

MILL HOUSE, MARCHWIEL HALL, MARCHWIEL, WREXHAM

BAT MITIGATION STRATEGY

Rev B – October 2020

Revisions: Updated brown long-eared bat mitigation strategy (pg. 15 – 17)

Lawray Architects The Byre, Croesnewydd Hall, Wrexham, LL13 7YP

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1.0 INTRODUCTION



Lawray Architects have been appointed to develop a scheme to refurbish the property and add an extension to create a modern home suitable for C21st living. It is of great importance that the historical and cultural significance of the existing Grade II listed dwelling is retained, and that the site's established ecology is maintained and protected, and it's biodiversity enhanced.

The following roosts have been identified on site during surveys carried out in Summer 2019 (see Appendix A and B):

- *Common pipistrelle (Pipistrellus pipistrellus):* a day roost has been identified. A satellite roost has been found at Mill Cottage, whilst a singular bat was identified to be using the brick-built outbuilding with droppings identified within the loft space.
- *Soprano pipistrelle (Pipistrellus pygmaeus):* a satellite roost has been identified at the cottage; bats have been identified using southern and western aspects of the cottage building with droppings identified within the loft space.
- *Whiskered/Brandt's (Myotis mystacinus / M. brandtii):* a small day roost. Bats are entering mainly at barge boards to the west elevation.
- *Brown long-eared (Plecotus auritus):* a maternity roost exists at the cottage building and bats have been recorded using northern and southern aspects of the building. Evidence of this species in the form of droppings were located within the loft space.
- *Lesser horseshoe (Rhinolophus hipposideros):* a day roost has been identified at the outbuilding to the north-east.

This report has been prepared to accompany a full planning application and listed building consent for the proposed works to Mill House. It aims to provide a summary of the bat survey results, along with a written and illustrated proposed mitigation strategy.

2.0 SITE

The Mill House is a Grade II Listed Building (CADW Ref No: 17844) situated within the Marchwiel Estate and is thought to date to 1840. It is situated at the end of a track from the private drive of Marchwiel Hall.

The property is not within a conservation area but does form part of a small collection of buildings within a rural setting, and is adjacent to areas of Ancient Semi-natural Woodland (ASNW) to all aspects and Sontley Marsh SSSI to the south and west.

Site Address: Mill House, Marchwiel, Wrexham, LL13 0SS



3.0 EXISTING ROOSTS

Existing loft spaces are less than 0.5 metres high with insulation present throughout. The space is cluttered due to the presence of pipework and insulation, with such limited dimensions, however, it is warm and free from illumination and draughts. A total of 10 droppings were identified within the area accessed and are indicative of the Pipistrelle bat.

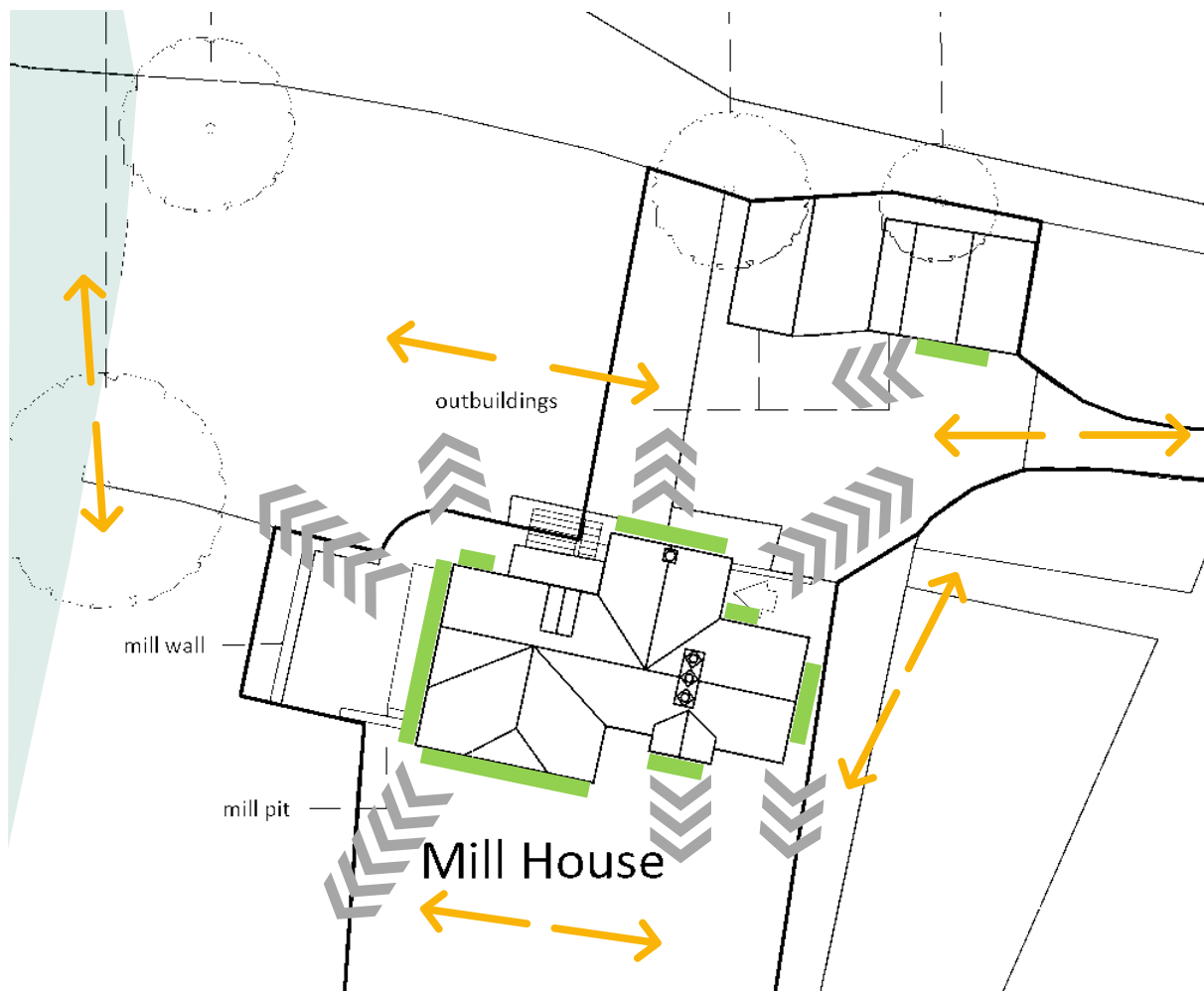
Additionally, 15 recent Brown Long-eared bat droppings were observed within the inaccessible loft void area and is it thus likely that further accumulations are present out of reach.

Both the brick-built outbuilding to the north-east and the Mill cottage were concluded to pertain to 'high' roost suitability, whilst fresh evidence of bats was noted to the exterior to Mill Cottage in the form of fresh droppings identified to be that of the Brown Long- Eared bat and Pipistrelle species, indicating that the structure remains in-use as a roost by bats.

Identified Bat Locations (2019 Survey):

Bat Species	Locations – Emerging/Re-entering (ER) or Foraging/Commuting (FC)	Count
Common pipistrelle bat	ER - West Gable at Eaves	15
	ER - North Window under Boarding	1
	ER - South gable at Eaves	12
	ER - North Verge	1
	ER - Outbuilding	1
Soprano pipistrelle bat	ER - South Gable at Eaves	14
	ER - Western Elevation at Verge	3
	ER - South East Dormer	2
Daubenton's bat	FC – Across Site North to South	1
Brown Long-Eared bat	ER - Northern Elevation at Eaves and Ridge Tile	19
	ER - South West Soffit	5
Whiskered/Brandt's bat	ER - Western Elevation at Eaves	4
Lesser Horseshoe Bat	ER - Outbuilding	1

Bat Locations Map (from 2019 Survey):



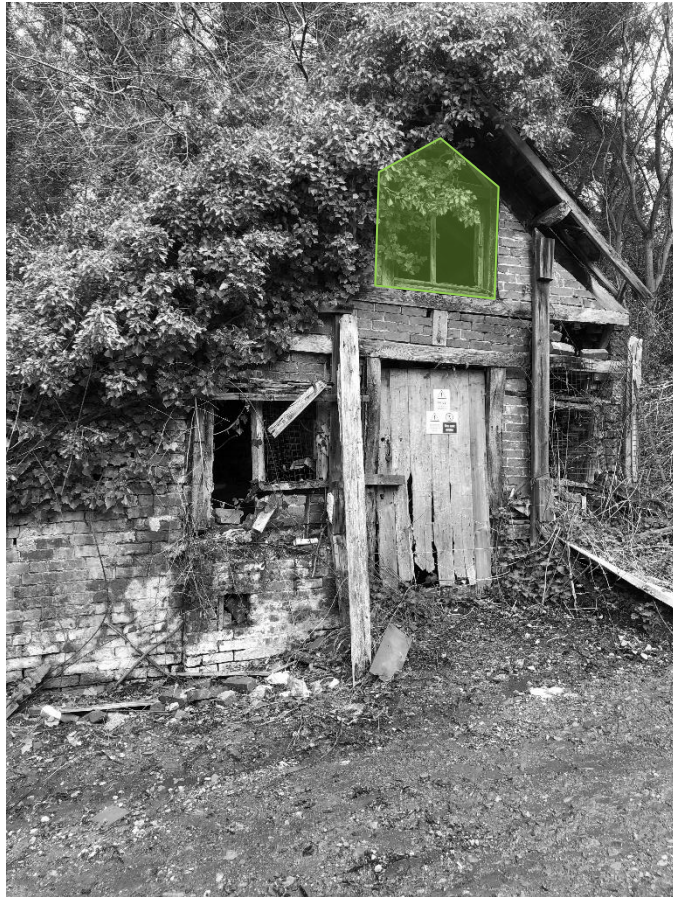
Key:

-  Point of bat emergence
-  Foraging activity
-  Commuting activity

In addition to the confirmed roost locations, the survey carried out in 2015 identified that the mill pit contains hibernation roost potential, though no hibernation survey has been carried out to confirm this, therefore mitigation will be put in place to accommodate this potential. The mill pit was found to be climatically cold, dark and damp, which can suit the hibernation requirements of several bat species. Furthermore, numerous internal crevices exist within the internal brickwork.

Identified emergence locations:





4.0 MITIGATION WORKS

Following the advice received by both Tyrer Ecological Consultants Ltd and Emma Broad at Wrexham County Borough Council, several mitigation works are proposed at Mill Cottage. This report focuses on the built mitigation works, in addition to this, a more general strategy can be found submitted with the application by Tyrer Ecological Consultants Ltd, which will be followed, and is summarised below.

STRATEGY OVERVIEW

The permanent destruction/modification of bat roost(s) will need to be addressed from both a conservation and legal perspective along with the application of appropriate mitigation. A European Protected Species Mitigation Licence (EPSML) will be required to legally destroy or modify a place(s) that is used for breeding, rest or shelter (roost) by bats, in this case the roost(s) identified at Mill Cottage.

In order that the LPA can implement its obligations under the Conservation of Habitats & Species Regulations 2017, appropriate and proportionate mitigation will need to accompany the planning application, or scheme of works, which will demonstrate that the “favourable conservation” of the species concerned can be maintained.

Notwithstanding that Planning Consent is granted or equally if the work is undertaken outside of the planning system whereby projects that do not require planning consent may affect bats or their roost, including disturbance, it does not absolve the applicant, site owner, developer or any other party involved with the work from ensuring that an application is made for a Natural Resources Wales (NRW) Mitigation licence to legally undertake work that will affect bat(s) or their roost/place of shelter. If work is undertaken without a licence and bat/s or their roost/s is/are affected

The following procedures and mitigation are designed to allow the Local Planning Authority in association with their ecological advisers to determine a Planning Application where a European Protected Species has been identified and will be affected by the work for which the Planning Application seeks consent. In addition Local Planning Authorities in accordance with the obligations placed upon them by way of their duties under the Conservation of Habitats & Species Regulations 2017 (as amended) have to take into consideration the presence of a European Protected species before determination of an application where it/they have been identified.

No foraging or commuting habitat will be lost as a result of the proposals nor will the new roosts be at any further distance from foraging places. The redevelopment of Mill Cottage and the brick-built outbuilding is an essential part of the owner’s plans for the site, but it is acknowledged that the presence of multiple bat roosts needs to be addressed from both a legal and conservation perspective. The mitigation proposals are seen to be the most productive way forward that will retain opportunities for bats.

To ensure that bats are not left without a roost while the redevelopment work at both structures takes place, five Schwegler 2F bat boxes (or equivalent) will be erected onto mature trees to the west and north of the site; they will be indefinitely retained during and after the work schedule and will also act as a receptor if bats have to be captured during the work schedule (see Figure 6).

The ecologist is to undertake induction on possible bat presence and documents that from the licence i.e. License, Method Statement and Work Schedule to be kept on site for the duration of the work.

Prior to any work being undertaken the presence/absence bats, as far as possible, will be established by undertaking detailed investigation of the areas at which bats have been located at Mill cottage and the brick-built outbuilding; typically under eaves, at roof verge and beneath ridge tiles and roof slates which will include torchlight endoscopic examinations. In addition, wherever opportunities for bats exist in other parts of the both buildings the inspection will extend to these areas.

The ecologist will also supervise careful dismantling of all places that will be removed as part of the proposed work which have been identified as offering roost potential as due to the number of opportunities for bats at both buildings exclusion is unlikely to be successful and cannot be relied upon. In addition wherever opportunities for bats exist in other parts of the both buildings the supervised dismantling will extend to these areas with strategies for safely removing bat(s) as long as a maternity colony is considered not to have taken up occupancy of either building.

All dismantling of roost and roost features at Mill Cottage will be undertaken during favourable weather conditions and outside of the breeding and hibernation season, broadly during the months of September-October and/or March-April. Dismantling of roost features at the brick-built outbuilding will be undertaken outside of the hibernation season which is within the period November-February.

External lighting is predicted to be above what currently exists throughout the survey area, though where present is to be directed away from bat roost access points, flight paths and foraging areas, further details provided in section 10.15.

Mitigation subject to the approval of Natural Resources Wales.

The roost provision on site will be dedicated for bats and permanent.

The built proposals are discussed in the following pages.

CREVICE DWELLING BATS MITIGATION



Common Pipistrelles, Soprano Pipistrelles and Brandt's/Whiskered bats have all been identified on site and so crevice dwelling opportunities need to be maintained. Disturbance to the Mill Cottage roof, eaves and soffits will be minimal if at all, with the existing materials and access points retained where possible, and Bitumen 1F underfelt used rather than breathable membrane. Where slate tiles have slipped on the roof and need replacing, access tiles will be provided to maintain access for crevice dwelling bats, as well as ridge access tiles (a minimum of 4).

Soffit and barge access shall be re-instated across areas currently used by Pipistrelles, Whiskered/Brandt's and Brown Long-eared bats and will allow access into existing loft voids at Mill cottage.

To the proposed cladding along the new extension and outbuilding, access holes can be provided to create new dwelling opportunities post-construction to further mitigate any disturbances caused.

To ensure that bats are not left without a roost while the redevelopment work at the cottage and outbuilding structures takes place, five Schwegler 2F bat boxes (or equivalent) will be erected onto mature trees to the west and north of the site; they will be indefinitely retained during and after the work schedule and will also act as a receptor if bats have to be captured during the work schedule.

Indicative positions of receptor boxes:



The ecologist will supervise careful dismantling of all places that will be removed as part of the proposed work which have been identified as offering roost potential as due to the number of opportunities for bats at both buildings exclusion is unlikely to be successful and cannot be relied upon. In addition wherever opportunities for bats exist in other parts of the both buildings the supervised dismantling will extend to these areas with strategies for safely removing bat(s) as long as a maternity colony is considered not to have taken up occupancy of either building.

All dismantling of roost and roost features at Mill Cottage will be undertaken during favourable weather conditions and outside of the breeding and hibernation season, broadly during the months of September-October and/or March-April. Dismantling of roost features at the brick-built outbuilding will be undertaken outside of the hibernation season which is within the period November-February.

LESSER-HORSESHOE BAT MITIGATION

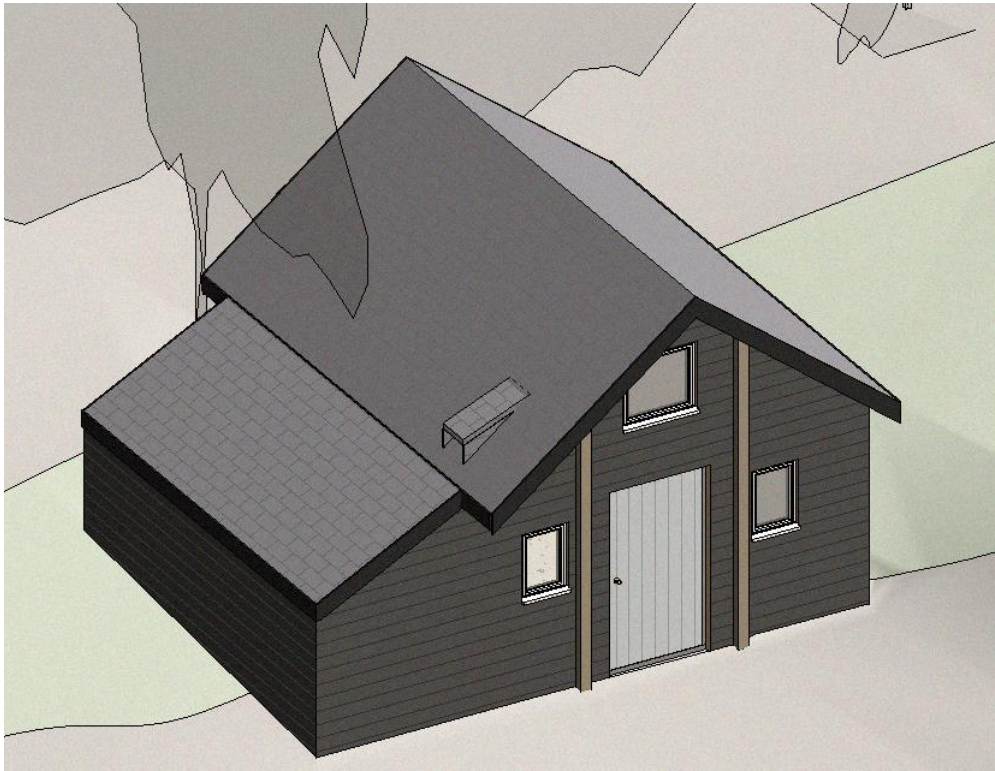


The dilapidated outbuilding is being used as a roost for a lesser-horseshoe bat as well as some pipistrelle bats. A replacement roost will be incorporated into the proposals for a replacement outbuilding to the north of the site, in the same location, which will replicate the existing dimensions and form of the current building, which will ensure the same aspect, size, access points and vegetation links are maintained. No lighting will be directed toward or placed within proximity of the new roost/outbuilding.

The new walls will be timber clad, backed with Bitumen 1F underfelt, and some of the original timber materials will be re-used where possible. Gaps of 15-18mm minimum width and 75mm length will be provided along the cladding. On the roof of the stand-alone roost to the south-east will be dedicated access for Lesser Horseshoe bats which will provide open access for bats to fly directly into the loft space, whilst not allowing for illumination in the loft space. The roof of the stand-alone roost will comprise slates backed with bitumen 1F underfelt as opposed to breathable membrane or any other underfelt material. The insulation and enclosed construction should improve the current internal temperatures for the bats and encourage them to stay.

Please read in conjunction with 'PROPOSED OUTBUILDING' drawings submitted with the application for further details and dimensions.

Proposed lesser horseshoe bat roost:

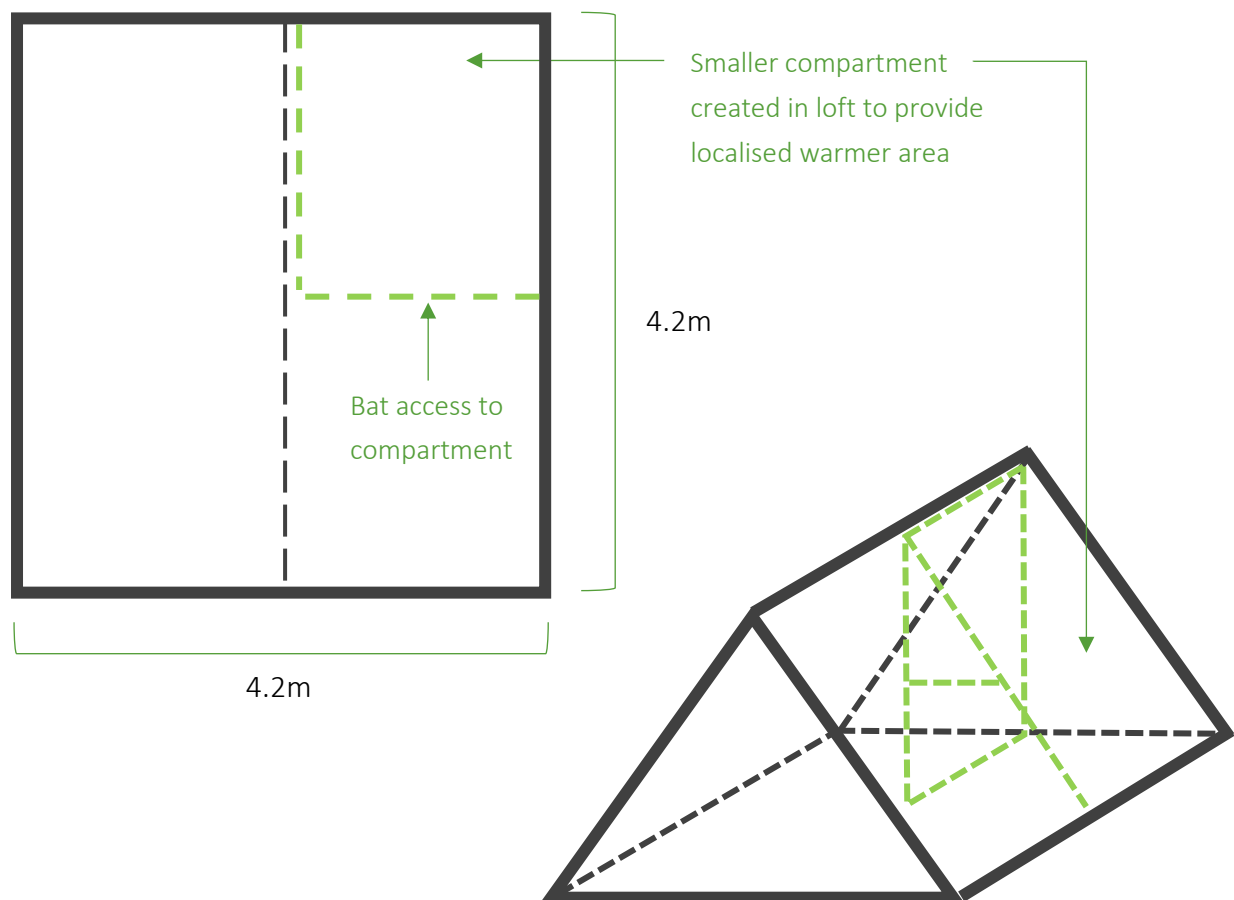


BROWN LONG-EARED BAT MITIGATION

These loft and crevice dwelling bats have been identified emerging and re-entering via the eaves, verges and ridge of Mill Cottage, and so access points will be retained in these areas using the strategies previously mentioned, for the bats to continue to use the loft whilst they adjust to the new roost over time.

The new purpose-built Brown Long-eared bat roost will feature a partitioned loft space measuring 4.2 x 4.2m in footprint and will be 2.0m in height from floor to ridge (42 degree slope). It will be located 2-3m distance from the bank of the Gefeilliau Brook (as the bank is too steep to support construction), where it will receive solar gain to support a maternity colony, and will be built using reclaimed timber frame, with blackened cladding to match the extension and outbuilding, 100mm insulation and Bitumen 1F felt underlay. The roof will be slate tile to match the existing roofs with Bitumen 1F felt underlay.

At intervals along the ridge beam and along the roof slope the bitumen roof felt will have 30 x 100mm slots cut out for crevice access between the felt and tiles. A double ridge board will be created with a gap of 20mm between boards to provide crevice situations. Elm cladding will be fixed on vertical 18mm battens over bitumen underfelt at the gable ends, with gaps of 15 - 20mm in the cladding for additional crevice opportunities. A 500 x 500mm hatch on the rear underside of the loft will provide access for monitoring.

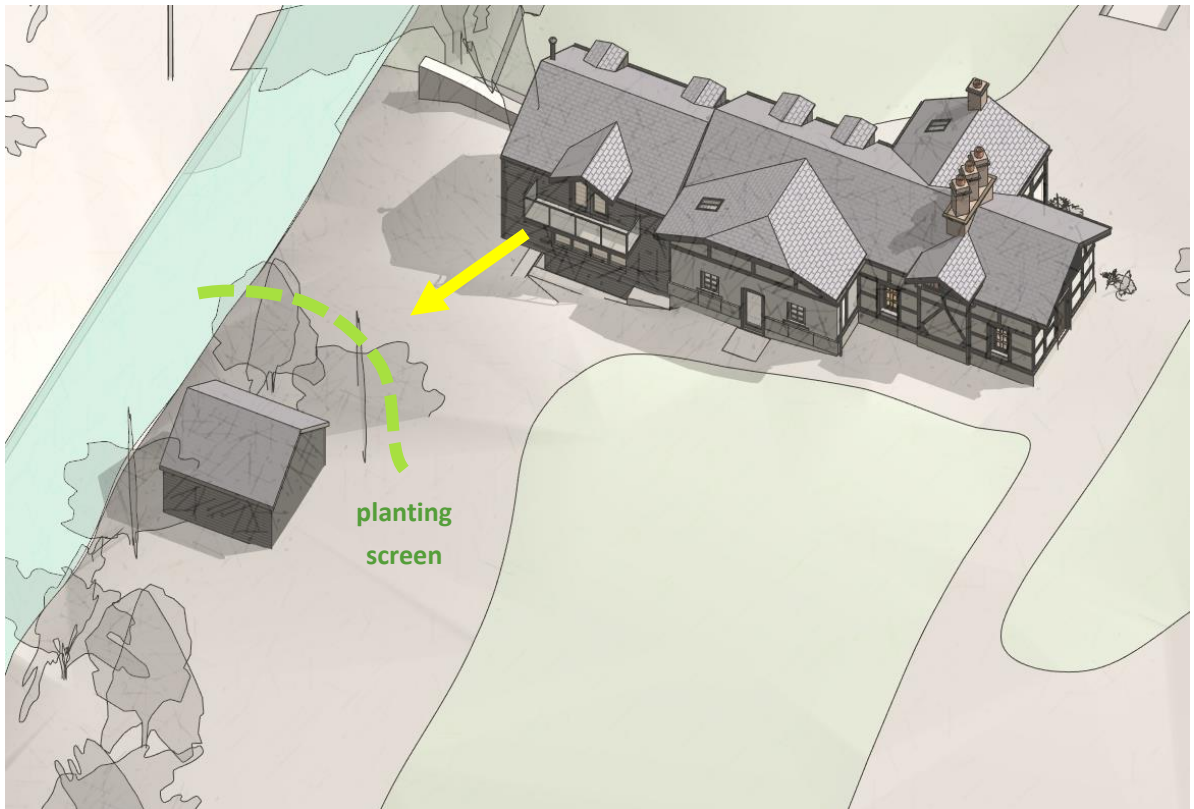
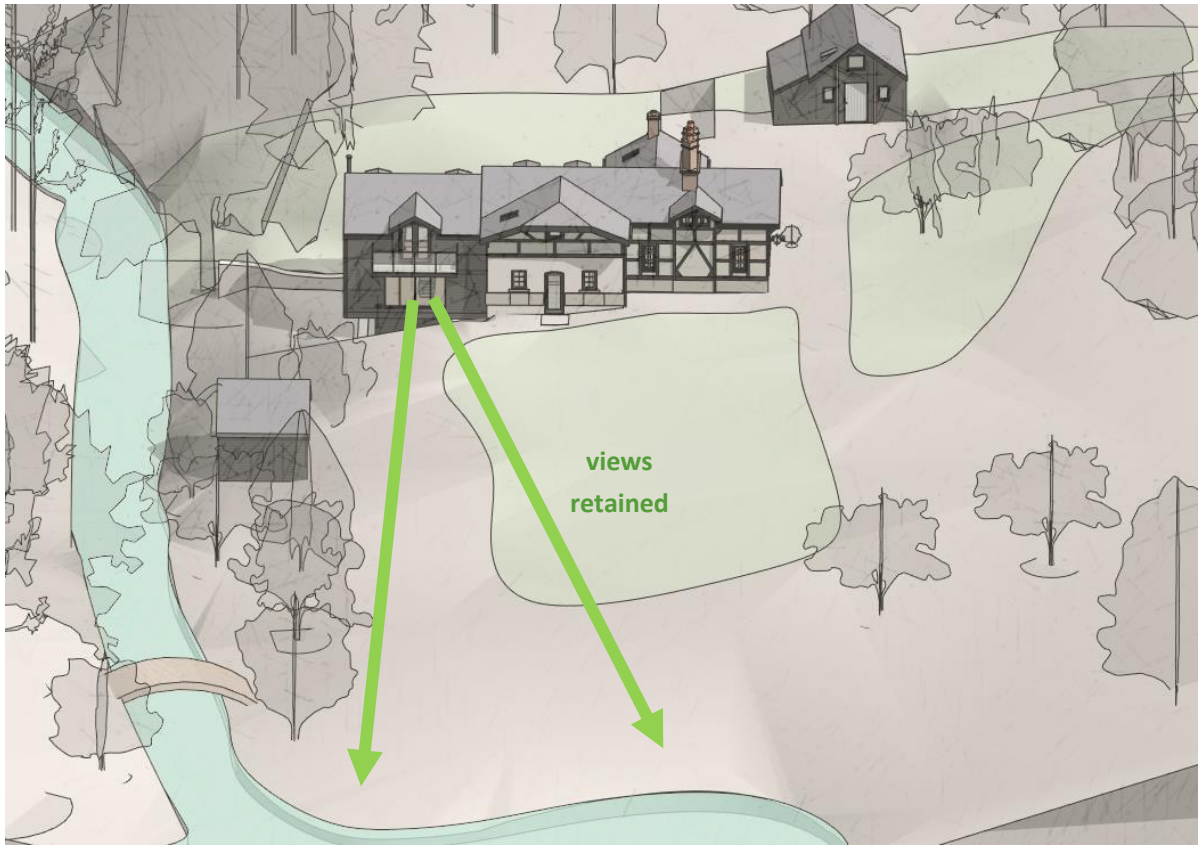


Proposed brown long-eared bat roost:



The roost is positioned alongside the brook (as close as possible, and set back no more than 3m), where feeding and foraging takes place. It is positioned at a distance of around 12.5m from the proposed extension and the nearest light source (which would be indirect, internal light emitting from within the rear windows of the extension, which would likely be low level and be significantly dimmed by curtains/blinds).

Low level trees and scrub in the area will be cleared to place the roost's footings, and a lack of tall trees in this area allows solar heat gain to benefit the roost all year round. To additionally shield the bat roost from light and noise pollution, planting and low level trees of 3-5m height will be planted to the north of the roost, where it will not impair solar gain, which will also allow the roost to be less visually imposing on site and help to retain and enhance the character of the site. Its proximity to the brook will ensure views to the lake are retained, ensuring the picturesque character of the site is preserved.



HIBERNATION ROOST MITIGATION

The mill pit and basement have been identified as having potential for a hibernation roost in the 2015 survey. No hibernation survey has taken place at Mill Cottage, and the basement opening has been blocked up since late 2015. Following the below table from 'Bat mitigation guidelines - A.J. Mitchell-Jones; January 2004', it is potentially still used by several bat species identified on site, including Whiskered/Brandt's bats for hibernation, though since the doorway has been blocked, the lesser horseshoe's access has been removed and it is therefore somewhat unlikely to be found here. According to the guidelines, Pipistrelles and Brown long-eared bats prefer to hibernate within buildings, for which the new roosts and retained loft access will provide opportunity and mitigation.

Species	Trees		Buildings		Underground	
	Maternity	Hibernation	Maternity	Hibernation	Maternity	Hibernation
Greater horseshoe bat <i>Rhinolophus ferrumequinum</i>	N	N	H	L	M	H
Lesser horseshoe bat <i>Rhinolophus hipposideros</i>	L	L	H	M	L	H
Bechstein's bat <i>Myotis bechsteinii</i>	H	H	L	L	L	M
Brandt's bat <i>Myotis brandtii</i>	L	L	H	H?	N	H
Daubenton's bat <i>Myotis daubentonii</i>	M?	L?	M	L	M?	H
Greater mouse-eared bat <i>Myotis myotis</i>	L	N	L	L	N	H
Whiskered bat <i>Myotis mystacinus</i>	M?	M?	H	L	N	H
Natterer's bat <i>Myotis nattereri</i>	M?	M?	H	L	L	H
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>			H?			
Common pipistrelle <i>Pipistrellus pipistrellus</i>	M	M	H	H	N	L
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	M	M	H	H	N	L
Leisler's bat <i>Nyctalus leisleri</i>	M	M	H	L	N	N
Noctule <i>Nyctalus noctula</i>	H	H	M	L	N	N
Serotine <i>Eptesicus serotinus</i>	N	N	H	H	N	L
Barbastelle <i>Barbastella barbastellus</i>	H	H	M	L	N	H
Brown long-eared bat <i>Plecotus auritus</i>	H	H	H	H	N	M
Grey long-eared bat <i>Plecotus austriacus</i>	L	L	H	L	N	M

Trees – includes all types of crevice and hollow as well as bat-boxes attached to trees
 Buildings – above-ground areas, with an emphasis on roof voids and other areas warmed by the sun.
 Underground – anywhere that provides cool humid conditions buffered against rapid temperature change.
 Includes caves, mines, tunnels, fortifications, cellars, ice-houses, lime kilns etc.

N – not recorded in recent times
 L – low dependence; unusual, but has been recorded
 M – some usage recorded, though perhaps not the most important type of site
 H – the most frequently recorded type of site for this species/activity

Table 4.1 Species associations with roost types.

To compensate the loss of the potential basement roost, it is proposed that the under-croft of the extension is utilised to create very similar conditions as those existing, to provide a potential hibernation roost. The current basement is not weather tight, is draughty, lacks insulation and has only one potential

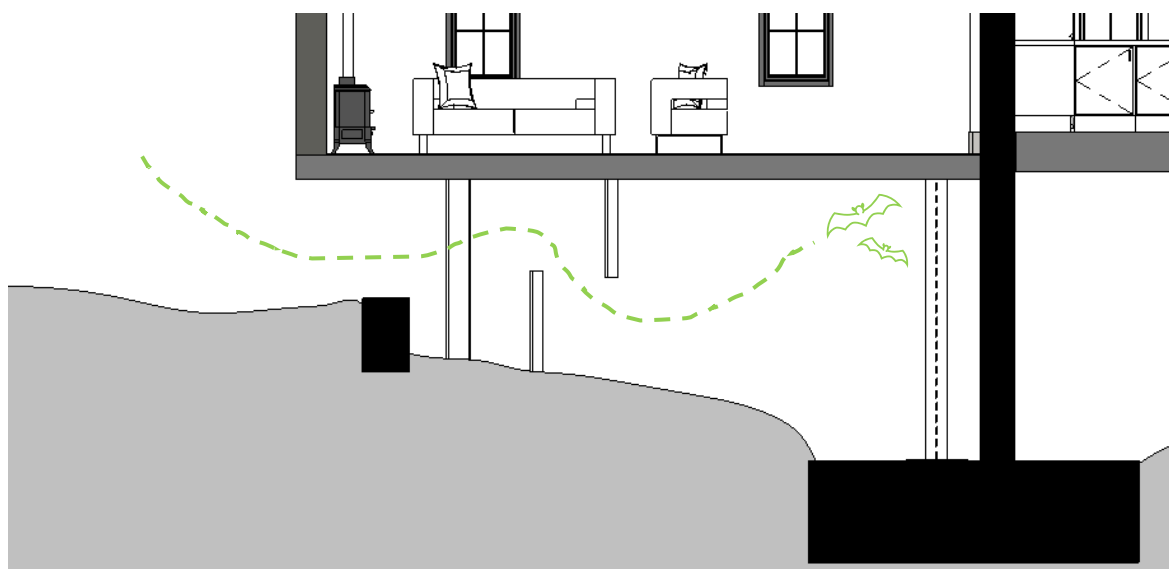
fly-in access point (which was removed 5 years prior). The walls are stone and mortar, with some areas cemented over, and are mostly free from crevices or holes. Most of the ceiling is smooth concrete finish, with one small section of exposed timber floor joists. The exterior mill pit stone walls (proposed under-croft) contain many gaps and opportunities for roosting.

The proposed under-croft area measures just slightly less than the existing basement at 24m² (5.1 x 4.7m). The floor-to-ceiling height of the under-croft will vary along the slope of the ground, at 2.2m to the east and 1.7m to the west, which almost replicates the existing floor to ceiling height of the basement, which is 1.9m at its highest point. These measurements surpass the recommended minimum size set out in the *Bat Mitigation Guidelines, 2004*.

The new under-croft 'roof' will be made of either stressed concrete beams, pre-stressed beam and block concrete or a cast in-situ floor (likely to be cast in-situ but dependant on structural engineer's specification) as recommended for underground hibernation roosts, with sufficient high quality insulation (min 150mm) plus a radiant heat barrier to ensure that no heat is transferred from the ground floor above to the under-croft via convection, conduction nor radiation.

The perimeter walls will be blackened timber clad to match the extension above, with insulation and bitumen felt underlay. The existing fly-in arch will be replicated in the new timber clad end-wall, maintaining similar flight paths and proximity to foraging areas of the brook and woodland. This western end of the site will receive no artificial lighting. The exposed stone wall of the mill pit will provide crevices and roosting opportunity. At the corners of the space, 600 x 600mm x 300mm roosting places will be created with suitable netting. The proximity of the brook and the soil floor with no damp proofing will ensure that high humidity is maintained within the under-croft naturally, and that temperatures remain cold and consistent throughout winter.

Section through basement roost:



Two half walls offset by 1m from the opening will eliminate draughts, weather ingress, and any light entering during the day and retain access for the bats.