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integrating nature conservation

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Ecological Impact Assessment

The Sussex Barn
Thistleworth Farm
Worthing Road
Dial Post
RH13 8NR

January 2022

Darwin Ecology Ltd
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QUALITY CONTROL		
The information which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct.		
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This report remains valid for 12 months from date of issue. Survey data are valid for 12-18 months from the date the survey was undertaken.		

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The views and opinions contained within the document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to works.

1. EXECUTIVE SUMMARY

1.1. Darwin Ecology Ltd was commissioned to undertake an Ecological Impact Assessment (EclA) of proposals for the building at The Sussex Barn, Thistleworth Farm, Worthing Road, Dial Post, BN13 8NR. The assessment was required to support a planning application for the complete renovation of the barn into a dwelling with a detached garage. This assessment was informed by a desk study, internal / external building inspection and emergence / re-entry surveys for bats.

1.2. During the internal inspection, around 100 scattered bat droppings were found within the barn. These droppings were then sent for DNA analysis and confirmed to belong to brown long-eared (*Plecotus auritus*) and common pipistrelle (*Pipistrellus pipistrellus*) bats. In addition, a single long-eared bat and a single daubentons bat (*Myotis daubentonii)* were found within the barn during internal inspections.

1.3. During the emergence / re-entry surveys, a peak total of two brown long-eared bats, a single *Myotis* bat, a single soprano pipistrelle (*Pipistrellus pygmaeus*) and a maximum of five common pipistrelle bats were found using the building.

1.4. The proposed plans show the works will directly impact confirmed roosts for brown long-eared, myotis, common and soprano pipistrelle bats within the barn. An appropriate licence will required to permit the above actions. Mitigation and compensatory measures to ensure the Favourable Conservation Status (FCS) of bats is maintained will include:

- Works within sensitive periods such the hibernation period (November to March inclusive) will be avoided;
- Education of contractors on protection afforded to bats through a Tool Box Talk;
- Ecological supervision and soft strip of features suitable for use by bats by hand and using hand tools prior to the rest of the building works;
- Provision of two Schwegler 2F double fronted bat box and one Vincent Bat Box Pro will be installed prior to any works start to be used in case day roosting bats are encountered. The boxes are to be installed in a location determined by a licensed bat ecologist to ensure likelihood of uptake is increased;
- A dedicated bat loft to be created on the detached garage to compensate for the loss of the internal roosting space;
- Creation of six access points will be created under tiles to compensate for the loss of external roosting features;
- Enhancement features in the form of crevices under ridge tiles and as additional integrated bat boxes should be included to provide further roosting opportunities;
- Monitoring of Sussex Barn for a minimum of 2 years, comprising visual checks in and emergence surveys; and
- Any new external lighting will be fitted with downward facing baffles and will be directed to avoid light spillage.

2. INTRODUCTION AND BACKGROUND

2.1. Darwin Ecology Ltd was commissioned to undertake an Ecological Impact Assessment (EcIA) of proposals for the building at The Sussex Barn, Thistleworth Farm, Worthing Road, Dial Post BN13 8NR. The assessment was required to support a planning application for the complete renovation of the barn into a dwelling with a detached garage. This assessment was informed by a desk study, internal / external building inspection and emergence / re-entry surveys for bats.

2.2. Green Link Ecology conducted phase 1 and phase 2 bat surveys at the barn in 2014. During the bat scoping survey they found less than 100 bat droppings likely belonging to brown long-eared bats indicating a day roost of a low number of bats. Their phase 2 surveys confirmed the use of the barn by a single brown long-eared bat as well as a minimum of three common pipistrelles.

2.3. The survey and report follow the Bat Conservation Trust (BCT) Good Practice Guidelines (2016). The subsequent Ecological Impact Assessment (EcIA) follows the roost assessment methodology set out by Wray *et al*. (2010) and the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (2018).

Site Overview

2.4. The site is located in a rural area south of dial post on the southern side of the A24. It comprises a detached barn currently used for storage as well as a number of temporary building on site (Map 1). The wider landscape is comprised of mostly arable farmland and fragmented areas of woodland. The small village of Dial Post is to the north (Map 2).

Scope of Assessment

2.5. The process of EcIA aims to identify, quantify and evaluate the potential effects of development-related or other proposed actions on habitats, species and ecosystems.

2.6. Potential effects on the following ecologically sensitive receptors have been considered during the EcIA:

- Statutory and non-statutory designated sites; and
- Features of potential importance (such as loft voids or external crevice features).

2.7. The aim of this report is to:

- Identify and describe bats roosts present within the site;
- Classify the the type of roost present (e.g. day roost, maternity roost etc);
- Carry out an impact assessment of the proposed works and how they will directly / indirectly affect bats and their roosts;
- Outline the relevant legislation and protection afforded to bats; and
- Provide avoidance, compensation, mitigation and enhancement measures recommended to avoid harm / injury to roosting bats.



Map 1: Site location within the local landscape. The Barn to be affected is highlighted in yellow. (Copyright Google Earth 2021)



Map 2: Site location within the wider landscape with a rough ownership boundary (Copyright Google Earth, 2021)

3. LEGISLATION & POLICY

General Wildlife Legislation

3.1. Wildlife in the United Kingdom (UK) is protected through European and national legislation, supported by national and local policy and guidance. Development can contribute to conservation and enhancement goals outlined by these various legislation and policy by retaining and protecting the most valuable ecological features within a site and incorporating enhancements to provide biodiversity net gain.

3.2. This section provides a brief summary of the principle legalisation and policy that triggers the requirement for PRA and further ecological assessments in the UK. The presence of protected species within a site are a material consideration during the planning process. PRAs and any necessary further ecological assessments provide an ecological baseline for a site and evaluation of the potential impact of proposals.

3.3. It is the responsibility of those involved with development works to ensure that the relevant legislation is complied with at every stage of a project. Such legislation applies even in the absence of related planning conditions or projects outside the scope of the usual planning process (i.e. permitted development projects or projects requiring Listed Building Consent only).

Bat Legislation

3.1. In England and Wales, all bat species and their roosts are legally protected under the European *Habitats Directive (1992)*; the *Conservation of Habitats and Species Regulations (2017)*; the *Wildlife and Countryside Act (1981) (as amended)*; the *Countryside and Rights of Way Act, 2000*; and the *Natural Environment and Rural Communities Act (NERC, 2006)*.

3.2. Barbastelle (*Barbastella barbastellus*), Bechstein's (*Myotis bechsteinii*), greater horseshoe (*Rhinolophus ferrumequinum*), lesser horseshoe (*Rhinolophus hipposideros*), brown long-eared, soprano pipistrelle, and noctule (*Nyctalus noctula*) bats are all species of principal importance in England under *Section 41* of the *Natural Environment and Rural Communities Act 2006*.

3.3. You will be committing a criminal offence if you:

- Deliberately capture, injure or kill a bat;
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
- Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat; or
- Intentionally or recklessly obstruct access to a bat roost.

3.4. The government's statutory conservation advisory organisation, Natural England, is responsible for administering EPS licenses that permit activities that would otherwise lead to an offence.

3.5. A licence can be obtained if the following three tests have been met:

- Regulation 53(9)(a) - there is "no satisfactory alternative" to the derogation, and;
- Regulation 53(9)(b) - the derogation "will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range" and;
- Regulation 53(2)(e) - the derogation is for the purposes of "preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment".

National Planning Policy

3.1. The *National Planning Policy Framework (2021)* aims to minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. Chapter 15 'Conserving and enhancing the natural environment' details what local planning policies should seek to consider with regard to planning applications.

3.2. Planning policies and decisions should contribute to and enhance the natural and local environment by:

> *174 a)* Protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
>
> *174 b)* 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;
>
> *174 d)* Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
>
> *175)* Plans should: distinguish between the hierarchy of international, national and local designated sites; allocate land with the lease environmental or amenity value, where consistent with other policies in this Framework; 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;

176) Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural beauty which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and Broads. The scale and extent of development within all these designated areas should be limited, while development within their settings should be sensitively located and designed to avoid or minimize adverse impacts on the designated area.

3.3. Specific policies regarding habitats and biodiversity comprise:

179) To protect and enhance biodiversity and geodiversity, plans should:

a) 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

b) 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.

180) When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoid (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;

b) development on land within or outside of Sites 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 feature of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) 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

d) development whose primary objective is to conserved or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around development should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

3.4. *Circular 06/05: Biodiversity and Geological Conservation* provides guidance on the application of the law relating to planning and nature conservation and complements the *National Planning Policy Framework*.

3.5. *Biodiversity 2020: A strategy for England's wildlife and ecosystem services* provides the *UK Biodiversity Action Plan* and country level biodiversity strategies for England, based on the list of habitats and species listed on *Section 41* of the *Natural Environment and Rural Communities Act 2006*. These are considered the habitats and species of principal importance requiring conservation action.

Local Planning Policy

3.6. West Sussex does not contain a single Biodiversity Action Plan document but instead has multiple plans addressing ecology and development.

West Sussex Tree Plan 2020-2025

3.7. This plan sets out three strategic aims to maintain, protect and improve the trees within West Sussex:

- to maintain the trees and woodlands in the County Council's ownership;
- to protect trees and woodlands from new development and other threats; and
- to improve tree cover in West Sussex through natural regeneration, the planting of new trees, and the creation of new woodlands.

Pollinator Action Plan 2019-2022

3.8. This plan acknowledges the importance of pollinators and sets out to raise awareness and ensure information is provided to the council and local business and people to help protect and increase pollinator populations. West Sussex County Council will work to fulfil 5 aims:

- encourage local plans, policy and guidance to represent the needs of pollinators

- protect and enhance the amount of pollinator habitat in West Sussex to prevent extinctions and improve the status of any locally threatened species
  - improve our knowledge and understanding of pollinators in our local area
  - increase awareness of pollinators and their habitat needs across local residents, businesses and other landowners
  - increase the contribution to pollinator conservation of land under the ownership of, or managed by, the County Council.

Structure Plan 2001-2016

3.9. This plan sets out the strategic planning framework for West Sussex and guides the way the county will grow and develop during the years leading up to 2016 and beyond. The County Council envisions West Sussex to continue to be a county with a network of small to medium-sized towns and villages, where people feel that the countryside is never far away and where social and economic needs are met in high quality environments. Protecting the environment and using natural resources and assets wisely is a key aim of the plan and policies which reflect this aim include making the best use of the land that has to be developed; safeguarding biodiversity and geological features; minimising flood-risk and protecting the coast; protecting, managing and using soil, air, water and minerals wisely; maximising energy efficiency; and managing waste.

4. METHODOLOGY

Desk Study

4.1. A desk study was undertaken for designated sites and bat species and habitat records within 2 km of the site:

- The MagicMap website was reviewed, to obtain information on any designated sites of nature conservation interest within 2 km of the site and details of any EPS licences issued within 2 km;
- Horsham District Council Planning Portal was searched for past and pending planning applications in the last two years that may have associated ecological documents detailing results of bat surveys; and
- Google Maps and Ordnance Survey (OS) Leisure Maps was utilised to view aerial photographs, maps and mapnik data, and to assess the ecological context of the site within the wider landscape.

Building Inspection

4.2. Ecologist Lewis Hooper BSc (Hons) CIEEMQual conducted a PRA at the site on 19th May 2022 in accordance with the following methodology:

External Survey

4.3. An investigation was carried out of external features with potential for use by roosting bats, such as gaps under roof and ridge tiles, gaps at soffit boxes or fascias. A search for bat droppings was made beneath each potential entry/exit point identified where accessible. The surveyor used binoculars and powerful, low-heat LED torch.

Internal Survey

4.4. An investigation was carried out of the roof void (including the floor and walls) for signs of bats roosting and the access potential into the roof void for bats. The surveyor looked for bats, bat droppings, likely access points, signs of feeding, dead bats, scratch marks and staining, and made a suitability assessment of the structure of the roof.

Potential to support roosting bats

4.5. The building was assessed for its potential to support roosting bats as detailed in Table 1 below which is taken from the Bat Conservation Trust 2016 guidelines Table 4.1 and Table 7.3.

Table 1: Roost Classification from the Bat Conservation Trust (2016) guidelines.

Category	Description of roosting habitat	Number of surveys required
Negligible	Negligible habitat features on site likely to be used by roosting bats.	No further surveys
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, protection, appropriate conditions and or suitable surrounding habitat to be used on a regular basis by large numbers of bats.	Single survey between May to August
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, condition and surrounding habitat but unlikely to support a roost of high conservation status.	Two separate surveys between May-August.
High	A structure with one or more potential roost sites that are obviously suitable for use by a larger number of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Three separate surveys

Emergence / Re-Entry Surveys

4.6. Three dusk emergence surveys were conducted during the 2022 survey season. Surveys were undertaken in line with BCT Good Practice Guidelines (2016), with any limitations outlined below.

4.7. The surveyors who conducted each survey are listed in **Table 2** below.

4.8. Surveyors were positioned strategically around the building(s) in order to provide adequate coverage of all elevations. Surveyors focused on any features identified during the Preliminary Roost Assessment (PRA) as having potential to be used as bat access points. The location of the surveyors and building numbers / names are shown on **Figure 3, Bat Survey Results**.

4.9. Dusk surveys began 15 minutes prior to sunset and lasted 2 hours after sunset. Surveyors recorded bat activity using hand-held Echometer Touch detectors connected to Android or iPhone devices. Analysis of recordings was undertaken after the surveys to confirm species identification. Observations recorded during surveys included bat access points, bat species, time, and type of activity (e.g. emergence, re-entry, commuting, foraging, etc.). Incidental records of bats within the vicinity of the building (but not necessarily roosting) were also recorded.

4.10. A Canon AX20 video camera and Black Sun 2 B502 infra-red illuminator were also used to film bat activity at a fixed position, covering an aspect of the building not visible to the surveyors. The video footage was reviewed following the survey to identify any bat activity captured and any significant activity patterns and access points were identified and recorded.

4.11. A summary of the survey dates and weather conditions are provided in **Table 2**.

Table 2: Emergence and re-entry survey dates and weather conditions

Date	Survey type	Sunset/ sunrise time	Start Weather conditions	End Weather conditions	Surveyors
04.08.2022	Dusk	20:41	Rain: 0 Wind: 1 Cloud cover: 10% Temperature: 21ºc	Rain: 0 Wind: 1 Cloud cover: 10% Temperature: 17ºc	Lewis Hoper BSc (Hons) Abigail Harrington BSc (Hons) Maddy Simmons BSc (Hons) Camera (internal) Camera
22.08.2022	Dusk	20:08	Rain: 1 Wind: 0 Cloud cover: 100% Temperature: 18ºc	Rain: 0 Wind: 1 Cloud cover: 100% Temperature: 18ºc	Abigail Harrington BSc (Hons) Lewis Hooper BSc (Hons) Camera
12.09.2022	Dusk	19:23	Rain: 0 Wind: 1 Cloud cover: 100% Temperature: 20ºc	Rain: 0 Wind: 1 Cloud cover: 100% Temperature: 19ºc	Joe Denny MSc Jenny Denny BA Camera

Evaluating Bat Roosts

4.12. The value of the bat roosts on site was assessed in accordance with the article published in the CIEEM, In Practice Magazine - *Valuing Bats in Ecological Impact Assessment* (Wray, *et al.*, 2010).

4.13. Roosts are assigned a relative ecological value based on the rarity of the species (Table 3) and categorisation of roost type (Table 4), informed by survey results. Once a value has been calculated, robust mitigation for any impacts identified from the proposed development can be determined.

Table 3: Categorising bat species by distribution and rarity

Rarest	Rare	Common
Greater horseshoe Bechstein's Alcathoe Greater mouse-eared Grey long-eared Barbastelle	Lesser horseshoe Whiskered Brandt's Daubenton's Natterer's Leisler's Noctule Nathusius' pipistrelle Serotine	Common pipistrelle Soprano pipistrelle Brown long-eared

Table 4: Valuing bat roosts

Geographic Frame of Reference	Roost Type
District, Local or Parish	Feeding perches (common species) Individual bats (common species) Small numbers of non-breeding bats (common species) Mating sites (common species)
County	Maternity sites (common species) Small number of hibernating bats (common and rarer species) Feeding perches (rarer/rarest species) Individual bats (rarer/rarest species) Small numbers of non-breeding bats (rarer/rarest species)
Regional	Mating sites(rarer/rarest species) including well-used swarming sites Maternity roosts (rarer species) Hibernation sites (rarest species) Significant hibernation sites for rarer/rarest species or all species assemblages
National/UK	Maternity sites (rarest species) Sites meeting Sites of Special Scientific Interest (SSSI) guidelines
International	Special Areas of conservation (SAC) sites

Limitations

4.14. The surveys were undertaken in accordance with the best practice guidelines within the peak bat activity period (May to September inclusive). The results are therefore considered to be an accurate representation of the general use of the building by roosting bats.

4.15. Nevertheless, bats may use roosting features intermittently throughout the year and may be present in larger or smaller numbers depending on their breeding cycle, weather conditions and in response to disturbance. Bats may be present at other times of the year and the results in this report should therefore be viewed in the context intended.

4.16. Three dusk surveys were undertaken with the use of infrared cameras instead of conducting a dawn survey in line with the recommendations and research findings outlined in the interim guidelines published by Bat Conservation Trust in 2022.

4.17. The desk study does not include data from the local environmental records centre (LERC). However, following CIEEM guidelines (2017) it is possible to conduct a robust assessment without the need of LERC data, for example for small-scale projects or on sites such as;

- a field in active arable cultivation where there is no impact on any hedges, trees or water bodies;
- small areas of cultivated garden/amenity grassland, as above; or
- small urban sites comprising mostly asphalt or compacted hardstanding.

4.18. The impacts of the proposed development are restricted to the building and an area of cultivated garden which will be lost under the footprint of the replacement dwelling. Therefore the lack of LERC data is not considered a limitation to the ecological assessment of the site.

5. SURVEY RESULTS

Desk Study

5.1. There are no statutory designated sites within 2km of The Sussex barn.

5.2. There is one record of EPS licences for bats within 2km of the site:

- 2017-31760-EPS-MIT: This licence related the the destruction of a breeding site for common pipistrelles (*Pipistrellus pipistrellus)* located approximately 2km west of the site.

Local Habitats

5.3. There are a small number of sites composed of ancient woodland habitat within 1km of the site, the closest of which is an un-named block located 650m south of the site. No areas of priority or protected habitats are present within or adjacent to the site, further areas of habitat within 1km of the site include priority deciduous woodland and semi-improved grassland.

Bat Scoping Assessment

External Assessment

5.4. Externally the barn is a hipped roof covered in clay tiles and single skin wooden cladding walls. The structure measures roughly 17m in length by 8m in width. The barn is in moderate to poor condition with the roof and walls bowing in places. A number of gaps externally were seen in roof tiles, gaps in the motor under ridge and hip tiles and gaps within the wooden cladding where it overlaps at the eaves.

Internal Assessment

5.5. Internally the barn is open to the apex and constructed of a timber frame including mortise and tenon joints. The roof is lined with bitumen felt and the space is used for storage. Light ingress was noted at the ridge, hips and through areas of the wooden cladding. Around 100 droppings were found internally (confirmed to be brown long-eared and common pipistrelle by DNA analysis). Internal inspections were conducted prior to the phase 2 surveys and a maximum count of two brown long-eared bats as well as a single Myotis identified as a Daubenton’s bat was noted on one occasion.



Image 1: A view of the southern elevation of the barn



Image 2: A view of the northern elevation of the barn



Image 3: A view of the western elevation of the barn



Image 4: A view of the barn internally



Image 5: A second view of the barn internally

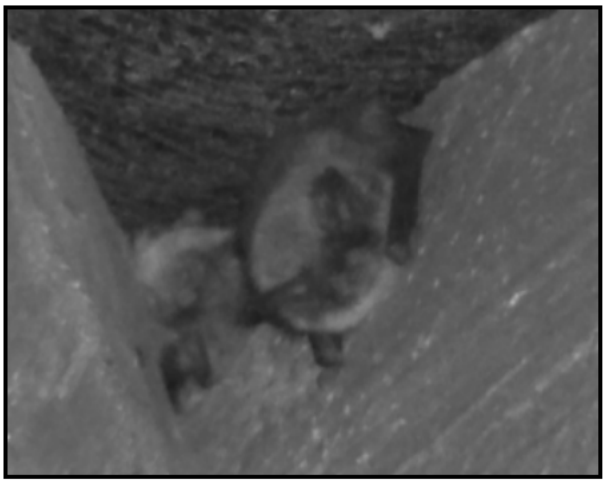


Image 6: A view of the likely Daubenton's bat and a long-eared bat besides it.

Emergence / Re-Entry Survey Results

Survey 1

5.6. During the dusk emergence survey on the 4th August 2022, a total of two brown long-eared bats, five common pipistrelles and a Daubenton's bat were confirmed roosting within and/or emerging from the barn. Overall, moderate levels of activity were noted around the barn including foraging by common and soprano pipistrelles and a passing serotine.

5.7. Prior to the survey commencing, two brown long-eared bats were seen roosting within the barn as well as a Daubenton's bat which was found before the survey and was still present after the survey ended.

Table 5: 04.08.2022 - Dusk emergence survey.

Timing	Species	Activity	Roost type	No. of bats	Structure
Start: 20:26 Sunset: 20:41 End: 22:41	Brown long-eared	Emergence	Day roost	2	Roof tile bellow the top hip tile on western end
	Common pipistrelle			2	From hip tile and from wooden cladding on western elevation
				3	From hip tile on eastern elevation
	Daubentons	Roosting inside		1	Internal hip joint

Survey 2

5.8. During the dusk emergence survey on 22nd August 2022, a total of four common pipistrelle bats and a single soprano pipistrelle bat was observed emerging from the barn. Throughout the survey there were moderate levels of activity with foraging common and soprano pipistrelles around the barn as well as passing noctule.

Table 6: 22.08.2022 - Dusk emergence survey.

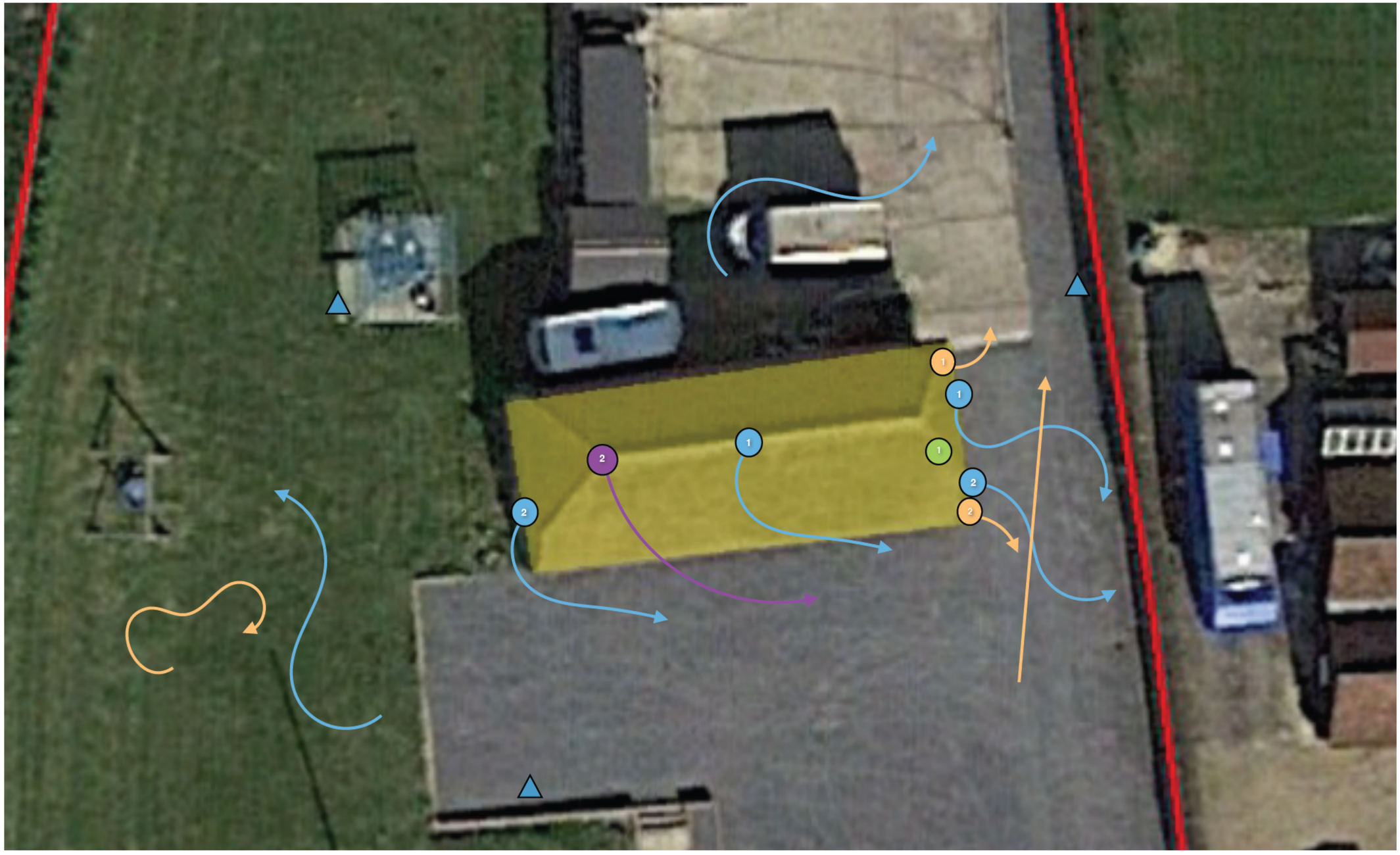
Timing	Species	Activity	Roost type	No. of bats	Structure
Start: 19:53 Sunset: 20:08 End: 22:08	Common pipistrelle	Emergence	Day roost	1	From hip tile on western elevation
				2	From ridge tile in the middle of the barn
				1	From roof tile on eastern elevation
	Soprano Pipistrelle			1	From hip tile on eastern elevation

Survey 3

5.9. A total of two common pipistrelles and two soprano pipistrelles were seen emerging from the building. There were moderate levels of activity with foraging by common and soprano pipistrelles, as well as passes by noctule, long-eared bats and a Daubenton's bat.

Table 7: 12.09.2022 - Dusk emergence survey.

Timing	Species	Activity	Roost type	No. of bats	Structure
Start: 19:23 Sunset: 19:38 End: 21:38	Common pipistrelle	Emergence	Day roost	1	From hip tile on western elevation
				1	From roof tile on the southern elevation
	Soprano pipistrelle			2	From hip tile on eastern elevation



***NOTE Areas are indicative and are not shown to exact scale.**

Building surveyed

Surveyor Location

Bat Emergence/ Re-entry Location and Flight Path (coloured by species)

Bat Species

Common Pipistrelle

Soprano Pipistrelle

Noctule

Brown Long-eared

Internal Daubentons

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Project: Sussex Barn

Figure 2: Emergence/ Re-entry Survey Results

Date: September 2022

6. IMPACT ASSESSMENT

Designated Sites

6.1. It is not anticipated that the proposed works will impact any statutory designated sites, priority habitats or ancient woodlands through land take. There will be no net increase in residential units and therefore no resulting impacts to surrounding designated sites, green space and wildlife sites through increased footfall.

Evaluation of Bat Roosts on Site

6.2. The barn at Sussex Barn is confirmed to be a day roost for up to three soprano pipistrelles using two roost locations, six common pipistrelles using four roost locations, two brown long-eared bats and a single daubenton's bat using the barn internally.

6.3. No evidence was found on site to suggest a maternity roost of any species is present.

6.4. See **Table 9** for value of each roost in accordance with Wrey *et al.*, 2010. Impact of works.

Table 9: Value of bat roosts at Sussex Barn.

Species	Rarity	Roost Type	Value
Brown long-eared	Common	Day Roost	Local, District, or Parish
Common pipistrelle	Common	Day Roost	Local, District, or Parish
Soprano pipistrelle	Common	Day Roost	Local, District, or Parish
Daubentons	Rare	Day Roost	County

Roost Impact Assessment

6.5. The proposed plans at the Sussex barn include the complete renovation of the barn into living space as well as the construction of a designated detached garage.

6.6. Potential impacts to bats therefore include destruction of a roosting site, with potential for disturbance, injury or killing of bats in their roosts during works.

6.7. In the absence of mitigation, the works would therefore result in an offence under the *Conservation of Habitats and Species Regulations (2017).*

Mitigation

6.8. The following mitigation strategy provides details of the mitigation measures to minimise the risk of killing or injury of individual bats during the works process. The compensation strategy demonstrates that compensatory roosts will be provided to replace the roosting opportunities present at the existing building, which will be lost.

6.9. In line with the Bat Mitigation Guidelines (Mitchell-Jones, 2004) the barn is of high conservation value to bats due to the number of species using it including a rare species of county level importance. Therefore the mitigation and compensation is creating a like-for-like replacement of the roost as a minimum. The construction of a designated bat loft on the garage will provide suitable compensation for species found on site. Monitoring of the roost should take place for at least 2 years. An appropriate licence is required. Due to the number of species / roosts present a full EPS mitigation licence will be required.

6.10. *EPS Mitigation Licence:* A licence application can be submitted following planning approval by the Local Planning Authority (LPA) and a licence must be granted prior to any works commencing on site with potential to impact bats or their roosts. Licences will be issued by Natural England if the three licensing tests detailed in Section 3 are met. Whilst Natural England aim to provide licensing decisions within 30 working days, current processing times have ranged between 30 and 60 working days.

6.11. Such licences will only be granted where it can be shown that there will be no detriment to the species of bat concerned, and therefore suitable mitigation measures are required. In order to ensure that the 'Favourable Conservation Test' can be met, a mitigation statement will need to be submitted as part of the licence application. This includes measures to minimise the risk of killing or injury of bats during the proposed works and to ensure that there is long term provision of roosting opportunities on site. Input from a licensed consultant will be required during licensable activities at the site (such as the removal of features with potential for roosting bats).

6.12. *Timing of Works:* The works are affecting summer bat roosts and the works can take place between April - October avoiding the hibernation season.

6.13. *Toolbox Talk:* Before commencing any work on site, all contractors will be inducted by a licensed bat ecologist or accredited agent in a tool box talk, to ensure they are aware of the risks to wildlife on site, particularly the presence of bat roosts, their legal protection and of working practices to avoid harming bats and other species in order to ensure working practices on site follow legal requirements.

6.14. *Ecological Supervision:* Immediately prior to any works on site, the barn must be subject to an internal and external survey by a suitably qualified and licensed bat ecologist to ensure as far as possible that no bats are present. In addition, hand removal / soft strip of internal and external features suitable for use by bats must be done very cautiously and under supervision by a bat licensed ecologist.

6.15. *Bat Boxes:* To provide a compensatory roosting and safe release site for bats during works, at two three bat boxes will be installed prior to works commencing on site, comprising one Schwegler 2F with double fronted, and one Vincent Bat Box Pro, on mature trees or buildings on site. These boxes will remain on site in perpetuity. The location will be determined by a licensed bat ecologist to ensure likelihood of repeated use is increased.

The bat boxes will be installed at a height of at least 4 m, preferably on a southern un-cluttered aspect with good connectivity to linear features such as other mature trees and hedgerows.

6.16. *Roofing Membrane:* **NO breathable roofing membrane will be permissible in any part of the building that may be used by bats**. Breathable roofing membrane creates a lethal entanglement hazard to bats. Any deviation from this will need to be approved by the ecologist who can provide details regarding alternative ventilation methods.

6.17. *Timber Treatment*: Any use of timber-treatment or pest control treatment must be selected from the approved lists for safe use in or near bat roosts which can be provided on request.

6.18. *Lighting:* Any new external lighting must be directed to avoid light spillage onto vegetation, particularly linear habitat features such as woodland edges or potential roosting sites within trees and buildings. Bats are sensitive to light and could potentially avoid the area if access points or the surrounding areas become lit. Appropriate lighting options will prevent a negative impact on bats potentially using the habitats on site and should be approved by a suitably qualified and licensed bat ecologist. Lighting plans should be approved and signed off by a licensed bat ecologist prior to submission, to ensure the scheme is suitable for bats. If appropriate measures are taken to reduce light spillage from the development, it is likely that there will be no negative impacts on local bat populations.

6.19. See **Appendix 2** for further information on designing lighting to minimise impacts on bats.

6.20. *Habitats:* The proposals do not result in significant loss of foraging habitat for bats, however, a wildlife friendly landscaping scheme is recommended to enhance the site for bats and other wildlife.

Compensation

Alternative Roost Provision for Brown Long-Eared Bats and Daubenton's bat

6.21. As the identified brown long-eared roost and Daubenton's day roost will be destroyed in the conversion of the barn an alternative roost must be provided to remain on site in perpetuity. This loft will be untrussed, and measure 1.8m H x 3.7m W x 8.8m L providing enough volume for bats to fly within the loft. The void must be lined with Type 1F bitumen felt, and the roof must be tiled and have a wet ridge and wet verges. Access points must comprise a minimum of 2 x gable end mortar gap features, 2 x ridge tile access points and 2 x lifted tile access points. The internal void space must include additional crevice provisions, such as a triple ridge beam or squeeze box feature (**Appendix 3**).

Roosting Features for Pipistrelle Bats

6.22. It is recommended that a minimum of six roosting features be created in order to provide compensatory roosting opportunities for pipistrelle bats. Features currently being used will

be replaced like-for-like on both the bat garage and the barn including raised tiles, ridge tile features and gaps in wooden cladding.

6.23. Raised roof tile features are an adaptable and inexpensive method of creating a bat roosting features suitable for a range of bat species. The location of these features should be decided by an ecologist, but should face unobstructed flight lines and suitable commuting habitat, such as hedgerows or tree lines

6.24. Wet or mortared ridges are also a preferred technique on buildings where bat access needs to be reinstated.

6.25. Areas of feather/wavey edge wooden cladding which is not interlocking and has boarding behind it can easily be used to create bat features. Gaps under the wooden cladding can be created using small wooden wedges to give bats access to the cavity behind the cladding.

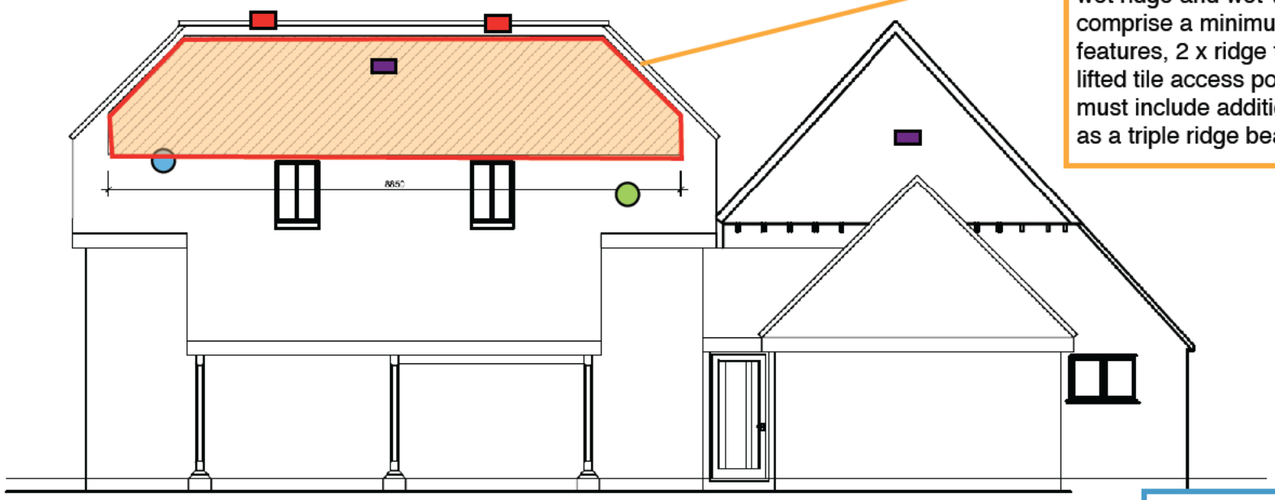
6.26. Where discrete features are being created, breathable roofing membrane must NOT be used in order to avoid hazards to bats.

Monitoring

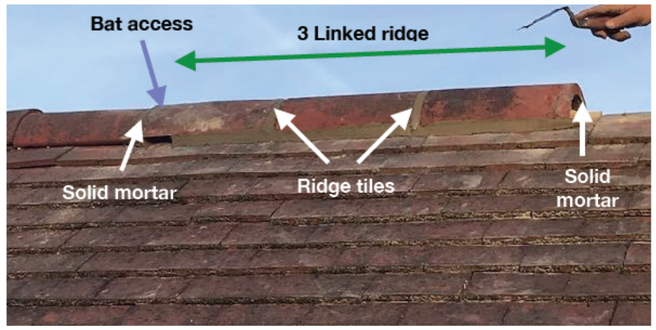
6.27. As a requirement of the EPS license, monitoring of Sussex Barn will be required for a minimum of 2 years. Monitoring will be conducted both externally and internally on all buildings on site, along with any mitigation features and bat boxes on site. Monitoring checks will involve ensuring that all mitigation and compensation features are in good condition and remain functional, as well as providing any relevant recommendations or alterations to mitigation provisions to ensure the long-term success of the scheme.

6.28. In summary, monitoring will comprise:

- Internal and external roost assessments of all buildings on site in Years 2 and 3; and
- One emergence / re-entry survey during the active bat season (May - August) to take place in Year 2 post completion of any works, with the assistance of infrared videography.



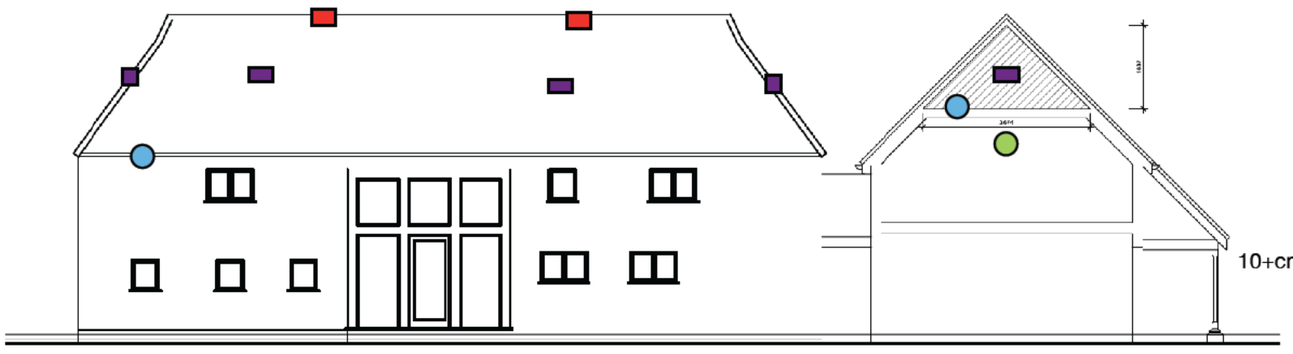
Bat loft - Created with a void space of 1.8m H x 3.7m W x 8.8m L. Roof must be tiled and have a wet ridge and wet verges. Access points must comprise a minimum of 2 x gable end mortar gap features, 2 x ridge tile access points and 2 x lifted tile access points. The internal void space must include additional crevice provisions, such as a triple ridge beam or squeeze box feature.

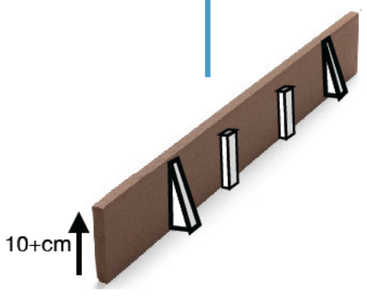


Ridge tile features - Created by doing a notch on the underside of a ridge tile measure 20mm high by 50mm wide, and leaving the gap free of mortar when bedding the tile into the ridge. To ensure three ridge tiles remain linked fill one side with mortar and leave the other side empty (do this on alternate sides to ensure the feature does not become draughty).

No breathable roofing membrane will be permissible at the replacement roost. **All bat licensed project require that type 1F bitumen felt lining is used.**

Gaps under fascia / Barge boards - The features should provide gaps of 15-20 mm between the board and the wall plate and should be created on the same locations bat roosts are currently present were possible





Fascia board with exaggerated angles to show access feature for bats with tapered entrance

Bat Boxes:

*1*x Schwegler 2F and 1 x Vincent Bat Box will be installed on suitable trees at a height of at least 4m, preferably on a southern un-cluttered aspect with good connectivity to linear features such as other mature trees and hedgerows. Additionally, two integrated bat boxes or 1 x Vincent Bat Box Pro and 1 x Schwegler 1FF will be installed on gable ends.







Loft void to be created

External gaps under fascia / barge board

Proposed locations of integrated bat boxes

Proposed locations of ridge tile features

Proposed locations of lifted tile features

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Project: The Sussex Barn, Thistleworth Farm

Figure 3: Mitigation and Compensation Plan

Date: January 2023

7. ENHANCEMENT RECOMMENDATIONS

7.1. National planning policy states that all developments should seek to enhance onsite biodiversity whether impacts on protected species are recorded or not. Incorporating enhancement features into new or renovated buildings should be carefully considered. These features can be simple and inexpensive, please see below for specific recommendations.

Wildlife Beneficial Landscaping Scheme

7.2. Any future landscape planting should seek to enhance biodiversity, improve connectivity to the surrounding habitats and provide food and shelter for a wide range of wildlife. All amenity planting and formally landscaped areas should be designed using a variety of plant species beneficial for wildlife. These do not necessarily have to be native but should be chosen for their ability to provide nectar or fruit and should be non-invasive species. There are a number of specialist seed mixes available specific to certain soil types, growing conditions and designed to benefit different groups of species such as bees or butterflies and moths.

7.3. All habitats should be managed in a suitable way to encourage a wide variety of insects and other wildlife to use the site.

7.4. Further information regarding habitat creation, enhancement and management can be provided on request and submitted with further survey results for the final planning application.

Bats

7.5. In addition to the proposed compensation features, two additional integrated bat boxes such as Green&Blue integrated bat brick will be installed on both gable ends of the barn. If this is not possible a Vincent Bat Box Pro and a Schwegler 1FF will be installed on the gable ends.

7.6. Additionally, five ridge tile features should be included on the roof. Further details are shown in **Appendix 3**.

Bird Boxes

7.7. To enhance the site for nesting birds, two bird boxes will be installed in suitable trees on site.

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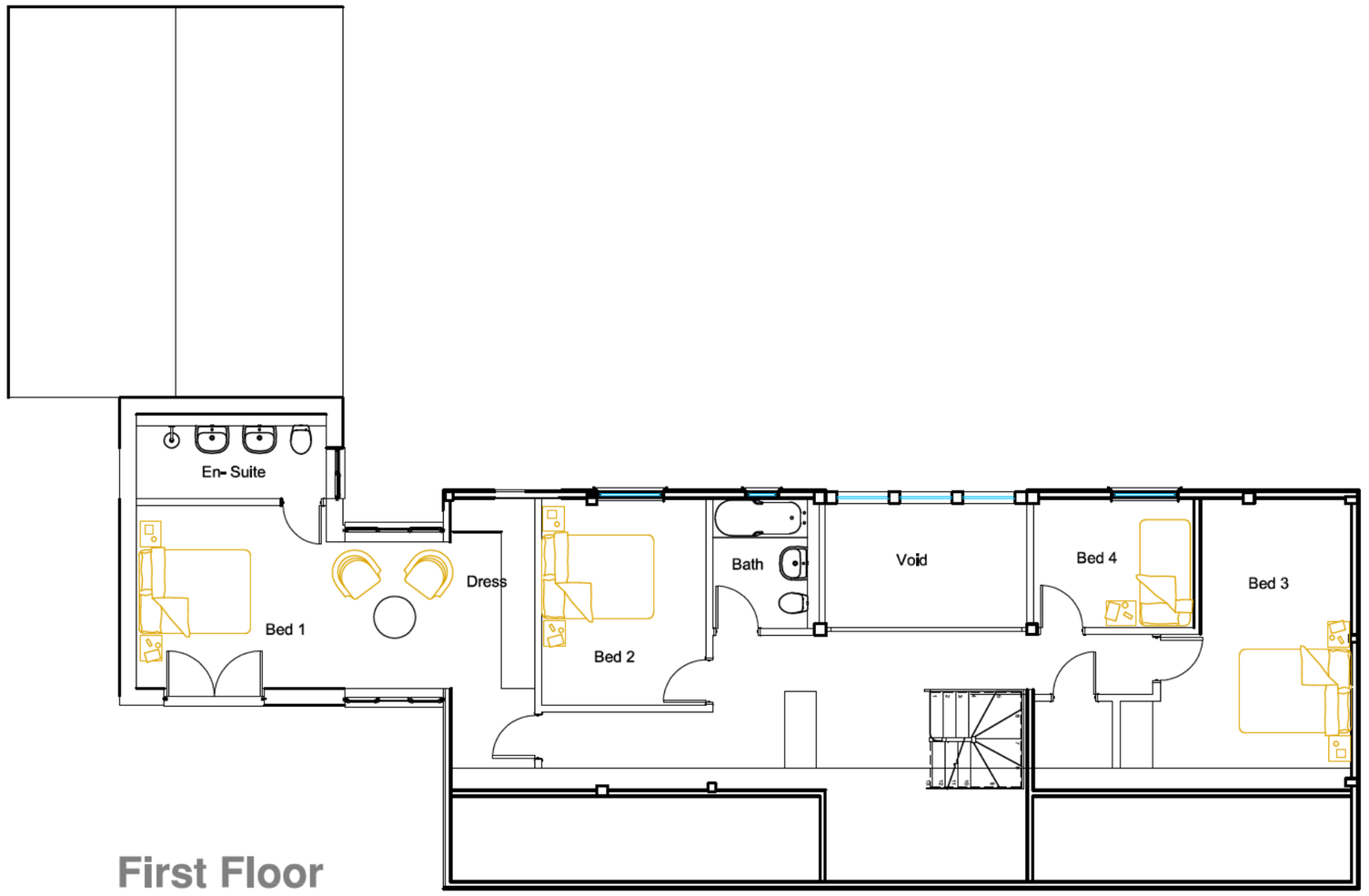
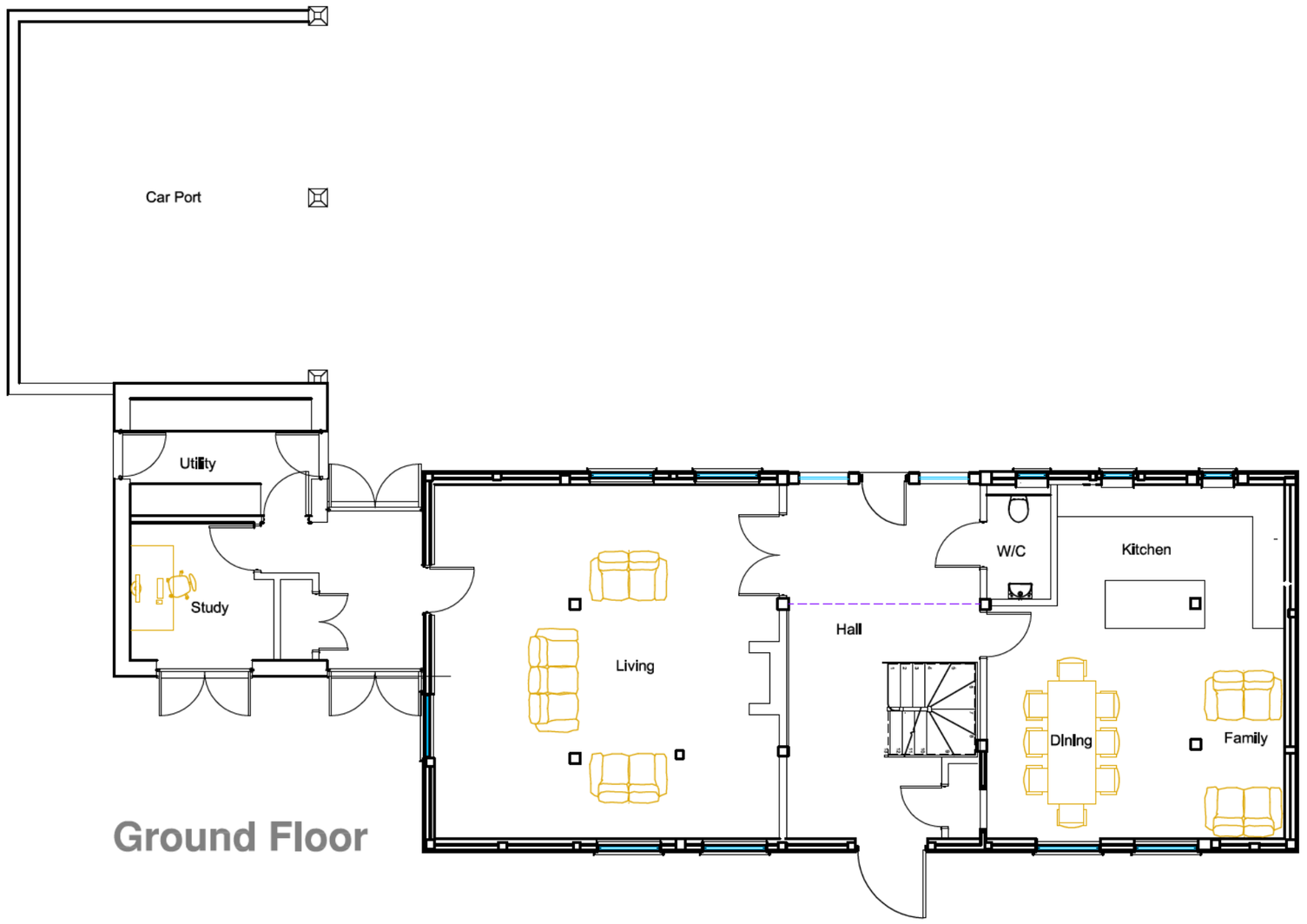
APPENDICES

APPENDIX 1 - PROPOSED PLANS



First Floor



Ground Floor

0m 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

1:100 Scale Bar

KEY
Floor Plans

- Proposed new walls
- Existing walls to be retained
- Proposed new floor area
  Total floor area = m²
- Existing floor area to be retained
  Total floor area = m²
- Grey broken lines indicates extent of demolition
- Area approved under previous application
  Total floor area = m²
- Purple broken lines Indicate extent of existing buildings to be removed
- Red broken lines indicates area approved under previous application

KEY
Site Layout

- Existing tree to be retained
- Existing tree to be removed
- Proposed new tree
- Proposed new planting areas
- Tree protection zone
- Existing areas of planting to be retained
- Grassed areas
- Purple broken lines indicate extent of existing buildings to be removed
- Red broken lines indicates area approved under previous application
- Site boundary
- Land to which application relates to.
- 1.8m high closeboarded fence
- Existing spot levels
- Proposed spot levels

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Proposed Floor Plans

Mr. & Mrs Banks
Sussex Barn, Sands Lane, Dial Post.

Site Area	Paper Size	Drawn by	Date	Scale	Drawing No.
	A2	GS	09-05-22	1:100	22-11-01

APPENDIX 2 - BATS & LIGHTING

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Bats & Lighting



THE IMPACT OF LIGHTING ON BATS

Bats favour a dark environment for both roosting and foraging as they are adapted to low-light conditions. Artificial lighting will disturb bats if the lighting covers roost access points, flight paths or foraging habitats.

The main peak of nocturnal insect abundance occurs at dusk and a delay in emergence results in a lower foraging rate for bats.

Artificial lighting creates a 'vacuum effect' for nocturnal insects. During the night nocturnal insects use the light of the moon* to navigate. However, artificial lighting and even sky glow above cities obscures the natural moonlight as it is closer and radiates light in multiple directions.

Some species of bats have been recorded foraging around street lights such as Pipistrelle species and Nyctalus species. However, species that are less tolerant of artificial light are at a disadvantage when foraging as insects are drawn away from these species usual foraging grounds into the zones of artificial light.

Lighting must be considered in context to any development as increased lighting may cause roost abandonment, reduced reproductive success, and reduced foraging. Mitigation to reduce the impacts of lighting for bats is therefore of great importance in bat conservation.

Table 1: Summary of predicted impact of lighting for each species/genus

Impact / Behaviour	High	Medium	Low
Maternity roost	All species	-	-
Night roost	*Rhinolophus hipposideros* *Rhinolophus ferrumequinum* *Myotis* spp. *Plecotus* spp.	*Pipistrellus* spp. *Nyctalus* spp. *Eptesicus serotinus* *Barbastella barbastellus*	-
Emergence	All species	-	-
Foraging	*Rhinolophus hipposideros* *Rhinolophus ferrumequinum* *Myotis* spp. *Plecotus* spp.	-	*Pipistrellus* spp. *Nyctalus* spp. *Eptesicus serotinus* *Barbastella barbastellus*
Commuting	*Rhinolophus hipposideros* *Rhinolophus ferrumequinum* *Myotis* spp. *Plecotus* spp.	-	*Pipistrellus* spp. *Nyctalus* spp. *Eptesicus serotinus* *Barbastella barbastellus*
Swarming	All species	-	-
Hibernation	All species	-	-

*For more information see Warrant, E., and Dacke, M. (2016) Visual Navigation in Nocturnal insects. *Physiology*, 31, 182-196.

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Bats & Lighting

Sources of light that can disturb bats include; light spill via windows, sport floodlighting, car headlights, roadside lighting, security lighting, aesthetic lighting of waterways, and aesthetic illumination of buildings. Glare will affect bats over greater distance than the target area directly illuminated.

Avoidance is the most effective method, but if this is not possible the following measures should be considered.

What lighting should I use?

- Low pressure sodium lights or 'warm' LEDs
- Wavelength above 540nm
- Colour temperature below 2700K
- Shielded lights that prevent light spill above a 70 degree angle
- Passive infrared (PIR) motion sensors





What to avoid:

- Lighting roost entrances, flightpaths, and foraging or commuting routes
- Reflective surfaces beneath lighting
- High level lights
- Non-directional lighting

Lighting should be considered at an early stage allowing impacts to be minimised through the design of the site.

Key Points

- Keep lighting intensity to the minimum level required
- Limit the times that lights are on to provide some dark periods (e.g. switching installations off between midnight and 5am)
- Dim lighting according to demand
- As an alternative to lighting pathways use paving materials that reflect moonlight
- Low level lighting allows darkness to be retained within higher vegetation
- Set dark habitat buffers - lighting should always be a minimum of 25m from vegetated margins and 40m from waterbodies
- Incorporate dark corridors within the site
- Compensate for the loss of dark areas by enhancing other dark areas
- Consider building design - install internal lighting away from windows

Bat Conservation Trust guidance note 08/18 'Bats and artificial lighting in the UK & http://www.cost-lonne.eu/recommendations/

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APPENDIX 3 - MITIGATION AND ENHANCEMENTS

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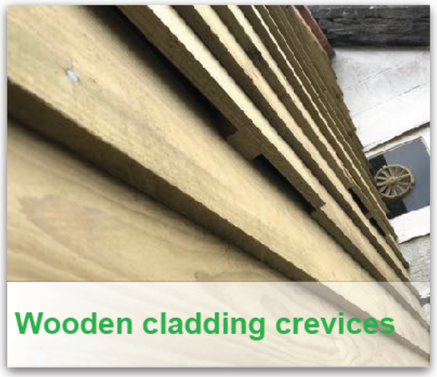
Integrated Bat Features



Wooden cladding crevices

Pieces of batten are placed under the boards to create roosting opportunities suitable for crevice roosting bats.



Gable end cavity wall feature

Cavity wall crevice with integrated bat box access, suitable for pipistrelle maternity roosts.





Squeeze box

Layered pieces of wood at the ridge or along the rafters create crevices suitable for a range of void dwelling bat species.



Ridge tile crevice/access

Three interconnecting ridge tiles within a wet ridge, with mortar gaps provide roost features for crevice dwelling bats or void access points.



Barge board crevices

Gaps beneath barge boards provide roosting opportunities for crevice dwelling bats.



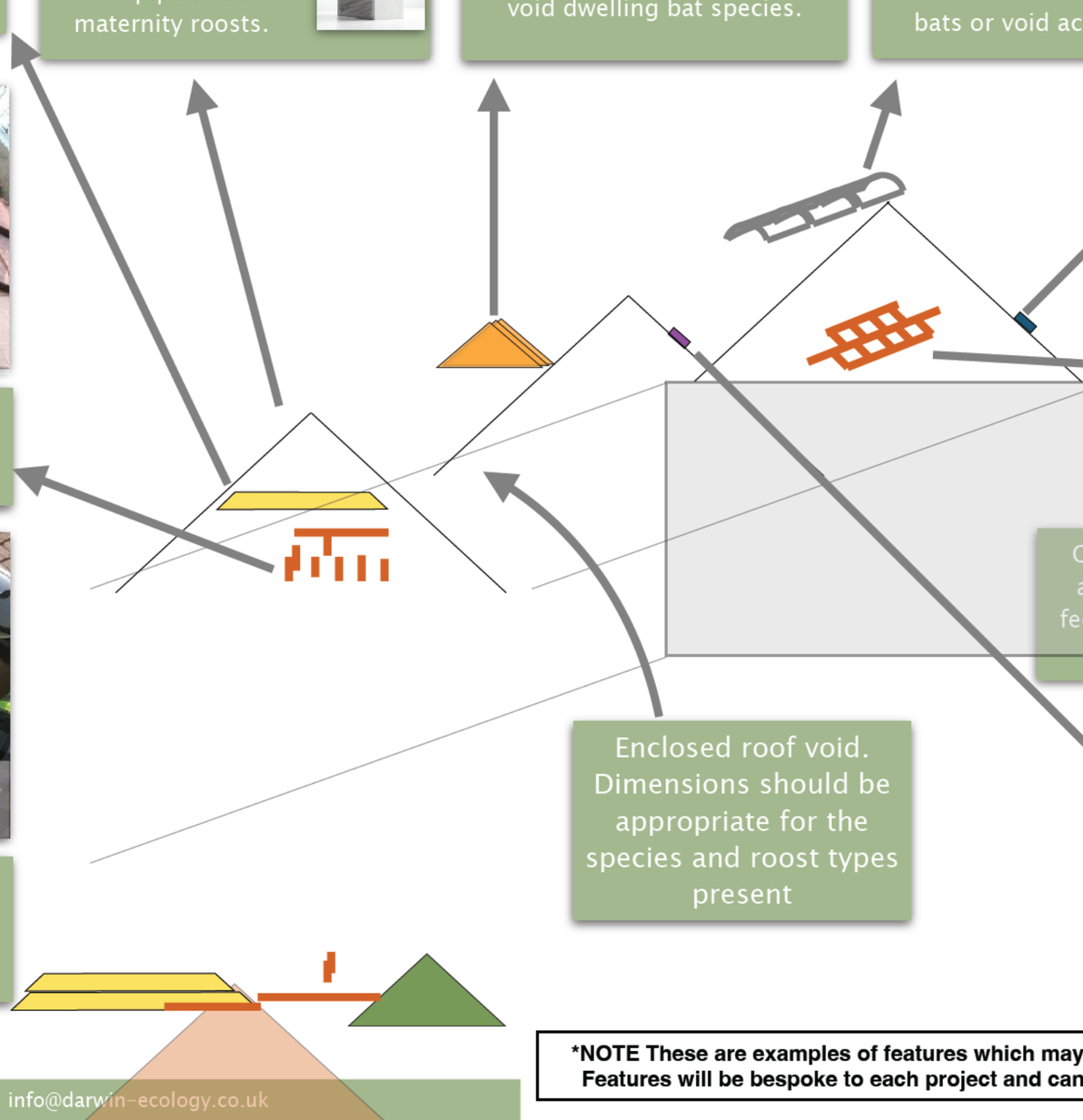
Hanging tile features

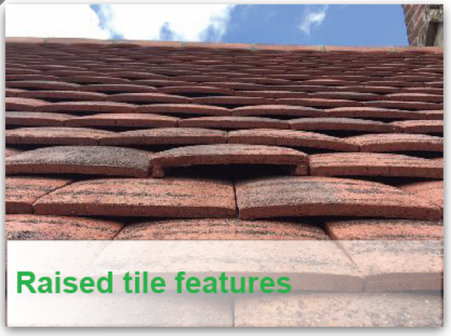
Hanging tiles are raised creating small gaps suitable for crevice roosting bats.



Lead flashing gaps

Gaps are created beneath small sections of lead flashing, creating crevices suitable for roosting bats





Raised tile features

Roof tiles are raised creating small gaps suitable for crevice roosting bats.



Gable end access points

Bespoke access to the loft void is created to provide small access points above the wall plate for void dwelling bats.

***NOTE These are examples of features which may be recommended, diagrams are not shown to exact scale. Features will be bespoke to each project and can be modified to incorporate different materials or designs.**

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