129 WHITEKNIGHTS ROAD, READING, BERKSHIRE

PRELIMINARY BAT ROOST ASSESSMENT

A Report to: Hives Architects LLP

Report No: RT-MME-152004-02 RevA

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REPORT VERIFICATION AND DECLARATION OF COMPLIANCE

This study has been undertaken in accordance with British Standard 42020:2013 “Biodiversity, Code of practice for planning and development”.

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The information which we have prepared is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management’s Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

DISCLAIMER

The contents of this report are the responsibility of Middlemarch Environmental Ltd. It should be noted that, whilst every effort is made to meet the client’s brief, no site investigation can ensure complete assessment or prediction of the natural environment.

Middlemarch Environmental Ltd accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

VALIDITY OF DATA

The findings of this study are valid for a period of 12 months from the date of survey. If works have not commenced by this date, it may be necessary to undertake an updated survey to allow any changes in the status of bats on site to be assessed, and to inform a review of the conclusions and recommendations made.

NON-TECHNICAL SUMMARY

In March 2020, Oakbridge Bespoke Homes Ltd commissioned Middlemarch Environmental Ltd to undertake a Preliminary Bat Roost Assessment at 129 Whiteknights Road, Reading. This assessment is required to inform a planning application associated with partial demolitions and extensions to the existing residential building.

To fulfil the above brief to assess the potential for the existing buildings on site to support roosting bats, a Preliminary Bat Roost Assessment was undertaken on 27th July 2020.

The preliminary assessment has revealed a number of potential high value roosting features within the building, such as, lifted/missing roof tiles and gaps underneath the ridge tiles. These features were present on all elevations of the building that will be demolished and due to their height and location could not be fully inspected during the assessment. As the presence of bats within the building could not be ruled out, in the absence of appropriate mitigation, potential impacts could include (if bats are present) destruction of a roost, direct harm, injury and disturbance. As such the building has been classed as having high potential to support roosting bats.

Furthermore, there is a potential of increased lighting on site during and post-development that could negatively impact roosting, foraging and commuting bats on site and in wider area.

Following the results of the Preliminary Bat Roost Assessment, the following recommendations have been made:

R1 Main Building

The main building at 129 Whiteknights Road, Reading has been identified as having high potential to support roosting bats. Bat Surveys: Good Practice Guidelines published by the Bat Conservation Trust (Collins, 2016) recommends that for structures with high bat roosting potential at least three dusk emergence and/or dawn re-entry surveys be undertaken during the bat emergence/re-entry survey season to determine the presence/absence of roosting bats within the structure. The bat emergence/re-entry survey season extends from May to September. At least two of the surveys should be undertaken during the peak season for emergence/re-entry surveys between May and August and one of the three surveys should be a dawn re-entry survey. If a roost is discovered during these surveys, a Natural England licence application may be required.

R2 Garage

The garage at 129 Whiteknights Road, Reading were fully inspected, and no bat roosts were identified. This structure had no potential for roosting bats. The survey data obtained for the site is valid for 12 months from the survey date. If development works to the surveyed structure have not commenced within this timeframe it will be essential to update the survey effort to establish if suitable features have developed and if bats have colonised the structure in the interim. In the unlikely event that a bat is found during demolition works all works must immediately cease and a suitably qualified ecologist should be contacted.

R3 Lighting

In accordance with best practice guidance relating to lighting and biodiversity (Miles et al, 2018; Gunnell et al, 2012), any new lighting should be carefully designed to minimise potential disturbance and fragmentation impacts on sensitive receptors, such as bat species. For further recommendations please refer to Chapter 6.

R4 Habitat Enhancement

In line with the National Planning Policy Framework, the development should aim to enhance the site for bats. Bat boxes should be installed to provide roosting habitat for species such as pipistrelle. In general, bats seek warm places and for this reason boxes should be located where they will receive full/partial sun, although installing boxes in a variety of orientations will provide a range of climatic conditions. Position boxes at least 4 m above ground to prevent disturbance from people and/or predators. The planting of species which attract night flying insects is encouraged as this will be of value to foraging bats, for example: evening primrose, goldenrod, honeysuckle and fleabanethe.

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1. INTRODUCTION

1.1 PROJECT BACKGROUND

In March 2020, Oakbridge Bespoke Homes Ltd commissioned Middlemarch Environmental Ltd to undertake a Preliminary Bat Roost Assessment at 129 Whiteknights Road, Reading. This assessment is required to inform a planning application associated with partial demolitions and extensions to the existing residential building.

In addition, Middlemarch Environmental Ltd has been commissioned to undertake a Preliminary Ecological Appraisal of this site, results of which are detailed within Middlemarch Report RT-MME-152004-01.

To fulfil the above brief to assess the potential for the existing buildings on site to support roosting bats, a Preliminary Bat Roost Assessment was undertaken on 27th July 2020.

All UK bat species are European protected species and they are capable of being material considerations in the planning process. A summary of the legislation protecting bats is included within Appendix 1. This section also provides some brief information on the ecology of British bat species.

1.2 SITE DESCRIPTION AND CONTEXT

The site under consideration is a rectangular pocket of land located at 129 Whiteknights Road, Reading, Berkshire. Is it centred on OS Grid Reference SU 74264 71924. The site contains a large detached residential property, a front garden with driveway and a larger rear garden to the north-east. The site covers an area of approximately 0.148 ha.

The site is bordered to the west and east by residential buildings, to the south by Whiteknights Road and to the north further residential gardens.

The majority of the site is covered by a two-storey residential building with single storey attached garage, amenity grassland with pockets of scattered trees and introduced shrubs. There were areas of hardstanding tarmac to the south of the site in a form of vehicular access to the garage and pedestrian access to the house. The rear garden is fenced off with wooden 6 ft fence.

The wider landscape is comprised of further residential buildings with large gardens to the north, west and east and patches of woodlands to the south.

1.3 DOCUMENTATION PROVIDED

The conclusions and recommendations made in this report are based on information provided by the client regarding the scope of the project. Documentation made available by the client is listed in Table 1.1.

Document Name / Drawing Number	Author
Existing and Demolition Plans / 2822 004P11	Hives Architects
Proposed Plans / 2822 005P16	Hives Architects
Existing and Proposed Elevations / 2822 003P13	Hives Architects
Existing and Proposed Street Elevations / 2807 004P11	Hives Architects
Proposed Block Plan / 2822 007P8	Hives Architects
Existing and Proposed 3D Views / 2822 006P9	Hives Architects
Front Garden Concept Plan / 865 01	Bradford-Smith

Table 1.1: Documentation Provided by Client

2. METHODOLOGY

2.1 DESK STUDY

As part of the Preliminary Ecological Appraisal (Report RT-MME-152004-01) an ecological desk study (which included a search for records of bats) was undertaken within a 1 km radius of the site. The consultee for the desk study was Thames Valley Environmental Records Centre.

Middlemarch Environmental Ltd then assimilated and reviewed the desk study data provided by this organisation. Relevant bat data are discussed in Chapter 3. In compliance with the terms and conditions relating to its commercial use, the full desk study data are not provided within this report.

The desk study included a search for statutory nature conservation sites designated for bats within a 10 km radius of the site.

2.2 FIELD SURVEY

In line with the specifications detailed in Bat Mitigation Guidelines (English Nature, 2004) and Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016), a Preliminary Bat Roost Assessment of the building and associated garage was conducted during daylight hours. A visual assessment was undertaken to determine the presence of any Potential Roost Features (PRFs), together with a general appraisal of the suitability of the site for foraging and commuting. Table 2.1 provides examples of PRFs. Any accessible PRFs were inspected using binoculars, a torch and endoscope for evidence of possible bat presence. Building and garage were surveyed externally and internally.

For reasons of health and safety, the survey was only undertaken in areas accessible from 3.5 m ladders.

Based on the PRF's present, the survey area was assessed using the suitability classes detailed within Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016), as detailed in Table 2.2.

Example of Potential Roost Features
<u>Externally</u> • Access through window panes, doors and walls; • behind peeling paintwork or lifted rendering; • behind hanging tiles; • weatherboarding; • eaves; • soffit boxes; • fascias; • lead flashing; • gaps under felt (even including those of flat roofs); • under tiles/slates; • existing bat and bird boxes; and • any gaps in brickwork or stonework permitting access into access to cavity- or rubble-filled walls. <u>Internally</u> • behind wooden panelling; • in lintels above doors and windows; • behind window shutters and curtains; • behind pictures, posters, furniture, peeling paintwork; • peeling wallpaper, lifted plaster and boarded-up windows; • inside cupboards and in chimneys accessible from fireplaces. • within attic voids: • the top of gable end or dividing walls; • the top of chimney breasts; • ridge and hip beams and other roof beams; • mortise and tenon joints; • all beams (free-hanging bats); • the junction of roof timbers, especially where ridge and hip beams meet; • behind purlins; • between tiles and the roof lining; and • under flat felt roofs.

Table 2.1: Potential Roost Features (Adapted from Collins, 2016)

Suitability	Description
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
Negligible	Negligible habitat features on site likely to be used by roosting bats.

Table 2.2: Classification of Structures with Bat Potential (Adapted from Collins, 2016)

3. DESK STUDY

3.1 STATUTORY NATURE CONSERVATION SITES

The site is not located within 10 km of any statutory nature conservation sites designated for the presence of bats.

3.2 SPECIES RECORDS

The data search was carried out in March 2020 by Thames Valley Environmental Records Centre. Records of bat species within a 1 km radius of the survey area provided by the consultee are summarised in Table 3.1. It should be noted that the absence of records should not be taken as confirmation that a species is absent from the search area.

Species	No. of Records	Most Recent Record	Proximity of Nearest Record to Study Area	Species of Principal Importance?	Legislation
Brown long-eared bat *Plecotus auritus*	3	2018	100 m north-west	✓	ECH 4, WCA 5, WCA 6
Noctule *Nyctalus noctula*	24	2017	160 m north-west	✓	ECH 4, WCA 5, WCA 6
Pipistrelle *Pipistrellus* sp.	12	2016	160 m north-west	#	ECH 4, WCA 5, WCA 6
Soprano pipistrelle *Pipistrellus pygmaeus*	29	2017	180 m north-west	✓	ECH 4, WCA 5, WCA 6
Unidentified bat *Chiroptera* sp.	8	2017	200 m north-west	#	#
Common pipistrelle *Pipistrellus pipistrellus*	29	2018	230 m north-west	-	ECH 4, WCA 5, WCA 6
Unidentified myotis *Myotis* sp.	2	2016	240 m north-west	-	ECH 4, WCA 5, WCA 6
Daubenton's bat *Myotis daubentonii*	2	2015	360 m west	-	ECH 4, WCA 5, WCA 6
Long-eared bat *Plecotus* sp.	3	2015	410 m south-east	#	ECH 4, WCA 5, WCA 6
Natterer's bat *Myotis nattereri*	1	2016	930 m north	-	ECH 4, WCA 5, WCA 6
Serotine bat *Eptesicus serotinus*	3	2016	930 m north	-	ECH 4, WCA 5, WCA 6
Unidentified bat *Vespertilionidae* sp.	1	2014	Potentially within a 1 km radius*	#	#

Key:
#: Dependent on species.

ECH 2: Annex II of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora. Animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation.
ECH 4: Annex IV of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora. Animal and plant species of community interest in need of strict protection.
WCA 5: Schedule 5 of Wildlife and Countryside Act 1981 (as amended). Protected animals (other than birds).
WCA 6: Schedule 6 of Wildlife and Countryside Act 1981 (as amended). Animals which may not be killed or taken by certain methods.

Species of Principal Importance: Species of Principal Importance for Nature Conservation in England.

Table 3.1: Bat Species Records Within 1 km of Survey Area

4. SURVEY RESULTS

4.1 INTRODUCTION

The Preliminary Bat Roost Assessment was conducted on 27th July 2020 by Sophie Moy (Senior Ecological Consultant, Level 1 Class Licence Number: 2018-331168-CLS-CLS) and Margarita Smoldareva (Ecological Consultant).

Weather conditions were recorded and are presented in Table 4.1.

Parameter	Conditions
Temperature (°C)	18
Cloud Cover (%)	100
Precipitation	Light Drizzle
Wind Speed (Beaufort)	F1

Table 4.1: Weather Conditions During the Preliminary Bat Roost Assessment

4.2 CONSTRAINTS

Due to the general construction and absence of secure floor beams across the whole of the loft void, it was not possible to fully inspect the loft space.

4.3 SURVEY RESULTS

4.3.1 Main Building

External Assessment
The main building at 129 Whiteknights Road was large two-storey residential brick-built detached house, built in early 1900s. The building was in relatively good state of repair and was un-occupied at the time of the survey. The building had pitched clay tiled roof and chimney. It was brick built with single glazed windows (Plate 4.1).

Plate 4.1: Overview of the Building (Southern Elevation)

A survey of the roof of the building was conducted from ground level. Numerous features were recorded within the roof in form of missing (Plate 4.2 and Plate 4.4) or lifted clay tiles (Plate 4.3 and Plate 4.5) on all elevations which could be utilised by bats to enter the building and potential roosting locations. In addition,

on the eastern and western elevations (Plate 4.6) the roof ridge tiles had a substantial gap which can be used to enter a potential roosting space. It was not possible to inspect any of these ingress holes due to the height at which they were located and as such it was not possible to establish if bats had used these features to enter a roost location at the time of surveying.

Plate 4.2: Missing Tile on Northern Elevation

Plate 4.3: Lifted Tiles on Southern Elevation

Plate 4.4: Missing Tile on Eastern Elevation

Plate 4.5: Lifted Tiles on Southern Elevation

Plate 4.6: Gaps Underneath the Ridge Tiles on Western Elevation

The brickwork on the chimney was in good condition and no cracks or crevices were recorded. The lead flashing between chimney bricks and clay tiles was tightly fitted with no gaps for entry were recorded. The soffits were tightly fitted, and no crack or crevices or missing bricks were recorded within the brickwork. The wooden window frames, door frames and brickwork, had no gaps that could be utilised by bats and the single glazed windows were all in good condition.

Numerous features were recorded around the building which could be utilised by bats to gain entry into the building and potential roost locations. These features include:

- Lifted roof tiles;
- Missing roof tiles; and,
- Gaps underneath the ridge tiles.

It was not possible to fully inspect the features due to the height at which they were located and as such it was not possible to establish if bats had used these features to enter a roost location at the time of surveying. No evidence of roosting bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded within the features that could be fully inspected during the survey.

Internal Assessment

The loft void was two metres high with wooden timber frames and insulated with fibre glass (Plate 4.7). Only a small section of the void was boarded to walk along therefore it could not be fully inspected at the time of survey. The loft was not used to store any personal items and was internally insulated with fibre glass. The small section that could be reviewed was fully inspected, and no bat evidence was recorded.

An old wasps' nests, water tank and large chimney breast were recorded. Wooden ridge beams were heavily cobwebbed (Plate 4.8) indicating the space had not recently been used by fauna. The brick gable ends (Plate 4.10) had gaps around the edges which could be utilised as potential roosting feature by bats. The loft void had a strong draft at the time of the survey indicating that the loft space may not provide consistent temperature or a stable environmental conditions to support void dwelling bats in the section of the loft void that could be inspected. Additionally, there was external damage to the roof tiles that has created large ingress point for bats to utilise (4.9).

Plate 4.7: Inside the Loft Void

Plate 4.8: Wooden Beams were Cobwebbed

It was not possible to fully inspect all features within the loft space such as brick gable ends which had gaps and the space between roof tiles and the sarking as the area was not accessed by the surveyor, the floor was deemed to be unsafe in the large portion of the loft and as such was not surveyed and as such the bat roosting potential of this area could not be determined. Whilst no evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the internal inspection of the building, not all areas could be fully assessed.

Plate 4.9: Ingress point allowing access

Plate 4.10: Brick Gable End

During further internal assessment, the spacious internal rooms with large windows provided significant levels of ambient lighting (Plate 4.11). Along the remaining floors, all rooms had large windows and were in good state of repair. No evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the internal inspection of the building.

Plate 4.11: Example of Spacious Internal Room

4.3.2 Garage

External Assessment
The garage was single storey and in good state of repair with roofing felt flat roof which was partly covered by English ivy *Hedera helix* on northern elevation (Plate 4.12). Large double vehicular doors to the front and two single glazed wooden framed windows to the rear were present. There were no gaps between concrete blocks and doors and windows. Ivy growth was not substantial to form gaps and crevices between stems and concrete blocks. The garages had no potential ingress points for bats to utilise and no evidence of bats were recorded during external inspection.

Internal Assessment
At the time of the survey the garage was used to store personal items and gardening tools (Plate 4.13). The ceiling was made of smooth textured concrete blocks and timber beams which were fully inspected and no evidence of bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded during the internal inspection of the building.

Plate 4.12: Ivy Growth of Northern Elevation

Plate 4.13: Inside the Garage

4.3.3 Trees

There were three scattered trees to the rear of the garden (in the east corner of the site boundary). Species recorded: western redcedar *Thuja plicata*, elder *Sambucus nigra* and Box *Buxus sempervirens*. The redcedar tree was in poor condition (no cracks or holes suitable for bats) and elder and box in good condition. These trees offered negligible potential for roosting bats.

4.4 Site and Surrounding Habitats

The development site, which measures approximately 0.148 ha, is located within the town of Reading, Berkshire. The site contains a front garden with a driveway, and a larger rear garden. At the time of the

survey the site was dominated by amenity grassland and hard standing with scattered trees and introduced shrub. These habitats provided potential foraging opportunities for bats. The trees also provided valuable commuting habitat for bats. Overall, the site was assessed as being suitable for foraging and commuting bats.

Habitats within 1 km of the site suitable for roosting, commuting and foraging include:

- Residential houses and associated gardens;
- Running water and standing waterbodies;
- Pockets of woodland;
- Churches, schools, hospitals and associated grounds; and,
- Railway lines with vegetated banks.

Whiteknight Lake and associated vegetated grounds are situated 0.4 miles to the west providing connectivity through similar residential properties and large linked gardens to the site. Similarly, Harris Garden situated 0.8 miles to the south of the site, provide foraging grounds for bats. In addition, Maiden Erlegh Local Nature Reserve and Laurel Park located 0.8 miles to the south-east also offer bats foraging grounds.

Further connecting landscape consists of Highwood Nature Reserve (1.3 miles) to the north-east, Palmer Park (1.5 miles) to the north-west, and further north River Thames, Thames Valley Park and large water bodies located 2.8 miles away.

5. DISCUSSION AND CONCLUSIONS

5.1 SUMMARY OF PROPOSALS

This assessment is required to inform a planning application associated with partial demolitions and extensions to the existing residential building. The flat roof garage and hipped roof kitchen extension (Plate 4.2) are to be demolished to facilitate the construction of a ground floor extension. Extension works on the first floor of the building will extend northeastwards and involve extensive works to the existing hipped roof.

5.2 ASSESSMENT OF BUILDINGS

The assessment of the main building at 129 Whiteknights Road resulted in the observation of multiple suitable features externally that could support roosting bats or provide access points to internal features. These features include:

- Lifted roof tiles;
- Missing roof tiles; and,
- Gaps underneath the ridge tiles.

It was not possible to fully inspect the features due to the height at which they were located and as such it was not possible to establish if bats had used these features to enter a roost location at the time of surveying. No evidence of roosting bats, e.g. droppings, urine staining, feeding remains or scratch marks, was recorded within the features that could be fully inspected during the survey.

The internal assessment of the loft void identified various ingress points that could be utilised by bats such as damaged/missing roof tiles and gaps between brick gable ends. These features were not inspected fully due to inaccessible areas of the loft void. There was a draft noted due to holes in the building within the loft which may deter bats however this was not significant enough to rule out the probability of roosting. The main building was assessed as having high potential to support roosting bats.

The single storey garage was not suitable to support roosting bats due to absence of ingress points and/or characteristics of the buildings. The garage was assessed as having negligible potential to support roosting bats.

5.3 POTENTIAL IMPACTS ON BATS

It was not possible to rule out the presence of roosting bats within the Main Building, which is to undergo partial demolition and extensive roof works. The Main building was assessed as offering high potential for roosting bats. Should bats be found to be using the high potential features within the main building on site for roosting, there is potential for direct harm, injury and disturbance. A recommendation for further survey work has therefore been made in Chapter 6.

The site is also located in a residential setting with opportunities for foraging or commuting bats within the residential gardens. Should this be lost or if the development is to increase lighting, either during the construction or operational phase of the development, then there is potential for impacting foraging bats within the area resulting from the fragmentation of suitable habitat for bats. Any lighting left on overnight, or close to dawn and dusk, could have an impact on bats roosting and/or using the site to commute or forage. Recommendations have been made in Chapter 6.

It is understood that the vegetation within the rear garden to the main building are being retained as part of the proposed works. Therefore, there will be no loss of potential habitat for foraging and commuting bats.

6. RECOMMENDATIONS

All recommendations provided in this section are based on Middlemarch Environmental Ltd's current understanding of the site proposals, correct at the time the report was compiled. Should the proposals alter, the conclusions and recommendations made in the report should be reviewed to ensure that they remain appropriate.

R1 Main Building

The main building at 129 Whiteknights Road, Reading has been identified as having high potential to support roosting bats. Bat Surveys: Good Practice Guidelines published by the Bat Conservation Trust (Collins, 2016) recommends that for structures with high bat roosting potential at least three dusk emergence and/or dawn re-entry surveys be undertaken during the bat emergence/re-entry survey season to determine the presence/absence of roosting bats within the structure. The bat emergence/re-entry survey season extends from May to September. At least two of the surveys should be undertaken during the peak season for emergence/re-entry surveys between May and August and one of the three surveys should be a dawn re-entry survey. If a roost is discovered during these surveys, a Natural England licence application may be required.

R2 Garage

The garage at 129 Whiteknights Road, Reading were fully inspected, and no bat roosts were identified. This structure had no potential for roosting bats. The survey data obtained for the site is valid for 12 months from the survey date. If development works to the surveyed structure have not commenced within this timeframe it will be essential to update the survey effort to establish if suitable features have developed and if bats have colonised the structure in the interim. In the unlikely event that a bat is found during demolition works all works must immediately cease and a suitably qualified ecologist should be contacted.

R3 Lighting

In accordance with best practice guidance relating to lighting and biodiversity (Miles et al, 2018; Gunnell et al, 2012), any new lighting should be carefully designed to minimise potential disturbance and fragmentation impacts on sensitive receptors, such as bat species. Examples of good practice include:

- Avoiding the installation of new lighting in proximity to key ecological features, such as introduced shrubs and amenity grassland
- Using modern LED fittings rather than metal halide or sodium fittings, as modern LEDs emit negligible UV radiation.
- The use of directional lighting to reduce light spill, e.g. by installing bespoke fittings or using hoods or shields. For example, downlighting can be used to illuminate features such as footpaths whilst reducing the horizontal and vertical spill of light.
- Where the use of bollard lighting is proposed, columns should be designed to reduce horizontal light spill.
- Implementing controls to ensure lighting is only active when needed, e.g. the use of timers or motion sensors.
- Use of floor surface materials with low reflective quality. This will ensure that bats using the site and surrounding area are not affected by reflected illumination.
- For internal lights, recessed light fittings cause significantly less glare than pendant type fittings. The use of low-glare glass may also be appropriate where internal lighting has the potential to influence sensitive ecological receptors.

R4 Habitat Enhancement

In line with the National Planning Policy Framework, the development should aim to enhance the site for bats. Bat boxes should be installed to provide roosting habitat for species such as pipistrelle. In general, bats seek warm places and for this reason boxes should be located where they will receive full/partial sun, although installing boxes in a variety of orientations will provide a range of climatic conditions. Position boxes at least 4 m above ground to prevent disturbance from people and/or predators. The planting of species which attract night flying insects is encouraged as this will be of value to foraging bats, for example: evening primrose *Oenothera biennis*, goldenrod *Solidago virgaurea*, honeysuckle *Lonicera periclymenum* and fleabane *Pulicaria dysenterica*.

REFERENCES AND BIBLIOGRAPHY

Altringham, J (2003). *British Bats.* New Naturalist. HarperCollins.

BSI. (2015). BS8596:2015 *Surveying for bats in trees and woodland*. British Standard Institution, London.

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

English Nature (2004). *Bat Mitigation Guidelines*. English Nature, Peterborough.

Gunnell, K., Grant, G. and Williams, C. (2012) *Landscape and urban design for bats and biodiversity*. Bat Conservation Trust.

Joint Nature Conservation Committee (2012). *UK Post-2010 Biodiversity Framework*. Available: http://jncc.defra.gov.uk/pdf/UK_Post2010_Bio-Fwork.pdf

Jones, K and Walsh, A (2006). *A Guide to British Bats.* The Mammal Society, London.

Middlemarch Environmental Limited (2020) *Preliminary Ecological Assessment: 129 Whiteknights Road, Reading, Berkshire.* Report RT-MME-152004-01.

Miles, J., Ferguson, J., Smith, N. and Fox, H. (2018) *Bats and artificial lighting in the UK. Bats and the Built Environment Series*. Bat Conservation Trust and Institution of Lighting Professionals.

Ministry of Housing, Communities and Local Government (2019) *National Planning Policy Framework*. Available: https://www.gov.uk/government/collections/revised-national-planning-policy-framework

Mitchell-Jones, A.J. & McLeish, A.P. (2004). *The Bat Workers' Manual (3nd Ed.).* JNCC, Peterborough.

The Conservation of Habitats and Species Regulations 2017.

APPENDIX 1

LEGISLATION

Bats and the places they use for shelter or protection (i.e. roosts) receive European protection under The Conservation of Habitats and Species Regulations 2017 (Habitats Regulations 2017). They receive further legal protection under the Wildlife and Countryside Act (WCA) 1981, as amended. This protection means that bats, and the places they use for shelter or protection, are capable of being a material consideration in the planning process.

Regulation 41 of the Habitats Regulations 2017, states that a person commits an offence if they:

- deliberately capture, injure or kill a bat;
- deliberately disturb bats; or
- damage or destroy a bat roost (breeding site or resting place).

Disturbance of animals includes in particular any disturbance which is 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.

It is an offence under the Habitats Regulations 2017 for any person to have in his possession or control, to transport, to sell or exchange or to offer for sale, any live or dead bats, part of a bat or anything derived from bats, which has been unlawfully taken from the wild.

Whilst broadly similar to the above legislation, the WCA 1981 (as amended) differs in the following ways:

- Section 9(1) of the WCA makes it an offence to *intentionally* kill, injure or take any protected species.
- Section 9(4)(a) of the WCA makes it an offence to *intentionally or recklessly** damage or destroy, *or obstruct access to*, any structure or place which a protected species uses for shelter or protection.
- Section 9(4)(b) of the WCA makes it an offence to *intentionally or recklessly** disturb any protected species *while it is occupying a structure or place which it uses for shelter or protection*.

*Reckless offences were added by the Countryside and Rights of Way (CRoW) Act 2000.

As bats re-use the same roosts (breeding site or resting place) after periods of vacancy, legal opinion is that roosts are protected whether or not bats are present.

The following bat species are Species of Principal Importance for Nature Conservation in England: barbastelle bat *Barbastella barbastellus*, Bechstein's bat *Myotis bechsteinii*, noctule *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, greater horseshoe bat *Rhinolophus ferrumequinum* and lesser horseshoe bat *Rhinolophus hipposideros*.

The reader should refer to the original legislation for the definitive interpretation.

ECOLOGY

At present, 18 species of bats are known to live within the United Kingdom, of which 17 species are confirmed as breeding. All UK bat species are classed as insectivorous, feeding on a variety of invertebrates including midges, mosquitoes, lacewings, moths, beetles and small spiders.

Bats will roost within a variety of different roosting locations, included houses, farm buildings, churches, bridges, walls, trees, culverts, caves and tunnels. At different times of the year the bats roosting requirements alter and they can have different roosting locations for maternity roosts, mating roosts and hibernation roosts. Certain bat species will also change roosts throughout the bat activity season with the bat colony using the site to roost for a few days, abandoning the roost and then returning a few days or weeks later. This change can be for a variety of reasons including climatic conditions and prey availability. Bats are known live for several years and if the climatic conditions are unfavourable at a particular roost, they may abandon it for a number of years, before returning when conditions change. Due to the matriarchal nature of bat colonies, the locations of these roosts can be passed down through the generations.

Bats usually start to come out of hibernation in March and early April (weather dependent), when they start to forage and replenish the body weight lost during the hibernation period. The female bats then start to congregate together in maternity roosts prior to giving birth and a single baby is born in June or July. The female then works hard to feed her young so that they can become independent and of a sufficient weight to survive the winter before the weather gets too cold and invertebrate activity reduces. Males generally live solitary lives, or in small groups with other males, although in some species the males can be found living with the females all year. The mating season begins in the autumn. During the winter bats hibernate in safe locations which provide relatively constant conditions, although they may venture outside to forage on warmer winter nights.