



USDAW, Wilmslow Road, Manchester

Ecological Appraisal

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Control sheet

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Executive Summary

An extended Phase 1 Habitat survey and building inspection survey were completed during February 2020 at a site located off Wilmslow Road, Manchester (NGR: SJ 85530 94329). Following this, a bat emergence survey of Building 1 was undertaken in September 2020. The surveys were undertaken to inform a planning application for the partial demolition of existing buildings, conversion and extension of retained building and new development to accommodate student residential accommodation and amenity / management facilities, with hard and soft landscaping, parking and access arrangements.

Key ecological features, potential impacts, further survey requirements and outline mitigation measures are summarised in the following table.

Table 1: Summary of ecological considerations

Ecological Feature	Potential Impact	Further surveys	Outline Mitigation
Roosting bats (Buildings)	Disturbance of roosting bats	N	Adopt precautionary demolition measures
Roosting bats (Mature trees)	Direct impacts Loss of habitat	Y*	*Further ground/aerial inspection survey required if semi-mature / mature trees are to be directly impacted.
Foraging bats	Disturbance due to noise/light spillage Loss of habitat	N	Compensatory planting to replace lost habitat. Careful use of lighting during works and within developed areas.
Nesting birds	Direct impacts Loss of habitat	N*	Undertake vegetation clearance and demolition / any works to the roof of buildings B4 or B5 outside the bird nesting season (March – September inclusive) or *pre-clearance nesting bird checks by an ecologist will be required. Compensatory planting to replace lost habitat.
Small mammals including hedgehog	Direct impacts Loss of habitat	N	Adopt reasonable avoidance measures during vegetation clearance. Cover excavations overnight.
Adjacent woodland HPI	Damage to branches / roots Pollution	N	Adopt tree protection and pollution prevention measures
Scattered trees, scrub and ornamental shrub	Loss of habitat	N	Compensatory planting of native species at a ratio of two trees for every one removed.
Presence of rhododendron (<i>Rhododendron</i> sp.)	Spread of non-native invasive species	N	Affected shrubs are to be removed in line with best practice guidance.

1. Introduction

- 1.1 Bowland Ecology Ltd was commissioned by Watkin Jones Group to complete an extended Phase 1 Habitat survey, building inspections and bat survey at a site located off Wilmslow Road, Manchester (NGR: SJ 85530 94329). The site is subject to proposals for the partial demolition of existing buildings, conversion and extension of retained building and new development to accommodate student residential accommodation and amenity / management facilities, with hard and soft landscaping, parking and access arrangements.
- 1.2 The site is located in Fallowfield, a suburb of Manchester, immediately bounded by terraced residential properties to the south, Platt Fields Park to the west, Manchester High School for Girls to the north and Fallowfield Campus (University) to the east. Habitats within the site comprise buildings, amenity grassland, scattered trees, scrub and ornamental shrubs. Appendix E presents the extent of the red-line boundary and habitats present.
- 1.3 The purpose of the survey was to: 1) identify and map all habitats occurring within the survey area, 2) identify the presence of (or potential for) wildlife interests with particular reference to the need for further surveys and legal requirements, and 3) provide an ecological assessment, identify potential impacts and provide recommendations pertaining to the proposal.
- 1.4 This report includes a description of survey methods and results and outlines recommendations to provide protection and enhancements for biodiversity and protected species.

2. Methodology

- 2.1 The desk study, extended Phase 1 Habitat survey, bat survey and ecological impact assessment follow the Guidelines on Ecological Report Writing (CIEEM, 2017), the Guidelines for Ecological Impact Assessment in the UK (CIEEM, 2018) and are in line with the British Standard BS42020:2013 'Biodiversity – Code of practice for planning and development'.

Desk study

- 2.2 The aim of the desk study was to identify the presence of statutory and non-statutory wildlife sites within the search area and any records of legally protected species or Habitats and Species of Principal Importance (HPI/SPI) for the conservation of biodiversity (Section 41 NERC Act 2006).
- 2.3 The Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk) was reviewed for information on locally, nationally and internationally designated sites of nature conservation importance (statutory sites only) on or within 1 km of the site boundary.
- 2.4 Local records on and within 1 km of the site were obtained following a data search with Greater Manchester Ecology Unit (GMEU).
- 2.5 Ordnance Survey maps and aerial photographs (<http://maps.google.co.uk/maps>) were reviewed to help identify any continuous habitat and any other notable habitats within the surrounding area.
- 2.6 Natural England's licensing method statement template (Form WML-A14-2 (version December 2015¹) advises that, for developments resulting in permanent or temporary habitat loss at distances over 0.25 km from the nearest pond, careful consideration should be given to whether a survey is appropriate. Although the species may use suitable terrestrial habitat up to 0.5 km from a breeding pond, in this instance a 0.25 km search radius was considered appropriate due to the limited extent of suitable terrestrial habitats for amphibians within the site.

Extended Phase 1 Habitat survey

- 2.7 The extended Phase 1 Habitat survey followed standard methodology (JNCC, 2010 and CIEEM, 2013). All features of ecological significance were target noted and a colour coded map of the habitats on site has been produced.
- 2.8 This survey methodology records information on the habitats together with any evidence of and potential for legally protected and notable fauna, in particular:
- Identification of trees with bat roosting potential (Collins, 2016) (Appendix B);
 - assessing the suitability of habitats notable and protected species such as nesting birds (including any active or disused nests), reptiles, (*Arvicola amphibius*), otter (*Lutra lutra*), badger (*Meles meles*) and invertebrates;
 - checking for the most common invasive plant species subject to strict legal control including: Japanese knotweed (*Fallopia japonica*), giant knotweed (*F. sachalinensis*), hybrid knotweed (*F. x bohemica*), giant hogweed (*Heracleum mantegazzianum*), rhododendron (*R. ponticum*, *R. ponticum* x *R. maximum* and *R. luteum*) and Indian balsam (*Impatiens glandulifera*); and

¹ <https://www.gov.uk/government/publications/great-crested-newts-apply-for-a-mitigation-licence>

- assessing the suitability of the habitat for amphibians, including the protected great crested newt (*Triturus cristatus*). The pond on site was subject to a habitat suitability index (HSI) (Oldham *et al.* 2000) assessment for great crested newt.

2.9 The extended Phase 1 Habitat survey was carried out by Matt Clifford MSc, BSc (Hons), ACIEEM and Sophie King MSc, BSc on the 5th February 2020. The weather during the survey was dry and overcast with a light breeze (Beaufort Scale: 1-2) and an approximate temperature of 6°C.

Building Inspection Survey for Bats

- 2.10 A daytime internal and external inspection for bats of all the buildings within the red line boundary was also undertaken on the 5th February 2020 by the surveyors listed above. The survey followed the Bat Conservation Trust (BCT) 'Good Practice Guidelines' (Collins, 2016).
- 2.11 The external inspection involved checking for field signs of bats on external features of the buildings, with particular attention being paid to ledges, walls, doors and the surrounding ground.
- 2.12 The internal inspection involved a search of the buildings for field signs such as; bats, bat droppings, urine stains, bat feeding remains (moth wings, insect cases), bat staining, a distinctive smell of bats, scratch marks and smoothing of surfaces, which would indicate a roosting site. Ladders, binoculars and high-power torches (Cluson Clu-lite 500,000 candlepower and LED Lenser 7.2) were used to aid the survey.
- 2.13 Natural England's Bat Mitigation Guidelines (2004) states that a significant bat roost can normally be determined on a single visit at any time of the year, provided that the entire structure is accessible and that signs of bats have not been removed by others.
- 2.14 Using the information collected during the external and internal assessment, a 'roost potential' score was given to each building according to the criteria shown in Appendix B (Collins, 2016).

Emergence / Re-entry Bat Survey

- 2.15 A dusk emergence survey of Building 1 was undertaken in September 2020. The survey methodology followed the guidelines as described in Collins, 2016. Details regarding the start time, weather conditions and surveyors on the survey is shown in Table 2 below.

Table 2: Summary of bat survey weather conditions and surveyors

Date	Timings	Weather Conditions	Surveyors ²
29.09.2020	Start: 18:34 End: 20:19 Sunset: 18:49	Overcast (100% cloud cover), mild with a light breeze (F1 Beaufort scale). Start Temp – 14°C. End Temp - 11°C Precipitation – Nil	FS, SR, HD

- 2.16 Surveyors were positioned to get the best coverage of Building 1, particularly where it joins onto Building 2. Surveyor 1 (FS) was situated to the north of Building 1, whilst surveyor 2 (SR) was in the courtyard to the west and surveyor 3 (HD) was in the car park to the east. The surveys were aided by the use of the Bat Box Duet, and EM Touch bat detectors.

² FS: Fiona Shuttle BSc (Hons), SR: Samuel Robinson BSc (Hons), HD: Helena Davies BSc (Hons)

Limitations

- 2.17 The timing of the Phase 1 Habitat survey was outside the optimum period (April to September inclusive) (JNCC, 2010). However, the entire site was accessible and the majority of habitats are commonly occurring and species-poor. Therefore, the survey timing is not considered to be a major limiting factor on the assessment of the habitats present and their potential to support legally protected species.
- 2.18 The timing of the bat emergence survey was in late September, at the end of the main bat activity season (April to September inclusive) and outside maternity roosting season (May to August inclusive). Additionally, only one bat survey was possible within the bat activity season due to timing constraints, even though Building 1 holds moderate potential to support roosting bats (best practice guidance recommends two surveys of moderate potential buildings). However, Building 1 is to be retained and, with the exception of the demolition of the adjacent building (B2), no direct impacts are anticipated to this building. An internal inspection of the southern section of the loft of Building 1 was undertaken both during the Phase 1 survey and prior to the bat emergence survey to search for evidence of occupancy of the roof void by bats. Additionally, the bat survey observed that the southern section of the building was lit up by streetlighting and external floodlights which reduced the likelihood of a maternity roost within the building. Therefore, the timing and survey effort was considered sufficient to inform a full assessment of the potential of Building 1 to support bats.
- 2.19 The internal inspection of buildings was limited, in particular the northern section of Building 1's loft void could not be accessed. However this part of the building is to be retained and no direct impacts anticipated. Additionally, a thorough external inspection, which included access to the roof to inspect the condition of slate tiles, allowed a robust assessment of the roosting potential of buildings on site.
- 2.20 The list of invasive plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) is extensive and these plants are found in a range of different habitats, including aquatic habitats. The extended Phase 1 habitat survey checked, in particular, for the presence of Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, rhododendron and Indian balsam. There may be other invasive plant species present on the site which were not recorded, but it is considered that this survey is sufficient to identify any significant constraints posed by invasive plants.

3. Results

Designated sites and Habitats of Principal Importance

- 3.1 There are no statutory or non-statutory designated wildlife sites on or within 1 km of the site. The site falls within the following Impact Risk Zones (IRZ): Hollinwood Branch Canal Site of Special Scientific Interest (SSSI) located 7 km to the east of the site; Rochdale Canal SSSI located 7.4 km north east of the site and Huddersfield Narrow Canal SSSI located 9 km south east of the site. However, the proposals do not fall into any of the categories for which the local planning authority (LPA) should consult Natural England. Therefore, no further consideration regarding the IRZ is required.
- 3.2 The search of the MAGIC identified numerous areas of deciduous woodland HPI within 1 km of the site. Of these, the closest is located immediately north of the site boundary and has good connectivity with the school grounds to the north and the park to the west.
- 3.3 Based on a review of OS maps and aerial imagery, there are no ponds 0.25 km of the site. The extended Phase 1 habitat survey revealed no ponds within the site boundary.

Habitats

- 3.4 Target notes summarising key interest features for wildlife recorded during the extended Phase 1 Habitat survey are included in Appendix C. The Phase 1 Habitat Plan of the site presented in Appendix E includes the locations of the target notes.

Amenity grassland (TN7)

- 3.5 The central landscaped area comprises amenity grassland. The grassland is closely mown to maintain a very short sward. Species noted were limited to meadow grass species (*Poa* spp.), common daisy (*Bellis perennis*), white clover (*Trifolium repens*), pointed spear-moss (*Calliergonella cuspidata*) and cat's-ear (*Hypochaeris radicata*).

Introduced shrub (TNs 2, 3 and 6)

- 3.6 Ornamental planting includes the following species; rhododendron (*Rhododendron* sp.), privet (*Ligustrum* sp.) and Wilson's honeysuckle (*Lonicera nitida*). Raised beds of stone construction are planted with ornamental garden species.

Scattered trees (TNs 1, 2, 3, 4, 5 and 6)

- 3.7 Scattered trees are abundant across the site; individual trees vary in age including sapling, young, semi-mature and mature trees. Species noted include; oak (*Quercus* sp.), pedunculate oak (*Quercus robur*), sycamore (*Acer pseudoplatanus*), cherry (*Prunus* sp.), ash (*Fraxinus excelsior*), beech (*Fagus sylvatica*), lime (*Tilia* sp.) and yew (*Taxus baccata*).

Scattered scrub (TNs 2, 3, 4 and 6)

- 3.8 Occasional native scrub species are present within the ornamental planting. Species comprise holly (*Ilex aquifolium*) and sapling trees listed in paragraph 3.8.

Hardstanding, buildings and walls

- 3.9 Tarmac footpaths and car parking areas are present surrounding the buildings and amenity grassland. Red-brick walls are present along the majority of the site boundary and there are numerous raised beds constructed with low dry-stone walls.
- 3.10 Buildings are present within the site, detailed descriptions of which are provided in Appendix D.

Species

Plants (including invasive species)

- 3.11 No notable plant species or non-native invasive species were returned by the desk study within the 1 km search area. The site comprises species-poor, intensively managed habitats dominated by common and introduced plant species, with limited botanical diversity. Non-native invasive plants present within the site include rhododendron, which is present in the ornamental planting throughout the site (including at TNs 2 and 3).

Bats

Desk study

- 3.12 Forty bat records were returned by the desk study. Species include; common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Daubenton's (*Myotis daubentonii*), and noctule (*Nyctalus noctule*), alongside unidentified pipistrelles (*Pipistrellus* sp.) and unidentified bat species. Of these, the nearest were multiple records in Platt Fields Park, approximately 0.3 km west of the site boundary. The majority of bats were recorded in flight; foraging and/or commuting.
- 3.13 In addition, the desk study returned records of five bat roosts within the search area, comprising common pipistrelle and unidentified pipistrelle species. The closest roost record is of a common pipistrelle maternity roost, with 44 recorded bats, located 0.1 km south east of the site.

Daytime Building Inspections

- 3.14 The buildings on site include a mid-19th century red brick building with associated modern extensions (B1, B2 and B3), alongside a single-storey garden workshop (B4) and outhouse (B5). For the purpose of this report, the mid-19th century red brick building (B1) and associated modern extensions (B2, B3) are described separately. Appendix D presents full building descriptions and photos. The building locations are shown in Appendix E.
- 3.15 Following the inspection survey, buildings were categorised as having either negligible, low or moderate potential to support roosting bats. Table 2 summarises the potential roosting features (PRF) provided by each building, and the overall potential for roosting bats of each surveyed building.

Table 2: Summary of potential bat roosting features associated with B1 – B5

Building	Summary of bat PRFs	Overall bat roost potential
B1	Raised and slipped roof slates on all roof pitches. Lead flashing replaces missing ridge tiles. Lead flashing is also used to seal roof tiles, chimney stacks and skylights to the brickwork. The lead flashing is warped, creating potential access points for bats. Timber eaves and soffit boards appear well-sealed from the ground inspection; however, it is possible that there are concealed entry points for bats. Internally, timber beams and missing mortar in the brickwork create multiple crevices suitable for roosting bats. The building has multiple loft voids beneath pitched slate roofing, not all of which were accessible for inspection.	Moderate
B2	No PRF were noted during the inspection.	Negligible
B3	No PRF were noted during the inspection	Negligible
B4	Multiple access points for bats are present under the corrugated metal and corrugated plastic mono pitched roof. However, the building is considered to provide suboptimal roosting conditions for bats due to extreme temperature fluctuations associated with the roofing material, the internal void being naturally lit and regular disturbance. No internal PRFs were noted.	Negligible
B5	Multiple access points for bats are present under the corrugated metal mono pitched roof. The building is considered to provide sub-optimal roosting conditions for bats due to the extreme temperature fluctuations associated with the roofing material and the internal space being regularly disturbed. No internal PRFs were noted.	Negligible

- 3.16 Overall, no evidence of roosting bats was found during the external and internal inspections of the buildings, however the northern loft voids of B1 (moderate potential for roosting bats) were not accessible for inspection.
- 3.17 The majority of trees within the site provide negligible roosting opportunities for bats, however, PRFs were observed on seven trees (BT1 – 7). PRFs include knot holes, fluting, welds and tear outs. Furthermore, a number of mature trees just beyond the site's northern perimeter have features that are likely to be suitable for roosting bats. However, no access for further assessment of these trees was available. Tree locations are presented within Appendix E. Tree descriptions and photos are included with the Target Notes (see Appendix C).

Nocturnal Emergence Survey

- 3.18 A dusk emergence survey was undertaken on Building 1 on 29th September 2020. No bats were observed to emerge from the building. Bats recorded during the survey were all common pipistrelle bats (high activity). All surveyors noted that the building was fairly well-lit by external security lighting, in particular the eastern face of the building.
- 3.19 The table in Appendix G summarises bat activity recorded during the survey. Surveyor 1 detected the first bat at 18:54, 5 minutes after sunset, to the north of the building. This appeared from the playing fields to the north of the site and did not emerge from the building. Following this, common pipistrelles were frequently recorded socialising and foraging along the treeline to the north of the building throughout the survey. Surveyor 2, to the west of the building, also observed high foraging activity levels and lots of social calls throughout the survey, predominantly above the garden and not in close proximity to the building. Finally, Surveyor 3 had less activity overall and calls were faint, indicating that fewer bats passed within close proximity of this location.

- 3.20 The northern face of the building was predominantly unlit at the time of survey, with only a dim, downwards facing external light on the porch, however, the site manager advised that this face is typically well-lit by a floodlight (which was broken at the time of survey but to be fixed). A downwards facing light was present on the western face of the building, however, it was noted that this did not light up the roof so unlikely caused significant disturbance. However, the southern and eastern faces of the building were well lit by both streetlights and security floodlights, with less vegetation surrounding the building in these locations.

Birds

- 3.21 Records of bird species listed on Section 41 of the NERC Act (2006) returned by the desk study include; bullfinch (*Pyrrhula pyrrhula*), dunnock (*Prunella modularis*), herring gull (*Larus argentatus*) house sparrow (*Passer domesticus*), song thrush (*Turdus philomelos*) and starling (*Sturnus vulgaris*). One record of kingfisher (*Alcedo atthis*) a Schedule 1 listed bird, was also returned by the desk study. However, no suitable habitat for this species is provided within the survey area and so kingfisher are not of notable consideration.
- 3.22 Introduced shrub, scattered scrub and individual trees provide suitable nesting habitat for a range of tree and shrub breeding birds. Buildings also offer nesting and roosting opportunities for small nesting birds, such as wren (*Troglodytes troglodytes*), robin (*Erithacus rubecula*), pied wagtail (*Motacilla alba*), house sparrow and blackbird (*Turdus merula*).

Amphibians

- 3.23 The data search returned no records of great crested newt or common amphibians within the 1 km search area. In addition, there are no ponds within the site boundary or within a 0.25 km search area. MAGIC also revealed that there are no active European Protected Species Licences for great crested newt within 1 km of the site.
- 3.24 Dominant habitats within the site, comprising intensively managed amenity grassland, hardstanding and buildings, are unsuitable for amphibians. However, ornamental shrubs and scattered scrub provide suitable terrestrial refugia and foraging opportunities.
- 3.25 Overall it is considered highly unlikely that great crested newt and other common amphibians are present within the site and would be impacted by the proposed works. Therefore, amphibians are given no further consideration within this report.

Reptiles

- 3.26 No records of reptiles were returned by the desk study. Whilst areas of dense scrub provide potential shelter for reptiles, dominant habitats within the site are structurally simple and lack botanical diversity. The site is also isolated from more favourable reptile habitat in the wider area by urban development, roads and boundary walls. Overall, the presence of reptiles within the site is considered to be of negligible risk and they are not considered further within this report.

Badgers

- 3.27 Three records of badger were returned by the desk study, of which the nearest is located approximately 0.4 km north east of the site. Wilmslow Road (A6010), a busy road immediately east of the site, would present a deterrent to badger commuting from this area, however it is still possible that badgers forage within the site.
- 3.28 No evidence of badger, including setts, latrines and signs of foraging, was found during the survey.

Other mammals

- 3.29 Ornamental shrubs, scrub, scattered trees and amenity grassland provide suitable habitat for hedgehog (*Erinaceus europaeus*), a SPI, of which 12 records were returned by the desk study.
- 3.30 Non-SPI mammals considered likely to occupy habitats within the site include common shrew (*Sorex araneus*), pygmy shrew (*Sorex minutus*), stoat (*Mustela erminea*) rabbits (*Oryctolagus cuniculus*) and fox (*Vulpes Vulpes*). Furthermore, grey squirrels (*Sciurus carolinensis*) were observed during the survey and a number of dreys were recorded within trees throughout the site (see Appendix C).

4. Evaluation and Assessment of Potential Impacts

- 4.1 An assessment of effects on ecological features has been made using the available design and survey information and the professional judgement of the ecologist. This includes a consideration of the relevant legislation (Appendix A) and planning guidance. If there are changes to the proposals, such as a change to the proposed development design or to the construction method and programme, the assessment would need to be reviewed.
- 4.2 The proposed development is the partial demolition of existing buildings, conversion and extension of retained building and new development to accommodate student residential accommodation and amenity / management facilities, with hard and soft landscaping, parking and access arrangements. It is understood that Buildings 2 – 5 will require demolition to facilitate the development, however, Building 1 will be retained and no direct impacts are anticipated to the external of this building. Several trees are to be felled to facilitate the proposed development, as well as removal of some areas of scrub and introduced shrub. New planting includes trees, hedgerow, lawn and ornamental planting (see soft landscaping plans in Appendix F).

Habitats of Principal Importance

- 4.3 Several HPis were identified during the desk study, including an area of deciduous woodland HPI immediately adjacent to the site boundary. Potential direct impacts to the adjacent HPI could include root compression reducing tree viability and pruning. Indirect impacts including pollution (fuel spillages incidents, runoff and dust) and vibration disturbance during site clearance and construction, may also occur in the absence of mitigation. Dust pollution in particular, has the potential to negatively impact the habitat through an increase in dust deposition. For example, the smothering effects from the grounding of dust reduces the amount of light available for photosynthesis which can affect the long-term success of trees.

Habitats

- 4.4 The hardstanding and amenity grassland habitats within the site hold very limited value for wildlife. Loss of these habitats poses no negative ecological impact.
- 4.5 Additional habitats within the site, including ornamental shrub, scrub and scattered trees, and are of greater value to local wildlife, further detailed below. Unmitigated, the loss of these habitats will result in a negative ecological impact. However, proposed landscaping plans indicate compensatory planting for all above habitats, with an additional new hedgerow to be planted too.

Species

Invasive plants

- 4.6 One non-native invasive plant species, rhododendron, was identified on site. In the absence of mitigation, any construction works taking place within close proximity to this species risks committing an offence by causing their spread in the wild (Appendix A).

Bats

- 4.7 Buildings within the site were assessed for their suitability for roosting bats following the initial building inspection survey (Appendix D). B2, B3, B4 and B5 are considered to have **negligible** potential for roosting bats due to the absence of PRFs and/or the roofing materials creating sub-optimal roosting conditions for bats. Therefore,

demolition or works affecting these buildings are unlikely to result in the injury and/or killing of bats or the loss of suitable bat roosting habitat.

- 4.8 Building 1 was assessed as having **moderate** potential to support roosting bats during the initial site visit. It is understood that the proposed development will not directly impact this building, with the exception of the impacts from demolition of Building 2 which adjoins the southern end of Building 1. Consequently, a single dusk emergence bat survey was undertaken of this building (in late September). Although the timing of the survey was sub-optimal for identifying maternity roosts (maternity season is typically considered to extend from May to August inclusive), an internal inspection of the southern section of the loft void of Building 1 was conducted which identified **no evidence of roosting bats**. The northern end of the loft could not be accessed but no works are anticipated in proximity to this end of the building.
- 4.9 High levels of bat activity were recorded during the emergence survey and weather conditions were suitable, but no bats were observed to emerge from the building. Thus, indicating that no transitional bat roosts were present at the time of survey. Furthermore, external lighting lit up the southern end of the building which likely limits the suitability of this end of the building throughout the year. Therefore, considering that few direct impacts are anticipated to Building 1, the survey effort was considered sufficient to inform a full assessment of its potential to support bats. Following the emergence survey, it was concluded that there is **low** potential for bats to be roosting in Building 1 and it is unlikely that the proposed works will result in significant disturbance to roosting bats, subject to the adoption of appropriate working practices.
- 4.10 In addition to the buildings, seven mature trees were noted as having potential to support roosting bats due to the presence of PRFs (see Appendix E). Proposed landscaping plans indicate that three trees with bat roosting potential are to be felled to facilitate the proposed development (BT4, 5 & 7), and tree pruning works may be required on trees to be retained. Consequently, there is a risk of causing direct impacts to roosting bats and a loss of bat roost sites. There is also a risk of indirectly disrupting roosting bats which may be using trees, through noise, dust and/or artificial external lighting used during both the construction and / or operational phases of the development.
- 4.11 Individual trees, scattered scrub, and ornamental shrubs within the site provide foraging resources for bats. These features are considered to have moderate suitability, due to their habitat connectivity to woodland, grassland and open water (Collins, 2016). Unmitigated, the loss of some small areas of vegetation may cause a minor negative ecological impact to foraging bats. Foraging bats may also be deterred by any additional external lighting installed during construction works and within the new development.

Birds

- 4.12 Ornamental shrubs, scrub, individual trees within the site offer suitable opportunities for nesting birds. Any works to remove this vegetation undertaken during the breeding season (March to September inclusive), may result in direct impacts to nesting birds and a loss of nesting habitat. Damage/destruction of nests and young would constitute an offence under the Wildlife and Countryside Act (1981, as amended; see Appendix A).
- 4.13 The buildings were noted to provide potential habitat for opportunistic nesting birds, including house sparrow, recorded in the desk study and listed as a SPI under Section 41 of the NERC Act (2006). Proposed demolition works undertaken within the breeding season risk direct impacts upon nesting birds as listed above.

Badger

- 4.14 No evidence of badger presence or suitable badger sett building habitat was identified during the survey. However, three records of badger were returned by the desk study and suitable badger foraging habitat is present on site, therefore, there is a risk of the works causing disturbance to badgers if any excavations are left uncovered overnight which badgers may fall into.

Other mammals

- 4.15 Unmitigated, construction activities such as the clearance of vegetation and ground works, risk causing harm or mortality to small mammals, including hedgehog.

5. Recommendations

- 5.1 This section provides the required measures to mitigate the impacts of the proposed development. A key element of the National Planning Policy Framework is to minimise impacts to biodiversity and provide enhancements. Paragraph 109 states that “*The planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible*”. It also states in Paragraph 118 that “*when determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by encouraging opportunities to incorporate biodiversity in and around developments*”. This section also therefore includes suggested enhancement measures. The following recommendations are designed to comply with legal requirements and national and local planning policy.

Designated sites and Habitats of Principal Importance

- 5.2 Measures to safeguard the Root Protection Area (RPA) of trees in the adjacent Broadleaved Woodland HPI will be implemented during construction, in line with BS 5837:2012 (British Standard: BS5837).
- 5.3 Appropriate pollution prevention measures will be adhered to throughout site clearance to ensure the adjacent broadleaved woodland HPI is not negatively affected by the development. Currently there is no published guidance available in England, however the Scottish Environmental Protection Agency (SEPA) and Northern Ireland Environment Agency (NIEA) have recently published updated guidance (NetRegs, 2018). In the absence of any guidance in England it is advised that the information published on the NetRegs website is adhered to during the works. The information provided is considered recognised good practice and the most up to date guidance currently provided. Suitable mitigation that should be adopted during Site clearance and construction includes (but is not limited to);
- Maintaining high standards of housekeeping;
 - Dampening down working areas and haul roads in dry periods;
 - Using covered wagons and skips; and
 - Keeping roads clean with the use of road sweepers.

Habitats

- 5.4 The loss of trees and scrub will be minimised where possible. Measures to safeguard the Root Protection Area (RPA) of retained mature trees will also be implemented during construction, as outlined in paragraph 5.2. Compensation for any loss of trees and scrub will include the planting of native species of local provenance, with a preference towards planting berry bearing species, such as rowan (*Sorbus aucuparia*) and hawthorn (*Crataegus monogyna*) and avoidance of planting ash or ornamental species (see Appendix H for recommended species lists). It is recommended that new trees are planted at a ratio of two trees for every one lost.

Species

Invasive plants

- 5.5 If the removal of any stands of rhododendron is required as part of the proposals, this should be undertaken in a way to prevent further spread and in accordance with the Forestry Commission’s Practice Guide (Edwards, 2006). Larger bushes should be cut and the stumps treated with an appropriate, approved herbicide. Any regrowth from cut

stumps should be treated with herbicide. Seedlings can either be hand pulled or carefully treated with herbicide to minimise impact on surrounding native flora.

Bats

- 5.6 Buildings; B2, B3, B4 and B5 are considered to have **negligible** potential for roosting bats, therefore no mitigation will be required with respect to these buildings.
- 5.7 Building 1 was considered to provide low potential to support roosting bats following the emergence survey. Considering that no direct impacts are anticipated to this building, with the exception of impacts from the demolition of Building 2, which adjoins the southern end of Building 1, the works pose a very low potential risk to roosting bats. In order to reduce the risk of impacting bats to a negligible level, the following Reasonable Avoidance Measures (RAMs) will be adhered to during the demolition works. If the scope of the works deviates from the information provided, the project ecologist should be contacted for further advice:
- Before any works proceed all contractors should be made aware of the possible presence of bats, bat field signs to look for and procedure if bats are found or discovered (Appendix I);
 - Works should be scheduled to occur between November and April (inclusive), when bats are highly unlikely to be present within the building;
 - All roof removal works are to be undertaken by hand in the eastern corner of Building 2, in proximity to Building 1. Stripping prior to should be carried out with a suitably licenced ecologist on call during the works;
 - If works must be completed outside this time period, all soft stripping of the roof should be supervised by a suitably licenced and experienced ecologist;
 - If bats are encountered within the working area, all works must cease immediately and the on-call ecologist notified, who will attend site;
 - The ecologist will remove the bat, check the health of the bat and then place it in a suitable bat box; and
 - If a bat is discovered in imminent danger, carefully move the bat wearing gloves, and place within a suitable container (a covered box such as a shoe box) with air holes and place in a safe, dark and quiet location. Contact the project ecologist for further instruction.
- 5.8 Three trees with bat roosting potential (BT4, 5 & 7) will require felling to facilitate the proposed development. Prior to pruning or felling works of any tree with bat roosting potential (BT1 – 7, see Appendix E), a further in-depth inspection, including an aerial inspection if necessary, will be required to determine their use by bats.
- 5.9 Measures outlined to compensate for the loss of trees, shrub and scrub within the site (paragraph 5.4) will minimise impacts to foraging/commuting bats. Furthermore, it is recommended that a sensitive lighting scheme is incorporated into the development, in accordance with the appropriate guidance (ILP, 2018). Key considerations include:
- Switching off lighting at night or using motion sensors;
 - Use of sodium lighting over mercury or metal halide lamps; and,

- Temporary and permanent external lighting will be carefully directed to avoid light spillage onto bat roosting/foraging habitats.

Birds

- 5.10 Any necessary vegetation removal works and works affecting the roof and roof verge/eaves on B1, B4 and B5 will take place outside the breeding bird season (March to September inclusive) in order to prevent any impacts upon nesting birds.
- 5.11 If any of the above works must be carried out within the bird breeding season, vegetation and/or buildings; B4 and B5, will be subject to a pre-clearance bird survey carried out by a suitably experienced ecologist. No works will be carried out within 5 m of an identified nest until the young have fledged and are no longer returning to the nest site. Works will only be undertaken once a scheme ecologist has declared the nest to be no longer in use.
- 5.12 Mitigation for the loss of breeding bird habitat should include the planting of native species of trees and shrubs (see paragraph 5.4) and the provision of alternative nesting opportunities in the form of nest boxes within the new development.

Small mammals including hedgehog

- 5.13 During construction, any excavations associated with works should be covered overnight or fitted with egress boards to prevent animals becoming trapped. Any small mammals found within the works area during construction should be carefully relocated off-site to a sheltered and undisturbed location with plenty of vegetation cover.
- 5.14 If pruning or felling works to trees with squirrel dreys is required, this should be carried out when vulnerable young are not present so as to not cause unnecessary suffering. Despite grey squirrels being a non-native, invasive species, it is an offence to intentionally inflict unnecessary suffering to any wild mammal under the Wild Mammals (Protection) Act 1996. Should the species not be deterred from site on commencement of works, specialist assistance may be required to humanely deter the species from the site.

Enhancement measures

- 5.15 The following wildlife enhancement measures will also be delivered through the scheme:
- Log/brash piles will be created from any felled trees/hedgerow to attract invertebrates and fungi, which will also provide shelter and foraging resources for small mammals and amphibians.
 - Provision of artificial or natural hedgehog boxes located in a quiet undisturbed area with ground covering vegetation, preferably against a bank, wall or fence. For example, three or four logs may be arranged to leave an appropriately sized hole for a hedgehog to nest in, covered with abundant twigs and leaves.

Re-survey of the Site

- 5.16 If no works are undertaken on site within 12 months of this survey or if any changes to the proposals are made, a further ecological survey may be necessary (because of the mobility of animals and the potential for colonisation of the site).

References

British Standards Institution (2013) *BS 42020:2013 Biodiversity – Code of practice for planning and development*. British Standards Institution, London.

British Standards Institution (2012). *BS 5837:2012 Trees in relation to design, demolition and construction. Recommendations*: British Standards Institution, London.

CIEEM (2017a). *Guidelines on Ecological Report Writing*. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2017b). *Guidelines for Preliminary Ecological Appraisal 2nd Edition*. Chartered Institute of Ecology and Environmental Management, Winchester.

Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd Edition). The Bat Conservation Trust, London.

Edwards (2006). *Managing and controlling invasive rhododendron*. Forestry Commission: Edinburgh.

Natural England. (2017). Great crested newts: apply for a mitigation licence (A14) [ONLINE] Available at: <https://www.gov.uk/government/publications/great-crested-newts-apply-for-a-mitigation-licence>

Institute of Lighting Professionals (2018). *Bats and artificial lighting in the UK*. The Bat Conservation Trust, London.

JNCC (1993 revised 2010) *Handbook for Phase 1 Habitat Survey: A technique for environmental audit (reprint)*. Joint Nature Conservation Committee, Peterborough.

Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10 (4), 143-155.

Stace, C. (2010) *New Flora of the British Isles*. Third Edition. Cambridge University Press, Cambridge.

Appendix A - Legal Information

This report provides guidance of potential offences as part of the impact assessment. This report does not provide detailed legal advice and for full details of potential offences against protected species the relevant acts should be consulted in their original forms i.e. The Wildlife and Countryside Act, 1981, as amended, The Countryside and Rights of Way Act 2000, The Natural Environment and Rural Communities Act, 2006 and The Conservation of Habitats and Species Regulations 2017.

Species	Legislation	Offences	Notes on licensing procedures and further advice
Species that are protected by European and national legislation			
Badger	Protection of Badgers Act 1992	Wilfully kill, injure or take a badger; Intentionally or recklessly damage, destroy or obstruct access to a badger sett; Disturb a badger in its sett. It is not illegal to carry out disturbance activities in the vicinity of setts that are not occupied.	Where required, licences for development activities involving sett loss, damage or disturbance are issued by Natural England (NE). Licences for activities involving watercourse maintenance, drainage works or flood defences are issued under a separate process. Licences are normally not granted from December to June inclusive because cubs may be present within setts. https://www.gov.uk/badgers-protection-surveys-and-licences
Bats <i>European protected species</i>	Conservation of Habitats and Species Regulations 2017 Reg 41	Deliberately ¹ capture, injure or kill a bat; Deliberate disturbance ² of bats; Damage or destroy a breeding site or resting place used by a bat. The protection of bat roosts is considered to apply regardless of whether bats are present.	An NE licence in respect of development is required in England. https://www.gov.uk/bats-protection-surveys-and-licences <i>European Protected Species: Mitigation Licensing- How to get a licence</i> (NE 2010) <i>Bat Mitigation Guidelines</i> (English Nature 2004) <i>Bat Workers Manual</i> (JNCC 2004) <i>BS8596:2015 Surveying for bats in trees and woodland</i> (BSI, 2015)
	Wildlife and Countryside Act 1981 (as amended) ⁴ S.9	Intentionally or recklessly ³ obstruct access to any structure or place used for shelter or protection or disturb a bat in such a place.	Licence from NE is required for surveys (scientific purposes) that would involve disturbance of bats or entering a known or suspected roost site.

Species	Legislation	Offences	Notes on licensing procedures and further advice
Birds	Conservation of Habitats and Species (Amendment) Regulations 2012	N/A	Authorities are required to take steps to ensure the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the United Kingdom, including by means of the upkeep, management and creation of such habitat. This includes activities in relation to town and country planning functions.
	Wildlife and Countryside Act 1981 (as amended) ⁴ S.1	Intentionally kill, injure or take any wild bird; Intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; Intentionally take or destroy the nest or eggs of any wild bird. Schedule 1 species Special penalties are liable for these offences involving birds on Schedule 1 (e.g. most birds of prey, kingfisher, barn owl, black redstart, little ringed plover). Intentionally or recklessly³ disturb a Schedule 1 species while it is building a nest or is in, on or near a nest containing eggs or young; intentionally or recklessly disturb dependent young of such a species.	No licences are available to disturb any birds in regard to development. Licences are available in certain circumstances to damage or destroy nests, but these only apply to the list of licensable activities in the Act and do not cover development. General licences are available in respect of 'pest species' but only for certain very specific purposes e.g. public health, public safety, air safety. https://www.gov.uk/wild-birds-protection-surveys-and-licences https://www.gov.uk/prevent-wild-birds-damaging-your-land-farm-or-business
Other species Rabbits, foxes and other wild mammals For Species of Principal Importance, see below	Wild Mammals (Protection) Act 1996	Intentionally inflict unnecessary suffering to any wild mammal.	Natural England provides guidance in relation to rabbits (Technical Information note TIN003, Rabbits- management options for preventing damage, July 2007) and foxes (which are also protected under the Wildlife and Countryside Act 1981 from live baits and decoys, see Species Information notes SIN003 (2011), <i>Urban foxes</i> and SIN004 (2011) <i>The red fox in rural areas</i> as well as other wild mammals. Lawful and humane pest control of these species is permitted.

¹Deliberate capture or killing is taken to include "accepting the possibility" of such capture or killing

²Deliberate disturbance of animals includes in particular any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to affect significantly the local distribution or abundance of the species to which they belong.

Lower levels of disturbance not covered by the Conservation of Habitats and Species Regulations 2017 remain an offence under the Wildlife and Countryside Act 1981 although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided. Thus deliberate disturbance that does not result in either (a) or (b) above would be classed as a lower level of disturbance.

³The term 'reckless' is defined by the case of Regina versus Caldwell 1982. The prosecution has to show that a person deliberately took an unacceptable risk, or failed to notice or consider an obvious risk.

⁴ The Wildlife and Countryside Act (1981) has been updated by various amendments, including the Countryside and Rights of Way Act 2000 and the Natural Environment and Rural Communities Act 2006. A full list of amendments can be found at <http://jncc.defra.gov.uk/page-1377>.

Habitats & Species	Legislation	Guidance
Species and Habitats of Principal Importance for the Conservation of Biodiversity: Hedgehog	Natural Environment & Rural Communities Act 2006 S.40 (which superseded S.74 of the Countryside & Rights of Way Act 2000).	S.40 of the NERC Act 2006 sets out the duty for public authorities to conserve biodiversity in England. Habitats and species of principal importance for the conservation of biodiversity are identified by the Secretary of State in consultation with NE, are referred to in S.41 of the NERC Act for England. The list of habitats and species was updated in 2008: http://webarchive.nationalarchives.gov.uk/20140605090108/http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx The habitats and species listed are not necessarily of higher biodiversity value, but they may be in decline. Habitat Action Plans and Species Action Plans are written for them or are in preparation, to guide their conservation. Ecological impact assessments should include an assessment of the likely impacts to these habitats and species.
Rhododendron	Wildlife and Countryside Act 1981 (as amended) S.14	It is illegal to plant these species or otherwise cause them to grow or spread in the wild. <i>Managing and controlling invasive rhododendron</i> (Forestry Commission, 2006) <i>Guidance on Section 14 of the Wildlife and Countryside Act, 1981</i> (Defra, 2010)

Appendix B - Bat Roost Potential and Habitat Suitability Categories

Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape (Collins, 2016).

Suitability	Description of Roosting Habitat	Commuting & Foraging Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitats to be used on a regular basis or by a larger number of bats (i.e. unlikely to be suitable maternity or hibernation). A tree of sufficient size and age to contain potential roosting features but with none seen from the ground, or feature seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions, and surrounding habitat but unlikely to support a roost of high conservation status.	Continuous habitat connected to the wider landscape that could be used by bats for commuting, such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging, such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis, and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats, such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close and connected to known roosts.

Appendix C - Target Notes and Trees with Bat Potential

TN / Tree no.	Description	Photo
TN1	Line of mature and semi-mature trees along the southern edge of the eastern car park. Species comprise <i>Prunus</i> sp., ash and beech. These trees were assessed as having negligible potential to support roosting bats. The eastern most beech tree has a large squirrel drey at approximately 10 m.	
TN2	Line of mature and semi-mature trees and mature shrubs close to eastern perimeter. Species include lime sp., oak and sycamore, together with a young yew tree and frequent rhododendron shrubs. The ground beneath the trees has been subject to recent ground preparation and planting and was mostly bare soil at the time of survey. Grey squirrels were regularly observed during the survey and dreys were recorded within a number of the trees at this location.	
TN3	Landscaped area surrounded by hardstanding comprising frequent mature rhododendron and other ornamental shrubs, together with occasional holly and yew trees. Ground flora is very limited with abundant dead leaves in places.	
TN4	The northern boundary comprises semi-mature and mature trees, together with frequent ornamental shrubs and tree saplings. Species include lime sp., holly, rhododendron, yew, beech, and sycamore. Other than BT6 all of these trees were assessed as having negligible potential to support roosting bats. The ground beneath the trees has been subject to recent ground preparation and planting and was mostly bare soil at the time of survey. Grey squirrels were regularly observed during the survey and dreys were recorded within a number of the trees at this	

	location.	
TN5	A number of mature trees just beyond the sites north perimeter comprise features that are likely to be suitable for roosting bats.	
TN6	The western perimeter of site comprises a planting bed with a number of ornamental shrubs including rhododendron, privet and Wilson's honeysuckle adjacent to a car park. A mature sycamore tree and small number of beech saplings are located at the edge of the car park, within the north-east corner of the site.	
TN7	Landscaped area comprising amenity grassland surrounded by planting beds. The amenity grassland is managed and was at a very short sward at the time of survey. The sward is of limited species diversity with daisy, white clover, pointed spear-moss, cats ear and a meadow grass species observed. The planting beds had been subject to recent ground preparation and planting and was mostly bare soil at the time of survey.	
BT1	Semi-mature sycamore tree with a small, north facing tear-out feature at 1 metre. No other potential roosting features were observed within the tree. Overall, the tree is assessed as having low potential to support roosting bats.	
BT2	Mature pedunculate oak tree with a number of potential roosting features including a north-east facing knot hole at approximately 8 metres. Overall the tree is assessed as having moderate potential to support roosting bats.	

BT3	Semi-mature lime sp. with a number of potential roosting features including shallow knot holes and slight fluting. Overall the tree is assessed as having low potential to support roosting bats. A squirrel drey was observed within this tree.	
BT4	Semi-mature yew tree with frequent shallow fluting. Overall the tree is assessed as having low potential to support roosting bats.	 
BT5	A young holly tree with a north facing tear-out at 1.5 m that comprises narrow but deep upwards leading internal cavity. Overall the tree is assessed as having low potential to support roosting bats.	
BT6	Tall, semi-mature sycamore tree with a knot hole at approximately 10 m that potentially comprises a cavity suitable for roosting bats. Overall the tree is assessed as having low potential to support roosting bats.	

BT7	Relatively young yew tree with occasional shallow fluting and a weld feature. Overall the tree is assessed as having low potential to support roosting bats.	
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Appendix D - Building Descriptions, Inspection Results and Photographs

Building number	Description	Photograph
B1	<u>External</u> – A mid-19th century building of red brick construction, currently used as offices. The building is two to three storeys in height, with a basement. The windows and doors are in good condition and well-sealed to the brickwork, with no access points for bats noted. The roof is multi-pitched with one brick chimney stack; a close-up examination of the pitches on the southern section of the building was undertaken from the roof of B2. The roof tiles and ridge tiles are slate and in moderate condition. Occasional lifted and slipped tiles create Potential Roosting Features (PRF) for bats, missing ridge tiles have been replaced with lead flashing which has warped, creating potential access points and PRF for bats. Lead flashing has also been used to seal the chimney stack to the brickwork, to seal the skylights to the brickwork. The lead flashing across the roof is lifted, creating potential access points and PRF for bats. The gable ends of multi-pitched roofs are present on the eastern (plate 1) and northern (plate 2) elevation and feature timber eaves. From the ground inspection the eaves appear to be well sealed to the brickwork, however it is possible that there are concealed access points for bats beneath the eaves, which were not observed from ground level. The western elevation (plate 3) is pitched, with a timber soffit board present. From the ground level this appears to be well-sealed to the brickwork, however it is possible that there are concealed access points for bats. B2, the modern extension building is adjoined to B1 from the southern elevation (plate 3). White staining on the walls, most likely from nesting / roosting birds is present on the eastern, northern and western elevations. Bird deterrent spikes were also noted on the ledges beneath the eaves. <u>Internal</u> – The loft void (plate 4) of the two sections of pitched roof to the south east of B1 was accessible for inspection. The loft voids were naturally lit due to the presence of two skylights. Exposed timber beams have roof membrane lining between them, which is in moderate condition, with only occasional lifting and tears. Insulation is present on the floor between timber ceiling joists. A small hole was noted on the southern elevation of the roof, creating a potential entry point for	 Plate 1: B1 eastern elevation  Plate 2: B1 northern elevation  Plate 3: B1 western elevation

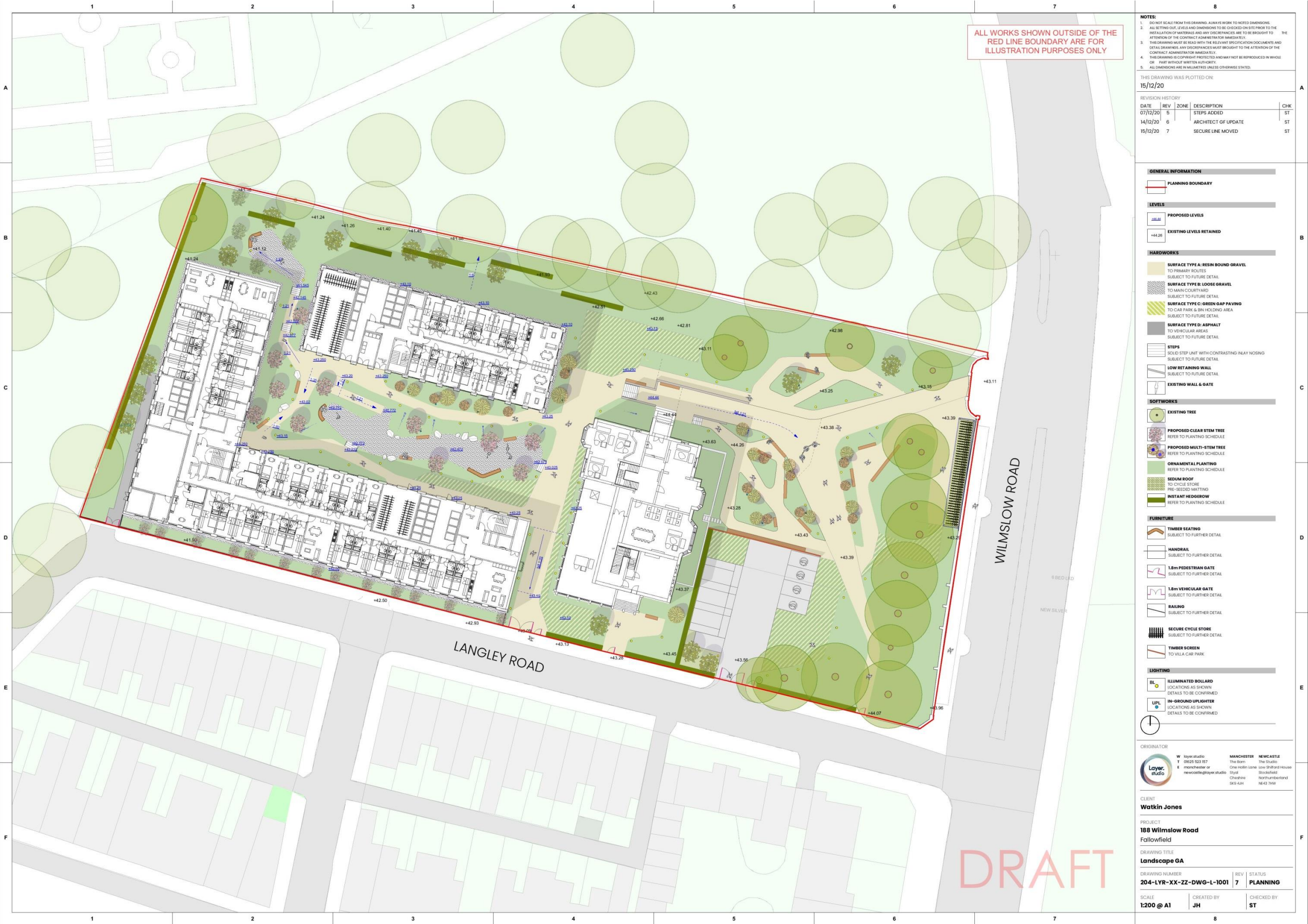
Building number	Description	Photograph
	bats. Partitioning brick walls are in poor condition, with holes present which lead to further, inaccessible loft voids. Missing mortar (image 5) in the brickwork provides access points to crevices for bats. Despite being naturally lit, the complex layout of the loft void creates multiple dark areas and crevices for bats. No evidence of bats was noted during the internal or external inspection. Overall the building is considered to have moderate potential for roosting bats. Not all loft voids were accessible for survey, it is possible that those un-surveyed will be more suitable for roosting bats due to the absence of skylights.	 Image 4: B1 southern section of loft void  Image 5: B1 missing mortar
B2	A three-storey extension, which joins the southern elevations of B1 and B3. The building is a modern red brick construction, currently utilised as commercial offices and warehouse space. The roof is flat, with concrete facings, which are well sealed to the wall-top brickwork. No PRFs for bats were noted on the roof or along the wall-tops. The mortar on all elevations is in excellent condition and well-sealed. PVC windows and doors are all in good condition, with no entry points or PRFs for bats. Overall B2 is considered to offer negligible potential for roosting bats.	 Figure 6: B2 northern elevation.
B3	A two-storey modern extension, which joins the northern elevation of B2, is currently utilised as offices and a covered carpark. The roof is flat, with concrete facings that are well sealed to the wall-top brickwork. The brickwork, windows and doors are in excellent condition on all elevations well-sealed to the brickwork and with no gaps in the mortar. Louvered ventilation panels are present on the eastern elevation; however, wire meshing prevents access for bats. There is a covered car park in the centre of the building. The ceiling of the car park is in good condition, with no PRFs for bats noted. The carpark is naturally lit and also has multiple light fittings, creating sub-optimal conditions for bats. Overall B3 is considered to offer negligible potential for roosting bats	 Figure 7: B3 eastern elevation.

Building number	Description	Photograph
B4	A small, single-storey red brick building, currently utilised as a garden workshop. The roof is a lean-to/mono pitch, north facing roof, which, is constructed of a combination of plastic and corrugated metal sheeting. There are multiple entry points for bats beneath the corrugated sheeting, however, the fluctuations in temperature associated with the roofing materials is considered to create sub-optimal roosting conditions for bats. The brick walls are in moderate condition, with some missing mortar, however, closer inspection revealed that these areas do not lead to crevices suitable for bats. The door is timber and in moderate condition, no access points for bats were noted. The windows have been sealed up with breezeblocks, providing no PRFs or entry points for bats. Internally the building is naturally lit due to the sections of transparent corrugated plastic roofing. No evidence of roosting bats was found. Overall B4 is considered to provide negligible potential for roosting bats.	 Image 8: B4 north and western elevations
B5	A small, single-storey red brick building, currently utilised as a bike store. The southern elevation forms part of the site boundary wall. The roof is lean-to/mono pitch, south facing and constructed of corrugated metal. Lead flashing seals the roofing to the building. Despite the lead flashing being in good condition, there are multiple entry points for bats beneath the corrugate sheeting. As described in B4, the roofing material is considered to provide sub-optimal conditions for roosting bats due to extreme temperature fluctuations. Three doors are present on the southern elevation, with large gaps, providing entry points for bats above the two outer doorways. The internal inspection revealed that while the space was dark, there were no PRFs for bats and no evidence of roosting bats was found. Overall B5 is considered to provide negligible potential for roosting bats.	

Appendix E - Phase 1 Habitat Plan



Appendix F – Proposed Landscaping Plan



Appendix G – Dusk Emergence Bat Survey Results

Time	Species	Activity
Surveyor 1 (FS, northern face of Building 1)		
18:54 – 19:12	Common pipistrelle	1 bat foraging behind surveyor, above the tree canopy and into the park
19:01	Common pipistrelle	Foraging and socialising, from north-west to north-east along treeline
19:08	Common pipistrelle	As above, opposite direction
19:21	Common pipistrelle	Commuting brief pass Heard Not Seen (HNS), then foraging behind surveyor
19:25	Common pipistrelle	Foraging in front of surveyor, in open area next to northern face of building, then commute to Surveyor 2
19:33	Common pipistrelle	Foraging, flying low, between Surveyor 2 and 3
19:35	Common pipistrelle	Commute from Surveyor 2, forage along treeline then into park behind surveyor
19:35	Common pipistrelle	Commute from Surveyor 3, forage along treeline then into park behind surveyor
19:38	Common pipistrelle	Foraging and commuting along edge of trees into park
19:40 – 20:19	Common pipistrelle	At least 2 bats frequently foraging and socialising throughout rest of survey, HNS and some in open area to north of building
Surveyor 2 (SR, western face of Building 1)		
19:06	Common pipistrelle	Very faint, HNS
19:09	Common pipistrelle	Faint pass, HNS
19:17	Common pipistrelle	Faint pass, HNS
19:23	Common pipistrelle	Quick foraging pass, HNS
19:26	Common pipistrelle	Foraging in front of building and in garden
19:28	Common pipistrelle	Foraging over building
19:33	Common pipistrelle	Foraging and social calling over garden
19:37	Common pipistrelle	Foraging over garden
19:41	Common pipistrelle	Lots of foraging
19:45	Common pipistrelle	Foraging between trees
19:47	Common pipistrelle	Foraging and social calls, HNS
19:49	Common pipistrelle	Foraging over building
19:53 – 19:56	Common pipistrelle	Foraging over garden
19:56	Common pipistrelle	Social calling HNS
20:00	Common pipistrelle	Foraging continues HNS, social calls
20:04	Common pipistrelle	Foraging behind surveyor, social calls
20:08	Common pipistrelle	Foraging continues HNS, social calls
20:12 – 20:16	Common pipistrelle	Continuous foraging and social calling, HNS
Surveyor 3 (HD, eastern face of Building 1)		
19:22	Common pipistrelle	HNS, brief pass
19:39	Common pipistrelle	HNS, brief pass
19:46	Common pipistrelle	HNS, social calls
19:47	Common pipistrelle	HNS, social calls
19:49	Common pipistrelle	HNS, brief pass
19:55	Common pipistrelle	HNS, brief pass
19:58	Common pipistrelle	HNS, brief pass
19:58	Common pipistrelle	Moved further north due to bright lights on south-east of building limiting

		visibility. HNS, brief pass
19:59	Common pipistrelle	HNS, brief pass
20:04	Common pipistrelle	HNS, social calls
20:05	Common pipistrelle	HNS, social calls
20:07	Common pipistrelle	HNS, social calls
20:11	Common pipistrelle	HNS, social calls
20:12	Common pipistrelle	HNS, social calls
20:14	Common pipistrelle	Foraging and social calls
20:18	Common pipistrelle	HNS, social calls

Appendix H - Suitable Native Species for use in Planting Schemes

Scientific name	Common Name	Scientific name	Common Name
Large Trees		Large Shrubs	

<i>Alnus glutinosa</i>	Alder	<i>Cornus sanguinea</i>	Dogwood
<i>Betula pendula</i>	Silver birch	<i>Euonymus europaeus</i>	Spindle
<i>Carpinus betulus</i>	Hornbeam	<i>Juniperus communis</i>	Juniper
<i>Fagus sylvatica</i>	Beech	<i>Ligustrum vulgare</i>	Wild privet
<i>Fraxinus excelsior</i>	Ash	<i>Rhamnus cathartica</i>	Buckthorn
<i>Ilex aquifolium</i>	Holly	<i>Rosa caesia</i>	Hairy dog rose
<i>Pinus sylvestris</i>	Scots pine	<i>Rosa canina</i>	Dog rose
<i>Populus nigra</i>	Black poplar	<i>Rosa micrantha</i>	Small-flowered sweet briar
<i>Quercus petraea</i>	Sessile oak	<i>Rosa stylosa</i>	Short-styled field rose
<i>Quercus robur</i>	English oak	<i>Rosa tomentosa</i>	Harsh downy rose
<i>Salix alba</i>	White willow	<i>Salix myrsinifolia</i>	Dark-leaved willow
<i>Salix fragilis</i>	Crack willow	<i>Salix purpurea</i>	Purple willow
<i>Tilia cordata</i>	Small leaved lime	<i>Salix aurita</i>	Eared willow
<i>Tilia platyphyllos</i>	Large-leaved lime	<i>Viburnum lantana</i>	Wayfaring tree
<i>Ulmus glabra</i>	Wych elm	<i>Viburnum opulus</i>	Guelder rose
<i>Ulmus minor</i>	small-leaved elm		
<i>Ulmus procera</i>	English elm		
Medium Tree		Medium Shrubs	
<i>Betula pubescens</i>	Downy birch	<i>Cytisus scoparius</i>	Broom
<i>Crataegus monogyna</i>	Hawthorn	<i>Rosa agrestis</i>	Small-leaved sweet briar
<i>Populus tremula</i>	Aspen	<i>Rosa arvensis</i>	Field rose
<i>Prunus avium</i>	Wild cherry	<i>Rosa mollis</i>	Soft downy rose
<i>Prunus padus</i>	Bird cherry	<i>Rosa rubiginosa</i>	Sweet briar
<i>Salix caprea</i>	Goat willow	<i>Rosa sherardii</i>	Sherard's downy rose
<i>Salix pentandra</i>	Bay willow	<i>Sorbus anglica</i>	English whitebeam
<i>Salix triandra</i>	Almond willow	<i>Ulex europaeus</i>	Gorse
<i>Sorbus aria</i>	Whitebeam	<i>Ulex gallii</i>	Western gorse
<i>Sorbus aucuparia</i>	Rowan		
<i>Sorbus domestica</i>	Wild service tree		
<i>Taxus baccata</i>	Yew		
Small trees		Small shrubs	
<i>Acer campestre</i>	Field maple	<i>Rosa pimpinellifolia</i>	Burnet rose
<i>Arbutus unedo</i>	Strawberry tree	<i>Ruscus aculeatus</i>	Butchers broom
<i>Buxus sempervirens</i>	Box	<i>Salix herbacea</i>	Dwarf willow
<i>Corylus avellana</i>	Hazel	<i>Salix lanata</i>	Woolly willow
<i>Crataegus laevigata</i>	Midland hawthorn	<i>Salix lapponum</i>	Downy willow
<i>Malus sylvestris</i>	Crab apple	<i>Salix myrsinites</i>	Whortle-leaved willow
<i>Prunus spinosa</i>	Blackthorn	<i>Salix reticulata</i>	Net-leaved willow
<i>Pyrus cordata</i>	Plymouth pear		
<i>Frangula alnus</i>	Alder buckthorn		
<i>Salix cinerea</i>	Grey willow		
<i>Salix viminalis</i>	Osier		
<i>Sambucus nigra</i>	Elder		

Appendix I - Information for Contractors on Bats

BATS



Information, legal responsibilities and best practice for the construction industry

Legal Protection

All UK Bat species are protected by European and UK law, in practical terms this means it is an offence to:

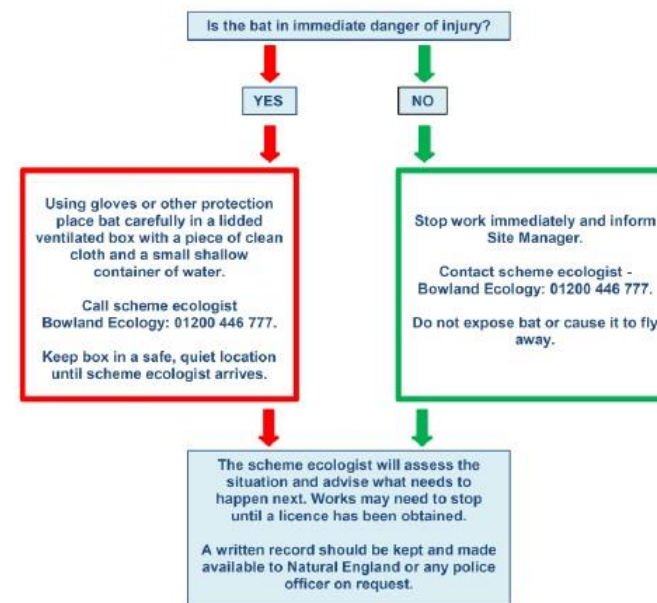
- Deliberately capture, injure or kill a bat;
- Deliberately disturb bats;
- Damage or destroy a breeding site or resting place (even if bats are not occupying the roost at the time);
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb a bat in such a place;
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat.

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.

Defences include:

1. Tending/caring for a bat solely for the purpose of restoring it to health and subsequent release.
2. Mercy killing where there is no reasonable hope of recovery (provided that person did not cause the injury in the first place – in which case the illegal act has already taken place).

Found a bat during unsupervised works?



Field signs of bat presence:

- Live or dead bats: the smallest UK bat species, the pipistrelle is only 3.5-4.5cm long.
- Droppings: bat droppings look like mouse droppings but will crumble between your fingers (they are dry and made entirely of insects).
- Feeding remains: piles of butterfly/moth wings are often left below bat feeding perches.



Places that bats may use in buildings



Schematic from www.bats.org.uk

Bats can roost in the following places:

- The top of gable end or dividing wall;
- The top of chimney breasts;
- Ridge and hip beams and other roof beams;
- Mortise and tension joints;
- All beams/ceilings/pipework (free hanging bats);
- The junction of roof timbers, especially where ridge and hip beams meet;
- Behind purlins;
- Between tiles and the roof lining;
- Under flat felt roofs;
- In trees (cracks/holes/ivy cladding) ;
- Under barge boards;
- In cavity walls;
- In cracks in stone or concrete;
- Behind peeling paint/wall coverings;
- Gaps behind window and door frames;
- Between window panes and timber boarding.

Why wear gloves?

There is a small risk that some bats carry a rabies virus – European Bat Lyssavirus. The purpose of wearing gloves is to reduce the chance of being bitten, as the virus is transmitted via bat saliva. Thick leather gloves are appropriate for removing a bat from imminent danger but these should be clean.



In the event that you are bitten, wash the wound, gently but thoroughly, with soap and water. Speak to a health professional immediately, advising them that you have been bitten by a bat.

References:

Bat Conservation Trust. August 2016. Why wear gloves when handling bats?
BCT Bat Surveys for Professional Ecologists, Good Practice Guidelines, 3rd Edition, 2016

version 1 August 2017

BATS AND ARBORICULTURAL WORKS



Information, legal responsibilities and best practice

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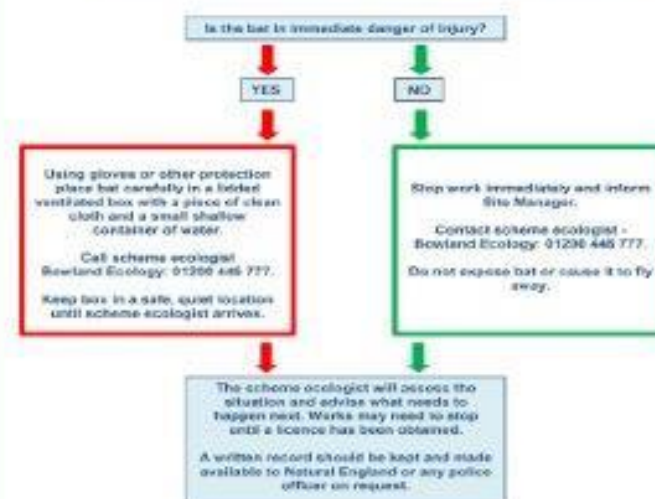
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References:

Bat Conservation Trust. August 2016. Why wear gloves when handling bats?
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How are trees important to bats?



Bats can roost in the following places:

- Woodpecker holes, rot holes, hazard beams,
- Vertical or horizontal cracks and splits in stems or branches,
- Partially detached platey bark, gaps between overlapping stems, double leaders forming compression forks
- Knot holes arising from naturally shed branches, or branches previously pruned back to the branch collar,
- Man-made holes, cankers caused by localised bark death,
- Cavities created by branches tearing out from parent stems,
- Other hollows and cavities, including butt-rot
- Partially detached ivy with stem diameters over 50mm.

Field signs of bat presence:

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