



**Tyn-y-Caeau, Margam Road, Margam,
Port Talbot, Neath Port Talbot, SA13 2NW**

Bat Survey Report for Recycling Plant & Machinery Ltd



***A European Protected Species Licence will be required
for works to be undertaken on the original dwelling***
**Government and CIEEM guidelines were followed in
relation to the COVID-19 pandemic.**

Report type	Bat Survey Report
Report reference	IG2020TynyCaeau
Site	Tyn-y-Caeau, Margam Road, Margam, Port Talbot, Neath Port Talbot, SA13 2NW
Grid reference	SS 79267 86383
Client(s)	Recycling Plant & Machinery Limited
Date(s)/time(s)/ type(s) of survey(s)	Scoping survey: 30 th May 2020 1st Dusk activity survey: 30 th May 2020 between 21:05 and 23:20 2nd Dusk activity survey: 13 th June 2020 between 21:20 and 23:35 Dawn activity survey: 27 th June 2020 between 03:30 and 05:10 Remote recording between the 26 th June and the 7 th July 2020
Surveyor details	Scoping survey: Mr Glyn Lloyd-Jones, Natural Resources Wales Licence number S085044/1 (at the time of survey, now S088445/1). Activity surveys: Mr Glyn Lloyd-Jones; Mr Mike Jones; Ms Jody Evans; Mr Pete Watts; Ms Sharon Doherty; Mr Greg Evans; Mr Iestyn Evans, Natural Resources Wales Licence number S086081/1; and Miss Ceri Daugherty, Natural Resources Wales Licence number, S086102/1
Architect	Mr R. Banks, Evans Banks Planning

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Reviewed by	Ceri Daugherty	Author	
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Executive summary

- ✦ At Ty'n-y-Caeau (the property) the original period dwelling is a large north-west facing predominantly two storey detached building which is subject to proposed plans for conversion to a mixed (residential and commercial) development. It is constructed of rendered and painted walls and has natural slate roofs with lead flashing around the chimneys. The walls of the original house are intact and generally in good condition with only some small (non-exploitable) cracks while the timber soffits/facias/weatherboards are predominantly tight to the walls with only a small number of potentially exploitable gaps. The roof slates themselves are predominantly in good condition with no missing or damaged slates, but there were one or two areas where they may have slipped, thus creating potentially exploitable gaps, and there is also some loose lead flashing around the chimney pot to the left of the front elevation. The timber/uPVC framed windows and doors are generally intact (the rear door having been boarded up after being vandalised leading to the house being open) with only one pane of glass in the original timber framed windows to the front having slipped. The detached north east facing two storey (with subterranean rooms to the rear so this aspect is three storey) annexe is constructed of smooth rendered walls with a slate roof, brown uPVC framed windows and doors, and brown uPVC soffits/fascias/weatherboards and rainwater goods. The building is in very good condition with no observable exploitable gaps and no damage to either the walls or roof. The detached stone outbuilding has an unlined slate roof which is in very good condition but there are gaps at the walls top as well as other aperture in the stonework. Internally, the large windows of the original house allow a lot of light internally; thus reducing the potential for day roosting in these areas while the loft spaces at the property have many undisturbed cobwebs, a lot of dust, and some signs of rodent use.
- ✦ On the 30th May 2020, I&G Ecological Consulting Ltd undertook a daytime bat scoping survey of the buildings at the property. As a result of the findings dusk surveys were undertaken on the 30th May and the 13th June 2020 and a dawn survey was undertaken on the 27th June 2020. The weather conditions present at the site were conducive to bat activity and access was available to all parts of the site.
- ✦ This report confirms the findings of those surveys, completed in accordance with current best practice (Collins, J. (Ed.) 2016) and conducted by experienced, licensed ecologists and experienced assistants.
- ✦ The property is located on the southern side of the community of Margam, 4.6km south-east of the town of Port Talbot. Despite its location close to a heavily industrialised area **it is within favourable bat habitat but is not within 10km of any site which is designated for its bat interest.**
- ✦ As part of the scoping survey undertaken by I&G Ecological Consulting Ltd on the **Annexe and the Stone Outbuilding**, no bats or their signs were found, and collectively they are considered to have **low to moderate** potential to support roosting bats, and a **low to moderate** risk of bats using the features present. During the activity survey, four species of bat; **Common pipistrelle, Soprano pipistrelle, Myotis species and Lesser horseshoe** were using the surrounding environment for foraging and commuting, but no bats were seen to leave or enter any part of either building. **There are** therefore currently **no bats using these buildings**, they receive no ecological protection under wildlife legislation and there are no ecological constraints to the proposed works.
- ✦ During the scoping survey of the **Original (Period) Dwelling**, no bats were found, but droppings and feeding signs (peacock butterfly wings) were found within the hall fireplace area, which DNA analysis confirmed were from **Lesser horseshoe bats**. The Anabat recorded only **Lesser horseshoe** calls while during the second dusk survey, **one Lesser horseshoe was detected entering the building via a slipped glass pane to the front, and during the dawn survey, one bat of the same species was seen to leave the same area.** In addition, **three P. pygmaeus** bats were seen to leave loose lead flashing around the chimney pot to the left of the front elevation on the first dusk survey, **five P. pygmaeus** bats were seen to leave on the second dusk survey and **four P. pygmaeus** bats were seen to enter on the dawn survey. There is also an area where the roof steps down to the rear of the dwelling where **two P. pipistrellus bats** were seen to leave on the first dusk survey. These and a further one species (**Myotis species**) were seen/detected by the surveyors utilising the immediate surroundings for foraging and commuting.
- ✦ In relation to **Roost Characterisation Assessment**, from the evidence gathered, it is considered that **the original dwelling is being used as a feeding perch for an individual (probably male) Lesser horseshoe bat. The loose roof materials are also providing refuge for 5 soprano and 2 common pipistrelles.**
- ✦ **No evidence of nesting birds** was found in any of the buildings and **no signs of owl activity** were discovered.
- ✦ **Mitigation measures will need to be implemented and the following recommendations have been made (and will be included in the final plans).**
 - ✦ **Recommendation 1:** prior to works commencing, a dedicated roost space is to be created within the detached stone building on site for the species confirmed to be present. 300mm x 400mm "Cowled" Letterbox access will be provided as well as x 4 wall top gaps, and one in eight crevices are to be retained in the stonework.
 - ✦ **Recommendation 2:** x 1 Beaumaris (or similar) and x 1 Kent style (or similar) bat box to be affixed internally within the dedicated roost space.

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1. Introduction

1.1 Scope and purpose of survey

1.1.1 Any sign of use of a site by bats is enough to confirm that the space has 'bat interest' and is enough to confirm the importance of the location to bat species. All species, as well as their resting places, are protected by law and the site is protected even when bats are not present. See appendix 1 for an introduction to bat surveys, including the aims of the scoping survey, appendix 2 for an overview of the legislation, and appendix 3 for information on roost types and survey timings. Appendix 4 lists all surveyors who undertake work for I&G Ecological Consulting Ltd and includes their experience.

1.1.2 This report confirms the results of, and conclusions and recommendations from, the surveys undertaken. It aims to provide the local planning authority with sufficient information to enable a full assessment of the potential ecological impacts of the proposed development. The CIEEM Guidelines for Ecological Report Writing (2017) state that it is important that the structure and content of a report should be proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed development. This report has therefore been written in line with these guidelines and is to be read in conjunction the Ecological Appraisal Report produced by I&G Ecological Consulting Ltd in May 2020.

1.1.3 For the purposes of this survey report, the site boundary is defined as the buildings and surfaces within the overall site footprint.

1.2 Site characteristics and proposed works

1.2.1 Tyn-y-Caeau (the property) is located on the southern side of the community of Margam, 4.6km south-east of the town of Port Talbot. The area is heavily industrialised to the north and west but the property sits within approximately 3.5 acres of its own mature grounds and is within close proximity to other favourable bat habitat. Beyond its own boundary, to the east (on the other side of the M4 motorway) are the parklands, grasslands and woodland – including ancient woodland – of Margam Country Park. To the north-west, within 400m are the greens and roughs of British Steel (Port Talbot) Golf Club while to the south, within 300m are the grounds of Margam Crematorium. Beyond the Crematorium, just over 700m away is Eglwys Nunydd Reservoir. To the west, 800m away is a railway line while the coastline is 2.5km to the west.

1.2.2 The property is subject to proposed plans for change of use from dwelling house and annex building into a mixed used development consisting of guest house accommodation consisting of 16



guest rooms, with associated bar, cafe and spa facilities, and truck stop with 21 HGV parking spaces. The proposal includes the demolition of an existing single storey rear extension, and the erection of a single-storey rear extension. Figure 1 shows an aerial view of the property while figure 2 is of the wider environment and figure 3 is a location plan. Plan drawings are included in appendix 5.

Figure 1: Aerial view of the property which is outlined in red.
(from Apple® Maps)

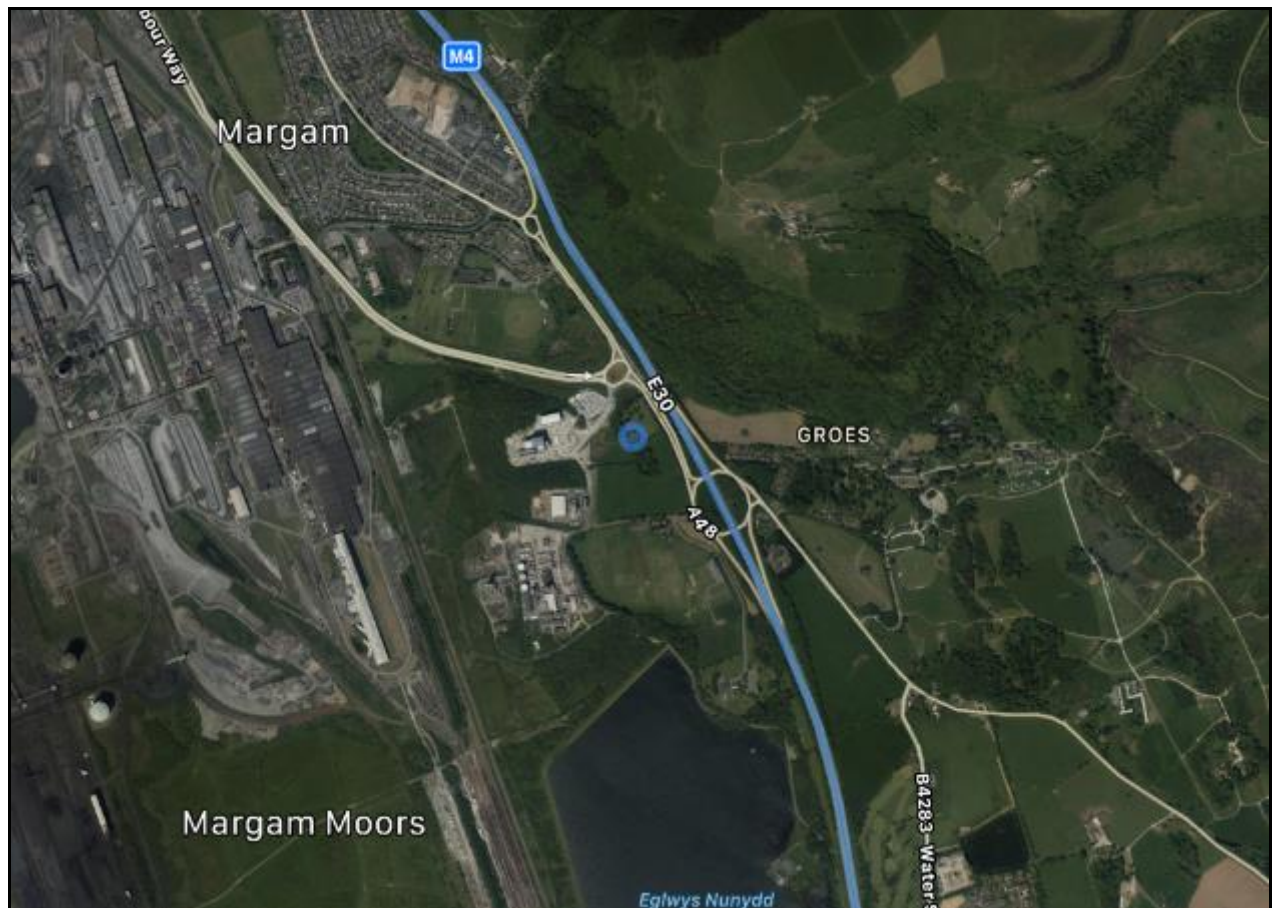


Figure 2: Map showing the wider environment. The property is indicated by a blue dot. (from Apple® Maps)

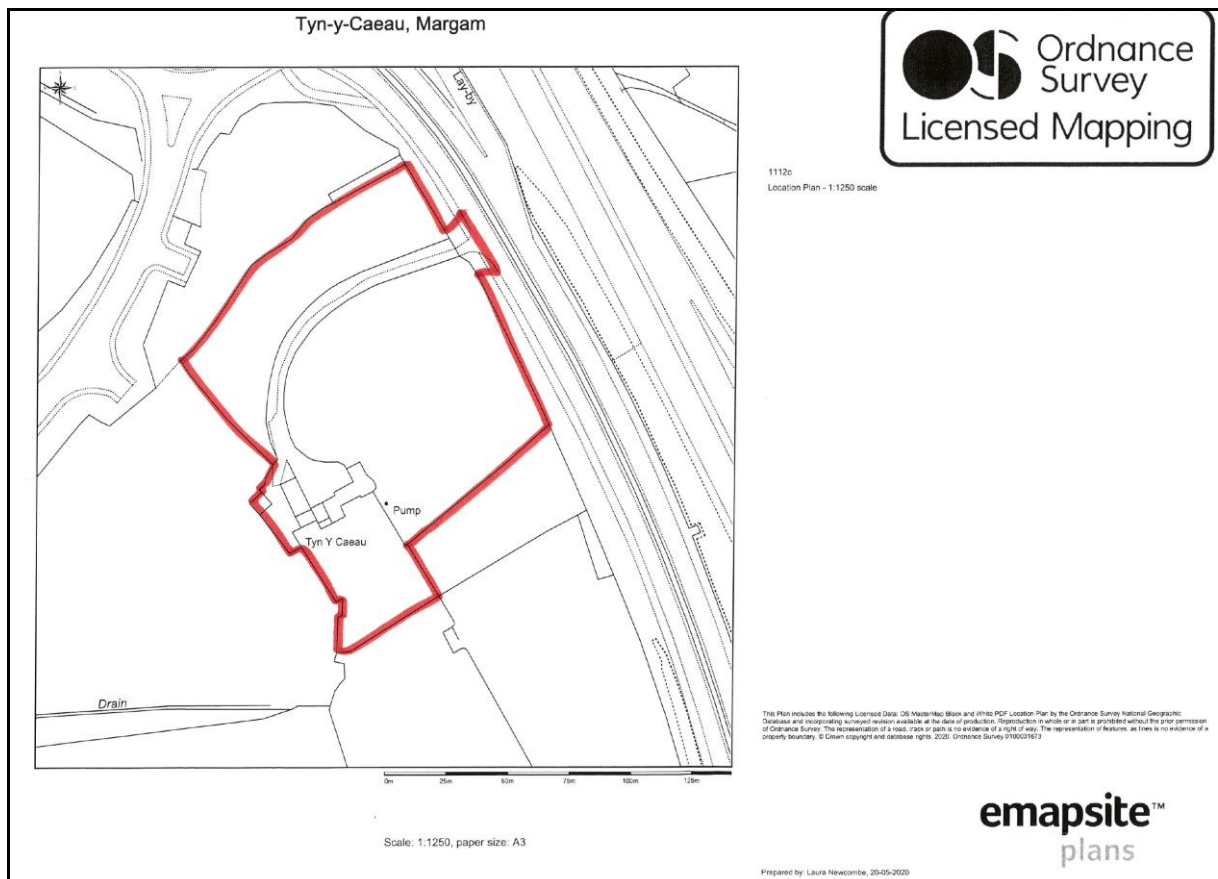


Figure 3: Location plan (provided by the architect)

2. Desk study methods and results

2.1 Methods

2.1.1 A 2km search area is used which covers the predicted zone of influence of the proposed development. Where bats are found to be present, any sites within 10km which are designated for their bat interest will also be noted. The reasons for the site designations have also been considered when discussing potential impacts on the biodiversity of these sites. Multi-Agency Geographic Information for the Countryside (MAGIC) and Lle are both used to establish the proximity of National and International Statutory Designations, particularly in relation to designations for bat interest. Species searches are also conducted through the Local Records Centre (LRC) where appropriate. An online search of planning applications at the property is undertaken to understand its planning history, especially relating to bats.

2.2 Results

2.2.1 No statutory or non-statutory protected features of ecological significance are present within nor adjacent to the property. Within 2km, Eglwys Nunydd Reservoir Site of Special Scientific Interest (SSSI)/Site of Importance for Nature Conservation (SINC) is 715m to the south while Margam Moors SSSI is 1.37km to the south-west. Neither of these sites are designated for their bat interest, and there are no sites which are designated for their bat interest within 10km. Within 2km there are 13 areas of Ancient Semi Natural Woodland, 10 Restored Ancient Woodland Sites, seven Plantations on Ancient Woodland Sites, and six Ancient Woodland Sites of Unknown Classification, along with two additional Wildlife Sites/SINCs: Margam Country Park and Junction 38 Wetland Complex. Further, within 2km there are no Wildlife Trust Sites, Local or National Nature Reserves.

2.2.2 The data search conducted in May 2020 reported 185 records for the following 13 species within 3.8km:

- **Common pipistrelle (*Pipistrellus pipistrellus*):** 36 records, the closest being four records from between 2006 and 2007 for bats at the site (a potential roost in the house was mentioned). There were an additional four records from elsewhere at the site.
- ***Pipistrellus* species:** eight records, the closest being two 2006 records from the site itself.
- **Soprano pipistrelle (*Pipistrellus pygmaeus*):** 40 records, the closest being two 2006 records for an individual bat at the site. There were an additional 10 records from elsewhere at the site.
- **Brown long-eared (*Plecotus auritus*):** 15 records, the closest being a 2010 record for droppings from 686m away.
- **Noctule (*Nyctalus noctula*):** 14 records, the closest being a 2013 record from 851m away.
- **Daubenton's (*Myotis daubentonii*):** eight records, the closest being a 2013 record from just over 1km away.
- **Greater horseshoe (*Rhinolophus ferrumequinum*):** six records, the closest being a 2016 record from just over 1km away.
- **Leisler's (*Nyctalus leisleri*):** two records, the closest being a 2016 record from just over 1km away.
- **Serotine (*Eptesicus serotinus*):** two records, the closest being a 2016 record from just over 1km away.
- **Lesser horseshoe (*Rhinolophus hipposideros*):** nine records, the closest being a 2015 record from just under 1.2km away.
- **Natterer's (*Myotis nattereri*):** 14 records, the closest being four 2015 records from just under 1.2km away.
- **Barbastelle (*Barbastella barbastellus*):** one 2015 record from 1.23km away.

- **Unknown bat (*Chiroptera*):** three records, the closest being two records from 2002 and 2004 for a roost 1.25km away.
- ***Myotis* species:** 16 records, the closest being four 2015 records from just under 1.2km away.
- **Nathusius' pipistrelle (*Pipistrellus nathusii*):** six records, the closest being a 2016 record from 1.2km away.
- **Brandt's (*Myotis brandtii*):** one 2016 record from just over 1.2km away.
- **Whiskered (*Myotis mystacinus*):** one 2016 record from just over 1.2km away.
- ***Plecotus* species:** eight records, the closest being a 1936 record from 2.15km away.
- ***M. brandtii*/*M. mystacinus*:** one 1991 record from 2.24km away.
- There were also 65 records for **Barn owl (*Tyto alba*)**, the closest being a 2015 record from 95m away.

2.2.3 In relation to bird interest at sites within 2km, Eglwys Nunydd Reservoir SSSI is the largest sheet of fresh water in the county. The reservoir attracts large numbers of wintering waterfowl and passage migrants. Notable species including Great Crested and Little Grebes, Mallard, Gadwall and Coot now breed.

2.2.4 On online search found only the current application (P2020/0601, validated on the 14th August 2020) for which this bat survey report is being produced.

3. Field survey methods and results

3.1 Methods

3.1.1 A Preliminary Roost Assessment (PRA) was undertaken on the 30th May 2020 (following government guidelines in relation to the COVID-19 pandemic). to identify Potential Roost Features (PRF). Details of the equipment used by I&G Ecological Consulting Ltd can be found in appendix 1. The survey was led by Glyn Lloyd-Jones.

3.1.2 In relation to survey limitations, many of the UK species of bat are crevice dwelling, and bats or signs of bats can be difficult to find within a building. In addition, there may be areas that are inaccessible to the surveyor. Externally, the surveyors were able to access all parts of the buildings from ground level, noting that the original dwelling and the outbuilding have vegetation coverage in some areas. Internally, surveyors were able to access all areas. In addition, three activity surveys were undertaken in good weather conditions to provide confidence in the results, and to understand how bats are using the surroundings. Therefore, using the equipment available to them all areas were thoroughly surveyed by the surveyors to maximise effectiveness.

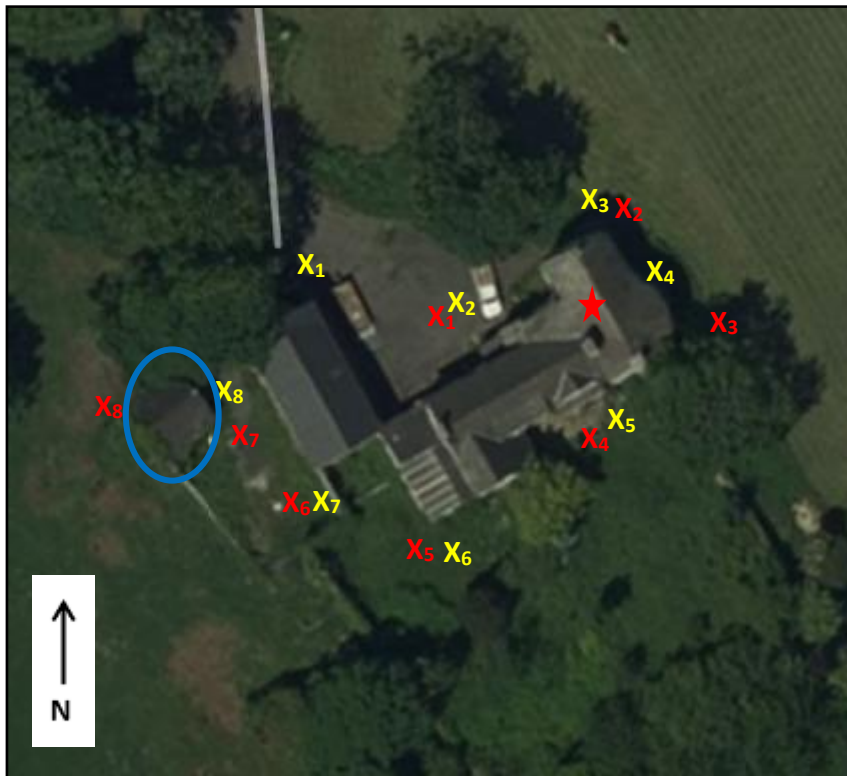
3.1.3 The Anabat was deployed within the attic of the mansion house on the 26th June 2020 and was removed on the 7th July 2020.

3.1.4 As a result of the findings of the PRA and the limitation identified, two dusk emergence surveys and one dawn re-entry survey were undertaken. The first dusk survey was undertaken on the 30th May 2020 and the surveyors were Glyn Lloyd-Jones, Iestyn Evans, Pete Watts, Jody Evans, Ceri Daugherty, Greg Evans, Mike Jones, and Sharon Doherty. Sunset was at 21:21, the survey started at 21:05 and ended at 23:20. The weather remained dry through the survey with little to no cloud cover, humidity was 40%, there was no wind, and the temperature started at 21.4°C and ended at 19.6°C.

3.1.5 The second dusk survey was undertaken on the 13th June 2020 and the surveyors remained as for the first dusk survey. Sunset was at 21:33, the survey started at 21:20 and ended at 23:35. The weather remained dry throughout with approximately 75% cloud cover, humidity was 85%, there

was a light north-westerly breeze of 1mph, and the temperature remained relatively constant at between 15.5°C and 15.6°C.

3.1.6 The dawn survey was undertaken on 27th June 2020, and the surveyors remained as for the previous surveys. Sunrise was at 04:59, the survey started at 03:30 and ended at 05:10. The weather remained dry throughout with approximately 80% cloud cover, humidity was 90%, there was a light southerly wind of 3–4mph, and the temperature started at 16.2°C and ended at 15.5°C.



3.1.7 Figure 4 shows the position of surveyors during the surveys. Those in yellow are the positions on the first dusk and the dawn activity surveys while those in red are the second dusk survey when the focus was on the original house and the outbuilding (as the proposed mitigation in blue circle). Each surveyor had a Magenta 5 or an Elekon Batscanner bat detector to assist in identification and detection of bats and their behaviour. The location of the Anabat is indicated by a red star.

Figure 4: Surveyor positions during the activity surveys.
(from Apple® Maps)

3.2 Survey results

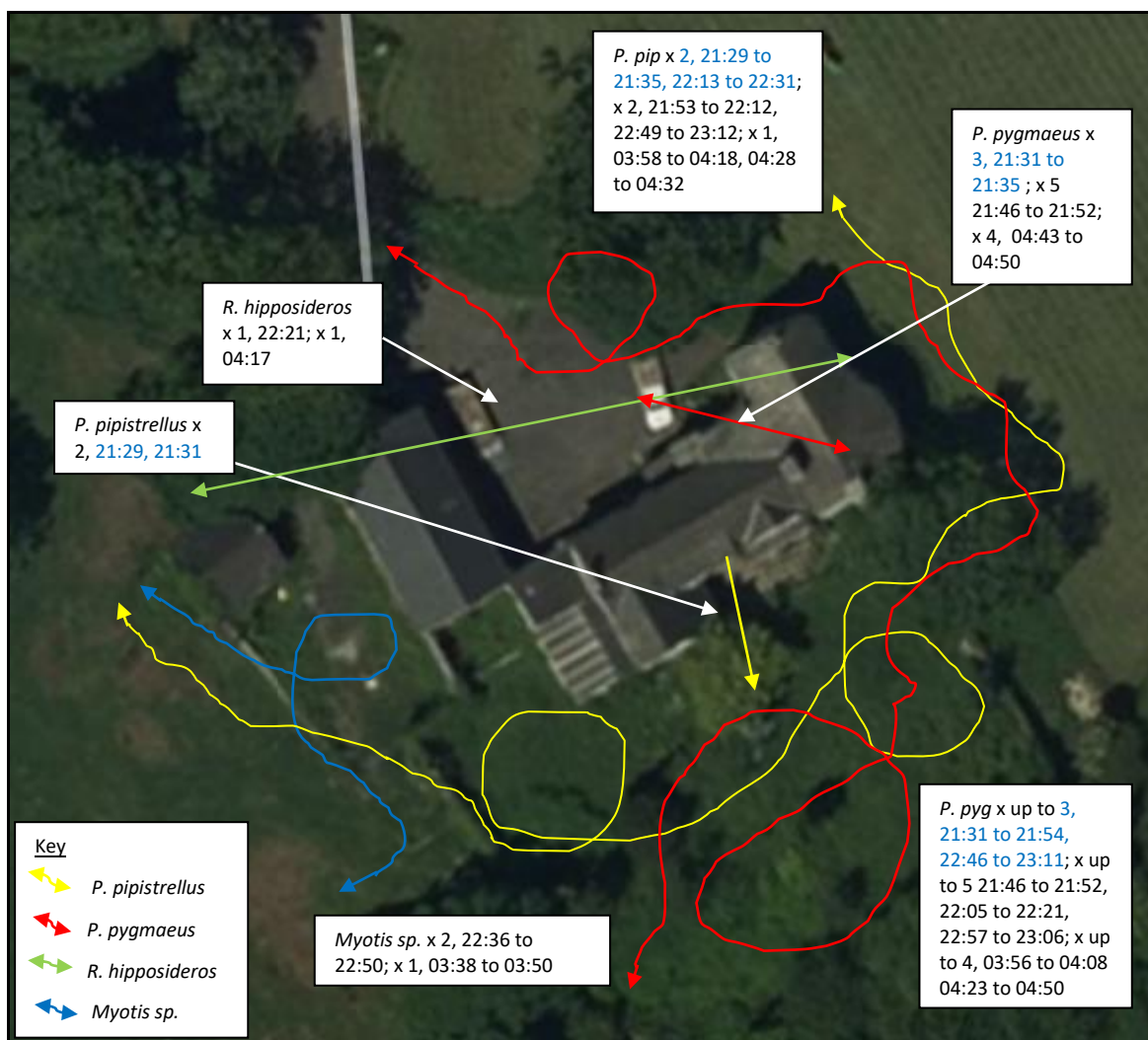
3.2.1 The PRA found that the original period dwelling is a large north-west facing predominantly two storey detached building which is subject to proposed plans for conversion to a mixed (residential and commercial) development. It is constructed of rendered and painted walls and has natural slate roofs with lead flashing around the chimneys, a mix of uPVC and timber framed windows and doors, and where present the soffits/fascias/weatherboards are painted timber. The walls of the original house are intact and generally in good condition with only some small (non-exploitable) cracks while the timber soffits/fascias/weatherboards are predominantly tight to the walls with only a small number of potentially exploitable gaps. The roof slates themselves are predominantly in good condition with no missing or damaged slates, but there were one or two areas where they may have slipped, thus creating potentially exploitable gaps, and there is also some loose lead flashing around the chimney pot to the left of the front elevation. The windows and doors are generally intact (the rear door having been boarded up after being vandalised leading to the house being open for a few months last year) with only one pane of glass in the original timber framed windows to the front having slipped. The detached north east facing two storey (with subterranean rooms to the rear so this aspect is three storey) modern annexe at the property is constructed of smooth rendered walls with a slate roof, brown uPVC framed windows and doors, and brown uPVC soffits/fascias/weatherboards and rainwater goods. The building is in very good condition with no observable exploitable gaps and no damage to either the walls or roof. The detached stone outbuilding has an unlined slate roof which is in very good condition but there

are gaps at the walls top as well as other aperture in the stonework. Internally, the large windows of the original house allow a lot of light internally; thus reducing the potential for day roosting in these areas while the loft spaces at the property. There were many undisturbed cobwebs, a lot of dust, and some signs of rodent use but no bats or their signs were found in these areas. As a result of all the findings, it is considered that at present the annexe has **low** potential to support roosting bats and a **low** risk of bats using the features present, while the stone outbuilding has **moderate** potential to support roosting bats and a **moderate** risk of bats using the features present. **No evidence of the presence of bats was found either externally or internally.** Site survey images are included in appendix 6. Within the hall area and fireplace close to the front door of original dwelling both droppings and feeding signs (peacock butterfly wings) were found. DNA analysis confirmed that the droppings were from *R. hipposideros*. The DNA certificate is included in appendix 7. This fireplace is next to the formerly broken back door – subsequently boarded up.

3.2.2 The Anabat was in working order throughout the time it was deployed and this was confirmed by the Anabat log files. The machine was triggered by only one species of bat, the Lesser horseshoe. All calls occurred between 21:00 and 05:00 and the highest number of passes was nine, recorded between 22:00 and 23:00 on the 5th July. No bat calls were recorded during the daytime hours. The Anabat results are included in appendix 8.

3.2.3 Figure 5 shows the flight lines of bats detected and includes the species seen/detected and the times they were detected. Flight activity follows:

Figure 5: Aerial map (from Apple® Maps) showing the flight lines of bats detected on the surveys



30/05/2020: Sunset was at 21:21, the survey started at 21:05 and ended at 23:20

13/06/2020: Sunset was at 21:33, the survey started at 21:20 and ended at 23:35

27/06/2020: Sunrise was at 04:59, the survey started at 03:30 and ended at 05:10

- ***P. pipistrellus***: On the first dusk survey, **two bats were seen to leave an area to the rear of the original dwelling (SE)** where the roof steps down, with the first emergence being eight minutes after sunset. No bats were detected either leaving or entering any building on the following two surveys. However, on all surveys, bats were detected foraging to the north-east, south-east and south-west (and partial calls were also heard to the north on the first dusk survey). The earliest activity on the second dusk survey was 20 minutes after sunset and the latest activity on the dawn survey was 27 minutes before sunrise.
- ***P. pygmaeus***: **Three bats were seen to emerge from loose lead flashing around the chimney pot to the left of the front elevation (east facing)** on the first dusk survey, five bats were seen to leave on the second dusk survey and four bats were seen to enter on the dawn survey. On all surveys, bats were detected foraging and commuting to the north-east, south-east and south-west of the buildings. The earliest activity on the first survey was an emergence at 10 minutes after sunset, the earliest activity on the second dusk survey was an emergence 13 minutes after sunset, and the latest activity on the dawn survey was a re-entry nine minutes before sunrise (with some swarming activity detected). In addition, bats were detected foraging, commuting and socialising to the north-west, north-east and south-east.
- ***R. hipposideros***: On the second dusk survey, **one bat was seen to enter the original dwelling via a slipped pane of glass at 48 minutes after sunset and one bat was seen to leave the same area on the dawn survey at 42 minutes before sunrise**. Partial calls were heard to the south and west on all surveys.
- ***Myotis* species**: No activity was detected on the first dusk survey while on the second dusk survey and the dawn survey bats **were detected foraging and commuting** to the south of the annex and stone outbuilding while calls were also heard to the north. The earliest activity on the second dusk survey was 63 minutes after sunset while the latest activity on the dawn survey was 69 minutes before sunrise.

3.2.4 Flight activity summary for the Annexe and Stone Outbuilding: During the activity surveys, four species of bat; ***P. pipistrellus*, *P. pygmaeus*, *R. hipposideros* and *Myotis* species** were using the surrounding environment for foraging and commuting, but no bats were seen to leave or enter any part of either building.

3.2.5 Flight activity summary for the Original Dwelling: During the second dusk survey, **one Lesser horseshoe was detected entering the building via a slipped glass pane to the front, and during the dawn survey, one bat of the same species was seen to leave the same area**. In addition, **three *P. pygmaeus*** bats were seen to leave loose lead flashing around the chimney pot to the left of the front elevation on the first dusk survey, **five *P. pygmaeus*** bats were seen to leave on the second dusk survey **and four *P. pygmaeus*** bats were seen to enter on the dawn survey. There is also an area where the roof steps down to the rear of the dwelling where **two *P. pipistrellus*** bats were seen to leave on the first dusk survey. These and a further one species (***Myotis* species**) were seen/detected by the surveyors utilising the immediate surroundings for foraging and commuting.

3.2.6 No evidence of nesting birds was found in any of the buildings and **no signs of owl activity** were discovered.

4. Conclusions and recommendations

4.1 Interpretation and conclusions

4.1.1 Using the findings of the desk study and field surveys, it is **concluded that the property is located within close proximity to favourable bat habitat but is not within 10km of any sites which are designated for their bat interest**. The **Annexe and the Stone Outbuilding** at the property presently have only **low to moderate** potential to support bats and while two species of bat (*P. pipistrellus* and *P. pygmaeus*) were using the surroundings for foraging and commuting, **bats are not currently using these buildings**. **It is therefore considered that proposed development (of these buildings) will not have a negative impact upon the bat species using the area**. The localised scale of the proposed development also suggests that the impact on the local ecology is likely to be negligible and the proposed enhancement detailed in 4.2 should result in a positive impact.

4.1.2 **Roost Characterisation Assessment for the Original (Period) Dwelling:** From the sonograms detected and the DNA evidence, it was clear that the building was being used as an *R. hipposideros* bat roost. However, due to the low quantity of faeces, the findings of the activity surveys, the absence of any bats during the daytime inspection, the very low number of calls recorded as well as the timings, it was considered very unlikely that the building was being used as a maternity roost. Therefore, it was concluded that the building was more likely to be used as a **feeding perch by a solitary *R. hipposideros*** bat and this was supported by the timings of the bat calls and that fact that one bat was seen to enter the dwelling on the second dusk survey and one bat was seen to leave on the dawn survey. Partial calls of *R. hipposideros* bats were also heard during all the surveys. In addition, *P. pygmaeus* and *P. pipistrellus* were seen to leave and enter the ridge next to the chimney and from the rear of the roof. However, due to the lack of guano internally, the findings of the activity surveys, the absence of any bats during the daytime inspection, and the absence of any calls on the Anabat, it was considered that it was unlikely that the loft or interior of the building was being used as a maternity roost. Therefore, it was concluded that externally, the gaps in the roof slates of the building were more likely to be used as a **daytime roost for a small number of *P. pygmaeus* (five confirmed)** and as an **occasional daytime roost for *P. pipistrellus* (two confirmed)** bats. The only viable access and egress point for the *R. hipposideros* was the slipped pane of glass in the upper floor window and this was where bats were seen to enter and leave (using night vision equipment). Previously, that species could once gain access via the vandalised door which has since been boarded up and sealed. See appendix 9 which shows roost status and resulting mitigation/compensation requirements. Using this, it can be considered that the *P. pipistrellus* and *P. pygmaeus* roosts are of low conservation significance as they are non-maternity roost for a common species. In relation to mitigation (Mitchell-Jones, A.J., 2004, p. 39), there is flexibility over the provision of bat boxes, access to new buildings etc., and there are no conditions about timing or monitoring. In relation to the *R. hipposideros* roost, it can be considered that this is of moderate low conservation significance as it is a feeding perch for an Annex II species. In relation to such roosts, mitigation should include the provision of new roost facilities where possible. Such facilities need not be exactly like for like, but should be suitable based on the species' requirements, and there are minimal timing constraints or monitoring requirements. The proposed mitigation is considered suitable as it retains a roost space in a dedicated building at the site. In addition, monitoring measures have been recommended.

4.1.3 *Crevice-dwelling bats* (such as *P. pygmaeus* and *P. pipistrellus*) can crawl into roosts via small gaps in the range of 15–20mm high by 20–50mm wide. The roost area should maintain a crevice of this approximate size gap that the bats can roost between. The area this roost provision covers can be small but about 1m² would be useful for summer nursery roosts. The height of entry can be from 2–7m. *Horseshoe bats* need a larger access so that they can fly (instead of crawl) directly into the roost. *R. hipposideros* bats need an access of 300mm (w) x 200mm (h), while *R.*

ferrumequinum bats need 400mm (w) x 300mm (h). As above, the roosting area should not be trussed, to allow flight, and should again (where possible) be of similar dimensions to the roost being replaced. All bats and their roosts, irrespective of the number of bats, species, and whether bats are present or not, receive protection from the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended). As a result, in the absence of mitigation, the proposed works could result in the damage/destruction of bat roosts for three species of bat, as well as the potential disturbance, killing and/or injury of bats. Destruction of a roost is an absolute offence under the above legislation and **therefore, an EPS derogation licence must be obtained from Natural Resources Wales for the works to be legally undertaken on the original dwelling.**

4.1.4 Enforceable conditions of the EPS licence will require the maintenance of mitigation measures already incorporated to minimise the risk of disturbance, killing or injury of bats (i.e. timing and methods of demolition works), and compensation measures to ensure there is continued bat roosting provision at the site and that the site is enhanced for protected species. These are outlined in section 4.2 and detailed in 5.2.

4.1.5 There are not considered to be any survey limitations which would impact upon the findings and recommendations of this report.

4.2 Recommendations

4.2.1 As noted in section 4.1 above, all bats and their roosts are protected under the Conservation of Habitats and Species Regulations 2017, and the Wildlife and Countryside Act 1981 (as amended). An EPS licence must be obtained for the works to legally proceed on the original dwelling.

4.2.2 ***P. pygmaeus*, *P. pipistrellus*** and ***R. hipposideros*** are both species of principal importance. With regards to such species (Biodiversity Action Plan (BAP) species) in Wales, under section 42 of the Natural Environment and Rural Communities Act 2006, and sections 6 and 7 of The Environment (Wales) Act 2016 – the LPA must ‘have regard’ to the conservation of their biodiversity in considering the planning application. In the Environment (Wales) Act 2016 Section 6 *places a duty upon Local Authorities to enhance biodiversity and the resilience of ecosystems* and 7 *to Creating local biodiversity lists and a duty to take steps to maintain and enhance biodiversity*.

4.2.3 Measures will be required to help meet obligations within The Environment (Wales) Act 2016 and Planning Policy Wales 10th Edition (Dec 2018); as well as compensate for the loss of roosting opportunity. Excellent long-term enhancement can be delivered, see appendix 10 for proposals and examples. Mitigation measures (against the risk of disturbing, killing, or injuring bats during the works), and compensation measures (to provide continued bat roosting provision at the site) will need to be implemented as conditions of the licence. The recommendations are as follows (and locations of all measures, dimensions of roost space and access points are to be included in the final plans submitted to the LPA):

Recommendation 1: Prior to works commencing, a dedicated roost space is to be created within the detached stone building on site for the species confirmed to be present. Letterbox access will be provided as well as x 4 wall top gaps, and one in eight crevices are to be retained in the stonework. In addition, as per

Recommendation 2: x 1 Beaumaris (or similar) and x 1 Kent style (or similar) bat box to be affixed internally within the dedicated roost space.

4.2.4 An outline Method Statement has been included (see 5.1) to enable the LPA to have '*regard to the requirements of the Habitats Directive... in the exercise of their functions in considering the planning application*'. A full Method Statement will be prepared as part of an EPS licence application to be submitted to Natural Resources Wales.

4.2.5 All wild birds and their nests (when in use), eggs and dependent young are afforded protection under the Wildlife and Countryside Act 1981 (as amended), nesting season is generally from 1st March until 31st July and works cannot be conducted whilst birds are nesting. No evidence of nesting birds was found but any nests subsequently found must be confirmed vacant before work commences.

4.2.6 This ecological report will remain valid for a period of 18 months from the date of the last survey i.e. until 27/12/2021 (CIEEM, 2019). A further scoping survey may be required to update the site information if planning is not obtained or works do not commence within that period, especially if the property to be developed has fallen into disrepair.

5. Outline method statement for planning and mitigation/ compensation measures

5.1 Outline method statement for planning – Annexe and Outbuilding

5.1.1 **No bats** were detected utilising the annexe or the outbuilding and there are no restrictions on the timing of the work in relation to bats. If the proposed plans involve works to the roofs, extra care will be taken at wall tops, and when stripping the roofs. All materials are to be lifted and not slid as – despite a negative survey – bats can still be found in these areas. **If bats are found at any stage, all works will stop and a qualified ecologist called for advice and guidance.** Monitoring will be undertaken on the outbuilding once converted for bat use following the methodology outlined within the method statement and timetable. (Mitchell-Jones, 2004 – figure 4, page 39). **Given the proximity of the buildings to the dwelling, the works on the outbuilding will be completed prior to any other works taking place, and works to the annexe will preferably take place between October and April to avoid potential disturbance.**

5.1.2 Current plans, including lighting plans for the outbuilding which is to be the proposed mitigation are not currently available but will be submitted. These plans must ensure that exterior lighting is kept to a minimum to prevent any adverse impacts on bats. In particular, external lighting around the recommended mitigation must be carefully designed to avoid any impact upon bats (Institution of Lighting Professionals, 2018). If an external lighting scheme is proposed for this application a plan will be produced that demonstrates compliance with the lighting principles outlined within the guidance referenced above. This lighting plan must be agreed by the Local Planning Authority Ecologist.

5.1.3 Where external lighting is necessary, this should utilise a number of key design points to limit any impact, as follows: Low level lighting pointed towards the ground; LED bulbs to be used of 2700 Kelvin (*p.18 of the lighting guidelines referenced above*) and below (warm white light and not daylight); use of light shields and hoods to direct the light downwards and prevent vertical and horizontal light spill; and use of passive infrared (PIR) motion sensors on timers to ensure lights only come on when necessary.

5.2 Outline method statement for planning and mitigation/compensation measures – Original dwelling

5.2.1 As there are bats present within the original dwelling at the property, an outline method statement for both the LPA and the licence application is required; this will inform the ecologist undertaking the licensing work. If bats other than the named species on the licence are discovered during any stage then all work must stop and I&G / NRW be called for advice and guidance.

5.2.2 This Outline Mitigation Strategy will form the basis of the EPS Method Statement to be submitted to Natural Resources Wales following the receipt of planning permission. It aims to address the timing and methods of activities; provision of new bat roosts and site enhancement; impact on, and maintenance of, existing roosts; lighting and habitat provisions; and monitoring.

Timing and methods of activity

5.2.3 All contractors will receive a toolbox talk prior to the commencement of works to outline the status of the building, conditions of the licence and Method Statement. High risk works will be directly supervised by a licensed bat ecologist.

5.2.4 All roof works (if needed) to the main (period house) will be undertaken carefully by hand and in the presence of a licensed bat ecologist. *Pipistrellus* bats were seen to leave two roof areas, and it is always possible that bats may be using other areas.

5.2.5 It is not anticipated that any bats will need to be captured or excluded during the works. See table 1 for a provisional timetable of works.

Table 1: Provisional timetable of works

Stage	Dates	Works
0	From receipt of planning permission to receipt of EPS licence	• NO works to the period dwelling roof. This includes works which may impact on these areas. Works on the annexe can proceed once the relevant planning permissions are in place preferably within the period October to April. • A dedicated roost space is to be created within the detached outbuilding at the property prior to works commencing on the dwelling. To be accessed via a cowled “letterbox” measuring 400mm x 300mm (to cater for both Rhinolophid species) on the north-east elevation and x 4 soffit gaps. Internally, affix x 1 Kent style and x 1 Beaumaris bat box.
1	From receipt of EPS licence	• Toolbox talks. • Ecologist to be on site to check when all roof/roofware works are taking place on the period dwelling.
2	Completion of works	• Monitoring check to confirm bat access points provided correctly (roost and bat box inspection on both barns) – One visit in year 1 following completion of the development. • One dusk activity observation or one dawn activity observation to be carried out during the summer survey period (when works are complete) in Years 1 and 3 post completion by a suitably qualified ecologist. • Reporting to Welsh Government.

Maintaining bat roost provision

5.2.6 As per **recommendation 1**: prior to works commencing, a dedicated roost space is to be created within the detached stone building on site (35m west of the loft space of the house and some 30m from the site where horseshoe droppings were found) for the species confirmed to be present. Letterbox access (at least 300mm high x 400mm long to provide for both Rhinolophidae) will be provided as well as wall top gaps, and one in eight crevices are to be retained in the stonework. In addition, as per **recommendation 2**: x 1 Beaumaris (or similar) and x 1 Kent style (or similar) bat box to be affixed internally within the dedicated roost space. To be affixed in an elevated position (2m or >). See appendix 10 for further details.

5.1.7 Any new timbers/timber products must be checked to ensure that chemicals toxic to bats are not used (TIN 092) and the only lining membrane for the soffit areas that bats may encounter is 1F traditional bitumen membrane. Research has demonstrated that **none** of the modern breathable membranes currently on the market are safe to use where bat roost mitigation is provided.

Lighting and Habitat provisions

5.1.8 Current lighting plans for the dwelling are not known but should any be proposed they must ensure that exterior lighting is kept to a minimum to prevent any adverse impacts on bats. The recommendations include no lighting either internally or externally on the bat house, but any external lighting around the recommended mitigation must be carefully designed to avoid any impact upon bats (Institution of Lighting Professionals, 2018). If an external lighting scheme is proposed for this application a plan will be produced that demonstrates compliance with the lighting principles outlined within the guidance referenced above. This lighting plan must be agreed by the Local Planning Authority Ecologist.

5.1.9 Where external lighting is necessary, this should utilise a number of key design points to limit any impact, as follows: Low level lighting pointed towards the ground; LED bulbs to be used of 2700 Kelvin (*p.18 of the lighting guidelines referenced above*) and below (warm white light and not daylight); use of light shields and hoods to direct the light downwards and prevent vertical and horizontal light spill; and use of passive infrared (PIR) motion sensors on timers to ensure lights only come on when necessary.

5.1.10 Habitat. The site plan in appendix 5 shows the proposed habitat. Only part of the site will be cleared for the truck stop and all boundary habitat is to be retained. There are no known plans to alter the habitat around the bat mitigation site. Measures to support Swallows, House martins and House sparrows could also be provided as they are a UK BAP species. Suitable designs and measurements may be found within the publication '*Biodiversity for low and zero carbon buildings – a technical guide for new build*' (Williams, 2010). **Planting must be retained and possibly enhanced around the bat roost area.**

5.1.11 Monitoring. The following monitoring checks are proposed have been provided correctly will include:

- Prior to commencement of other works (no EPS licence required) – Completion of bat house mitigation and inspection by the named ecologist (photos and report to be sent to NRW). Inspection of the dwelling and annexe prior to works commencing (as close as possible to the date works are to start).
- Summer 2022 (Between 1st June and 31st August) or the summer one year after completion of the works. Roost inspection and one dusk and one dawn activity observation.
- Summer 2024 (Between 1st June and 31st August or year three after completion. Monitoring visits to ensure mitigation maintained.

Appendix 1: An introduction to bat surveys

A note on bat surveys

- ✧ All bats and their roosts, irrespective of the number of bats, species, and whether bats are present or not, are fully protected by the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended). Bats are the only mammal capable of true flight. They are notoriously difficult to survey for as they cannot be heard unaided and are difficult to see due to their nocturnal behaviour. They are also small and can live in the smallest of crevices, so may often be overlooked because of their size.
- ✧ Wales has relatively high numbers of most of the species that occur in Britain; the rural landscape with its abundance of wooded areas, river valleys and hedgerows means that buildings are commonly used as roosting sites by bats. This is particularly the case for older buildings (typically with stone walls and slate roofs) that are located close to good feeding areas, on the edge of settlements, or that are rarely disturbed.
- ✧ Bats may also change their resting and feeding places regularly throughout the year, depending on the time of year and weather conditions. Thus, other signs of use are also looked for such as their droppings or signs of feeding.
- ✧ To gain an understanding as to how bats are using a building, a survey may also involve dusk and/or dawn observations which may need to be repeated at different times throughout the year.
- ✧ The search buffers implemented as part of the survey are considered to more than adequately cover the predicted zone of influence of the proposed development. The reasons for the site designations have also been considered when discussing potential impacts on the biodiversity of these sites. If the sites are designated for their bat or bird interest, this will be mentioned.
- ✧ Survey methodologies are implemented as appropriate, based on the surveyors' assessment of the site features and with particular reference to the advice in Bat Surveys for Professional Ecologists: Good practice guidelines, 3rd edition (Collins, J. (Ed.), 2016) & The Bat Workers' Manual, 3rd edition. (Mitchell-Jones, A.J., & McLeish, A.P. (Ed.), 2004). Reports are written with reference to the CIEEM (2015) Guidelines as well as BS42020.
- ✧ A PRA visit (scoping survey) is used to identify all potential access and egress points for bats in the building, and to identify crevices and possible dwelling places. Internal and external inspections are aided using powerful binoculars and close-focussing monoculars, as well as ladders, high powered Cree flashlights and head-torches. We also have thermal imaging cameras and night vision devices at our disposal as well as full spectrum photographic cameras which can photograph a bat in complete darkness with an infrared flash. Exploitable crevices are also endoscoped with either a hand-held digital scope or a smart phone compatible scope. Digital thermometers and hygrometers are also at our disposal.
- ✧ The survey consists of a visual inspection of the interior and exterior of the building(s) for evidence of bat use, including droppings, smells, feeding remains, staining, and scratching around roost exit and entry points. Potential features conducive (but not necessarily predictive) to bat presence include voids in the stonework, wooden beams, any associated rot holes, gaps behind soffits or within walls and fascia boards, raised tiles, any raised render, and any sufficiently large crevices. The general condition of the building(s) is examined, including the structure of the roof, condition of walls, the potential for disturbance, and the position of the building in relation to connectivity to good bat habitat.
- ✧ If positive bat signs are discovered, or the construction style suggests cryptic bats *may* be present, an Anabat SDII or Anabat Express is deployed within the space of the building surveyed.

Appendix 2: Overview of the legislation

- ✦ All bats and their roosts, irrespective of the number of bats, species, and whether bats are present or not, are fully protected by the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (as amended).
- ✦ There is a risk that works could result in the damage or destruction of a bat roost or roosts, the disturbance of bats, and the potential killing or injury of bats, sufficient survey effort (where indicated) helps to minimise this risk.
- ✦ All wild birds, their nests, eggs and dependent young are afforded protection under the Wildlife and Countryside Act 1981 (as amended), with the bird nesting season generally from 1st March until 31st August.

Technical Advice Note (TAN) 5 (Welsh Government, 2009) specifically provides advice about how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation. The TAN provides advice for local planning authorities on the key principles of positive planning for nature conservation; nature conservation and Local Development Plans; nature conservation in development management procedures; development affecting protected internationally and nationally designated sites and habitats; and development affecting protected and priority habitats and species.

Under Section 2.4 within the TAN 5, 'when deciding planning applications that may affect nature conservation local planning authorities should':

- ✦ Pay particular attention to the principles of sustainable development, including respect for environmental limits, applying the precautionary principle, using scientific knowledge to aid decision making and taking account of the full range of costs and benefits in a long- term perspective;
- ✦ Contribute to the protection and improvement of the environment, so as to improve the quality of life and protect local and global ecosystems, seeking to avoid irreversible harmful effects on the natural environment;
- ✦ Promote the conservation and enhancement of statutorily designated areas and undeveloped coast;
- ✦ Ensure that appropriate weight is attached to designated sites of international, national and local importance;
- ✦ Protect wildlife and natural features in the wider environment, with appropriate weight attached to priority habitats and species in Biodiversity Action Plans;
- ✦ Ensure that all material considerations are taken into account, and decisions are informed by adequate information about the potential effects of development on nature conservation;
- ✦ Ensure that the range and population of protected species is sustained;
- ✦ Adopt a step-wise approach to avoid harm to nature conservation, minimise unavoidable harm by mitigation measures, offset residual harm by compensation measures and look for new opportunities to enhance nature conservation; where there may be significant harmful effects local planning authorities will need to be satisfied that any reasonable alternative sites that would result in less or no harm have been fully considered.
- ✦ Bats are listed under Schedule 5 and 6 of the Wildlife and Countryside Act 1981 and protected under sections 9 and 11 (as amended by the Countryside and Rights of Way (CROW) Act 2000).
- ✦ The Environmental Damage (Prevention & Remediation) Regulations 2009 – A protected species and its habitat are protected under this legislation as well as others.

✎ The Conservation of Habitats and Species Regulations 2017 – (regulation 43) fully protects all bats and their roosts, making it **an offence to deliberately kill, injure or capture** (take) bats; *to deliberately disturb bats; damage or destroy bat roosts* or resting places (this is considered an ‘Absolute Offence’ as damage and destruction may detrimentally effect the Continuous Ecological Functionality of that roost/resting place); possess or transport a bat or any part of a bat; sell (or offer for sale) or exchange bats or parts of bats.

✎ For any offence to occur a derogation or **European Protected Species (EPS) licence** must be gained from Natural Resources Wales. To gain an EPS Licence, they must be satisfied that;

i. granting the licence would not be detrimental to the Favourable Conservation Status (FCS) of the populations of species concerned within its natural range;

ii. the derogation (licence) is in the public interest of Health and Safety or for other reasons of over-riding public interest, including those of a socio-economic nature or will have a benefit of primary importance to the environment; and

iii. there is no satisfactory alternative to the derogation which would allow the described development to proceed but which would avoid or reduce, the need for any adverse impact to the species.

Bats are also protected by;

✎ Appendix III of the Bern Convention.

✎ Appendix II of the Bonn Convention (including the Convention's Agreement on the conservation of Bats in Europe).

✎ Natural Environment and Rural Communities Act 2006 (in England).

✎ The Environment (Wales) Act 2016: specifically, Sections 6 (*places a duty upon Local Authorities to enhance biodiversity and the **resilience of ecosystems***) and 7 (*Creating local biodiversity lists and a duty to take steps to **maintain and enhance biodiversity***).

✎ All bats are listed in Annex IV of The Conservation of Habitats and Species Regulations 2012 and are therefore designated as *European Protected Species*. These *protected* species are afforded enhanced protection and more stringent licensing provisions than those protected by the Wildlife and Countryside Act (WACA) alone. There are also biodiversity obligations to be met within the Well-being of Future Generations (Wales) Act 2015 [WFG] and the seven Well-being goals which include an emphasis on socio-economic resilience as well as protecting culture, heritage and the Welsh language. One Act does not take precedence over the other.

Appendix 3: Types of bat roost and survey timings

As the mitigation guidelines state: The presence of a significant (important) bat roost... can normally be determined on a single visit at any time of year; providing that the entire structure is accessible and that any signs of bat activity have not been removed by others. The table below shows the applicability of survey methods. The table has been reproduced from Bat Mitigation Guidelines (table 5.2) (2004).

Season	Roost type	Inspection	Bat detectors and emergence counts
Spring (Mar – May)	Building	Suitable (signs, perhaps bats)	Limited, weather dependent
	Trees	Difficult (best for signs before leaves appear)	Very limited, weather dependent
	Underground	Suitable (signs only)	Static detectors may be useful
Summer (June – August)	Building	Suitable (signs and bats)	Suitable
	Trees	Difficult	Limited: use sunrise survey
	Underground	Suitable (signs only)	Rarely useful
Autumn (September – November)	Building	Suitable (signs and bats)	Limited, weather dependent
	Trees	Difficult	Rather limited, weather dependent; use sunrise survey?
	Underground	Suitable (signs, perhaps bats)	Static detectors may be useful
Winter (December – February)	Building	Suitable (signs, perhaps bats)	Rarely useful
	Trees	Difficult (best for signs after leaves have gone)	Rarely useful
	Underground	Suitable (signs and bats)	Static detectors may be useful

The table below shows the recommended survey timings and is reproduced from the Good Practice Guidelines (table 7.1) (3rd Edition, 2016). This is for presence/absence surveys to give confidence in a negative result for structures (also recommended for trees but unlikely to give confidence in a negative result).

Low roost suitability	Moderate roost suitability	High roost suitability
May to August (structures) No further surveys required (trees)	May to September ^a with at least one of the surveys between May and August ^b	May to September ^a with at least two of the surveys between May and August ^b

^a September surveys are both weather and location dependent. Conditions may become more unsuitable in these months, particularly in more northerly latitudes, which may reduce the length of the survey season.

^b Multiple survey visits should be spread out to sample as much of the recommended survey period as possible; it is recommended that surveys are spaced at least two weeks apart, preferably more, unless there are specific ecological reasons for the surveys to be closer together (for example, a more accurate count of a maternity colony is required but it is likely that the colony will soon disperse). If there is potential for a maternity colony then consideration should be given to detectability. A survey on 31 August followed by a mid-September survey is unlikely to pick up a maternity colony. An ecologist should use their professional judgement to design the most appropriate survey regime.

The table below shows the recommended minimum number of surveys to be carried out according to roost potential. It is reproduced from the Good Practice Guidelines (table 7.3) (3rd Edition, 2016).

Low roost suitability	Moderate roost suitability	High roost suitability
One survey visit. One dusk emergence or dawn re-entry ^a (structures). No further surveys required (trees)	Two separate survey visits. One dusk emergence and a separate dawn re-entry survey ^b	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 ^b

^aStructures that have been categorised as low potential can be problematic and the number of surveys required should be judged on a case-by-case basis (as noted in section 5.2.9 of the guidelines). If there is a possibility that quiet calling, late-emerging species are present then a dawn survey may be more appropriate, providing weather conditions are suitable. In some cases, more than one survey may be needed, particularly where there are several buildings in this category.

^b Multiple survey visits should be spread out to sample as much of the recommended survey period (see table 7.1 above) as possible; it is recommended that surveys are spaced at least two weeks apart, preferably more. A dawn survey immediately after a dusk one is considered only one visit.

Roosts required by bats

Hibernation sites (hibernacula). Sheltered areas with relatively stable winter temperatures.

Underground cavities, caves, mines, cellars, hollow trees and cavities and crevices in buildings or similar structures are examples.

Nursery roosts (maternity roosts). Places usually warm, where adult females of a colony gather to give birth and rear their young. These are often traditional sites with a history of such use and include roof voids, walls, soffit boxes, hollows and cracks/splits in trees and cavities in bridges and similar structures.

Night roosts/feeding perches. Places where bats may gather at night away from the day roost after initial feeding. These places are often quite exposed and may not be suitable for day roosting. They are often recognisable by deposits of droppings and insect remains.

Intermediate/dispersal roosts. Sites where small numbers of bats may gather after hibernation before taking up residence in the nursery roost. Bats may return to these sites after dispersal from the nursery roost and before entering hibernation.

Mating/male roosts. Places that an individual male may defend from other males and to which he will attempt to lure females. These will include small holes/cavities in trees, stonework, caves, mines and buildings.

Access, size of roost space and structure

- *Crevise-dwelling bats* (such as Soprano pipistrelles) can crawl into roosts via small gaps in the range of 15–20mm high by 20–50mm wide. The roost area should maintain a crevice of this approximate size gap that the bats can roost between. The area this roost provision covers can be small but about 1m² would be useful for summer nursery roosts. The height of entry can be from 2–7m.

- *Roof-void dwelling bats* require similar dimensions to access the roost but typically need timber joists or beams on which to roost. The height of entry can be from 2–7m.

- *Bats needing a flying area* require the same access dimension as mentioned above, 15–20mm (h) x 20–50mm (w) situated over 2m in height. The roosting area should not be trussed, to allow flight, and should ideally (wherever possible) be of similar dimensions to the roost being replaced.

- *Horseshoe bats* need a larger access so that they can fly (instead of crawl) directly into the roost. Lesser horseshoe bats need an access of 300mm (w) x 200mm (h), while greater horseshoe bats need 400mm (w) x 300mm (h). As above, the roosting area should not be trussed, to allow flight, and should again (where possible) be of similar dimensions to the roost being replaced.

Appendix 4: List of surveyors

Surveyor	Licence	Experience/background
Mr Glyn Lloyd-Jones	Bats	Glyn has significant experience in survey and presentation skills and has also assisted/worked with many other licensed bat surveyors as well as local bat groups over the past years. Glyn has also worked for EAW, NRW and CCW for over a decade and has gained significant experience of working for regulators and conservation bodies. He possesses both a Bachelor's degree (with honours) and Master's degree in the biological sciences and is a member of the Royal Society of Biology. He also holds a bat licence in England. He has also undertaken many badger, tree and herpetofaunal surveys. Natural Resources Wales Licence number S085044/1.
Mr Iestyn Evans	Bats	Iestyn has extensive experience in conservation, habitat improvement and management and has also worked with and assisted other licensed bat workers for many years. He has also helped with local bat group surveys and assisted in data gathering for the Beacon for Bats project undertaken by the Vincent Wildlife Trust. Iestyn has also assisted the Glamorgan Bat Group and will also help supervise and mentor members of the newly incarnated Carmarthenshire Bat Group. Natural Resources Wales Licence number S086081/1.
Mr Pete Watts	Trainee	Peter provides survey support with his keen eye for detail and vigilance. He has accompanied I&G Ecological Consulting Ltd on many surveys and is becoming a valuable and experienced surveyor.
Mr Greg Evans	Trainee	Greg attends dusk and dawn Surveys to provide extra monitoring for possible entry and exit points for bats. He is currently building his experience in this area and is a keen amateur natural historian with an enthusiasm and affinity for bats.
Miss Ceri Daugherty	Trainee	Ceri worked at Team Leader level within the SNCO for Wales for many years and has experience in dealing with customers both internal and external as well as negotiating with landowners. She also has prior practical conservation management experience as both a Countryside Ranger and a conservation volunteer. She possesses a Master's degree in Environmental Impact Assessment and a Bachelor's degree (with honours) in the natural sciences. She is a valuable member of the team – her eye for detail having proved very useful on many occasions. Natural Resources Wales Licence number S086102/1.
Ms Jody Evans	Assistant	Whenever we need extra assistance in observing and recording bat activity on buildings, Jody has provided an excellent and reliable service.
Ms Sharon Doherty	Assistant	Whenever we need extra assistance in observing and recording bat activity on buildings, Sharon has also provided an excellent and reliable service.
Ms Wendy Larcombe	Assistant	Wendy has an Honours degree in Environmental Biology and over 17 years' experience working in the field of conservation, including as a Planning Ecologist and as a freelance Ecologist. She has a wide range of experience, both paid and voluntary which includes extended Phase 1 habitat surveys, building assessment for bats, bat/barn owl surveys, summer roost counts (Gower), and winter roost counts (Black Mountains). She has undertaken a range of training including bat ecology and surveying and is a valued member of the team.

Appendix 5: Site plans

 1 North East 1:150		 2 North West 1:150	
 3 South East 1:100		 4 South West 1:100	

Rev	Description	Date

DATE: SURVEY DESCRIPTION:

STATUS: PURPOSE OF ISSUE:

PROJECT:

Tyn-Y-Caeau,
Margam, Port Talbot

Existing Elevations

DESIGNED BY: CHECKED BY: DATE: 10/07/15

AUTHOR: 1:150 PROJECT NUMBER: 2017

PROJECT NUMBER: A102 10/07/2015

Existing (above) and proposed (below) elevations for the house.

 1 North East 1:150		 2 North West 1:150	
 3 South East 1:150		 4 South West 1:150	

Rev	Description	Date

DATE: SURVEY DESCRIPTION:

STATUS: PURPOSE OF ISSUE:

PROJECT:

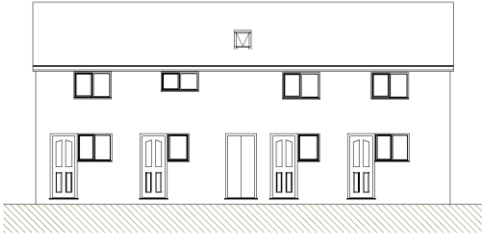
Tyn-Y-Caeau,
Margam, Port Talbot

Proposed Elevations

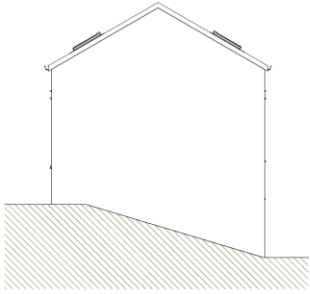
DESIGNED BY: CHECKED BY: DATE: 10/07/2015

AUTHOR: 1:150 PROJECT NUMBER: 2017

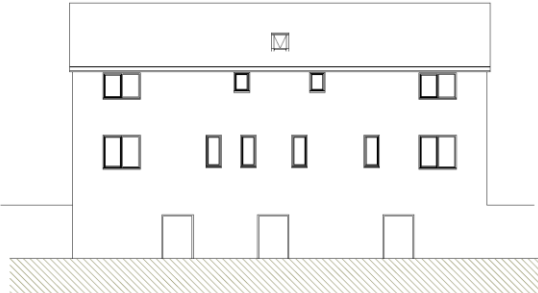
PROJECT NUMBER: A102 10/07/2015



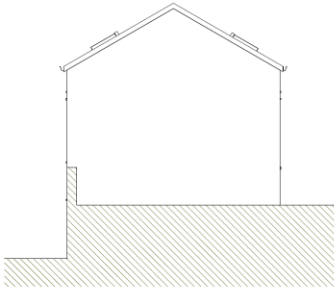
1 North East
1 : 100



2 North West
1 : 100



3 South West
1 : 100



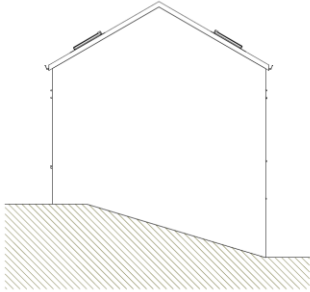
4 South East
1 : 100

No.	Description	Date	CODE	STATUS	SUITABILITY DESCRIPTION	PURPOSE OF ISSUE	PROJECT	Date	Scale (@ A3)	DRAWING NUMBER	REV
							Tyn-Y-Caeau, Margam, Port Talbot	24/10/2019	1 : 100		
							Existing Elevations	Author			
								Checked by			

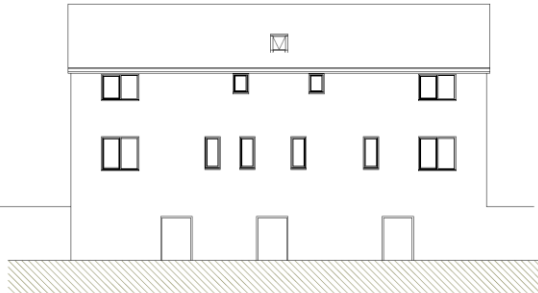
Existing (above) and proposed (below) plans for the annexe



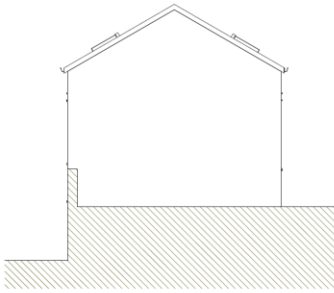
1 North East
1 : 100



2 North West
1 : 100

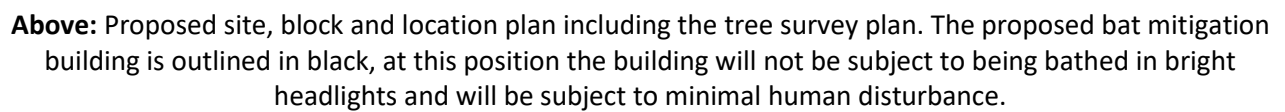


3 South West
1 : 100



4 South East
1 : 100

No.	Description	Date	CODE	STATUS	SUITABILITY DESCRIPTION	PURPOSE OF ISSUE	PROJECT	Date	Scale (@ A3)	DRAWING NUMBER	REV
							Tyn-Y-Caeau, Margam, Port Talbot	30/04/2020	1 : 100		
							Proposed Elevations	Author			
								Checked by			



Appendix 6: Site survey images



Images showing the construction and condition of the original period dwelling. It is a large north-west facing predominantly two storey detached building which is subject to proposed plans for conversion to a mixed (residential and commercial) development. It is constructed of rendered and painted walls and has natural slate roofs with lead flashing around the chimneys, a mix of uPVC and timber framed windows and doors, and where present the soffits/fascias/weatherboards are painted timber.



Images of the natural slate roofs on the original dwelling along with some of the windows. The white arrow in image three shows the slipped glass pane where the *R. hipposideros* bat is presently entering and exiting the building. The slates themselves are predominantly in good condition with no missing or damaged slates, but there were one or two areas where they may have slipped, thus creating potentially exploitable gaps e.g., image eight. As can be seen in images two and seven, there is also some loose lead flashing around the chimney pot to the left of the front elevation, and this is where **three *P. pygmaeus*** bats were seen to leave on the first dusk survey, **five *P. pygmaeus*** bats were seen to leave on the second dusk survey and **four *P. pygmaeus*** bats were seen to enter on the dawn survey. Image four shows the area where the roof steps down to the rear of the dwelling where **two *P. pipistrellus*** bats were seen to leave on the first dusk survey.



The walls of the original house are intact and generally in good condition with only some small (non-exploitable) cracks while the timber soffits/facias/weatherboards are predominantly tight to the walls with only a small number of potentially exploitable gaps (including where *P. pipistrellus* bats were seen to leave, as shown on the previous page). The windows and doors are generally intact (the main door having been boarded up after being damaged leading to the house being open) with only one pane of glass in the original timber framed windows at the front having slipped.



Images showing the north east facing two storey (with subterranean rooms to the rear so this aspect is three storey) annexe at the property. It is constructed of smooth rendered walls with a slate roof, brown uPVC framed windows and doors, and brown uPVC soffits/fascias/weatherboards and rainwater goods. The building is in very good condition with no observable exploitable gaps and no damage to either the walls or roof.



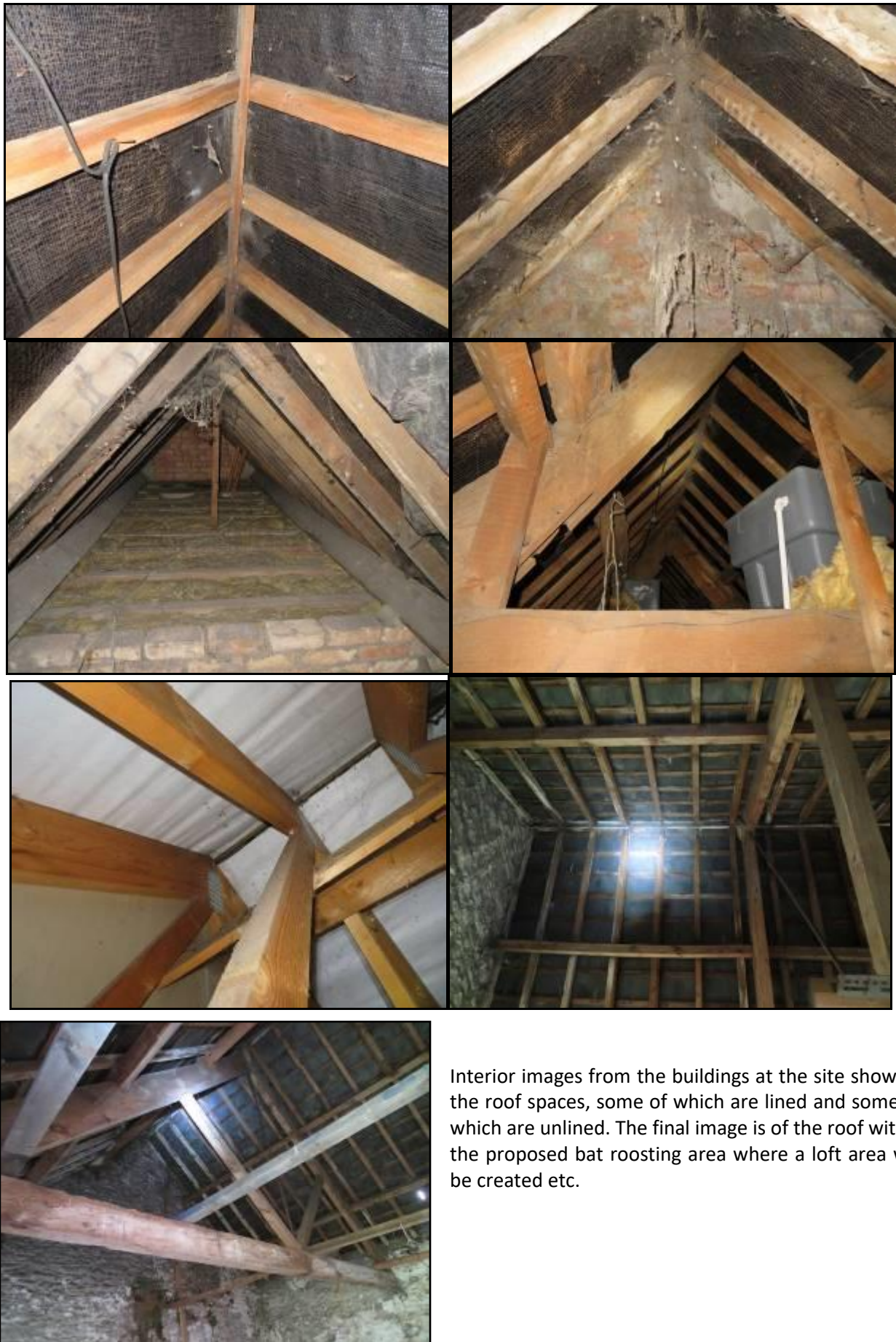
Images one to three show the outbuilding which is to be used as bat mitigation at the site. The proximity to the Margam Steelworks can be seen in image three. Image 4 shows one of the Ash trees on site which may require felling as disease is present. The final image is of a mature magnolia tree which could be retained for its decorative value.



Additional images showing the mature trees within the grounds of the property which extends to around 4 acres. Some of the Ash trees show signs of Ash dieback (caused by the fungus *Hymenoscyphus fraxineus*) and may need felling before works can safely commence. Some specimen trees on site should remain where possible.



Images in and around the fireplace within the hall area and fireplace close to the front door where both droppings and feeding signs (peacock butterfly wings) were found. DNA analysis confirmed that the droppings were from *R. hipposideros*. Image one shows the boarded up front door which was where the bat was likely to have previously accessed the building before it was boarded up.



Interior images from the buildings at the site showing the roof spaces, some of which are lined and some of which are unlined. The final image is of the roof within the proposed bat roosting area where a loft area will be created etc.



Additional interior images from the property. Images four to seven show the subterranean rooms of the modern annexe. No bats or their signs were found anywhere here. Used cans of dog food and rough sleeping signs were found.



Additional interior images of the loft spaces at the annex property. There were many undisturbed cobwebs, a lot of dust, and some signs of rodent use but no bats or their signs were found.



All potentially exploitable internal crevices were endoscoped and explored and no bats or their signs were found.



Additional interior images from the property. Image one shows the large windows of the original house which allow a lot of light internally; thus reducing the potential for day roosting in these areas. Image two shows the only viable access and egress point for the *R. hipposideros* bat, which is through a slipped pane of glass in the upper floor window. Images five and six show one area (inside the main porch) where there is damage to the ceiling, no bats or signs were found here either.



Additional images showing the items and surfaces within the outbuilding (proposed bat roost) at the property.

Appendix 7: DNA analysis



Folio No: E8508
Report No: 1
Purchase Order: BAT Dropping samples JULY 2020
Client: I & G ECOLOGICAL CONSULTING LTD
Contact: Glyn Llyod-Jones

TECHNICAL REPORT

ANALYSIS OF BAT DROPPINGS FOR SPECIES OF ORIGIN IDENTIFICATION

SUMMARY

The droppings of bats contain small amounts of DNA belonging to the organism from which they originated. By analysing droppings collected from a bat roost or colony for the presence of DNA, a robust identification of the species present can be made. Recent advancements in molecular methods including PCR (polymerase chain reaction) and DNA sequencing mean that 92% of bat species worldwide can be identified including all 17 UK resident bat species.

RESULTS

Date sample received at Laboratory: 13/07/2020
Date Reported: 23/07/2020
Matters Affecting Results: None

Lab Sample ID.	Site Name	O/S Reference	Genetic Sequence	Common Name	Result	Sequence Similarity
E8508-1		-	ATTATANTCGGGGCTTTGG AACTGACTGGTTCCACTTAT GATCGGAGCCCCGACATG GCCTTTCTCGTATAAATAAT ATGAGTTTCTGACTTCTGCC CCCTTCTTTCTACTACTACT AGCCTCATCTATAGTGAAG CGGGAGCGGGTACGGGCTG AACAGTCTATCCCCCTCTAG CAGGAAACCTAGCCACGCA GGAGAAGGATAGA	Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	98.98%
E8508-2	Margam	-	TTGCCNNNGCTGGAGAATAT AAGCTTCTGACTCCTACCCC CCTCTTTCTACTTCTATTGG CCTCATCTATGGTTGAATCT GGTGCTGGAACCGGCTGAAC TGTTTACCCCTTTAGCGG GAAANCTAGCCACGNN	Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	99.16%
E8508-3		-	NCCTAATCANAATCGGAGGC TTCGGGAAGTATTGGTGCC ACTAATAATTGGAGCCCTG ATATAGCTTTTCCCGAATA AATAACATAAGCTTCTGACT	Brown long- eared bat	<i>Plecotus auritus</i>	98.98%

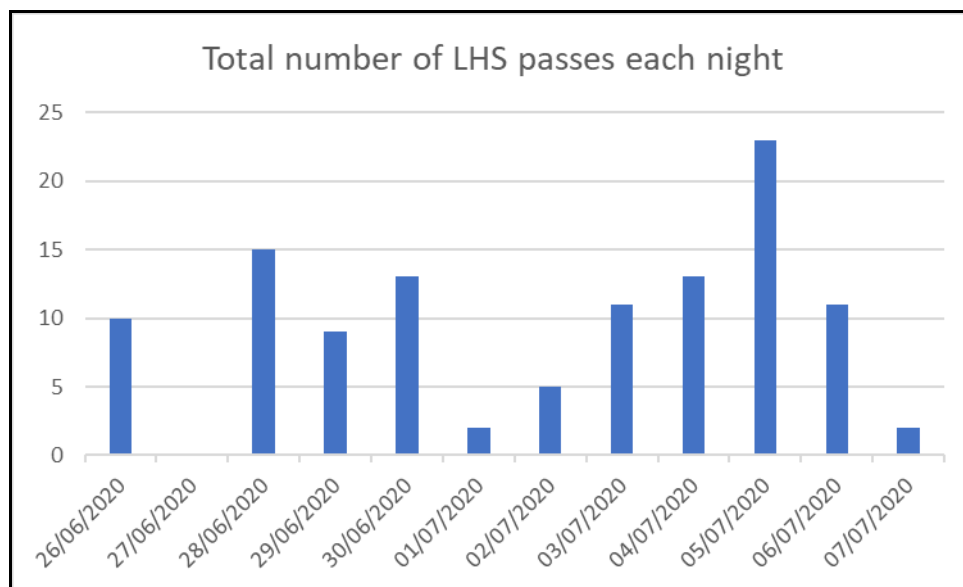
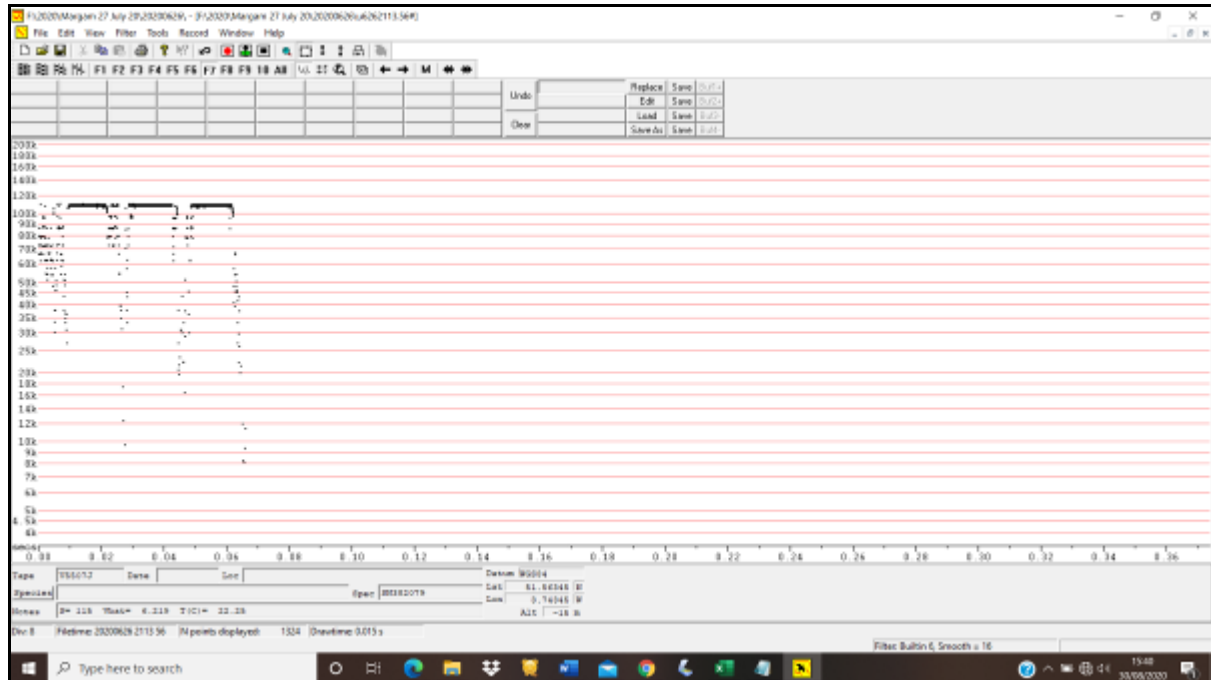


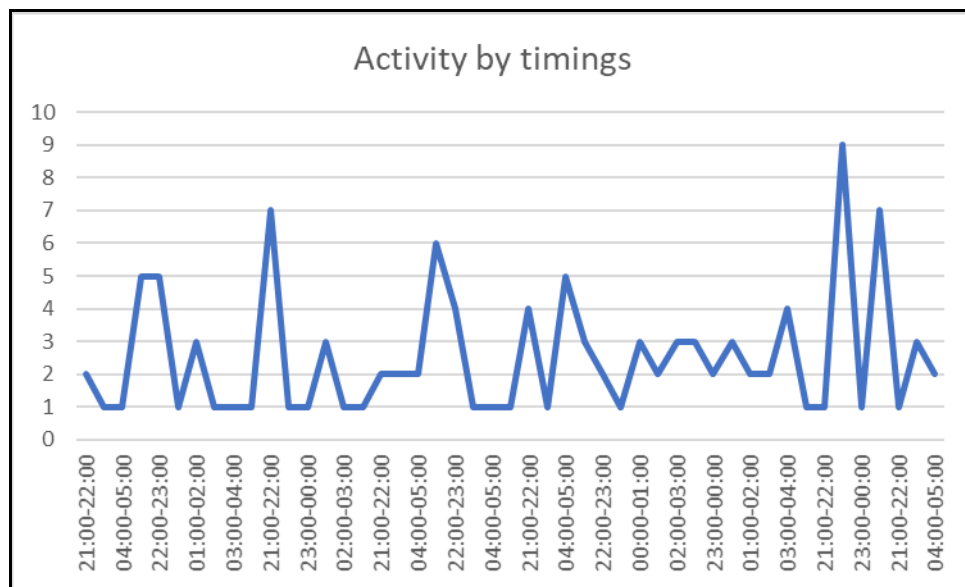
Appendix 8: Anabat Results

Lesser Horseshoe – *Rhinolophus hipposideros*

Date	Time	Number of passes (sequence of calls)
26/06/2020	21:00-22:00	2
27/06/2020	03:00-04:00	1
	04:00-05:00	1
	21:00-22:00	5
	22:00-23:00	5
	23:00-00:00	1
28/06/2020	01:00-02:00	3
	02:00-03:00	1
	03:00-04:00	1
	04:00-05:00	1
	21:00-22:00	7
	22:00-23:00	1
	23:00-00:00	1
29/06/2020	00:00-01:00	3
	02:00-03:00	1
	04:00-05:00	1
	21:00-22:00	2
	22:00-23:00	2
30/06/2020	04:00-05:00	2
	21:00-22:00	6
	22:00-23:00	4
	23:00-00:00	1
01/07/2020	04:00-05:00	1
	22:00-23:00	1
02/07/2020	21:00-22:00	4
	22:00-23:00	1
03/07/2020	04:00-05:00	5
	21:00-22:00	3
	22:00-23:00	2
	23:00-00:00	1
04/07/2020	00:00-01:00	3
	01:00-02:00	2
	02:00-03:00	3
	21:00-22:00	3
	23:00-00:00	2
05/07/2020	00:00-01:00	3
	01:00-02:00	2
	02:00-03:00	2
	03:00-04:00	4
	04:00-05:00	1
	21:00-22:00	1
	22:00-23:00	9

	23:00-00:00	1
06/07/2020	04:00-05:00	7
	21:00-22:00	1
	22:00-23:00	3
07/07/2020	04:00-05:00	2





Sonogram Interpretation of Activity & Building Usage

The Anabat machine was deployed within the loft area of the original (period) house on the 26th June 2020 and was removed on the 7th July 2020. The machine was in working order throughout and this was confirmed by the anabat log files. The machine was triggered by only one species of bat, The Lesser horseshoe. No bat calls were recorded during the daytime hours. During the daytime inspections, a small number of droppings were discovered within the downstairs fireplace, and DNA analysis of the guano confirmed that they were produced by Lesser horseshoe bats.

From the sonograms detected and the DNA evidence, it was clear that the building was being used as a Lesser horseshoe bat roost. However, due to the low quantity of faeces, the findings of the activity surveys, the absence of any bats, and the very low number of calls recorded as well as the timings, it was considered very unlikely that the building was being used as a maternity roost. Therefore, it was concluded that the building was more likely to be used as a feeding perch by a solitary bat and this was supported by the timings of the bat calls and that fact that one bat was seen to enter the dwelling on the second dusk survey and one bat was seen to leave on the dawn survey. Partial calls of Lesser horseshoe bats were also heard during all the surveys.

Soprano pipistrelles and Common pipistrelles were seen to leave and enter the ridge next to chimney to the front and from the rear of the roof. The only viable access and egress point for the Lesser horseshoe bat was the slipped pane of glass in the upper floor window and this was where bats were seen to enter and leave (using night vision equipment). Previously, that species could once gain access via the vandalised back door which has since been boarded up and sealed.

Appendix 9: Roost status and mitigation

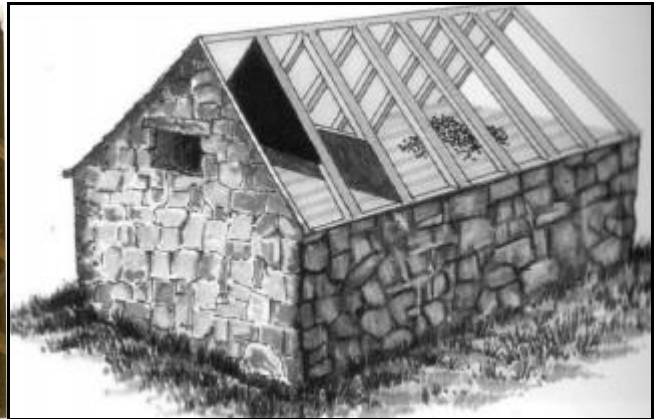
The figure below is taken from p. 39 of the Bat Mitigation guidelines (Mitchell-Jones, A.J., 2004) and focus upon the need for appropriate, but proportionate, mitigation.

Conservation significance	Low	Roost status	Mitigation/compensation requirement (depending on impact)
	High		
		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.
		Maternity sites of rarest species	

Figure 4. Guidelines for proportionate mitigation. The definition of common, rare and rarest species requires regional interpretation.

Appendix 10: Roost compensation & enhancement measures

Mitigation and enhancement recommendations: *Recommendation 1:* Prior to works commencing, a dedicated roost space is to be created within the detached stone building on site for the species confirmed to be present. Letterbox access will be provided as well as x 4 wall top gaps, and one in eight crevices are to be retained in the stonework. *Recommendation 2:* x 1 Beaumaris (or similar) and x 1 Kent style (or similar) bat box to be affixed internally within the dedicated roost space. To be affixed in an elevated position (2m or >).



Top: The south-east facing outbuilding on site which is to be converted – prior to works commencing – to provide a dedicated roost space for *R. hipposideros*, *P. pygmaeus* and *P. pipistrelles* (as well as all crevice-dwelling and roof-void dwelling species). The final plans for the bat mitigation house to be submitted to the LPA are to include all exterior and interior dimensions and material. They are also to indicate the location on the north-east elevation of the letterbox access and crevice access and to confirm confirm the blocking up of the existing windows confirm that no external lighting will be included and that no light spill from the house or annexe will occur

Bottom left: Hot boxes incorporate a floor, which has an access space for bats cut into it. These features ensure that the roost provides a range of microclimates, cooler areas for when summer temperatures get too high, and warmer areas during cooler weather. This is essential to meet the varying needs of the colony. The warmest areas are most critical for the pregnant and lactating females (noting that the roost currently present is not a maternity roost).

Bottom right: Example of letterbox access entrance on gable end with baffle entrance on gable end with baffle behind to reduce light ingress and air flow (Schofield, 2008) The pitched slate roof is to be retained with exposed timbers within the roof void for feeding. The access points will be via letterbox access (with rain canopy and ledge) and located away from the prevailing wind (south-westerly direction) or otherwise

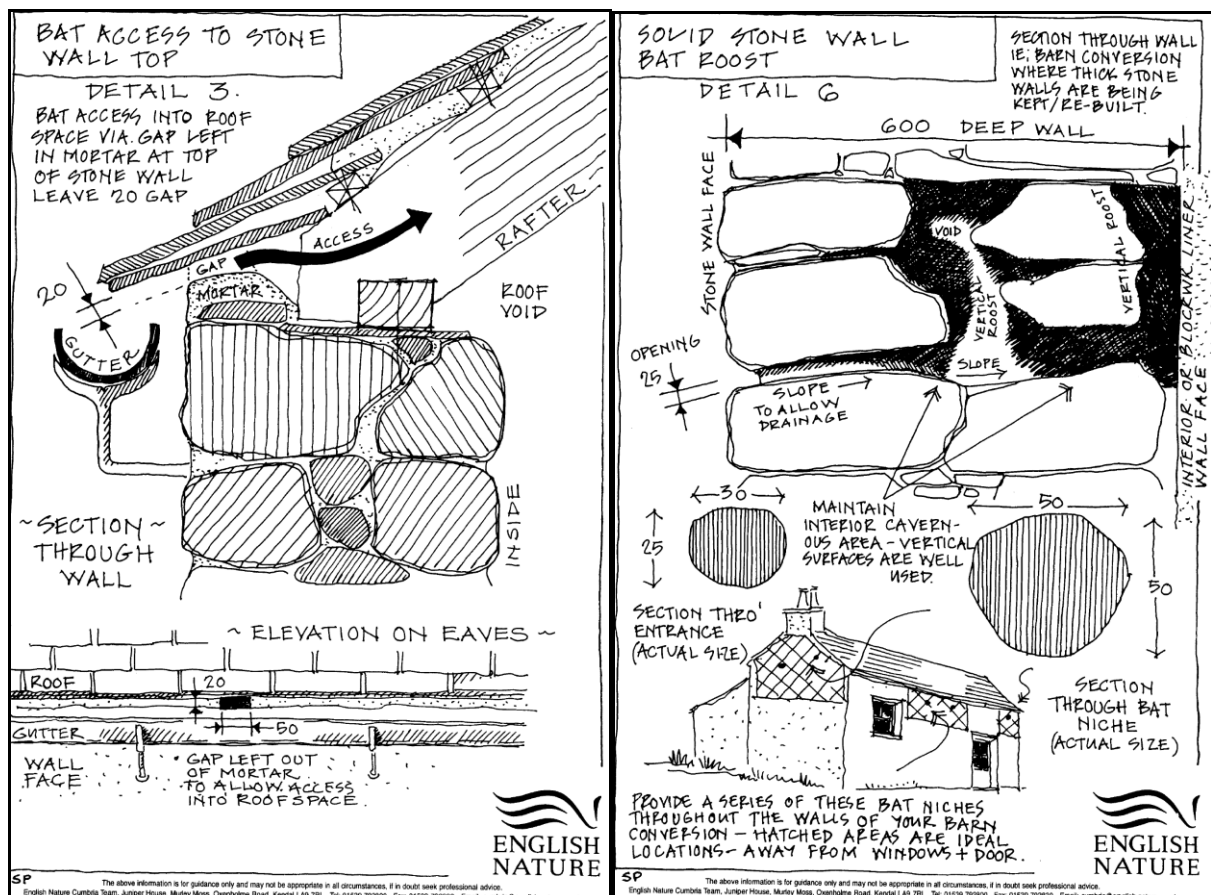
protected via a hedgerow or other scrub planting. Bat access should be at a minimum height of 1.3m above the adjacent ground level and a wooden baffle is to be installed internally 500mm back from the entrance to reduce light ingress and air flow. The existing hedgerow is to be retained and where there may be gaps (particularly on the southern elevations, these should be planted with trees and shrubs linking to a nearby hedgerow to provide a necessary flight line.

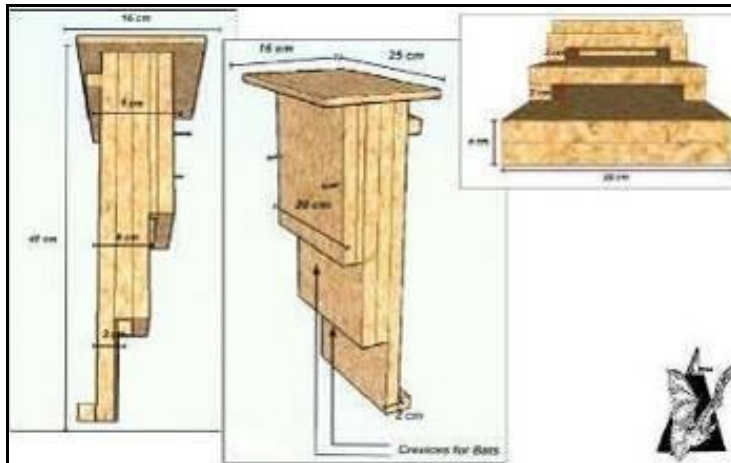
The door will be kept locked at all times except for accessed by a licensed bat ecologist. The cowed 300mm x 200mm bat roost entry point for *R. hipposideros* bats will be at the apex of the southern elevation and will be at the attic floor level. There will also be a 20mm gap between the fascias (in 4 places) and the walls (with access internally) (see Figure 19 on the following page) to allow access by all crevice dwelling (and most roof void dwelling) bat species.



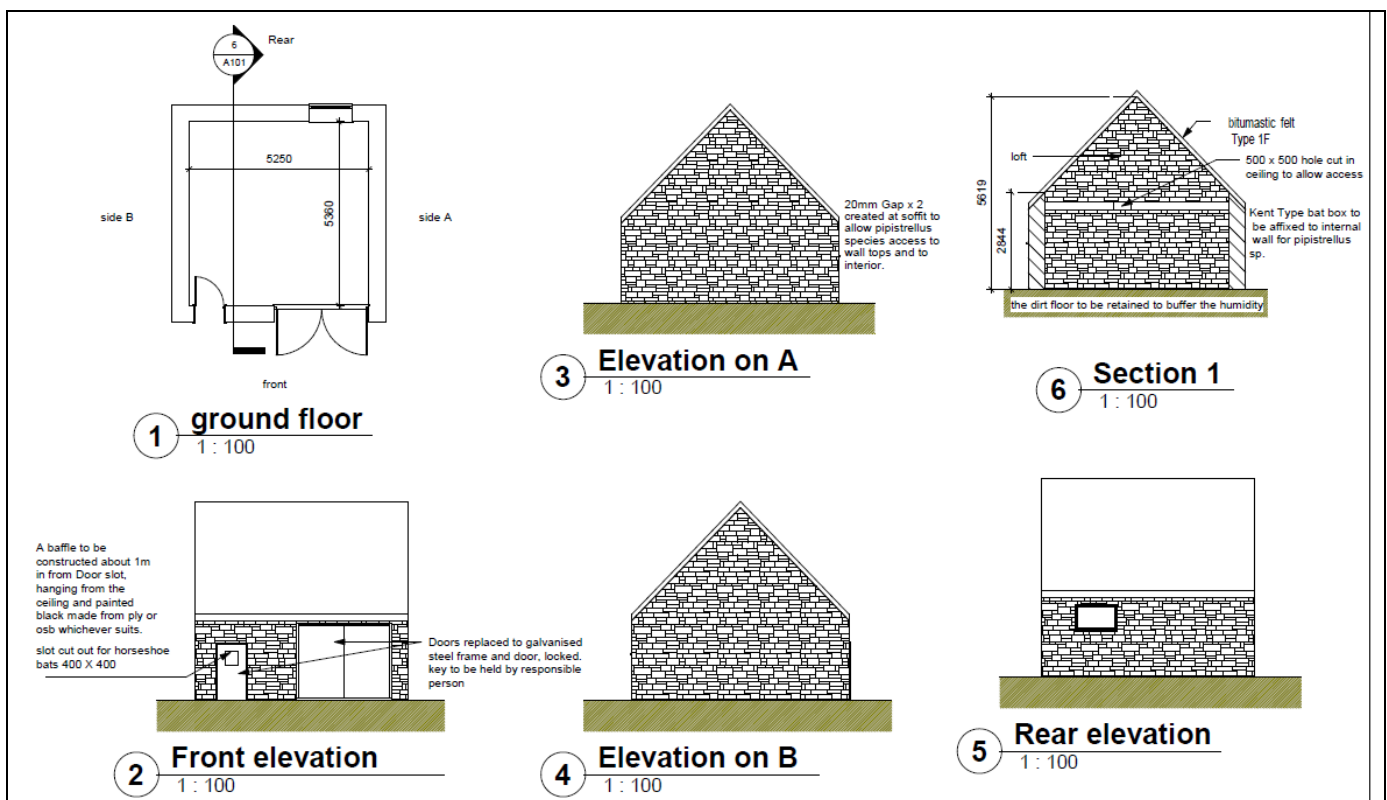
Crevice-dwelling bats (such as Soprano pipistrelles) can crawl into roosts via small gaps in the range of 15–20mm high by 20–50mm wide to be created at the wall tops. The roost area should maintain a crevice of this approximate size gap that the bats can roost between. Gaps will also be created/retained in the walls to provide additional roosting opportunities. *Horseshoe bats* need a larger access so that they can fly (instead of crawl) directly into the roost. Lesser horseshoe bats need an access of 300mm (w) x 200mm (h). The roosting area should not be trussed, to allow flight. The letterbox access is to be installed as low as practically possible but at least 0.4m above

ground level of. This ensures that bats are away from clutter during access and will not be impeded by any potential bird's nests. The entrance is to be sloped downwards and outwards with waterproofing (e.g. lead lining) below to minimise ingress by rain. An optional canopy above can be used. Additional draught reducing and light deflecting baffles could be used in conjunction with this access feature. Any weather shielding must not restrict roost access. **NO BREATHABLE ROOFING MEMBRANE IS TO BE USED WITHIN THE ROOST AREA. ONLY TYPE 1F BITUMASTIC FELT IS TO BE USED IF FELTING BECOMES NECESSARY.**





Above: The Kent style bat box. **Right:** The Beaumaris bat box.



Above: The bat roost mitigation. The 400x400 Or 400x300mm slot in the door should be cowled to reduce chances of bird and squirrel access.

Appendix 11: I&G Ecological Consulting Ltd legal disclaimer

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We confirm that in preparing this report, we have exercised reasonable skill and care, taking into account the project objectives, the agreed scope of the work, and prevailing site conditions.

Advice in this report is based on the judgement of I&G Ecological Consulting Ltd and the interpretation of data gathered during the course of their survey on the property named in this document. ***Until payment has been received, this report remains the intellectual property of I&G Ecological Consulting Ltd and can be withdrawn from the planning process at our request. You are also not covered by any of our indemnity or liability insurance until the report has been paid for in full.***

The findings and advice given during the course of this survey is provided by employees of I&G Ecological Consulting Ltd acting only on behalf of I&G Ecological Consulting Ltd.

The employees of I&G Ecological Consulting Ltd may hold other paid employment but none of their advice, nor work undertaken in respect of producing this report, refers to any roles or responsibilities held in any other employment other than that held at I&G Ecological Consulting Ltd.

All work undertaken in this report is the sole responsibility of I&G Ecological Consulting Ltd.

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