

Angela Graham Bat Consultancy Service Limited

Office 47, Bury Business Centre, Kay Street, Bury, Lancs, BL9 6BU

tel - 0161 763 6171, fax - 0161 761 7854, mob - 07710 184142

e-mail : bat.consultancy@talktalk.net Company no. 7492656



Bat Survey Report (preliminary day-time survey):

**Trees on land to rear of
12 Owlerbarrow Road,
Walshaw,
Bury,
BL8 1RD**

OS grid reference:
SD 7813 11360

Commissioned-by:
Mr. M. Rodfar

Survey Dates: 20/6/23 and 24/6/23

Report Date: 28/6/23

Table of Contents

1. Summary	page 3
2. Introduction	page 4
3. Bats and the law	page 7
4. Survey	page 8
5. Limitations of the Survey	page 9
6. Findings	page 10
7. Conclusions/Discussion	page 13
8. Recommendations	page 15
9. References	page 16
Appendix 1 – existing and proposed site plans, showing trees	page 17
Appendix 2 - Angela Graham's Experience	page 19
Appendix 3 - Criteria used in assessing risk of roosting (in the absence of obvious evidence of roosting)	page 21
Appendix 4 - Recommendations for further survey work when the findings of the preliminary survey were negative	page 22
Appendix 5 - Examples of available integrated bat boxes	page 23

N.b. Copyright applies to all my reports and they must not be altered in any way whatsoever by anyone other than myself, or combined with any other report/s, irrespective of who wrote them, without the proposed changes being submitted to me in writing and agreed by me in writing.

1. Summary.

(This summary should be read in conjunction with the conclusions and recommendations.)

Trees on this site were inspected as well as possible for bat roosting potential, prior to removal of some to facilitate the construction of a dwelling in what is currently the garden of number 12.

The site is in a sub-urban location which links directly with wooded habitat; beyond which are Parker's Lodges. A variety of bat species are likely to occur and the plot currently provides what appears to be high quality bat feeding habitat.

There are a large number of trees on this site and it's likely there will be at least some minor defects where bats could roost, but no major defects were seen. The major limitation of trying to survey these trees in June has to be taken into account however.

If a recording device were left here over a series of summer nights it would be expected to record perhaps 3 to 6 species different species with varying degrees of regularity.

Bat activity survey work would help to determine the current importance of the site for bats but wouldn't be likely to change my recommendations. Bat feeding habitat isn't protected by law and bats move between tree roosts very frequently so further survey work to attempt to identify/confirm roosting sites currently hidden by foliage would be likely to fail. Accordingly, I am not recommending any bat activity survey work. Appendix 4 gives the basic criteria for additional survey work being needed.

However, an inspection of the trees when out-of-leaf should be undertaken to double-check that no major defects have been missed. As there is a risk of the presence of nesting birds, it is advisable the trees should not be felled between the months of March and August inclusive, and beyond August trees will start to lose their leaves. Similarly the hedge to the front of the existing house should not be removed during the nesting season unless an ecologist has confirmed the absence of nesting by birds.

The extent to which defects exist that can be used by bats, can be better ascertained when the trees are out-of-leaf. Aerial survey may be necessary at the time of felling, with input from the bat consultant.

I understand there is a planning requirement to replace each tree removed with two specimens. Given the relatively limited space available for replanting, hopefully this will ensure as many existing trees as possible are retained. From an ecological perspective trees should preferably be of native species. Smaller growing varieties that are good for wildlife include hawthorn, elder and rowan.

In time new planting will compensate for the inevitable loss of insect populations and bat feeding habitat in the short term. The significance of that loss in the short term will depend on the number of trees removed, but some impact is inevitable.

I always urge the retention of as many mature, healthy, native trees as possible. As well as providing food and a sheltered feeding environment for bats, in time they will develop a degree of bat roosting potential. Certainly some larger specimens should be retained if at all possible and I urge the provision of a few bat boxes in those trees, especially as the existing house appears to have had had some bat roosting potential in

the past. A minimum of 3 bat boxes should be put-up. Integrated bat boxes can also be incorporated into the new build. Aim to install at least 2 in different elevations, towards the eaves. These measures would accord with the biodiversity objectives of the National Planning Policy Framework.

When the work is done, it should be by contractors who are familiar-with and sympathetic-to the law relating to bats and birds. They should be aware of the frequency-with-which and manner-in-which bats use trees and be familiar with the work of Henry Andrews on bat roosts in trees. Even if aerial inspection is not recommended at the time of the work, as a result of findings of the next inspection from the ground; if there is *any* doubt about their expertise with respect to bats, the bat consultant **MUST** attend site to provide a tool-box-talk before work commences.

Care should be taken when planning any lighting on the site, to ensure any potential roosting features provided and bat flight lines along boundaries to access them are appropriately shielded.

Sparrow-nesting boxes could also be installed in the new build if the hedge to the front of the existing house has been removed. Dense shrubbery in the planting scheme would also provide an alternative nesting site for species such as this one and the dunnock, both of conservation concern.

2. Introduction

I was asked to assess the importance of trees on this site to bats as part of the planning process, prior to removal of some to facilitate the construction of a dwelling in what is currently the garden of number 12. Incidentally I comment on any issues discovered with respect to other protected/priority/invasive species and species of conservation concern.

Number 12 is a modern-style house dating from around the 1980s. It has a very long, narrow rear garden, with trees along all three boundaries:



Garden from top (north) and bottom

There's a low hedge and a few small trees and shrubs along the drive to the north of the house, which will be used to provide access to the new build:



House and drive from north

The site is in a sub-urban location which links directly with wooded habitat; beyond which are Parker's Lodges. The nearest is 250m away to the south:



Location of site indicated by red circle

A tree survey was done by Mulberry TMC in March 2018 and reported-on in February 2022. A site plan showing the existing and proposed site layout, as well as their numbering of the trees, is reproduced in Appendix 1.

The pipistrelle bat (2 species: *Pipistrellus pipistrellus* - the common pipistrelle, and *Pipistrellus pygmaeus* - the soprano pipistrelle) is common and widespread in the area.

Roosts of these species can occur in any building that provides suitable roosting crevices, with the risk of bat presence increased by close proximity to good bat feeding habitat and commuting routes; for example tree-lines, hedges, woodland, scrub and water courses and bodies. The bats use different roosts at different times of year, sometimes singly and sometimes in large groups of females with dependent young. They can move frequently and unpredictably between the roost sites known to them. The majority of house-holders with a roost of this species are unaware of it.

In summer females gather together each with their single off-spring in, sometimes large, maternity colony groups. Disturbance can cause the abandonment of babies (pups). In autumn when the young are independent, females visit males to mate. In winter the bats hibernate and rousing from hibernation - a slow process - can result in a depletion of fat reserves that may compromise the bats' ability to survive the winter. Females become pregnant in spring when their food (insects) becomes available again.

Pipistrelle bats in particular are extremely small, weighing about 5g (the weight of a 2p coin) so need only the smallest of gaps in order to enter to roost; often making use of external features and wall cavities without leaving signs in the loft/interior.

A search of DEFRA's Magic database discovered that a 4 bat European Protected Species licences had been granted for developments between 1.2 and 2 kms away. All were for common pipistrelle.

A data search from the National Biodiversity Network discovered no bat records within 1km, though I have personally recorded common pipistrelle, soprano pipistrelle, Daubenton's (*Myotis daubentonii*) and whiskered (*Myotis mystacinus*)/Brandt's (*Myotis brandtii*), which are hard to separate without dna analysis. Extending the search to 2kms added the first three of these species and I have myself recorded noctule (*Nyctalus noctula*). I am aware that the South Lancashire Bat Group have recorded multiple additional species in the Kirklees Valley within 2kms.

Bats also roost in tree cavities, and individual bats may roost in minor defects including underneath raised bark and in dense ivy (1).

Breeding birds.

Dense shrubbery, including ivy and brambles, are often used for nesting by the wren (*Troglodytes troglodytes*), dunnock (*Prunella modularis*), also known as the hedge accentor, and house sparrow (*Passer domesticus*) - all species of conservation concern and listed in Section 41 of the Natural Environment and Rural Communities Act (NERC) as species "of principal importance for the purpose of conserving biodiversity" - along with unlisted, common species such as the blackbird (*Turdus merula*). Trees, especially with dense ivy cover, as well as shrubs, can also be used by the song thrush (*Turdus*

philomelos) - another Section 41 bird of conservation concern - as well as a range of more common species.

3. Bats and the Law

All British bats and their roosts are legally protected under the Wildlife and Countryside Act of 1981 (as amended) and the EC Habitats Directive of 1994 as implemented by the Conservation of Habitats and Species Regulations 2017.

Where a development will destroy a bat roost, a Low Impact Class Licence or a European Protected Species Licence (Mitigation Licence) is required before the roost can be interfered with in any way. The former applies in cases where only small numbers of common species of bat are using the building within certain parameters. It usually takes approximately 2 weeks for these licences to be issued, whereas the turn-around time for a full European Protected Species Licence is approximately 7 weeks once the application has been submitted. Any licence issued is a legally binding document.

Licences can only be issued providing planning permission has been granted, where applicable.

When a roost is found, both the bat consultant and the planners have to apply the "three tests" required by Natural England. Essentially these are:

- That the development is necessary for the purpose of "preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequence of primary importance for the environment";
- That there is "no satisfactory alternative";
- That the action authorised "will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range".

N.b. The way in which the necessity is assessed includes whether the client has an alternative that it would be reasonable to expect them to adopt.

Necessary mitigation and compensation measures to ensure the favourable conservation status of bats will be maintained, would include appropriate timing and methodology for the work, including details of how the bats will be provided-for in the long term.

Planners are required by the Government to satisfy themselves before granting planning consent that it would be possible for a licence to be obtained if necessary. Accordingly they are obliged to apply the three tests before issuing consent. For this reason enough survey work has to have been undertaken that the planning authority can evaluate whether or not the three tests can be satisfied and what degree of compensation/enhancement is necessary. To avoid delays in obtaining consent it is in the client's best interest to find out sooner rather than later whether any bat roosting issues need to be addressed.

Natural England, the Government body responsible for administering the law relating to bats, have issued guidelines to planners on how to proceed with respect to bats

Outside the planning system, the onus is on developers/members of the public, to have sufficient investigations undertaken to satisfy themselves (and the authorities in the event of a subsequent investigation), that their actions are unlikely to be in contravention of bat legislation.

N.b. It should always be remembered that bats often roost in places not anticipated by a lay person, such as modern buildings, trees with cavities, and bridges. Some

leave no signs in lofts, as they roost underneath external features such as roof slates, ridges, weather-boarding and cladding.

In the case of a building, tree or other feature not already known to be a bat roost, if bats are found during the course of work, contractors are legally obliged to stop work and seek advice. This should be from an appropriately experienced and licenced bat ecologist.

Breeding birds.

The Wildlife and Countryside Act of 1981 gives protection to the nests of all wild birds whilst being built or in use, including by newly fledged birds that have not left the immediate vicinity of the nest. The bird nesting season is generally considered to be 1st March to 31st July for most species but can extend a number of weeks either side of this depending on the species concerned and weather conditions in that particular year. Natural England cite the nesting season as being 1st March to 31st August.

A consortium of organisations, via their report on "The population status of birds in the UK: Birds of Conservation Concern 5 (2021)" have listed species according to their conservation need based on red, amber, green basis, where red is of the highest conservation concern (2).

Additional Relevant Legislation and Policy.

Between 1995 and 2010 certain more vulnerable habitats and species were the subject of National or Local Biodiversity Action Plans. This strategy for the protection of biodiversity has been superseded by UK post-2010 Biodiversity Framework, which is largely now implemented at county level. Internationally The Convention on Biodiversity produced a Strategic Plan for Biodiversity 2011-2020. Further to this the EU Biodiversity Strategy was launched in 2011.

Section 41 of the Natural Environment and Rural Communities Act 2006 lists species "of principal importance for the purpose of conserving biodiversity". The list was up-dated in 2014 and includes the brown long-eared bat (*Plecotus auritus*), noctule (*Nyctalus noctula*) soprano pipistrelle (*Pipistrellus pygmaeus*) and 4 other bat species.

The National Planning Policy Framework of 2012 (3) states that "the planning system should contribute to and enhance the natural and local environment" by a number of means, including "minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks... ."

4. Survey

I made a daytime visit on **20/6/23** to undertake a preliminary survey of the trees, assess their likely importance to bats and advise whether or not a precautionary approach or further survey work is needed. Heavy rain made working conditions difficult, so a second visit was made on **24/6/23**.

Having been involved with bat survey work for 35 years and consultancy work for 26 years, it is always my objective to carry-out my work in a manner consistent with accepted Good Practice Guidelines (4) and consistent with the code of practice of the CIEEM. I hold Natural England Class Licences CL21 (Annex B) and 18. Amongst other

things these cover me to apply for Low Impact Licences for clients and undertake bat survey work. I also have a CL29 Barn Owl Class Licence. My credentials are expanded-upon in Appendix 2. The basic criteria I use for assessing the level of risk of roosting are given in Appendix 3. Henry Andrew's work on bat roosts in trees was taken into account (1).

As far as possible, I surveyed the trees from the ground with the aid of 2 million candle-power torch, camera with 6x optical zoom and binoculars (8x42). Head-torch, 10x 50 binoculars, fibrescope (6 and 13mm heads, extendable to 2m), camera with 18x zoom and mirrors were also available if needed.

I was looking for access to potential roosting places and evidence of their use, such as droppings and staining.

I also take into consideration the surrounding habitat and the range of bat species it appears likely to support, along with the quality of the habitat linkages with the wider area.

The survey was conducted with the needs of different species of bat over the seasons in mind.

Incidentally I comment on any relevant issues discovered with respect to bat feeding habitat and commuting routes, possibly including likely roosting sites nearby, as well as any relevant findings with respect to other protected/invasive species, biodiversity priority species and species of conservation concern.

5. Limitations of the survey

This was a preliminary survey to discover whether there are obvious signs of use by bats and to assess potential for use. If potential exists, usually follow-up work is required at dusk or dawn, possibly at a more appropriate time of year.

Summer is not the recommended time for trying to assess for bat roosting potential in deciduous trees due to the density of their foliage and the extent to which other plants can obstruct survey access up-to and around the trees. The arborist's survey was done in winter and ideally the bat survey would have been too; though not 5 years in advance.

There was a discrepancy between the number of trees the client seemed to think were being removed, and what was stated in the tree report. It wasn't always possible to be sure where one Group identified in the tree report ended and another started or, when not all trees in a group were stated to be for removal, which were indicated as coming out and which weren't. The proposal may have changed to some extent since the report was written.

It should be noted that droppings are the sign most frequently found, but they are often deposited in areas that cannot be easily visualised, if at all, and they can turn to powder quite quickly. They are usually soon washed and blown away from exposed external surfaces so evidence of use often doesn't last long and pipistrelle bats in particular can change roosts frequently. However, an assessment has been made of potential bat roosting places associated with the exterior of the building.

The survey was carried-out in a period of rainy weather increasing the likelihood of droppings having been washed or blown from external surfaces.

As bats often roost in crevices in winter, and are particularly hard to locate when hibernating, the report will highlight any areas that could be used by bats in winter without their presence necessarily being obvious

6. Findings

The property is on the edge of a small estate of similar properties.

To the east of the development site is an overgrown area of naturally regenerating vegetation:



To the south is a pasture with trees and hedge boundaries:



To the west are the large gardens of other dwellings:



View of site from south along western boundary

While there are some smaller trees, mainly towards the bottom of the garden away from the proposed location of the new house, including old fruit trees; most are large, mature specimens, both deciduous and coniferous. A variety of native deciduous species are present including whitebeam, lime, field maple, oak, ash, willow, bird cherry, hawthorn and ash. There are large cherry laurel's too.

The tree report made reference to felling 5 willow trees with stem decay from Groups 2, 3 and 5 (see Appendix 1).

As trees with decay may have bat roosting potential an attempt was made to identify any such potential associated with these trees.

In only one willow reported to have decay taking place, was any decay obvious with the access available at the time of this survey. This was at low level on the south side of a tree in Group 2. It appeared this is quite innocuous currently from a bat roosting potential point-of-view:



There could have been further defects at higher level that could not be seen in summer, though the likelihood of the presence of a large cavity seems low.

There is damage to a limb of another willow in Group 5 however:



Currently this does not appear to provide bat roosting potential.

Group 2 is a collection of large, mainly native trees in close proximity to each other on the eastern boundary near the house:



These trees are along the boundary of the existing garden that is to be retained by number 12; including part that will be made into a car-parking area for the new build. (See Appendix 1.)

Although there is a public footpath immediately beyond the eastern boundary, the extent of the foliage made it impossible to survey these trees effectively. All that can be

said is that they appeared in good condition, with the exception of the willow referred-to above.

Superficially it appears there is no reason from a development point-of-view for the majority of trees in Group 2 to be under threat or removal, except perhaps that some cutting back may be needed to facilitate access at the time of the development, which may also potentially cause damage to the root zones. At least one close to the house needs removal to provide access to the new development.

I understand the hedge and small trees (Group 1) to the north of Group 2 are also for removal. There is no bat roosting potential associated with these, but birds such as the house sparrow could nest in the hedge. The house sparrow is a species of conservation concern. Nesting sites of all wild birds are protected whilst in use.

No obvious defects were seen in other trees on the site.

As the house is in close proximity to trees/shrubs that need to be removed, incidentally the east-facing boxed-eaves were checked for bat roosting potential. This type of eaves in a property of this age and construction often provides access for bats. Pipistrelle bats in particular tend to favour properties of this kind.

The boxing to the eaves is of plastic so may not be original. Small gaps of the sort bats might potentially have been able to use have been filled with expanding foam:



A bat ecologist can only hope this was to deter insects, not bats.

7. Conclusions/Discussion

Appendix 2 gives an outline of the criteria used in assessing the level of risk of use by bats.

There are a large number of trees on this site and it's likely there will be at least some minor defects where bats could roost, but no major defects were seen. The major limitation of trying to survey these trees in June has to be taken into account however.

The area generally is one of good quality bat feeding habitat, and the character of the garden, with mature, native trees and central lawn, is in keeping with it. Two lines of mainly large trees with a strip of lawn in-between, from the point-of-view of a bat is essentially a woodland ride, and bats will inevitably make use of it to some extent.

If a recording device were left here over a series of summer nights it would be expected to record perhaps 3 to 6 species different species with varying degrees of regularity.

Bat activity survey work would help to determine the current importance of the site for bats but wouldn't be likely to change my recommendations. Bat feeding habitat isn't protected by law and bats move between tree roosts very frequently so further survey work to attempt to identify/confirm roosting sites currently hidden by foliage would be likely to fail. Accordingly, I am not recommending any bat activity survey work. Appendix 4 gives the basic criteria for additional survey work being needed.

However, an inspection of the trees when out-of-leaf should be undertaken to double-check that no major defects have been missed. As there is a risk of the presence of nesting birds, it is advisable the trees should not be felled between the months of March and August inclusive, and beyond August trees will start to lose their leaves. Similarly the hedge in Group one should not be removed during the nesting season unless an ecologist has confirmed the absence of nesting by birds.

The extent to which defects exist that can be used by bats, can be better ascertained when the trees are out of leaf. Aerial survey may be necessary at the time of felling, with input from the bat consultant.

I understand there is a planning requirement to replace each tree removed with two specimens. Given the relatively limited space available for replanting, hopefully this will ensure as many existing trees as possible are retained. From an ecological perspective trees should preferably be of native species. Smaller growing varieties that are good for wildlife include hawthorn, elder, rowan and blackthorn.

In time new planting will compensate for the inevitable loss of insect populations and bat feeding habitat in the short term. The significance of that loss in the short term will depend on the number of trees removed, but some impact is inevitable.

I always urge the retention of as many mature, healthy, native trees as possible. As well as providing food and a sheltered feeding environment for bats, in time they will develop a degree of bat roosting potential. Certainly some larger specimens should be retained if at all possible and I urge the provision of a few bat boxes in those trees, especially as the existing house appears to have had some bat roosting potential in the past. Integrated bat boxes can also be incorporated into the new build. See Appendix 5. This would accord with the biodiversity objectives of the National Planning Policy Framework.

When the work is done, it should be by contractors who are familiar-with and sympathetic-to the law relating to bats and birds. They should be aware of the frequency-with-which and manner-in-which bats use trees and be familiar with the work of Henry Andrews (1). Even if aerial inspection is not recommended at the time of the work, as a

result of findings of the next inspection from the ground; if there is *any* doubt about their expertise with respect to bats, the bat consultant **MUST** attend site to provide a tool-box-talk before work commences.

Contractors must understand that if at any time a bat or droppings that may have come from a bat are found work **must** stop **immediately**. They have a legal obligation to do this. Further advice **must** then be sought from the bat consultant before work continues, even if the bat has flown off or droppings appear old.

Care should be taken when planning any lighting on the site, to ensure any potential roosting features provided and bat flight lines along boundaries to access them are appropriately shielded. (5)

Sparrow-nesting boxes could also be installed in the new build if the hedge in group one has been removed.

8. Recommendations

These recommendations should be read in conjunction with the conclusions above.

Avoid felling during the bird nesting season, and have a repeat inspection from the ground when leaf-fall has taken place sufficiently to allow the trees to be viewed more effectively.

Further recommendations will be made based on the findings. Aerial inspection at the time of felling may be necessary with input from the bat consultant.

Retain as many trees as possible, especially large, mature trees. Use native species such as hawthorn, elder and rowan to compensate for the loss of trees that can't be retained. If pear trees are felled, replace them with younger fruit trees.

Aim to install at least 2 integrated bat boxes in the new build, in different elevations, towards the eaves.

Aim to put up a minimum of 3 bat boxes in retained trees. The bat consultant can advise on type and positioning.

The potential impact of any proposed external lighting on bats and other wildlife should be given due consideration.

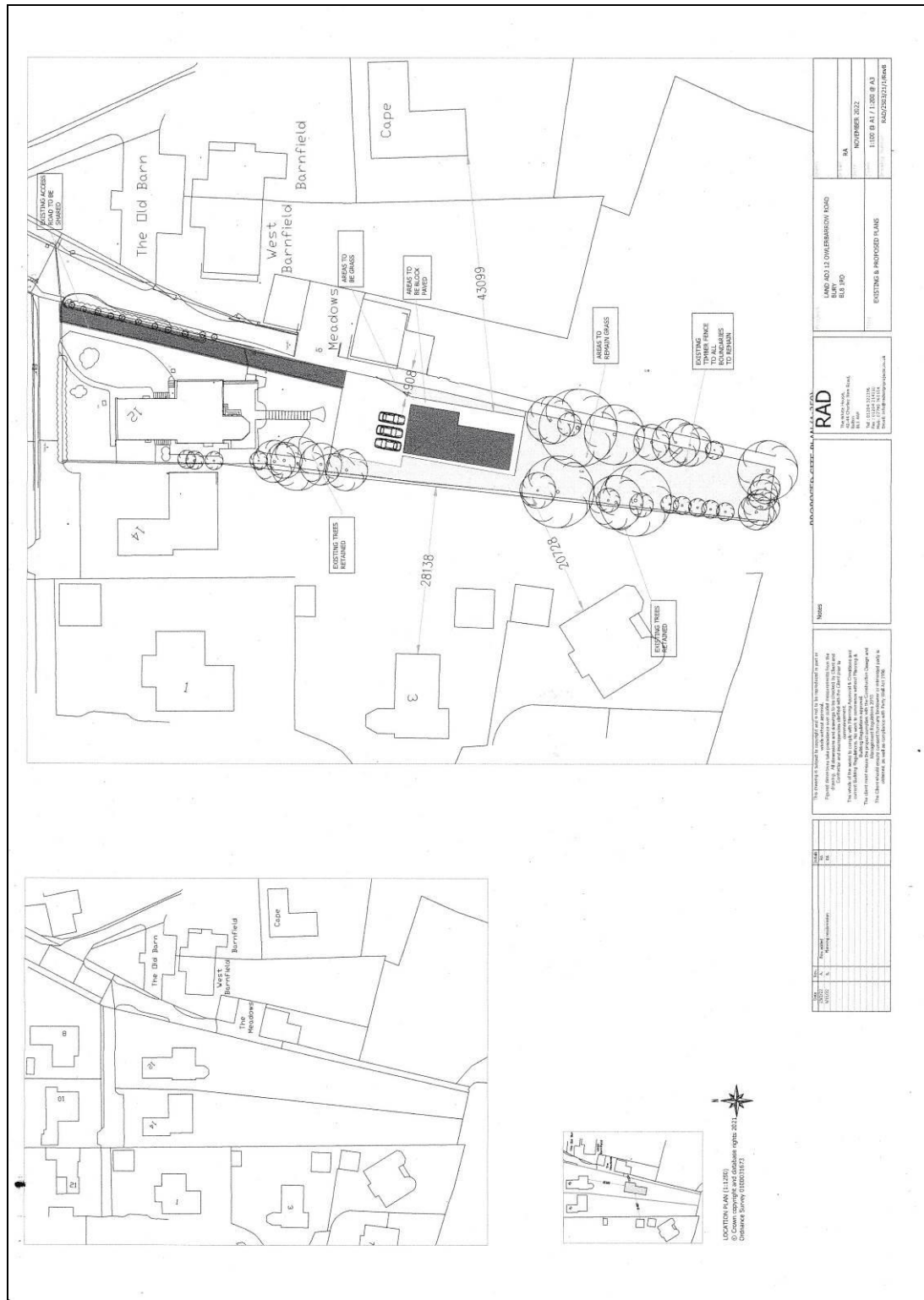
Sparrow-terracing in/on the new build can compensate for the loss of any nesting habitat if the hedge in Group 1 is felled. Dense shrubbery in the planting scheme would also provide an alternative nesting site for species such as this one and the dunnock, both of conservation concern.

9. References

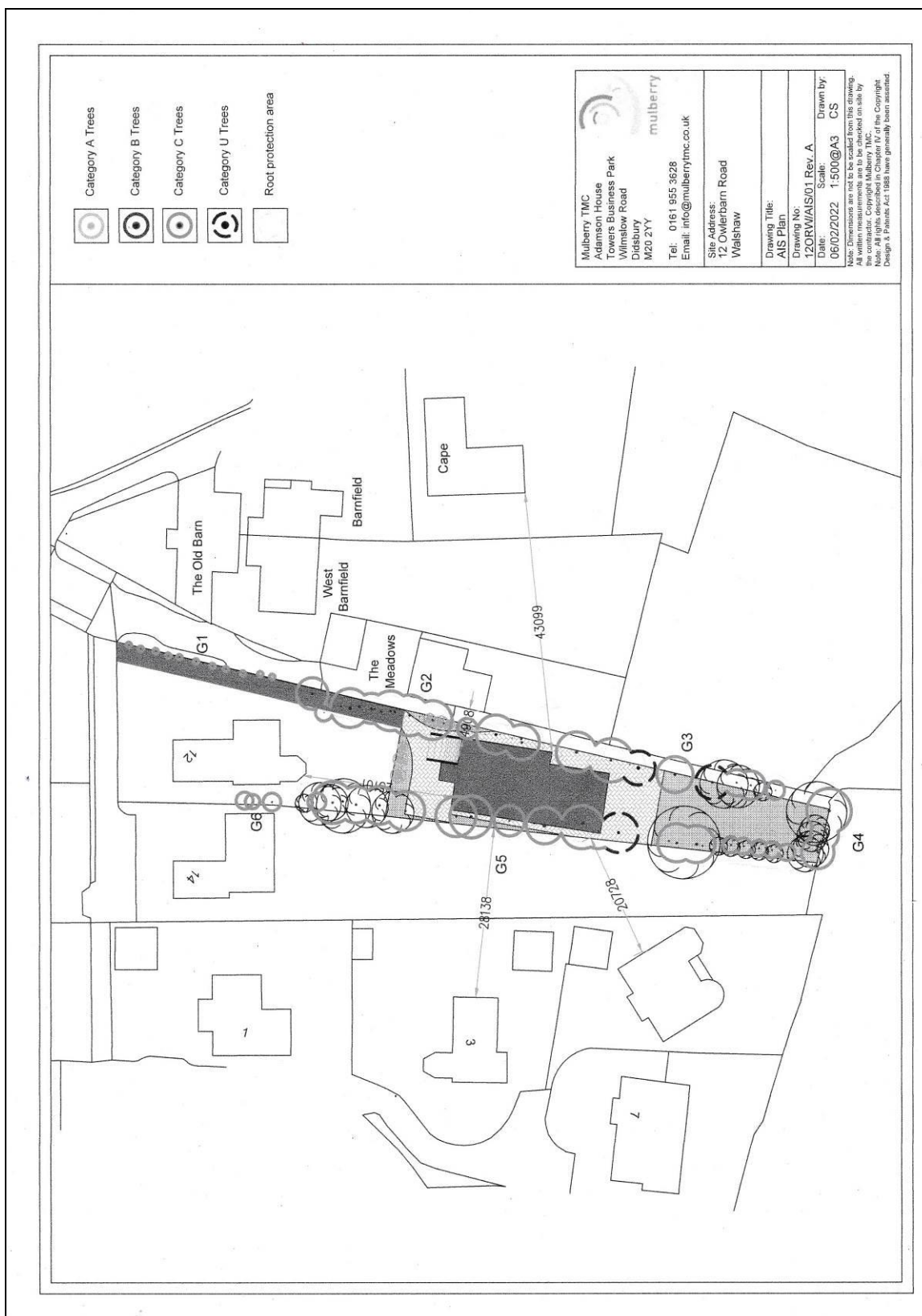
1. Andrews, H. (2018). Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecological Professionals. Pelagic Publishing.
2. Eaton, M. A. et al. (2015). Birds of Conservation Concern 5: the status of all regularly occurring birds in the UK, Channel Islands and Isle of Man. British Birds 114: 723-747.
3. Department for Communities and Local Government (2012). National Planning Policy Framework.
4. Ed. by Collins, J. (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines - Third Edition. Bat Conservation Trust.
5. Bat Conservation Trust (2018). Guidance Note 8/18: Bats and Artificial Lighting in the UK.

© Angela Graham. June 2023

Appendix 1 – Existing and proposed site plans, showing trees



Existing and proposed site layout plans



Tree groupings (G1 to 6) as devised by Mulberry TMC

Appendix 2 - Angela Graham's Experience.

- I hold Natural England Class Licences CL21 (Annex B) - Registered Consultant 163 - and CL18 (CL18 (2015 11871 - CLS-CLS). CL21 covers me to apply for Low Impact Class Licences for clients - a more stream-lined system for quickly obtaining a licence from Natural England when a roost of a small number of common bat species will be impacted-upon by the development. CL18 covers me for survey/consultancy/scientific work. I have a supplementary licence to possess up to 10 live/dead bat specimens (20123429). I have a CL29 licence to disturb barn owls.
- I'm a member of The Chartered Institute of Ecology and Environmental Management.
- I undertake my work in accordance with the principles outlined in the Bat Conservation Trust's "Good Practice Guidelines".
- I have been involved in bat conservation for over 30 years, initially as a member of the South Lancashire Bat Group from its inception in 1987 and as a volunteer with the Nature Conservancy Council (NCC) - first licenced in 1989. Later, and for many years, I was Co-ordinator/Chair and Trainer for the South Lancashire Bat Group. I trained the people who currently run the group, one of whom has been a Trustee for the Bat Conservation Trust. I was a founder member of the Greater Manchester Bat Group in 2002 and ran the group for 4 years.
- Over the last 27 years I have done increasing numbers of bat surveys on a consultancy basis, firstly part-time then full time from December 2003.
- My experience in applying-for European Protected Species Licences with respect to bats spans over 20 years.
- From 2003 to 2008 I represented the bat groups of the north-west region at national bat worker meetings, hosted by the Bat Conservation Trust.

Other experience includes:

- Attending bat-worker conferences every year since 1988 (mainly England, some in Wales) plus additional symposia on specific topics such as mitigation and woodland bats.
- Helping with winter surveys of underground hibernation sites in Clwyd and north Lancashire.
- Participating in "Bat Detector Workshops" during the 1990s in different areas of the country, concerned with locating bat roosts and feeding sites/commuting routes.
- Sitting on local council "Wildlife Advisory Groups" (WAGs) in the Greater Manchester area from the early 1990s until around 2005.
- Helping local authorities and the Greater Manchester Ecology Unit formulate their Biodiversity Action Plans for bats.
- Administering the bat casework for English Nature (now Natural England) in the South Lancashire and Greater Manchester areas over 1998-2000.
- Assisting with research involving mist netting, harp trapping and radio-tracking.
- Continuing to attend courses run by recognised experts to ensure I stay up-to date both with respect to bat survey-work and conservation, and issues such as health and safety.
- Re-passing the Construction Site (CITB) Operatives test in June 2017.
- Contributing to the Bat Conservation Trust's survey standards guidelines.

Other ecological experience includes:

- Bird watching for fun since 1982 with a general interest in wildlife, ecology and conservation for a similar period.
- Attending short courses and field training with respect to grasses, flowering plants, British mammals including water voles, reptiles and amphibians, non-native invasive plant species, Extended Phase 1 Habitat Surveying, National Vegetation Classification, Environmental Impact Assessment and use of GIS.
- Taking part in British Trust for Ornithology breeding bird surveys annually.
- A year-long sandwich placement assisting with badger research, including radio-tracking.
- Short periods of voluntary work with the Lancashire Wildlife Trust and Royal Society for Protection of Birds.

Appendix 3 - Personally-devised criteria used in assessing risk of roosting (in the absence of obvious evidence at the preliminary survey).

Risk of roosting	Definition	Suggested Action
Nil	Whole of structure/tree can be seen well enough to be sure there are no roosting opportunities.	No need to consider bats further unless development is delayed and potential roosting places might develop in time.
Minimal/negligible	All or most of structure/tree can be seen well enough to suggest there are few, if any, places suitable for roosting and the location does not provide easy access to potential feeding grounds.	Although roosting is thought to be unlikely and therefore the development is unlikely to impact on the favourable conservation status of bats, a precautionary approach should be taken in relevant areas at the time of the work. Further survey work needed only if development delayed.
Low	Whole of structure/tree can be seen well enough to know there are no more than a few openings that could be used by an individual bat or two and/or these provide access to the sorts of features that are likely to be suboptimal due to materials and/or conditions within (eg unstable temperature); and/or the location provides limited access to potential feeding grounds.	Although regular roosting is thought to be relatively unlikely and the development is unlikely to impact on the favourable conservation status of bats, a single survey at dusk or dawn in favourable weather conditions would be appropriate to accord with good practice. This would reduce the extent to which the judgement is based on speculation. If the findings were ambiguous e.g. possible bat emergence and/or considerable bat activity around the building, the survey would need repeating.
Moderate/medium	A small number of openings are present in an area of reasonable habitat, and at least some seem likely to provide access to good conditions for roosting bats, and/or a loft/hay-loft is present that appears to have good qualities for roosting but there were limitations to access or no evidence of bats was found at the time. Cellars may be assessed as potentially being suitable for hibernation in winter,	Further work is needed to better assess the abundance of bat activity in the vicinity and whether or not bats seem to make use of the roosting potential available. To accord with good practice a dusk emergence survey and a dawn return-to-roost survey will be necessary. A second inspection of the interior may also be necessary - if the survey was undertaken in winter for example. As the absence of bats on two occasions wouldn't guarantee absence at other

	but the conditions and/or location aren't optimal.	times, possibly including winter, some precautions would be needed at the time of the work and some roosting potential should be retained/re-created. In the case of cellars and equivalent, inspection in winter is necessary. Some work, for example pointing old stone walls, should be avoided in winter.
High	There is at least one feature that is typical of those favoured by bats for regular roosting and it/they provide access to abundant insect food on-site and/or via good links with the wider natural environment. The feature/s could be suitable for use by a maternity colony, either as a main or satellite roost, or by a territorial male in autumn in the case of pipistrelles, or by individuals or small numbers of bats at any time of year, including winter when hibernating.	The extent to which bats of different species make use of the potential available needs to be investigated by carrying-out at least 3 surveys at dusk and/or dawn spaced over the months of May to September inclusive, possibly extending into April or October if weather conditions are favourable. (Air temperature above 8°C and not more than light rain and/or gentle breeze. I generally plan to do surveys only when the forecast is for 10°C or above.) Maternity colonies have largely disbanded by September, but territorial male pipistrelles may be missed without a survey in September and a lot of smaller roosts are discovered at this time of year. As bats could hibernate unseen in winter and/or roost at other times not covered by the survey work, appropriate precautions would be needed at the time of the work along with maintenance of appropriate potential roosting places.
High - hibernation only	Cave-like places with stable conditions and high humidity, such as cellars can be used for hibernation in winter.	High-risk potential hibernation sites need at least 3 inspections spaced over the winter months as bats will move between sites depending on the weather conditions.

Appendix 4 - Recommendations for further survey work when the findings of the preliminary survey were negative.

Bat Conservation Trust

Table 7.3 Recommended minimum number of survey visits for presence/absence surveys to give confidence in a negative result for structures (also recommended for trees but unlikely to give confidence in a negative result).

Low roost suitability	Moderate roost suitability	High roost suitability
One survey visit. One dusk emergence or dawn re-entry survey ^a (structures). No further surveys required (trees).	Two separate survey visits. One dusk emergence and a separate dawn re-entry survey. ^b	Three separate survey visits. At least one dusk emergence and a separate dawn re-entry survey. The third visit could be either dusk or dawn. ^b

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

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

Taken from "Bat Surveys for Professional Ecologists: Good Practice Guidelines", 3rd Edition (2)

Table 7.1 Recommended timings for presence/absence surveys to give confidence in a negative result for structures (also recommended for trees but unlikely to give confidence in a negative result).

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

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

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

Taken from "Bat Surveys for Professional Ecologists: Good Practice Guidelines", 3rd Edition (2)

Appendix 5 – examples of available integrated bat boxes

N.b. An internet search for "integrated bat boxes" will bring up types and suppliers of these boxes but advice from the bat consultant should be sought before they are ordered.

EcoSurv Habitat

<http://www.habibat.co.uk/category/bat-boxes>

"Designed to be built into an exterior wall and is available in a variety of faces to match the building. Standard facings of red or blue brick - ideal for new builds - are normally available from stock, or boxes can be made to your specific requirements with a face of brick, stone, timber, or plain (for rendering). Supplied un-pointed."



Example of Habitat boxes Can also be faced with stone.

Ibstock Ecozone

<http://www.ibstock.com/sustainability-ecozone.asp>





Above: typical unit in situ. Photo © Angela Graham

Green and Blue Bat Block/Brick

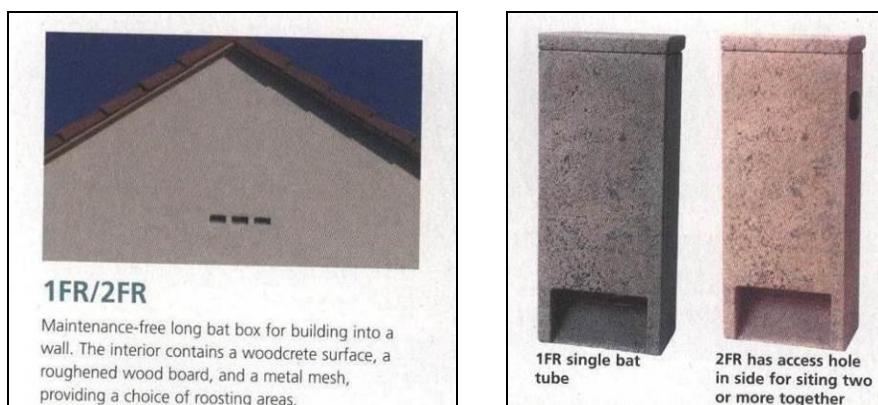
<https://www.greenandblue.co.uk/products/bat-block-bat-brick>



Green and Blue Bat Block/Brick in situ

Schwegler 1FR/2FR

An internet search for Schwegler bat boxes will readily bring up suppliers of these boxes



Schwegler 1FR/2FR

Forticrete

Available from building-supply merchants



Above and below - standard colours available. Others available to order



Example of Forticrete boxes in situ

A similar box is available from Habibat. See above listing.