



**PRELIMINARY ROOST
ASSESSMENT & PRESENCE /
ABSCNECE SURVEY (BATS)**

The Barn, The Green, Croft Village
Leicestershire LE9 3EQ

Report reference: PR085A_07_19PRA/PA



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**PRELIMINARY RO
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ABSCNECE SURVEY (E**

Contents

Executive Summary	1
1. Introduction	2
1.2 Proposed work	2
1.3 Personnel and quality assurance	2
2. LEGISLATION.....	2
3. Methodology.....	5
3.2 Preliminary Ecological Appraisal	6
3.3 Designated Sites	6
3.4 Protected Species	6
3.5 Preliminary Roost Assessment.....	6
3.6 Presence / Absence Survey	7
4. CONSTRAINTS.....	7
5. RESULTS.....	8
5.1 Preliminary Ecological Appraisal	8
5.2 Designated Sites	9
5.3 Protected Species	9
5.4 Preliminary Roost Assessment.....	9
5.5 Presence / Absence Survey	10
6. CONCLUSIONS	11
7. RECOMMENDATIONS	12
8. Impact Assessment.....	13
9 Mitigation and Compensation.....	13

Appendix A Photographs


Appendix B Bat Flight Plan

Appendix C Raw Survey Data

Appendix D Sonograms

Appendix E Bat and Bird Box Products

Survey undertaken, and report undertaken by Lawrence Armstrong BSC (Hons). Class 2 bat license number: 2016-26134-CLS-CLS.

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Executive Summary

Lawrence Armstrong was commissioned by Mr Michael Potter (Contractor) to undertake a Preliminary Roost Assessment (PRA) and Presence / Absence Survey (PAS) at The Barn, Croft Village Leicestershire LE9 3EQ. Full Ordnance Survey grid reference: SP 51367 95990. The client proposes the demolition of a: two Storey brick agricultural barn (+ 100 years old), an attached single storey brick lean to with an attached single storey brick shed and build a traditional style dwelling with re-used brick on the original footprint of the barn. A PRA was undertaken by Lawrence Armstrong on 21 June 2019 which found the barn to have 'moderate' bat roost potential, the lean to – no day roost potential due to daylight leakage and 'low' bat roost potential at the shed due to a small number of gaps between roof tiles. The habitat around the property has 'moderate' ecological value for bats. No designated sites will be impacted by the development. One European Protected Species License (EPSL) application for bats was found within 2km of the property. No bat off site bat roosts or flight lines will be impacted during this development. There are no sites designated for wildlife within a 200m radius of the property. Three presence absence surveys were undertaken by Lawrence Armstrong and Philip May between 21 June and 21 July 2019. A single common pipistrelle *Pipistrellus pipistrellus* bat was recorded emerging and re-entering a 1m wide hole where missing tiles are present at the east elevation of the two-storey barn during the first survey. Emergence observations were made on 22 June, emergence and re-entry on 6 July and an emergence, re-entry and second emergence on 20 July 2019. The timing of these latter emergences is thought to be a single bat but the presence of two bats cannot be ruled out. The barn was subject to internal access restrictions due to structural damage caused by the removal of supporting walls and brace when garages were added to the west façade. This prevented the successful identification of the roost chambers. Under the current proposals, demolition of the barn will destroy a daytime summer roost for one or two non-breeding male/female *P. pipistrellus* bats which contravenes current wildlife legislation.

Prior to any demolition works, a EPSL will be required to legally destroy the roost. A Method Statement and Mitigation Plan will be required to support a EPSL application. Once prepared, a period of 30 days is required for the license to be processed by Natural England. No work can take place during the bat active season 1 May – mid September in this part of the country. At least three bat roosting features will be required to be included at the design stage of the new development. One of these should be located as close as possible to the roosts entrance to be lost i.e. a gap between roof tiles at the east elevation at the same location. It will not be possible to replace with like for like roost. Other features include: one bat tube integrated into brick work at the southern gable and a further bat access tile at the ridge. Information on type and siting location is provided in Appendix E. This report is valid for a period of two years after which, a further inspection of the building will be required. This period may be reduced at the request of the Local Planning Authority. NB: Natural England may require a re-inspection if a period of three months has elapsed between the date of the last inspection (21 July 2019) and the start of works.

1. Introduction

- 1.1.1 Lawrence Armstrong was commissioned by Mr Michael Potter (Contractor) to undertake a Preliminary Roost Assessment (PRA) and Presence / Absence Survey (PAS) at The Barn, Croft Village Leicestershire LE9 3EQ. Full Ordnance Survey grid reference: SP 51367 95990.
- 1.1.2 The purpose of the PRA is to establish whether the property is currently being used by bats for roosting purposes or, has the potential to support roosting bats. Should the survey findings indicate bats are currently roosting or have the potential to roost at the property, then further PAS's will be required during the bat active period May – September to identify what species are present, the numbers of bats within the roost and type of roost present.
- 1.1.3 Where bats are known to be present then the timing of works can be rescheduled to a time when bats are not present at the roost and the original roost retained in its current state. If retaining the roost in its current state is not possible, a European Protected Species License (EPSL) will be required to legally destroy the roost.

1.2 Proposed work

- 1.2.1 The client proposes the demolition of a two storey brick agricultural barn (+ 100 years old) with an attached single storey brick lean to with attached brick shed and replace with a new dwelling on the original footprint of the barn.

1.3 Personnel and quality assurance

- 1.3.1 The surveys were carried out by Ecologists Lawrence Armstrong and Phillip May. Lawrence Armstrong has been undertaking bat surveys professionally for over ten years and holds a Class 2 bat survey license. License Number: 2016- 26134-CLS-CLS. Phillip May has 35 years' experience as an ecologist and holds a Class 1 Bat Survey License (license number to follow).

2. LEGISLATION

- 2.1.1 The following is for guidance only and is not intended to be a definitive statement of the law. A more comprehensive description can be viewed within the relevant primary and secondary legislation, refer to footnotes. Anyone unsure of their legal rights or obligations should consult a legal representative.

- 2.1.2 In England, all British bats and their roosts are protected under the Wildlife & Countryside Act 1981 (as amended)¹ and by the Conservation of Habitats and Species Regulations (2012)². Taken together the above legislation make it an offence to:
- Deliberately or intentionally kill, injure or take a bat;
 - Damage, destroy or intentionally or recklessly obstruct access to any place that a bat uses for shelter or protection (this is taken to mean all bat roosts whether bats are present or not);
 - Intentionally or **recklessly** disturb a bat while it is occupying a structure or place that it uses for shelter or protection.
- 2.1.3 The Natural Environment and Rural Communities Act (NERC) Section 40 (1) Duty to Conserve Biodiversity places a legal duty upon a public authority that "Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity". Public authority includes a local authority and a local planning authority, in England this means a county council, district council or a parish council.
- 2.1.4 Section 41 (1) of the NERC Act states that the Secretary of State in consultation and under guidance from Natural England, must publish a list of living organisms and habitats of principal importance for conserving biodiversity. In England, there are 56 habitats of principal importance and 943 species of principal importance.
- 2.1.5 As there is potential habitat for breeding birds within the work area, this report will provide advice on best practice advice on reasonable avoidance measures and mitigation for breeding birds.
- 2.1.6 The above is a summary of the main legislation only. Should clarification be required then readers of this report should consult the full versions which can be found within the appropriate governmental websites.

Relevant Policy

- 2.1.7 The National Planning Policy Framework (NPPF) of March 2012 replaced the previous planning policy for biodiversity conservation; Planning Policy Statement 9 (PPS9).

¹ Wildlife and Countryside Act: <https://www.legislation.gov.uk/ukpga/1981/69>

² The Conservation of Habitats and Species Regulations: <http://www.legislation.gov.uk/uksi/2012/1927/contents/made>

2.1.8 Paragraph 170 (B) states "To protect and enhance biodiversity and geodiversity, plans should:

- promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

2.1.9 Paragraph 175 (B) states that "when determining planning applications, local planning authorities should apply the following principles:

- if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.

Biodiversity Action Plans

2.1.10 The UK Government became a signatory of the Convention on Biological Diversity (CBD) in 1992 in Rio de Janeiro. The CBD was formed following the recognition that biological diversity was an important global asset to present and future generations. The UK Government responded by establishing the Biodiversity Steering Group to implement the UK Biodiversity Action Plan (UK BAP).

2.1.11 First published in 1994, the UK BAP detailed the UK's biological resources and provided a basis for plans to be implemented to conserve the most threatened species and habitats at a national scale.

2.1.12 The UK BAP lists seven species of bat as 'priority' species requiring country level action plans to secure their conservation. These species are also listed as Species of Principal Importance under Section 41 of the NERC Act (2006):

- Barbastelle (*Barbastella barbastellus*)
- Bechstein's (*Myotis bechsteinii*)
- Noctule (*Nyctalus noctula*)
- Soprano Pipistrelle (*Pipistrellus pygmaeus*)
- Brown Long-eared (*Plecotus auritus*)
- Greater Horseshoe (*Rhinolophus ferrumequinum*)
- Lesser Horseshoe (*Rhinolophus hipposideros*)

2.1.13 Local Action plans were also produced to provide a framework for habitat and species conservation at regional and local levels known as Local Biodiversity Action Plans (LBAP's). The Leicester, Leicestershire and Rutland Biodiversity

Action Plan lists all UK bats as 'priority' species and are locally important if present in the county³.

3. Methodology

- 3.1.1 The methods follow closely those outlined in Collins (2016)⁴. All bat species listed in this report shall be referred to by their common name followed by their italicised scientific name after which, only their abbreviated scientific name shall be given.
- 3.1.2 All measurements given are approximate. For photographs with detailed descriptions of features referred to in the text, refer to Photographs in Appendix A.
- 3.1.3 For information on bat flight observed during all PAS's, Appendix B Bat Flight Plan.
- 3.1.4 For detailed information of bats recorded during the PAS's, Appendix C Raw Survey Data.
- 3.1.5 For sonograms of bats recorded and identified to species, Appendix D Sonograms.
- 3.1.6 For bat box products suggested for mitigation and compensation at this site, Appendix E.

³ Timms, S. The Leicestershire & Rutland Environmental Records Centre (2016). The Leicester, Leicestershire and Rutland Biodiversity Action Plan: A Space for Wildlife 2018 – 2026.

⁴ Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.

3.2 Preliminary Ecological Appraisal

3.2.1 An aerial investigation was undertaken using Google Earth, the Multi Agency Geographical Information for the Countryside (MAGIC)⁵ websites and Ordnance Survey mapping to identify features considered to have important conservation value for bats for either roosting, foraging or commuting purposes. This includes quantifying areas of woodland, scattered trees, hedgerows, scrub, rough grassland, ponds, lakes, rivers, streams and canals as well as houses and other structures for roosting. These habitat features provide the primary sources of roosting, commuting, foraging and breeding habitat for bats.

3.3 Designated Sites

3.3.1 The MAGIC website was investigated for statutory and any non-statutory designated sites within a 200m radius of the properties nearest boundary. Given that building materials are to be re-used and dismantled by hand, a 200m radius search is suitable for a development of this size.

3.4 Protected Species

3.4.1 The Leicestershire and Rutland Environmental Records Centre (LRERC) was not commissioned to carry out a biological records search of bats for at this time however, a such records may be required at the request of the Planning Authority and will be required as part of a European Protected Species License (EPSL) application.

3.4.2 Records of EPSL applications for bats within a 2km radius of the property was investigated using the MAGIC website.

3.5 Preliminary Roost Assessment

3.5.1 The Preliminary Roost Assessment (PRA) was undertaken on 21 June 2019. The survey comprised where possible, internal and external building inspections to look for ingress or egress points suitable for bat access and evidence of bats. A broad habitat assessment was also undertaken following Bat Conservation Trust Guidelines (Collins, 2016)⁴. These methods were used to determine if bats are currently roosting or have the potential to roost at the property.

3.5.2 The external inspection included searches around the roof, external walls and ground immediately below walls of the barn. An internal inspection was not possible due to structural hazards at the barn namely the upper gable end

⁵ <http://www.natureonthemap.naturalengland.org.uk/>

leaning outwards. The roof tiles along the length of the barn were visibly unaligned and the east walls are bowing suggesting the whole building has moved towards the outward leaning gable end, refer to Photograph 1 Appendix A.

- 3.5.3 An external and internal inspection of the lean to and attached brick shed was possible and included searches between roof tiles, around roof support timbers, windowsills, floors, walls and surfaces of stored items.
- 3.5.4 Ingress / egress points suitable for bats are searched for and include; holes, cracks and crevices with large enough apertures to allow access to bats which can be as low as 15mm x 20mm, Mitchell Jones 2004⁶.
- 3.5.5 Evidence searched for included: bats either free hanging or in crevices, chattering or squeaking of bats, droppings, prey remains, fur oil, urine staining and tell tail odour.

3.6 Presence / Absence Survey

- 3.6.1 Three PAS's were undertaken at the property using one surveyor during two back to back dusk and dawn surveys and two surveyors for a single dusk survey. The PAS's were undertaken on 21 - 22 June, 6 July and 20-21 July 2019 respectively. The lean to and attached shed were inspected before and after each survey visit to check for signs of bat use.
- 3.6.2 Dusk surveys were undertaken at 15 minutes before sunset until two hours after sunset and dawn surveys at 2 hours before sunrise until sunrise.
- 3.6.3 Equipment used included: ladders, close focusing binoculars, torch, tape measure, sample pots, gloves, Pettersson D240 bat detector and Edirol R05 digital recorder, Peersonic RPA 3 and an Anabat Swift for active recording during surveys.

4. CONSTRAINTS

- 4.1.1 External evidence of bats such as droppings can be removed by the effects of weathering so may not be present at the time of the survey.
- 4.1.2 The barn could not be entered safely to undertake an internal inspection due to structural damage and the risk of collapse thus the dimensions of the roosting chamber could not be measured.
- 4.1.3 Habitat features in the wider area identified using aerial photography OS mapping products and the MAGIC websites are outdated and may not be present at the time of the survey.

⁶ Mitchell Jones, A.J. 2004. Bat Mitigation Guidelines. English Nature (now Natural England) ISBN 1 85716 781 3.

5. RESULTS

5.1 Preliminary Ecological Appraisal

- 5.1.1 The property is situated in a semi-rural setting at The Green, Croft Village 11km south west of Leicester City Centre. Full Ordnance Survey grid reference: SP 51367 95990.
- 5.1.2 The immediate habitat to the north comprises: rear gardens of neighbouring houses on Dovecot Drive beyond which is a strip of woodland plantation screening around Croft and Huncote Quarry. There is a strip of woodland plantation to the east side of the quarry which abuts Thurlaston Brook the latter which runs south to the River Soar.
- 5.1.3 To the south of the barn is a well-managed walled garden with a small koi carp pond which will form the garden to the new development. The south of the garden is surrounded by mature deciduous trees within 23m of the barn and which connects to a small wooded area 0.2ha in size. The wooded area provides an almost unbroken bat commuting feature and wildlife corridor to the River Soar 135m south of the barn.
- 5.1.4 To the east is a 1.7ha area of rough grassland dominated by tall ruderals comprising mainly common nettle *Urtica dioica* fringed by bramble *Rubus* sp., willow *Salix cinerea* and alder *Alnus glutinosa*.
- 5.1.5 To the west are occupied houses on Huncote Road and Hill Street to the north of which, a small wooded area abuts the southern end of Croft and Huncote Quarry.
- 5.1.6 All of the above habitats are suitable for supporting small numbers of common bat species such as the common pipistrelle *Pipistrellus pipistrellus*, brown long eared *Plecotus auritus* and whiskered *Myotis mystacinus* bats. The habitat has 'moderate' ecological value for bats. Other species may be present.

5.2 Designated Sites (Statutory)

5.2.1 There is one statutory designated site within a 200m radius of the property. Croft and Huncote Quarry Site of Species Scientific Interest is situated 100m to the north west. The primary reason for designation is the sites geology and exposed tonalitic igneous rocks of Ordovician age and manganese mineralisation of Triassic age. The development will not impact upon the integrity of this site due to the limited size of the development and distance from the site.

Non-statutory

5.2.2 There are no non-statutory designated sites within a 200m radius of the sites nearest boundary.

5.3 Protected Species

5.3.1 There is one EPSL applications for bats within a 2km radius of the property. The species the license was granted is *P. pipistrellus* for the destruction of a resting place and breeding site. The license date is 2010 – 2012. License reference: EPSM2009-943. The application site is 1.4km from the property.

5.3.2 Two further EPSL applications granted for great crested newt *Triturus cristatus* were for the damage and destruction of resting places. License dates 2012 – 2015 and 2017 – 20121. Both application sites are 1.6km from the property. The site is contained by brick walls, so this species is not a constraint to the development.

5.4 Preliminary Roost Assessment

The Barn

5.4.1 The barn is a two-storey brick built agricultural building age unknown but at least +100 years old. The roof is covered with clay tiles and there is no roof lining present evidence of which could be viewed by torchlight through missing windows and holes in the roof using binoculars. There are numerous gaps at the ridge although missing roof lining will reduce the potential for bats roosting under ridge tiles, but this cannot be ruled out. The roof has elevations oriented north west and south east.

5.4.2 The walls are constructed of solid 9-inch brick and there are numerous cracks throughout the building due to structural movement. The lower cracks could be inspected and showed no potential roosting chambers.

- 5.4.3 The barn has 'moderate' bat roosting potential. The hibernacula qualities of the barn are currently unknown. Photographs 1 – 2.

Lean to

- 5.4.4 A single storey lean to is attached to the barn at its northern end and runs north west making an L shaped plan. The roof is corrugated tin with no roof lining present. There is a missing window and damaged front door allowing bat access to the interior.
- 5.4.5 The interior of the lean to is light filled via a missing window and damaged front door. The area is dusty and subject to regular disturbance as it is used for storage. No signs of bats throughout. The lean to has no day roosting potential but may serve as a feeding perch or night roost for *P. auritus*. The hibernacula qualities of the lean to are currently unknown. Photographs 3 – 4.

Brick shed

- 5.4.6 A small single storey brick shed is attached to the eastern end of the lean to. The roof covering is clay tiles with ae roof lining of lath and plaster. There are gaps between loose fitting roof tiles to the front which provide potential access between the tile and roof lining. The shed is used for storing logs and is subject to regular disturbance and is lit at night by security lighting from the main house. No signs of bats throughout. The shed has 'low' bat roosting potential. The hibernacula qualities of the shed are currently unknown. Photographs 5 – 6.

5.5 Presence / Absence Survey

- 5.5.1 The results of the PAS's is provided in detail within Appendix C. A summary of results is given in Table 1 which shows the survey type, date of survey, location covered during the surveys, surveyor ID and survey results.

Table 1. Survey type, date, location, surveyor and survey results

Survey type	Date	Location	Surveyor	Results
Dusk	21/06/2019	Barn west side & Lean to with shed	LA	Negative
Dawn	22/06/2019	Barn east side	LA	Bat entered hole in east elevation
Dusk	06/07/2019	Barn east and west side, lean to with shed	LA & PM	Bat emerged from hole in east elevation and re-entered later
Dusk	20/07/2019	Barn east side	LA	Bat emerged and re-entered later and later

				emerged from hole in east elevation
Dawn	21/07/2017	Barn west side & Lean to with shed	LA	Negative

6. CONCLUSIONS

- 6.1.1 The surveys have shown that a one or two non-breeding male/female *P. pipistrellus* bats is confirmed roosting at the barn. The roost is a typical summer day roost for this species. The entrance to the roost is at the east elevation through a large hole (1m wide) where roof tiles are missing. The location of the roosting chamber could not be identified due to access restrictions into the barn which is leaning at one end with walls bowed along its eastern façade. Demolition of the barn would contravene current legislation regarding bats and their resting places.
- 6.1.2 A total of 28 registrations were made during all three surveys indicating the area surrounding the site is used by low numbers of common bats with only two species recorded *P. pipistrellus* and *N. noctula*. Seven registrations were recorded at the west side of the barn with the lean to and shed and 21 registrations at the east side throughout all surveys. Most registrations were of the *P. pipistrellus* and *N. noctula* commuting close by, but off site.
- 6.1.3 The low numbers of bats may be due in part to better habitat surrounding Croft Quarry and roosting opportunities at buildings in close proximity to more dense vegetation around the periphery of the quarry. There are limited ingress points into the upper floor of the barn from the west façade limited to just one window providing some fly through access, but which is partially covered by a timber frame and wire mesh bird deterrent.
- 6.1.4 The lean to and shed are not currently being used by bats. The lean to will not be used by bats due to daylight illuminating the interior by day and security light pollution at night.
- 6.1.5 The shed has low roosting potential between loose fitting roof tiles and lath and plaster roof lining, but this is in poor condition and illuminated at night.

7. RECOMMENDATIONS

- 7.1.1 As the proposed work will destroy a summer roost for one or two *P. pipistrellus* bats, a EPSL application to legally destroy the roost will be required before any demolition work can commence.
- 7.1.2 A suitable Method Statement, and Mitigation Plan will be required to support the EPSL application. No work can take place during the bat active season May – Mid-September. A EPSL application will take one week to produce and 30 days to be processed by Natural England.
- 7.1.3 Compensation should include a like for like (or as near as possible) bat roost replacements in a location as close as possible to the original roost entrance, Photograph 2.
- 7.1.4 Further bat roosting features should be included to satisfy national and local policy and provide a net gain in the number of bat roosting features to that to be lost, see Paragraph 2.1.10. It will not be possible to replace a like for like roost in this case, so a raised roof tile placed at the centre of the existing hole at the east elevation tile will be acceptable in this instance. Other features suggested here are: one bat tube integrated into brick work at the southern gable (the gable currently leaning) and a further bat access tile providing roof ridge access. Access to wall cavities are not possible where wall insulation is planned. Information on the type of products available and siting location is provided in Appendix E.

Roof lining

- 7.1.6 Breathable roof membrane should not be used around bat roosts as these eventually entangle bats which then give distress calls which in turn attracts other bats to become entangled. Bitumen 1F felt type is the only known safe product to use where bats are known to be present. Any product claiming to be bat friendly are not currently supported by the Statutory Nature Conservation Organisation, Natural England⁷.

Lighting

- 7.1.8 Any security lighting during construction should not be directed towards any vegetated areas around the periphery of the site as this may impact bat commuting habitat adjacent to the site particularly to the north and west.
- 7.1.9 Post development lighting should be mindful of bats and other nocturnal fauna and low voltage types sought. The use of hoods and cowls can direct light

⁷ <mailto:https://www.bats.org.uk/our-work/buildings-planning-and-development/breathable-roofing-membranes-brms>

where needed. Permanent security lighting should be fitted with motion sensors to avoid unnecessary illumination.

8. Impact Assessment

Long term impact

- 8.1.1 Under the current proposals, the long-term impact will be the loss of a summer roost for one or two *P. pipistrellus* bats.
- 8.1.2 If external security lighting is planned, this may impact bat usage of the barn and its garden area for bat foraging.
- 8.1.2 Potential breeding bird habitat will be lost through demolition of the barn.

Short term impact

- 8.1.3 The short-term impact will be noise and vibration from machinery, power tools, vehicles and personnel.
- 8.1.4 Security lighting during the building phase has the potential to disturb nocturnal animals including bats.

9 Mitigation and Compensation

Timing

- 8.2.1 Bats are present at summer roosts 'generally' between 1 May and mid-September in any year, but this is subject to region, temperature / weather conditions and can be earlier or later. The following suggested timings may be subject to change and is dependent upon planning permission or other building related issues and any final decision will be required for a working method statement as part of the EPSL application to Natural England.

Roof soft strip



- 8.2.2 The contractor has stated that prior to demolition, the roof will be hand (soft) stripped from a cherry picker for health and safety reasons due to the poor structural state of the barn.
- 8.2.3 As the surveys have shown the barn does not support a maternity roost, the stripping of the roof coverings at the barn should ideally take place between Mid-September and 1 May in any year⁶. As the hibernacula qualities of the barn are unknown, work undertaken at these times will not require the supervision of a bat licensed ecologist. If this is not possible and the roof strip is required to be undertaken between 1 May and 15 September in any year, then



this should be supervised by a Ecological Clerk of Works (ECoW) with a license to handle bats who will be required to supervise a partial roof strip, see below.


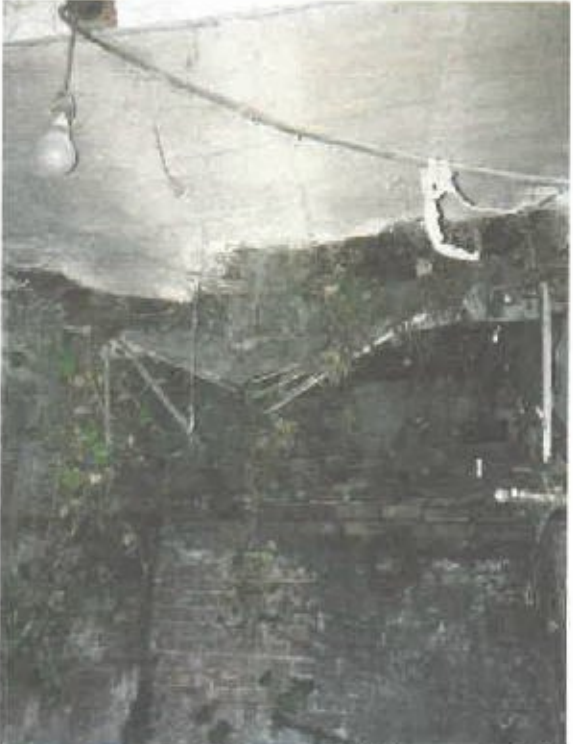
Working method

- 8.2.4 The ridge tiles should be carefully removed by hand and inspected underneath for bats before stacking. The critical elements of this work will only be undertaken in dry weather in order to reduce the risk to bats should they become exposed. In the event that a bat is found, the licensed ecologist will attempt to capture it and place any bats in captivity (a holding tank) with a water supply and fitted with suitable material for bats to hang from prior to releasing the same night at the site when the roof is made unsuitable for roosting. The building can then be demolished.
- 8.2.5 It would be prudent to soft strip some sections of the shed roof as some loose tiles were observed with lath and plaster underneath. The lean to will not require any supervised works.
- 8.2.6 Should the new building not be constructed when bats return to summer roosts 1 May in any year, then interim bat boxes should be sited on nearby trees before this date, Figures 6 and 7 in Appendix E. A number of mature trees to the north west of the site are suitable for this purpose but will need the permission of landowners.
- 8.2.7 The new building will require at least three roost replacements to meet current policy and providing biodiversity net gains, refer to Paragraph 2.1.10.

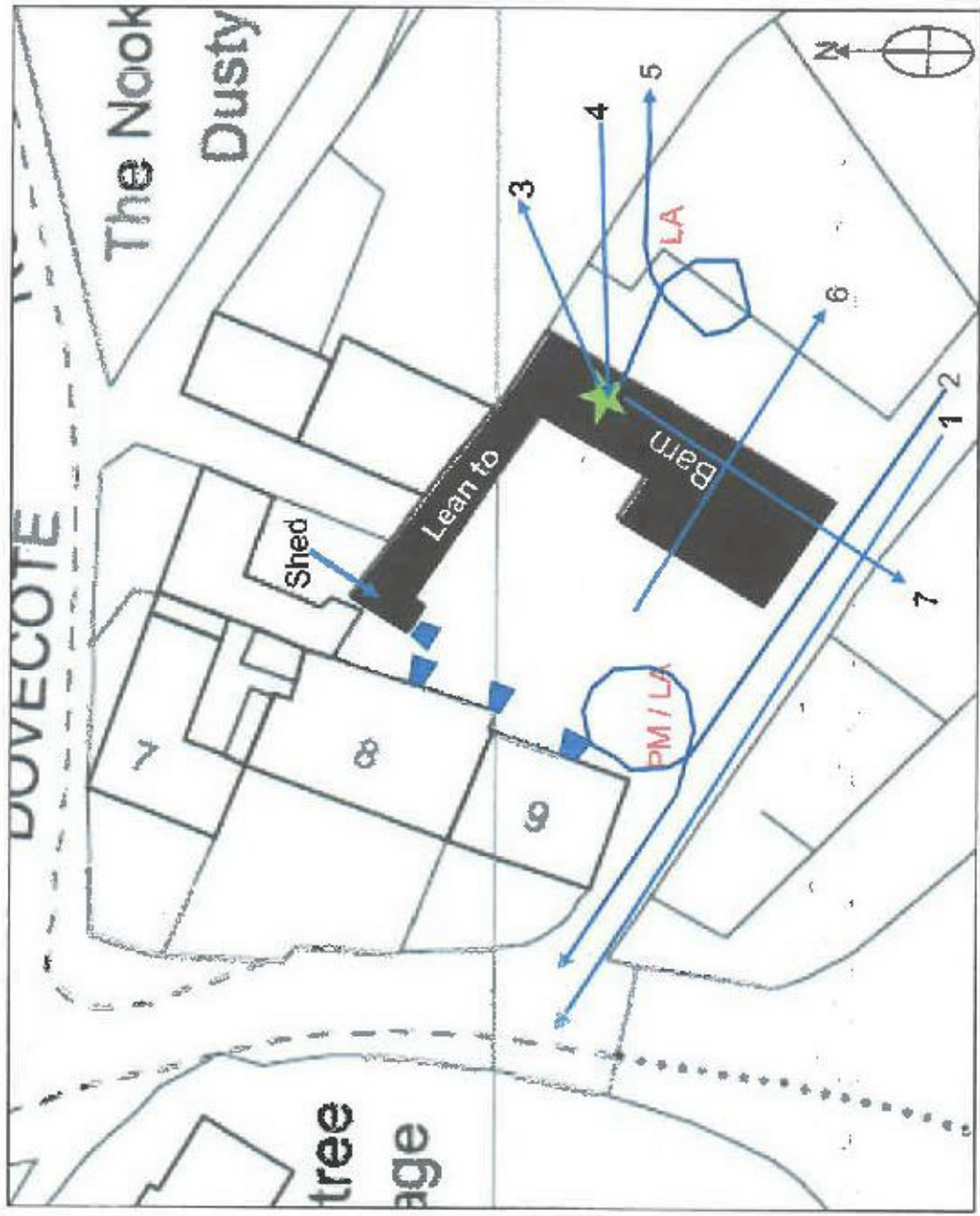
Appendix A Photographs

TARGET NOTE	HABITAT DESCRIPTION	PHOTOGRAPH(S)
1	<p>Facing east toward the front of the barn. The roof has numerous gaps at the ridge. There is no roof lining present throughout. The south west gable is leaning outward which prevented entry for internal inspection. The two single storey garages are a more recent extension and the removal of supporting structures to create this extension has compromised the structure of the building.</p>	 A photograph showing the front of a barn with a dark, gabled roof. The roof appears to have several gaps or missing sections, particularly along the ridge. In the foreground, there is a gravel area and a blue car parked on the right side. The sky is overcast.
2	<p>Facing west toward the barn. The roof is damaged and a <i>P. pipistrellus</i> is utilising the gap in the roof (arrowed).</p>	 A photograph of the barn from a distance, showing the full structure including the roof and surrounding area. A red arrow points to a specific gap in the roofline. The barn is surrounded by trees and a path leads towards it. The sky is blue with some clouds.

<p>3</p>	<p>Facing north east toward the lean to which backs on to a neighbouring garden. The roof is corrugated tin with no roof lining present. Bats can enter through missing windows or a damaged door.</p>	 A photograph showing the exterior of a building with a corrugated metal roof. A white van is parked on the left, and a dark car is parked in the center. The building has a brick chimney and a blue door on the right. Two white arrows point to the roofline.
<p>4</p>	<p>The interior of the lean to is light filled and there are no areas where bats could roost present. No signs of bat use were found during the internal inspection.</p>	 A photograph showing the interior of a lean-to structure. The space is cluttered with various items, including a round table with a red top, a wooden pallet, and a yellow container. The walls are made of brick and the ceiling is corrugated metal.

<p>5</p>	<p>The attached brick shed is used for storing logs. There are gaps between roof tiles and brickwork.</p>	
<p>6</p>	<p>The interior of the shed shows the ceiling to have collapsed. The roof is lined with plaster so bats may be able to roost between the roof tiles and plaster ceiling. No signs of bats were found during the internal inspection.</p>	

Appendix B Bat Flight Plan



Bat Flight Plan

LA / PM Surveyor location ID

Bat flight direction & number



Hole in east elevation



Current lighting position



NOT TO SCALE

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ID: CM-00818164
Centre: 451368 E, 295993 N
July 31 2019
Centre Maps Live

Appendix C Raw Survey Data

The surveys were undertaken in suitable weather conditions. Table 2 provides information on the weather conditions before and after each PAS's.

Table 2. Weather conditions before and after the Presence / Absence surveys at the Barn, Croft Village, Leicestershire LE9 3EQ.

Survey conditions	Survey 1 Dusk 21 June 2019 Sunset: 21.32	Survey 1 part II Dawn 22 June 2019 Sunrise: 04.42	Survey 2 Dusk 6 July 2019 Sunset: 21.29	Survey 3 Dusk 20 July 2019 Sunset: 21.15	Survey 3 Part II Dawn 21 July 2019 Sunrise: 05.08
Start – finish time	21.17- 23.30	02.42- 04.57	21.14- 23.29	21.02- 23.15	03.30- 05.08
Temperature °C	14 – 12	11 – 8	16 – 14	19 – 17	14 – 14
Wind speed Beaufort scale	1 – 1	1 – 2	2 – 3	3 – 2	3 – 2
Cloud cover %	0 – 0	40 – 0	30 – 70	100 – 10	100 – 90
Precipitation	Dry – Dry	Dry – Dry	Dry – Dry	Dry – Dry	Damp – Dry
Humidity %	78 – 86	79 – 88	81 – 85	70 – 72	83 – 83

Presence / Absence Raw Survey Data

Table 3. Dusk survey 1 at the barn lean to and shed on 21 June 2019 showing: time recorded, species, location, behaviour and flight number which correlates to the bat flight direction observed as shown in Appendix B Bat Flight Plan and surveyor ID. HNS denotes bat Heard Not Seen.

Dusk survey (1) Barn west side, lean to and shed 21 June 2019 sunset: 21.32 Start: 21.15 Finish: 23.30					
Time	Species	Location	Bat behaviour	Flight No: see Bat Flight Plan	Surveyor
22.18	<i>P. pipistrellus</i>	Seen flying SE to NW between gable end and fence then N	Commuting	1	LA
22.23	<i>P. pipistrellus</i>	HNS	Commuting	N/A	LA
23.29	<i>P. Pipistrellus</i>	Seen flying SE to NW between gable end and fence then foraged near surveyor then flew N	Foraging	2	LA
23.15	Unknown <i>Pipistrellus</i>	HNS	Commuting	N/A	LA
23.16	<i>P. pipistrellus</i>	HNS	Commuting	N/A	LA
End 23.30					

A total of five bat call registrations were made during the survey with four identified as *P. pipistrellus* and one unidentified *Pipistrellus* sp. The first bat was recorded as commuting at 22.18 which is 46 minutes past sunset. The *P. pipistrellus* generally emerges from the roost between 20-30 minutes after sunset which suggests this bat may be roosting further afield although light levels were high due to no cloud during this survey. Two of the registrations were observed in flight with two of these heading from the south east to north west toward the woodland around Croft Quarry approximately 130m aw.

Table 4. Dawn survey 1 part II at the barn east side 22 June 2019 showing: time recorded, species, location, behaviour and flight number which correlates to the bat flight direction observed as shown in Appendix B Bat Flight Plan and surveyor ID. HNS denotes bat Heard Not Seen.

Dawn survey 1 Part II Barn east side 22 June 2019 sunrise: 04.42 Start: 02.42 Finish: 04.57 (HNS = heard not seen)					
Time	Species	Location	Bat behaviour	Flight No: see Bat Flight Plan	Surveyor
03.09	<i>P. pipistrellus</i>	HNS	Commuting	N/A	LA
03.31	<i>P. pipistrellus</i>	Seen flying NE from hole in east elevation then flew NW	Emerging then commuting not echolocating	3	LA
04.02	<i>P. pipistrellus</i>	single entry into the hole in the east elevation	Commuting	4	LA
End 04.57					

A total of three bat call registrations were made and were identified as *P. pipistrellus*. A single bat emerged from the hole in the east elevation of the barn at 03.31 and commuted north west. One bat was seen flying from the north east to south west and entered the hole in the east elevation of the barn at 04.02 and did not emerge again and is roosting at the building.

Table 5. Dusk survey 2 at the barn east side and barn west, lean to and shed on 6 July 2019 showing: time recorded, species, location, behaviour and flight number which correlates to the bat flight direction observed as shown in Appendix B Bat Flight Plan and surveyor ID. HNS denotes bat Heard Not Seen.

Dusk survey (2) 6 July 2019 sunset: 21.29 Start: 21.14 Finish: 23.29					
Time	Species	Location	Bat behaviour	Flight No: see Bat Flight Plan	Surveyor
22.00	Unknown <i>Pipistrellus</i> sp.	emerging from hole east elevation of barn	One circuit near surveyor then flew east.	5	LA
22.11	<i>P. pipistrellus</i>	HNS	Commuting	N/A	LA
22.16	<i>N. noctula</i>	HNS	Commuting	N/A	LA
22.19	<i>N. noctula</i>	HNS	Commuting	N/A	PM

Dusk survey (2) 6 July 2019 sunset: 21.29 Start: 21.14 Finish: 23.29					
Time	Species	Location	Bat behaviour	Flight No: see Bat Flight Plan	Surveyor
22.27	Pipistrellus sp.	Single entry east elevation	Commuting not echolocating	4	LA
22.28	N. noctula	HNS	Commuting	N/A	LA
22.28	N. noctula	HNS	Commuting	N/A	PM
22.36	P. pipistrellus	HNS	Commuting	N/A	LA
22.37	Unknown	Seen flying NW to SE 10m over roof of barn	Commuting no echolocating	6	LA
End 23.29					

A total of nine bat call registrations were made during this survey. Four records were of *Pipistrellus* sp. A single *Pipistrellus* sp. bat emerged from the barn's east elevation and hole in the roof at 22.00. The bat circled once and flew east, ref to Bat Flight Plan. A *Pipistrellus* sp. bat entered the hole in the roof at 22.27. Seven registrations were made by surveyor LA and two by surveyor PM which is due to the lack of access to the barn interior at this façade as well as security lighting to the west side of the barn. The noctule *Nyctalus noctula* was recorded at 22.28 by both surveyors and is the same bat.

Table 6. Dawn survey 1 (part II) at the annex north side 18 June 2019 showing: time recorded, species, location, behaviour, flight number which correlates to the bat flight direction observed as shown in Appendix B Bat Flight Plan and surveyor ID. HNS denotes bat Heard Not Seen.

Dusk survey 3 Barn east side 20 July 2019 sunset: 21.15 Start: 21.02 Finish: 23.13					
Time	Species	Location	Bat behaviour	Flight No: see Bat Flight Plan	Surveyor
21.40	Unknown	Emerged from hole in east elevation	Commuting not echolocating	3	LA
22.01	Unknown	Single entry east elevation	Commuting not echolocating	4	LA
22.09	N. noctula	HNS	Commuting	N/A	LA
22.13	Unknown	Emerged from hole in east elevation and flew SW along east elevation	Commuting not echolocating	7	LA

Dusk survey 3 Barn east side 20 July 2019 sunset: 21.15 Start: 21.02 Finish: 23.13					
Time	Species	Location	Bat behaviour	Flight No: see Bat Flight Plan	Surveyor
22.15	<i>N. noctula</i>	HNS	Commuting	N/A	LA
22.21	<i>N. noctula</i>	HNS	Foraging	N/A	LA
22.26	<i>N. noctula</i>	HNS	Commuting	N/A	LA
22.33	<i>N. noctula</i>	HNS	Commuting	N/A	LA
22.47	<i>P. pipistrellus</i>	HNS	Commuting	N/A	LA
22.59	<i>P. pipistrellus</i>	HNS	Commuting	N/A	LA
23.00	<i>N. noctula</i>	HNS	Commuting	N/A	LA
End 23.13					

A total of 11 bat call registrations were made during this survey. A single bat was seen to emerge from a hole in the roof at the east elevation at 21.40 at 26 minutes past sunset and most likely the *P. pipistrellus*. At 22.01 twenty-one minutes later, a single bat was observed flying from north east to south west into the same hole in the roof. Twelve minutes later a bat made a single entry into the same east elevation. This is thought to be the same bat and unusually, no echolocation was heard during all three observations however, the bat presented a flight pattern and physiology of the *P. pipistrellus*. The remaining registrations were of *N. noctula* which were heard mainly commuting between 22.09 – 22.33 and two *P. pipistrellus* passes near the close of survey.

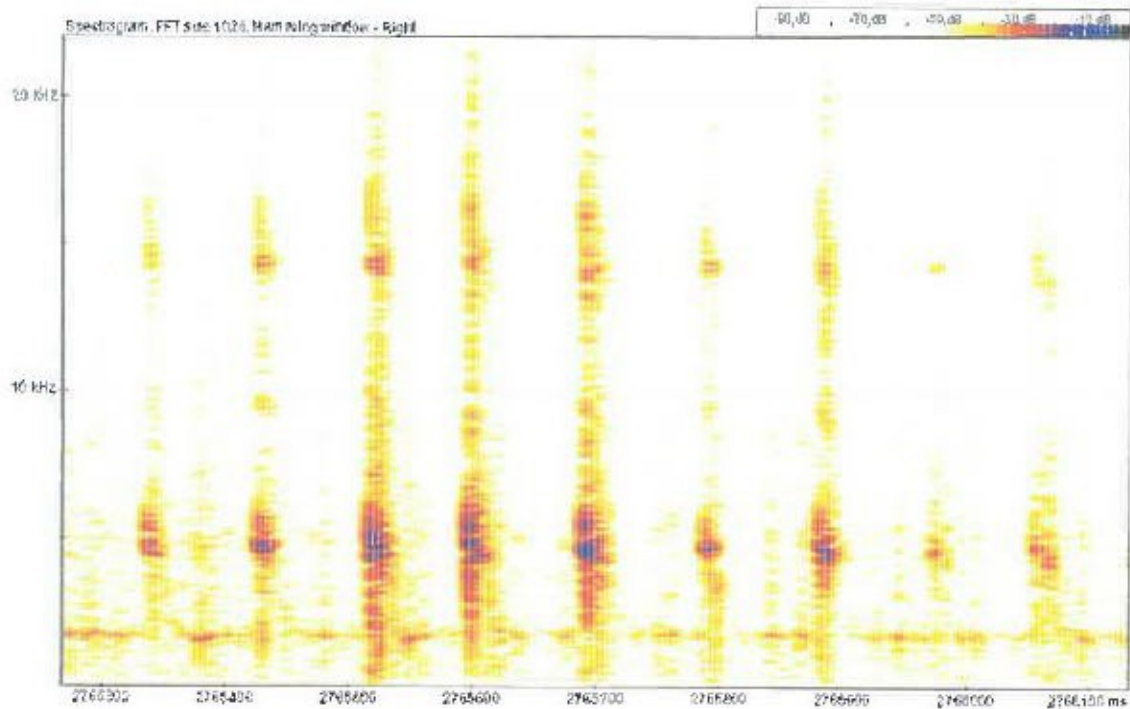
Table 7. Dusk (survey 3) at the House 11 July 2019 showing: time recorded, species, location, behaviour, flight number which correlates to the bat flight direction observed as shown in Appendix B Bat Flight Plan and surveyor ID. HNS denotes bat Heard Not Seen.

Dawn survey (3 part II) Barn west, lean to and shed 21 July 2019 sunrise: 21.23 Start: 03.30 Finish: 05.08					
Time	Species	Location	Bat behaviour	Flight No: see Bat Flight Plan	Surveyor
End 23.23					LA

No bat registrations were recorded during the dawn survey at the west barn, lean to and shed during this survey.

Appendix D Sonograms

The following sonogram is an image of the call structure of the **P. pipistrellus** bat. This recording was made on 6 July 46 minutes after the start of the dusk survey. The bat was observed emerging from the hole at the east elevation. The bat circled the surveyor and headed east to forage, refer to Appendix B and flight number 5 to view the flight pattern when this recording was made.



Bat Sound analysis program shows peak frequency around 43 kHz.

Appendix E Bat and Bird Box Products

Bat box and bird nest box products suitable for habitat replacement schemes.

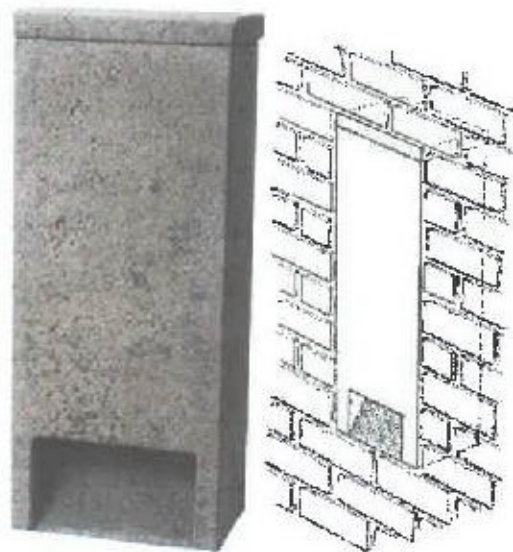


Figure 1. 1 FR Schweggler Bat Tube

Contact: <https://www.nhbs.com>

The 1FR Bat Tube is designed to be installed on the external walls of buildings, either flush or beneath a rendered surface. This makes it ideal for situations where you wish the box to be discrete as only the entrance hole will be visible. It can also be painted to match your building with an air permeable paint if desired.

The 1FR is specifically designed to meet the characteristic behavioural requirements of the types of bats that inhabit buildings. It has an integrated wooden panel onto which bats can cling and a ridged entrance slope which makes it easy for them to enter and leave the box safely. The design maintains excellent climatic conditions inside providing bats with a safe and stable environment in which to roost and it requires no maintenance because droppings fall out of the entrance ramp.

Ideally facing south fitted to gable of house as near as possible to original roost location, refer to Photograph 1.

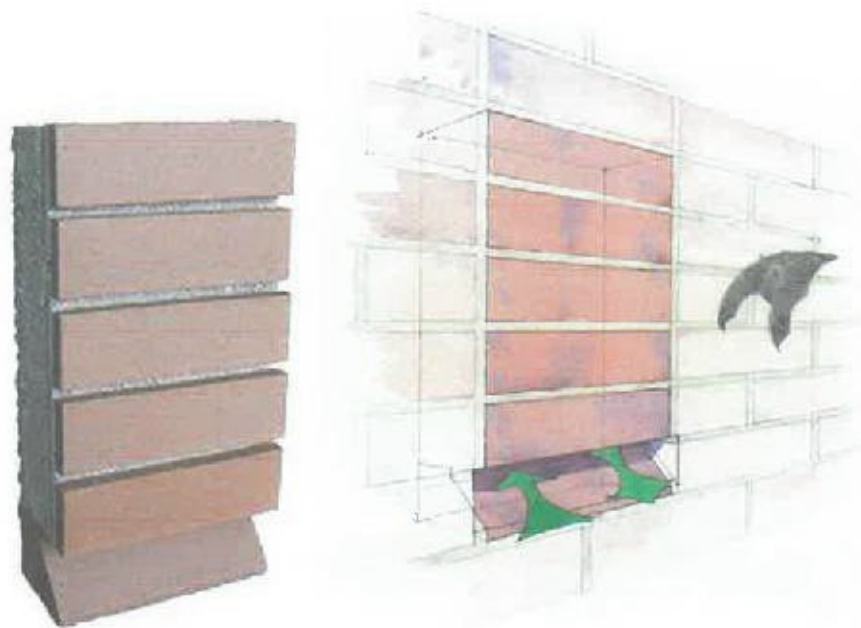


Figure 2. Habitat Bat Box 001.

Contact: <https://www.nhbs.com>

The Habitat Bat Box is a large, solid box made of insulating concrete with an internal roost space, which can be incorporated into the fabric of a building as it is built or renovated. A variety of facings can be fitted to suit any existing brick, wood, stonework or rendered finish, rendering the box unobtrusive and aesthetically pleasing. The Habitat box is suitable for species which are most commonly found roosting in buildings in the UK, such as Pipistrelle, Natterer's, Whiskered, and Brandt's bats.

Ideally facing south fitted to gable of house as near as possible to original roost location, refer to Photograph 1.

This box can be faced in standard Staffordshire Smooth Red brick, blue brick or buff brick and is ideal for new builds. It is supplied un-pointed so it can be matched as closely as possible to the building.



Figure 3. Bat Access Tile Set.

Contact: <https://www.nhbs.com>



Figure 4. Spicer Tiles Bat Access Tile Set - Medium Antique

Contact: <https://www.roofingsuperstore.co.uk>

A very attractive tile for use on barn conversions or to mix in with second hand Spicer peg tiles. With its unique pitted surface, the Medium Antique is ideal where the benefits of a new clay tile are required, but weathers quickly to give a mellow aged look.



Figure 5. Spicer Tiles Hanbury Bat Access Tile Set - Appledore Blend

Contact: <https://www.roofingsuperstore.co.uk>

Hanbury clay roof tiles are hand-crafted to the highest standards to create authentic and good-looking roof tiles to achieve a roof full of character and individuality. One of the last few handmade clay roof tiles available in the UK, a British clay is made to produce the warm tones found in the Hanbury range. Accessories alongside Hanbury tiles, such as the half round ridge tile and valley tile, aren't handmade however these tiles still meet all of the British standard requirements for clay roof tiles.

For the following bat boxes costs and to view alternative box types, see :
[https://www.nhbs.com/4/bat-boxes?q=&fR\[hide\]\[0\]=false&fR\[live\]\[0\]=true&fR\[shops.id\]\[0\]=4&hFR\[subjects_equipment.lv1\]\[0\]=Bat%20Boxes](https://www.nhbs.com/4/bat-boxes?q=&fR[hide][0]=false&fR[live][0]=true&fR[shops.id][0]=4&hFR[subjects_equipment.lv1][0]=Bat%20Boxes)

Please see text below for correct siting of bat boxes.



Figure 6. 2F Schwegler Bat Box.



Figure 7. 1FF Schwegler Bat Box.



Figure 8. Beaumaris woodstone bat box.

The following information describes siting bat boxes. Source: Bat Conservation Trust. [/www.bats.org.uk/our-work/buildings-planning-and-development/bat-boxes/putting-up-your-box](http://www.bats.org.uk/our-work/buildings-planning-and-development/bat-boxes/putting-up-your-box)

“Structures for summer roosting should be positioned where they are sheltered from the wind but unshaded for most of the day. Summer maternity roosts (in the northern hemisphere) should be on a south-easterly to south-westerly aspect. It is always best to provide several different options for bats so that they can choose the most appropriate temperature based on their needs.

This can be achieved by grouping several bat boxes each with a different aspect; two or three boxes is preferable to one, although a single box still has a chance of being used depending on the bat species that use the local area. Three boxes can be arranged around the trunk of larger trees – see below for details about putting up bat boxes.

Bat boxes are more likely to succeed in areas where there is a good mixture of foraging habitat, including trees, and a source of water (most maternity roosts are located within a short distance of permanent fresh water such as a stream, pond, river or lake). Bat boxes in areas with few other roosting opportunities are also likely to be more successful.

Bat boxes should also be located close to unlit linear features, such as lines of trees or hedgerows. Bat species use these features for navigation between their roosting sites and feeding grounds and to avoid flying in open and exposed areas.

Ensure the bats approach to the box is not impeded, for example by branches – clear away underneath the box so the bats can land easily before crawling up into the box”.



Figure 6. Jacobi Jayne Cedarwood Modern Nest Box 26mm & 32mm hole

Contact for all items below: <https://www.gardenwildlifedirect.co.uk>

Avoid siting nest boxes south facing to avoid full sun to increase take up. Ideally facing north or east. Height should be 3-4m above ground minimum. Box can be tilted slightly forward to allow rain for fall clear of the entrance.



Figure 7. Jacobi Jayne Woodcrete Nest Box Green or Brown 26mm and 32mm hole.



Figure 9. Tom Chambers Robin Nest Box

Should be sited north, north east or east

