HENDRA FARM

BAT EMERGENCE

&

REMOTE MONITORING SURVEYS

SOUTHERN FACE, POSITION 1.

Report reference: *HEA972b2023*

Date: November 2023

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Site Location: - *Hendra Farm, Darite, Liskeard, Cornwall. PL14 5HJ*

Grid reference: - *SX 25506 69568*

Surveyors: - *Jessica Hutchinson, Christopher Maule, Coral Edgecombe, Tamar Horn and Martin Williams.*

Natural England Licence numbers: - *2015-15065-cls-cls (Bats) JESSICA HUTCHINSON*

Date of Survey(s): 31st August - 03rd October 2023

Document Control		
Action	**Personnel**	**Date**
Set-up by	Chris Maule	23/10/2023
Prepared by	Jessica Hutchinson/Christopher Maule	23/10/2022
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Revision details					
Revision	**Date**	**Comments**	**Prepared by**	**Reviewed by**	**Approved by**
Final	21/11/2023		Jessica Hutchinson	Chris Maule	Jessica Hutchinson

EXECUTIVE SUMMARY

Brief Survey Summary	
Bats:	A day roost of Common Pipistrelles is present within the roof void and associated roofing materials of the Site. Pipistrell droppings were present within the roof void and bats were emergent from the structure. A good diversity of species were recorded around the Site, eight species in total inclusive of both the Rarer annex ii Horseshoe species, Greater and Lesser.
Further Work:	The mitigation included within this report is subject to any deviation resultant of any differing requirements under a European Protected Species License granted by Natural England. The proposed works would require a minimum of a Bat Mitigation License (BML) to legally commence with the proposed scheme of an additional storey. If the terms and conditions of the BML cannot be met then a European Protected Species Mitigation (EPSM) License, or similar, will need to be obtained. Mitigation is proposed in the creation of similar habitat within the roofing materials of the extended property. A minimum of four crevice features will be provided at the wall tops and within the ridge to facilitate future roosting by Pipistrelles. In the knowledge that the Site is a confirmed roost only membranes certified as suitable for use within a bat roost will be used. Lighting around roosting features will be constrained. Regarding all protected species, vigilance when works are undertaken, and timing of works are of great importance and should any evidence of a protected species be identified then further advice must be sought from the ecologist before works recommence. Refer to the timing chart in Appendix 1 for reference to breeding birds and bats. If works do not commence within a year of this survey an updated survey will be required.

CONTENTS

HENDRA FARM

BAT EMERGENCE AND REMOTE MONITORING SURVEYS

1. Introduction

Hutchinson Ecological Associates[1] were contracted to undertake further assessment of the building Hendra Farm (here after referred to as the Site) regarding bats, post the Preliminary Roost Feature Assessment (PRFA) identifying evidence of bats within the roof void.

As bats are legally protected within the UK, refer to Appendix 2 for legislation detail, it is essential that the species and populations at a site are fully assessed to ensure that the proposed scheme can be managed to maintain a Favourable Conservation Status (FCS); no overall significant impact on the bat species using the site; Aims & Objectives, and Methodology are included within Appendix 2.

Hendra Farm is a single storey L-shaped bungalow constructed mainly of rendered block with stone cladding on the southern face. There is a single large roof void beneath a pitched slate roof which is underlain with bitumen felt and insulted across the floor.

The immediate habitat surrounding the Site is amenity gardens comprising of lawn and boarders with gravelled driveway that provides access from the South and extends in part around the whole structure. Agriculture buildings are to the East and West with some residential dwellings to the South and West. The wider habitat extends into pasture fields with mature hedges that extend to the North to open moorland and to the South into the wood Tremarcoombe valley.

The Site is located equal-distant between the villages of Darite to the southeast and Higher Tremarcoombe to the southwest and situated within Bodmin Moor in southeast Cornwall. The Cornish towns of Liskeard is approx. 4.5km to the Southand Launceston approx. 15km northeast and the City of Plymouth approx. 25km to the southeast.

Our understanding is that an application is to be made to the Local Planning Authority (LPA), to add second storey to the property within the same footprint. The proposed plans have not been viewed. This report is, therefore, required to support the application to the Local Planning Authority (LPA).

An aerial view of the Site is outlined within Figure 1 with supporting photographs on the front cover and within Figure 2.

[1] *hereafter referred to as HEA*

2. Results: Background, Historical Records and Survey

Consideration to constraints must be applied when interpreting the results from all the completed surveys. The results of the site-specific surveys are included within the below figures and photos.

2.1 Background and Historical Data

Due to the small size of the Site, no data search from the local records centre was deemed necessary and online resources were utilised. These included the National Biodiversity Network (NBN), MAGIC and Natural England.

NBN (2023)

A single species of bat, the Common Pipistrelle, has been recorded within a 0.5km of the Site with a further species, Daubenton's, been recorded within 1km's. Greater & Lesser Horseshoe bats have been recorded within 2km radius with a further two species within 5kms, Natterer's and Brown Long-eared. Soprano Pipistrelle and Noctule have been recorded within a 10km radius.

Magic (2023)

A European Protected Species Mitigation Licence (EPSM) has been granted for destruction of a resting place of Lesser Horseshoe licence number 2020-20302020-48376-EPS-MIT 1.1km to the South.

2.2 Previous survey effort

Previous survey effort completed within August 2023 by HEAecology identified bat droppings indicative of Pipistrelle within the roof void; it is not possible to determined which pipistrelle species is present from droppings alone.

2.3 Site Description

Hendra Farm is a relatively modern L-shaped bungalow of block construction with some aesthetic stone cladding to the South. It has a pitched slated roof and a single large, insulted roof void with bitumen underlay. Access into features of the structure and the roof void are readily available at wall tops, eaves, ridge and lead flashing.

2.4 Survey Conditions

All the 2023 surveys were completed within optimal weather conditions at a suitable time of year and within suitable parameters for the survey completed. The conditions in which these were undertaken are listed in chronological order in Appendix 3.

2.5 Survey Constraints

There were no significant constraints to the survey other than they did not span the entire season.
The remote monitoring detectors batteries ran for the full duration of the deployment.

2.6 Survey Results

Day roost of low numbers of Common Pipistrelle bats were recorded emergent from the Site.

The location of bat evidence and emergent bats is illustrated on the photos included within Figure 2 and the results plan in Figure 3. Sonograms of emergent bats are included within Figure 4.

A good diversity of species (eight) was recorded around the site during the survey effort and included both the rare Greater & Leser Horseshoe species and, Common & Soprano Pipistrelle, Natterer's and Daubenton's, Noctule and Long-eared bats.

2.5.1 Emergence Surveys

The position of the surveyors are illustrated within Figure 1 along with surveyor information.

31/08/2023
Four bats of a single species, Common Pipstrelle, were emergent from or entered the southern face gable end and include; 20:22 emergent at the ridge, 20:28 entering at the ridge, 20:36 emergent from the ridge, and, 21:26 entered the West pitch wall top.

Six species of bat were recorded using the Site or surrounding area and include, in order of abundance: Common Pipistrelle, Soprano Pipistrelle, Noctule, Long-eared, Natterer's and Daubenton's.

15/09/2023
Two bats of a single species, Common Pipistrelle, were recorded emergent from the well tops on the West pitch of the southern gable end at 20:04 and 20:05.

Five species of bat were recorded using the Site or surrounding area and include, in order of abundance: Common Pipistrelle, Soprano Pipistrelle, Noctule, Long-eared and Daubenton's.

03/10/2023
No bats were recorded emergent or entrant.

Five species of bat were recorded using the Site or surrounding area and include, in order of abundance: Common Pipistrelle, Soprano Pipistrelle, Noctule, Long-eared and Daubenton's.

2.5.2 Remote Monitoring

A single Wildlife Acoustics Song Meter Mini was deployed in the roof space from the 15/09/2023 to the 03/10/2023, recording for 18 nights. No bat species were recorded.

3. Discussion and Impact Evaluation

The site comprises of a single building and immediate surrounding gravel driveway and amenity garden, typical of a residential dwelling and habitats of predominantly low grade and low in species diversity. No significant impacts upon the site habitats are significant beyond at site level, except for the building, which is used by bats, a protected species. Impacts on the building will therefore be a material consideration during planning with likely local/parish level impacts envisaged with the implementation of mitigation. The impacts are evaluated below in table 1.

Due to bat roosts being present, which will be disturbed and in part destroyed by the proposed works then legally a derogation license needs to be in place before works commence on bat roosting features.

In the absence of mitigation and a license there is the potential during works for the destruction of the day roost with potential for individual bats to be killed and the roosts permanently lost. This would have a minor adverse effect upon this species population at a local/parish level (being a common and widespread species. However, this would be an offence with heavy unlimited fines and a potential six-month prison sentence. Post completion of the works then bats may be able to return and roost in similar features, albeit not the original protected roost and not suitable materials, therefore it is unlikely that there would be any long-term impact or residual effect on the Favourable Conservation status (FCS) of this species. There would; however, be the risk of adverse cumulative effects if similar projects were undertaken nearby in a similar manner and impacts upon the FCS could then heighten in adversity.

With the implementation of mitigation there will be temporary minor adverse impacts on the bat population roosting at the site whilst works are being completed however, with the inclusion of new or retained roosting features then a negligible residual effect is envisaged. Cumulative effects would also be negligible with the implementation of proportionate mitigation even potentially becoming minor beneficial with the inclusion of enhancement features.

Common Pipistrelle
Common Pipistrelles are a common and widespread species, the most abundant in the UK. This species inhabits crevices and is often found in bat boxes and trees within woodland as well as within buildings. The presence of a day roost of low numbers/individuals deems the site to be of local/parish importance to the nature conservation of this species.

Table 1 – Bat Roosts & Impact Evaluation

Species	Number (at least)	Roost Type	Structure	Location & Access	Conservation Status	Roost Value	Impacts in absence of mitigation				Impacts with Mitigation			
							Short-term	Long-term	Residual effects	Cumulative effects	Short-term	Long-term	Residual effects	Cumulative effects
Common Pipistrelle	4	Day	Hendra Farm Bungalow	Roof void, ridge, wall-tops	Low	Local	Minor adverse: destruction of bat roost, potential to kill injure or harm bats	Minor adverse; bats loose current roost however similar likely habitat may become available with time	Negligible–Minor adverse if habitat suitable for individuals to roost does not become available with time.	Negligible–Minor adverse; should similar impacts be undertaken upon similar roosts within the locality	Minor adverse; disturbances during works	Negligible; mitigation implemented, and bat roosting features and enhancements become established	Negligible - Minor beneficial	Negligible - Minor beneficial

4. Recommendations and Mitigation

If works do not commence within twelve months of this survey being undertaken an updated survey will be required prior to commencement of works to ensure that the status of the Site, regarding these species, has not altered. Post two – three years a full re-survey will be required in accordance with Natural England guidance. The inclusion of any enhancements referred to in the below text is at the discretion of the site owner / developer.

Mitigation and enhancement feature designs are included within Figure 5, the proposed locations of these are still to be determined.

4.1 License

A day roost of Common Pipistrelle bats will be disturbed or destroyed by the proposed works. Therefore, a derogation license will need to be obtained from Natural England before works commence and cover the roosts listed above.

Such a licence will need to provide details regarding maintaining the Favourable Conservation Status (FCS) of the Site through mitigation and be in place before works commence on features used by roosting bats. The Local Planning Authority (LPA) will also be looking to achieve a net gain to biodiversity to comply with the current legislation.

Due to the presence of a single roost of a common and widespread species at the Site a Bat Mitigation License (BML) license could be used if the terms and conditions can be complied with. If the terms and conditions cannot be met, then a European Protected Species Mitigation (EPSM) license will be required. A fuller description of the licences and procedure are available within Appendix 4.

4.2 Further work

Should the application to Natural England be older than three months of age from the most recent survey then a site walkover will need to be completed or, if older than twelve months since last survey then the site will need to be re-assessed with a building inspection possibly supported by an emergence or dawn re-entry survey if the environs have significantly deviated.

4.3 Mitigation

Note; that all mitigation proposals are subject to any differing requirements under a derogation license granted by Natural England. The mitigation locations may need to be determined and positioned within the plans.

Both temporary and permanent mitigation features will be required to maintain the FCS at the site for the current population dynamics and species.

Temporary mitigation will be in the form of two wooden wedge-shaped bat boxes mounted onto nearby trees to West. This mitigation will be used as receptor sites for any bats encountered and requiring movement during the licensable works and be retained to provide a future enhancement and net gain.

Permanent mitigation will by means of creation of similar crevice habitat to that currently used for roosting and the creation of roosting features within the ridge of the roofing. Four wall top type access will be created on the Southern gable end and two ridge access will be provided, one of the southern gable end and another on the ridge elsewhere. Suitable designs to implement these features are included within Figure 5.

The roof void will be underlain with Bitumen 747 felt or a membrane certificated as safe for use in bat roosts; man-made breathable membranes are hazardous to bats and very few are safe for use within a bat roost.

Timing of works, where possible, to avoid times of peak impact are also essential in ensuring minimal impacts, avoidance of maternity (June – August inclusive) and hibernation (November/December – Feb/March) are advisable; note that this is best practice and not a total close on this window of time and unlikely to impact this Site.

Regarding lighting, all lighting will be absent or constrained to the minimal health and safety requirement by bat roosting features, enhancements, and the periphery of the site. This is to ensure that nocturnal activities are not significantly disturbed. Overspill from the windows and doors of the new residential structure can be constrained internally by light fittings being set back into the rooms away from windows. Security lights will be restricted to the duration which they are on for and angled away from any feature used by bats. Any additional lighting must be compliant with the Bats and Artificial Lighting at Night Guidance note (https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/)

Where inclusion of permanent mitigation features will disturb, destroy, or modify a bat roost these will need to be implemented under license from Natural England, this will have to be in place before works commence. During works in such areas, i.e. removing the features beneath which bats reside, a watching brief and supervision will be required from a suitably qualified bat ecologist as part of the license terms and conditions.

4.4 Enhancement

If wanting to provide further enhancement of the site, then a range of bat boxes or features could be included in the design. It is recommended that further enhancements are discussed with the ecologist before being implemented and that at very least enhancement in line with the LPA policies are included; LPA enhancements may vary between LPA's.

4.5 Non-licensable works

Not all works on the site will require a license to proceed. Prior to the commencement of works the ecologist will be consulted regarding the construction program and provide a list of actions that can be undertaken without licensing.

Before works commence, all operatives will be provided with a "toolbox" talk regarding the ecological constraints at the Site. This will include the legal implications and each operative's responsibilities.

Due to the nature of the taxon, it is recommended that any workers commencing work within the site prior to obtaining the necessary assents are vigilant at all times. If a bat is disturbed at any point as "an incidental action of an otherwise legal operation" then works must cease immediately with further advice sought from a suitably qualified, Natural England Licensed bat ecologist and Natural England, to whom the incident must be reported. The ecologist will then determine how works will proceed. Re-commencement may require the preparation of a methods statement in agreement with Natural England, if an offence is likely to be committed, or an amendment or application made to Natural England for an EPS license.

4.6 Once the license has been granted

The ecologist may need to attend site prior to commencement to assess and undertake any necessary exclusions.

When destroying or disturbing the bat roost, i.e. removing the features beneath which bats reside, a watching brief and supervision will be required from a suitably qualified bat ecologist as part of the license terms and conditions. These works will also be timed to minimise impacts upon the bats.

Any significant time delays or deviation from the original license terms and conditions at the time of being granted will need to be re-submitted to Natural England and agreed.

4.7 Monitoring

Due to only a single bat of the most abundant UK species, common and widespread, having been recorded it is not determined that and post licensing monitoring will be required. Should this alter or an EPSM be required then the necessity for post license monitoring may alter and be proportionately required; this will be species and population dependant.

5. Conclusions

Any development will have an impact upon local nature conservation and ecology either directly or indirectly, regardless of the scale. Despite this, the inclusion of mitigation and enhancement features can achieve an overall net gain to biodiversity; this does not necessarily need to be targeted at the species impacted upon most significantly but attain an overall improvement in habitat quality and maintain a Favourable Conservation Status (FCS).

A BML derogation license will need to be granted from Natural England before works on the roof and roof void of the building on the Site can commence. Such a license will need to be obtained for day roosts of Common Pipistrelle bats.

Mitigation is prosed with temporary mitigation during works consisting of two wooden bat boxes mounted on nearby trees and the creation of similar roosting features (four wall top and two ridge) within the new roof on the newly constructed first floor. This mitigation will be subject to any deviation and change required for licencing; suitable methods of implementing the mitigation are included within the figures. Only Bitumen 747 1F type or certificated as safe for use within bat roost underlay will be used, and lighting will be constrained and only that specified suitable for bats.

As with all works, vigilance for any protected species or signs of, is always recommended by all workers. Should evidence of a protected species or an individual be identified then works must stop and further advice sought from the ecologist.

If works do not commence within twelve months of this survey an update survey will be required to ensure that the status of the Site, regarding these species, has not significantly altered. Post 2-3 years a full Site re-survey will be require in accordance with Natural England guidelines.

6. References

- HEAecology (2023). Hendra Farm; Preliminary Roost Feature Assessment for Bats, Barn owls and Nesting birds.

Figure 1 – Google Earth Image Extract of the Site

Above: The site, within the red line, with the structure indicated by the red arrow. Surveyor positions are illustrated by the yellow arrows.

Below: table of surveyors and positions.

Date	Position	Surveyor
31/08/2023	1	CE
31/08/2023	2	TH
31/08/2023	3	CM
15/09/2023	1	LM
15/09/2023	2	JH
15/09/2023	3	CM
03/10/2023	1	CM
03/10/2023	2	MW
03/10/2023	3	CM

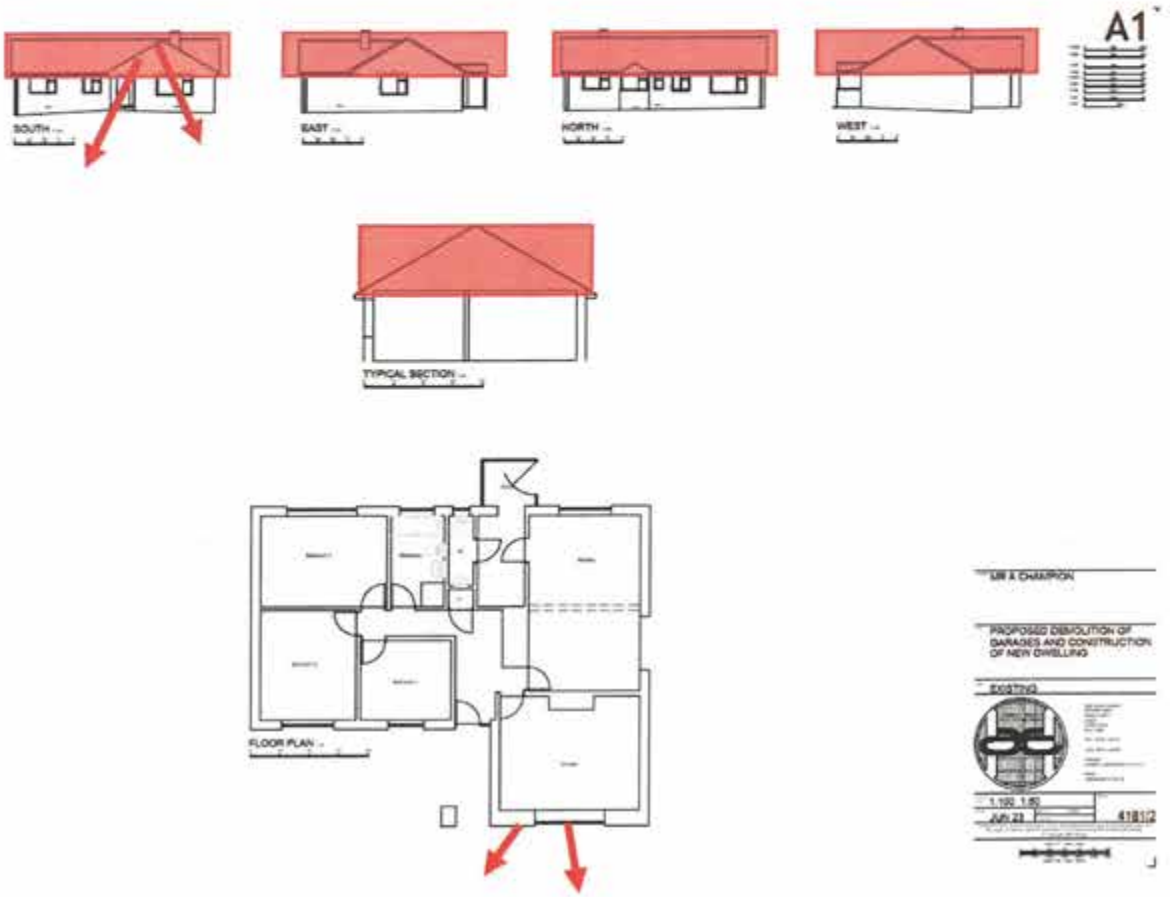
Figure 2 – Photos of the Site

Figure 1. Surveyor position 3. The red arrows illustrate the location of emergent Common Pipistrelle bats.

Figure 2. Surveyor possitoin 1.

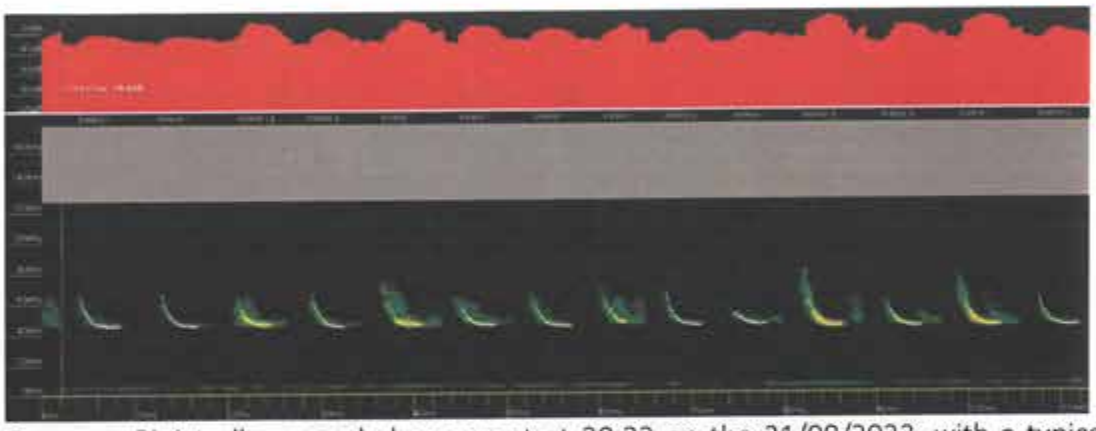
Figure 2. Surveyor possitoin 1.

Figure 3 – Results plan

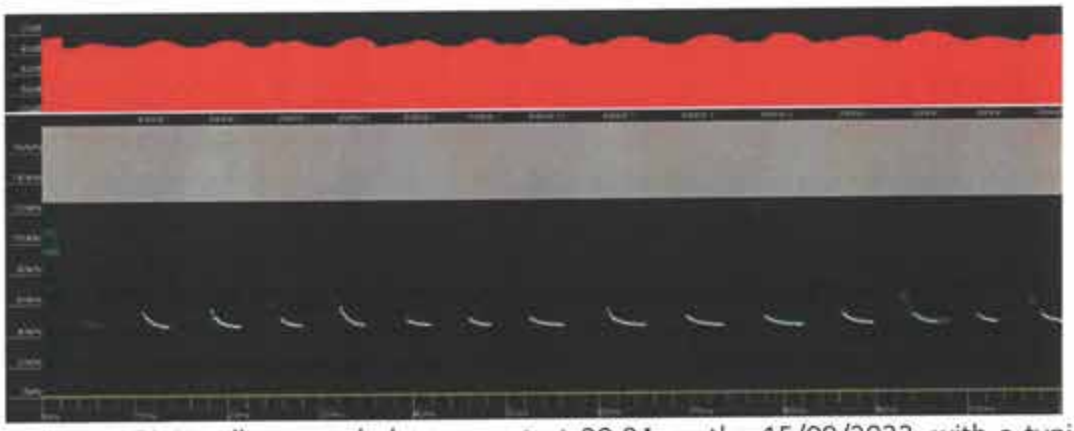


The red shaded areas illustrate the bat roost and where bat droppings were recorded, the greatest density beneath the apexes. The red arrow illustrates the location of emergent bats.

Figure 4 – Sonograms of bats recorded at the Site

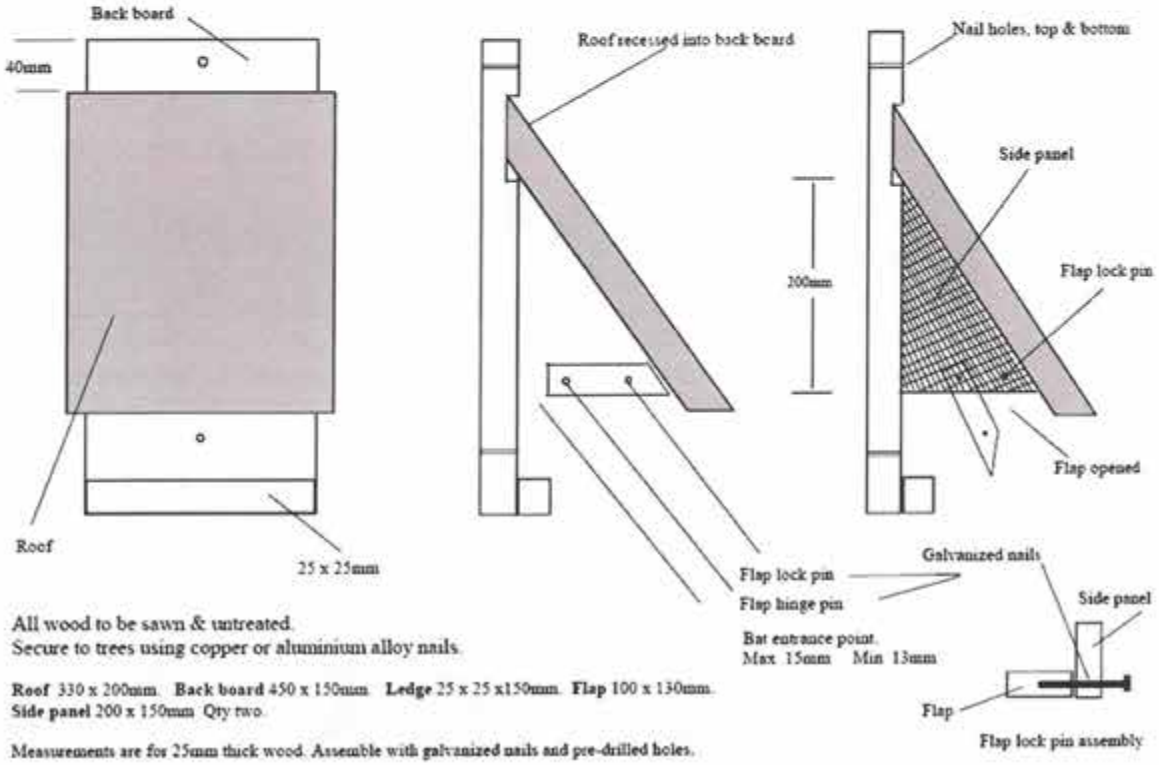
a. 

Common Pipistrelle, recorded emergent at 20:22 on the 31/08/2023, with a typical quasi frequency modulated to constant frequency hockey shaped call with a peak frequency of approx. 45k Hz (Russ, 2012).

b. 

Common Pipistrelle, recorded emergent at 20:04 on the 15/09/2023, with a typical quasi frequency modulated to constant frequency hockey shaped call with a peak frequency of approx. 45k Hz (Russ, 2012).

Figure 5 – Mitigation: Bat Boxes and roosting features that can be included into the design



a.

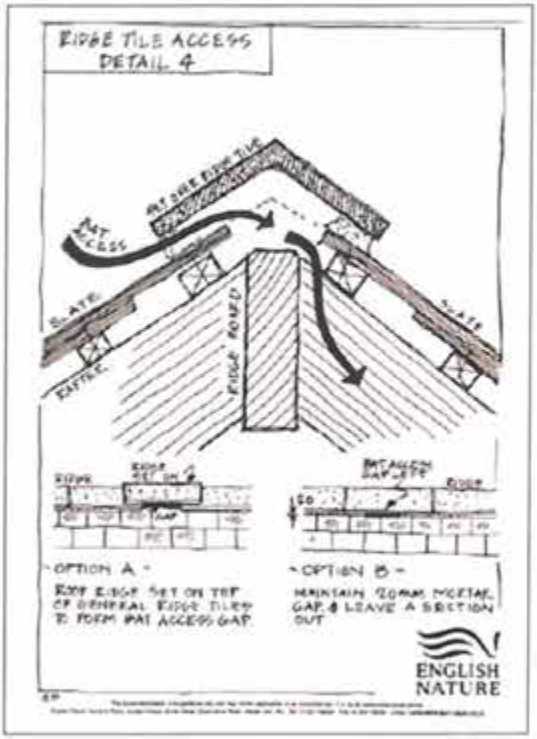
Wooden wedge-shaped bat boxes to be used as temporary mitigation

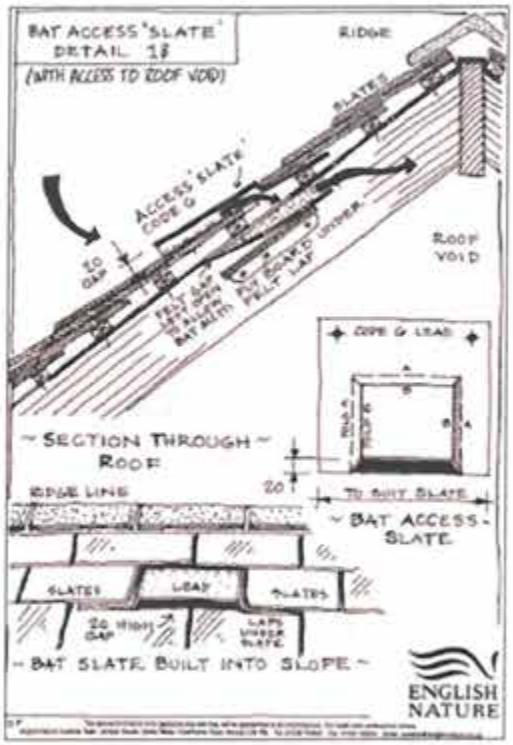
b.

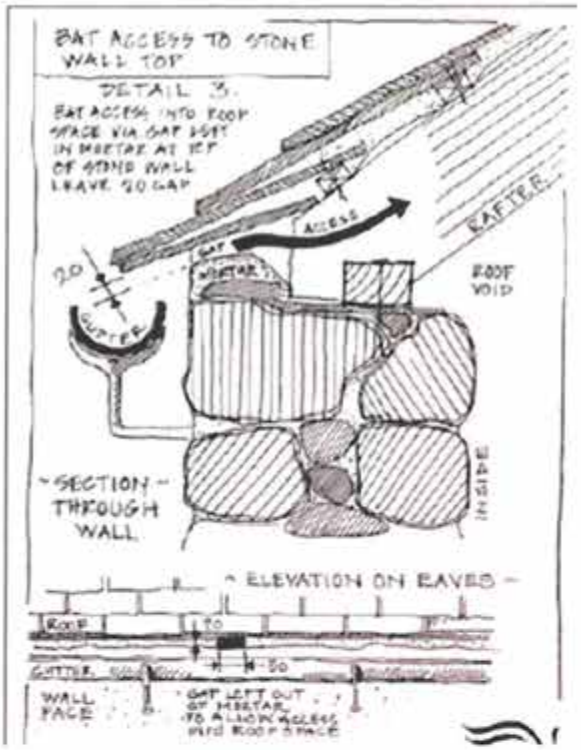
Bat boxes to be used as permanent mitigation, constructed into the new residences. Left, Bat Access Unit, and, right, Habitat Bat Box. These designs are suggestive and better designs in keeping with the construction character may be substituted in.

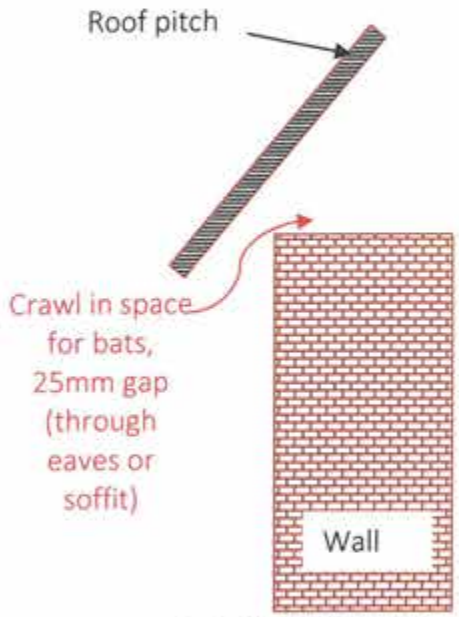
c. Norfolk bat Brick

d. Ibstock Bat Brick A

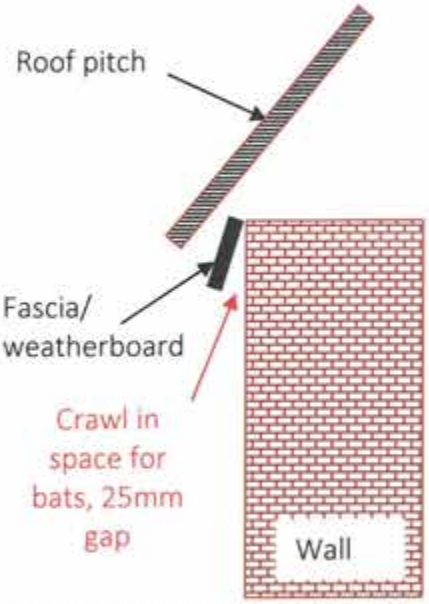

RIDGE TILE ACCESS
DETAIL 4
BAT ACCESS
SLATE
RAFTER
RIDGE BOARD
SLATE
- OPTION A -
- OPTION B -
ENGLISH
NATURE


BAT ACCESS 'SLATE'
DETAIL 1B
(WITH ACCESS TO ROOF VOID)
RIDGE
SLATES
ACCESS 'SLATE'
CODE 6
ROOF
VOID
20
GAP
- SECTION THROUGH -
ROOF
CODE 6 LEAD
RIDGE LINE
20
TO SUIT SLATE
- BAT ACCESS -
SLATE
SLATES
LEAD
SLATES
20 HIGH
GAP
- BAT SLATE BUILT INTO SLOPE -
ENGLISH
NATURE

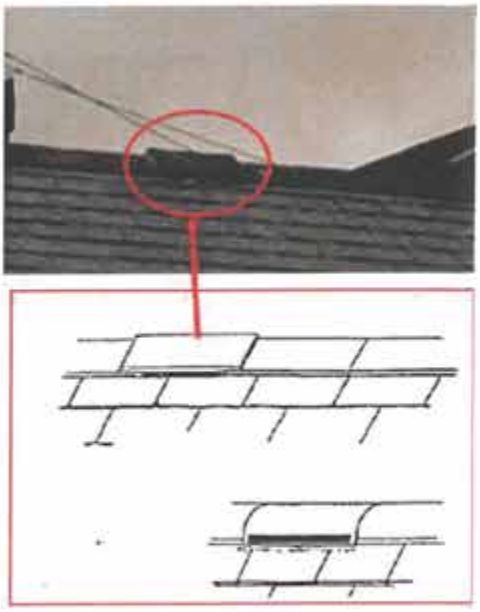

BAT ACCESS TO STONE
WALL TOP
DETAIL 3.
BAT ACCESS INTO ROOF
SPACE VIA GAP LEFT
IN MORTAR AT TOP
OF STONE WALL
LEAVE 20 GAP
ACCESS
BAT
MORTAR
RAFTER
ROOF
VOID
20
GUTTER
- SECTION -
THROUGH
WALL
INSIDE
- ELEVATION ON EAVES -
ROOF
TO
GUTTER
20
WALL
FACE
GAP LEFT OUT
OF MORTAR
TO ALLOW ACCESS
INTO ROOF SPACE



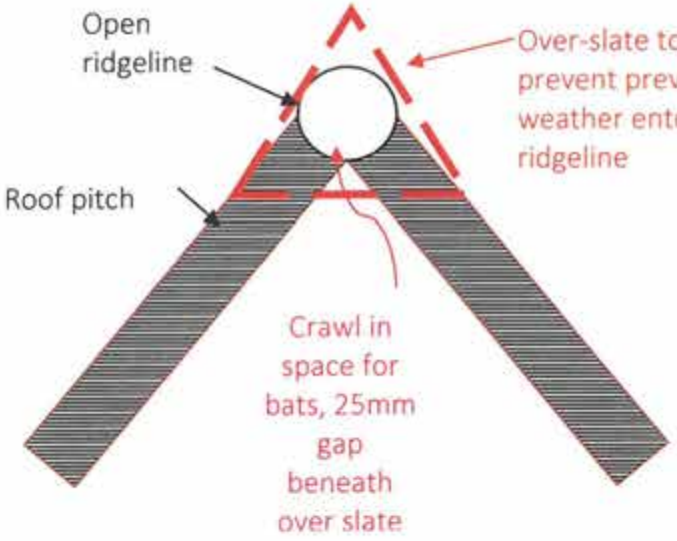
a. Wall Top access



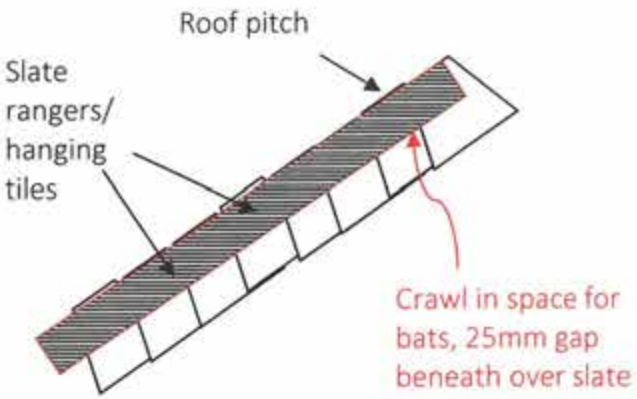
b. Facia/weather board access



c. Raised ridge tiles



d. Ridgeline Access



e. Slate ranger access

f. Ridge-line access

g. Bat slates

APPENDICES

Appendix 1 – Bat and Bird Timing Chart

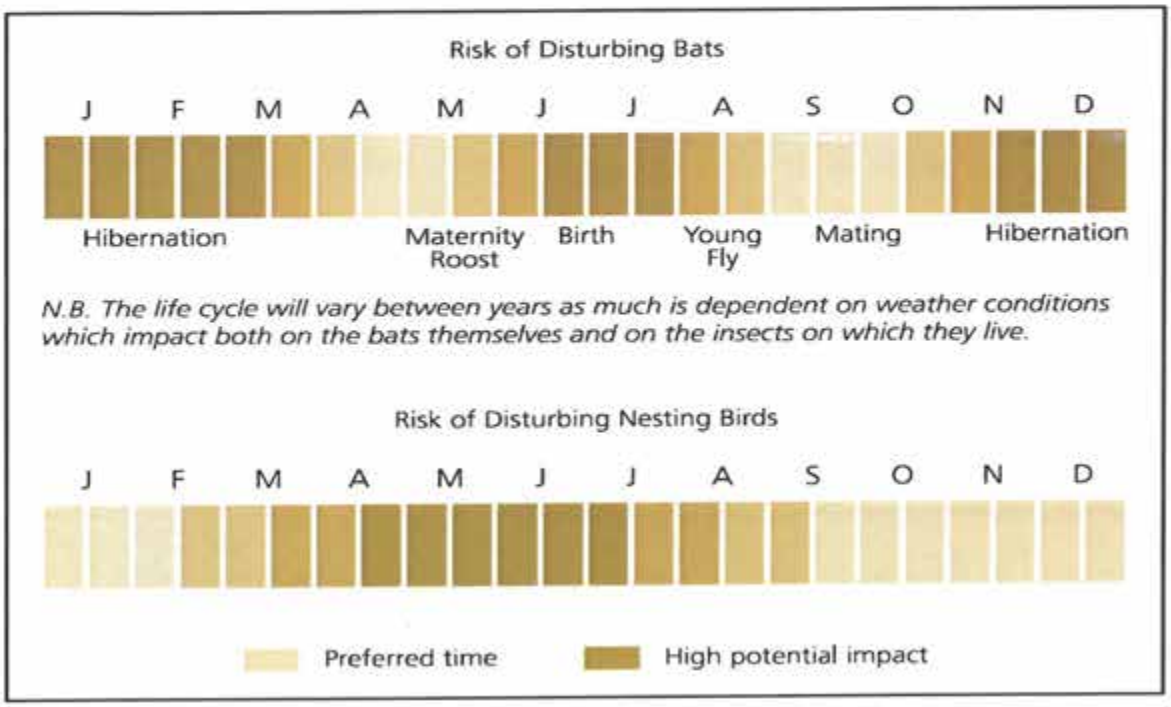


Chart reproduced from DEFRA publication PB10367 Bats, Buildings & Barn Owls. Crown copyright

Appendix 2 – Bats

Aims & Objectives

The overall aim is to establish the extent of ecological constraint upon the proposed development, with reference to the species noted within the below objectives, and to propose appropriate mitigation to minimise ecological impacts. Specific objectives include, where possible:

- Bats:
    - Determine if Bats are roosting at the Site;
    - If present, establish what Bat species are on Site; and,
    - Make recommendations upon further surveying, mitigation and licensing with Natural England.

A further aim was to refer to other species on Site of importance to local nature conservation that although may not be protected or notable, may be impacted upon by the proposed scheme and advise upon limitations to impacts.

Legislation

Many bat species populations have declined significantly in recent years and thus have been afforded legal protection (protected species). All bats, and their roosts, are protected by The Wildlife & Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations (as amended) 2019) albeit if a bat is in a roost, or not. Thus, it is an offence to kill, injure, capture, or disturb a bat, or obstruct, damage or destroy a bat roost.

It is an offence to deliberately disturb a species of British bat species, if the action has a significant effect on; (i) the ability of any significant groups of animals of that species to survive, breed, or rear or nurture their young, or, (ii) the local distribution or abundance of that species. If it is relatively likely that bats are going to be encountered in a building, tree or structure and be significantly disturbed, then it is an offence to knowingly enter the roost and a Natural England licensed bat worker is required to conduct an inspection. Intervention that causes disturbance to a roost may have significant effects on local bat populations even when the bats may not be present.

Methodology

Data Search

Historical and online data resources were reviewed within a minimum of a 1 km radius of the site and included the National Biodiversity Network[2], Natural England[3] and MAGIC[4].

Building Survey/Inspection

The surveys were carried out by, or with, a Natural England licensed bat worker and was completed with guidance Bat Conservation Trust survey guidelines (2016). The buildings were inspected internally and externally for signs of bats. Indicators used to determine bat use and

[illegible] hereafter referred to as the NBN
[illegible] hereafter referred to as NE
[illegible] www.magic.gov.uk

activity were visual bat identification, droppings and associated volume, feeding signs (moth wings or insect carapace), and urine staining and associated smell. Where appropriate, the survey was aided by binoculars, endoscopes, mirrors, torch light and ladders.
The surveys initially assigned criteria for the potential to support roosting bats, depending upon the criteria assigned (refer to Table 1 for criteria) the need for extended survey effort was determined. Where further survey effort identified the presence of bats the roosting species and use of the Site was classified, refer to Table 2 for classification of roost types. An assessment of the impacts upon the bat roost and species will be assessed in the absence and presence of mitigation with consideration to residual and cumulative effects.

Internal Inspection

A systematic building survey strategy was adopted, and all work was assisted with a powerful torch, light and ladders. The floor space and then walls of the structure were surveyed for bat signs. Further inspection of cracks and crevices with bat roost potential were made i.e., cracks in walls, doorways, windows, associated framework and lintels. Finally, the roof space, including rafters, beams, purlins, eaves and ridge boards were surveyed. Potential bat roost emergence and entrance points were recorded.

External Inspection

The ground immediately surrounding the structure, or beneath any projections of the structure, were surveyed. Walls, fascia's, soffits, cracks and crevices where bats may live were surveyed with a powerful torch, mirrors and endoscopes. Loose slates and ridge lines were surveyed using binoculars and torch light with further inspection, if required, using a ladder. All items attached to the building that may provide a potential bat roost, emergence or roost entrance, were inspected and recorded.

Thermal Inspection

All features suitable for bat roosting were further viewed with a Helion Pulsar 38QF thermal scope with magnification and Infrared T2 Pro to seek any abnormal heat sources which could indicate a roosting bat.

Bat Emergence Survey

The emergence surveys started 30 minutes before and finished an hour after sunset. Observers, with a bat detector (one or two of the following: EM2, Duet Batbox, Anabat SD1 and Tranquillity (II), were positioned to cover all aspects of the structure to record any bats emerging from a roost.

Thermal Inspection

All features suitable for bat roosting were further viewed with a Helion Pulsar 38QF thermal scope with magnification to seek any abnormal heat sources which could indicate a roosting bat.

Night Vision

Night vision scopes were used to assist surveyors when the light became too short to see any emergent bats.

Sound Analysis

Bat calls recorded were analysed using Analook and Kaleidoscope software.

Table *1 - Criteria for Buildings Potential to Support Roosting Bats*

Roosting Potential	Criteria
Negligible	Lacking habitat features suitable to be used by roosting Bats.
Low	Low numbers of features, one or more, that could be used by individual Bats or low numbers to roost. However, these potential roost features do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by large numbers of Bats (i.e. unlikely to be suitable for maternity or hibernation).
Moderate	Either an increased number of features that could be used by Bats, or greater numbers of, to roost. Often of greater size, or afford shelter, protection, conditions and surrounding habitat that is of a higher value. Often unlikely to support roosts of a high conservation status (with respect to roost type only and not species, species are assessed later if confirmed present).
High	Either an increased number of features or features of significant size which afford suitable/high value shelter, protection, conditions and surrounding habitat. Roost features have obvious suitability for use by larger numbers of Bats on a regular basis, potentially for longer periods of time due size, shelter, protection, conditions and surrounding habitat. Potential to be used for activities such as Maternity or hibernation.
Confirmed	Evidence of Bats confirmed through observation of Bats or evidence of.

Table 2 - Bat Roost Definitions, Impact Evaluation Indices and Effect Calculator

1. **Definitions of roost types to be included in the application (further detail can also be found in the Bat Mitigation Guidelines and the BCT's "Bat Surveys Good Practice Guidelines"):**
    a. *Day roost*: 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.
    b. *Night roost*: a place where Bats rest or shelter in the night but are rarely found in the day. May be used by a single individual on occasions or it could be used regularly by the whole colony.
    c. *Feeding roost*: a place where individual Bats or a few individuals rest or feed during the night but are rarely present by day.
    d. *Transitional/occasional roost*: used by a few individuals or occasionally small groups for generally short periods of time on waking from hibernation or in the period prior to hibernation.
    e. *Swarming Site*: where large numbers of males and females gather during late summer to autumn. Appear to be important mating Sites
    f. *Mating Sites*: Sites where mating takes place from later summer and can continue through winter.
    g. *Maternity roost*: where female Bats give birth and raise their young to independence.
    h. *Hibernation roost*: where Bats may be found individually or together during winter. They have a constant cool temperature and high humidity.
    i. *Satellite roost*: 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.
    j. *Other* – please explain what the roost type is if not one of the above (we recognise that roost types are interchangeable and not always easy to classify according to the nuances of certain species).

These are valued, for the purpose of impact assessment, geographically with regard to the species status. The following table is open to some interpterion as there are regional and national variations in species distribution and abundance, for example Horseshoe species are rare and more abundant in the South-West but are rare and less abundant the further east you go so a Horseshoe identified in the east would be extremely rare by comparison to it being rare in the west. This is based upon work by Wray *et al,* 2010.

2. Categorisation of Bats species by National Rarity

Rarity within range	England	Wales	Scotland	Northern Island
Common population over 100,00	Common pipistrelle Soprano pipistrelle Brown long-eared	Common pipistrelle Soprano pipistrelle	Common pipistrelle Soprano pipistrelle	Common pipistrelle Soprano pipistrelle
Rarer population, 10,000-100,00	Lesser horseshoe Whiskered Brandt's Daubenton's Natterer's Leisler's Noctule Nathusius pipstrelle Serotine	Lesser horseshoe Daubenton's Natterer's Brown long-eared	Daubenton's Natterer's Brown long-eared	Daubenton's Natterer's Leisler's Noctule Nathusius pipstrelle Brown long-eared
Rarest population under 10,000	Greater horseshoe Bechstein's Alcathoe Greater mouse-eared Barbastelle Grey long-eared	Greater horseshoe Whiskered Brandt's Bechstein's Alcathoe Noctule Nathusius pipstrelle Serotine Barbastelle	Whiskered Brandt's Alcathoe Noctule Nathusius pipstrelle Leisler's	Whiskered

3. **Bat Roost Impact Evaluation Assessment criteria table**

Geographical 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 numbers 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 Sites (*rarer/rarest species*) Hibernation Sites (*rarer/rarest species*) Significant hibernation Sites
National/UK	Mating Sites (*rarer/rarest species*) Sites meeting SSSI guidelines with Bats roosting or noted within the citation.
International	SAC Sites with Bats roosting or noted within the citations and definitions.

4. **Duration of impacts allow for the assessment of effects when cross referenced with the magnitude of the Impact. The definition of the durations is categorised within the below table.**

Description of Duration of impact	
Duration	**Criteria**
Temporary	Effects resultant of grounds work preparation and constructional phases of the development
Short term	Effects 1-2 years post development completion
Mid term	Effects 2-5 years post development completion
Long term	Effects 5-15 years post development completion
Permanent	Effects 15 years or beyond

5. **Magnitude of impact is cross referenced with the impact duration to establish the effect of the proposed scheme**

Description of magnitude of effect	
Impact Description	Criteria
Major Adverse	The change is likely to cause a permanent adverse effect on the integrity of an ecological receptor.
Minor Adverse	The change adversely affects the valued ecological receptor, but there will probably be no permanent effects on its integrity.
Negligible	No effect
Minor Beneficial	The change is likely to benefit the receptor in terms of its conservation status, but not so far as to achieve favourable conservation status.
Major Beneficial	The change is likely to restore an ecological receptor to favourable conservation status, or to create a feature of recognisable.

6. **Matrix of Residual effect is applicable to the duration of the impact for the purposes of assessment**

Basic matrix used to determine significance of effects						
Impact Evaluation	International	National	Regional	County / Metropolitan	District / Borough	Parish / Neighbourhood
Magnitude						
Major Adverse	Critical	Critical	Critical to moderate	Large to moderate	Moderate to minor	Minor to moderate
Minor Adverse	Large to minor	Large to minor	Large to minor	Moderate to minor	Moderate to minor	Minor
Negligible	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Minor Beneficial	Large to minor	Large to minor	Large to minor	Moderate to minor	Moderate to minor	Minor
Major Beneficial	Critical	Critical	Critical to moderate	Large to moderate	Moderate to minor	Minor to moderate

References

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Appendix 3 - Survey Conditions

Survey	Date	Weather	Cloud Cover (%)	Wind	Precipitation	Temp (°C)
Emergence Survey	31/08/2023 19:50-21:35 Sunset 20:05	Good	100	None	Rain-Very Light drizzle.	18.1-16.7
Remote Monitoring	15/09/2023-03/10/2023 19:00-07:00 Sunset 20:00	Good	100-0	Very light breeze	Nil-Short showers	20-12
Emergence Survey	15/09/2023 19:17-21:04 Sunset 19:32	Good	40-10	Very slight breeze-None	Nil	18-12
Emergence Survey	03/10/2023 18:37-20:22 Sunset 18:56	Good	50-20	None	Nil	12.8-11.5

Appendix 4 – Derogation Licenses from Natural England with regard to bats

Licensing procedure

Although there are two types of licensing procedure regarding bats, EPSM and Low Impact BML, there are similarities between the two in that, works must commence within twelve months of this survey effort with a walkover no older than three months of age prior to any application being presented and they both seek to satisfy the current legislation with the three derogation tests.

Natural England, to license for destruction/damage/modification of a bat roost, or to disturb/injure/kill a bat, would need the client to have demonstrated the fulfilment of the below three derogation tests under the Habitats Directive as implemented through the Conservation (Natural Habitats & C.) Regulations 1994;

- Regulation 44(2)(e): The "Purpose" test (the activity specified must meet the specified purpose). Demonstrating the need, either Preserving Public Health and Safety or, Imperative reasons of Overriding Public Interest; planning policy and structure evidence would be used here to specify the purpose, how and why it must be achieved in the way proposed.
- Regulation 44(3)(a): There is no Satisfactory Alternative. Demonstrate that the works proposed cannot be completed in any other manner which would avoid or lessen impacts by comparison to the proposed works. Timing and scheduling of works implementation cannot avoid destruction of a bat roost or significant disturbance.
- Regulation 44(3)(b): The action authorised will not be detrimental to the maintenance of the population of the species as a favourable conservation status in their natural range. Mitigation must be instated which will ensure that the current populations of bat species recorded at the site will be maintained and have no wider impact upon the wider meta population off site.

If the site does not fall within the terms and conditions of the BML then the EPSM license will need to be obtained and is applicable to the site.

Monitoring may be required for either license however this is species and roost status dependent.

Please note that Natural England does make charges for licenses for development gain.

European Protected Species Mitigation (EPSM) License

The EPSM license consists of four parts, the application form, method statement, work schedule and in some cases a reason statement; it is unlikely that a barn conversion will need a reason statement completed. All sections will need to be agreed with the client before being presented to Natural England. The application, method statement and work schedule will be predominantly completed by the ecologist with assistance from the client and their advising parties upon specific sections and timings of works. If a reason statement is required then this will be completed by a combination of the ecologist and the clients advising planning operative

i.e. planning consultant, architect, etc. Upon receipt, Natural England will take 30 working days in which to come to a decision as to whether a license will be granted and will examine the detailed mitigation contained within the document to ensure that the FCS of the site can be maintained through all stages of the development.

It must be understood that making a license application to Natural England is not confirmation of success and re-applications with Further Information Request (FIR) data may be necessary.

Bat Mitigation License / Bat Low Impact License

The Low impact BML is significantly constrained with terms and conditions and is for use only with low impact works to roosts of low numbers of common and widespread species and only available with a low limited number of structures on site. This licence can only be used if the terms and conditions can be strictly adhered to and is obtainable in approx. 15 days from Natural England acknowledging receipt. This license can only be obtained through specific registered consultants who can provide you, upon request, with the terms and conditions of this license; HEA have registered consultants that can advise you further on this.

Delays to licencing

Prior to any license application further survey effort may be required to support it and ensure that circumstances have not altered and to meet the criteria. Should the application to Natural England be older than three months of age from the most recent survey then a site walkover will need to be complete or, if older than twelve months since last survey then the site will need to be reassessed with a building inspection possibly supported by an emergence or dawn re-entry survey if the environs have significantly deviated. Post two to three years a full recovery is likely to be require.