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Bat Emergence Survey Report

Site Name

Stonehurst – North Lodge

Issue Date

19th September 2025

Client

Mr and Mrs Edge

Author

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Project No: 10344

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Document Control

Issue No	Author	Reviewer	Issue Date	Additions/alterations	Notes
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About the Author

This report has been prepared by Annie Butcher, an Assistant Ecologist at The Ecology Co-op. She has two years' experience working with bats.

About the Reviewer

This report has been reviewed by Emma Baker, who is a Senior ecologist with eight years experience. She holds Level 1 great crested newt and hazel dormouse survey licenses. As a Full member of the Chartered Institute for Ecology and Environmental Management (CIEEM), she is bound by their code of professional conduct.



Report Summary

Purpose	The Ecology Co-op was commissioned by Mr and Mrs Edge to undertake bat emergence surveys, further to a proposal to redevelop the existing property to serve additional residential units through the conversion of the loft spaces and garage plots into habitable rooms, as well as seeking to amend aspects of the property, such as skylights and additional windows, in line with the building's original concept.
Context	The site currently comprises a number of older buildings, including North Lodge. A previous survey of the dwelling carried out by The Ecology Co-op confirmed the presence of brown long-eared <i>Plecotus auritus</i> bat droppings within Void 1 and identified bat potential associated with multiple gaps beneath roof tiles and hanging tiles, as well as gaps behind soffits on the western aspect. During the initial scoping assessment, areas of the site could not be accessed or fully accessed due to survey limitations. Overall, the property was determined to offer moderate to high suitability for roosting bats but was later downgraded to offer moderate suitability as these unassessed areas were confirmed as being unaffected by the proposed works. Based on the above assessment and in line with Bat Conservation Trust Guidelines, two bat emergence survey visits were carried out between June and July 2025 to determine the presence of roosting bats and evaluate the conservation importance of the site for bats. The purpose of this survey work was to provide advice to inform a planning application for the redevelopment of the existing property.
Key findings	One common pipistrelle <i>Pipistrellus pipistrellus</i> day roost was identified on the eastern aspect, supporting a minimum of one bat (located outside the zone of impact). And one brown long eared bat <i>Plecotus auritus</i> transitory roost identified through the presence of droppings within the void space. Other species including soprano pipistrelle <i>Pipistrelle pygmaeus</i> , noctule <i>Nyctalus noctula</i> , <i>Myotis</i> sp., and long-eared <i>Plecotus</i> sp. bats were detected foraging or passing over the property.
Interpretation	These surveys indicate that North Lodge is used by a small number of bats, with one roost identified that supports a single common and widespread species located outside of the zone of impact and another to be destroyed as a result of the proposed development.
Recommendations	As the proposed development involves the destruction of void features, the destruction of the roost features used by bats cannot be avoided and, in the absence of mitigation, this could potentially result in harm to individual bats. Therefore, a European Protected Species (EPS) licence will be required for the development to legally proceed. . Based on the results of the survey and predicted scale of impact, this development would be eligible for licensing under 'earned recognition' (accreditation level 1) or 'Bat mitigation Class Licence' (BMCL) issued by Natural England and held by certain qualified bat ecologists.



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1 INTRODUCTION

1.1 Background

The owners of North Lodge, Stonehurst Cottage, Ardingly intend to submit a planning application for a proposed development that involves the redevelopment of the existing property to serve additional residential units through the conversion of the loft spaces and garage plots, as well as the adjustment of aspects of the property, such as skylights and additional windows, to line with the building's original concept.

The full address for the site is Stonehurst House, Selsfield Road, Haywards Heath, RH17 6TN. The central National Grid Reference for this site is TQ 34340 31691.

The Ecology Co-op undertook a bat scoping assessment of the existing building in March 2025, during which several features were identified that were suitable to support roosting bats¹.

Overall, the building was assessed as having moderate potential to support roosting bats and in accordance with current best practice guidelines², a minimum of two emergence surveys were recommended to determine the presence of roosting bats and evaluate the conservation importance of the site for bats.

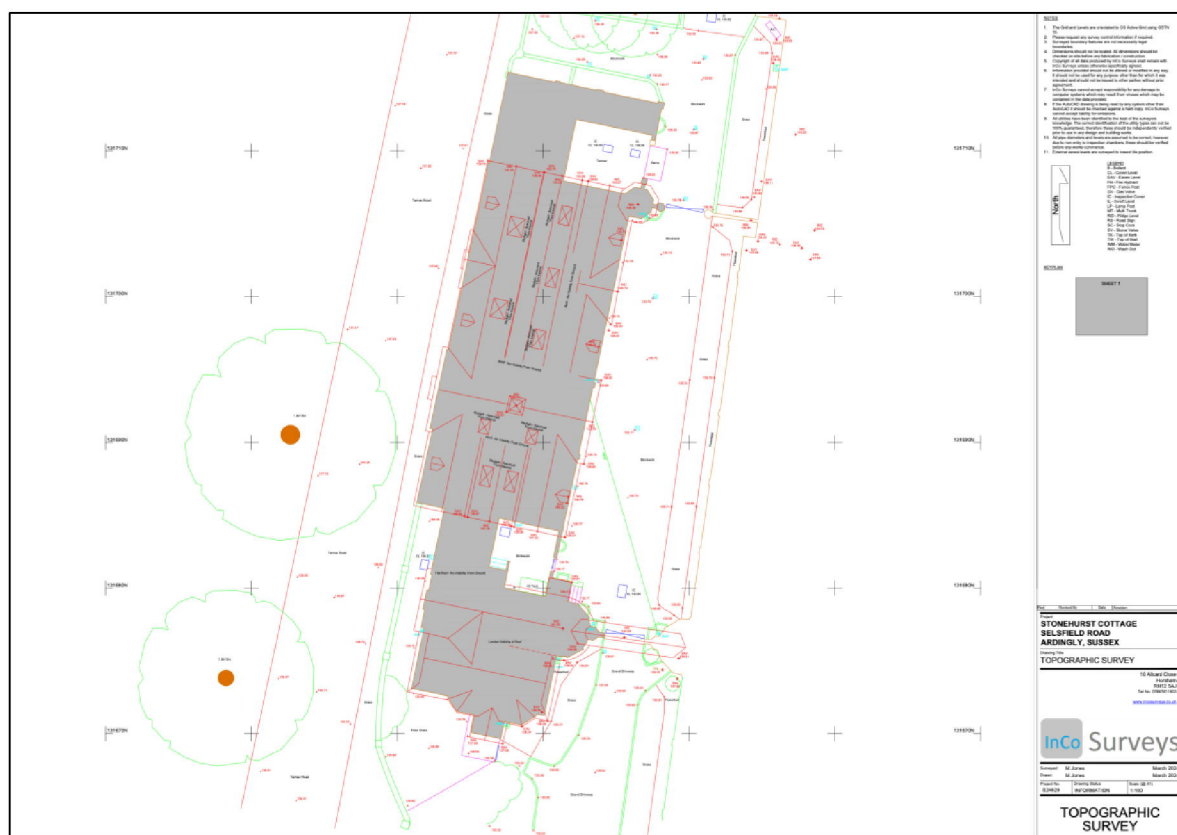


Figure 1. Topographical survey of the proposed development at north lodge. Image provided courtesy of Gould Baxter,

1 The Ecology Co-op (2025) Bat Scoping Report – Stonehurst: North Lodge.

2 Collins, J.(ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edn). The Bat Conservation Trust, London.



image produced by InCO Surveys, project number S24829, dated March 2024.

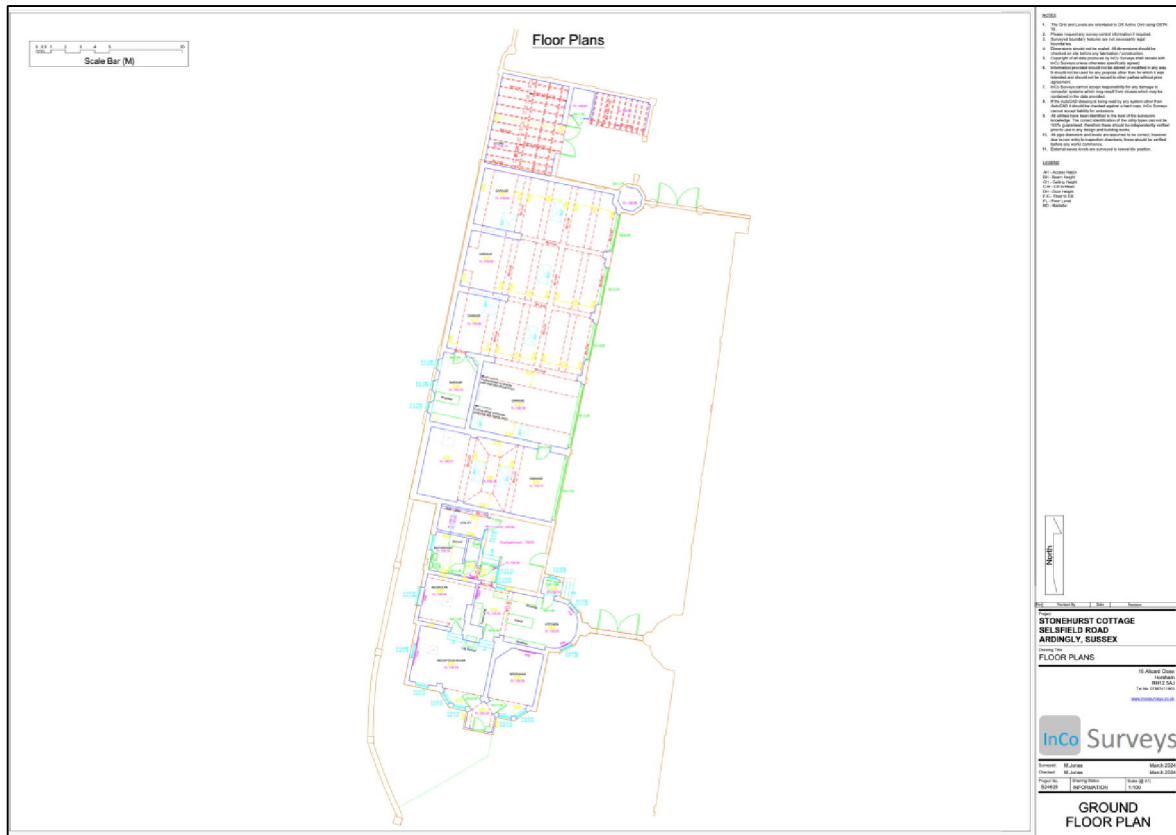


Figure 2. Existing floor plans of the proposed development at north lodge. Image provided courtesy of Gould Baxter, image produced by InCO Surveys, project number S24829, dated March 2024.

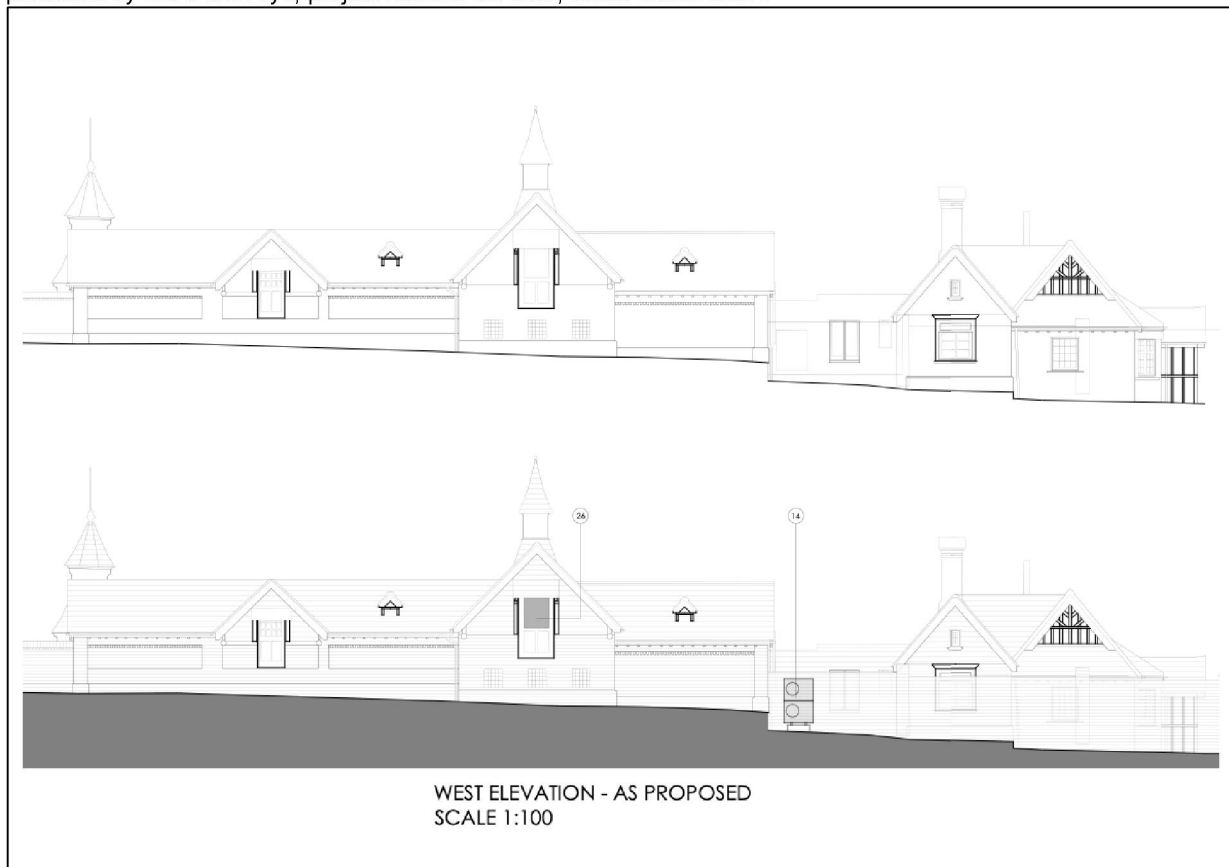


Figure 3. View of the western elevation with the existing layout illustrated in the top layout and the proposed to the bottom.



Image provided courtesy of Gould baxter.



Figure 4. View of the southern elevation with the existing layout illustrated in the top layout and the proposed to the bottom. Image provided courtesy of Gould baxter.

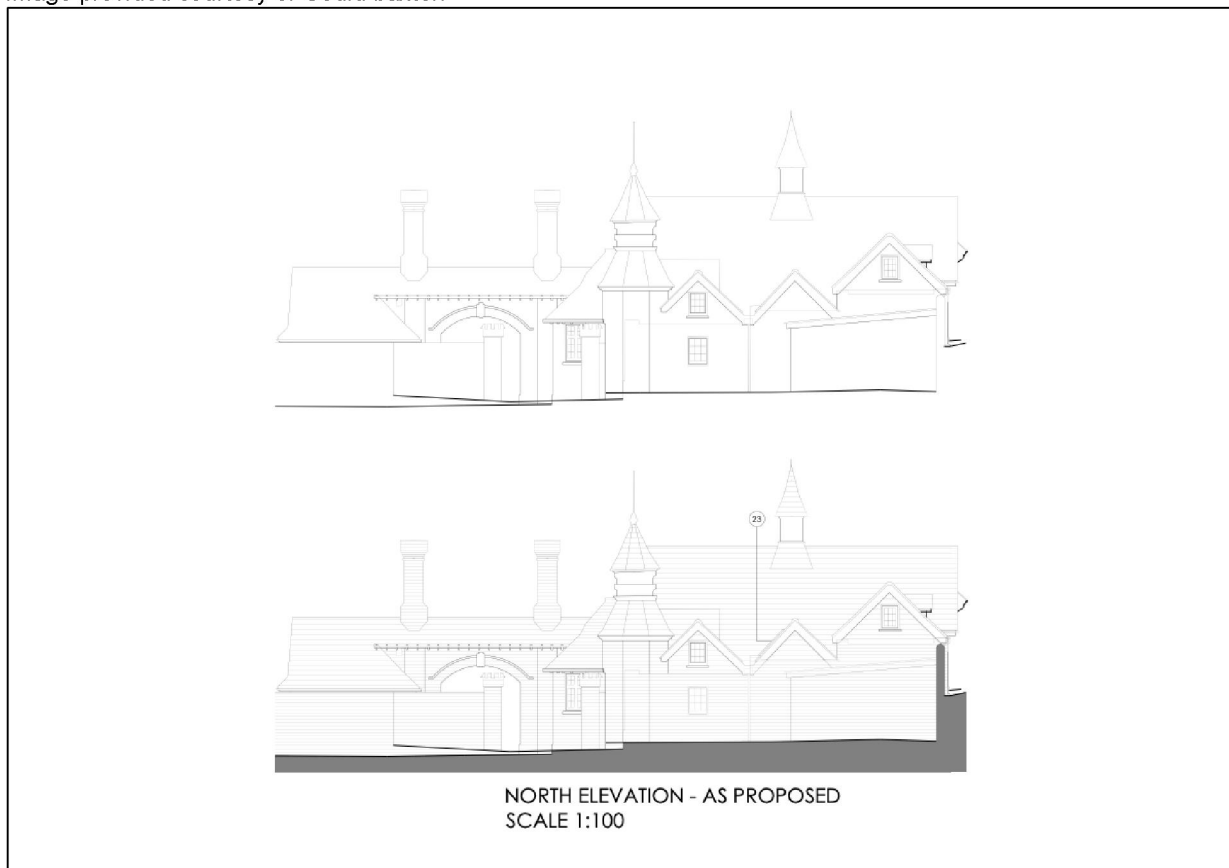


Figure 5. View of the northern elevation with the existing layout illustrated in the top layout and the proposed to the bottom.



Image provided courtesy of Gould baxter.



Figure 6. View of the eastern elevation with the existing layout illustrated in the top layout and the proposed to the bottom. Image provided courtesy of Gould baxter.

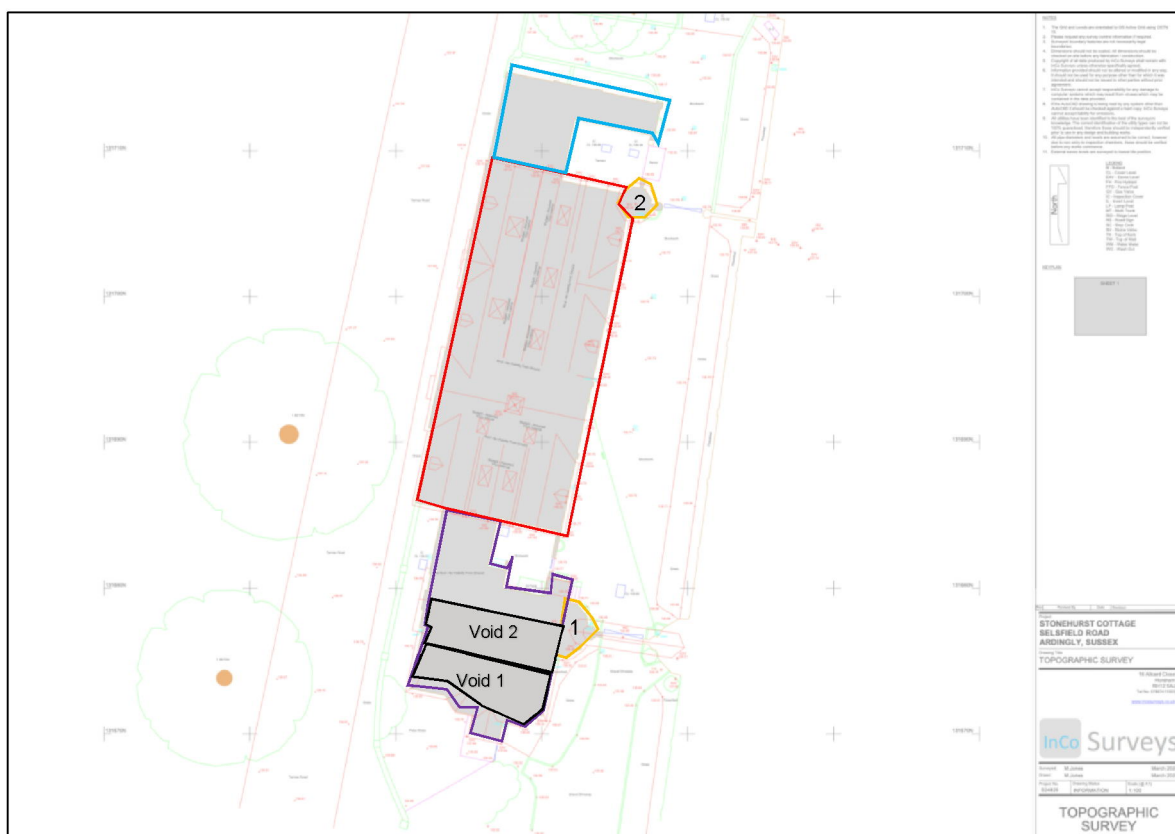


Figure 7. View of approximate property divisions and void locations (purple boundary = the cottage, red boundary = the garages, yellow boundary's = the towers, blue boundary = the store).



1.2 Purpose of the Report

In accordance with recommendations, bat emergence surveys were carried out by The Ecology Co-op between June and July 2025 led by Joshua Harwood, an Associated member of the Chartered Institute of Ecology and Environmental Management (ACIEEM) and licensed bat surveyor (Level 1).

The purpose of this survey work was to determine presence of roosting bats and where necessary prescribe further surveys and/or appropriate mitigation advice to inform the planning application for the proposed development at the site.

This survey and report was carried out at the request of Mr and Mrs Edge.

2 LEGAL PROTECTION

Details of legislation and legal protection afforded to all species of British bats are given in Appendix 1.

The results of this survey will be used to determine the need for an appropriate mitigation strategy to ensure compliance with UK and EU wildlife legislation.

3 METHODOLOGY

Two emergence surveys were undertaken on the 25th June and 21st July 2025, using the methodology set out in the best practice guidelines prepared by the Bat Conservation Trust. The surveys focused upon multiple gaps beneath roof tiles and hanging tiles, as well as gaps behind soffits on the western aspect, using six surveyors and seven night-vision/thermal-vision cameras positioned according to Figure 1. From these positions, surveyors could see all features potentially suitable for roosting bats that were identified during the initial bat scoping survey. All cameras were supported with infra-red torches to improve the clarity of the footage after sunset.

The surveyors recorded any bat activity on or around the potential roosting entry/exit features identified during the scoping survey, using full spectrum handheld bat detectors to identify species through call frequencies. The bat calls were logged and recorded as sonograms for later confirmation of species where necessary. Darkest points for cameras are presented in Appendix 2.

The following equipment was used to support the first survey:

- 4 x Echometer Touch 2 Pro detectors with Apple recording devices;
- 2 x Elekon Batlogger M2 detectors;
- 3 x Nightfox Whisker night-vision cameras;
- 3 x Canon XA 20 night-vision cameras; and
- 1 x TI TK612 thermal-vision camera.

The following equipment was used to support the second survey:

- 3 x Echometer Touch 2 Pro detectors with Apple recording devices;
- 3 x Elekon Batlogger M2 detectors;
- 3 x Nightfox Whisker night-vision cameras;
- 2 x Canon XA 20 night-vision cameras;
- 1 x FLIR A700 thermal-vision camera; and



- 1 x TI TK612 thermal-vision camera.



Figure 8. An aerial image of the site, showing the positions of surveyors (red dots), night-vision cameras (orange dots) and thermal-vision camera (blue dot) during the first survey visit. Arrows indicate the primary focus of each surveyor. Image produced court



Figure 9. An aerial image of the site, showing the positions of surveyors (red dots), night-vision cameras (orange dots) and thermal-vision cameras (blue dots) during the second survey visit. Arrows indicate the primary focus of each surveyor. Image



produced courtesy of Google maps (map data ©2025 Google).

3.1 Limitations to Emergence Surveys

In accordance with best practice guidelines, each survey visit was undertaken during the peak period in bat activity and during good weather conditions. The results presented here are therefore considered to be an accurate representation of the general use of the property by roosting bats.

Nevertheless, bats can 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. These surveys record the emergence of bats at the time of the survey visits and therefore only provide a snapshot of bat roosting activity at the site at that time. Bats may be present at other times, and the results should therefore be viewed with caution.

Due to the length, height and complexity of the building in combination with the close proximity to the property's boundaries, the viewpoints of the northern, eastern and southern aspects were restricted. The strategic positioning of surveyors and night-vision/thermal-vision cameras, and close radio contact between observers have been used to reduce the limitation as much as feasibly possible, however, this restriction could not be entirely mitigated for.

During the first survey visit, the night-vision camera positioned on the northern aspect of the property did not have sufficient lighting to view the whole aspect due to the complexity of the building including several pitched roofs and angles available within the ownership boundary. It was not possible to add any additional lighting during the survey visit to mitigate this, as additional lighting may have created more dark spots in the image through infrared shadows. This limitation was mitigated for during the second survey visit as the northern aspect of the property was covered by a thermal-vision camera which does not require the use of infra-red torches.

4 RESULTS

4.1 Bat Emergence Surveys

4.1.1 Survey Conditions

The dates, times, weather conditions, temperatures and personnel for each survey visit are presented in Table 1 below:

Table 1. Details of surveys undertaken, timings weather conditions and personnel.

Date	Survey start time/end time	Temp. degrees centigrade, weather conditions throughout survey	Surveyors
25 th June 2025	Start time: 20:50 Sunset: 21:20 End time: 23:20	Max/min temp: 19–14°C. 60% cloud cover and light air (BF1), dry.	Joshua Harwood Eleanor Fitter Eleanor Curran Tom Haley Dan Davies Brooke Waites
21 st July 2025	Start time: 20:32 Sunset: 21:02 End time: 23:02	Max/min temp: 18–16°C. 25% cloud cover and light breeze (BF2), dry.	Joshua Harwood Eleanor Fitter Eleanor Curran



			Tom Haley Dan Davies Brooke Waites
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4.1.2 Bat Emergence Results

The following descriptions summarise bat activity and emergence from the building for each survey visit.

- 25th June 2025

No emergences were seen during the survey visit. General bat activity was moderate. The first bat detected was a common pipistrelle bat *Pipistrellus pipistrellus* heard foraging south-west of the property 29 minutes after sunset. Common pipistrelle bats were recorded commuting and foraging consistently throughout the survey. Soprano pipistrelle bats *Pipistrelle pygmaeus* were heard commuting and foraging 58 minutes after sunset and continued intermittently throughout the survey. A *Myotis* sp. bat was heard commuting north-west of the property at 22:20. Three additional passes of commuting *Myotis* sp. bats were recorded during the survey at 22:54, 23:06, and 23:17.

- 21st July 2025

One common pipistrelle bat was seen to emerge from beneath roof tiles to the right of the chimney stack (adjacent to Tower 1) on the eastern elevation of the property 21 minutes after sunset (Figure 10 and Figure 11).

General bat activity was relatively high. The first bat detected was a common pipistrelle bat commuting north-west of the property 17 minutes after sunset. Common pipistrelle bats were recorded commuting and foraging constantly throughout the survey. Soprano pipistrelle bats were heard commuting and foraging 32 minutes after sunset and continued fairly consistently throughout the survey. Commuting *Myotis* sp. bats were recorded intermittently throughout the survey after 22:00. Long-eared *Plecotus* sp. bats were heard commuting and foraging close to the east and south aspects of the property between 22:24 – 22:58. A noctule bat *Nyctalus noctula* was heard commuting south-east of the building twice during the survey visit at 22:43 and 22:54.



Figure 10. An image of the eastern aspect of North Lodge, showing the approximate emergence location of one common pipistrelle bat (red arrow) from beneath roof tiles to the right of the chimney stack (adjacent to Tower 1), and its flight path during the survey on the 21st July 2025 indicated.

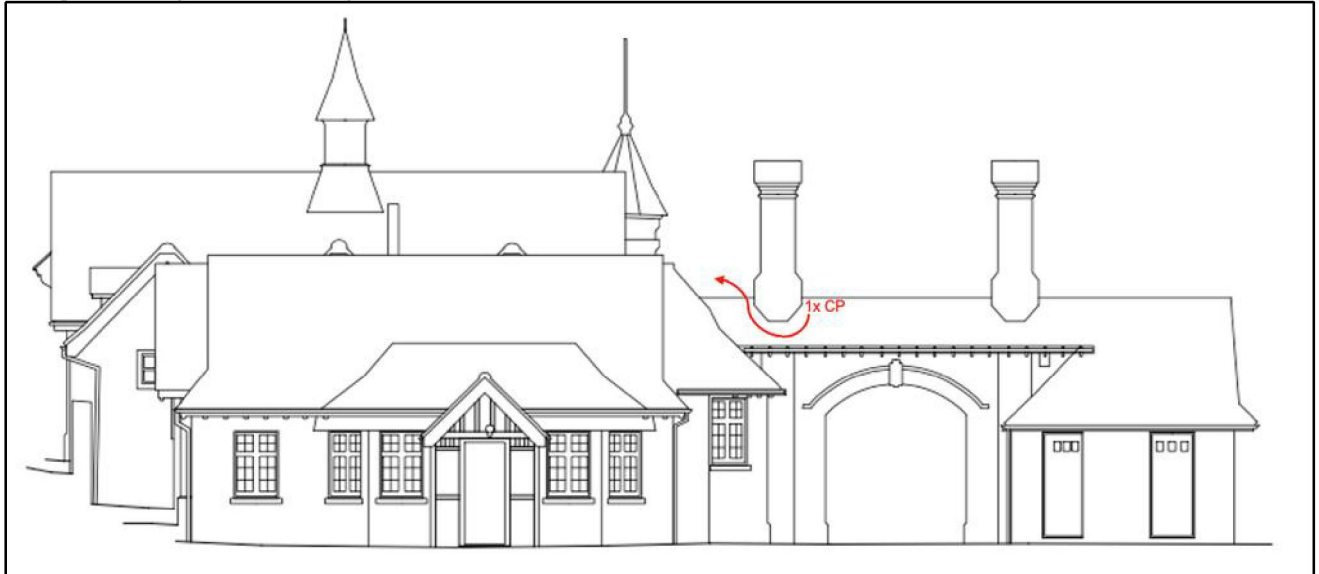


Figure 11. View of the eastern aspect of North Lodge, showing the approximate emergence location of one common pipistrelle bat (red arrow) and its flight path during the survey on the 21st July 2025 indicated.

5 IMPACT ASSESSMENT AND MITIGATION RECOMMENDATIONS

5.1 Interpretation of Findings

No bat roosts have been identified within the areas of North Lodge to be affected by the proposed works.



The emergence surveys of North Lodge have identified the presence of one solitary common pipistrelle day roost associated with the roof tiles to the right of the chimney stack (adjacent to Tower 1) on the eastern elevation of the property. The location of this bat roost is illustrated in Figures 3 and 4 (above). The roost will be unaffected by the proposed works. Common pipistrelle bats are the most common and widespread species in the UK, and solitary day roosts have the lowest conservation significance for any species. Overall, the conservation significance of this roost is considered to be low at site level given the abundance of this species locally and nationally.

The bat scoping assessment identified a small number of droppings (<20) in Void 1. DNA analysis of these has confirmed the droppings to be of brown long-eared bats *Plecotus auritus*. However, no brown long-eared bats were seen to emerge from the property during the survey visits. All commuting and foraging activity of brown long-eared bats during second survey visit was recorded by surveyors located on the eastern and southern boundaries of North Lodge. A suspected large roost of brown long-eared bats (relative to the species) is known to be present within the Stonehurst Main House, less than 50 metres away from North Lodge. The roost was not subject to further surveys however the number and location of bat droppings found within the void indicated a roost size of up to 15 individuals (based on numbers of individuals found from similar dropping numbers and patterns).

The small number of droppings and lack of bats found roosting within the property during the scoping assessment and the subsequent bat emergence surveys indicate that the property has been used in an investigatory use by bats in the local area, or may act as a transitory roost. Due to the lack of clear evidence either way with higher conservation status afforded to a transitory roost this roost type has been assumed. A transitory roost of brown long eared bats. Therefore, a European Protected Species (EPS) licence will be required for the development to legally proceed. Based on the results of the survey and predicted scale of impact, this development would be eligible for licensing under 'earned recognition' (accreditation level 1) or 'Bat mitigation Class Licence' (BMCL) issued by Natural England and held by certain qualified bat ecologists.

5.2 Outline Mitigation Measures

As the proposed development involves the destruction of void features, the destruction of the roost features used by bats cannot be avoided and, in the absence of mitigation, this could potentially result in harm to individual bats. Therefore, a European Protected Species (EPS) licence will be required for the development to legally proceed. The possible measures that would be required to safeguard bats and achieve this are outlined below:

- **Toolbox Talk**

Prior to the commencement of the works, the named ecologist (or an accredited agent) on the EPS licence, will attend site to meet with contractors and provide a 'Tool-Box Talk'. The short training will cover bats and their legislation, where bats have been identified within the building, which species have been found and agreed working methods.

The ecologist's attendance to site will also be a good opportunity to install alternative roosting provisions as detailed below.

- **Alternative roost provisions**

As a contingency measure, should the development result in the abandonment of roosts, suitable alternative roosting opportunities for, brown long-eared bats will be installed on the exterior of the Stonehurst north lodge or an adjacent building within the same ownership boundary. As only one roost



was identified a single replacement bat box is considered sufficient

The brown long eared roost can be compensated for by an appropriately sized cavity. The bat box must be appropriately installed and approved by a suitably qualified ecologist prior to any works on site being undertaken and can serve as a rescue box if needed.

- Preparatory works – ‘soft strip’

All hanging/roof tiles should be carefully hand stripped one by one from the walls under the direct supervision of a licenced bat ecologist and under a site mitigation licence. Any bats found shall be gently captured and placed into bat boxes that have been secured to trees surrounding the site in advance.

- Timing

The hand stripping of tiles should be undertaken in the period between mid-March the end of October to avoid disturbing bats that could be in hibernation. As no maternity roosts have been identified on site there is no requirement to avoid the maternity season (May to August inclusive). Works must be completed during appropriate weather conditions where the day of works is dry with no rain and overnight temperatures exceed 8°C (at lowest recorded temperature) for a minimum of three consecutive nights prior to any works being undertaken). Any works to areas identified to support breeding birds must ensure that no active nests are present at the time of disturbance by a suitably qualified ecologist or undertaken outside of the bird nesting season (March to September inclusive).

- Artificial lighting

The use of artificial lighting inappropriately can result in significant disturbance to bats. Should lighting be required during or post development, detailed design should include a lighting scheme that minimises these impacts by following the Bat Conservation Trust’s guidance on lighting, reproduced in Appendix 3 of this report.

- Roofing Membranes

Only Bitumen 1F roofing felt will be used in areas where bats could gain access to the new building, this is because Non-Bitumen Coated Roofing Membranes (NBCRM) can fray and entangle bats. This is not restricted to specific compensation measures described above, but could also extend to all unintentionally created opportunities, for example: naturally occurring gaps between new roof tiles.

Please note whilst recent developments in NBCRM permit the use of these provided they have passed a snagging propensity test.

5.3 Conclusions

The proposed development will impact up to one roost relating to common and widespread species (brown long eared bat). In the absence of mitigation impacts are not considered significant to bat conservation beyond the local level. The proposed mitigation measures outlined above will ensure that individual bats will not be harmed during the construction, and that roosting opportunities remain after completion. The applicants are confident that the three tests under Regulation 53 (2) (e) can be satisfied and an EPS licence can be obtained. As such, the planning authority can be satisfied that securing this mitigation and EPS licence under reserved matters will ensure that its duty to comply with the Conservation of Habitats and Species Regulations (2017) as amended,



will have been fully met.

Should you need any further advice on the information provided above, please do not hesitate to contact The Ecology Co-op.



APPENDIX 1 – LEGISLATION AND POLICY

All species of British bat are fully protected under the Wildlife and Countryside Act 1981 as amended through inclusion in Schedule V. All bat species in the UK are also included in Schedule II of the Habitats Regulations 2017 which transpose Annex II of the Council Directive 92/43/EEC 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora ("EC Habitats Directive") which defines European protected species of animals.

Bat species are afforded further protection by the Natural Environment and Rural Communities Act 2006.

Under the above legislation it is an offence to:

- kill, injure or take an individual;
- possess any part of an individual either alive or dead;
- intentionally or recklessly damage, destroy or obstruct access to any place or structure used by these species for shelter, rest, protection or breeding;
- intentionally or recklessly disturb these species whilst using any place of shelter or protection; or
- deliberate disturbance in such a way as to be likely to impair their ability to:
 - survive, to breed or reproduce, or to rear or nurture their young; or
 - in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
 - to affect significantly the local distribution or abundance of the species to which they belong;
- keep (possess), transport, sell or exchange, or offer for sale or exchange, any live or dead bat, or any part of, or anything derived from a bat.

It is also an offence to set and use articles capable of catching, injuring or killing bats (for example a trap or poison), or knowingly cause or permit such an action. In the case all species of British bat there is also protection under Schedule 6 of The Wildlife and Countryside Act 1981 (as amended) relating specifically to trapping and direct pursuit of these species.

The Habitats Directive and Habitats Regulations provide for the derogation from these prohibitions for specific reasons provided certain conditions are met. An EPS licensing regime allows operations that would otherwise be unlawful acts to be carried out lawfully. In England, Natural England is the licensing Authority and, in order to grant a license, ensures that three statutory conditions (sometimes referred to as the 'three derogation tests') are met:

- a licence can be granted for the purposes of "preserving public health or safety or for other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment" (Regulation 53 (2) (e));
- a licence can only be granted if "there are no satisfactory alternatives" to the proposed action;
- a licence shall not be granted unless the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

A bat roost is defined as "any structure or place, which any wild bat uses for shelter or protection." Bats tend to re-use the same roosts; therefore, legal opinion is guided by recent case law precedents, that a roost is protected whether or not the bats are present at the time. This can include all summer roosts, used for breeding, resting or sheltering and all winter roosts used for hibernating.



APPENDIX 2 – DARKEST POINTS AND THERMAL VIEWPOINTS



Photographs 1a & 1b. Images of the darkest point from the first survey of North Lodge (25/06/25).



Photographs 2a & 2b. Images of the darkest point from the first survey of North Lodge (25/06/25).



Photographs 3a & 3b. Images of the darkest point from the first survey of North Lodge (25/06/25).



Photograph 4. An image of the thermal vision viewpoint from the first survey of North Lodge (25/06/25).



Photographs 5a & 5b. Images of the darkest point from the second survey of North Lodge (21/07/25).



Photographs 6a & 6b. Images of the darkest point from the second survey of North Lodge (21/07/25).



Photographs 7a & 7b. Images of the thermal vision viewpoints from the second survey of North Lodge (21/07/25).



Photograph 8. An image of the darkest point from the second survey of North Lodge (21/07/25).



APPENDIX 3 – EXAMPLES OF REPLACEMENT BAT ROOSTING FEATURES



Figure 1. Left to right, the 2F, 2FN and the 1FS bat boxes produced by Schwegler. These and other brands are available at many on-line wildlife stores. These are constructed of ‘woodcrete’ (a mixture of cement and woodchip) and are designed to be durable and replicate the stable thermal properties of trees and buildings. They may be attached to trees or buildings.



Figure 2. Examples of integral bespoke bat roosting features that may be incorporated into buildings during construction/renovation. From left to right: an example of bat access tile into loft space; the 2FR bat tube; and an example of 2FR bat tubes installed into a house wall in a series of three. Other brands and designs are available.



APPENDIX 4 – REDUCING IMPACTS OF ARTIFICIAL LIGHT

Bright external lighting can have a detrimental impact upon foraging and commuting bat flight paths, but more importantly can also cause bats to remain in their roosts for longer. Artificial lighting can also cause significant impacts to other nocturnal species, most notably moths and other nocturnal insects. It can also result in disruption of the circadian rhythms of birds, reducing their fitness.

Guidelines issued by the Bat Conservation Trust³ should be referred to when designing the lighting scheme. Note that lighting designs in very sensitive areas should be created with consultation from an ecologist and using up-to-date bat activity data where possible. The guidance contains techniques that can be used on all sites, whether a small domestic project or larger mixed-use, commercial or infrastructure development. This includes the following measures:

Avoid lighting key habitats and features altogether

There is no legal duty requiring any place to be lit. British Standards and other policy documents allow for deviation from their own guidance where there are significant ecological/environmental reasons for doing so. It is acknowledged that in certain situations lighting is critical in maintaining safety, such as some industrial sites with 24-hour operation; however, in the public realm, while lighting can increase the perception of safety and security, measurable benefits can be subjective. Consequently, lighting design should be flexible and be able to fully consider the presence of protected species.

Apply mitigation methods to reduce lighting to agreed limits in other sensitive locations – lighting design considerations

Where bat habitats and features are considered to be of lower importance or sensitivity to illumination, the need to provide lighting may outweigh the needs of bats. Consequently, a balance between a reduced lighting level appropriate to the ecological importance of each feature and species, and the lighting objectives for that area will need to be achieved. The following are techniques which have been successfully used on projects and are often used in combination for best results:

- dark buffers, illuminance limits and zonation;
- sensitive site configuration, whereby the location, orientation and height of newly built structures and hard standing can have a considerable impact on light spill;
- consideration of the design of the light and fittings, whereby the spread of light is minimised ensuring that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Consideration should be given to the height of lighting columns. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light-spill or require more columns. Column height should be carefully considered to balance task and mitigation measures. Consider no lighting solutions where possible such as white lining, good signage, and LED cat's eyes. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times;
- screening, whereby light spill can be successfully screened through soft landscaping and the installation of walls, fences and bunding;

³ Bat Conservation Trust and Institute for Lighting Professionals (2023) Guidance note 8. Bats and Artificial Lighting. <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>



- glazing treatments, whereby glazing should be restricted or redesigned wherever the ecologist and lighting professional determine there is a likely significant effect upon key bat habitat and features;
- creation of alternative valuable bat habitat on site, whereby additional or alternative bat flightpaths, commuting habitat or foraging habitat could result in appropriate compensation for any such habitat being lost to the development;
- dimming and part-night lighting. Depending on the pattern of bat activity across the key features identified on site it may be appropriate for an element of on-site lighting to be controlled either diurnally, seasonally or according to human activity. A control management system can be used to dim (typically to 25% or less) or turn off groups of lights when not in use.

Demonstrate compliance with illuminance limits and buffers

- *Design and pre-planning phase*; it may be necessary to demonstrate that the posed lighting will comply with any agreed light-limitation or screening measures set as a result of your ecologist's recommendations and evaluation. This is especially likely to be requested if planning permission is required.
- *Baseline and post-completion light monitoring surveys*; baseline, pre-development lighting surveys may be useful where existing on or off-site lighting is suspected to be acting on key habitats and features and so may prevent the agreed or modelled illuminance limits being achieved.
- *Post-construction/operational phase compliance-checking*; as a condition of planning, post-completion lighting surveys by a suitably qualified person should be undertaken and a report produced for the local planning authority to confirm compliance. Any form of non-compliance must be clearly reported, and remedial measures outlined. Ongoing monitoring may be necessary, especially for systems with automated lighting/dimming or physical screening solutions.

Lighting Fixture Specifications

The Bat Conservation Trust recommends the following specifications for lighting on developments to prevent disturbance:

- Lighting spectra: peak wavelength >550nm
- Colour temperature: <2700K (warm)
- Reduction in light intensity
- Minimal UV emitted
- Upward light ratio of 0% and good optical control

Further reading:

Buglife (2011) A review of the impact of artificial light on invertebrates.

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