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Bat Scoping and Ecological Assessment

**389 Gosbrook Road,
Caversham, Reading RG4 8ED**

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Report Summary

1. Blue Infinity Property Group commissioned the Ecology Co-op to undertake a Bat Scoping and Ecological Assessment of 389 Gosbrook Road, Reading. The purpose of this report is to present the findings of this survey and identify any potential ecological constraints to the proposed demolition of the existing commercial bungalow, formerly offices and light industrial workshop, to facilitate a re-development of the site to a 6-unit residential apartment scheme. The pre-application design proposal includes 6 no. units, 5no. 1bed apartments and 1no. 2bed apartments within a 2.5 storey building form.
2. The site includes the existing workshop, with ancillary offices to the front consisting of a small bungalow. All buildings on site have been vacant for some time. There is an enclosed yard comprising of amenity grassland at the southern end of the site and areas of hard-standing forecourt across the northern and western areas. The site is within a predominantly residential area to the north, east and west, with a Grade II listed property bordering the eastern boundary and a number of industrial buildings to the south along Send Road. The River Thames is located approximately 215m south of the site, bordered by tree lines and small woodland strips.
3. An assessment of the site was carried out by Natural England Bat Class 2 Licence holder and Principal Ecologist Xenia Snowman BSc (Hons.) on the 23rd November 2020. This included a ground-based external inspection of the buildings, internal inspections of the inside of the buildings and an appraisal of the surrounding habitats, to evaluate the site for its potential to support roosting bats or other protected or notable species. All bat species are European Protected Species (Annex IV, 'Habitats Directive').
4. No evidence of roosting bats was found during the survey. However, following this inspection, the bungalow was assessed as having 'low' potential to support bat roosts based on the features identified. A small number of suitable bat roosting crevices were identified between the hand-made clay tiles on the roof of the bungalow, particularly on the western aspect. Although the workshop contains a gap where the chrysotile roof sheets meet the ridge, this feature was re-assessed to have negligible potential to support bat roosts due to the internal structure and conditions. The immediate surrounding area was assessed as having low potential to support bat populations, as well as to be utilised by foraging and commuting bats, with the areas surrounding The River Thames assessed as having high potential to be utilised by roosting, foraging and commuting bats.
5. As the potential roost features identified on the bungalow during the inspection will be impacted by the proposed demolition of these buildings, in line with the bat survey guidelines, one emergence survey is required in order to assess for the presence, or likely absence of roosting bats, prior to works. This will be preceded by a repeat internal inspection. The removal of the roof tiles on the south-eastern corner of the bungalow will be supervised by a licensed bat ecologist regardless of the survey outcome, as visibility of



this area is obstructed. In the absence of further survey work, the impact on bats resulting from the demolition of the bungalow cannot be fully assessed. This bat emergence survey can be undertaken between May and August.

6. Recommendations are also made for reasonable avoidance measures with regard to nesting birds in the trees and buildings. However, Due to the nature of the site and the habitats and structures present, all other areas due to be affected by the proposals are of negligible potential for utilisation by other protected or notable species.

This report has been prepared by The Ecology Co-operation Ltd, with all reasonable skill, care and diligence within the terms of the Contract with the client. This report only becomes the property of the client once payment for it has been received in full.

We disclaim responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.



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1 INTRODUCTION

1.1 Purpose of the Report

The Ecology Co-op has been commissioned to undertake a bat scoping and ecological assessment of 389 Gosbrook Road by Blue Infinity Property Group. This report presents the findings of a walkover survey and building inspection for occupation by bats, undertaken by Natural England Bat Class 2 licensed Principal Ecologist Xenia Snowman BSc (Hons.) on 23rd November 2020. It provides details of the potential for any protected species and/or habitats to be present at the site and an assessment of the potential ecological constraints to the proposed works. Recommendations for further surveys that are likely to be required to inform a planning application are provided, if necessary. Where appropriate, measures to avoid, mitigate and/or compensate for impacts are outlined.

1.2 Background

The site is located at 389 Gosbrook Road, Caversham, Reading RG4 8ED. The central grid reference for the site is SU 72377 74534.

The site comprises two vacant buildings including a bungalow, formerly comprising offices, and an industrial unit, formerly a workshop which are set within a heavily-developed, predominantly residential area.

The boundary to the development site is displayed in Figure 1, with the location of the site within the wider context shown in Figure 2. Figure 3 shows the site layout for 389 Gosbrook Road, provided by OB Architecture.

The proposed development includes the demolition of the existing buildings on site, including a bungalow and an industrial workshop to facilitate the re-development of the site to a 6-unit residential apartment scheme. The pre-application design proposal includes 6 no. units, 5no. 1bed apartments and 1no. 2bed apartments within a 2.5 storey building form. A proposed site plan is presented in Figure 3.



Figure 1. An aerial image of 389 Gosbrook Road, Reading with the survey site indicated by a red line boundary. Image produced courtesy of Google maps (Map data ©2020 Google).



Figure 2. An aerial image of 389 Gosbrook Road, Reading (indicated by a red arrow) within the context of the wider landscape. Image produced courtesy of Google maps (Map data ©2020 Google).



Figure 3: The proposed site layout for 389 Gosbrook Road, Reading, provided by OB Architecture, (Drawing reference: 298-OBA-00-ZZ-DR-A-0102) December 2020.



Figure 4: The proposed north elevation for 389 Gosbrook Road, Reading, provided by OB Architecture, (Drawing reference: 298-OBA-00-ZZ-DR-A-0410) December 2020.



Figure 5: The proposed south elevation for 389 Gosbrook Road, Reading, provided by OB Architecture, (Drawing reference: 298-OBA-00-ZZ-DR-A-0412) December 2020.



Figure 6: The proposed west elevation for 389 Gosbrook Road, Reading, provided by OB Architecture, (Drawing reference: 298-OBA-00-ZZ-DR-A-0411) December 2020.



1.3 Policy and Legislation

Legal protection applying to all bat species in the UK is outlined in Appendix 1 of this report.

The results of this survey will be used to determine the need for further surveys, impact avoidance measures and/or an appropriate mitigation strategy to ensure compliance with UK and EU wildlife legislation.

2 METHODOLOGY

The methodology used for this survey are in accordance with the bat survey guidelines produced by the Bat Conservation Trust¹.

2.1 Desk Study

A search of online mapping resources was undertaken to characterise the local context of the site with respect to semi-natural habitats and linear features of value to foraging and commuting bats.

The MAGIC website resource (www.magic.gov.uk) was used to identify the location of designated sites for nature conservation within 2km and European Protected Species (EPS) licences granted within a 1km radius of the survey site. Priority habitats and ancient woodland sites upon or adjacent to the site have also been identified, due to their ecological value and potential to act as important foraging resources for bats.

Priority habitats and ancient woodland are classified as habitats of principal importance. Habitats of principal importance are listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act, 2006², which places a duty on Local Planning Authorities to have due regard to biodiversity.

2.2 Field Survey

Bats can use a wide range of features including loft spaces, cavity walls, loose tiles, mortice joints and cracks/gaps in a variety of built structures. They can also be found in trees with holes, splits, cracks, cavities, ivy, and loose bark.

A detailed building inspection was carried out, looking for potential access points and 'potential roosting features (PRFs)' that bats could use and any evidence indicating the presence of bats using the building, such as rub marks, staining or droppings. This included a ground-based external inspection around the building and internal inspection, where safe access was possible. The survey was aided by the use of binoculars, a high-powered torch and endoscope.

¹ Collins, J.(ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

² HM Government (2006). Natural Environment and Rural Communities Act 2006. Available online at: <https://www.legislation.gov.uk/ukpga/2006/16/section/41>.



The potential for roosting bats for each feature, or group of features was assessed as either negligible, low, moderate, or high, in accordance with best practice. Any evidence confirming the presence of bats that was found was clearly recorded including photos and samples taken (e.g. droppings), where appropriate.

The habitats surrounding the site and wider landscape were broadly assessed for their potential to support foraging and commuting bats.

2.3 Other Protected and/or Notable Species

Any birds identified, or evidence of nesting birds discovered during the site visit were recorded. Special attention was paid to notable species such as red-listed Birds of Conservation Concern (Eaton et al. 2015) and those species afforded special protection on Schedule 1 of the Wildlife and Countryside Act (1981).

Whilst this survey focussed on bats and no specific searches were made with respect to other protected species, any evidence of other protected species that was encountered during the site visit was also recorded.

3 RESULTS/OBSERVATIONS

3.1 Desk Study

There are no designated sites within 2km of the site boundary (Figure 4) and therefore, no designated sites that include bats as a designated feature within the zone of influence from the site, but a number of priority habitats are located within 2km which are likely to be of value to foraging and commuting bats (Figure 5).

There are four EPS licences granted for mitigation projects concerning bats within 1km of the site shown on the Magic Maps website (Figure 6). The closest of these is approximately 730m to the north-west and is in relation to a roost on common pipistrelle bats *Pipistrellus pipistrellus* (Licence ref no. EPSM2011-3175). The other three were concerning a roost of Daubenton's bats *Myotis daubentonii* (Licence ref no. 2017-28045-EPS-MIT), common pipistrelle bats (Licence ref no. EPSM2013-6155) and soprano pipistrelle bats *Pipistrellus pygmaeus* (Licence ref no. 2014-1343-EPS-BDX).

3.2 Site Context and Surrounding Habitats

389 Gosbrook Road is located in Lower Caversham, to the North of Reading Town Centre on the junction of Gosbrook Road and Send Road. The site includes the existing workshop, with ancillary offices to the front consisting of a small bungalow. There is a small enclosed yard comprised of amenity grassland at the southern end of the site enclosed by wire mesh gates, with the southern boundary wall shared with the adjacent residential bungalow. Areas of hard-standing forecourt are located across the northern and western areas of the site. The western boundary with Send Road has



no defined boundary, with the exception of a raised concrete slab which covers the front forecourt. The northern boundary is a partly demolished red brick wall. The site is within a predominantly residential area to the north, east and west, with a Grade II listed property bordering the eastern boundary and a number of industrial buildings to the south, along Send Road. The River Thames is located approximately 215m south of the site, bordered by tree lines and small woodland strips. The River Thames and woodland provide good quality habitat likely to support bat populations, as well as be utilised by foraging and commuting bats.



Figure 4. Designated sites within a radius of 2km of 389 Gosbrook Road, Reading. Image produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0).

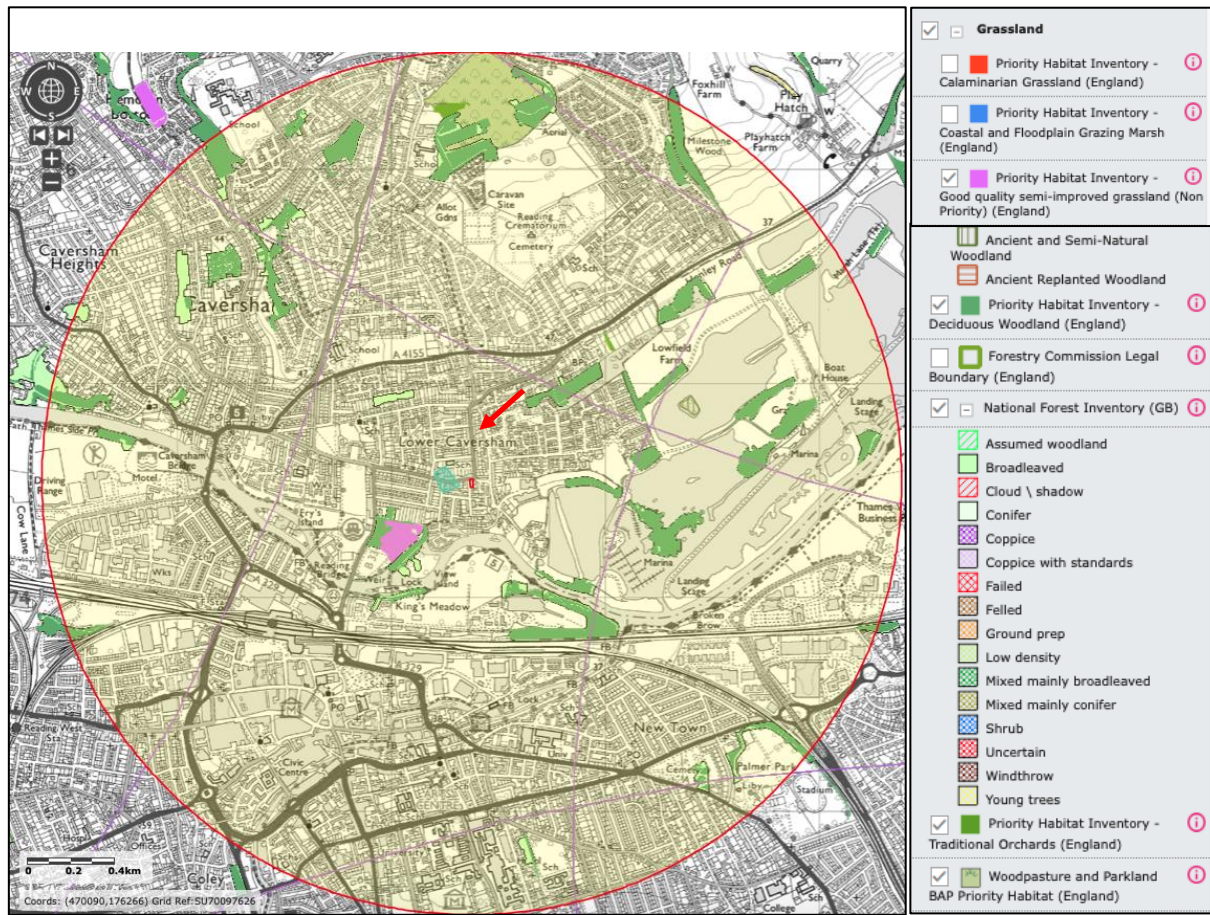


Figure 5. Priority habitats within a radius of 2km of 389 Gosbrook Road, Reading (indicated by a red arrow). Images produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0).



Figure 6: Granted EPS licences within 1km of the application site. Image produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0).

3.3 Building Inspection for Bats

All site photographs can be viewed in Section 3.6.

The 389 Gosbrook Road site contains a number of vacant buildings, including the existing workshop, with ancillary offices to the front, consisting of a small bungalow. The bungalow is a small brick-built building with a pitched, hipped roof covered in a mixture of factory-formed and hand-made clay tiles where small areas of tiles appear to have been replaced. Wooden soffits surround the bungalow, which have not been maintained, but no gaps were visible. Gaps beneath the hand-made clay roof tiles provide potential bat access and roosting locations, between these and the close-boarding internally.

Internally, one loft void is present which is timber-framed and boarded at floor-level as well as the roof being lined with close-boarding. The space is uncluttered and measures approximately 9m (l) x 6.5m (w) x 2.2m to the roof apex. The timbers were heavily cobwebbed, and no bats or evidence of bat usage was present within the void.

During the survey, low numbers of potential bat roosting features were identified and in accordance



The Bat Conservation Trust Survey Guidelines⁴, based on the features identified the bungalow was assessed as having 'low' potential to support roosting bats.

The workshop is a large industrial building with a pitched, gabled roof and a single-pitched lean-to abutting the southern aspect. The building is constructed of brick walls, with the roof built from part-corrugated steel and majority chrysotile sheeting. A single gap was identified within the roof where the side panels meet the ridge. However, although it may provide access for bats to enter the workshop, internally there is no gap where this feature is located.

The workshop is primarily a large open-plan space internally, with no loft voids present, but some small rooms leading off from the main workshop. At loft height is a boarded storage area, accessed via an open staircase and unobstructed from the main workshop. No evidence of bat usage or features were identified internally with the potential to support roosting bats.

During the survey, no potential bat roosting features were identified and in accordance The Bat Conservation Trust Survey Guidelines⁴, the workshop was assessed as having 'negligible' potential to support roosting bats.

No trees on site had potential to support roosting bats and will be retained and protected throughout the development. Therefore, tree roosting bats would not be a constraint to development.

3.4 Protected and/or Notable Species

The site includes the existing workshop, the small bungalow, a small, enclosed yard comprising of amenity grassland and large areas of hard-standing. No evidence of nesting birds or other protected or notable species was noted during the initial scoping assessment survey. The single tree on and trees adjacent to the site, as well as the buildings have the potential to support common/garden species of nesting birds during the course of the bird breeding season (typically running between March and August). Due to the nature of the site and the habitats and structures present, all other areas due to be affected by the proposals are of negligible potential for utilisation by other protected or notable species.

3.5 Survey Limitations

An initial site assessment such as this is only able to act like a 'snapshot' to record any flora or fauna that is present at the time of the survey. It is therefore possible that some species may not have been present during the survey but may be evident at other times of the year. It is also not possible to fully inspect all features which may be used by roosting bats, such as between roof tiles and lining or within cavity walls. For this reason, habitats are assessed for their potential to support bats and other species, even where no direct evidence (such as droppings) has been found.

The south-eastern corner of the bungalow roof was not easily visible during the survey and is in a position where it will not be possible to view this small area during the bat emergence survey. Therefore, as this is a small area and the majority of the roof is covered in factory-made clay tiles with negligible bat roosting potential, regardless of the survey results, this area will require licensed ecological supervision of the tile removal prior to any mechanical demolition.



3.6 Photographs



Photograph 1. The northern (front) and western (side) elevation of the bungalow and workshop at 389 Gosbrook Road.



Photograph 2. The western (side) elevation of the bungalow and forecourt at 389 Gosbrook Road.



Photograph 3. The western (side) elevation of the workshop at 389 Gosbrook Road.



Photograph 4. The southern (rear) elevation of the workshop and part of the yard at 389 Gosbrook Road.



Photograph 5. The yard and part of the southern (rear) elevation of the workshop and at 389 Gosbrook Road.



Photograph 6. The western (side) elevation of the bungalow at 389 Gosbrook Road showing potential bat access and roosting features between hand-made clay roof tiles.



Photograph 7. The northern (front) and eastern (side) elevation of the bungalow at 389 Gosbrook Road showing the majority factory made clay tiles with negligible bat roosting potential.



Photograph 8. The loft void within the bungalow at 389 Gosbrook Road showing the boarded floor, timber frame and roof lined with close-boarding.



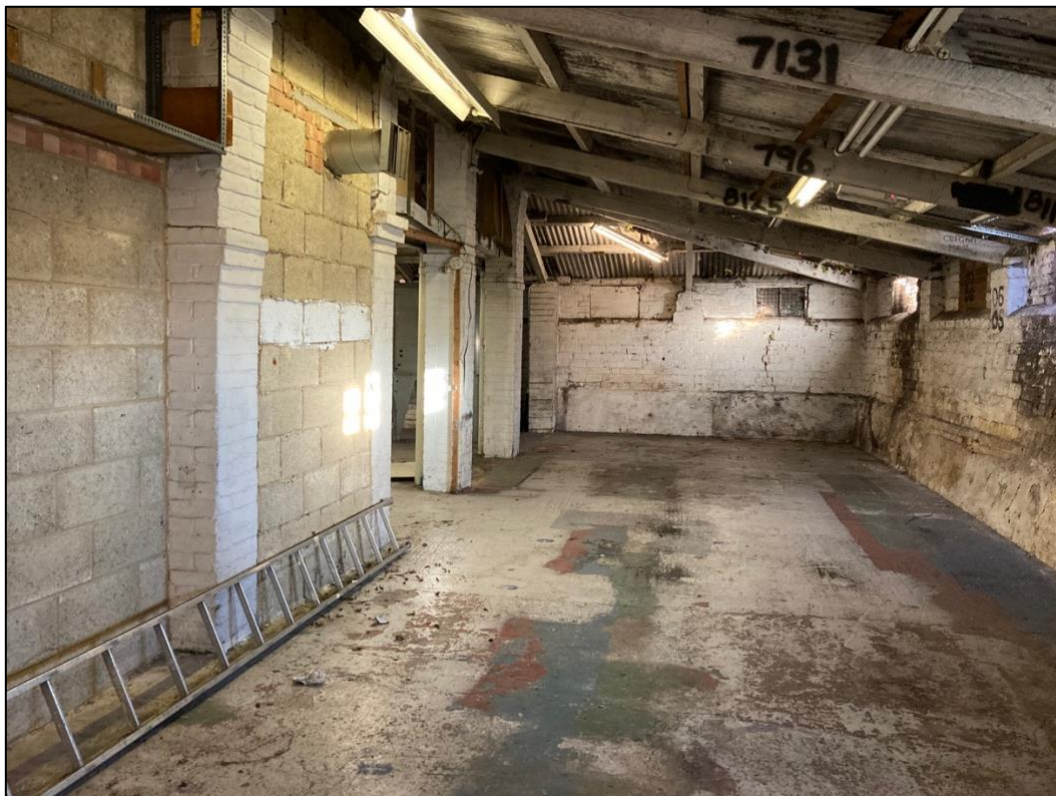
Photograph 9. The loft void within the bungalow at 389 Gosbrook Road showing the heavily cob-webbed timber beams, timber frame and roof lined with close-boarding.



Photograph 10. The southern aspect of the workshop roof with a gap created where the chrysotile roofing sheets meet the ridge.



Photograph 11. Showing the underside of the apparent gap feature created at the ridge, highlighting that internally there is an absence of a crevice-feature suitable for use by roosting bats.



Photograph 12. The internal areas of the workshop at ground-level.



Photograph 13. The internal areas of the workshop at ground-level.



Photograph 13. The internal areas within the raised storage area of the workshop.



4 ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES

4.1 Bats

Without further survey work, the level of impact on bats and their roost sites resulting from demolition of the bungalow cannot be fully assessed. In accordance with the Bat Conservation Trust guidelines, the overall potential for the bungalow is rated as 'low' and one bat emergence/re-entry survey is required to confirm the presence/likely absence of roosting bats. To ensure adequate coverage of all potential roost features associated with the bungalow, it is estimated that two observers and one infrared camera will be required for the survey visit.

These surveys can be undertaken between May and August inclusive, at dusk or at dawn, to observe any bats emerging from, or re-entering roosts. Surveyors will use ultrasonic recording equipment to establish the species of bat present. Regardless of the survey results, the emergence/re-entry survey will be preceded by a repeat internal inspection and as a precautionary measure, the roof tiles on the south-eastern corner of the bungalow roof will be removed under direct bat licensed ecological supervision as this area is partially obscured. If bat roost/s are discovered at any point in the development, further surveys to classify the nature of the roost (day/maternity/hibernation) may be required. The identification of a bat roost also means that during the development, careful timing of the development to avoid impacts on bats, a precautionary 'soft strip' of tiles supervised by a licensed and suitably qualified bat handler and provision of permanent bat roosting features into the development, may be required, depending on the nature of the roost.

A European Protected Species licence will be required for any actions that would directly disturb, modify or destroy a bat roost. This would include measures to replace the existing roosting habitat such as designing integral bat roosting opportunities into the building fabric such as bat tiles and internal voids/access points for bats, depending on the scale of impact.

As the site may be used by foraging and commuting bats, it is important that the potential for disturbance from artificial lights is considered. The proposed development should include an 'ecologically sensitive lighting scheme' in accordance with guidance produced by the Bat Conservation Trust (summarised in Appendix 2).

4.2 Opportunities for Enhancement

The proposed works represents an opportunity for habitat enhancement to benefit insects, birds, dormice and bats. Any planting scheme should include native shrub, tree and flowering species known to encourage insect diversity.

The landowner is encouraged to install bat and bird boxes (Figures 7 and 8) across the site on proposed building and mature trees due to be retained and protected throughout works, and following completion, to provide an enhancement for roosting bats and nesting birds.



Figure 7. Left to right, the 2F Schwegler Bat Box (General Purpose), 2FN Schwegler Bat Box – both designed to last for 20-25 years, The Eco Kent Bat Box and the Low Profile Woodstone Bat Box – both self-cleaning designs. These and other brands are available at many on-line wildlife stores. These are constructed of ‘woodcrete’ (a mixture of cement and woodchip), woodstone (a breathable and insulating material made from concrete and FSC Certified wood fibres) and recycled LDPR plastic outer and FSC spruce inner in the case of the Eco Kent Bat Box. These are designed to be durable and replicate the stable thermal properties of trees and buildings. They may be attached to trees or buildings.



Figure 8. Some examples of bird boxes from the Vivaro Pro Woodstone range (two left images) designed to provide a well-insulated interior with a more consistent internal temperature than an ordinary wooden box and the 1MR Schwegler Avianex (right image). These boxes are guaranteed to last between 10 and 25 years.

The developer is encouraged to consider installing bat boxes to provide an enhancement for roosting bats on site overall. Bat boxes, such as the Woodstone Bat Box are designed to be mounted on walls of buildings and provide a self-contained roost. Alternatively, bat boxes such as the 2F Schwegler Bat Box are designed for mounting on trees.

4.3 Other Protected and/or Notable Species

In the absence of sensitive timing, demolition of the bungalow and workshop has the potential to result in the destruction of active birds’ nest and the killing/injury of eggs/young. It is recommended that demolition of the structures is undertaken outside of the nesting bird season (avoiding March-August inclusive). If this is not possible, the buildings should be subject to nesting bird checks by a suitably qualified ecologist, as appropriate to the works. If an active nest is identified, a minimum exclusion zone for all works within 5m radius of the nest must be established to the nest to protect it from disturbance until the young have fledged.

As with bats, consideration should be given to the installation of features within the site to provide an enhancement for nesting birds. Traditional wooden bird boxes can be mounted on trees and provide nesting opportunities for common species of garden bird such as blue tit *Cyanistes caeruleus* and great



tit *Parus major*. House sparrow terraces can also be installed on the walls of buildings and provide opportunities for communal nesting by several pairs of birds.

If any protected species are found during the proposed work, work should be stopped immediately, and an ecologist must be contacted immediately for advice.

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



APPENDIX 1 – Wildlife Legislation and National Planning Policy

The following text is intended for general guidance only and does not constitute comprehensive professional legal advice. It provides a summary of the current legal protection afforded to bats.

All bat species in the UK are 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 ("The EC Habitats Directive"). As such all bat species in the UK are defined as 'European Protected Species (EPS).

Four species of bat (Bechstein's bat *Myotis bechsteinii*, Barbastelle bat *Barbastella barbastellus*, greater and lesser horseshoe bats, *Rhinolophus ferrumequinum* and *R. hipposideros*) are also listed on Annex IV of the EC Habitats Directive. This requires the designation of a series of sites which contain important populations of these species as Special Areas of Conservation (SACs).

All species of British bat are also fully protected under the Wildlife and Countryside Act (1981), as amended, through inclusion in Schedule V.

All species of bat are listed on Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006). Section 41 of the NERC Act lists the habitats and species of principle importance. This places a statutory duty on all public bodies, including planning authorities, under Section 40, to take, or promote the taking by others, steps to further the conservation of habitats and species of principal importance for the conservation of biodiversity in England (commonly referred to as the 'Biodiversity Duty'). This duty extends to all public bodies the biodiversity duty of Section 74 of the Countryside and Rights of Way (CROW) Act 2000, which placed a duty only on Government and Ministers.

Under the above legislation it is an offence to:

- Kill, injure or take any individual bat of any species;
- possess any part of an individual bat, either alive or dead;
- intentionally or recklessly damage, destroy or obstruct access to any place or structure used by bats for shelter, rest, protection, or breeding;
- intentionally or recklessly disturb these species whilst using any place of shelter or protection; or
- deliberately disturb bats in such a way as to be likely to impair their ability to:
 - survive, to breed or reproduce, to rear or nurture their young; 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. There is also protection under Schedule 6 of The Wildlife and Countryside Act 1981 (as amended) relating specifically to trapping and direct pursuit of bats.

A European Protected Species (EPS) License in relation to bats is required from Natural England for any work that would result in an otherwise unlawful activity (e.g. damage to a bat roost). A license can



only be issued to permit otherwise prohibited acts if Natural England are satisfied that all the following three tests are met:

- The proposal is for ‘preserving public health or public safety, or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment’;
- There is no satisfactory alternative; and
- The action authorised by the license will not be detrimental to the maintenance of bat populations at a favourable conservation status in their natural range.

A bat roost is defined by the Bat Conservation Trust’s Bat Surveys—Good Practice Guidelines 3rd Edition as “the resting place of a bat”. In general, the word roost is interpreted 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 includes summer roosts used for resting during the day and/or breeding; or winter roosts, used for hibernating.



APPENDIX 2 – 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 on 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 considered while designing the lighting scheme. A simple process which should be followed where the impact on bats is being considered as part of a proposed lighting scheme. It contains techniques which 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 on 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
- Consider 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. Consider 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
- 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.

³ Bat Conservation Trust and Institute for Lighting Professionals (2018) Guidance note 8. Bats and Artificial Lighting. <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>



- 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 proposed 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.



Further reading:

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

Royal Commission on Environmental Pollution (2009) *Artificial light in the environment*. HMSO, London.
Available at: <https://www.gov.uk/government/publications/artificial-light-in-the-environment>

Rich, C., Longcore, T., Eds. (2005) *Ecological Consequences of Artificial Night Lighting*. Island Press.
ISBN 9781559631297.

CPRE (2014) *Shedding Light: A survey of local authority approaches to lighting in England*. Available
at: <http://www.cpre.org.uk/resources/countryside/dark-skies/item/3608-shedding-light>

Planning Practice Guidance guidance (2014) When is light pollution relevant to planning? Available at:
<https://www.gov.uk/guidance/light-pollution>

Institution of Lighting Professionals (2011) *Guidance Notes for the Reduction of Obtrusive Light*
GN01:2011. Available at: <https://www.theilp.org.uk/resources/free-resources/>