# Block K, Coleg Gwent

# Usk Campus

# Bat and Nesting Bird Survey Report

**September 2021**

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**DOCUMENT CONTROL**

| Block K, Coleg Gwent, Usk Campus<br>Bat and Nesting Bird Survey Report | | | | |
|---|---|---|---|---|
| Revision | Date | Prepared by | Checked by | Approved by |
| 1.0 | 19 November 2020 | Ffion Jones<br>Assistant Ecologist | Luke Owen<br>Assistant Ecologist | Paul Hudson MCIEEM<br>Principal Ecologist |
| 2.0 | 15 September 2021 | Holly Gillon<br>Assistant Ecologist | Rory Jones MCIEEM<br>Senior Ecologist | Paul Hudson MCIEEM<br>Principal Ecologist |
| 3.0 | 16 September 2021 | Holly Gillon<br>Assistant Ecologist | Rory Jones MCIEEM<br>Senior Ecologist | Paul Hudson MCIEEM<br>Principal Ecologist |

## Summary

<table>
<tr><td>Brief and Site Location</td><td>This report presents the findings of a bat and nesting bird survey report of an office building known as Block K, located at Coleg Gwent, Usk Campus, Usk, Monmouthshire, NP15 1XJ (Ordnance Survey Grid Reference: SO 3671 0194).</td></tr>
<tr><td>Proposed Works</td><td>The proposed developments include the addition of an emergency escape staircase, and a self-contained structure with a lift within.</td></tr>
<tr><td>Survey Methodology</td><td>The survey comprised the following:<ul><li>A preliminary bat roost assessment which included a survey for nesting birds;</li><li>One dusk emergence survey of Block K and;</li><li>One dawn re-entry survey of Block K.</li></ul></td></tr>
<tr><td>Results of Dusk Emergence and Dawn Re-entry Surveys</td><td>The following bat roosts were confirmed:
<table>
<tr><td>Bat Species</td><td>Maximum Count</td><td>Roost Type</td><td>Roost Location</td></tr>
<tr><td>Soprano pipistrelle</td><td>1</td><td>Occasional[1/2]<br>Day roost[3]</td><td>The soprano pipistrelle accessed the building through a gap under the ridge tile on the south-eastern elevation where the extension joins the main roof.</td></tr>
<tr><td>Soprano pipistrelle</td><td>1</td><td>Occasional[4/5]<br>Day roost[6]</td><td>In the preliminary inspection, two bat droppings were recorded on the eastern elevation of the building’s second roof void.</td></tr>
</table>
One soprano pipistrelle bat returned to Block K in the dawn re-entry survey. There was a low level of activity of bats comprising four species that were observed foraging and commuting.</td></tr>
<tr><td>Evidence of Nesting Birds</td><td>No evidence of past or current nesting by birds was noted during the surveys either within or on the exterior of the building.</td></tr>
<tr><td>Requirements for Additional Survey</td><td>None required.</td></tr>
</table>

[1] Occasional use of bat roosts is typical of all UK bat species to some extent, as bats are known to alternate between several roosting sites to avoid predator detection and build-up of parasites.

[2] It is likely that the roost is used occasionally due to the infrequent nature of roosting recorded at the site (i.e. on one of the two survey occasions).

[3] Day roosts are defined by NE as a place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer.

[4] Occasional use of bat roosts is typical of all UK bat species to some extent, as bats are known to alternate between several roosting sites to avoid predator detection and build-up of parasites.

[5] It is likely that the roost is used occasionally due to the infrequent nature of roosting recorded at the site (i.e. on one of the two survey occasions).

[6] Day roosts are defined by NE as a place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer.

| | |
|---|---|
| Predicted Impacts of Development on Bats and Nesting Birds | Negative impacts to bats and birds will be avoided if the recommendations set out in Section 6 are followed.<br>The continued ecological functionality of the building is expected to be maintained, post-construction. |
| Mitigation and Compensation of Proposed Impacts | Detailed recommendations are given in Section 6 of this report which includes the following:<br>• Precautionary measures to avoid potential impacts on bats and nesting birds during works, including roosting provision, timing of works, site induction and construction protocols; and<br>• Bat roosting provision for bats in the surrounding site.<br>These measures will allow for the continued ecological functionality of the building so that the conservation status of bats is maintained or enhanced. |
| Licensing Requirements for Bats | The proposed works will not affect either bat roost. An NRW European Protected Species bat licence will not be required, provided the works are undertaken following the mitigations detailed in Section 6. |

# 1. Introduction

## 1.1. Brief

This report presents the findings of a bat and nesting bird survey of an office building known as "Block K" at Coleg Gwent, Usk Campus, Usk, Monmouthshire, NP15 1XJ (Ordnance Survey Grid Reference: SO 3671 0194)[7]. The building proposed for development is referred to as "Block K" throughout the remainder of this report.

Block K is situated within the boundary of Monmouthshire County Council, planning reference DM/2020/00338[8].

## 1.2. Site Description

The site lies approximately 1.2km to the north-west of Usk, and 0.2km to the north-east of the A472. The wider landscape surrounding the site comprises rural habitats such as pasture and arable fields and woodland. Rows of mature coniferous and broadleaved trees border the site to the north and south-west respectively, latter of which lie immediately south-west of Block K. To the east of the site lies "Block A" and north of the site lies the front lawn of "Block J". The wider landscape comprises agricultural farmland, patches of mature woodland, and the River Usk flows 0.35km to the east of the building.

The location of Block K is shown on Plan 1: Location Plan.

## 1.3. Proposed Works

The proposed developments include the addition of an emergency escape staircase, and a self-contained structure with a lift within.
Proposed plans can be found in Drawing 1: Development Proposals.

## 1.4. Legislation and Planning Policy

### 1.4.1. Bats

All UK species of bat are designated as 'European Protected Species'. Their breeding sites or resting places[9] (roosts) are fully protected under the Wildlife and Countryside Act 1981[10] (as amended) and the Conservation of Habitats and Species and Planning (various amendments) (England and Wales) Regulations

[7] Latitude and Longitude: 51.712569, -2.9173483
[8] hiips://planningonline.monmouthshire.gov.uk/online -applications/
[9] Resting places are defined as 'areas that are essential to sustain an animal or group of animals when they are not active' (Anon 2007).
[10] hiips://www legislation gov.uk/ukpga/1981/69

2018 [11], until and unless superseded by The Conservation of Habitats and Species (Amendment) (EU Exit) ['CHSAEU'] Regulations 2019[12].

Works affecting bats are subject to licensing procedures by Natural Resources Wales (NRW). The legal protection and licensing procedures are summarised in Appendix 1.

### 1.4.2. Nesting Birds

All wild British birds (whilst building nests, nesting and sitting on eggs) and their nests and eggs, (with certain limited exceptions[13], are protected by law under Section 1 of the Wildlife and Countryside Act 1981[14] (as amended) and the Countryside and Rights of Way Act 2000[15]. Some species, such as barn owls (*Tyto alba*), are listed in Schedule 1 have additional protection from disturbance during the breeding season as do their nests, eggs and dependent young.

## 1.5. Survey Scope

The survey comprised the following:

- A preliminary bat roost assessment which included a survey for nesting birds;
- One dusk emergence survey of Block K and;
- One dawn re-entry survey of Block K.

## 1.6. Reporting

This report aims to:

- Outline the survey methodology used;
- Present the results of the survey;
- Provide an interpretation of the survey results;
- Determine the need for further targeted surveys on site; and
- Provide suitable recommendations in line with planning policy and wildlife law including potential licencing requirements, mitigation, compensation and enhancement measures.

[11] http://www legislation gov.uk/uksi/2018/1307/contents/made

[12] EU Exit – The European Union (Withdrawal) Act 2018 (the EUWA) will end the supremacy of EU law in UK law, will convert directly applicable EU legislation (in particular, EU Regulations and Decisions) as it stands at the moment of exit into domestic law, and will preserve legislation previously made in the UK to implement EU obligations. The legislation will generally have the same effect that it had before the UK left the EU, unless or until it is changed by Parliament. In some cases, there may be changes in referencing and guidance as a result of secondary legislative amendments.

[13] Details of the exceptions are available at hiips://bit.ly/2KiQTFH

[14] hiips://www.le gislation.gov.uk/ukpga/1981/69

[15] hiips://www.legislation.gov.uk/ukpga/2000/37

# 2. Methods

## 2.1. Desk Study

An assessment of the site and surrounding area was carried out, including existing habitats, from maps and aerial photographs. A Geographic Information System (GIS) dataset obtained from NRW was used to search for statutory and non-statutory conservation designated sites for bats within 10km. A 2km search was undertaken for all other statutory and non-statutory conservation designated sites.

A search of the local planning portal was undertaken to look for other sites within the same postcode area which have had bat surveys submitted as a part of their planning application.

## 2.2. Field Study

### 2.2.1. Daytime Internal and External Inspection

A systematic search was made of the exterior and interior of Block K looking for features that bats could use for entering/exiting and roosting[16]. In addition, a search was made for the presence of bats or evidence of bat use, such as droppings, feeding remains, urine staining, scratch marks and the remains of dead bats. The survey was undertaken on 2nd November 2020 by Rory Jones[17] MCIEEM (NRW Licence Number: S086186/2), accompanied by Luke Owen[18/19] and Ffion Jones[20/21].

A high-powered torch (Clulite), an endoscope (Ridgid Micro CA-300), binoculars and a ladder were available for use, as appropriate during the survey.

Bat droppings[22] were collected into grip seal bags without handling (i.e. wearing disposable gloves or using tweezers) to avoid cross contamination, and stored in a cool, dry area. The droppings were retained to be sent to the University of Warwick for DNA sequencing if required, to precisely determine species.

### 2.2.2. Dusk Emergence and Dawn Re-entry Survey

The evening dusk emergence survey commenced 15 minutes prior to sunset, and continued until 90 minutes after sunset.

[16] Bats may utilise gaps as small as 8mm by 20mm (Bat Conservation Trust, Cluster flies leaflet).
[17] Rory is employed as an ecologist with Acer Ecology and is an experienced and licensed bat worker holding both Welsh (Natural Resources Wales Licence Number: S086186/2) and English (Natural England Licence Number: 2015-16057-CLS-CLS) licenses. He graduated with a BSc. in Environmental Geoscience from Cardiff University and has eight years postgraduate experience in the environment sector. He has undertaken extensive training in protected species assessment and has undertaken numerous building inspections, dusk emergence and dawn re-entry survey. Further details of his qualifications and experience can be found at hiip://bit.ly/2qI5Db1s.
[18] Luke accompanied Rory and helped with the external building inspection. He did not enter the loft space during the survey.
[19] Luke graduated with a degree in Zoology from the University of Bristol. He is currently receiving training from Acer Ecology in his first season of bat survey work, working as an Assistant Ecologist.
[20] Ffion graduated with a degree in Ecology and Conservation from the University of Exeter. She is currently receiving training from Acer Ecology working as an assistant ecologist. She also has two seasons of dusk and dawn survey work.
[21] Ffion accompanied Rory and helped with the external building inspection. She did not enter the loft space during the survey.
[22] It should be noted that pygmy shrew (*Sorex minutus*) droppings can closely resemble bat droppings (i.e. this species is an insectivore and so the droppings are crushable, and contain insect remains and so can easily be confused with bat droppings). Pygmy shrew droppings are occasionally found within loft voids.

The dawn re-entry survey commenced 90 minutes before sunrise and continued for 15 minutes after sunrise.

Four surveyors: Rory Jones, Holly Gillon, Arina Huang and Maddy McCarthy undertook the dusk emergence survey. Luke Owen, Alice Wynne-Griffiths, Holly Gillon and Arina Huang undertook the dawn re-entry survey. Surveyor details can be found in Appendix 2. The surveyors were all equipped with Elekon Batlogger M bat detectors.

Surveyors were positioned at viewpoints where they had good sight of all elevations of the buildings, so that all potential roosting features could be observed to detect any bat emerging from, or re-entering, Block K. Bat activity near Block K was recorded to help ascertain flight lines.

In accordance with Section 2.6.1 of the Bat Conservation Trust's Bat Surveys for Professional Ecologists (Collins, 2016) surveys were undertaken during nights with temperatures above 10°C at sunset and during mornings where the previous sunset temperature was above 10°C. The surveys were also undertaken in the absence of rain and strong wind (5.4 m/s or greater, which is equivalent to 13 mph or Beaufort 4).

### 2.2.3. Assessment of Bat Roost Suitability

The value of the site for bats (and any potential roost sites therein) was assessed, in accordance with Table 4.1 of the Bat Surveys for Professional Ecologists (Collins, 2016) (see Appendix 4). The assessment was based on the relative abundance and quality of potential roost sites; and the habitat features within both the site and the surrounding landscape, suitable for roosting, foraging and commuting bats.

### 2.2.4. Survey for Nesting Birds

A visual search was undertaken for active bird nests, as well as any signs which might indicate either past or current nesting, such as guano, singing birds, birds carrying nesting material, food items, faecal sacs and calling chicks.

### 2.2.5. Constraints

<u>General Temporal Constraints</u>

An ecological survey can only identify what was present on site at the time it was conducted. However, habitat usage by species can change over time.

<u>Timing</u>

The time of year when the preliminary roost assessment was carried out (November) coincides with the time when bats are spending longer amounts of time in torpor and some bats begin hibernation. However, signs of roosting activity from previous summers can still be identified and the potential of a building can be assessed outside the active season. Therefore, the timing of the inspection is unlikely to have significantly constrained the survey.

Restricted Access

The south-eastern corner of the main pitch's internal roof void was inaccessible due to areas of rock wool insulation on the exposed joists. Due to health and safety reasons this small area of the void was not surveyed close up, however this constraint is not considered to have affected the overall assessment of the building.

Data Search

A Local Records Centre (LRC) data search was not undertaken due to the small size and nature of the development. The overall impact on biodiversity is likely to be localised and of low significance and current proposals suggest no land will be lost or linear features severed. It is considered very unlikely that the development will have any impact outside the footprint of the works. The data search results are considered unlikely to impact on the decision-making process and therefore a LRC search has not been undertaken.

This approach is consistent with CIEEM's Guidelines for Accessing and Using Biodiversity Data (2016) which states that small scale internal renovations may not require a LRC search where: there is no requirement for any other preliminary survey (e.g. for habitats or other protected species) other than nesting birds or barn owls; and no trees likely to be used by roosting bats are to be affected (e.g. felling, pollarding, crown reduction, limb removal).

# 3. Results

## 3.1. Desk Study

### 3.1.1. Bat Roosts within 2km of the survey area

Based on evidence from previous survey reports at the campus and the associated data searches (Acer Ecology, various reports), there are a high number of bat roosts within 2km (over 60 in total). Records of roost sites included the following species:

- Common pipistrelle (*Pipistrellus pipistrellus*) (including nursery roost);
- Soprano pipistrelle (*Pipistrellus pygmaeus*);
- Pipistrelle species (*Pipistrellus* spp.) (including nursery roost);
- Brown long-eared bat (*Plecotus auritus*);
- Daubenton's bat (*Myotis daubentonii*);
- Natterer's bat (*Myotis nattereri*);
- Noctule (*Nyctalus noctula*);
- Whiskered/Brandt's bat (*Myotis mystacinus/Myotis brandtii*);
- Lesser horseshoe bat (*Rhinolophus hipposideros*) (including hibernation and nursery roosts);
- Greater horseshoe bat (*Rhinolophus ferrumequinum*);
- Myotis species (including hibernation roost); and
- Unidentified bats.

The closest records occurred within the campus, as evidenced by Just Mammals in 2009. In addition to the roost records there are many records of bats foraging or commuting in the locality, including Brandt's bat and Nathusius' pipistrelle (*Pipistrellus nathusii*).

### 3.1.2. Protected Sites

<u>Statutory Sites Notified for Bats (Special Areas of Conservation (SACs)) or Sites of Special Scientific Interest (SSSIs) Within 10km</u>

- The River Usk (Lower Usk) SSSI and at the nearest point lies 0.3km to the east of the survey area. Of special interest are the craneflies (*Tipilidae*) associated with silty river margins in the vicinity of Newbridge on Usk. The fish fauna is of international significance including several rare and scarce species and there is an expanding population of otters. Several scarce higher plant species occurring along the river's tidal reaches are also of special interest. Whilst not a special feature of the site, there is a good range of breeding birds associated with riverine habitats. The citation states that 'the frequent tree cover provides valuable feeding and roosting habitats for several bat species including Daubenton's bat; and
- Part of the Wye Valley Lesser Horseshoe SSSI Bat Site and Llangovan Church SAC and SSSI lie approximately 8.9km to the east of the survey area. Both sites form part of the Wye Valley and Forest of Dean Bat Sites SAC. Several individual SSSIs along the England – Wales border make up

the SAC. The SAC includes buildings and caves which are used by lesser horseshoe and greater horseshoe bats for breeding and hibernating. Other bat species found within the SAC include brown long-eared and Natterer's bats. The area forms 'one of the most important areas for woodland conservation in the UK' and supports a variety of woodland habitats, including beech (*Fagus sylvatica*) forests and yew (*Taxus baccata*) woodlands.

Other Protected Sites Within 2km

- The River Usk SAC at the nearest point lies 0.3km to the east of the survey area. It incorporates the River Usk corridor and its associated habitats. It is also designated separately as the Lower Usk and Upper Usk SSSI's (see first bullet point above). The river corridor supports a wide range of habitats including woodland, marshy grassland, tall herb, swamp and fen vegetation. The primary designation is due to the presence of the EC Habitats Directive Annex I Habitat – "Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation". The SAC also supports populations of the following Annex II species: Allis shad (*Alosa alosa*), twaite shad (*Alosa fallax*), bullhead (*Cottus gobio*), river lamprey (*Lampetra fluviatilis*), brook lamprey (*Lampetra planeri*), otter, sea lamprey (*Petromyzon marinus*) and Atlantic salmon (*Salmo salar*).

The location of protected sites is shown in Plans 2 and 3: Protected Sites Within 2km and 10km respectively.

Non-statutory Protected Sites

*Sites of Importance for Nature Conservation (SINC)*

Ten nearby SINCs were recorded:

- Beech Hill Farm;
- Berthin & Prescarra;
- Berthin Brook Wet Meadow;
- Blackwell Wood;
- Coed Cox;
- Coed-duon;
- Coed-y-Bristley;
- Craig y Garcyd;
- Graig Foel; and
- Upper Llancayot Wood.

Craig y Garcyd is the closest SINC to the proposed development site, located approximately 0.47km to the north-west. SINCs shown with an asterisk have been designated for ASNW/PAWS and do not have any summary information available. SINCs are considered to have substantive nature conservation value at the

regional or district level. They are usually designated at the county or county borough level by the relevant local planning authority and are recognised as a planning constraint in the relevant statutory development plan. However, none of the SINCs lie adjacent or within the proposed development site. Given the small scale of the development proposals and the limited scope for impacts outside of the development footprint, no negative impacts to SINCs are anticipated. Therefore, they are not mentioned again in the context of this report.

*Ancient Woodland Sites*

There are 54 areas of Ancient Semi-Natural Woodland (ASNW)[23], 11 Restored Ancient Woodland Sites (RAWS)[24], eight Plantations on Ancient Woodland Sites (PAWS)[25], and one Ancient Woodland Site of Unknown Category[26], located within 2km of the site. The nearest area of ancient woodland is approximately 0.4km to the north-east of the site.

Protected Sites Summary

Given the small scale of the proposed development, the localised nature of the proposed works, and the limited scope for impacts outside of the footprint of the proposed works, no adverse impacts to the protected sites are likely to occur. These sites are not mentioned any further in this report.

## 3.2. Field Study

### 3.2.1. Ecological Context of Site

Lighting

The site is assessed as being within Zone E3[27] (Institute of Lighting Professionals, 2012) as it is on a college campus in a suburban setting with numerous other buildings in close proximity to Block K. Additionally, there are some streetlights present near Block K, including in the car park approximately 50m to the east of the building, which generate extensive artificial lighting, somewhat decreasing the quality of foraging and commuting bat habitat[28].

Site and Surrounding Habitats

The site is collectively considered to provide high quality foraging and commuting habitat for bats due to its close association with several watercourses, particularly Berthin Brook that lies approximately 0.2km

[23] Ancient Semi-Natural Woodland (ASNW) – broadleaf woodlands comprising mainly native tree and shrub species which are believed to have been in existence for over 400 years.
[24] Restored Ancient Woodland Sites (RAWS) – woodlands which are predominately broadleaves now and are believed to have been continually wooded for over 400 years. These woodlands will have gone through a phase when canopy cover was more than 50% non-native conifer tree species and now have a canopy cover of more than 50 percent broadleaf.
[25] Plantation on Ancient Woodland Sites (PAWS) – sites which are believed to have been continuously wooded for over 400 years and currently have a canopy cover of more than 50 percent non-native conifer tree species.
[26] Ancient Woodland Site of Unknown Category (AWSU) – woodlands which may be ASNW, RAWS or PAWS. These areas are predominantly in transition and existing tree cover is described as 'shrubs', 'young trees', 'felled' or 'ground prepared for planting'.
27 E3: Suburban lighting zone, with medium district brightness.
28 Lighting can impact on bats' roosting sites, commuting routes and foraging areas.

north of Block K and flows into the River Usk SSSI. The woodland is well-linked to designated sites, other areas of mature woodland, lines of mature trees, hedgerows, and pasture. These habitats form a continuous network that provides excellent connectivity to the wider landscape.

### 3.2.2. Building Description from the Perspective of Bat Habitat

The following table summarises the key features of the building.

Table 1: Key Features of Building

| | |
|---|---|
| Building Type | Block K is a large, detached structure that is mainly two-storey, with the north-eastern section of the building being partly single-storey. The construction detail comprises red brick that is rendered with rough cast.<br><br>The main pitch of the roof takes up the bulk of the roof running from west to east, with two subsidiary pitched roofs attached running from south to north (Photo 1-3). |
| Roof | The building's roof is partly pitched and partly hipped with the main pitch of the roof running on a southwest-northeast axis. The subsidiary pitch runs through the centre of the roof on a northwest-southeast axis. The north-eastern section of the roof also has a flat section covered in bitumen felt. The remainder of the roof is constructed from terracotta tiles which also make up the hanging tiles situated on the western and eastern elevation; the ridge tiles are clay (Photo 4).<br><br>The roof tiles are generally well aligned and in good condition, but some are missing or slipped (Photo 5 and 6). Additionally, the hipped ridge tiles on the eastern subsidiary roof are raised (Photo 7). Tiles around the two chimneys on the main pitch roof are also raised (Photo 8 and 9). Edge tiles at the eaves are impeded by close-fitting guttering on all elevations (excluding a small section on the eastern elevation although the ridge tiles are tightly fitted to the roof) (Photo 1-4 and 7). Additionally, the edges of the felt roof on the eastern subsidiary roof are also close-fitted with guttering (Photo 10). |
| Chimneys | There are five chimneys on the building, all in good condition. There are two on the main pitched roof, with a third on the gable end of the eastern elevation (Photo 1). There is also a chimney on the gable end of the western subsidiary pitch and one on the eastern subsidiary pitch (Photo 10). |
| Lead Flashing | There is raised lead flashing providing potential roosting features on the two chimneys on the southern elevation of the main pitched roof (Photo 11 and 12). |
| Soffits, Fascias and Bargeboards | The uPVC soffits are well sealed on all elevations, however, there is a small gap between the soffit box and the external wall on the flat roofed section of the building (Photo 13). |
| Vents | There is a small number of vents on the building, however, they are too small and covered over with paint to be utilised by bats. |
| Windows | The windows and doors have uPVC frames that are closely fitted to the external walls and are in good condition. There is a wooden door on the eastern elevation that may provide access into the building as there are holes in the wooden panels (Photo 14). |
| Roof Void | There are three roof voids within the building:<br>Roof void 1 was 2.5m in height and covers the majority of the building's footprint.<br>Roof void 2 is connected to roof void 1 and is where the bat droppings were found on the roof hatch (Photos 16,17,19,20).<br>Roof void 3 was the smallest void at 1.5m tall, 3.5 wide and 4m long (Photo 18). |
| Roof Lining | The three roof voids are lined with timber sarking boards (Photo 15). |
| Roof Construction | The internal roof voids are constructed with modern timber beams and are in good condition (Photo 16). |
| Insulation of Void | Rock wool insulation covered sections of the floor in the first roof void with other sections comprising bare joists (Photo 16 and 17). |

| | |
|---|---|
| Water Tank | There is a water tank within the first internal roof void, that is open and empty. |
| Security Lighting | There are security lights on all elevations (Photo 1,2,14,19). |

Photos Showing the Building and its Features

Photo 1: North Western Elevation and Highlighted Security Lights

Photo 2: North Eastern Elevation and Highlighted Security Lights

Photo 3: Southern Elevation

Photo 4: Hanging Tiles on Eastern Elevation

Photo 5: Slipped Terracota Tile

Photo 6: Missing Terracota Tile

Photo 7: Raised Ridge Tiles

Photo 8: Raised Tile by Chimney

Photo 9: Raised Roof Tile Near Metal Chimney

Photo 10: View of Flat Roof Part of Building

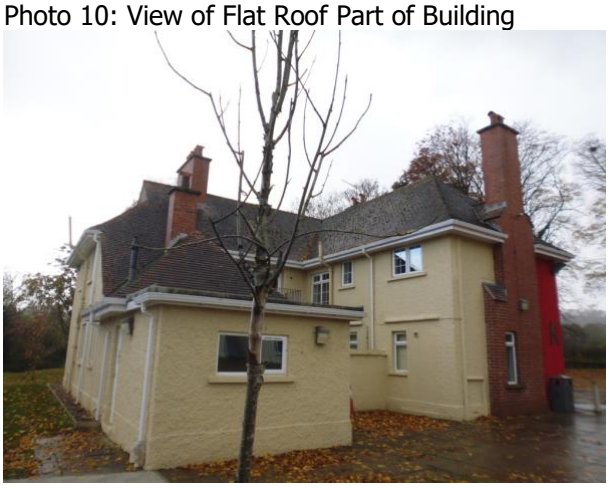

Photo 11: Gaps in Lead Flashing on Chimney

Photo 12: Gap Under Lead Flashing of Chimney

Photo 13: Gap Between Soffit Box and External wall

Photo 14: Wooden Door on Eastern Elevation with Highlighted Gaps and Security Light

Photo 15: Timber Sarking in Roof Void

Photo 16: Structure of Roof Voids

Photo 17: Rock Wool Insulation

Photo 18: Roof-Void 3

Photo 19: Security Lights on Southern Elevation

### 3.2.3. Potential Bat Access Points and Bat Roosting Locations

The following potential roost sites were recorded:

- R1 – Missing tiles on the hipped roof north east of the building and southern elevation of the roof (see Photo 6);
- R2 – Gaps in the lead flashing on the bases of the chimneys (see Photos 11 and 12);
- R3 – Internal roof voids (see Photos 15-17); and
- R4 – Soffit box on eastern elevation (see Photo 13).

### 3.2.4. Evidence of Bats

The site inspection recorded two bat droppings in Roof-void 2, the droppings that were found were deposited in a discrete aggregation on the roof hatch (see Photos 19 and 20). They are brown in colour and dry suggesting they are deposited from this year or the previous year. The species could not be conclusively identified.

Photos Showing Droppings

| Photo 19: Bat Droppings | Photo 20: Location of Bat Droppings (Circled) Amongst Mouse Droppings |
|---|---|
|  |  |

### 3.2.5. Nesting Bird Survey

No signs of birds having recently nested were found during the survey within or on the exterior of the building.

### 3.2.6. Dusk Emergence and Dawn Re-entry Surveys

The results of the dusk emergence and dawn re-entry surveys are summarised below.

Table 2: Summary of Conditions During Dusk Emergence and Dawn Re-entry Surveys

| | **Survey 1** | **Survey 2** |
|---|---|---|
| **Date** | 13/07/2021 | 25/08/2021 |
| **Sunset/Sunrise Time** | 21:26 | 06:12 |
| **Start Time** | 21:11 | 04:42 |
| **Finish Time** | 22:56 | 06:27 |
| **Start Temperature** (°C) | | 18 |
| **Sunset Temperatur**e (°C) | 21 | |
| **Rain** | None | None |
| **Wind (Beaufort scale)** | 2 | 0 |
| **Cloud Cover (Oktas)** | 3/8 | 8/8 |

Table 3: Summary of Dusk Emergence and Dawn Re-entry Surveys Results

| | **Survey 1: Dusk Emergence** | **Survey 2: Dawn Re-entry** |
|---|---|---|
| **Emergences/ Re-entries** | No bats emerged from the building or interacted closely with the building. | One soprano pipistrelle re-entered the building at the south-eastern elevation via a gap beneath the ridge tile where the extension joins the main roof at 06:08. |
| **Important Commuting/ Foraging Routes** | Bats commuted along the trees and hedgerow along the southern site boundary. | No noteworthy commuting routes were identified. |

| | | |
|---|---|---|
| **Bat Activity**[29] | Overall, low levels of bat activity were recorded.<br>Common pipistrelle (*Pipistrellus pipistrellus)* and<br>soprano pipistrelle (*Pipistrellus pygmaeus*)<br>were recorded regularly.<br>Lower levels of activity of noctules (*Nyctalus noctula*) were also recorded. | Overall, low levels of bat activity were recorded.<br>Common and soprano pipistrelle were recorded regularly throughout the survey.<br>Unidentified *Myotis* species[30] were recorded occasionally, including A narrow range Myotis[31] species (considered most likely whiskered[32] or Brandts).<br>Lower levels of activity of noctules were also recorded. |

| | | |
|---|---|---|
| **Bat Social Calls** | No social calls were recorded. | Numerous social calls were recorded throughout the survey, including common and soprano pipistrelle mating/song flight calls. |

**<u>Photos Showing Confirmed Soprano Pipistrelle Roost /Access Sites</u>**

| Photo 21: Photo Showing soprano pipistrelle access point (pink circle) | Photo 22: Photo Showing soprano pipistrelle access point (pink circle) |
|---|---|
|  |  |

[29] Activity thresholds have been quantified using personal judgement according to past experience of surveying similar sites.

[30] Differentiation between Myotis species (especially when flying within confined spaces) is often problematic and not always possible. This is because of the use of frequency modulated calls (FM) which have highly overlapping features making it difficult to distinguish between species.

[31] Differentiation between Myotis species (especially when flying within confined spaces) is often problematic and not always possible. This is because of the use of frequency modulated calls (FM) which have highly overlapping features making it difficult to distinguish between species.

[32] Myotis call with the bulk of the energy distributed between 40 and 50 Khz. Kinks or 's' bends were not present in the sound files analysed, and calls stayed above 30 kHz. The sonograms of whiskered bats rarely have kinks or 's' bends present and calls rarely go below 30Khz.

# 4. Evaluation

## 4.1. Bat Roost Type and Roost Characterisation

The preliminary roost assessment, dusk emergence and dawn re-entry surveys confirmed that the following roosts are present within Block K:

Table 4: Roost Characterisation

| Bat Species | Maximum Count | Roost Type | Roosting Location/Access Points | Rarity Category[33] | Importance of Roost[34] |
|---|---|---|---|---|---|
| Soprano pipistrelle | 1 | Occasional[35/36] Day roost[37] | The soprano pipistrelle accessed the building through a gap under the ridge tile on the south-eastern elevation where the extension joins the main roof. | Abundant and widespread | Local |
| Soprano pipistrelle | 1 | Occasional[38/39] Day roost[40] | In the preliminary inspection, two bat droppings were recorded on the eastern elevation of the building's second roof void. | Abundant and widespread | Local |

## 4.2. Assessment of Suitability of Building to Support Roosting

The building was assessed during the initial preliminary roost assessment survey as having moderate suitability for use by crevice-dwelling bats; moderate suitability for use by roof-void dwelling bats; and negligible suitability for use by direct access species (horseshoe species). Full justification of the assessment

[33] Rarity as defined in Table 3.1 of the Bat Mitigation Guidelines (2nd edition) Beta version.
[34] Importance of Roost as defined in Table 3.2. of the Bat Mitigation Guidelines (2nd edition) Beta version.
[35] Occasional use of bat roosts is typical of all UK bat species to some extent, as bats are known to alternate between several roosting sites to avoid predator detection and build-up of parasites.
[36] It is likely that the roost is used occasionally due to the infrequent nature of roosting recorded at the site (i.e. on one of the two survey occasions).
[37] Day roosts are defined by NE as a place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer.
[38] Occasional use of bat roosts is typical of all UK bat species to some extent, as bats are known to alternate between several roosting sites to avoid predator detection and build-up of parasites.
[39] It is likely that the roost is used occasionally due to the infrequent nature of roosting recorded at the site (i.e. on one of the two survey occasions).
[40] Day roosts are defined by NE as a place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer.

can be found in the Appendix 3. This assessment was used to determine the number of dawn re-entry and emergence surveys required (see Appendix 4).

### 4.3. Potential Winter Roosts

The building has some very limited potential for supporting pipistrelle bats, the crevices between the roof tiles and lead flashing on the roof of the building could feasibly provide potential roosting opportunities for bats in winter, though these features are deemed sub-optimal, due to the high degree of thermal insulation that this area will receive from direct sunlight during the winter months. The building is unlikely to provide adequate protection from sub-zero temperatures to be used throughout the winter. Pipistrelle bats are sometimes found hibernating adjacent to their breeding roosts in secure locations such as cavity walls that have relatively stable temperatures. Other individuals disperse to roost in small numbers in more exposed locations such as around window frames or other shallow cavities/crevices. Often there are no obvious external signs of their presence (JNCC, 2004).

### 4.4. Important Bat Commuting Routes and Foraging Areas

The trees and hedgerows to the south of Block K appear to be used as commuting and foraging bats by bats, mainly by common and soprano pipistrelles.

### 4.5. Birds – Interpretation of Nesting Bird Survey

No evidence of past or current nesting by birds was noted during the preliminary roost assessment or the dusk emergence and dawn re-entry surveys, either within or on the exterior of the building.

# 5. Impact Assessment

The potential impacts are based on the development proposals at the time of writing. This impact assessment may need to be reviewed and amended if any alterations are made to the development proposals.

## 5.1. Potential Impacts of Development on Bats

Short-term Impacts: Disturbance

If the proposed work was undertaken whilst bats were present, it could result in the physical disturbance of bats, direct human interference, increased noise and vibration disturbance, and potentially direct injury or killing of bats from being crushed or entombed. If the work is undertaken between April and September, there is greater potential bats to be impacted.

Short-term Impacts: Noise, Dust and Vibration During Construction Phase

Potential indirect impacts on bats during the construction phase include noise, dust and vibration disturbance or obstruction of access points due to the possible installation of scaffolding, particularly if it is combined with netting, sheeting or boarding.

Long-term Impacts: Roost Loss and Modification

Due to the minimal scope of the lift and emergency staircase installation, there will be no works to the roof structure and consequently, there are anticipated to be no long-term impacts to the roost.

Long-term Impacts: Loss of Commuting and Foraging Habitat or Severance of Flight Lines

Vegetation in close proximity to a roost can be extremely important as it provides a dark area, protection from the wind/weather and from predators immediately after emerging. In addition, it protects bats from light spill and provides structure for acoustic orientation and navigation and opportunities for foraging (Collins, 2016). However, no linear features (hedgerows, treelines) will be affected by the works, therefore no fragmentation or isolation is anticipated. The impact on bat foraging and commuting routes is unknown but considered unlikely to have a negative effect due to the small scale of the development.

Lighting

Indirect disturbance impacts during occupation are likely to involve increased light levels. Most UK bat species are sensitive to light pollution which can create a barrier to roost use, foraging and dispersal (Stone, 2013, Institution of Lighting Professionals & Bat Conservation Trust, 2018 and EUROBATS Advisory Committee, 2018).

However, soprano pipistrelle bats are one of the least light-sensitive species (Stone, 2013,) as they emerge from roost sites early and re-enter late.

Furthermore, the central reaches of the site are already subject to a fair degree of artificial lighting at night via the security lighting of Block A and general campus lighting.
Nonetheless, precautionary measures must be incorporated into the new design proposals to ensure that indirect impacts associated with lighting are avoided as far as can be reasonably achieved.

### 5.2. Potential Impacts of Development on Birds

There are anticipated to be no potential direct impacts due to the absence of evidence of nesting birds in the building.

# 6. Required Actions

## 6.1. Licensing Requirements

The proposed works will not affect either bat roost. An NRW European Protected Species bat licence will not be required, provided the works are undertaken following the mitigations detailed below.

## 6.2. Precautionary Measures

The implementation of the following precautionary measures will minimise the potential for disturbing, injuring or killing bats during works.

### 6.2.1. Installation of Bat Boxes for Bats Displaced During Works

In advance of the works, two Schwegler 2F bat boxes with a double front panel (or suitable alternative), (Appendix 7), will be erected on suitable, large trees[41] within the grounds of the site to provide compensatory alternative roosting habitats during the construction and demolition period for any soprano pipistrelle bats which may be displaced as a result of the works. Ideally, the bat boxes will be installed at a height of at least 4m from ground level. Where applicable, the bat boxes should utilise straps rather than nails to avoid damaging trees.

There are numerous suitable trees located within the site, particularly to the south-east of Block K, this area is secluded and near to linear habitat features of the trees and hedgerows along the southern boundary.

The bat boxes will be retained on site after completion of the works in-perpetuity as a biodiversity enhancement.

### 6.2.2. Timing of Works

Given the roost type: Non-breeding summer day roost and the low numbers of bats, no seasonal restrictions are required.

However, works should ideally not take place during the core summer months between May to August, and instead works to the fascias, soffits and bargeboards etc. should be undertaken from 1st October to 31st March at a time when there is least likelihood of bats being present. The October to March timescale would minimize potential for disturbance for bats and eliminate the risk of causing accidental harm to nesting birds. If external scaffolding needs to be erected as part of the works and will remain in place during April to September, no netting or sheeting will be used on the scaffolding

[41] The bat box should ideally be positioned to face either south-east, south or south-west and located as high as possible, ideally located in a sunny position which is as close as possible to the previous roosting location. A flight path clear from any obstructions should be maintained around the bat box once in situ. The bat box should be positioned away from horizontal branches directly below or above the bat box which could easily be accessed by cats. Ash trees should be avoided due to future problems with Chalara or ash dieback (*Hymenoscyphus fraxineus*).

Furthermore, Section 6.2.11 states that *'the best times for building operations are spring and autumn, when bats are active and least vulnerable'. However, where buildings are only used opportunistically by individual or very small numbers of non-breeding bats for (likely) short periods of time, it may be possible to undertake such operations with care during the summer. Active bats will usually keep out of the way of any operations (Mitchell-Jones, 2004)'*.

### 6.2.3. Site Induction and Toolbox Talk

A suitably qualified bat ecologist will give a 'tool-box talk' to all contractors involved in works that could affect bats. This will take place prior to the commencement of works. All site workers will be briefed on the legal status of bats, the likely places to find them, the working practices required to minimise and avoid harming or disturbing bats (e.g. the procedure required for removing tiles etc.), and the action to be taken if bats are encountered during the works. All site workers will be made aware that in the event of bats (or occupied birds' nests) being found, or suspected, when the ecologist is not on site, all works must stop in the affected area until appropriate expert advice sought from the bat ecologist or NRW. A copy of the NRW licence and the Bat Licence Method Statement will be remain on site at all times and a summary sheet of guidance will be given to the contractors working on site.

### 6.2.4. Bat Discovery Action Plan

If bats are encountered during supervised works, the licensed bat handler will capture the bat/s with thin-gloved hands or hand net and place the bat/s in a drawstring cloth bag. Removed bats will be temporarily transferred to a day holding facility (a well-insulated specially designed bat box) and will then be transferred into a species-specific bat box that will be fixed at a suitable location on or very near to the site. This will allow the bat/s to settle in a safe place for the remainder of the day, and to emerge safely in the evening. Any injured bats or bats requiring supplementary feeding would be immediately taken into care. This process will apply for (up to a maximum of five individuals). If this situation arises whilst works are being undertaken during the winter, a Schwegler 1FW hibernation bat box will be installed on the site to provide an alternative hibernation resource.

If any unexpected bats are observed (i.e. other species not included within the development licence) then all works will stop near the bats and will not recommence until advice from NRW has been sought.

If a bat is discovered during unsupervised times when the ecologist is not present, work will cease immediately and the bat ecologist will be consulted for advice or attend the site. The bat/s will be rescued by the licensed bat handler using the methodology described above or allowed to move of its/their own accord. If it is not possible to contact the bat worker, the NRW Species Protection Officer must be contacted immediately and their advice sought. Builders, contractors and other unlicensed personnel are explicitly forbidden to handle bats.

### 6.3. Mitigation Measures

The main aim of the proposed mitigation will be to minimise disturbance to the existing roost.

#### 6.3.1. External Roosting Opportunities

As detailed in Section 6.2.1, two Schwegler 2F bat boxes with a double front panel (or suitable alternative), (Appendix 7) will be retained from the precautionary measures pre-construction, on suitable, large trees[42] within the grounds of the site to provide compensatory alternative roosting habitats post construction for any soprano pipistrelle bats which may be displaced as a result of the works. Ideally, the bat boxes will be installed at a height of 4m from ground level. Where applicable, the bat boxes should utilise straps rather than nails to avoid damaging trees.

#### 6.3.2. Maintenance of Bat Roosting Features in Perpetuity

The installed bat roosting features will be maintained in perpetuity with future occupiers being made aware of their purpose, function and importance by the developer at the point of sale of the dwellings.

### 6.4. Post-Development Monitoring

Given the minor nature of the bat roost it is considered that no further post-construction monitoring by an ecologist will be necessary. However, it is advisable that the applicant (i.e. it is not necessary for this to be undertaken by the ecologist) undertakes a post-construction check one year after completion of the work to ensure that the crevice-roosting opportunities still exist and have not been blocked up. Photographic evidence that the monitoring check has been undertaken should be provided to NRW.

### 6.5. Longevity of Report

Bat Surveys for Professional Ecologists (Collins, 2016) states that the survey data should ideally be from the last survey season before a planning or licence application is submitted, although the length that survey data remains valid should be decided on a case-by-case basis and is dependent upon several factors[43]. It is considered that if development works do not begin within eighteen months (CIEEM, 2019) to two years of the date of this report, an update survey may be required in accordance with guidance in BS 42020:2013[44] and CIEEM (2019), to determine if conditions and evidence of bat use has changed since described in the current report.

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[42] The bat box should ideally be positioned to face either south-east, south or south-west and located as high as possible, ideally located in a sunny position which is as close as possible to the previous roosting location. A flight path clear from any obstructions should be maintained around the bat box once in situ. The bat box should be positioned away from horizontal branches directly below or above the bat box which could easily be accessed by cats. Ash trees should be avoided due to future problems with Chalara or ash dieback (*Hymenoscyphus fraxineus*).

[43] The factors identified are as follows: Were the original surveys carried out according to good practice guidelines?; Were the original surveys constrained in any way?; Do the results of the original surveys support the original conclusions and are these still relevant?; Has the nature of the site or the surrounding area changed since the original surveys were undertaken; and are additional surveys likely to provide information that is material to a decision, the design of mitigation measures, or specific advice relating to a proposed activity.

[44] As set out in Section 6.2.1, Point 7 which states that ecological information should not normally be more than two/three years old, or as stipulated in good practice guidance).

## 7. References

**Anonymous (2007)** *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC*. Final version, February 2007.

**BSI (2013)** *BS 42020:2013 Biodiversity – Code of practice for planning and development.* British Standards Institution, London.

**CIEEM (2019)** Advice Note on the Lifespan of Ecological Reports and Surveys hiips://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf

**CIEEM (2016)** *UK Guidelines for Accessing and Using Biodiversity Data*. Chartered Institute of Ecology and Environmental Management (CIEEM).

**CIEEM (2021)** *Bat Mitigation Guidelines: A Guide to Impact Assessment, Mitigation and Compensation for Developments Affecting Bats*. Beta version 1.0: June 2021.

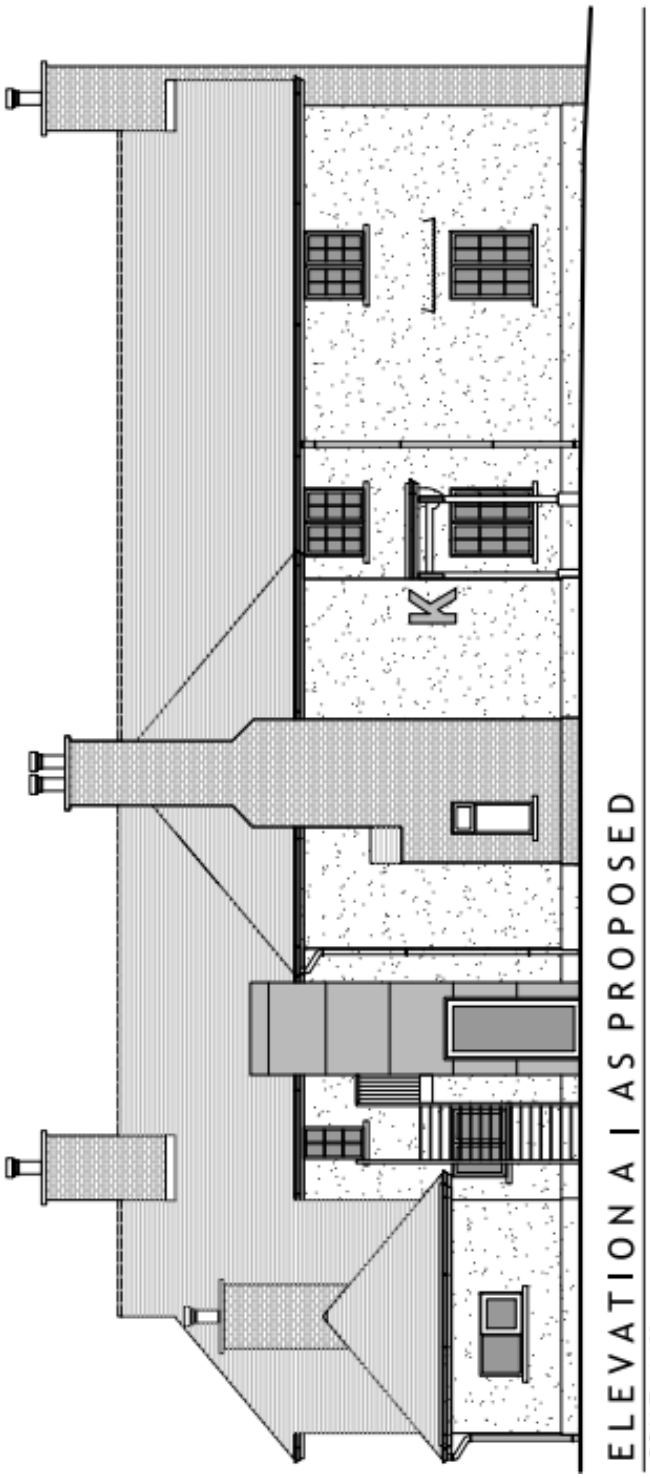
**Collins, J (ed) (2016)** *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn).* The Bat Conservation Trust, London.

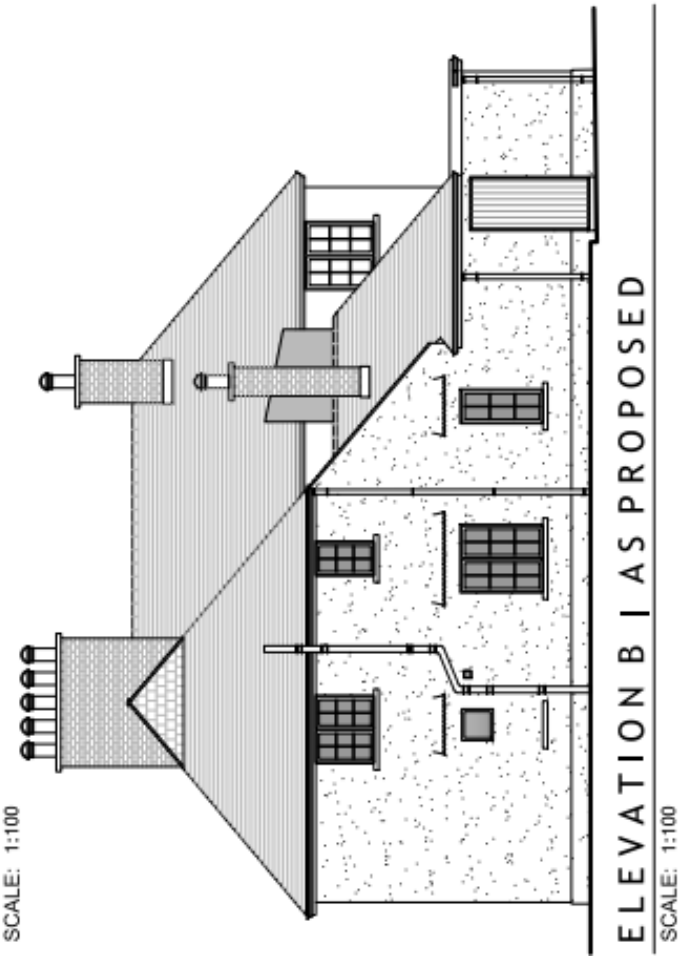
**Institute of Lighting Professionals (2012)** *Guidance for The Reduction of Obtrusive Light*.

**Mitchell-Jones, A.J, & McLeish, A.P. Ed., (2004)** *Bat Workers' Manual* (*3rd Edition).* Joint Nature Conservation Committee, Peterborough.

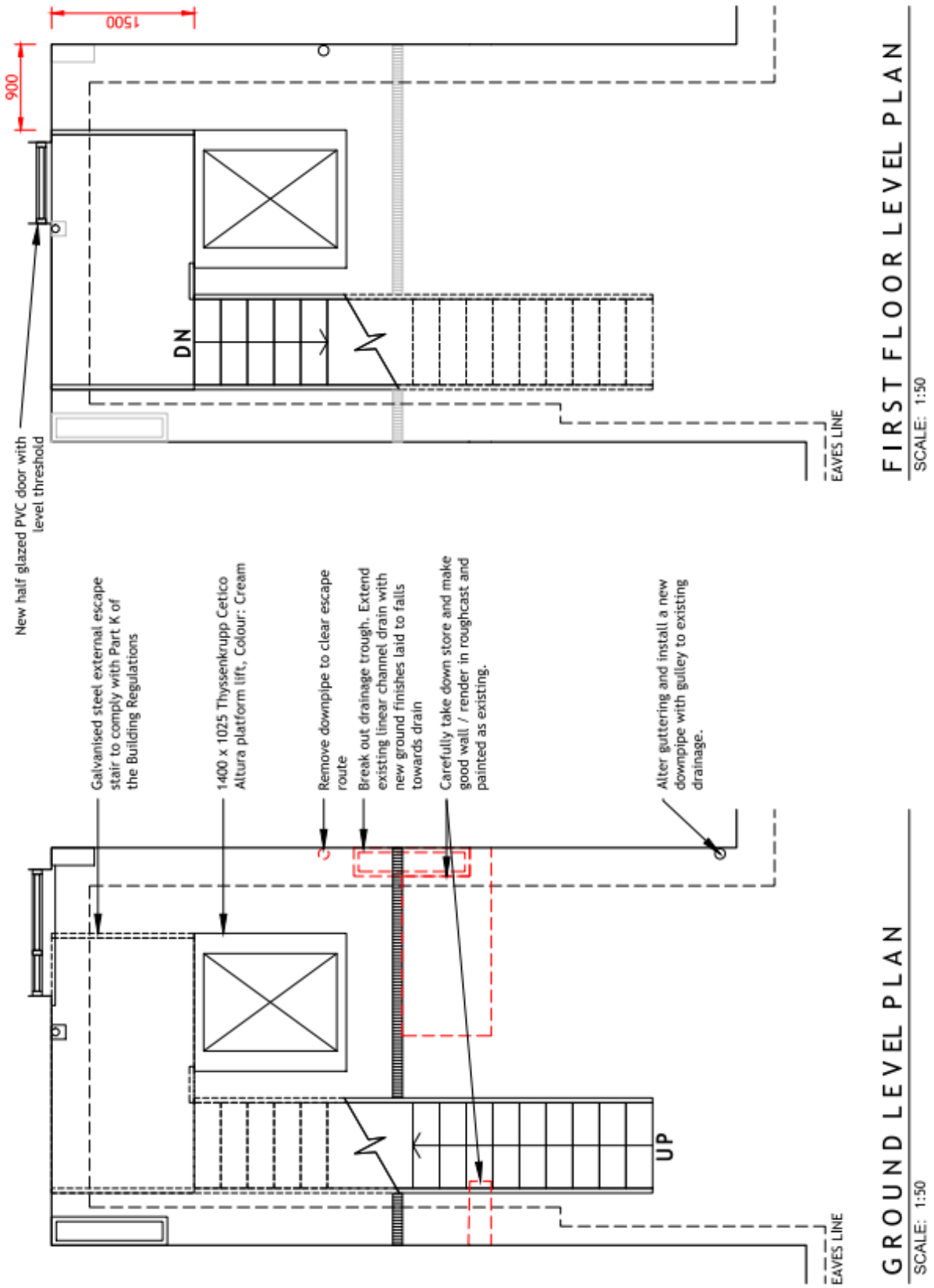
**Mitchell-Jones, A.J. (2004)** *Bat Mitigation Guidelines*. Natural England, Peterborough.

**Drawing 1: Existing Site Plans**



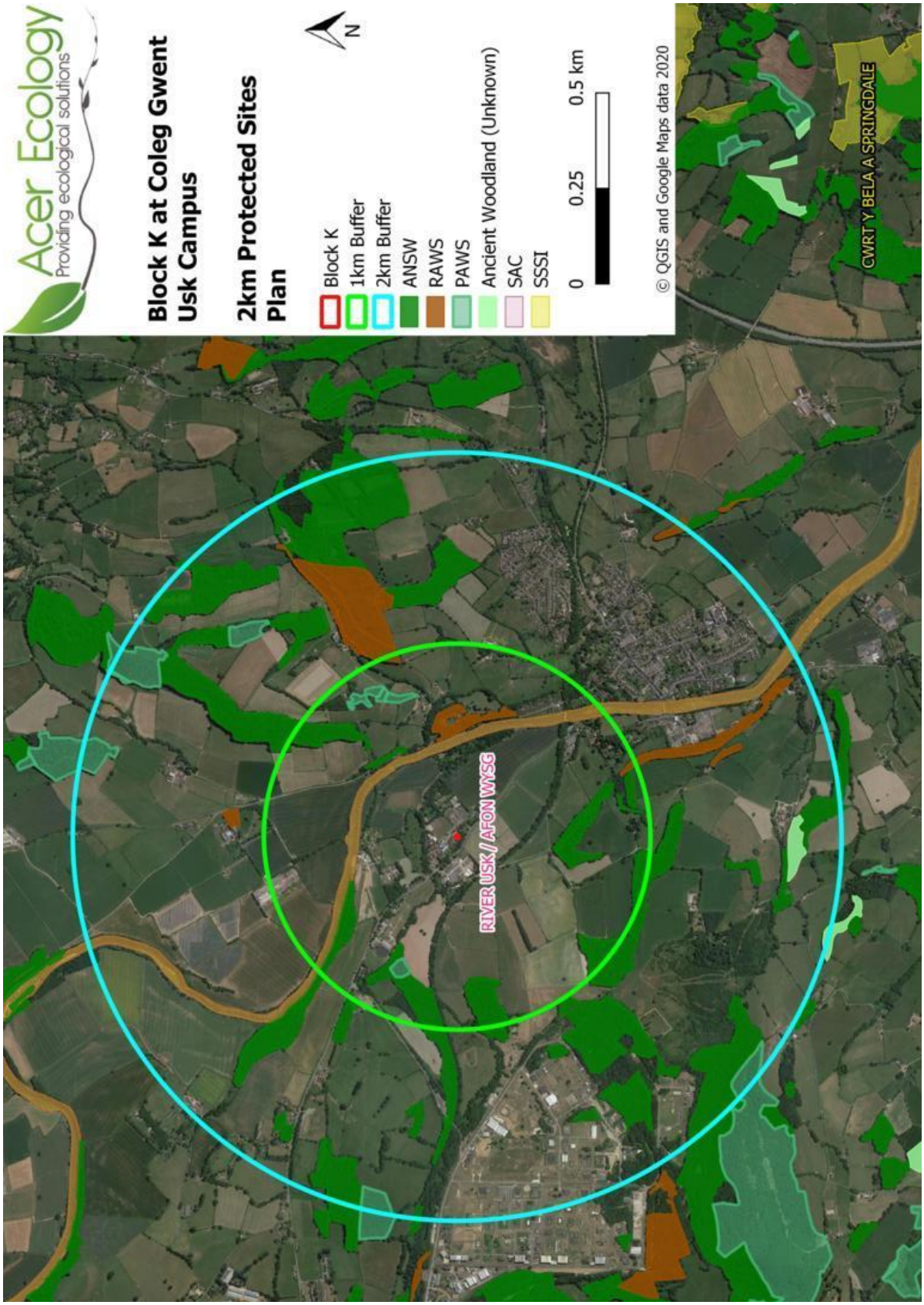



## Drawing 2: Proposed Development

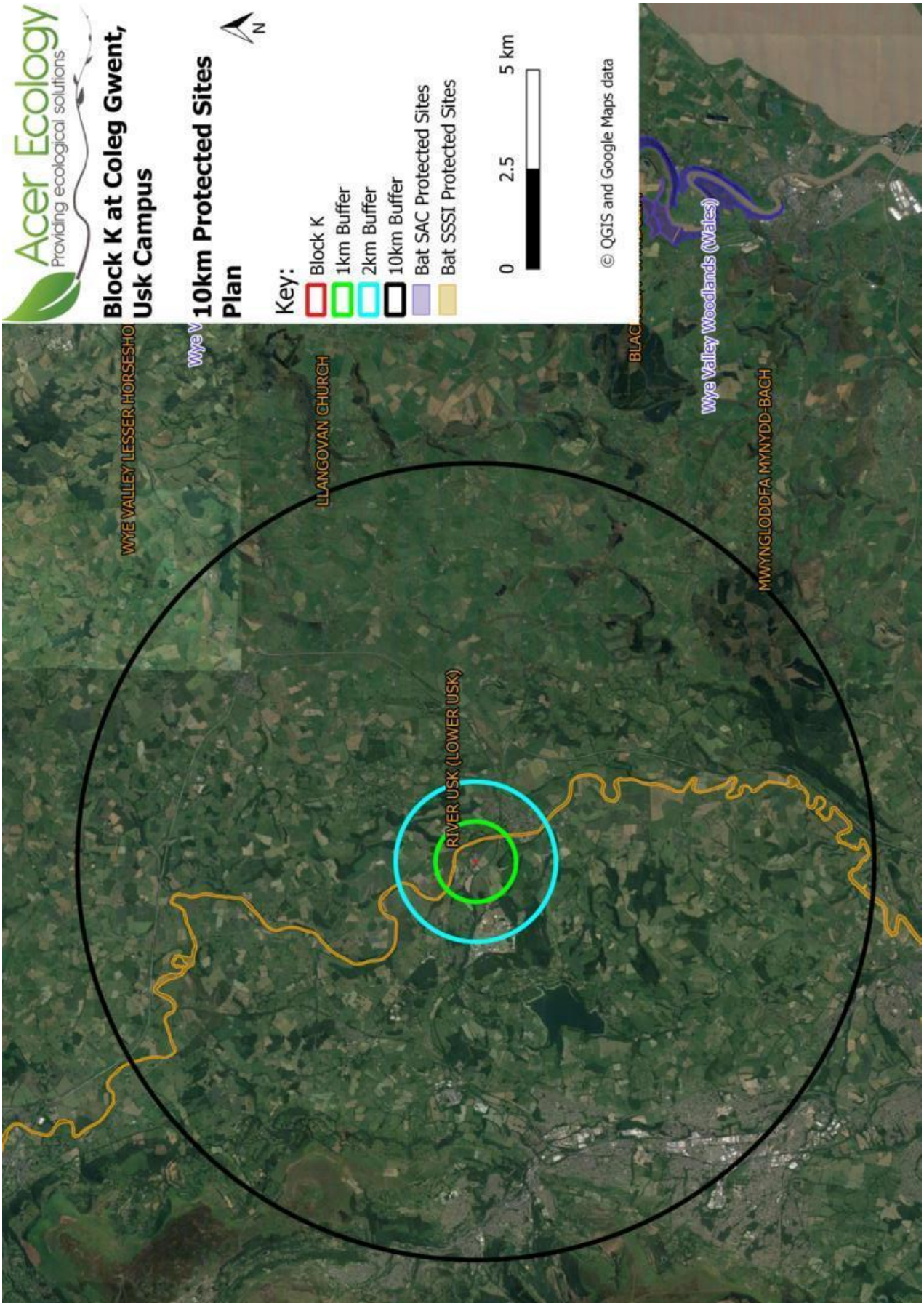


## Plan 1: Location Plan

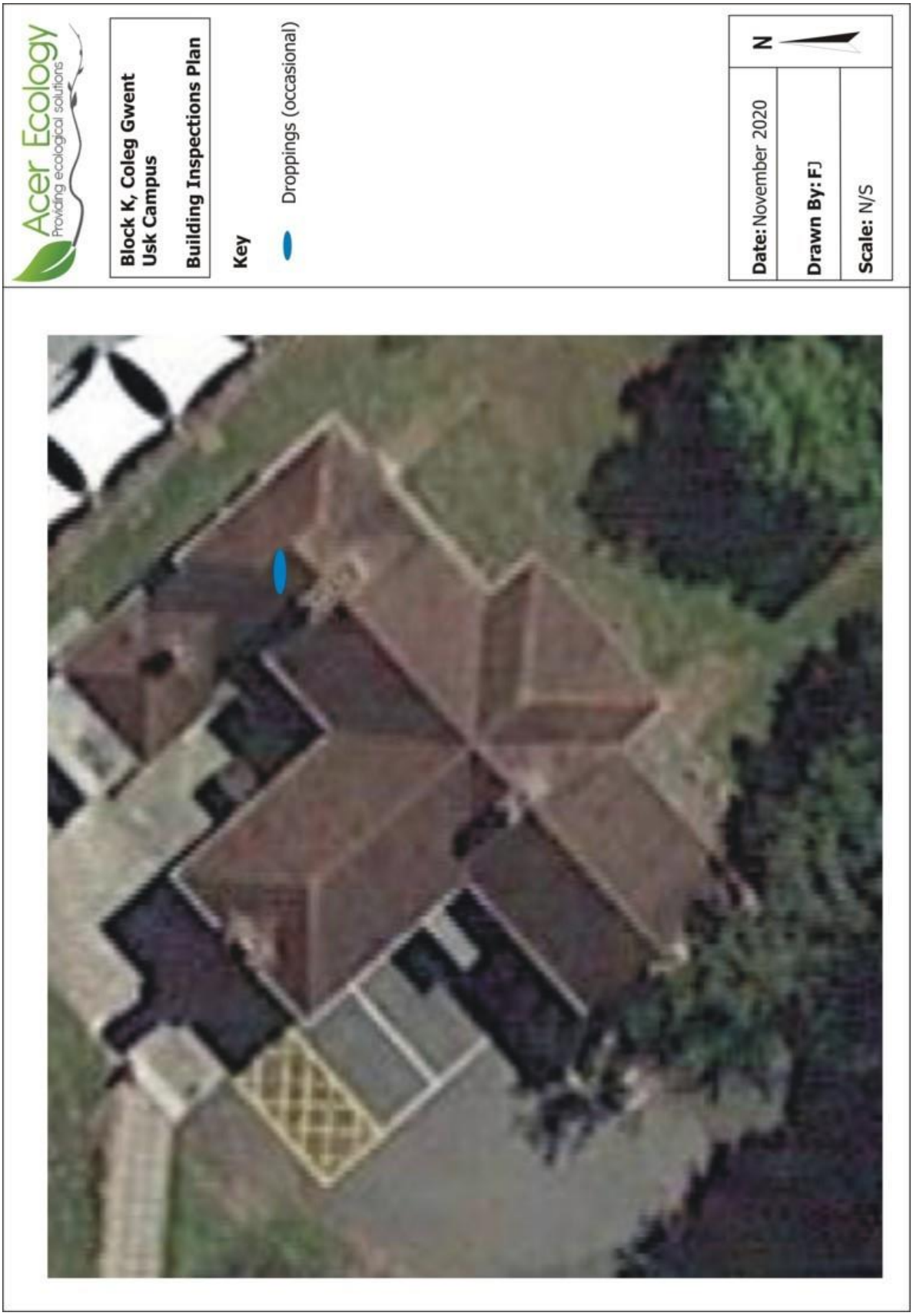
## Plan 2: Protected Sites Within 2km



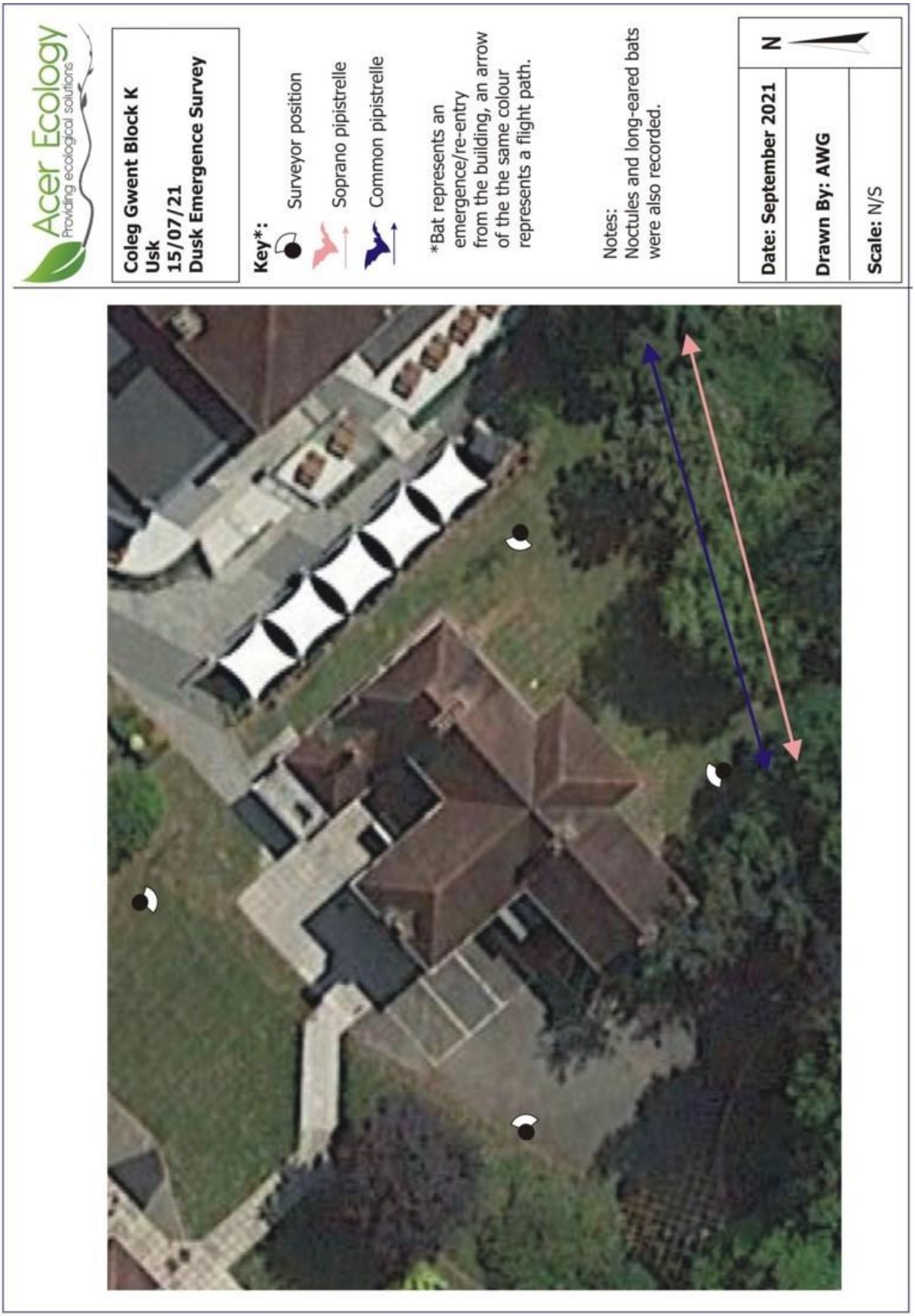
## Plan 3: Protected Sites Within 10km



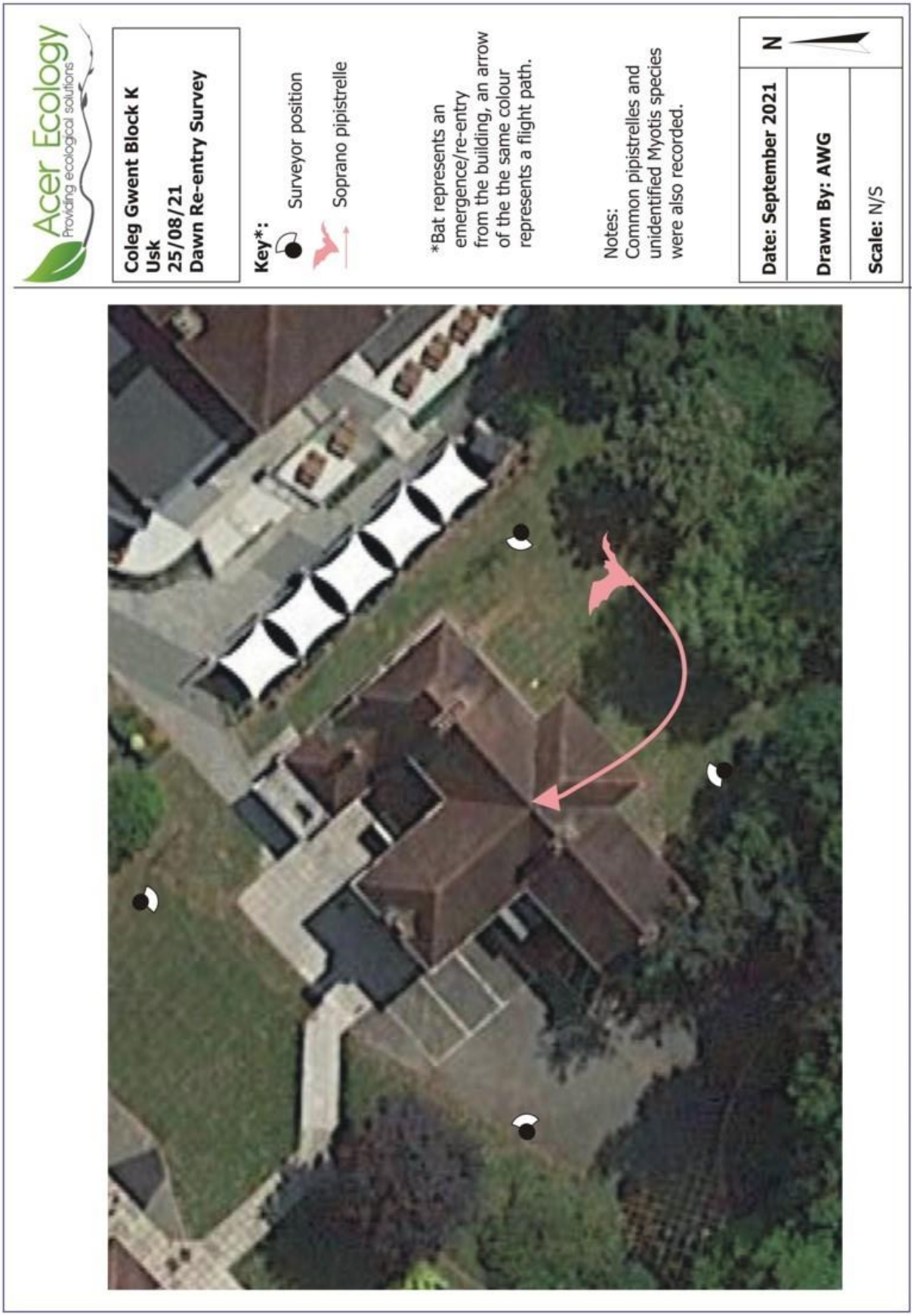
## Plan 4: Building and Preliminary Roost Inspection



## Plan 5: Dusk Emergence Survey Results



## Plan 6: Dawn Re-entry Survey Results



## Appendix 1: Bat Ecology and Legislation Protecting Bats and Their Roosts

### Bat Ecology

There are 17 known breeding species of bat found in the UK, with additional species recorded as migrants or vagrants. All of them are small, nocturnal, flying, insectivorous mammals that are under conservation threat and many having undergone massive population declines over the last century. Some species, such as common and soprano pipistrelle are relatively common and widespread in the UK, while others, such as greater horseshoe bats, have an extremely restricted distribution.

Most bats will use a variety of roosts of different types throughout the year. The winter hibernation sites typically have cool, humid conditions with a stable microclimate and low levels of disturbance. Most British bats hibernate in caves or artificial structures that fulfil these requirements such as mines, tunnels and cellars. Bats emerge from hibernation around late March or early April and move into transition or intermediary roosts. Around early May, female bats gather in colonies to form summer or maternity roosts, and it is here where they will give birth between late May and early July. A colony may consist of many individuals (sometimes hundreds of bats) of mixed age and sex. Roosts may be in a variety of habitat types including tree-holes, caves, buildings and other secure crevices or internal spaces with appropriate stable temperatures and humidity. Bats may change roost locations many times during a year and colonies may split up and reform during this period. Males occupy solitary roosts in autumn, to which they attract females for mating.

### Legislation

All British bat species and any place used for shelter or protection, or a breeding site or resting place (their roosts) are fully protected under the amended Wildlife and Countryside Act 1981 through inclusion in Schedule 5. The roosts are protected irrespective of whether bats are present at the time. All bats are 'European Protected Species' and fully protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species and Planning (various amendments) (England and Wales) Regulations 2018, until and unless superseded by The Conservation of Habitats and Species (Amendment) (EU Exit) ['CHSAEU'] Regulations 2019. These pieces of legislation make it illegal to deliberately or recklessly:

- kill, injure or capture bats;
- disturb bats;
- damage, destroy, or obstruct access to bat roosts (including sites that are currently unoccupied);
- possess or transport a bat or any part of a bat unless acquired legally; or
- sell, barter or exchange bats or parts of bats.

Disturbance is defined as that which is likely to impair bats ability:

- to survive, to breed or reproduce, or to rear or nurture their young;
- to hibernate or migrate; or
- to significantly affect the local distribution or abundance of the species to which they belong.

**Habitats Regulations Licensing**

If a European Protected Species will be affected by a development, Natural Resources Wales (NRW) can issue licences under the Habitats Regulations to permit otherwise prohibited acts. Licences for certain activities can be granted providing "3 tests" are satisfied, that is:

1. the purposes of "preserving public health or safety, or for reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment";
2. there must be "no satisfactory alternative"; and,
3. the derogation is "not detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range".

Licences are issued by NRW, with NRW assessing Test 3, and the Local Planning Authority assessing tests 1 & 2 (where proposals are not subject to planning, then NRW alone will assess all three tests). Where Planning regulations apply, NRW will only issue a licence after determination of the planning application.
The licence application will require the production of a detailed method statement, which sets out the activities to be carried out under the licence to minimise the risk of bats being harmed during construction works, and to ensure that bats will be conserved during the development of the site. This will need to detail the mitigation proposed (such as the replacement or compensation roost), the timescale and schedule of works, the number, size and locations of bat access points to be provided, the type of materials to be used (roofing material, roof lining, fascias, soffits and bargeboards etc.), lighting proposals, action to be taken in the event bats are found during works and a post-development monitoring programme. The method statement will need to be accompanied by scaled plans and maps detailing the bat mitigation features. A cross-section of the access points and roost space is often required. The method statement must ensure that provision is made for new or continued roosting opportunities after the completion of development works. In some instances, a method statement is requested by the Local Planning Authority or Natural Resources Wales before the planning application is determined.

**Environment (Wales) Act 2016**

The Environment (Wales) Act 2016[45] dictates that Local authorities have a duty to have regard to the conservation of biodiversity in exercising their functions. The duty affects all public authorities and aims to raise the profile and visibility of biodiversity, to clarify existing commitments relating to biodiversity, and to make it a natural and integral part of policy and decision making. Part 1 Section 7 of the Act provides a list of the '*living organisms of principal importance for maintaining and enhancing biodiversity in relation to Wales*'. This includes seven bat species (soprano pipistrelle, barbastelle (*Barbastella barbastellus*), Bechstein's (*Myotis bechsteinii*), noctule, brown long-eared, lesser horseshoe and greater horseshoe bats).

45 hiip:// www legislation gov.uk/anaw/2016/3/contents

## Appendix 2: Surveyor Experience

**13th June 2021**

Rory Jones MCIEEM - Rory is employed as an ecologist with Acer Ecology and is an experienced and licensed bat worker holding both Welsh (Natural Resources Wales Licence Number: S088963/1) and English (Natural England Licence Number: 2015-16057-CLS-CLS) licences. He graduated with a BSc. in Environmental Geoscience from Cardiff University and has eight years postgraduate experience. He has undertaken extensive training in protected species assessment and has undertaken numerous building inspections, dusk emergence and dawn re-entry survey. Further details of his qualifications and experience can be found at hiip://bit.ly/2qI5Db1s .

Holly Gillon - Holly graduated with a degree in Biology from the University of Bristol. She is currently working as an Assistant Ecologist and has undertaken numerous dusk emergence and dawn re-entry surveys. Further details of her qualifications can be found at hiips://www.linkedin.com/in/holly -gillon-b115b31b6/.

Arina Huang – Arina is an undergraduate at Cambridge university currently undertaking a degree in Natural Sciences. She is currently receiving training from Acer Ecology in her first season of bat survey work, as part of a summer internship programme.

Maddy McCarthy - Maddy is a final year Biology student at the University of Bristol. She is currently receiving training from Acer Ecology in her first season of bat survey work, as part of a summer internship programme.

**25th August 2021**

Luke Owen - Luke graduated with a degree in zoology from the University of Bristol. He works for Acer Ecology Ltd as an Assistant Ecologist and has undertaken numerous dusk emergence and dawn re-entry bat surveys and is in his second season of ecology work. Further details of his qualifications and experience can be found at hiips://www.linkedin.com/in/luke -owen-5343721a3.

Alice Wynne-Griffiths - Alice graduated with a degree in Zoology from the University of Bristol. She is currently working as an Assistant Ecologist and has undertaken numerous dusk emergence and dawn re-entry surveys. Further details of her qualifications can be found at: hiips://www.linkedin.com/in/alice -wynne-griffiths-1533ab1a2/.

Holly Gillon – as above

Arina Huang – as above

## Appendix 3: Justification for Number of Surveys Undertaken

The building is assessed as supporting a confirmed roost. Droppings were found within the roof space of the building confirming the presence of bats. However, it was not possible to determine if the droppings were produced by crevice-dwelling bats (pipistrelle species and smaller Myotis species such as Brandt's (*Myotis brandtii*) and whiskered bats (*Myotis mystacinus*)) or roof-void dwelling bats (long-eared species, large Myotis bats such as Natterer's bat (*Myotis nattereri*)). There is also potential for crevice dwelling bats to roost elsewhere within the building.

The building has negligible suitability for use by direct access species requiring a large access point and large roost space (lesser and greater horseshoe) as there were no suitable access points large enough for these species[46] recorded during the survey.

The building is deemed to have an overall moderate bat roosting suitability. This assessment will be used to determine the level of further survey effort required (see Appendix 4).

[46] Both species prefer larger openings (Schofield, 2008) but sometimes even smallish openings with a minimum diameter of 10cm (lesser horseshoe) can be sufficient (Reiter & Zahn, 2006).

## Appendix 4: Guidelines for Assessing Potential Bat Roosting Suitability and Determining Required Number of Dusk/Dawn Surveys

| Suitability | Description of Roosting Habitat | Minimum Number of Dusk/Dawn Surveys Required[47] |
|---|---|---|
| Negligible | Negligible habitat features on site likely to be used by roosting bats. | None. |
| 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[48] 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[49]. | One survey visit. One dusk emergence or dawn re-entry survey (Survey period from May to August) (Collins 2016). |
| 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[50] (with respect to roost type only) the assessments in this table are made irrespective of conservation status, which is established after presence is confirmed. | Two separate survey visits. One dusk emergence and a separate dawn re-entry survey[51]. Surveys should be undertaken from May to September with at least one of the survey between May and August (Collins 2016). |
| 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. | Three separate survey visits. At least one dusk emergence and a separate dawn re-entry survey. The third visit could be either dusk or dawn. Surveys should be undertaken from May to September with at least two of the surveys from May to August (Collins 2016). |
| Confirmed Roost | Evidence of bats or use of bats found. | Minimum of two required to characterise the roost. If it is not possible to characterise the roost on the basis of two surveys, additional surveys may be required. In the event that no evidence of bat roosting is detected during the dusk and dawn surveys a third survey may be required. In this situation DNA analysis of the droppings may also be required. |

47 Adapted from Tables 7.1 and 7.3 of the Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016).
48 For example, in terms of temperature, humidity, height above ground levels, light levels or levels of disturbance.
49 Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK, but ecologists should be aware of the potential for large numbers of this species to be present during the autumn and winter in large buildings in highly urbanized environments.
50 'High roost status' is not defined within Collins, 2016. Acer Ecology Ltd. interpret maternity, hibernation, swarming sites, mating sites, and satellite roosts as being of 'high roost status' and exclude day roosts, night roosts, feeding roosts, transitional/occasional roosts from this definition. Pre-maternity/collecting roosts are not included within Collins, 2016 and will be assessed on an individual basis.
51 Multiple surveys should be spread out to sample as much of the survey period as possible. It is recommended that surveys are spaced at least two weeks apart, preferably more. A dawn survey immediately after a dusk survey is considered only one visit.

## Appendix 5: Guidelines for Assessing Bat Habitat Suitability

| Suitability | Commuting and Foraging Habitat |
|---|---|
| Negligible | Negligible habitat features on-site likely to be used by commuting and foraging bats. |
| Low | Commuting Habitat<br>Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.<br>Foraging Habitat<br>Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub. |
| Moderate | Commuting Habitat<br>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.<br>Foraging Habitat<br>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water. |
| High | Commuting Habitat<br>Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.<br>Foraging Habitat<br>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland.<br>Proximity to Known Bat Roosts<br>Site is close to and connected to known roosts. |

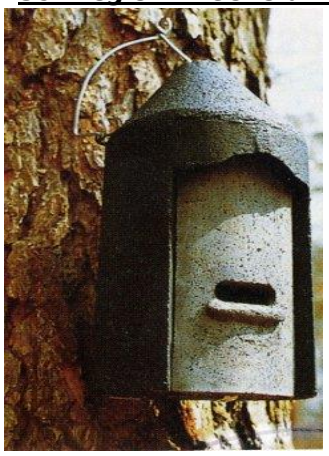
## Appendix 6: Guidelines for Proportionate Mitigation

| Conservation significance | Roost status | Mitigation/compensation requirement (depending on impact) |
|---|---|---|
| Low | Feeding perches of common/rarer species | Flexibility over provision of bat-boxes, access to new buildings etc. No conditions about timing or monitoring |
| | Individual bats of common species | |
| | Small numbers of common species. Not a maternity site | |
| | Feeding perches of Annex II species | Provision of new roost facilities where possible. Need not be exactly like-for-like, but should be suitable, based on species' requirements. Minimal timing constraints or monitoring requirements + |
| | Small numbers of rarer species. Not a maternity site | |
| | Hibernation sites for small numbers of common/rarer species | Timing constraints. More or less like-for-like replacement. Bats not to be left without a roost and must be given time to find the replacement. Monitoring for 2 years preferred. * |
| | Maternity sites of common species | |
| | Maternity sites of rarer species | Timing constraints. Like-for-like replacement as a minimum. No destruction of former roost until replacement completed and usage demonstrated. Monitoring for at least 2 years. |
| | Significant hibernation sites for rarer/rarest species or all species assemblages | |
| | Sites meeting SSSI guidelines | Oppose interference with existing roosts or seek improved roost provision. Timing constraints. No destruction of former roost until replacement completed and significant usage demonstrated. Monitoring for as long as possible. |
| High | Maternity sites of rarest species | |

Notes: The definition of common, rare and rarest species requires regional interpretation.
* The level of monitoring specified is no longer considered appropriate by Local Planning Authorities and NRW. At least three years of monitoring is considered to be required for maternity roosts of 'rarer' species and five years for 'rarest' species.
+ Minimal monitoring requirements has not been defined by NE or NRW. On previous schemes this has been interpreted by NRW as checks being undertaken by the applicant (rather than the ecologist) one-year post-construction to ensure that the bat access points still exist and have not been blocked up. Photographic evidence that the monitoring check has been undertaken should be provided to NRW.

## Appendix 7: Schwegler 2F Bat Box

**Schwegler 2F General Bat Box**



The Schwegler 2F General Bat Box is the standard and most popular bat box. Ideal for summer roosts and is constructed of woodcrete, providing a breathable, stable temperature within and is suitable for long-term mitigation projects.

**Position:** Ideal for trees, should be mounted on tree trunks at a height of 3m – 6m. Can be positioned in clusters of three, with each box facing west through a south-eastern aspect to provide a variety of micro habitats.
**Height:** 33cm.
**Diameter:** 16cm.
**Weight:** 4kg.

*Selection of Trees*

Selected trees should ideally be a minimum of 500mm diameter at the height of fixing. Trees should not be obviously unstable or badly rotted. The timber and bark at the point of fixing should be sound.

*Position of Boxes on Trees*

Boxes should be mounted on tree trunks, rather than on boughs or branches. The mounting location should not be heavily shaded. Boxes should be mounted vertically on the tree. Where applicable, the bat boxes should utilise straps rather than nails to avoid damaging trees.

Bat boxes should be mounted a minimum of 3m from the ground, and ideally placed in clusters of three.

The entrance to the box should be clear of obstructions and obstacles in the flight-path towards it. An 'open airspace' of about 3m square should be preserved in front of and below the entrance, and elsewhere any overhanging branches should be at least 1m away.

The mounting location should be readily and safely accessible by ladder, but not accessible by someone climbing up the trunk or onto an adjacent tree or wall etc.

Some lower branches may need to be trimmed below the box to remove ready handholds or footholds for would-be tree-climbers (as well as any small branches crowding the entrance).

As far as possible, boxes should be placed in locations which are not conspicuous from the ground, so as not to attract unwanted attention from passers-by. This objective is assisted by selecting locations which are not visible/accessible from public footpaths, byways etc.

*Double Roost Panel*

An internal double front panel creates roosting opportunities for crevice-inhabiting bats such as common and soprano pipistrelles.

*Bat Box Availability*

The 2F bat box is available from a number of suppliers including Jacobi Jayne (www.jacobijayne.com), NHBS (www.nhbs.com) where it retails at approximately £35.95+VAT.