BAT EMERGENCE SURVEY FOR:

29 -31 High Street, Hampton Wick, London, KT1 4DA

For: Allan Frost
29-31 High St, Hampton Wick

Issued by: **Wychwood Environmental Ltd**

www.wychwoodenvironmental.com

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CONTENTS

EXECUTIVE SUMMARY

Proposed development

- The development proposals include eight new residential units and the replacement of all existing commercial floorspace. Full details are given in the planning submission.

Likely impact on protected species

- Negligible risk of encountering crevice-dwelling species of bats (*Pipistrellus sp.)* under roof and hanging tiles.
- Negligible risk to attic dwelling brown long-eared (*Plecotus auritus*) bats.

Further surveys

- No further surveys are required.

Proposed mitigation

- Neither a European Protected Species and Mitigation (EPSM) licence or Bat Mitigation Class Licence (BMCL) will be required for works to progress.
- Precautionary mitigation is advised.
- Roofing work is recommended for Autumn (September –November) or Spring (March-April) to avoid periods of roosting and hibernation, however other times are permitted. Tile removal to be done under supervision of a suitably qualified and licensed ecologist.
- Replacement and enhancement of roosting areas in the extended dwelling (e.g. via inserting an integrated bat boxes and bat access tiles).
- Inclusion of at least 4 'access' bat tiles/slates (or similar) across the roof of the new property.
- A Tool Box Talk will be provided to roofers outlining precautionary working practices.

Further actions to be taken

- The erection of at least one crevice bat box for pipistrelles (e.g. 1FF Schwegler) on site prior to any works commencing, and then retained as an enhancement.
- The biodiversity enhancements and mitigation measures should form part of the Biodiversity Enhancement and Mitigation Plan (BEMP), as outlined in the previous PEA and PRA reports, to be secured by an appropriate planning condition.
- Appropriate (wildlife friendly) landscaping and a lighting plan should also be detailed in the BEMP.

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1.0 INTRODUCTION

1.1 Wychwood Environmental Ltd was instructed by Mr. Frost to undertake bat emergence surveys on the property at 29-31 High Street, Hampton Wick, London, KT1 4DA, in order to provide supporting information for a planning application for the extension to the current dwelling. These surveys follow previous bat Potential Roost Assessments (PRAs) completed in October 2019[1] and November 2020[2]. The PRA surveys identified low roost potential and a further emergence survey was advised.

1.2 The survey was necessary to collect data relating to the possible presence of roosting bats and to provide any necessary guidance and mitigation advice to ensure that no bats or roosts are likely to be adversely affected by the development. The survey was conducted to ensure that plans would not be constrained by the presence of roosting bats. The surveys should also refine the classification of the roost.

1.3 *Bats are European protected species, protected via The Conservation of Species and Habitats Regulations (2017) and also the Wildlife and Countryside Act 1981, as amended. Therefore, it is an offence to kill or injure a bat or interfere with any roosting or resting site. A bat roost is interpreted as "any structure or place used for shelter or protection" whether or not bats are present at the time.*

1.4 The surveys were completed to inform the Local Planning Authority (LPA) of any material impacts resulting from the proposed development and to ensure compliance with the requirements of the Natural Environment and Rural Communities (NERC) Act (2006) (Section 40) and the Government Circular: Biodiversity and Geological Conservation –Statutory obligations and their Impact within the Planning System (ODPM 06/2005, Defra 01/2005). Details of legislation and legal protection afforded to all species of British bats are given in Appendix 1.

[1] Wychwood Environmental (2019) Preliminary Ecological Assessment: 29-31 High Street, Hampton Wick, London, KT1 4DA.
[2] Wychwood Environmental (2020) Potential Roost Assessment: 29-31 High Street, Hampton Wick, London, KT1 4DA.

1.5 The application site (Figures 1-3) is immediately bordered to the north by Hampton Wick High Street, neighbouring residential gardens to the west and commercial properties to the east. The White Hart Hotel car park is immediately adjacent to the site to the south. The River Thames is located approximately 140m to the east of the site and separated by other commercial and residential properties. Bushy Park and Home Park Site of Special Scientific Interest (SSSI) is located 150m to the southeast of site at its closest point.

1.6 There is poor habitat connectivity between areas of habitat suitable for bats and the site surveyed. The bat potential of the surroundings should be considered 'Low' on a scale High, Moderate and Low (as outlined in Table 4.1 of the BCT 2016 Good Practice Guidelines'). Further details on the site and location are given in the PEA and PRA reports.

1.7 The surveys focused on buildings 1 and 4, as previously identified in the previous PEA and PRA reports (Figure 4).

1.8 The scheme has been revised since the original ecological assessment. Proposals now include eight new residential units and the replacement of all existing commercial floorspace. Full details are given in the planning submission.

1.9 Section two of this report describes the methodologies used for the bat surveys. Section three provides the results of these surveys, section four provides discussion and implications for development and conclusions are made in section five. Details of legislation relating to, and legal protection afforded to all species of British bats are given in Appendix 1.

2.0 METHODOLOGY

Activity/Emergence Surveys

2.1 An emergence survey was conducted on the 10th of May 2021, by Dr Andrew Perkin (Natural England Bat Class license holder: 2020-47354-CLS-CLS), Dr Michael Bright, Nadine Clark BSc MSc MCIEEM (Natural England Bat Class licence holder 2015-14593-CLS-CLS), and Cecilia Montauban MSc, following best practice guidelines as outlined by the Bat Conservation Trust (BCT 2016). One dusk emergence survey using four surveyors (two per building) was conducted at the proposed site. The survey was conducted 15 minutes before sunset and for 1.5 hours after sunset, (Table 1).

2.2 Surveyors positioned themselves to allow for the best visibility of areas, identified as possible emergence points (Figure 6). Echometer Touch[3] and Anabat SDII/Express[4] bat detectors were used to assist with determining the nature of any bat activity and with bat identification. Analysis software (Analook W and Kaleidoscope) was used to verify calls identified in the field. All data was verified by Dr Craig Turner MCIEEM FRGS FLS (Natural England Bat Class license holder: 2016-21436-CLS-CLS).

2.3 Infra-red cameras (and IR lights) were trained on the parts of the building during some surveys to aid observation and monitoring for any emergence/re-entry behaviour.

Table 1 – Survey weather conditions

Date	Sunset/Sunrise	Temp °C	Weather Conditions	Wind
10/05/2021	20:38 BST	13.1 – 10.2	4/8 Dry	BF 1-2

Constraints and Limitations

2.4 It should be noted that lack of evidence of a protected species does not necessarily preclude it from being present at a later date. In relation to use of habitats or roost sites by bat species, use of a particular area of land can vary not only on a seasonal basis but also from day to day. Whilst activity surveys are used to provide an estimate of the likely importance of a given area of habitat for bats, due to the highly mobile

[3] https://www.wildlifeacoustics.com/products/echo-meter-touch-2-ios
[4] https://www.titley-scientific.com/uk/

nature of bats, it is not possible to accurately determine the exact numbers of bats using standard non-intrusive survey methods.

2.5 The echolocation used by some bats is very quiet and difficult to detect; species such as brown long eared bat may have been present without registering on the bat detectors used during the activity survey.

2.6 The recording system employed by Anabats can only respond to the signal with the highest intensity at any time. As the signal from some bat species (such as common pipistrelles) will nearly always be more intense than that of other bat species (such as myotis bats), it is possible that some bat signals were not recorded. As a result, some bat activity may have been under-recorded.

2.7 The identification of bats in the genus *Myotis* to species level based on recorded echolocations is not always possible[5] with a high degree of confidence. This is due to the similarity and overlap in characteristics between Myotid bats and the calls they make, together with the ability of these bats to emit different calls in different habitats and situations. Techniques are being developed to assist with the identification of these bats from recordings, such as the use of 'slope' in the Analook programme designed for use with Anabat CF detectors. Comparison of slope between Myotid and a library of known calls was used to assist with identification.

[5] BCT guidelines identify that *Myotis* bats can only be identified with a low degree of confidence to species level, as set out in section 6.4.3 of the guidelines.

3.0 RESULTS

Activity/Emergence Surveys

3.1 During the surveys, at least four species of bats were seen/detected using the site (or in close proximity to it). These were: common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmeaus*), noctule (*Nyctalus noctule*), and serotine (*Eptesicus serotinus*). Species identifications were completed in Analook W (and/or Kaleidoscope Pro) against a known library of bat calls. Results are described below and detailed in Figure 7 (Appendix 2).

3.4 On the 10th May 2021, during the dusk survey of Building 1, the first record was at 20:52 (common pipistrelle), and the last at 22:02 (soprano pipistrelle). Throughout the survey period, soprano pipistrelles dominated activity and were seen and detected mainly to the rear of the property. These were infrequent passes by single individuals, with some foraging occurring throughout the survey period. Very low numbers of common pipistrelles were recorded during the survey. Activity to the front of this property was very limited with only a single common pipistrelle and a single serotine recorded.

3.5 A single noctule bat and a single serotine bat were also recorded over the site. No other species were recorded. No emergence events were recorded during the survey.

3.6 On the 10th of May 2021, during the dusk survey of Building 4, the first bat (soprano pipistrelle) was detected at 20:53. Again activity was very limited with only single bats observed at 5-10 minute intervals. Only common and soprano pipistrelles were recorded. No other species were recorded. No emergence events were recorded during the survey of Building 4.

3.7 In summary, no roosts were confirmed but there is local activity from four species. Most of the activity was from low numbers (1-2) of common and soprano pipistrelles.

4.0 DISCUSSION & IMPLICATIONS FOR DEVELOPMENT

Legislation

4.1 Bats are European Protected species, protected via The Conservation of Species and Habitats Regulations (2017) and also the Wildlife and Countryside Act 1981 (as amended). These make it illegal to kill, injure, capture or disturb bats; or to obstruct access to, damage or destroy bat roosts. A bat roost is interpreted as "any structure or place used for shelter or protection" whether or not bats are present at the time.

4.2 Penalties on conviction - the maximum fine is £5,000 per incident or per bat, up to six months in prison, and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery. Further details on the protection afforded to bats and their roosts are given in Appendix 1.

Overview

4.3 The evidence from the survey completed suggest that the properties are not being used by bats as a roost, and the proposed works would not result in the disturbance/loss of any roosts. The local vicinity around the site is also active with four species, including common and soprano pipistrelle, noctule, and serotine species of bats. As such, secondary disturbance impacts, such as lighting should also be considered. Foraging/commuting behaviour was recorded in the gardens to the rear of the building and along the entrance driveway and gardens to the sides of the house.

4.4 Planning proposals include eight new residential units and the replacement of all existing commercial floorspace, and as such no roost(s) will be directly impacted which would result in the destruction/disturbance of bat roosts, or has the potential to cause disturbance/harm to roosting bats. Works can therefore legally commence without the need for a European Protected Species Mitigation (EPSM) Licence or a Bat Mitigation Class Licence (BMCL). However, based on the evidence from the PEA and the bat surveys, appropriate and precautionary mitigation should be provided (see below).

Mitigation

4.5 An outline mitigation statement should be agreed prior to demolition (as part of the Biodiversity Enhancements and Mitigation Plan). In light of current and previous survey findings, brief mitigation guidelines are however provided below:

Timing

1) Works to the roof areas should be conducted at an appropriate time of year to minimise any risk of bats being present during proposed work. As best practice, works directly affecting the roof should ideally be conducted during the Spring (March-April) or Autumn (late September-early November) to avoid periods when bats are likely to be present within the building and when they there are least vulnerable, i.e. outside periods of breeding and hibernation.

Replacement roosting opportunity

2) The new structures should seek to provide roost areas for pipistrelle bats (e.g. in an integrated bat box and/or under access tiles). It is proposed this should be located on a southern aspect, away from windows and doors (subject to plans being confirmed). Detailed mitigation would be confirmed and agreed in a mitigation statement prior to demolition. Additionally, the properties should also incorporate external features, such as a minimum of 4 'access tiles' (e.g. clay roofing tiles (tudor bat tiles[6] or bat access slates[7]), on different aspects to compensate for the loss and enhance roosting habitat for crevice dwelling bats. The exact type and locations will be confirmed as part of the mitigation statement, which in turn would form part of the Biodiversity Enhancements and Mitigation Plan, as advised in the previous reports.

Materials

3) The new roof areas of the properties should be lined with bitumen Type 1F membrane and not a breathable membrane where bat access is provided, due to the risk of bat entanglement[8]. The use of bitumen still complies with building regulations[9].

[6] http://www.tudorrooftiles.co.uk/?content=bats
[7] http://www.habibat.co.uk/category/bat-access-tiles/habibat-access-slate
[8] http://www.batsandbrms.co.uk
[9] http://www.bats.org.uk/pages/breathable_roof_membranes.html

Alternative/enhancement roosting opportunities

4) In addition, at least one Schwegler 1FF[10] bat box (or similar for pipistrelles) should be erected around the site (e.g. on matures trees to the rear), providing alternative roosting opportunities for pipistrelle species whilst construction is underway. The bat box will be sited in a tree, best positioned at a height of between 4 to 6 metres. This box should be retained in location once all building works are complete, and thus provide an overall enhancement.

Specified supervised work

5) A suitably qualified and licensed ecologist should oversee any demolition works and the removal of any roof tiles, ridge tiles, hanging tiles and boarding from the existing property.

Tool Box Talk

6) Builders will be made aware of the possible presence of bats, and the legal protection afforded to them, and made to work with caution when removing any tiles. Tiles must be lifted vertically and removed by hand. Should any bats be found workers must cease work immediately and unless present onsite, advice must be sought from a suitably qualified and licensed ecologist.

Lighting

7) Bats clearly use the site for commuting and foraging and therefore outdoor lighting used within the new development must be at an absolute minimum, and where used, be 'bat friendly'. Lights should be at a low level and angled down or have baffles to prevent unnecessary light spilling into the surrounding area which could disturb bats, especially along tree lines. Security and timed lights should be at a low level and set to be on for as short a time as possible. A summary from the latest Guidance Note (08/18)[11] 'Bats and artificial lighting in the UK' is provided in Appendix 4 of this report. Brown long-eared bats are very light sensitive. Lighting around the new and existing properties should comply with the above guidance (and that given in Appendix 4). Full details would be set out as part of the licence application (in a lighting plan). It is

[10] 1FF Schwegler bat Box - http://www.nhbs.com/1ff_schwegler_bat_box_with_built_in_wooden_tefno_158636.html
[11] https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/

recognised there is pre-existing security lighting on the property, and lighting on the extended property should be compliant with current guidance.

Tree works

4.7 Whilst the felling of trees should be avoided, crown reduction and pruning works to trees around the property maybe required. It is recommended that any tree surgery is undertaken by an arboriculturist with knowledge of bats and the legal protection afforded to them. Trees may require a potential roost assessment if any are to be removed.

4.8 The sections of any tree that are removed should be left on the ground overnight (for at least 24hrs), in the unlikely event that a bat may be present, allowing it time to escape. Where possible, the felled wood should be retained on site in habitat piles. These works should be overseen by a licensed bat worker, in light of the potential need for additional tree removal/surgery work that has not been covered by this report.

Enhancements

4.9 In line with local and national policy (NPPF 2019[12]), the new development should seek to provide biodiversity enhancements. The following suggestions would enhance the site for wildlife.

4.10 A guide to bat friendly gardening is provided in Appendix 4. Any landscaping plan should take account of this guidance. Furthermore, areas of the amenity grass could be replaced with a species rich turf e.g. Wildflower Native Enriched Turf or Species Rich Lawn Turf to enhance diversity within the grassland sward (which will in turn attract insects, birds and bats)[13].

4.11 The biodiversity enhancements and mitigation measures should form part of the Biodiversity Enhancement and Mitigation Plan (BEMP), as outlined in the previous PEA and PRA reports, to be secured by an appropriate planning condition.

[12] https://www.gov.uk/government/publications/national-planning-policy-framework--2
[13] http://www.wildflowerturf.co.uk/Products/species-rich-lawn-turf.aspx

5.0 CONCLUSION

5.1 The buildings support no active bat roosts but a number of species are active in the local area. Mitigation measures, as outlined in this report, are advised to be detailed in a Mitigation Statement to form part of the BEMP. This is advised in order to avoid committing an offence and to safeguard the viability of local bat populations.

5.2 No further surveys are needed to inform the planning application. An additional building inspection and/or an update emergence survey may be required if works don't progress within twelve months. A building inspection will be required prior to any supervised demolition works.

6.0 REFERENCES

Bat Conservation Trust (2012) Bat Surveys – Good Practice Guidelines. Bat Conservation Trust, London.

Bat Conservation Trust (2011) Statement on the impact and design of artificial light on bats.

Mitchell-Jones, J. (2004) Bat Mitigation Guidelines. Natural England.

Mitchell-Jones, A.J. and McLeish, A.P. (2004) Bat Workers Manual. JNCC

APPENDIX 1 – Legislation, Policy & Licensing

Bats

All bat species in the UK are included in Schedule II of the Conservation of Habitats and Species Regulations 2018 which transpose Annex II of the Council Directive 92/43/EEC 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora ("EC Habitats Directive") which defines European protected species of animals. All species of British bat are fully protected under the Wildlife and Countryside Act 1981 (as amended) through inclusion in Schedule V.

Bat species are afforded further protection by the Countryside and Rights of Way (CRoW) Act 2000; and the Natural Environment and Rural Communities Act 2006.

Under the above legislation it is an offence to:
• kill, injure or take an individual;
• possess any part of an individual either alive or dead;
• intentionally or recklessly damage, destroy or obstruct access to any place or structure used by these species for shelter, rest, protection or breeding;
• intentionally or recklessly disturb these species whilst using any place of shelter or protection; or
• deliberate disturbance in such a way as to be likely to impair their ability to:
- survive, to breed or reproduce, or to rear or nurture their young; or
- in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
- to affect significantly the local distribution or abundance of the species to which they belong;
• keep (possess), transport, sell or exchange, or offer for sale or exchange, any live or dead bat, or any part of, or anything derived from a bat.

It is also an offence to set and use articles capable of catching, injuring or killing bats (for example a trap or poison), or knowingly cause or permit such an action. In the case all species of British bat there is also protection under *Schedule 6* of *The Wildlife and Countryside Act 1981* (as amended) relating specifically to trapping and direct pursuit of these species.

Penalties on conviction

The maximum fine is £5,000 per incident or per bat (some roosts contain several hundred bats), up to six months in prison, and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery.

Licencing

A European Protected Species Mitigation (EPSM) Licence or a Bat Mitigation Class Licence (BMCL) in relation to bats is required from Natural England for any work that would result in an otherwise unlawful activity (e.g. damage to a bat roost). A BMCL permits activities resulting in the disturbance and/or capture of certain species of bats and/or damage or destruction of roosts of low conservation significance. A license can only be issued to permit otherwise prohibited acts if Natural England are satisfied that all of the following three tests are met:

• The proposal is for 'preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment';
• There is no satisfactory alternative; and,
• The action authorised by the license will not be detrimental to the maintenance of bat populations at a favourable conservation status in their natural range.

A bat roost is defined by the Bat Conservation Trust publication Bat Surveys for Professional Ecologists—Good Practice Guidelines 3rd Edition as "*the resting place of a bat*"[14]. Generally however, the word roost is interpreted as "*any structure or place, which any wild bat uses for shelter or protection.*"

Bats tend to re-use the same roosts; therefore legal opinion is guided by recent case law precedents, that a roost is protected whether or not the bats are present at the time. This can include for summer roosts, used for breeding; or winter roosts, used for hibernating.

[14] Collins J (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn) (published by Bat Conservation Trust, London)

APPENDIX 2 – Figures.

Figure 1 – Approximate location of the site (red outline). Image taken from Google Earth.

Figure 2 – Approximate location of the site (red outline) within the wider landscape. Image taken from Google.

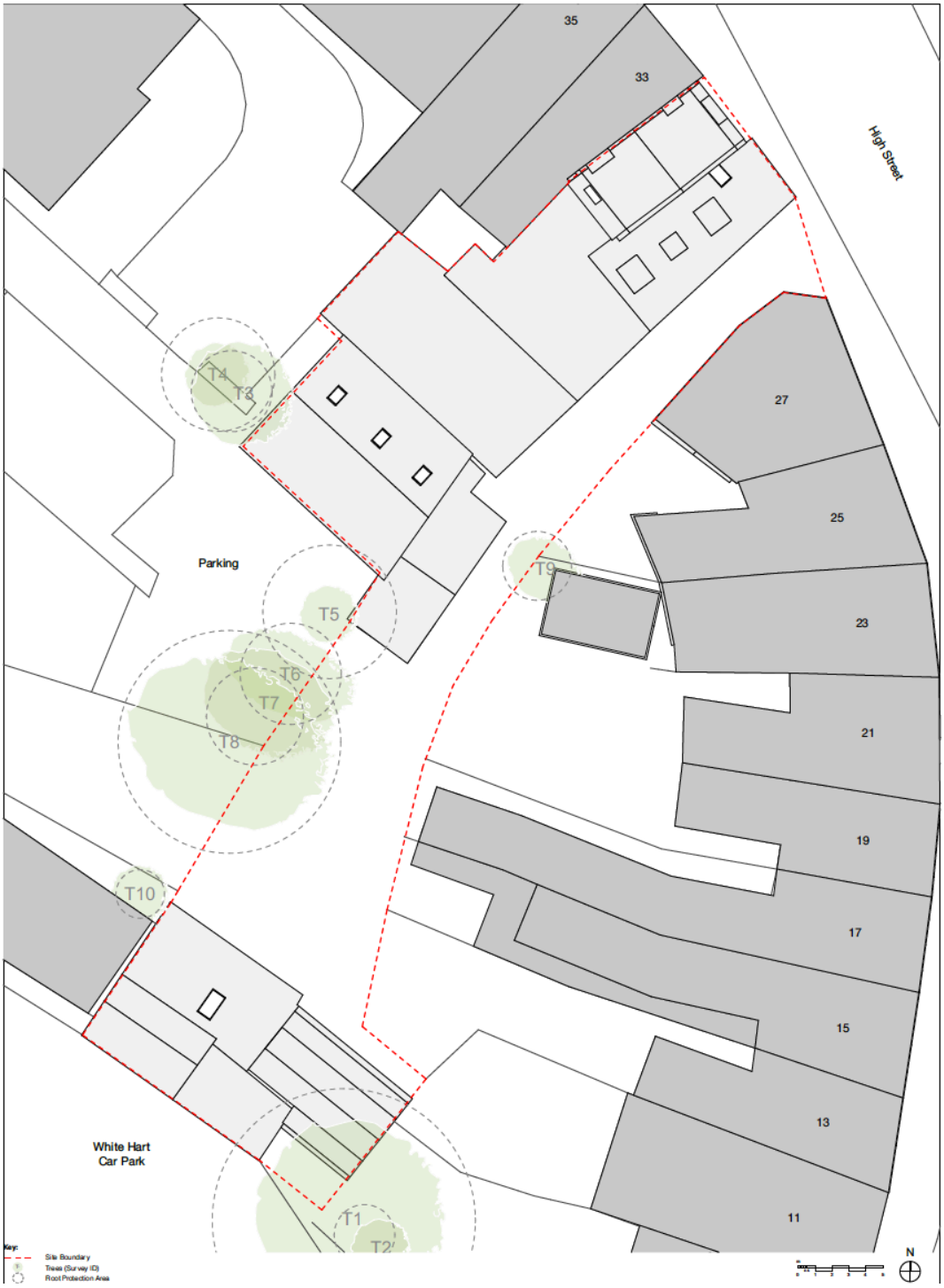

Figure 3. Red outline boundary of the existing site (source: Fletcher Crane Architects).

Figure 4. Modified plan, showing building numbers, and the main habitats on site: Grey – Buildings, Green – trees on adjacent land, hatched light grey – hardstanding (as detailed within the 2019 Preliminary Ecological Appraisal report).

Figure 6. Surveyor locations. Surveyors were not static and these locations varied slightly between surveys to ensure all aspects were covered.

Figure 7 – Summary of main bat foraging/commuting pathways (blue).

APPENDIX 3 – Images of the site.

Photo 1: North-eastern elevation of Building B1 that is adjacent to the High Street.

Photo 2: View of the access road looking north towards the High Street.

Photo 3: Area of car parking formed of brick paving on the southern section of the site.

Photo 4: Building B1 with Building B1 and B2 attached at second storey level.

Photo 5: Roof void of B1 showing an open uncluttered space and the partition wall for the neighbouring building.

Photo 6: Building 2 showing the virginia creeper and building 5.

APPENDIX 4 – Lighting guidance - the impact of artificial light on bats.

The following basic set of guidelines is summarized from the latest Guidance Note (08/18)[15] provides a concise checklist of points to consider with any lighting scheme:

- *Use professional lighting design engineers to model and predict light spill so that it can be avoided.*
- *Reduce light levels to the minimum necessary to meet legal and safety requirements.*
- *Reduce horizontal and upward/downward light spillage to the minimum achievable. The use of cowling, masks, louvers etc. and limiting the height of lighting columns may be important depending on the design of the lighting units. No bare bulbs. Lighting should only light the target area.*
- *Use non-reflective surfaces within the area to be lit to minimise indirect (reflected) spillage of light. The use of planting or other structures to add screening.*
- *Reduce the duration of lighting. The use of lighting 'curfews' can also be helpful - especially in the vicinity of bats roosts. For example, the emergence of bats, typically within the hour after sunset, may be disrupted (delayed) by raised light levels and this may result in a loss of feeding opportunities.*
- *Consider the type of light to be used and whether a different type or design may reduce potential impacts on bats and other wildlife. Narrow spectrum lighting with minimal UV emission should be used.*
- *Use 'screen planting' to limit light spill into dark areas*.
- *Use narrow spectrum light sources* to lower the range of species affected by lighting, as research has shown that spectral composition does impact biodiversity.
- *Use light sources that emit minimal ultra-violet light*
- *Avoid white and blue wavelengths of the light spectrum* to reduce insect attraction and where white light sources are required in order to manage the blue short wave length content they should be of a warm / neutral colour temperature <4,200 kelvin.

For more details, please refer to:

https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/

http://www.bats.org.uk/pages/bats_and_lighting.html

http://www.batsandlighting.co.uk/index.html

[15] https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/

APPENDIX 5 – Gardening for bats.

GARDENING FOR BATS

All sixteen species of bats in the UK eat insects, and need a good supply of these from spring through to the autumn. By growing flowers attractive to a range of insects, our gardens can become important feeding stations for bats, birds and other wildlife.

Many plants depend on insects

We grow flowers in our gardens for our own enjoyment. But colour and perfume are really the plants' way of advertising themselves to insects. Sweet nectar and protein-rich pollen are bait to encourage insects to visit. In return, pollen is carried from one flower to another on their bodies so the flowers are fertilised.

Bats need insects

Flying uses a lot of energy, so bats have huge appetites. All our UK bats eat insects. Five species, including the long-eared bat, prefer moths, but most bats rely more heavily on flies as food than any other insect group. Especially important are craneflies, and a range of midge families and their relatives. Pipistrelles, the bats most likely to visit your garden, depend on catching very large numbers of tiny insects, some of which are pests.

Flower shape and insect tongues

Flowers with long narrow petal tubes, such as evening primrose and honeysuckle, are visited by moths and butterflies. Only their long tongues can reach deep down to the hidden nectar.
Short-tongued insects include many families of flies and some moths. They can only reach nectar in flowers with short florets.
By planting a mixture of flowering plants, vegetables, trees and shrubs, you can encourage a diversity of insects to drop in and refuel.

Follow these general rules

? Plant flowers varying not only in colour and fragrance, but also in shape.
? Daisies and daisy-like flowers are open with a mass of shallow florets.
? Pale flowers are more easily seen in poor light.
? Single flowers have more nectar than double varieties
? Native wild flowers or those closely related are most useful
? Flowers with landing platforms and short florets such as daisy or carrot family attract many insects.
? Many flowering vegetables such as beans and courgettes are also good for insects.

Plant trees and shrubs

These are important in providing

- food for insect larvae
- food for adult insects
- shelter for flying insects
- roosting opportunities for bats.

In a small garden, choose trees that can be coppiced – cut down to the ground every few years - to allow new shoots to spring from the base. Young shoots and leaves will support leaf-eating insects, even if they do not produce flowers. Hawthorn and elder are useful small trees.

Create a wet area

A pond, a marshy area, even a half-tub made into a mini-pond can attract insects. Many of the tiny flies favoured by bats start life in water as aquatic larvae.

Say NO to insecticides

Chemical pesticides kill natural predators and so may do more harm than good. They reduce bats' insect prey, and surviving insects carry traces of poison.

Encourage natural predators

Hoverflies, wasps, ladybirds, lacewings, ground beetles and centipedes are the gardener's friends. As natural predators they help keep the balance, eating many pests.
? Allow some weeds to grow to provide ground cover for natural predators
? Grow favourites of hoverflies and other predators close to the flowers and vegetables that tend to become infested.
? Leave hollow-stemmed plants to overwinter as shelter for ladybirds.
? Leave heaps of dead leaves and brushwood undisturbed for hedgehogs.
? Most garden birds are effective predators. Provide them with regular food and water.

Prevent a CATastrophe

Many bats and other small mammals fall prey to Britain's most dangerous four-legged predator, the domestic cat. Cats do not need to stay out all night. Bring you cat in an hour before sunset so bats can emerge undisturbed.
(Send for our special leaflet on cats and bats.)

The Bat Conservation Trust, 15 Cloisters House
8 Battersea Park Road, London SW8 4BG
Tel 0845 1300 228 Fax 020 7627 2628
enquiries@bats.org.uk www.bats.org.uk
Registered Charity no 1012361 Company limited by guarantee, registered in England no 271282
August 2004

Gardening for bats

Aim at having flowers in bloom through the year, including both annuals and herbaceous perennials.
Below are some suggestions, but this is by no means an exhaustive list. See what grows well in YOUR garden, and what seems most attractive to insects.
Flowering times are approximate, varying in different areas. Regular dead-heading extends flowering period in many flowers. A=annual, HA=hardy annual, HHA=half-hardy annual, P=perennial, W=wild flower,

Flowers for borders			
St John's Wort	*Hypericum*	P	March-
marigolds	*Calendula*	H/A	March – Oct.
aubretia	*a. delltoidea*	P	March-June
honesty	*Lunaria rediva*	HB	March
forget-me-not	*Myosotis sp.*	A/P	March - May
elephant ears	*Bergenia*	P	April
Wallflowers	*Erysimum*	B	April - June
Cranesbills	*Geranium sp*	P	May – Sept.
Yarrow	*Achillea*	P	May -
Poppies	*Papaver sp.*	A	May - July
Dames violet	*Hesperis matronalis*	P	May - August
Red Valerian	*Centranthus ruber*	P	May – Sept.
Poached egg plant	*Limnanthes*	HA	June – Aug.
Knapweed	*Centaurea nigra*	P	June- Sept.
Phacelia		HA	June – Sept.
Ox-eye daisy	*Leucanthemum vulgare*	P	June – Aug.
Evening primrose	*Oenathera biennis*	B	June-Sept.
Candytuft	*Iberis umbellata*	HA	June – Sept.
Sweet William	*Dianthus barbatus*	B	June - July
Blanket flowers	*Gaillardia*	P	June -
Verbena	*V.bonariensis*	HHA	June – Oct.
Scabious	*knautia arvensis*	P	July-Aug.
Night-scented stock	*mattiola bicornia*	HA	July-Aug
Pincushion flower	*Scabious sp.*	A/P	July – Sept.
Cherry pie	*heliotrope*	HHA	July – Oct.
Mexican aster	*Cosmos sp.*	A/P	July – Oct.
Cone flower	*Rudbeckia sp.*	A/P	August-Nov.
Mallow	*lavatera sp.*	P	August-Oct.
Michaelmas daisy	*Aster sp.*	P	August-Sept.
Ice plant 'Pink lady'	*Sedum spectabile*	P	Sept.
Herbs – both leaves and flowers are fragrant			
Fennel	*Foeniculum vulgare*		July – Sept.
Bergamot	*Monarda didyma*		June - Sept
Sweet Cicely	*Myrrhis odorata*		April - June
Hyssop	*Hyssopus officianlis*		July - Sept
Feverfew	*Tanacetum parthenium*		June – Sept.
Borage	*Borago officinalis*		May – Sept.
Rosemary	*Rosemary officinalis*		March - May
Lemon balm	*Melissa officinalis*		
Coriander	*Coprianrum sativum*		June - August
Lavenders	*Lavendula sp.*		
Marjoram	*Origanum sp*		

Trees, shrubs and climbers important to insects		
Oak	*Quercus sp.*	large gardens only
Silver birch	*Betula pendula*	
Common alder	*Alnus glutinosa*	Suitable for coppicing
Hazel	*Corylus avellana*	Suitable for coppicing
Elder	*Sambucus nigra*	Small
Pussy willow	*Salix caprea*	Suitable for coppicing
Hawthorn	*Crataegus monogyna*	Suitable for coppicing
Honeysuckle	*Lonicera sp.*	grow a variety for succession.
Dog rose	*Rosa canina*	Climber
Bramble	*Rubus fruticosus*	Climber
Ivy	*hedera helix*	Climber
Buddleia	*Buddleia davidii*	shrub
Guelder rose	*Vibernum opulus*	shrub
Gorse	*Ulex sp.*	shrub

Plants for pond edges and marshy areas			
Purple loosestrife	*Lythrum salicaria*	W	June – Aug.
Meadow sweet	*Filipendula ulmaria*	W	June – Sept.
Lady's smock	*Cardamine pratensis*	W	April - June
Water mint	*mentha aquatica*	W	July – Sept.
Angelica	*Angeliica sylvestris*	W	July – Sept
Hemp agrimony	*Eupatorium cannabinum*	W	July – Sept.
Marsh marigold	*Caltha palustris*	W	March – May
Creeping Jenny	*Lysimachia nummularia*	W	May - August
Fringed water lily	*Nymphoides peltata*	W	June – Sept.
Water forget-me-not	*Myosotis scorpioides*	W	June – Sept.

Allow part of your lawn to grow long in summer and cut in autumn, removing the clippings. Avoid using fertilizers.
Compost heaps are good producers of insects too.

Add a seat to watch your garden come to life!

Other sources include:

https://www.buglife.org.uk/activities-for-you/wildlife-gardening

https://www.rspb.org.uk/birds-and-wildlife/advice/gardening-for-wildlife/creating-a-wildlife-friendly-garden/

https://www.rhs.org.uk/advice/design/design-with-plants/wildlife-friendly-garden-plants

https://www.wildlifetrusts.org/gardening