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1.0 INTRODUCTION

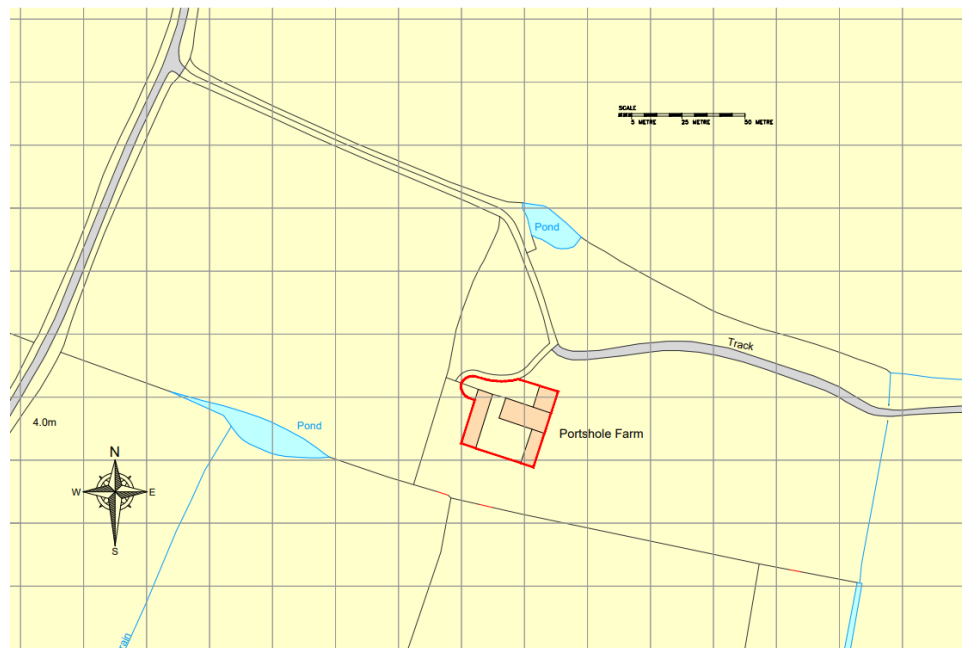
1.1 Background

This document outlines the results of the phase II bat survey carried out by Ecosupport Ltd during July 2022 of the property known as Portshole Barn, Sidlesham. These surveys were required to support a planning application for a development on the site after a PEA conducted identified the building as to be of **low potential** to support roosting bats, therefore highlighting the requirement to undertake one dusk survey (Ecosupport 2022). During the bat surveys, there was an emergence during the first survey therefore an additional 2 surveys were undertaken as the property was then classified as a **confirmed roost**.

1.2 Site Description & Location

The site comprises of Portshole Barn, an outbuilding, unsealed track and areas of grassland located around the outer parts of the site located at Ham Road, Sidlesham, Chichester, West Sussex, PO20 7NY (centered on OS grid reference SZ 84521 95615) (**Fig 1**). The southern and western boundaries of site are bound by arable fields whilst the northern and eastern boundaries of site are bound by a grassland field.

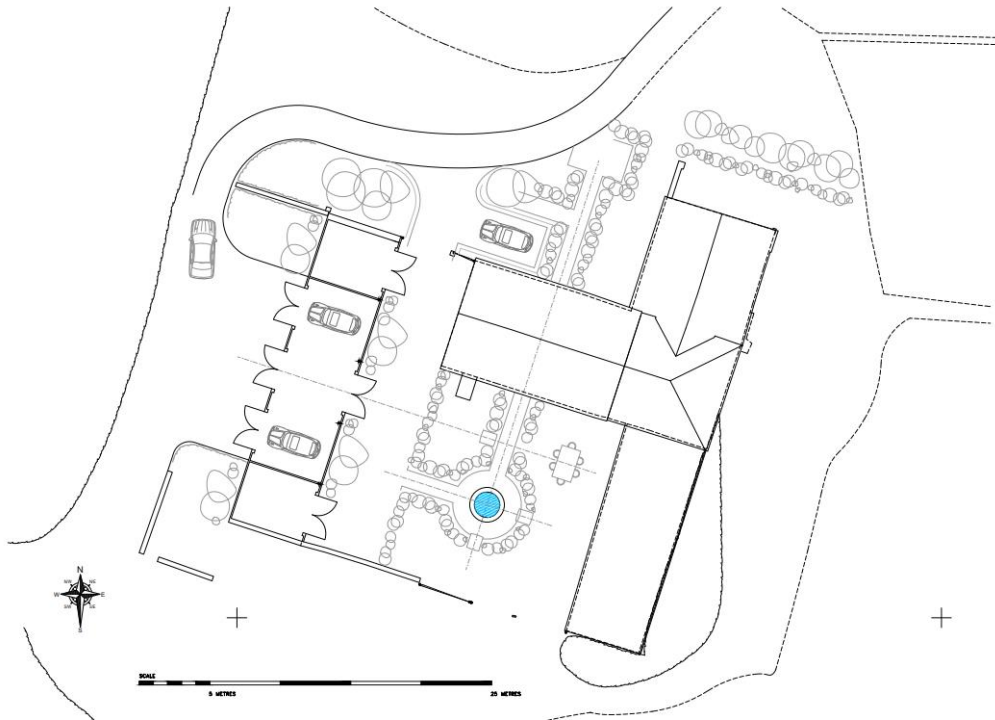
Figure 1. Approximate redline boundary of the site (provided by Architects Design & Management (ref: 1691 02 A))



1.3 Brief Description of the Proposals

Conversion of the barn to a residential dwelling and change of use of the outbuilding to be used associated with the residential dwelling (**Fig 2**).

Figure 2. Plan showing the proposed development on site (provided by Architects Design & Management (ref: 1691 21))



2.0 RELEVANT LEGISLATION & POLICY

2.1 Legislation & Policy Context

2.1.1 Relevant Legislation

The Wildlife & Countryside Act 1981 (as amended) is the primary piece of legislation by which biodiversity in the UK is protected. The most relevant areas of the Act to development related activities are:

- The protection of certain species listed in Schedule 5, which prohibits killing, injury, disturbance, damage and / or destruction of breeding sites and / or resting places and sale (it should be noted that all parts of this protection do not apply to all Scheduled species).

The Conservation of Habitats and Species Regulations (2018), this transposes the EU Habitats Directive (Council Directive 92/43/EEC) into UK domestic law. It provides protection for sites and species deemed to be of conservation importance across Europe. It is an offence to deliberately capture, kill or injure species listed in Schedule 2 or to damage or destroy their breeding sites or shelter. It is also illegal to deliberately disturb these species in such a way that is likely to significantly impact on the local distribution or abundance or affect their ability to survive, breed and rear or nurture their young.

The Natural Environment and Rural Communities (NERC) Act 2006 requires that public bodies to have regard to the conservation of biodiversity. This means that Planning Authorities must consider biodiversity when planning or undertaking activities. Section 41 of the Act lists species found in England which were identified as requiring action under the UK Biodiversity Action Plan and which continue to be regarded as conservation priorities under the *UK Post-2010 Biodiversity Framework*.

2.1.2 National Planning Policy

Section 15 of the National Planning Policy Framework (NPPF) 'Conserving and enhancing the natural environment' states that planning policies and decisions should contribute to and enhance the natural environment. They should do this by protecting and enhancing sites of biodiversity and minimising impacts on and providing net gains for biodiversity, including establishing coherent ecological networks.

The plan states to protect and enhance biodiversity plans should identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks. This includes the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them. Plans should identify the protection and recovery of priority species and opportunities for securing measurable net gains for biodiversity.

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

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- if significant harm to biodiversity resulting from a development cannot be avoided, 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;
- 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 improve biodiversity in and around developments 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.

2.1.3 Local – Chichester District Council (2014 – 2029)

Chichester's Local Plan recognises that the natural environment is a key factor in terms of attracting residents, investment and tourism to the area and that one of these key environmental assets is biodiversity. The Plan seeks to protect and enhance the environmental assets, whilst allowing development in areas where potential environmental harm is minimal or can be adequately mitigated.

Countryside protection policies and the development of green infrastructure will provide links both for wildlife and for residents and help to protect the separate identity and distinct character of individual settlements.

The Plan emphasises that both Chichester and Pagham Harbour are internationally recognised sites of nature conservation importance, subject to a high level of environmental protection under European Union and UK legislation. Along with the Medmerry Realignment which is subject to the same protection as designated European sites.

All new developments are encouraged to take account of and incorporate biodiversity into their features at the design stage. Policy 49 protects sites of biodiversity importance, which contain wildlife features that are of special interest. Exceptions will only be made where no reasonable alternatives are available and the benefits of development clearly outweigh the negative impacts. Where a development proposal would result in any significant harm to biodiversity and geological interests that cannot be prevented or mitigated, appropriate compensation will be sought.

The Local Plan states that “Conserving biodiversity is not just about protecting rare species and designated nature conservation sites”. It also encompasses the more common and widespread species and habitats. The Council will seek to preserve and enhance the biodiversity diversity of the district.

Policy 49 ‘Biodiversity’ states that planning permission will be granted for development where it can be demonstrated that:

- The biodiversity value of the site is safeguarded;
- Demonstrable harm to habitats or species which are protected or which are of importance to biodiversity is avoided or mitigated;
- The proposal has incorporated features that enhance biodiversity as part of good design and sustainable development;
- The proposal protects, manages and enhances the District’s network of ecology, biodiversity and geological sites, including the international, national and local designated sites (statutory and non-statutory), priority habitats, wildlife corridors and stepping stones that connect them;
- Any individual or cumulative adverse impacts on sites are avoided;
- The benefits of development outweigh any adverse impact on the biodiversity on the site. Exceptions will only be made where no reasonable alternatives are available; and planning conditions and/or planning obligations may be imposed to mitigate or compensate for the harmful effects of the development.

New Strategic Policy S10 ‘Green Infrastructure’ is subject to proposed amendments that are currently out to public consultation. These include re-numbering the Policy to S9 Green Infrastructure which is still to seek the provision of connected habitats, linking the network of designated sites and existing priority sites.

3.0 METHODS

3.1 Emergence Surveys

The bat surveys on the Portshole Barn property were led by Madison Errington (n (operating under the license of Tristanna Boxall NE class level 2 bat licence number 2015-14147-CLS-CLS) with assistance from Amy Johnston, Craig Huntingford, Darla Brown, Harry Horn, Josh Morrisby, Kelly Clarke, Kelly Lavendar, Lewis Lakudzala, Matt Baldwin and Michelle Tebbs, all experienced ecologists with Ecosupport (with the approximate locations of the surveyors indicated in **Fig 3**). Both heterodyne (Bat Box Duet, Peterson D230 and Elkon Batscanner) and time expansion (Anabat Express, Elekon Batlogger) detectors were used for identifying species calls / analysis of calls via sonogram (where required). The dusk emergence surveys began approximately 15 minutes prior to sunset and continued until approximately an hour and 25 minutes after with a dawn survey commencing 1 hr 45 minutes before sunrise and continuing until 10 minutes past sunrise. Survey sheets were used to record the following information:

- Time of call registration
- Species (if possible to identify using heterodyne detector)
- Location / activity
- Direction of flight (if seen)

Figure 3. Approximate locations of the surveyors (red circles) located around property during the bat surveys (Google Maps 2022)



3.2 Limitations

There were not considered to be any significant limitations to the survey, with it undertaken during the accepted survey season (Collins (ed) 2016) and with all access points covered.

The only limitation was the unexpected weather conditions experienced during the second dusk survey. The beginning of the survey noted presence of rain, however this stopped 10-minutes after sunset with occasional drizzle throughout the remainder of the survey. Shortly after the rain stopped, an emergence was observed. Following this, foraging and commuting bats were recorded across site at similar bat activity levels to that of the first dusk survey. Taking into consideration the bat activity levels and that an emergence was observed, it can therefore be considered that the weather at the beginning of the survey was considered to not be a significant limitation.

4.0 RESULTS

4.1 Emergence / Re-entry Surveys

The results of the bat emergence / re-entry surveys along with other relevant information of survey conditions are provided in **Tables 1** and **2** below.

Table 1. Relevant information on survey conditions recorded.

Date	Temp (°C)	Cloud Cover (%)	Wind (beaufort scale)	Start Time	Sunset / Sunrise Time	Finish Time	Additional Information
26/07/22	19	60	2	20:43	20:58	22:28	Dry
22/08/22	22	100	1	19:55	20:10	21:40	Raining
09/09/22	15	10	2	05:00	06:27	06:45	Dry

Table 2. Results from bat surveys on Portshole Barn. HNS = Heard Not Seen and the results of the surveys are shown in **Figs 4 - 5**.

Survey Date	Recorded Bat Roost(s)	Bat Activity on Site		
		Species	First Pass	Last Pass
26/07/22 (dusk)	5x Common Pipistrelle emergences	Common Pipistrelle	21:06	22:21
		Soprano Pipistrelle	21:30	22:18
		<u>Summary:</u>		
		<p>Activity during this survey was considered to be low, with 32 cases of individuals foraging and commuting within / adjacent to the site. Species diversity was also low with 2 species recorded.</p> <p>The first species recorded on this survey was a Common Pipistrelle (<i>Pipistrellus pipistrellus</i>) at 21:06 as HNS. A <i>P.pipistrellus</i> was then observed at 21:22 emerging from a gap at the corner of the north-eastern aspect of the barn and then commuted north (Fig 4). A <i>P.pipistrellus</i> was observed at 21:32 emerging from a gap in the brickwork adjacent to the ivy of the southern aspect of the barn and then commuted west (Fig 5). Furthermore, 4 <i>P.pipistrellus</i> were observed as emerging from adjacent to the first emergence from a gap under the eaves at 21:56 (Fig 4). 3 further individuals were noted as intermittently foraging around and inside the barn and commuting across the site with the last <i>P.pipistrellus</i> recorded at 22:21 as HNS</p>		

		<p>The second and final, species recorded was a Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>), recorded at 21:30 foraging from east to south west and within the barn. A further 12 <i>P.pygmaeus</i> were recorded as foraging in front and around the barn and commuting across site until they were last recorded at 22:18 as HNS.</p>		
22/08/2022 (dusk)	1x Soprano Pipistrelle emergence	Species	First Pass	Last Pass
		Soprano Pipistrelle	20:32	21:12
		Common Pipistrelle	20:36	20:58
		Long-eared Bat	20:49	21:10
		<p><u>Summary:</u></p> <p>Activity during this survey was considered to be low with a total of 16 bat passes recorded. Species diversity was however moderate with a total of 4 species recorded throughout the survey.</p> <p>The first species recorded on this survey was a Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>) which was observed at 20:32 emerging from a gap underneath the felt overhang on the gable end of the western aspect of the barn and then commuted north (Fig 5). A further 4 <i>P.pygmaeus</i> were recorded as foraging in front and around the barn and commuting across site until they were last recorded at 22:12 as HNS.</p> <p>The second species recorded on this survey was a Common Pipistrelle (<i>Pipistrellus pipistrellus</i>) at 20:36 as HNS. Following this, 5 further individuals were recorded foraging inside and around the barn and commuting across the site. The final <i>P.pipistrellus</i> was recorded at 20:58 as HNS.</p> <p>The third, and final, species recorded on this survey was a Long-eared Bat (<i>Plecotus</i> spp.) at 20:49 as HNS. Following this, 3 further <i>Plecotus</i> spp. were then recorded as foraging towards the east and the commuting west over the barn at 21:10.</p>		

		Species	First Pass	Last Pass
09/09/2022 (dawn)	No re-entries	-	-	-
		<u>Summary:</u> No bat activity was observed throughout the duration of this survey.		

Figure 4. Location of the Common Pipistrelle emergences during the first survey (red circles)



Figure 5. Location of the Common Pipistrelle emergence (red circle) during the first survey and the Soprano Pipistrelle emergence during the second survey (yellow circle)



4.2 Barn Owl and Kestrel Activity

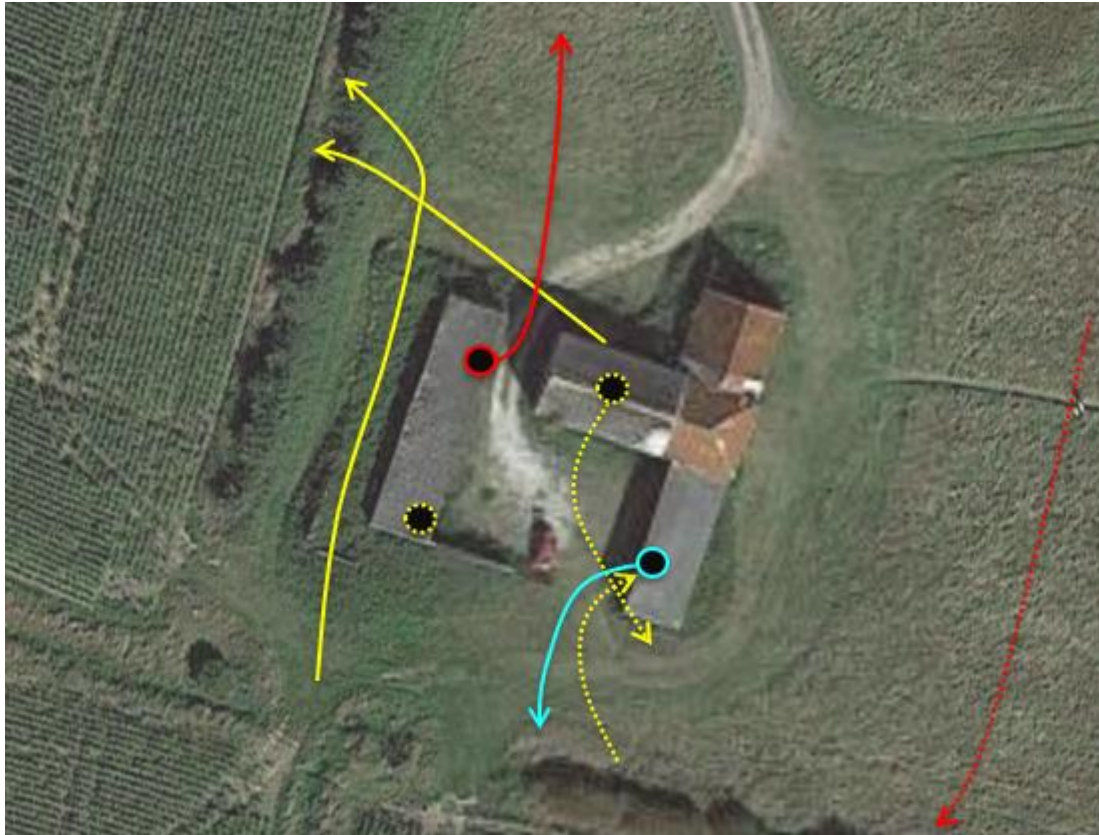
Prior to the start of the first survey, a single Barn Owl (*Tyto alba*) was observed as flying within the barn and then was observed as perched within the outbuilding where it then commuted north (**Fig 6**). Whilst at 21:19 a single Kestrel (*Falco tinnunculus*) was observed as commuting south overhead east of the site (**Fig 6**).

Prior to the start of the second survey, a single Kestrel was observed as perched on the ridge of the barn and then was observed as commuting southeast. At 20:04 a Kestrel individual was observed flying from the south into the lean-to of the barn, as well as a Kestrel observed perched within the nest box of the outbuilding. At 20:45 a Barn Owl was observed foraging behind the outbuilding towards the west. Furthermore, at 21:01 another Barn Owl individual was observed flying out of the barn and commuted west.

During the final survey, at 06:19 a pair of Barn Owls were observed as flying out of the lean-to of the barn, commuting south.

These incidental sightings support the Barn Owl and Kestrel usage and evidence identified in **Section 4.8** within the Preliminary Ecological Appraisal (Ecosupport 2022).

Figure 6. Activity flight lines (arrows) and perch sites (circle) of Barn Owls (solid line) and Kestrels (dashed line) identified during the surveys undertaken on-site (red = first survey, yellow = second survey, blue = third survey) (Google Maps 2022)



5.0 EVALUATION, IMPACTS & RECOMMENDATIONS

5.1 Summary & Evaluation of Results

5.1.1 Foraging and Commuting

Overall, the levels of foraging and commuting bats recorded on site during the surveys was low - moderate and comprised of common species only (Common Pipistrelle, Soprano Pipistrelle, Long-eared Bat). Given the size and nature of the development, and the surrounding urbanized habitat, it is considered there will only be **minor adverse impact** at the **Local Scale** for foraging and commuting bats.

5.1.2 Roosting

In total, 5 Common Pipistrelle's and 1 Soprano Pipistrelle were noted roosting within the area of impact (the locations are indicated above in **Figs 4 – 5** and below on proposed plans in **Figs 7 - 8**). Within the location whereby the 4 Common Pipistrelle's emerged from underneath the eaves during the first survey, it is considered that this roost would represent an example of a 'satellite roost'. The BCT guidelines (Collins (ed), 2016) describe such roost as:

'An alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of breeding females throughout the breeding season'

Whereas in the other locations, given the low max count numbers noted, it is considered those roosts would represent an example of 'day roosts'. The BCT guidelines (Collins (ed), 2016) describe such roosts as:

'A place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer'

Figure 7. Location of the Common Pipistrelle emergences (red circles) during the first survey and the Soprano Pipistrelle emergence during the second survey (yellow circle) as shown on proposed plans (provided by Architects Design & Management (ref: 1691 34))

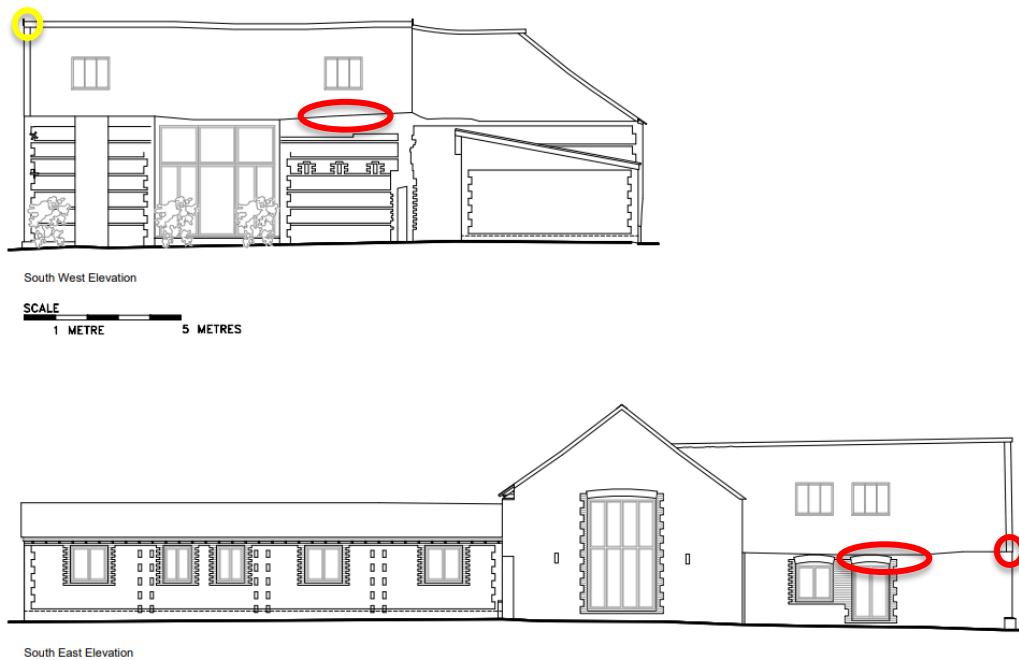
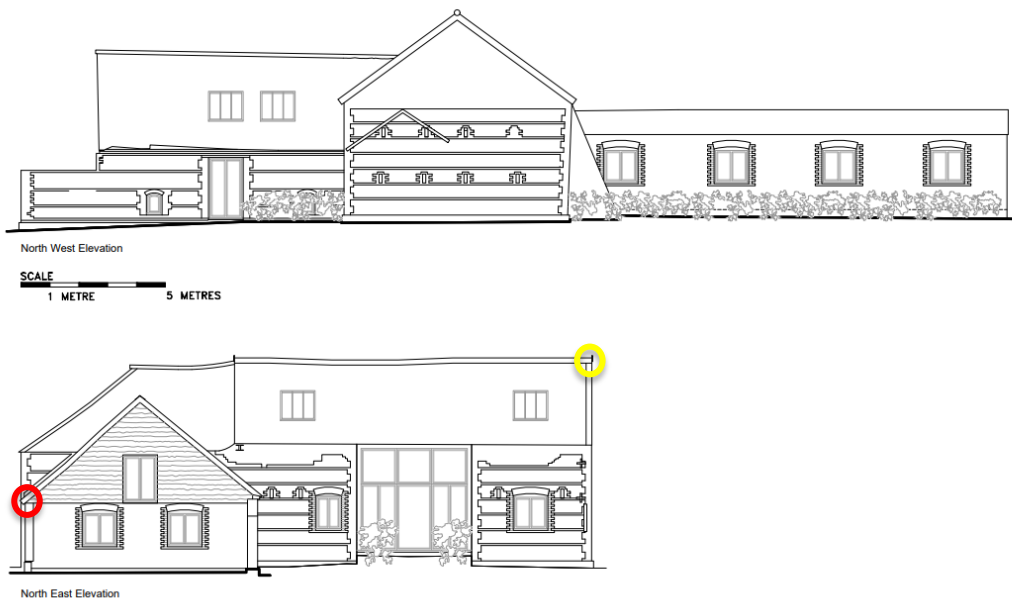


Figure 8. Location of the Common Pipistrelle emergence (red circle) during the first survey and the Soprano Pipistrelle emergence during the second survey (yellow circle) as shown on proposed plans (provided by Architects Design & Management (ref: 1691 33))



5.1.3 Site Status Assessment

In accordance with the *Bat Mitigation Guidelines* (Mitchell – Jones, 2004), the Common Pipistrelle and Soprano Pipistrelle roosts present within the barn are considered to be of **LOW CONSERVATION SIGNIFICANCE** and therefore of **LOCAL SIGNIFICANCE** using the IEEM valuation criteria for bat roosts (Wray et al., 2010).

5.1.4 Implications

Due to the presence of bat roosts within Portshole Barn, any works to the building that will result in damage or disturbance to the roosts (i.e. roofing works / works to the fascia) would likely constitute an offence under the Conservation of Habitats & Species Regulations (2010). In order for works that may result in such an offence (including demolition, modification of the building and repair) to legally take place, a European Protected Species (EPS) licence will be required. To inform an EPSL, the below sections detail appropriate mitigation and compensation measures.

5.1.5 Impacts in the absence of mitigation

In the absence of mitigation works (i.e obtaining a license, supervised works, providing compensatory roost locations ect), the proposals would result in the destruction and permanent loss of bat roosts, which would constitute a criminal offence as bats and their roosts are protected under legislation. This would therefore result in a ***certain impact*** at the ***local level***.

6.0 MITIGATION & COMPENSATION

6.1 Introduction

In order to fully comply with applicable legislation and planning policy, it is necessary to mitigate or compensate for any significant ecological impacts.

The chapter is divided into three sections, dealing with mitigation, compensation and enhancement. Mitigation refers to measures that can be undertaken to avoid or reduce ecological impacts, for example, by timing works to avoid periods when bats are roosting. Compensation refers to measures taken in order to offset potential significant impacts, for example by providing alternative roost sites to replace roost sites lost as a result of the works.

6.2 Bats

6.2.1 EPS Licence

All works that affect bat roosts carried out on the Portshole Barn (as per **Fig 4 & 5** and **Figs 7 & 8**) must take place under an EPSL obtained from Natural England and the destruction of the roosts and capture of bats (if required) will need to be carried out under the supervision of a licenced Ecologist. All works would be detailed within the EPSL Method Statement required as part of the licence application.

6.2.2 Timing

It is recommended that works avoid the hibernation period (November – February), when bats are in a torpid state and therefore more vulnerable, but also within the optimum period for carrying out works (as per Bat Mitigation Guidelines). Given that the roosts present are day roosts, no further timing restrictions will be required. It is therefore recommended that works are carried out between March and October. Works will take place in suitable weather conditions (i.e when overnight temperatures do not drop below 8 degrees immediately prior to or after works to the roosts take place) as defined by best practice guidance (Mitchell-Jones et al. 2004).

6.2.3 Supervision

Prior to any works getting underway the licensed bat worker will give a Tool Box talk which will detail best practice methods of sensitive stripping/removal of roofing tiles/materials, sensitive demolition of the building once the areas surrounding the roosts have been stripped and identifying signs of bats. Personnel will be educated on signs of bats and that, in the unlikely event a bat is found whilst the licensed ecologist is not on site, that all works should stop immediately until the licensee returns to site.

The licensed bat worker will then assist contractors with the removal of construction materials surrounding the roosts and any other areas which are considered to be high risk for roosting bats.

6.2.4 Capture (if required)

If during the sensitive removal of construction materials bats are discovered, the supervising ecologist will place the individuals into a holding bag (a soft cloth bag with closure-strings and with seams on the outside (Mitchell-Jones and McLeish, 2004)) to ensure the bat keeps calm and will not take flight during daylight hours. They will then immediately transport the bat to one of the mitigating bat boxes where the bat will be released and left undisturbed. During this time, the licenced bat worker will be wearing appropriate bat handling gloves to ensure the bat does not come to any harm. The licenced bat worker will have ample experience in handling a variety of bats and is confident in doing so.

6.2.5 Bat boxes

A Pole mounted maternity bat box will be installed within the garden to provide an alternative roosting location for the bats during the survey. The 5m pole with two bat boxes attached will be used to provide roosting opportunities for both Common and Soprano Pipistrelle. These boxes provide a suitable alternative roost location for individual / small numbers of bats whilst the works take place. This provides ideal quarters for bats that inhabit crevices, such as Pipistrelles.

6.2.6 Roof underlining

To cover for the eventuality that the converted dwelling may become suitable for bats in the future, roofing felt must be utilized in-line with Natural England guidance. Non-bitumen coated roofing membrane that has passed a 'snagging propensity test' (2022) or bitumen roofing felt (2015) should be utilised as opposed to Breathable Roof Membrane (BRM) for all roofing works as there is considerable evidence to suggest that BRM poses a threat to bats occupying a structure due to entanglement in the fibres (Natural England, 2015)

6.3 Compensation

Given the presence of a number of separate roosts on site which range from local level of significance, the most appropriate compensation would be the long term retention of the above measure in combination with the provision of new roosting opportunities within the converted building on site. The steps outlined below will be incorporated within the new development.

6.3.1 Common / Soprano Pipistrelles

Four new bat accesses in various positions will be installed to provide direct access into the loft space. This will provide a variety of entrance points and the locations have been selected to be as close as possible to the existing entrance locations to increase the likelihood of use.

Examples of two types of tiles that can be used (one at the ridge one to replace a regular tile) are shown below in **Fig 9**. It will be necessary to ensure that there are also gaps in the bitumen underlining and wooden sarking at these locations to provide direct access into the loft area as required. The above mitigation, alongside any natural gaps that are present between tiles, will provide ideal roosting access for the Common and Soprano Pipistrelle roosts as well as provide suitable roosting opportunities for a range of other species.

Figure 9. Example of two types of bat access tiles.



6.4 Monitoring and Maintenance

The *Bat Mitigation Guidelines* do not recommend further conditions in relation to the post development monitoring of bat roosts of low conservation significance. However, a compliance check will be carried out to ensure all agreed mitigation and compensation techniques have been implemented.

6.5 Barn Owls

6.5.1 Introduction

The following measures will reduce as far as possible the adverse impact upon the Barn Owl identified within Portshole Barn during the PEA and bat surveys.

6.5.2 Compensation – Barn Owl Box

To compensate for the loss of the Barn Owl perching sites in the barn, 1 No Barn Owl box will be provided on a pole (as per the design provided by the Barn Owl Trust). The pole will include additional horizontal wooden poles that can be used for perching (with the box providing potential nesting site). The box should ideally be placed at least 5 metres above the ground with a good viewpoint and be erected at least three months prior to works commencing on site. Indicative location of where this feature will be located is shown below in **Figure 10**.

Figure 10. Approximate redline boundary of the site with the indicative locations of the mounted Barn Owl box (yellow star) and Kestrel nest box (blue star) will be located (Magic Maps 2022)



6.5.3 Timing Constraints

Where possible, works will be undertaken outside of the bird nesting season, which spans March-August inclusive, to avoid any active nests being impacted. This timing largely coincides with restrictions associated with the mitigation for roosting bats. That being said, Barn Owls can nest throughout the year, and therefore works must be preceded by a nesting bird survey by a Suitability Qualified Ecologist (SQE). Should any active nests be identified a 5 metre buffer zone must be implemented around the nest until the chicks have fully fledged and the nest has been deemed inactive by the SQE (Natural England, 2015).

6.5.4 Barn Access Point

During construction works, if at any time all suitable access points for Barn Owls will be blocked by scaffolding, protective sheeting etc., the barn must first be checked by the supervising SQE for the presence of the Barn Owl(s). If present, the access point will be blocked at an appropriate time of day by the supervising SQE, once the Barn Owl has vacated the barn.

6.6 Additional Recommendations

6.6.1 Minimisation of Disturbance to Nocturnal Wildlife

A document (*Guidance Note 08/18 Bats and Artificial Lighting in the UK*) has been produced via a collaboration between the Institute of Lighting Professionals (ILP) and the Bat Conservation Trust (BCT), which outlines the latest recommendations to minimise the impacts of increased artificial lighting on bats. The key recommendations within this document have been outlined below and will be implemented provided there are no conflicts with any legal limits of illumination (in which case a suitable compromise should be reached).

‘Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following should be considered when choosing luminaires:

- *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 can 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 – See 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.*
- *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’ (Fig 11).*

Figure 11. (a) Shield 'barn doors' (b) cowl hood; (c) shield and; (d) external louvre Images from ILP (2011).



6.6.2 Bat Box

To act as biodiversity enhancement, a bat box will be erected onto the south of the barn. Woodstone or Woodcrete boxes are preferred as they are suitable for long-term use. The Beaumaris Woodstone bat box or the Schwegler 2FE box is recommended as it is suitable as a wall-mounted feature (**Fig 12**). These boxes are suitable for crevice-dwelling species such as Pipistrelle bats.

Figure 12. Beaumaris Woodstone bat box (left) and Schwegler 2FE bat box (right) which will be erected onto the barn.



7.0 REFERENCES

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