

Penstrowed Quarry, Caersws, Powys, SY17 5SG

Proposed change of use and construction of holiday lodges

Bat Survey

For: Mr G. Grigg (GF Grigg Construction Ltd)

06 July 2021

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1.0 INTRODUCTION

1.1 Background – Gerald Longley

Gerald Longley Ecological Consultants (GLEC Ltd) has been commissioned to undertake a Bat Survey at Penstrowed Quarry, Caersws, Powys, SY17 5SG (Grid reference SO067908). Gerald Longley has two decades of experience of wildlife surveying and, prior to working as an independent ecological consultant, held posts as Conservation Officer with Montgomeryshire Wildlife Trust and Head of Shrewsbury Countryside Unit.

1.2 Background – This survey

The development proposal covers work to change of land use and the construction of holiday lodges. The request for this bat survey comes from the Preliminary Ecological Appraisal carried out by Gerald Longley GLEC Ltd 15 December 2020 where recommendation 3 was:

3. Carry out a bat survey on the office/reception buildings (3) and transect and passive bat surveys across the quarry site in the active period for bats. Further mitigation works may lead from the results of this.

This will meet the client's need to ensure that if the offices are being used by protected species, notably bats or nesting birds, and the use of the wider quarry as a bat foraging area is assessed - their conservation needs are met and the law is not broken.

Under the law, a bat roost is any structure or place used for shelter or protection. "Structure" could be any building, wall, well, cave or mature tree. Bats use many roost sites and feeding areas throughout the year. These vary according to bat age, condition, gender and species, as well as season and weather. Since bats tend to re-use the same roosts for generations, the roost may be protected whether the bats are present or not. A full citation of the law with regard to bats and birds is given in the Appendices.

1.3 Report Summary

Penstrowed Quarry, Caersws, Powys, SY17 5SG

Bat Survey

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A Bat Survey based on Bat Conservation Trust guidelines (BCT, 2016) was carried out by GLEC Ltd at the office/reception and the wider quarry - Penstrowed Quarry, Caersws, Powys, SY17 5SG. The survey on the offices consisted of a thorough daytime inspection followed by one evening and two pre-dawn bat activity surveys between 17 May and 06 July 2021. The survey on the wider quarry consisted of a passive automatic bat survey between 17 May and 02 June 2021. The development proposal covers work to change of land use and the construction of holiday lodges.

A Preliminary Roost Assessment had also been carried out previously 15 December 2020 as part of the Eco Appraisal where no bat signs were found, but the offices were judged to have potential for bats being clad in timber.

At the offices no bats were recorded entering or emerging from the building during any of the activity survey visits. Common and soprano pipistrelle bats were recorded foraging near the building - proving bats were active, but not using the building.

No bird nests were recorded on or in the offices, but the Ecological Appraisal contains a recommendation for: Any buildings to be demolished or heavily altered are worked on in the dormant period ONLY - November to February inclusive to protect any nesting birds inside/on them.

These surveys establish that the offices are not being used by bats and there is no constraint to the proposed works from them. The surveys across the wider quarry indicated a good level of bat use by a range of species and enhancement of bat habitat will be provided to encourage bats to roost at the site and forage more. This should be with the provision of a purpose designed dedicated bat building and high levels of native plant landscaping.

It is recommended that:

1. The apparent absence of bats roosting in the offices indicates there is no ecological constraint to any proposed works with regard to bats. If they were to go ahead without mitigation, it is very unlikely that bats would be negatively affected. If bats are discovered during development works then Natural Resources Wales (NRW) or a suitably qualified ecologist must be contacted for advice. Works must cease and an European Protected Species (EPS) licence may be required to allow work to continue.
2. A range of biodiversity enhancement works be undertaken around the site, to be separately detailed in a Biodiversity Enhancement Plan and drawn up once full details of the holiday park are known, including: bird boxes, bat boxes, future management of the pond/lake proposed on the site and the southern bracken slopes, the sowing and management of new wildflower grassland areas etc.*
3. A Dedicated Bat Building is erected and a lake is formed with the building, within 30m of it and in its own fenced, secure, scrub planted enclosure. This will enhance a range of bat foraging and roosting opportunities where there are no roost features now and meagre habitat - it being an active site. Design should follow the guide in Appendix 6.3.

* This has already been recommended in the Preliminary Ecological Appraisal and the bat surveys confirm the importance of this.

2.0 METHODOLOGY

2.1 Aims of the survey

To establish the actual or likely presence or absence of bat roosts and/or bat species in the building.

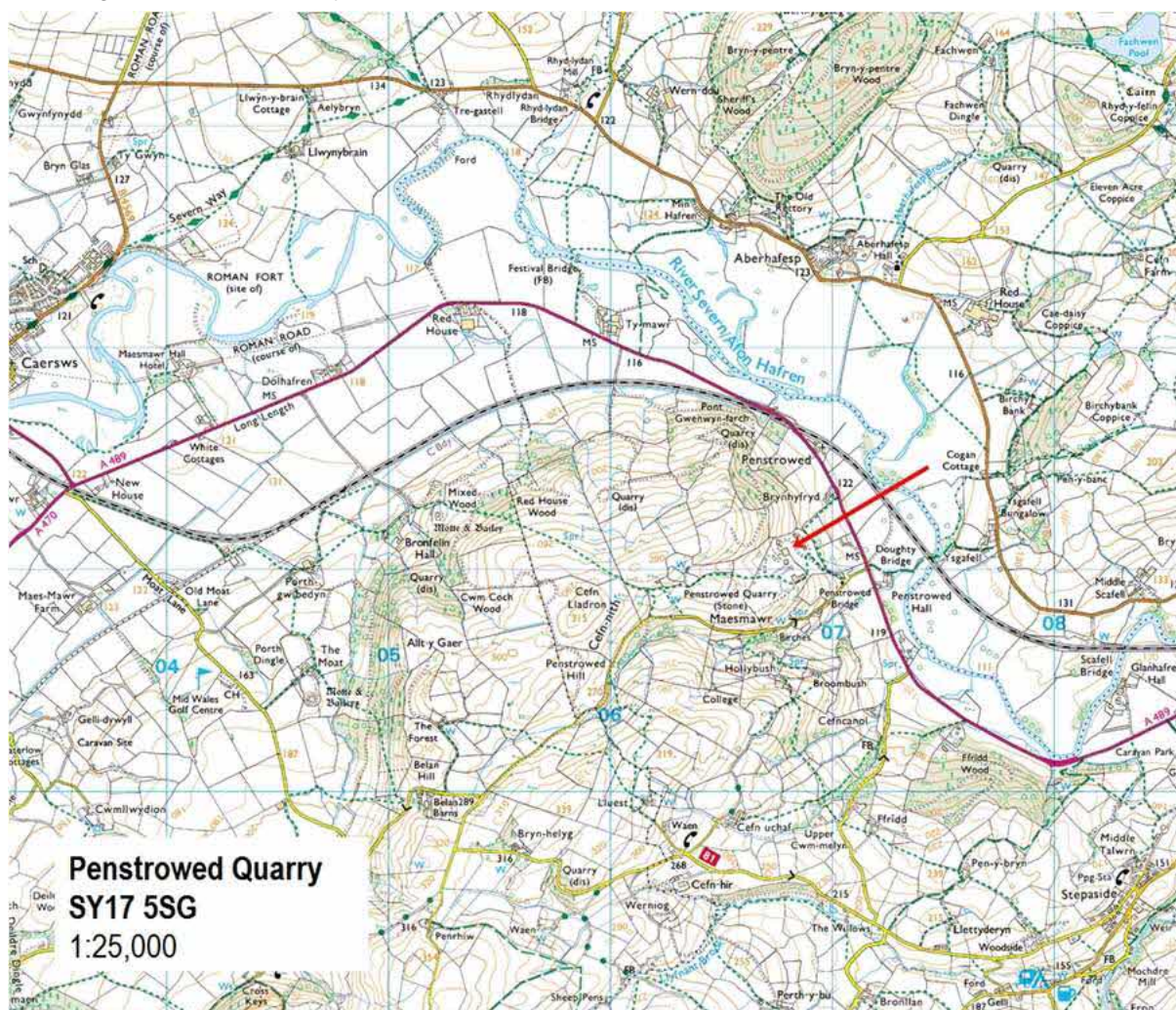
To establish the presence of any nesting birds in or on the building.

To make recommendations accordingly.

To assess the use of the wider site by foraging bats.

2.2 Desk Study

The 1:25000 Ordnance Survey map covering the site and aerial photos accessed from the internet were scrutinised initially to assess the wildlife value of the proposed development site and the surrounding habitat at a crude level. This looked for any semi-natural habitat that may be of value to wildlife, for example ponds, hedges, parkland, wetland, and woodland with interconnecting habitat links. Searches were made on MAGIC and the NBN Atlas for statutory designated sites coincident with or adjacent to the area of search and existing records of the keynote species within two kilometres.



2.3 Site Surveys

The surveys were designed by Gerald Longley using standard techniques based on the guidance and information in the Bat Conservation Trust Bat Survey Guidelines (2016).

Offices

The surveys of the building consisted of a thorough daytime inspection followed by one evening and two pre-dawn bat activity surveys. See the Appendices for a full list of equipment used. The pre-dawn bat detector surveys looked for possible re-entry into the building by bats and the evening activity surveys looked for emergence from the building. The visits also provided checks to assess whether nesting birds used the building. The surveyors were Gerald Longley (Natural Resources Wales (NRW) Licence no. S089602/1) all dates, Mary Thornton (NRW licence no. SO87511/1) 17 May 2021 and Lindsay Barton 24 June, 16 June and 02 July 2021.

The external and internal surveys of the building included an assessment for the potential for nesting birds and bats and a search for evidence, such as pellets, dead bats, prey remains, droppings, urine marks and staining. Close-focusing binoculars were used immediately below potential roost areas. Droppings around the bases of and/or stuck to walls, on shelves, wall plates, purlins, etc. were searched for with the aid of a high-powered torch. Holes and cracks in the walls, purlins, beams etc. and behind any cladding were inspected with the colour video endoscope where they could be safely reached.



Bat Survey of the Wider Quarry

It had been planned to carry out two types of bat survey in the quarry:

1. Passive automatic survey with a bat detector left onsite over some nights to record all bats that came within about 20-30m.
2. Transect survey where a fixed route is walked by a surveyor in the dark, with no lights on to avoid disturbing or displacing bats, with the surveyor carrying bat detectors. These surveys record bats encountered along the fixed route and help pinpoint areas that are good for bats, but only gather data on the few nights they are carried out.

After a risk assessment was carried out, it became clear that it would not have been safe in an active quarry site with cliffs, steep loose ground etc. to carry out a transect survey.

Therefore the wider quarry survey was only a passive bat survey with an Anabat SD2 bat detector left on site in an area in the northern part of the quarry, where there was good foraging habitat with scrub and trees close-by.

3.0 RESULTS

3.1 Desk Study

No specific records of bats were found for the site itself, but a geological Site of Special Scientific Interest (SSSI) was coincident with the site.

The 2km buffer desk study for sites and wildlife records revealed that the boundary of Penstrowed Quarry Geological SSSI, designated for its wide range of sedimentary rock features, was wholly contained within the development site. A second SSSI, a biological one, Gweunydd Penstrowed SSSI, designated for its unimproved neutral and acidic grasslands and population of the declining lesser butterfly orchid, was immediately adjacent to the south of the site. See Preliminary Ecological Appraisal Appendix 7.2 Extended Phase 1 Survey map with the SSSIs white outlined in green.

Common and soprano pipistrelles, brown long-eared, noctule and lesser horseshoe bats have all been recorded within 2km of the site.

It should be noted that the lack of records for a particular species in a particular location does not confirm that the species is absent.

3.2 Site Surveys

The office buildings

There were three buildings (reception/offices); two of these were attached and one detached. They were Portakabin type buildings which had been clad in timber. The timber boarding was horizontally laid, giving potential access for bats via small gaps and cracks and providing some possible habitat for bat roosting under the cladding.

The surroundings

The offices were on the north edge of the quarry site with the entrance road and car park to one side and a steep wooded bank above. There was potential for bats to feed around and over the wooded bank with much good habitat nearby.

Daytime inspection – 17 May 2021 (and 15 December 2020 in the Preliminary Ecological Appraisal and Roost Assessment)

No bats or signs of bats were found on the outside of the buildings during the Preliminary Roost Assessment and it was the same in May 2021, just gaps and cracks in the timber cladding and excellent foraging habitat nearby. The buildings had no attics or other spaces away from the cladding bats could go to roost in as the buildings were flat roofed Portakabins.

No birds or bird nests were found on or in the building.

First evening survey

17 May 2021 – 20.35 to 22.36 (sunset 21.06 BST)

A cool, still, dry evening. 10°C to 9°C. 3/8 oktas cloud cover. The surveyors were placed so as to view all elevations of the buildings.

From 21.46 until the end of the survey, occasional common pipistrelle bat (*Pipistrellus pipistrellus*) (45 KHz) and soprano pipistrelle bat (*Pipistrellus pygmaeus*) (55 KHz) passes were recorded over the road to the front of the offices.

There were also passes by noctule bat (*Nyctalus noctule*) overhead.

No bats were recorded emerging from the buildings.

Dawn survey

16 June 2021 – 03.20 to 05.10 (sunrise 04.49 BST)

A warm, dry, still morning. 14°C to 14°C. 8/8 oktas. The surveyors were placed so as to view all elevations of the building.

From 03.48 until 04.00, a small number of common and soprano pipistrelle passes were recorded along the road by the side of the buildings.

No bats were recorded entering the buildings.

Second dawn survey

06 July 2021 – 03.30 to 05.30 (sunset 04.59 BST)

A mild, very humid morning. Light west breeze at first then still. 12°C to 12°C. 8/8 oktas. The surveyors were placed so as to view all elevations of the building.

From 03.52 until 04.25, a small number of common and soprano pipistrelle passes were recorded along the road in front of the building.

No bats were recorded entering the buildings.

See also 7.0 SITE PICTURES

Bat Survey of the Wider Quarry

The wider quarry survey was a passive bat survey with an Anabat SD2 bat detector left on site in an area in the northern part of the quarry, where there was good foraging habitats of scrub and trees close-by. See the aerial image for the location of the bat detector.

It recorded for 17 nights from 17 May to 02 June 2021.

See table 1 for the results.

5 species of bat were recorded.

Two species of bat were recorded on every night, the common and soprano pipistrelle bats, so for 17 nights, with regular passes by these common bat species and foraging passes near the bat detector.

Two species of bat were recorded on nearly every night of the survey, the brown long-eared and noctule bats, with 12 and 14 nights out of the 17 respectively. To record the brown long-eared bats they must have been very close to the detector, within about 2m and calling towards its microphone; this is because they call so quietly and can often be hard to pick up or record and because when feeding on moths, they may not call at all. Noctules, conversely, are loud calling, large bats and the detector could pick up one if it called towards the microphone from 30 to 40m away.

The final bat species recorded was lesser horseshoe bat. This is a rarer species of bat most closely recorded to Penstrowed in a roost in Newtown, i.e. not far along the Severn Valley for a bat. This was recorded on 7 nights of the 17.

Table 1: Passive bat survey 2021					
In quarry for 17 nights					
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Date	Ppip	Ppyg	Paur	Nnoc	Rhip
17/05/21					-
18/05/21			-		-
19/05/21			-	-	-
20/05/21				-	-
21/05/21					-
22/05/21					-
23/05/21			-		-
24/05/21					
25/05/21					
26/05/21					-
27/05/21			-		-
28/05/21				-	
29/05/21			-		-
30/05/21					
31/05/21					
01/06/21					
02/06/21					
Nights recorded	17	17	12	14	7

Key to bat species:

Ppip: common pipistrelle (*Pipistrellus pipistrellus*)

Ppyg: soprano pipistrelle (*Pipistrellus pygmaeus*)

Paur: brown long-eared bat (*Plecotus auritus*)

Nnoc: noctule bat (*Nyctalus noctula*)

Rhip: lesser horseshoe bat (*Rhinolophus hipposideros*)

3.3 Constraints of this survey

As with all wildlife surveys conducted, the data collected is only a representation of the species and species presence markers found during the actual dates of the survey. There are other seasons and many species are mobile or transitory.

There were no constraints to the offices survey.

The wider quarry survey would have benefitted from a transect survey to try and pinpoint where bats were most commonly feeding. Unfortunately, for safety reasons, this type of survey could not go ahead. However, 17 nights of passive bat recording at the site made up for this, with many recordings of bats made.

Evidence for some crevice-dwelling bats, e.g. *Myotis* species, can be difficult to find. Brown long-eared bats are notoriously difficult to pick up on a bat detector as they call very quietly or not at all. They are also difficult to see during evening emergence, as it is getting very dark when they emerge. All counts of bats should be regarded as good estimates rather than as precise numbers.

3.4 Interpretation/evaluation of survey results

Offices

There were three buildings (reception/offices), two of these were attached and one detached. They were Portakabin type buildings which had been clad in timber. The timber boarding was horizontally laid, giving potential access for bats via small gaps and cracks and providing some possible habitat for bat roosting under the cladding.

The buildings had no attics or other spaces away from the cladding that bats could go to roost in as the buildings were flat roofed Portakabins.

The surroundings

The offices were on the north edge of the quarry site with the entrance road and car park to one side and a steep wooded bank above. There was potential for bats to feed around and over the wooded bank with much good habitat nearby.

There was good and reasonably extensive foraging habitat for bats close to the building and on the wooded slopes above.

In this full survey, consisting of three activity surveys carried out in the height of the bat survey season, no bat droppings were found, as in December 2020, and no bats were recorded entering or emerging from the building during the three activity surveys. It was concluded that the buildings were not being used by bats.

These surveys establish that the offices are not being used by bats and there is no constraint to the proposed works from them. The surveys across the wider quarry indicated a good level of bat use by a range of species and enhancement of bat habitat will be provided to encourage bats to roost at the site and forage more. This should be with the provision of a purpose designed, dedicated bat building and high levels of native plant landscaping.

Bat Survey of the Wider Quarry

The wider quarry survey was a passive bat survey with an Anabat SD2 bat detector left on site in an area in the northern part of the quarry where there was good foraging habitats of scrub and trees close-by. See Table 1 for the results.

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The final bat species recorded was lesser horseshoe bat. This is a rarer species of bat most closely recorded to Penstrowed in a roost in Newtown, i.e. not far along the Severn Valley for a bat. This was recorded on 7 nights of the 17.

In summary, the passive bat survey picked up common and widespread species of bat such as the two pipistrelle species. This is not surprising since these species range and forage around their roost sites up to a few kilometres, seeking out a wide range of food sources and habitats.

Noctules bats are a very far ranging bat species feeding on larger insects and their prey is often not site specific, often being detected well over 30m above the ground so their presence is often not directly linked to the habitat below.

Brown long-eared and lesser horseshoe bats feed close to the ground and do a large amount of gleaning - picking insects/spiders off foliage- , slow flying and even hovering. They are very attracted to good habitat with many food items, especially habitat with taller, rank vegetation and scrub. This means the bats were attracted to the quarry and specifically the type of vegetation there. They tend to follow hedgerows and patches of habitat and do not tend to fly across large open spaces. Since much of the quarry, by its very nature, consists of large open spaces of rock and soil, i.e. lacking any vegetation, it would appear that the bats probably got to the passive survey site by going around the periphery of its boundary and entering at a point where this richer vegetation exists.

The survey demonstrates there is potential for biodiversity enhancement works to be included in the proposed development as there is already some bat foraging even by a rarer species, the lesser horseshoe bat; the proposed development would remove large open spaces of bare rock and soil which is not ideal for bat foraging and turn it into a holiday park. To this end a landscaping plan that forms interconnecting belts of shrubs, scrub and trees with long grass and other rank(tall, unkempt, i.e. “weeds” not regularly mown) vegetation under and around them would be especially useful for bats.

Also the quarry has few bat roost suitable buildings around it and none in it. It has been shown in these surveys that the offices, although appearing to have some possible roosting habitat, do not have bats roost in them. It is therefore recommended that as part of the landscaping and other wildlife enhancing works, an additional habitat is provided that would attract bats greatly. It is recommended that a water body, especially a lake, be incorporated into the design and to make up for the shortfall of bat roosting habitat, in a fenced, scrub planted with long grass and “weeds” enclosed area, with no public access, a Dedicated Bat Building is provided on site to give a new range of bat roosting opportunities in the locality.

4.0 RECOMMENDATIONS

It is recommended that:

1. The apparent absence of bats roosting in the offices indicates there is no ecological constraint to any proposed works with regard to bats. If they were to go ahead without mitigation, it is very unlikely that bats would be negatively affected. If bats are discovered during development works then Natural Resources Wales (NRW) or a suitably qualified ecologist must be contacted for advice. Works must cease and an European Protected Species (EPS) licence may be required to allow work to continue.
2. A range of biodiversity enhancement works be undertaken around the site, to be separately detailed in a Biodiversity Enhancement Plan and drawn up once full details of the holiday park are known, including: bird boxes, bat boxes, future management of the pond/lake proposed on the site and the southern bracken slopes, the sowing and management of new wildflower grassland areas etc.*
3. A Dedicated Bat Building is erected and a lake is formed with the building, within 30m of it and in its own fenced, secure, scrub planted enclosure. This will enhance a range of bat foraging and roosting opportunities where there are no roost features now and meagre habitat - it being an active site. Design should follow the guide in Appendix 6.3

5.0 REFERENCES

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6.0 APPENDICES

6.1 Relevant Legislation

Bats – Legislation

All British bat species receive legal protection in the United Kingdom under the Wildlife and Countryside Act 1981 (WCA) (as amended). The WCA 1981 was amended by the Countryside and Rights of Way (CROW) Act 2000. All British bat species are listed under Schedule 5 of the 1981 Act, and are therefore subject to the provisions of Section 9, which makes it an offence to:

- Intentionally kill, injure or take a bat.
- Possess or control any live or dead specimen or anything derived from a bat.
- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection.
- Intentionally or recklessly obstruct access to any structure or place which a bat uses for shelter or protection.
- Sell, offer for sale, possess or transport for the purpose of sale or publish advertisements to buy or sell a bat.

Bats are also included in Annex IV of Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora. As a result of the UK ratifying this directive, all British bats are also protected under the Conservation of Habitats and Species Regulations 2010. It makes it an offence to:

- Deliberately capture or kill a bat.
- Deliberately disturb a bat in such a way as to be likely to significantly affect i) the ability of any significant group of animals of that species to survive, breed or rear or nurture their young, OR ii) the local distribution of that species.
- Damage or destroy a breeding site or resting place of a bat.

Under the law, a roost is any structure or place used for shelter or protection. This could be any structure, for example any building or mature tree. Bats use many roost sites and feeding areas throughout the year. These vary according to bat age, condition, gender and species, as well as season and weather.

Birds - Legislation

Under Section 1 of the Wildlife and Countryside Act 1981 it is an offence to intentionally kill, injure, handle or remove any wild bird (with the exception of a few pest species); take or damage a nest whilst in use or being built; and take or destroy eggs. A person is not guilty of any offence if their action was the incidental result of a lawful activity and could not have been reasonably avoided.

A higher level of protection is afforded to those birds listed in Schedule 1 of the Act. It is an offence to disturb Schedule 1 species whilst it is building or sitting on a nest, in addition to damaging or destroying their nests or eggs.

It is not an offence to disturb non-Schedule 1 species whilst they are building a nest or sitting on it. However, an offence may be committed if the bird is driven away from a nest by prolonged disturbance which results in the failure of eggs or death of dependent young.

6.2 Field equipment used for the survey:

Escort mini temperature data logger
Silva compass
Leica 8 x 42 close-focusing binoculars
Cluson Clubman 1 Million candle-power lamps
Access Cam Pro-Sight colour video endoscope (1m probe)
Telescopic mirror
Suunto clinometer
3.8m extendable ladder
8m extendable ladder
Anabat SD2 bat detectors with GPS and HP iPaq PDAs (active monitoring)
AnalogW v3.7w (bat data analysis software)
Anapocket v2.5b (bat data analysis software)
Kaleidoscope v1.12 (sound analysis software)
Batbox Duet bat detector (frequency division and heterodyne bat detector)
SSF2 Bat – bat detector
Two-way radios

6.3 GLEC Ltd Info sheet 06 New Dedicated Bat Building Generic Specifications

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Information Sheet 06

**New Dedicated Bat Building (DBB) for a range of bat species
With no human use for the building at all and consequently NO Building Regulations
needed for construction
(no storage, no electric power, lighting, solar panels or water installed)**

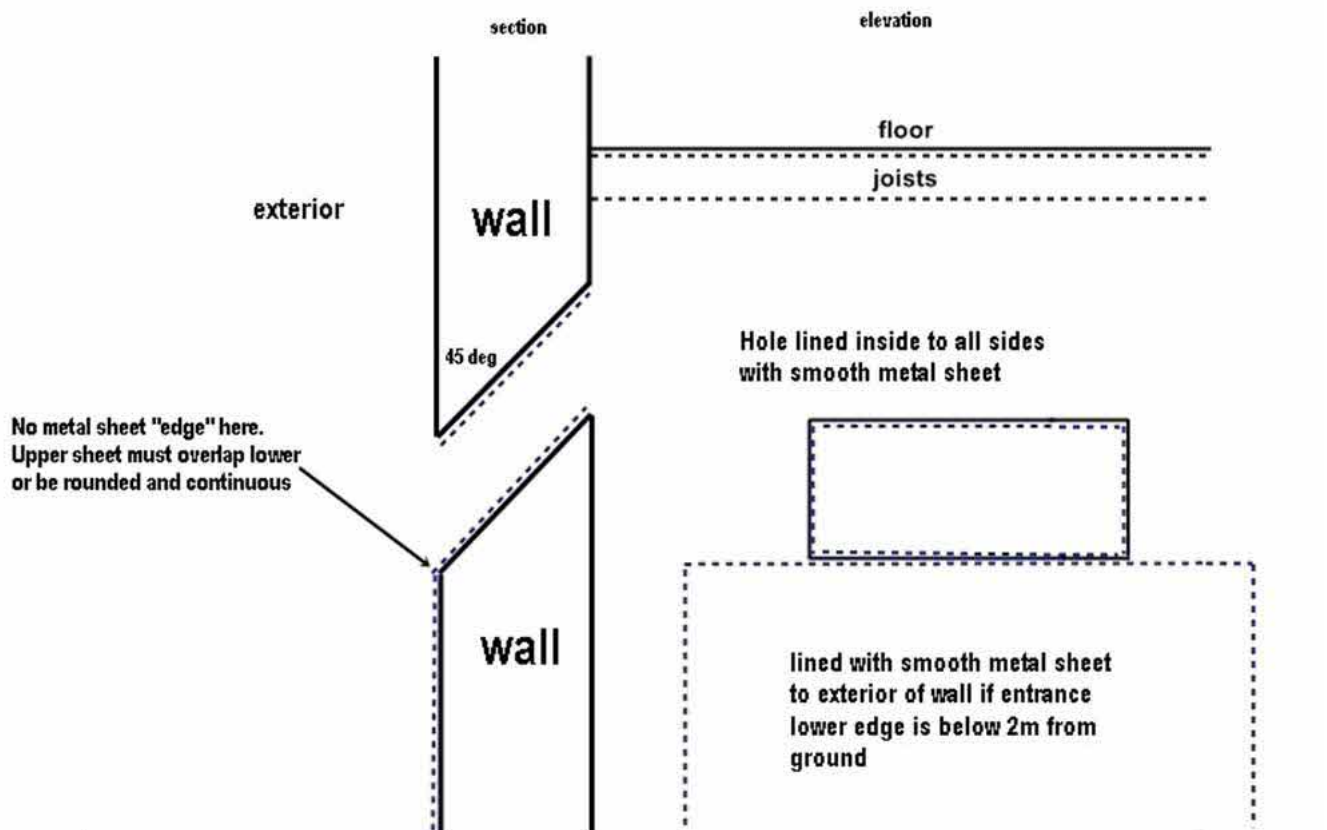
1. A new permanent roost being constructed for bats in the grounds of the same site must be close to the original roost, i.e. within 30-40m, (its location will be marked on a plan). The design will provide an upper loft with a floor and “cool room” below with a range of temperature regimes within the building, but with a minimum afternoon, mid-summer loft apex temperature of 30°C. The loft will be subject to solar gain providing the energy for the warm conditions in the loft part; the ideal roof pitch for this is 52°. The lower room will be much cooler with a floor left as earth for moist conditions and shall be further enhanced by digging it out below ground level, to create a type of cellar, to a depth of at least 1m to provide more stable temperatures in the winter. It will have no actual floor at ground level.
2. Of traditional gabled, “cut roof” construction with no trusses, the alignment of the roof ridge will be east-west. One roof pitch will have a southerly aspect to maximise solar gain to the loft space and ideally a roof pitch of 52°. The bat building will be close (within 3m) to existing shrubs/scrub if possible. New low shrubs/scrub or low hedges of native species must be planted at 2m spacing to join to existing vegetation to enhance the flight lines for bats and be planted in a stock-proof fenced buffer around the DBB of at least 5m. Tall tree species must NOT be planted as these will shade the roof and cause unwanted cooling. A list of suitable shrub/scrub species is included at the end of this information sheet. Vegetation inside the fenced enclosure will be left long and rank.
3. It will have a minimum loft height of 2.8m with minimum internal dimensions of 5m long, and width between 4m (roof pitch 55° for 2.8m high loft) to 5m (52° degrees gives a loft height of 3.2m). Eaves’ height to the underside of the floor joists inside will be a minimum of 2m. It will ideally avoid having an A frame or similar to support its purlins and have a single, open loft. If the building is over 8m long it can have a hipped roof which focuses heat better.
4. It is to be a permanent structure and will be constructed of concrete block, brick or stone and clad in horizontal timber weather boarding in Tanalyth E tanalised boards.
5. The pointing mortar work on the inside of the stone, brick or block work walls will, in around 20 random places on each wall (i.e. 80 in total) of its footing walls, be left out in small sections, 150mm long and 100mm deep into the wall and mortar depth (not open to the exterior though).
6. The roof will be constructed with a traditional cut and pitch method to form an unobstructed open space using tanalised (Tanalyth E), rough sawn/un-planed timbers to aid bats to hang and grip. Ancient timbers can be fixed in the roof structure with cracks, splits, open mortises, slots etc. in them; these do not have to be structural. It will ideally be roofed with slate (must be natural slate), but can be roofed with black or very dark clay tiles using traditional bitumastic roofing felt BS8747:2007 TYPE 1F under. Breathable ‘Tyvek’ type products must not be used. Ridge tiles will be dark or black coloured to absorb heat.
7. To the underside of the rafters on both pitches fix 6 number rough sawn battens, about 25mm x 25mm in dimension, the length of the building excluding in the hot box (see below).

The highest placed within 100mm of the apex beam and the other 5 at approx. 200mm spacing down the roof pitches. The lower parts therefore have no underside battens.

8. Five evenly spaced ridge tiles (more on buildings longer than 5m) will be “notched” to their lower edges to provide a slot 100mm long and an effective depth, when the ridge tile is in situ, of 20mm (and no larger or smaller) to both lower edges to provide access for bats under the ridge tiles, with a cavity left inside at this point. The ridge will be a mortared not “dry system” ridge.
9. A rectangular bat entrance/exit will be provided as a hole usually in the east facing wall. East is best but it must also be unaffected by artificial light spilling into it from outside or by window lighting elsewhere at the site so other elevations are possible. The entrance will be 500mm in width and 200mm in depth. It will be angled up through the wall at 45° in section. It will be installed with its upper edge at about 1.7m from ground level. If the eaves’ height is greater than 2m it can be higher. It is to enter the interior in the ground floor room (not into the loft) just below the loft floor. To deter cats jumping/climbing in the entrance, the bat entrance will be lined to all 4 sides in smooth metal sheeting. The area of exterior wall below the bat entrance will also be covered in a smooth metal sheet 1m wide over the timber cladding from ground level bending into the entrance hole with no “edge” there. The sheet will be as smooth as possible with any sheet overlaps being upper sheet over lower sheet.

General arrangement of bat access through wall

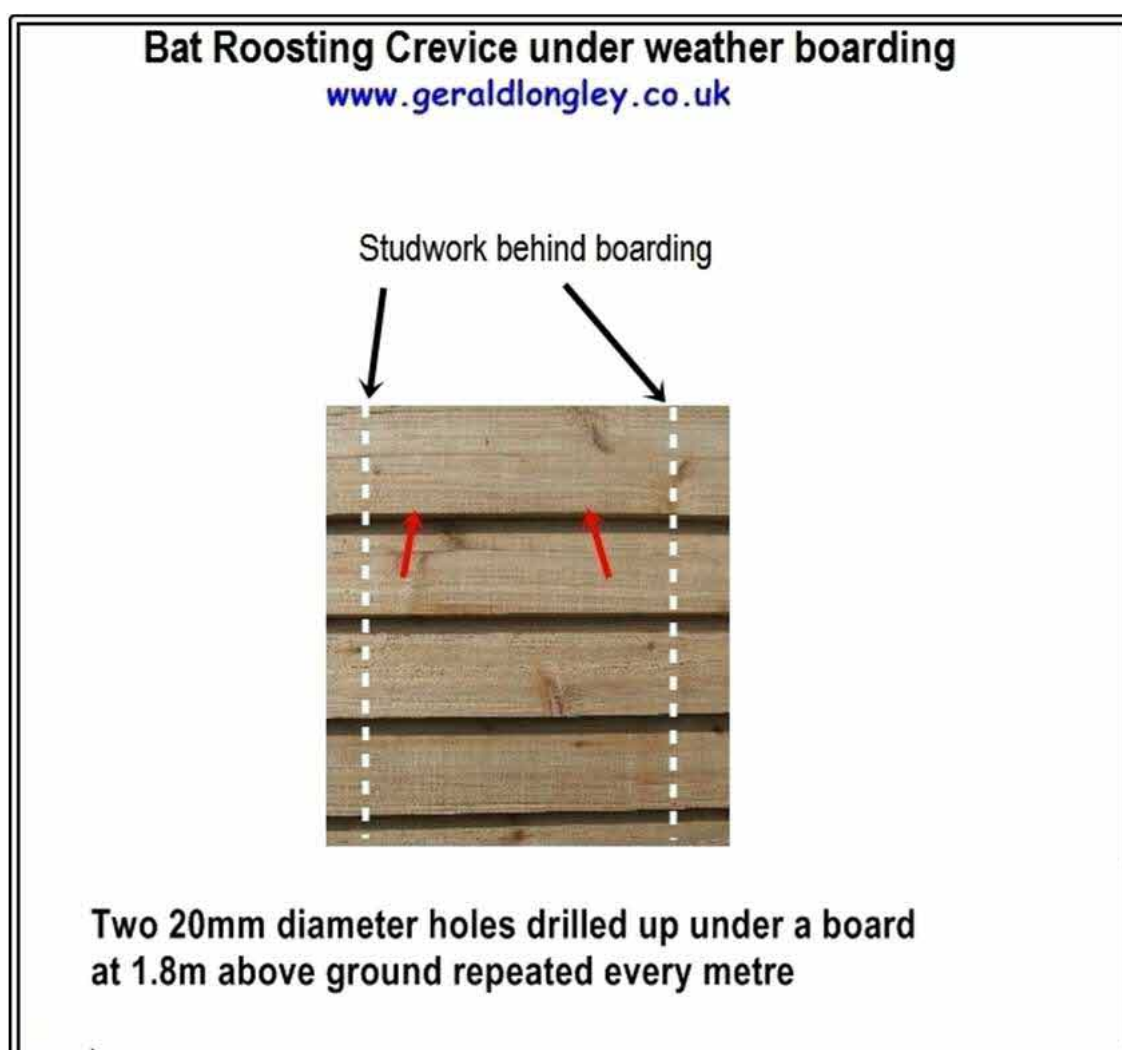
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10. In the centre of the loft, a “hotbox” will be constructed of sterling/OSB and untreated timber, to be approximately 2m long and 1m deep, sealed with mastic at its joints, painted black on the outside with a bat access hatch through its “floor” of 45cm by 45cm. See illustrative photo of a “hotbox” installed and a drawing with roof and slates removed for clarity (below).



11. An alternative bat entrance/exit slot, intended to be used in an emergency if the main bat access is blocked by a predator for example, must be provided in the opposite gable wall to the main entrance. A horizontal slot 300mm wide by 100mm high set with its upper edge 1.8m from the ground.
12. A human load bearing ceiling/floor will be installed at eaves level with rough sawn/un-planed timber joists and suitable timber flooring. An access hatch, 600mm by 600mm without a hatch door, no safety rail above and no access ladder will be installed in the centre of the ceiling/floor to allow bat access to the loft and human bat monitoring access.
13. A secure, lightless exterior door will be provided on one of the walls that does not have a bat access hole for human access to monitor bats. This door must be kept locked and will be labelled: "This building has no access. The door is locked. This building must not be used for any human purpose e.g. no storage. It is a Dedicated Bat Building."
14. The tanalised, horizontal exterior timber cladding will be on battens 50mm deep and will have holes, 20mm in diameter, at approximately 1m spacing, drilled up vertically at the bottom edge of a cladding board, at approximately 1.8m from the ground on each elevation to allow access for bats behind the cladding into the cavities between the battens.

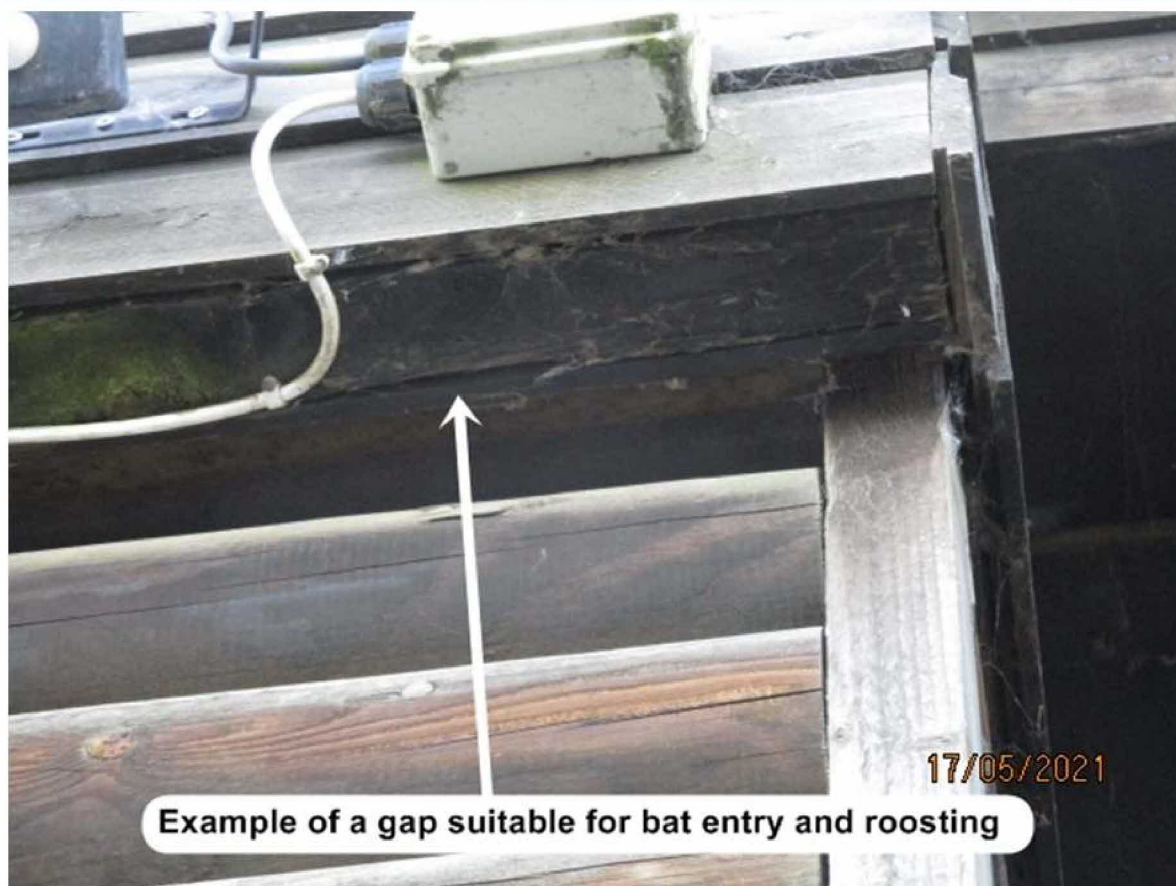


- 15.** At the eaves and along the gables soffit boxes will be built with rectangular bat access slots at their wall edge about every metre. Similar slots will be made at the apex of the gables. All slots will be 100mm long and 20mm deep (and no larger) giving access to the soffit boxes and the wall tops.
- 16.** It will have no lighting inside it or fixed to the outside of it and will have no exterior lighting within 20m of it at all and no exterior lighting directed at it. No electrical power will be wired in or supplied to the building or water supplied to it. It will have no human use, i.e. no storage, animal housing or any other human use.
- 17.** It will have no solar panels of any sort placed over or on the roof or walls or contain any wiring, inverter or controller from any other panels nearby.
- 18.** It will be completed to the satisfaction of the ecologist prior to any works on the building/structure it replaces and where bats are to be excluded from. All works will be carried out under a Mitigation Licence issued by Natural England or Natural Resources Wales (depending on location).

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Native Shrubs and Climbers		
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No. of Species	Scientific name	Common name
1	<i>Cornus sanguinea</i>	Dogwood
2	<i>Corylus avellana</i>	Hazel
3	<i>Crataegus monogyna</i>	Hawthorn
4	<i>Euonymus europaeus</i>	Spindle
5	<i>Frangula alnus</i>	Alder Buckthorn
6	<i>Ilex aquifolium</i>	Holly
7	<i>Ligustrum vulgare</i>	Wild Privet
8	<i>Lonicera periclymenum</i>	Honeysuckle
9	<i>Malus sylvestris</i>	Crab Apple
10	<i>Prunus padus</i>	Bird Cherry
11	<i>Prunus spinosa</i>	Blackthorn
12	<i>Rhamnus cathartica</i>	Buckthorn
13	<i>Rosa canina</i>	Dog rose
14	<i>Salix cinerea</i>	Grey Willow
15	<i>Sambucus nigra</i>	Elder
16	<i>Viburnum opulus</i>	Guelder-rose

7.0 SITE PICTURES





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