutting is completed, arisings will be searched, removed by hand and be responsibly disposed of off-site prior to the end of the same working day, to ensure that it is not used as a refuge by reptiles;
 - ✧ 24 hours after initial cutting, a secondary phase of directional vegetation clearance will then be carried out in the work area, cutting vegetation to ground level in order to ensure that no suitable habitat remains within the work area. Materials arising will be responsibly disposed of off-site prior to the end of the same working day.

Commencement of construction works

- 3.8.9 Once the construction zone is clear of potentially suitable reptile habitat it is unlikely that any reptiles will attempt to re-colonise and the construction programme can commence. However, the construction zone will be maintained in this manipulated condition until ground works commence to ensure that the area remains unattractive for reptiles in the interim.

Retained vegetation

- 3.8.10 Retained vegetation suitable for reptiles will be protected for the duration of the development works by the fencing specification detailed in section 3.3 above.

3.9 Disposal of Waste

- 3.9.1 It is not envisaged that the measures described above will produce significant quantities of waste; however, any wastes arising will be disposed of in accordance with the Site Waste Management Plan.
- 3.9.2 Materials will not be stored on site for long periods of time during construction, or will be raised onto pallets to avoid creating areas of shelter which can be exploited by protected species. If any habitat piles are created and left in-situ temporarily, they will be carefully dismantled by hand under ECoW supervision prior to removal to ensure that any species which have taken shelter there (e.g. reptiles) are not harmed.

4 Working Methods to Achieve Objectives: Enhancement and Compensation

4.1 Introduction

- 4.1.1 Section 40 of the NERC Act 2006 places a duty on public bodies to have regard to biodiversity conservation when carrying out their functions. In addition, the National Planning Policy Framework and the Yapton Neighbourhood Plan encourage ecological enhancements to be integrated into development projects in order to achieve an overall net-gain in biodiversity.
- 4.1.2 Table 4.1 summarises the recommendations for biodiversity net gain made in the Preliminary Ecological Appraisal (UEEC, 2020). The “R” reference numbers are shown on the Ecological Design Plan at Appendix II. Further detail on each is given in the subsequent sections.

Table 4.1: Summary of PEA net gain recommendations (UEEC, 2020)

#	Summary of PEA net gain recommendations (UEEC, 2020)
R11	Green spaces should be sown with a locally-sourced native wildflower and grass seed mix.
R12	Hedgerow creation and enhancement should use a range of native fruit, seed, nut and nectar-bearing species shrub species of local provenance.
R13	Hibernacula for reptiles and amphibians could be created within areas of retained habitat.
R14	The value of the site for birds could be enhanced by installing a range of artificial nest boxes onto new buildings and retained trees.
R15	The value of the site for bats could be enhanced by installing a range of artificial roost boxes onto new buildings and retained trees.

4.2 Wildflower Meadow Planting (R11)

- 4.2.1 New green spaces in the areas shown on the Ecological Design Plan at Appendix II are to be sown with a locally-sourced native wildflower and grass seed mix (i.e. wildflower meadow). This should be particularly targeted towards retained habitat features such as hedgerow boundaries, but should also be extended to public realm areas such as road verges, and if possible be included towards the margins of new areas of grassland within the site. A wildflower meadow treatment will provide a greater botanical diversity than currently present, and will benefit local populations of invertebrates. This will provide a habitat enhancement for reptiles, small mammals and invertebrates.
- 4.2.2 Using Emorsgate EM10 Tussock Mixture will provide areas of tussocky grassland with wildflowers that, once established, require little or no maintenance. This grassland type can form a good habitat for insects, small mammals, birds, amphibians and reptiles, providing nesting sites during spring, food during summer and autumn, and shelter during winter

(Emorsgate, 2019). The mix in Table 4.2 below will require mowing regularly throughout the first year of establishment to a height of 40-60mm, removing cuttings if dense. This will control annual weeds and help maintain balance between faster growing grasses and slower developing wild flowers.

Table 4.2: Emorsgate EM10 Tussock Mixture

Emorsgate EM10 wildflowers and grasses content and percentages		
%	Wildflowers: taxon	Common name
0.2	Achillea millefolium	Yarrow
1	Agrimonia eupatoria	Agrimony
1	Angelica sylvestris	Wild Angelica
1.5	Arctium minus	Lesser Burdock
2.5	Centaurea nigra	Common Knapweed
2	Centaurea scabiosa	Greater Knapweed
1	Chaerophyllum temulum	Rough Chervil
1.5	Daucus carota	Wild Carrot
1	Dipsacus fullonum	Wild Teasel
1	Galium album - (Galium mollugo)	Hedge Bedstraw
0.5	Geranium pratense	Meadow Crane's-bill
0.5	Knautia arvensis	Field Scabious
0.5	Leucanthemum vulgare	Oxeye Daisy
1	Plantago lanceolata	Ribwort Plantain
1.3	Prunella vulgaris	Selfheal
1.5	Silene dioica	Red Campion
0.5	Torilis japonica	Upright Hedge-parsley
1.5	Vicia sativa ssp. segetalis	Common Vetch
%	Grasses: taxon	Common name
2	Alopecurus pratensis	Meadow Foxtail (w)
20	Cynosurus cristatus	Crested Dogstail
16	Dactylis glomerata	Cocksfoot (w)
2	Deschampsia cespitosa	Tufted Hair-grass (w)
20	Festuca rubra	Strong-creeping Red-fescue
2	Holcus lanatus	Yorkshire Fog
10	Schedonorus arundinaceus - (Festuca arundinacea)	Tall Fescue (w)
8	Schedonorus pratensis - (Festuca pratensis)	Meadow Fescue (w)
kg/ha	Sowing rate: kg/acre	g/m2
40	16	4

4.3 Native Species Hedge Planting and Gap Filling (R12)

- 4.3.1 New species-rich hedgerows along western, northern and southern site boundaries in the areas shown on the Ecological Design Plan at Appendix II are to be planted using a range of native species of local provenance. Any gaps within the retained hedgerows will be filled within similar species. Fruit, seed, nut and nectar-bearing species will be used preferentially so that food sources are available throughout most of the year (e.g. hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, rowan *Sorbus aucuparia* and honeysuckle *Lonicera periclymenum*). If an evergreen hedge is required for landscape screening, suitable native species include holly *Ilex aquifolium*, holm oak *Quercus ilex* although both can be rather slow growing, ivy *Hedera helix* and privet *Ligustrum vulgare*. Beech *Fagus sylvatica* and hornbeam *Carpinus betulus* are also widely used as hedging plants and, although not evergreen, these will keep their brown leaves through winter if trimmed in late summer.

4.4 Eutrophic Standing Water

- 4.4.1 The creation of a pond is proposed along the western boundary of the site. This pond should contain a variety of depths, with shallow sloping sides providing access points for wildlife. It will be planted with native marginal vegetation such as amphibious bistort *Persicaria amphibian*, marsh marigold *Caltha palustris*, reed canary grass *Phalaris arundinacea*, brooklime *Veronica beccabunga*, wild angelica *Angelica sylvestris*, purple loosestrife *Lythrum salicaria*, greater bird's-foot trefoil *Lotus uliginosus*, and gypsywort *Lycopus europaeus*. Aquatic vegetation could include native species such as water crowfoot *Ranunculus aquatilis*, water mint *Mentha aquatic* and water forget-me-not *Myosotis scorpioides*, all of which can be used by newts for egg laying. Chestnut pallet fencing will be installed surrounding the pond on site post construction to protect it from post-development interference.

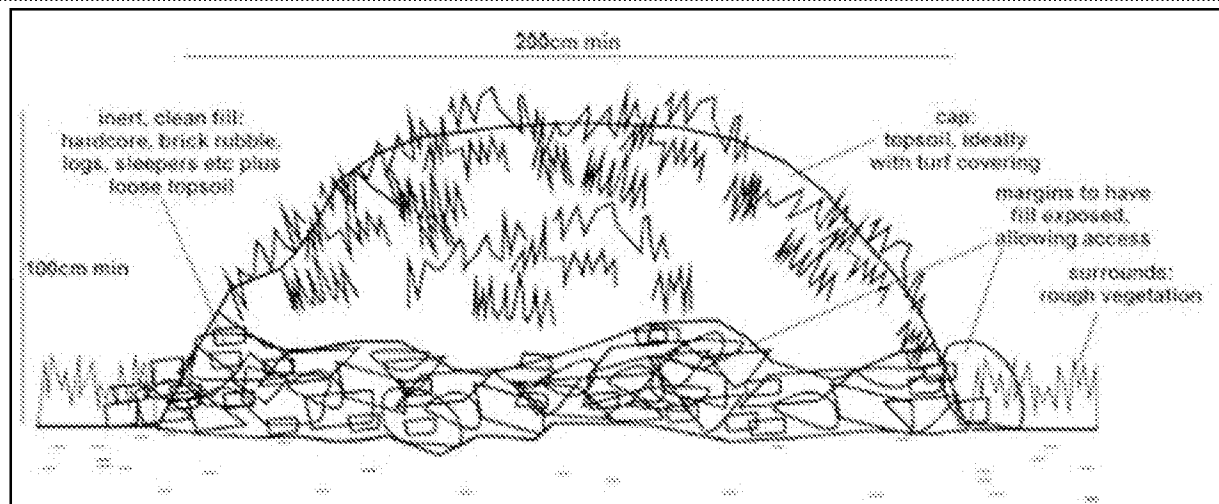
4.5 Hibernacula / Deadwood Habitats (R13)

- 4.5.1 Four hibernacula will be created within areas of retained habitat at the edges of the site close to boundary hedgerows, as shown on the Ecological Design Plan at Appendix II. These will be created according to the specification below to provide additional hibernation, shelter and egg-laying resources for reptiles and a range of other wildlife. Material from any felled trees or other cleared habitat can be used to reduce outsourced materials. Grass snake *Natrix natrix* breeding habitats can also be created by collecting grass clippings and other prunings arising from landscape management of the site, and composting them in a secluded corner of the site.

Box 1: Specification for creation of hibernacula / deadwood habitats

Hibernacula will be constructed from unevenly shaped, inert fill materials such as hardcore, brick rubble, rocks, logs, brash, etc, loosely filled with topsoil, and capped with topsoil and turf; these structures provide stable temperatures at which reptiles can hibernate. They will be located on a gentle slope to prevent flooding. They will either be piled on top of the ground (as depicted in the figure below) or dug into the ground, but in both cases will have exposed margins to allow access. They will be surrounded by rough, infrequently managed vegetation, and placed in out-of-the-way locations. They will measure at least 4m long by 2m wide by 1m tall, but ideally larger.

Box 1: Specification for creation of hibernacula / deadwood habitats



4.6 Roosting Bats (R15)

New roosting features within buildings

- 4.6.1 Bat boxes will be installed mainly within the buildings adjacent to the western boundary of the site, with a few along the southern boundary and one in the north of the site, as shown on the Ecological Design Plan at Appendix II.
- 4.6.2 The western aspect of plot 32, the southern aspects of plots 34, 50 and 1 and the northern aspects of plots 25 and 30 are suitable for installation of new roost features, as these locations provide access to the hedgerow corridors at the site boundaries which links the site to further hedgerows offsite. It is recommended that the following roosting habitat features are installed under the supervision of a qualified ecologist at heights of 3-6m:
- ✧ 4no Ibstock Enclosed Bat Box (or other manufacturer's equivalent), one per building: provides a self-contained bat box with a range of roosting zones, integrated within the exterior wall.
 - ✧ 2no Schwegler 1FR or 2FR Bat Tube (or other manufacturer's equivalent), to be installed on the external walls of buildings, either flush or beneath a rendered surface.

New roosting features within trees

- 4.6.3 One bat box will be installed on a retained tree along the western boundary, with a second on a retained tree in the north-eastern corner of the site, as shown on the Ecological Design Plan at Appendix II. It is recommended that the following roosting habitat features are installed under the supervision of a qualified ecologist at heights of 3-6m:
- ✧ 1no Schwegler 2F General Purpose Bat Box or the 2FN Woodland Bat Box (or other manufacturer's equivalent)
 - ✧ 1no Schwegler 1FF Flat Bat Box (or other manufacturer's equivalent).

- 4.6.4 General considerations for installation of bat roosts are listed in Box 2 below, while bat box specifications are listed at Appendix III. Further details on the specification of these and alternative systems can be found in Gunnell *et al.*, 2013.

Box 2: Considerations & key requirements for crevice-dwelling bats (after Gunnell <i>et al.</i>, 2013)	
Species	Barbastelle, serotine, Bechstein's, Brandt's, Daubenton's, whiskered, noctule, Leisler's, pipistrelles (common, soprano & Nathusius')
Consideration	Solution
Where in a development	Anywhere that the access is not illuminated by artificial lighting They should be installed facing vegetation features such as mature hedgerows or trees, but with a clear line of flight for bats entering or leaving the roost.
Where in a building	Summer maternity roosts in most southerly or westerly aspect for solar heating, or in a location that provides thermal stability Male roosts and winter hibernation roosts on northerly aspect
Height	2m–7m, preferably >4m above ground level
Dimensions	Any size as long as some components of the area are crevices of c.20–30mm wide Total area of >c.1m ² would be useful for summer maternity roosting Male roosts contain a smaller number of individual bats
Access dimensions	20mm–50mm (w) x 15mm–20mm (h)
Other considerations	Rough interior surface (for grip) Non-toxic and non-corrosive materials Absence of breathable roofing membranes to avoid the risk of entanglement Suitable thermal properties (reducing 24hr fluctuations), providing stability but allowing maximum thermal gain for summer roosts The use of thermal insulation materials for maternity roosts should be carefully considered in relation to other desired properties e.g. energy efficiency

4.7 Nesting Birds (R14)

Buildings

- 4.7.1 The following nesting habitat features will be installed under the eaves on the northern or eastern aspects on plots 25, 11, 21 (two boxes each) as shown on the Ecological Design Plan at Appendix II:
- ✦ 2no Schwegler 17 or 17A swift boxes (or other manufacturer's equivalent)
 - ✦ 2no Schwegler 1SP sparrow terraces (or other manufacturer's equivalent)
 - ✦ 2no Schwegler 9A house martin nest (or other manufacturer's equivalent)
- 4.7.2 Nest boxes will be installed at heights of 2–4m under the supervision of a suitably qualified ecologist. General considerations for installation of swift boxes are listed in Box 3 below, while

nest box specifications are listed at Appendix III. Purpose made boxes with a brick facing are available and would be suitable for the buildings.

Trees

4.7.3 In addition the following nest boxes will be mounted onto retained trees in the locations shown on the Ecological Design Plan at Appendix II. These features will provide conditions suitable for a range of bird species including tit species, spotted flycatcher *Muscicapa striata*, song thrush *Turdus philomelos*, treecreeper *Certhia familiaris*:

- ✧ 1no Schwegler 1B nest box, with 32mm hole (or other manufacturer's equivalent)
- ✧ 1no Traditional open-fronted nest box

Box 3: Considerations & key requirements for swifts (after Gunnell et al., 2013)	
Consideration	Solution
Where in a development	Anywhere high, shaded and away from disturbance and obstructions to their flight paths
Where in a building	Out of direct sunlight, such as deep under eaves or an aspect of the building that does not receive much direct sunlight Not adjacent to climbing plants that may give predators (e.g. rats) access to the nest Where the swifts will have clear airspace into which they can fly from their nests Preferably integral to the building, but where this is not possible, external under the eaves, under roof edges or gables It is important to have several potential nest sites for swifts in one area
Height	At least 5m above ground level
Dimensions	400mm (w) x 200mm (d) x 175mm (h) ideally, but can be smaller
Access dimensions	65mm (w) x 33mm (h) oval or rectangle. The bottom of the hole should be no more than 50mm from base of box
Other considerations	Swifts are colonial nesters so, where room allows, it is preferable to have more than one swift nest incorporated into a building. As a guide: 1 to 4 nest provisions on a single house 4 to 10 on a small block of flats 10 to 20 on a larger building e.g. offices or industrial site These figures may vary, taking account of site-specific constraints and criteria In establishing a new colony, playing recorded swift calls is advised to bring birds in to find the nest places

5 Implementation Timetable

5.1 Implementation of Site Enhancement Works

5.1.1 Table 5.1 sets out measures and timings to avoid, mitigate and/or compensate for predicted impacts, together with enhancement measures. Each measure is further explained in sections 3 and 4.

Table 5.1: Timetable for protection and enhancement of biodiversity

Feature	Potential impact	Avoidance, mitigation, compensation	Enhancement	Timing	Implemented by
Wildflower meadow	n/a	n/a	New green spaces are to be sown with a locally-sourced native wildflower and grass seed mix (i.e. wildflower meadow). This should be particularly targeted towards retained habitat features such as hedgerow boundaries, but should also be extended to public realm areas such as road verges, and if possible be included towards the margins of new areas of grassland within the site.	Between September 2020 and April 2021	Dandara
Hedgerows	Affecting tree root systems of hedgerow	Retain as many hedgerows as possible and compensate for any lost hedgerows	Plant species rich hedgerow along western, northern and southern site boundaries. Fill in any gaps within retained hedgerows. Native shrub species of local provenance will be required.	Between October 2020 and March 2021	Dandara
Eutrophic standing water	n/a	n/a	The creation of a pond is proposed along the western boundary of the site. This pond should contain a variety of depths, with shallow sloping sides providing access points for wildlife. It will be planted with native marginal vegetation. Chestnut	Any time	Dandara

Feature	Potential impact	Avoidance, mitigation, compensation	Enhancement	Timing	Implemented by
			pallet fencing will be installed surrounding the pond on site post construction to protect it from post-development interference.		
Hibernacula /deadwood	n/a	n/a	Creation of four hibernacula/ compost heaps within areas of retained habitat, and at the edges of the site close to boundary hedgerows.	Any time	Dandara
Bats	No bat roosts affected under current proposals for the site	n/a	One bat box on each building, plots 1, 25, 30, 32, 34 and 50 (Ibstock Enclosed Bat Box, Schwegler 1FT/2FR, or similar). Two bat boxes on the retained trees along the western boundary and the north-eastern corner of the site (1no Schwegler 2F/2FN, 1no Schwegler 1FF, or similar).	Bat boxes to be installed when structures are being built or fitted-out.	Dandara
	Disturbance to the boundary lines used by commuting and foraging bats and may be impacted by new lighting.	The boundary lines will be protected to avoid habitat loss. Artificial light to be minimised via low-level, directional lighting with minimal spill and glare and associated measures.	As above for roosting bats.	Prior to construction, during and post works.	Dandara
Nesting birds	Disturbance of nesting birds during site clearance	Removal of vegetation/buildings and to be undertaken outside of nesting bird season. Any construction works undertaken within the bird breeding season will require a site check for nesting birds.	6no bird nest boxes onto three new buildings 11, 21 and 25 (Schwegler 17/17A swift boxes, Schwegler 1SP sparrow terraces, Schwegler 9A house martin nest, or similar) 2no nest boxes on retained trees (Schwegler 1B or similar).	Site clearance to be undertaken September to February (outside of nesting bird season). Installation of nest boxes during development.	Dandara

Feature	Potential impact	Avoidance, mitigation, compensation	Enhancement	Timing	Implemented by
Mammals (excluding bats)	Harm to mammals	The mitigation for lighting for bats will also mitigate for any potential disturbance to other nocturnal mammals within the site. All excavations left overnight will either be covered over, or provided with a ramp to enable easy escape and inspected each morning prior to recommencement. Open pipework greater than 150mm outside diameter will be blanked off at the end of each working day. Where rabbit warrens are to be damaged or destroyed, this will be done in accordance with the Mammals Act 1996 by a registered pest control company.	Creation of hibernacula (as above). To enable dispersal of hedgehogs and other small mammals across the site and within the local area following development, small access gaps to measure c.13x13cm are recommended to be provisioned at the base of all new fence boundaries.	During and after development	Dandara
Reptiles	Harm to reptiles during site clearance	Follow reasonable avoidance measures including: removal of refuges, sequential strimming under ECoW supervision, keeping grassland cut short, protection of retained vegetation with fences, toolbox talks.	Creation of hibernacula (as above). Creation of tussocky wildflower meadow (as above).	Mar/Apr 2020 to Sep/Oct 2020	Dandara

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6 Maintenance and Monitoring

6.1 Initial Aftercare and Long-term Maintenance

Wildflower meadow

6.1.1 The following maintenance should be undertaken annually by the management company:

- ❖ In the first growing season, cut the growth to a height of 500mm-750mm after six to eight weeks of growth and repeat every two months during the summer. Leave the arisings laying on the ground for up to a week for the seeds to drop, and then clear it all away for compost.
- ❖ In subsequent seasons, restrict mowing from early April to August/ early September. Vary the time of cut each year or some plants may begin to dominate others.
- ❖ Cut the meadow in dry weather – it may be too high for a mower, so grass shears, a scythe or strimmer may be required.
- ❖ Mow meadow a couple more times during the autumn and once in early spring if it needs it.
- ❖ 'Spot' weeding may be required to remove colonisers like nettles, dock and thistles.

Hedgerows

6.1.2 The following maintenance should be undertaken annually:

- ❖ Once the hedge is established it should be cut in winter, ideally in early February. Hedge maintenance should not be done between March and July as birds are nesting. As fruit is usually borne on last year's growth it is better to cut hedges every other year. Alternatively, cut one side one year and the other side the next. If possible, allow some trees to develop as standards at about five to 10 metre intervals.
- ❖ If the hedge network is extensive, a flail may be the most efficient way to cut.
- ❖ If possible leave a wide undisturbed margin adjacent to the hedge, ideally at least 2m wide. Previously cultivated margins can be left to regenerate naturally or can be sown with a mixture of native grass and wild flower seeds. Pollen and nectar encourage insects, and the plants conceal the base of the hedge which can then provide a home and a run for small mammals. The margins can either have an annual cut in August, after the flowers have seeded, or be cut bi-annually in rotation. This ensures some over-wintering vegetation is always provided. The arisings should be removed.

Eutrophic standing water

6.1.3 The following maintenance should be undertaken:

- ❖ The pond should be dredged every 10-15 years. Pond management work is designed to improve the pond and therefore there is little risk of damage or destruction occurring, as the site will be enhanced. Large machinery can damage habitat and hibernacula if not carefully planned and the silt removed from pond must not be deposited on sensitive habitats. Before pond management work commences, a survey of the immediate area is a sensible precaution.
- ❖ Natural England envisages that carefully planned standard pond management works would be highly unlikely to result in offences, and therefore we would not normally expect licence applications.

Bird and Bat Boxes

6.1.4 The following monitoring/maintenance should be undertaken annually:

- ❖ Visit the site in January to check the bird boxes before nest building begins; clean out debris and repair as necessary;
- ❖ Visit the site in September/October to check the bat boxes after breeding but before hibernation; clean out debris and repair as necessary;
- ❖ Bat box checks should be undertaken by a suitably qualified and licensed ecologist.

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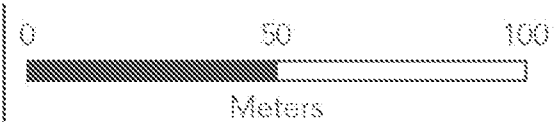
Appendix I: Phase 1 Habitats Map

Please see following page.



Land at North End Road, Yapton, West Sussex

	Survey area		Dense scrub
	Target note		Improved grassland
	Hedgerow, species-poor		Tall ruderal
	Hard-standing		Building



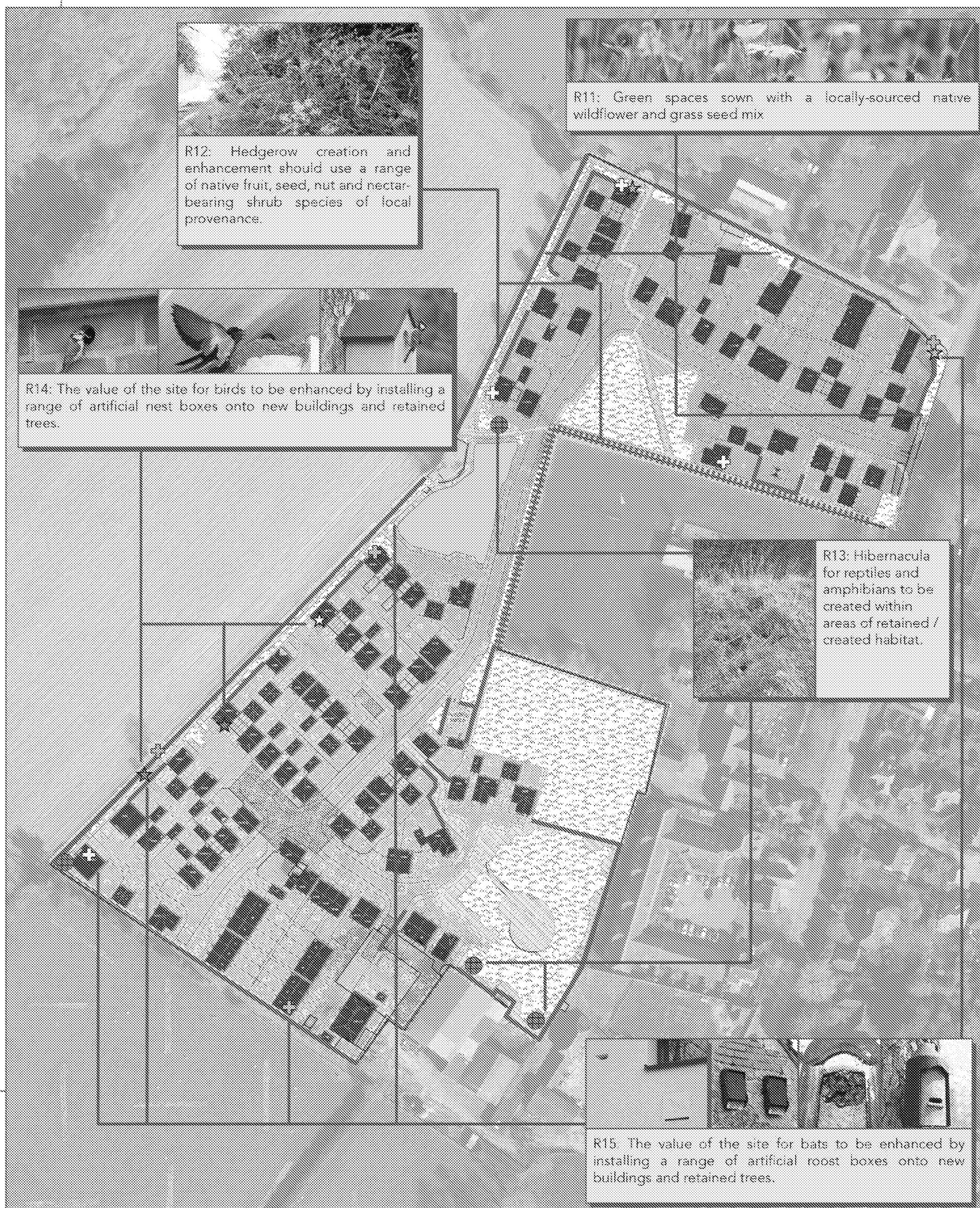
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URBAN EDGE Tel: 01273 686 766
ENVIRONMENTAL Email: hello@ueec.co.uk
CONSULTING Web: www.ueec.co.uk

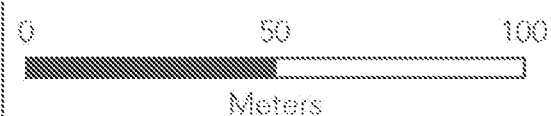
Appendix II: Ecological Design Plan

Please see following page.



Land at North End Road, Yapton

	Survey area		Schwegler 1FR / 2FR bat tube
	Pond planted with native meadow mixture for wetlands		Schwegler 2F or 2FN or 1FF flat bat box
	Native wildflower meadow planting		2 Schwegler 17 or 17A swift boxes
	Gap filling with native species		2 Schwegler 15p sparrow terraces
	Hedge planting with native species		2 Schwegler 9A House martin nests
	Hibernacula		Schwegler 1B bird box
	Bstock Enclosed Bat Box		Traditional open fronted nest box



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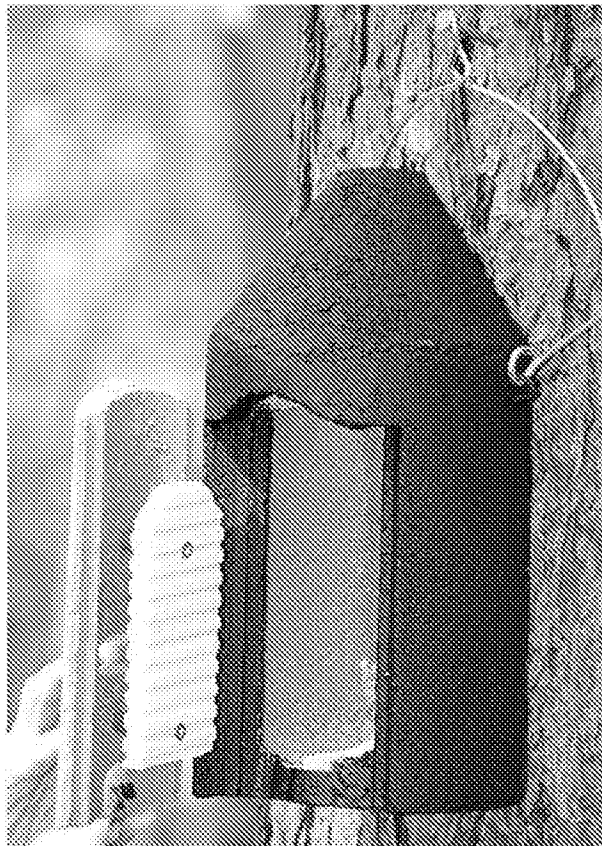
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URBAN EDGE ENVIRONMENTAL CONSULTING
Tel: 01273 686 766
Email: hello@ueec.co.uk
Web: www.ueec.co.uk

Appendix III: Bat & Bird Box Specifications



Schwegler 2F DFP General Purpose Bat Box:

Apex roof to mimic tree cavity, suitable for noctule, brown long-eared, Bechstein's and Daubenton's. Internal double front panel creates a crevice suitable for pipistrelles

Siting and Positioning:

On a tree-trunk or on buildings

Cleaning and Inspection:

Easy cleaning and inspection due to removable front panel. If occupied by bats, inspection and cleaning must be carried out by a licensed professional

Entrance hole:

Slotted hole

Occupants:

Bats

Material:

Air-permeable and long lasting SCHWEGLER wood-concrete



Schwegler 1FF Flat Bat Box:

Open at bottom so cleaning not required. Varied internal roost surfaces. Suitable for crevice roosters such as pipistrelles, and large enough for use as maternity roost

Siting & positioning:

On the tree-trunk or on buildings

Cleaning and inspection:

Open at bottom, cleaning not required. Easy to inspect due to removable front panel. If occupied by bats, inspection and cleaning must be carried out by a licensed professional

Entrance hole:

Width 12-24 mm x Length 21cm

Occupants:

Bats

Material:

Air-permeable and long lasting SCHWEGLER wood-concrete

Kit includes:

Roost box with removable front panel
Galvanized steel hanger - forestry approved
Aluminium Nail - forestry approved

Colour:

Black

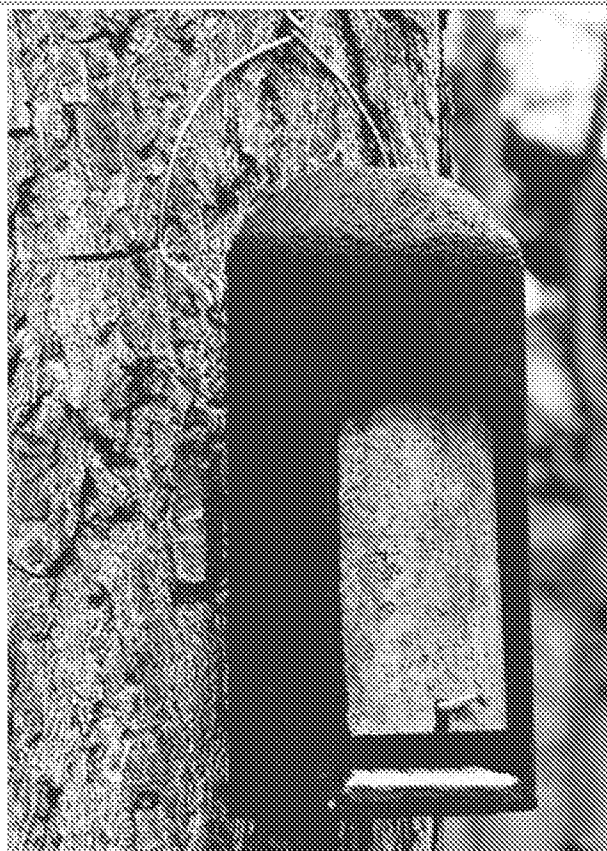
Dimensions:

Height: 350mm

Dia.: 165mm

Weight:

4kg approx.

**Kit includes:**

Roost box with swing-away front panel
Galvanized steel hanger - forestry approved
Aluminium Nail - forestry approved

Colour:

Black

Dimensions:

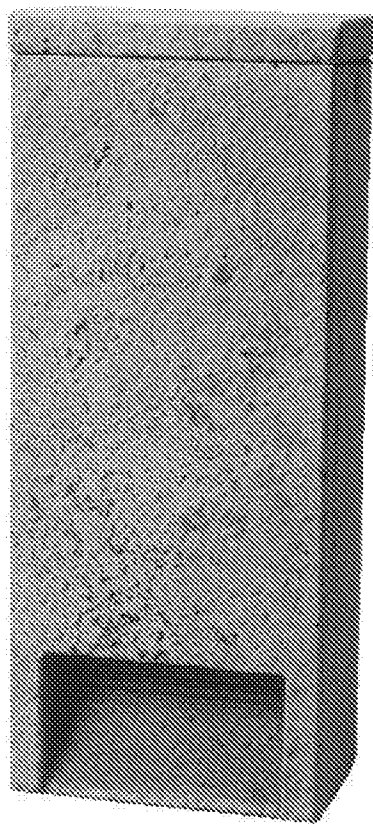
Depth: 140mm

Width: 270mm

Height: 430mm

Weight:

10kg approx.

**Schwegler 2FN Woodland Bat Box:**

Two entrances, one at the rear against the tree trunk and one at the front. A domed roof to form clusters and an increased internal height.

Suitable for brown long-eared and woodland species e.g. noctule

Siting and Positioning:

On a tree-trunk or on buildings

Cleaning and Inspection:

Easy cleaning and inspection due to removable front panel. If occupied by bats, inspection and cleaning must be carried out by a licensed professional

Schwegler 1FR/2FR Bat Tube:

Suitable for building into or mounting onto external walls. Open at bottom so cleaning not required. Can be used individually (1FR) or by connecting two or more 2FR. Suitable for bats that use buildings e.g. pipistrelles or serotine

Siting & positioning:

Can be installed on external walls – either flush or beneath a rendered surface in concrete and, during renovation work, under wooden panelling or in building cavities (e.g., slab-type building structures, bridges, etc). If required, it can be painted using standard air-permeable exterior

Entrance hole:

Slotted hole

Occupants:

Bats

Material:

Air-permeable and long lasting SCHWEGLER wood-concrete

Kit includes:

Roost box with removable front panel
Galvanized steel hanger - forestry approved
Aluminium Nail - forestry approved

Colour:

Black

Dimensions:

Height: 360mm

Dia.: 160mm

Weight:

4.9kg approx.

paint. Birds will not occupy this box.

Cleaning:

Maintenance-free

Entrance hole:

Height: 20mm

Width: 150mm

Occupants:

Bats

Material:

SCHWEGLER wood-concrete

Kit includes:

1 x Bat Tube

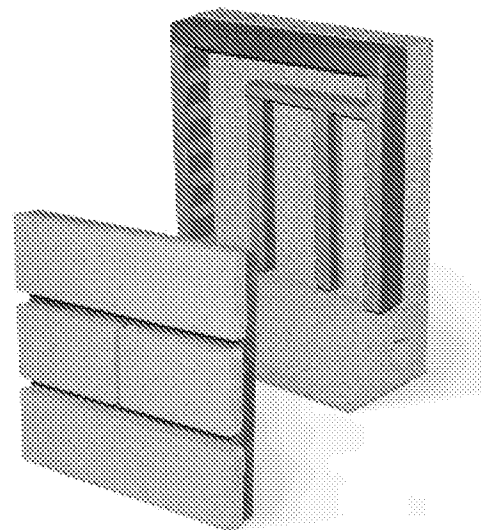
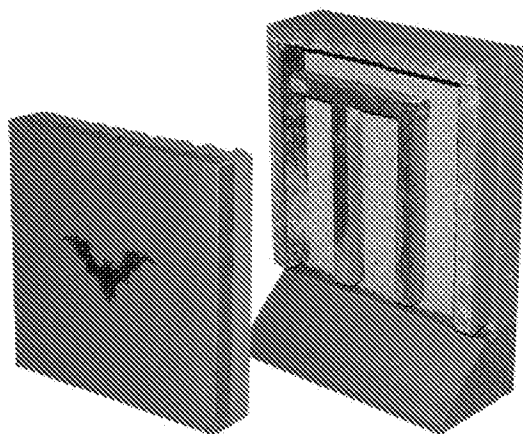
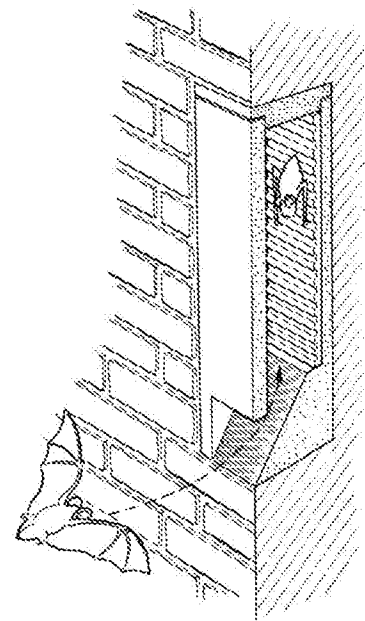
Colour:

Grey material, paintable with standard air-permeable wall-paint

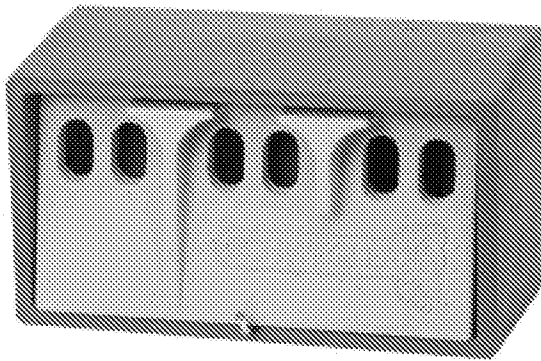
Dimensions:

Height: 475mm; Width: 200mm; Depth: 125mm

Weight: 10kg approx.

**Ibstock Enclosed Bat Box (Type B or C):**

- Designed specifically for pipistrelle bats
- Available in all brick types
- Discrete home for bats
- Various sizes
- Several roosting zones are created inside the box
- Bats are contained within the bat box itself
- Maintenance free with entrance at the base
- Suitable for new build & conservation work
- Bat Box Type B: 215 x 215 or 215 x 290 / Bat Box Type C: 215 x 215 or 215 x 290



Schwegler 1SP Sparrow Terrace:

Sparrows are social birds and like to nest in company. This terrace provides three brood chambers, each with two entrances, and a removable front panel for cleaning & inspection

Siting and Positioning:

On all types of houses in built-up areas, and on industrial and agricultural buildings such as barns, sheds and factories

Installation height:

2 metres or more above ground level

Cleaning and Inspection:

Easy cleaning and inspection due to removable front panel. Maintain outside of breeding season to avoid disturbance to active nests

Occupants:

House and Tree Sparrows, and in some instances other birds which use nest boxes such as Tits, Redstarts and Spotted Flycatchers

Material:

Air-permeable and long lasting SCHWEGLER wood-concrete

Kit includes:

Nest box, screws, wall plugs

Colour:

Brown or Stone

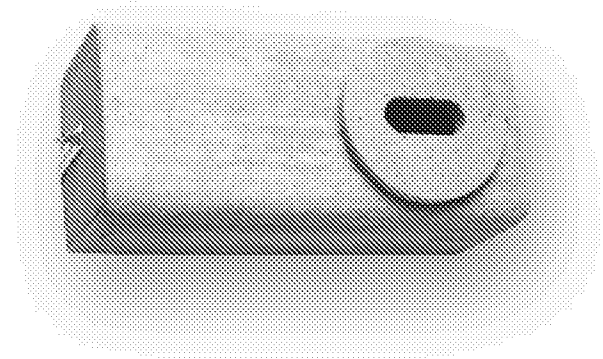
Dimensions:

Internal: W 10.5 x H 16 x D 15 cm (each chamber)

External: W 43 x H 24.5 x D 20 cm

Weight:

15kg approx.



Schwegler 17 swift Box:

Swifts nest in colonies so it is preferable to install several nest boxes together.

Siting and Positioning:

Preferably under the shelter of eaves or overhanging roofs. Ensure unobstructed access for birds entering and leaving the box.

Installation height:

At least 6 to 7 m above ground level

Cleaning and Inspection:

The box can be easily opened by rotating the circular plate containing the entrance hole by 90° and removing it. Cleaning is easy and convenient with this box but is not essential.

Occupants:

Swifts

Material:

Plant fibre and wood-concrete (100% asbestos-free).

Kit includes:

Nest box, flexible fixing bracket and screws/plugs.

Colour:

Grey

Entrance hole:

32 x 70mm

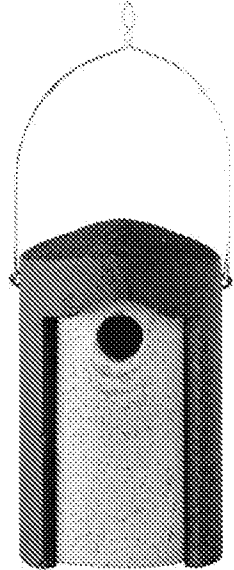
Dimensions:

Internal: H 14 x D 14 x L 30 cm

External: H 15 x D 15 x L 34 cm

Weight:

3.1kg approx.

	
Schwegler 9A House martin Box: It is best to put a few of these nests in the same place as they are very sociable birds and they will use more easily nests that are together. Siting and Positioning: Preferably under the shelter of eaves or overhanging roofs. Ensure unobstructed access for birds entering and leaving the box. Installation height: At least 2 to 6 m above ground level Cleaning and Inspection: Easy cleaning and inspection as part of the nesting area can be removed Occupants: House martin Material: Air-permeable and long lasting SCHWEGLER wood-concrete, backing board made of exterior grade, formaldehyde-free chipboard Kit includes: Nest box and backing board Colour: Grey and brown, can be painted Dimensions: External: H 11 x D 14x L 46 cm Weight: 2.7kg approx.	Schwegler 1B nest Box (32mm hole): The 1B nest box will attract a wide range of species Siting and Positioning: The box needs to be sheltered from the wind, rain and strong sunlight, so aim for an aspect of northerly, easterly or south-easterly Installation height: At least 2m above ground level Cleaning and Inspection: The front panel is removable for inspection and cleaning. Occupants: Great, Blue, Marsh, Coal and Crested Tit, Redstart, Nuthatch, Collared and Pied Flycatcher, Wryneck, Tree and House Sparrow and bats. Material: Schwegler Woodcrete Kit includes: Nest box and backing board Colour: Grey and brown, can be painted Dimensions: External: H 23 x D 16 Weight: 3.6kg approx.

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Appendix IV: Legislation and Planning Context

Legislation

General

The main legislative instruments for ecological protection in England and Wales are the Wildlife and Countryside Act 1981 (WCA; as amended), Countryside and Rights of Way Act 2000 (CROW; as amended), Natural Environment and Rural Communities Act 2006 (NERC) and the Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations; as amended).

WCA 1981 consolidated and amended pre-existing national wildlife legislation in order to implement the Bern Convention and the Birds Directive. It complements the Habitats Regulations, offering protection to a wider range of species than the latter. The Act also provided for the designation and protection of nationally important conservation sites of value for their floral, faunal or geological features, termed Sites of Special Scientific Interest (SSSI). Schedules of the act list protected species of flora and fauna, as well as invasive species, and detail the possible offences that apply to these species.

The CROW Act 2000 amended and strengthened existing wildlife legislation detailed in the WCA. It placed a duty on government departments and the National Assembly for Wales to have regard for biodiversity, provided increased powers for the protection and maintenance of SSSI, and created a right of access to parts of the countryside. The Act contained lists of habitats and species (Section 74) for which conservation measures should be promoted, in accordance with the recommendations of the Convention on Biological Diversity (Rio Earth Summit) 1992.

The NERC Act 2006 consolidated and replaced aspects of earlier legislation. Section 40 of the Act places a duty upon all local authorities and public bodies in England and Wales to promote and enhance biodiversity in all of their functions. Sections 41 (England) and 42 (Wales) list habitats and species of principal importance to the conservation of biodiversity (otherwise known as priority habitats/species as listed in the now superseded UK Biodiversity Action Plan). These lists supersede Section 74 of the CROW Act 2000. These species and habitats are a material consideration in the planning process.

The Habitats Regulations 2017 consolidate and update the Conservation of Habitats and Species Regulations 2010 and all its various amendments. The Regulations are the principal means by which Council Directive 92/43/EEC (The Habitats Directive) is transposed into English and Welsh law, and place a duty upon the relevant authority of government to identify sites which are of importance to the habitats and species listed in Annexes I and II of the Habitats Directive. Those sites which meet the criteria are, in conjunction with the European Commission, designated as Sites of Community Importance, which are subsequently identified as Special Areas of Conservation (SAC) by the European Union member states.

The Habitats Regulations also place a duty upon the government to maintain a register of European protected sites designated as a result of Council Directive 2009/147/EC on the Conservation of Wild Birds (The Birds Directive). These sites are termed Special Protection Areas (SPA) and, in conjunction with SACs, form a network of sites known as Natura 2000. The Habitats Directive introduces for the first time for protected areas, the precautionary principle; that is that projects can only be permitted having ascertained no adverse effect on the integrity of the site. Projects may still be permitted if there are no alternatives, and there are imperative reasons of overriding public interest.

The Habitats Regulations also provide for the protection of individual species of fauna and flora of European conservation concern listed in Schedules 2 and 5 respectively (European Protected Species (EPS)). Schedule 2



includes species such as otter and great crested newt for which the UK population represents a significant proportion of the total European population. It is an offence to deliberately kill, injure, disturb or trade in these species. Schedule 5 plant species are protected from unlawful destruction, uprooting or trade under the regulations. Under the Habitats Regulations disturbance includes any activity which is likely to: impair the ability of a EPS to survive, breed, reproduce, or rear/nurture its young; impair the ability of a EPS to migrate or hibernate; or significantly affect the local distribution or abundance of the species.

Badgers (*Meles meles*)

Badgers are listed under Schedule 6 of the Wildlife and Countryside Act which grants them partial protection. This protection is extended by the Protection of Badgers Act 1992 (Badger Act) which makes it an offence to take, injure or kill a badger, interfere with a sett, sell or possess a live badger, or mark or ring a badger without a licence. Under the Act disturbance is illegal without a licence. Natural England has published guidelines to be adopted when determining whether an activity is 'disturbing' i.e. a licence is required when, for example, using heavy machinery (generally tracked vehicles) within 30m of any entrance to an active sett. Licences are not normally issued during the badger breeding season (December – June inclusive).

Bats (*Chiroptera*)

Bats and their roosts are fully protected by protected by the WCA and the Habitats Regulations. The legislation makes it an offence, *inter alia*, to:

- ✧ Intentionally kill, injure or take a bat.
- ✧ Possess or control a live or dead bat, any part of a bat, or anything derived from a bat.
- ✧ Intentionally or recklessly damage, destroy or obstruct access to any structure or place that a bat uses for shelter or protection. This is taken to mean all bat roosts whether bats are present or not.
- ✧ Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection.
- ✧ Make a false statement in order to obtain a licence for bat work.

Birds

Birds are protected by the Wildlife and Countryside Act, 1981 (as amended). This legislation makes it an offence to intentionally kill, injure or take away any wild bird. It is also an offence to take, damage or destroy the nest of any wild bird while it is in use or being built or to take or destroy the egg of any wild bird. In addition, certain species are listed on Schedule 1 of the WCA (such as kingfisher *Alcedo atthis*). This makes it an additional offence to intentionally or recklessly disturb the adults while they are in and around their nest or intentionally or recklessly disturb their dependent young. Such species are considered to be in greater need of legal protection or of high nature conservation priority.

Birds of Conservation Concern ("BoCC4) are included on Red and Amber lists (Eaton *et al.*, 2015). Birds on the Red list are those of highest conservation priority due significant and sustained population decreases and/or range contractions (e.g. house sparrow *Passer domesticus* and starling *Sturnus vulgaris*). Birds on the Amber list are the next most critical group and include species whose population/range have shown moderate declines, or which have recovered to some extent from historical decline, such as dunnoek *Prunella modularis*.

Dormouse (*Muscardinus avellanarius*)

Dormouse is fully protected by the WCA and the Habitats Regulations. The legislation makes it an offence, *inter alia*:

- ✧ Intentionally kill, injure or take a dormouse.
- ✧ Possess or control a live or dead dormouse, any part of, or anything derived from a dormouse.
- ✧ Intentionally or recklessly damage, destroy or obstruct access to any structure or place that a dormouse uses for shelter or protection.

- ✦ Intentionally or recklessly disturb a dormouse while it is occupying a structure or place that it uses for shelter or protection.

Great crested newt (*Triturus cristatus*; GCN) (and natterjack toad *Bufo calamita*)

GCN is fully protected by the WCA and the Habitats Regulations. The legislation makes it an offence, *inter alia*, to:

- ✦ Intentionally kill, injure or take a GCN (including its eggs).
- ✦ Possess or control a live or dead GCN, any part of, or anything derived from a GCN.
- ✦ Intentionally or recklessly damage, destroy or obstruct access to any structure or place that a GCN uses for shelter or protection.
- ✦ Intentionally or recklessly disturb a GCN while it is occupying a structure or place that it uses for shelter or protection.

Otter (*Lutra lutra*)

Otter is fully protected by the WCA and the Habitats Regulations. The legislation makes it an offence, *inter alia*, to:

- ✦ Intentionally kill, injure or take an otter.
- ✦ Possess or control a live or dead otter, any part of, or anything derived from an otter.
- ✦ Intentionally or recklessly damage, destroy or obstruct access to any structure or place that an otter uses for shelter or protection.
- ✦ Intentionally or recklessly disturb an otter while it is occupying a structure or place that it uses for shelter or protection.

Reptiles

The four common species (slow-worm *Anguis fragilis*, common lizard *Zootoca vivipara*, adder *Vipera berus* and grass snake *Natrix natrix*) are partially protected under the WCA. They are protected, *inter alia*, against intentional killing and injuring. The handling and translocation of these reptiles does not require a licence.

Smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis* are fully protected by the WCA and the Habitats Regulations. The legislation makes it an offence, *inter alia*, to:

- ✦ Intentionally kill, injure or take a smooth snake or sand lizard.
- ✦ Possess or control a live or dead smooth snake or sand lizard, any part of, or anything derived from a smooth snake or sand lizard.
- ✦ Intentionally or recklessly damage, destroy or obstruct access to any structure or place that a smooth snake or sand lizard uses for shelter or protection.
- ✦ Intentionally or recklessly disturb a smooth snake or sand lizard while it is occupying a structure or place that it uses for shelter or protection.

Water vole (*Arvicola amphibious*)

Water vole is fully protected by the WCA. The legislation makes it an offence, *inter alia*, to:

- ✦ Intentionally kill, injure or take a water vole.
- ✦ Possess or control a live or dead water vole, any part of, or anything derived from a water vole.
- ✦ Intentionally or recklessly damage, destroy or obstruct access to any structure or place that a water vole uses for shelter or protection.
- ✦ Intentionally or recklessly disturb a water vole while it is occupying a structure or place that it uses for shelter or protection.

Weeds Act 1959 / Ragwort Control Act 2003

This legislation provides for orders to be made for control where notifiable weed species such as ragwort are said to be a problem. The act does not make it illegal to have ragwort (or other weed species) on your land, make it illegal

to allow ragwort to spread, or force landowners automatically to control it. However, if DEFRA is satisfied that there are injurious weeds to which this Act applies growing upon any land it may serve upon the occupier of the land a notice in writing requiring them, within the time specified in the notice, to take such action as may be necessary to prevent the weeds from spreading.

Planning context

National Planning Policy Framework (Section 15: Conserving and enhancing the natural environment)

The National Planning Policy Framework (NPPF), published in February 2019, outlines the Government's commitment to the conservation of wildlife and natural features. It is concerned with:

- ❖ *Protecting and enhancing valued landscapes, sites of biodiversity or geological conservation value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- ❖ *Recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
- ❖ *Maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- ❖ *Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current & future pressures;*
- ❖ *Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
- ❖ *Remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*

The NPPF requires that local plans should “distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value...; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries”.

To protect and enhance biodiversity and geodiversity, the NPPF states that planning policies should:

- ❖ *Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and*
- ❖ *Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.*

When determining planning applications, local planning authorities should aim to protect and enhance biodiversity by applying the following principles:

- ❖ *if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*

- ❖ *development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*
- ❖ *development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and*
- ❖ *development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.*

The following wildlife sites should be given the same protection as habitats sites:

- ❖ *potential Special Protection Areas and possible Special Areas of Conservation;*
- ❖ *listed or proposed Ramsar sites; and*
- ❖ *sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.*

The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site. The policies within the NPPF (and additional guidance contained within Circular 06/2005) are a material planning consideration.

UK/Local Biodiversity Action Plan Designations and Birds of Conservation Concern and Red Data Book Listings

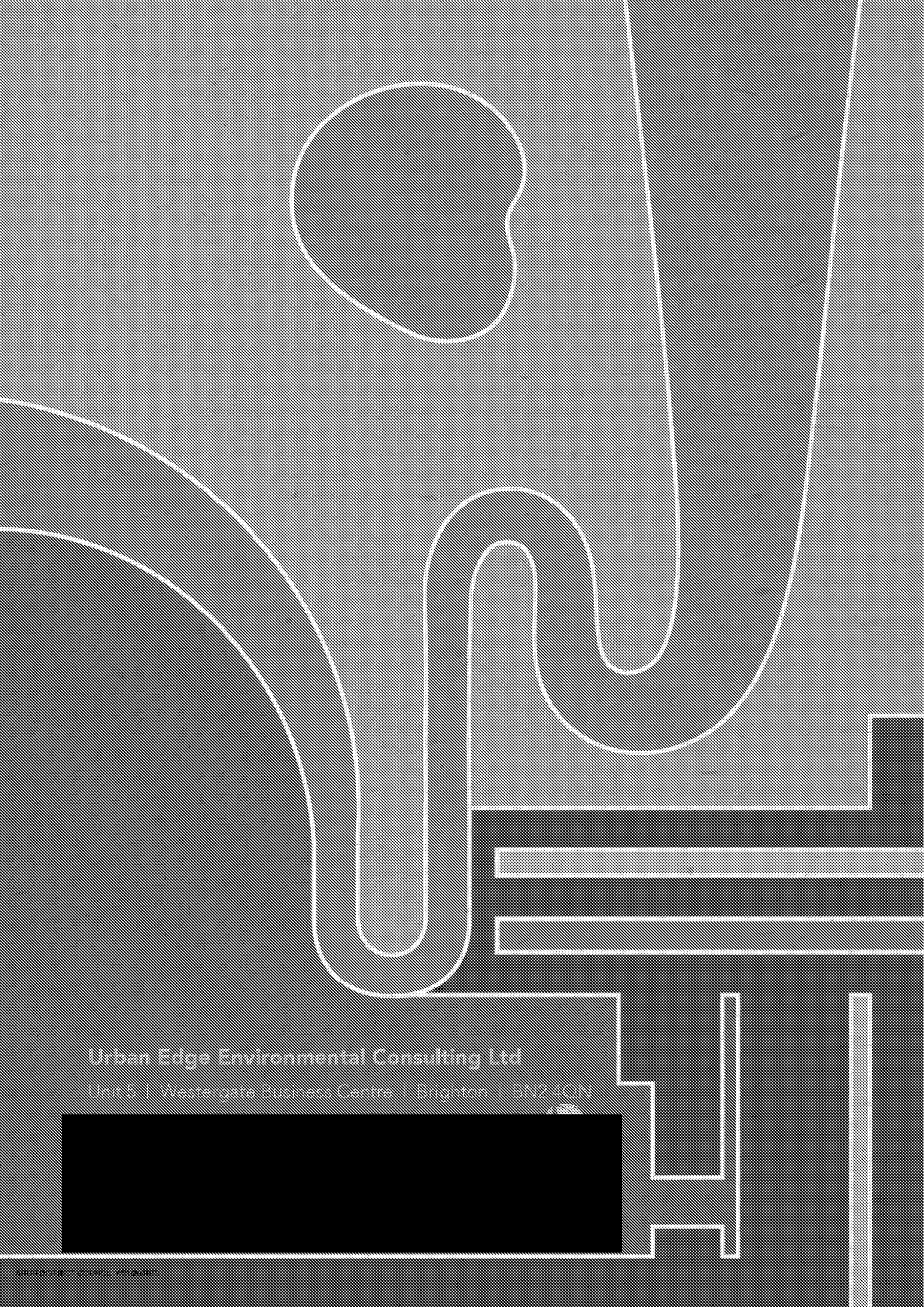
Note that BAP designations and status as RSPB Birds of Conservation Concern or Red Data Book species does not offer any further legal protection, but planning authorities are required to prevent these species from being adversely affected by development in accordance with National Planning Policy and the CROW and NERC Acts. The United Kingdom Biodiversity Action Plan (UKBAP), first published in 1994 and updated in 2007, was a government initiative designed to implement the requirements of the Convention of Biological Diversity to conserve and enhance species and habitats. The UKBAP contained a list of priority habitats and species of conservation concern in the UK, and outlined biodiversity initiatives designed to enhance their conservation status.

However, as a result of devolution, and new country-level and international drivers and requirements, much of the work previously carried out by the UK BAP is now focussed at a country-level rather than a UK-level, and the UK BAP was succeeded by the 'UK Post-2010 Biodiversity Framework' in July 2012. The UK lists of priority habitats and species nonetheless remain an important reference source and were used to draw up statutory lists of priority habitats and species in England, Northern Ireland, Scotland and Wales. The priority habitats and species correlate with those listed on Section 41 and 42 of the NERC Act.

The UKBAP required that conservation of biodiversity be addressed at a County level through the production of Local BAPs. These are targeted towards species of conservation concern characteristic of each area. In addition, a number of local authorities and large organisations have produced their own BAPs. Where they exist, Local BAP targets with regard to species and habitats are a material consideration in the planning process.

Appendix V: Legal and Technical Limitations

- This report has been prepared by Urban Edge Environmental Consulting Ltd (UEEC Ltd) with all reasonable skill, care and diligence within the terms of the contract made with the Client to undertake this work, and taking into account the information made available by the Client. No other warranty, expressed or implied, is made as to the professional advice included in this report or any other services provided by us.
- UEEC Ltd disclaims any responsibility to the Client and others in respect of any matters outside the scope of this contract. This report is confidential to the Client and is not to be disclosed to third parties. If disclosed to third parties, UEEC Ltd accepts no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any third party relies upon the contents of this report at their own risk and the report is not to be relied upon by any party, other than the Client without the prior and express written agreement of UEEC Ltd.
- The advice provided in this report does not constitute legal advice. As such, the services of lawyers may also be considered to be warranted.
- Unless otherwise stated in this report, the assessments made assume that the sites and facilities that have been considered in this report will continue to be used for their current planned purpose without significant change.
- All work carried out in preparing this report has utilised and is based upon UEEC Ltd's current professional knowledge and understanding of current relevant UK standards and codes, technology and legislation. Changes in this legislation and guidance may occur at any time in the future and may cause any conclusions to become inappropriate or incorrect. UEEC Ltd does not accept responsibility for advising the Client or other interested parties of the facts or implications of any such changes;
- Where this report presents or relies upon the findings of ecological field surveys (including habitat, botanical or protected/notable species surveys), its conclusions should not be relied upon for longer than a maximum period of two years from the date of the original field surveys. Ecological change (e.g. colonisation of a site by a protected species) can occur rapidly and this limitation is not intended to imply that a likely absence of, for instance, a protected species will persist for any period of time;
- This report has been prepared using factual information contained in maps and documents prepared by others. No responsibility can be accepted by UEEC Ltd for the accuracy of such information;
- Every effort has been made to accurately represent the location of mapped features, however, the precise locations of features should not be relied upon;
- Populations of animals and plants are often transient in nature and a single survey visit can only provide a general indication of species present on site. Time of year when the survey was carried out, weather conditions and other variables will influence the results of an ecological survey (e.g. it is possible that some flowering plant species which flower at other times of the year were not observed). Every effort has been made to accurately note indicators of presence of protected, rare and notable species within and adjacent to the site but the possibility nonetheless exists for other species to be present which were not recorded or otherwise indicated by the survey;
- Any works undertaken as a consequence of the recommendations provided within this report should be subjected to the necessary health & safety checks and full risk assessments.

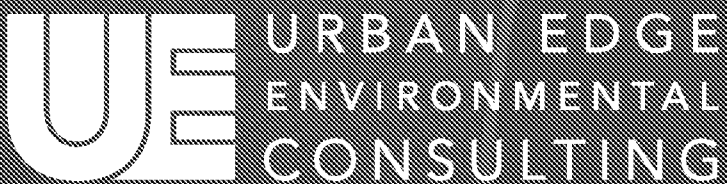


Urban Edge Environmental Consulting Ltd

Unit 5 | Westergate Business Centre | Brighton | BN2 4GN

Urban Edge Environmental Consulting Ltd

Unit 5 | Westergate Business Centre | Brighton | BN2 4QN



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