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**Hatch End Industrial Estate, Middle Aston,  
Bicester, Oxfordshire OX25 5QL**

**Bat Survey Report  
&  
Bat Mitigation Strategy**

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**October 2019**

***on behalf of Middle Aston Ltd***

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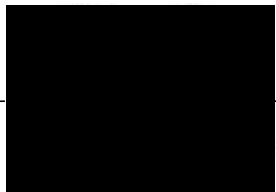
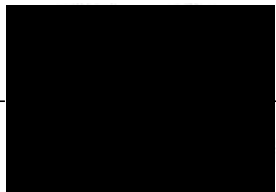
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<b>Client</b>	Middle Aston Ltd
<b>Job name</b>	Hatch End Industrial Estate, Middle Aston, Bicester, Oxfordshire OX25 5QL
<b>Survey dates</b>	16 <sup>th</sup> October 2018, 15 <sup>th</sup> August 2019, 3 <sup>rd</sup> September 2019 & 25 <sup>th</sup> September 2019
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## 1 Introduction

### 1.1 Site Description and Context

Hatch End Industrial Estate, referred to as 'the site' for the purposes of this report, is located to the western side of Fir Lane within the hamlet of Middle Aston. The central Ordnance Survey grid reference for the site is SP 4754 2648. Middle Aston is located to the immediate north of the neighbouring village of Steeple Aston in the Cherwell district of Oxfordshire. Please refer to Appendix 1 for site location plans.

The industrial estate consists of eight commercial buildings set amongst areas of hard-standing and amenity grassland. The majority of the buildings are former poultry sheds consisting of simple rectangular structures with wooden panel walls and pitched roofs of corrugated asbestos/metal. Site boundaries are formed by tree lines to the north and east, a hedgerow to the south and the edge of a double planted tree belt to the west. The wider landholding incorporates a greater extent of the double tree belt, along with additional areas of grassland and hedge, and is bound by an area of deciduous woodland to the south.

The focus of the current study is two of the buildings within the industrial estate; a single storey office building (Building F) located directly opposite the main access point onto the site from the Fir Lane to the east, and a converted agricultural barn (Building D) located approximately 15m to the west of the office (see Figure 1).



Figure 1. The locations of the study buildings (in yellow) at Hatch End Industrial Estate (outlined in red)

The site exists in a rural location, with open countryside extending to the east and west. Middle Aston House, a country manor house set in extensive grounds, is located to the immediate north of the site; the property grounds include several large waterbodies and areas of woodland copse. The landscape surrounding Middle Aston is dominated by agriculture, with arable fields and areas of improved pasture set within a network of interconnecting hedgerows. The River Cherwell flows north-south approximately 850m to the east of the site and presents a notable ecological feature within the environs of settlement.

## 1.2 Background

A Preliminary Ecological Appraisal of the site was carried out by Windrush Ecology Ltd on the 16<sup>th</sup> October 2018 and included a Preliminary Roost Assessment of the each of the buildings present (Windrush Ecology Ltd 2018).

The appraisal concluded the majority of buildings present had 'negligible' potential to provide shelter to roosting bats, with Building F being assessed as having 'low' bat roost potential. This assessment stemmed from the presence of gaps within the exterior of the building and the fact it contained a loft void that could not be accessed during the preliminary appraisal.

Due to Building F's 'low' bat roost potential assessment, it was recommended that bat emergence/re-entry surveys be undertaken to determine the presence/likely absence of roosting bats within the building. Windrush Ecology Ltd was commissioned to undertake the recommended further surveys and provide a relevant mitigation strategy, if required, in order to inform a planning application.

## 1.3 Proposed Works

There is a proposal to re-develop the site for commercial use and will involve the removal of all existing buildings.

See Appendix 4 for indicative proposals' plans.

## 1.4 Aims

The aims of the current study are to survey undertake emergence surveys of Building F in order to determine the presence/likely absence of roosting bats within the building, and to characterise the status of any roosts identified. The report discusses the likely impacts of proposals on bats and their roost sites and makes recommendations for appropriate mitigation, compensation and enhancement measures in this regard. The potential impacts of the development are assessed in accordance with the legal protection afforded to bats and their roost sites under The Conservation of Habitats & Species Regulations 2017 and the Wildlife and Countryside Act 1981.

The need for a European Protected Species (bat) licence is also discussed in light of the impact assessment. A Bat Mitigation Strategy is developed in order to protect bats and their habitats and to ensure the favourable conservation status of bat species.

It should be noted that although not forming one of the initial aims of the study, the incidental observation of a single bat emergence from Building D during an emergence survey focused Building F resulted in the identified bat roost within Building D also being taken into account when considering potential impacts and developing an appropriate bat mitigation strategy.

## 1.5 Bat Ecology

Bats are the only mammals to have developed the ability of true flight. At present, over 1,100 species of bat are recognised worldwide, making bats the second largest mammal group after rodents. As well as flight, bats have evolved a system of navigation and orientation using echolocation which has allowed many species to become nocturnal. There are 18 species of bat that occur within the British Isles, of which 17 are known to breed here. More species occur in the south and west of the country, with species numbers declining towards the north and into Scotland.

All bat species in the UK are nocturnal and feed exclusively on insects (they are insectivorous) which they catch in flight during their night-time activity, using echolocation to locate and home-in on their prey. Bats will roost during the daytime and seek out dark, enclosed and undisturbed places in which to do so, often using a variety of roosting sites within their home range. Different roost sites are used for different purposes (such as mating, giving birth and hibernation) and at different periods of a bat's life cycle.

During the summer, female bats will gather together in a maternity or breeding roost. In the UK, this starts to occur towards the end of May and the females will seek out a warm and undisturbed site in which to give birth. Because maternity roosts require a particular set of environmental attributes (such as location, temperature, orientation and size), breeding bats tend to return to roost and breed in the same locations year after year. Given that bats live a relatively long time (anywhere from 10-20 years), and only give birth to one pup a year, maternity colonies are crucial to the reproduction and survival of the local population and can be very sensitive to environmental change.

Relatively little is known about hibernation roosts, as tracking and locating hibernating bats is very difficult. However, many species (particularly those within the genera *Myotis* and *Rhinolophus*) have been found within underground sites such as caves, mines and cellars, where the temperature remains constant and low throughout the winter allowing the bats to remain in a state of torpor. The spring and autumn are periods of transition and bats can use a number of different locations on a temporary basis, often moving between roosts as environmental conditions change and temperatures fluctuate. In the autumn, bats will mate and it has been shown that male and female bats will gather at particular locations (such as a building, cave or tree) to meet, socialise and mate.

Bats choose to roost in a number of different locations, depending on the species, their activity pattern and the period of their lifecycle. Certain species, such as the pipistrelles, favour crevices and small cavities for roosting and will use features such as cracks, crevices and small rot holes in the boughs and trunks of trees and within certain features of buildings such as boxed eaves, gaps under roof tiles, hanging tiles and soffit boards. Other species favour large, uncluttered roof spaces and lofts within buildings where they can hang up on the underside of the roof and use the interior space for flying prior to emergence. Hollow trees, cellars, caves, barns, churches and cavity walls can also all be used for roosting, given suitable access. Certain species, such as the noctule, favour roosting sites within trees whilst others tend to favour buildings. Roost sites may be used by only a very small number of bats, such as solitary males, or may offer shelter to tens or hundreds of bats within maternity and hibernation roost sites.

The suitability of roosting sites is also highly influenced by the location or context of a tree, building or cave. Roost sites are most often favoured when they are within close proximity to foraging habitats and where those habitats are connected to one another within the landscape by features such as hedgerows, woodlands, rivers or sunken lanes along which bats disperse and 'commute' from place to place. Suitable foraging habitats are any places where insect prey is diverse and abundant such as woodlands, ponds, lakes, rivers, scrub, hedgerows and unimproved grassland or pasture. Thus, the ecological context of a site is very important for determining if bats may be present within a roost and the potential for a roost to be present tends to be much higher within rural or village locations.

## **2 Methodology**

### **2.1 Limitations on Survey Data**

As with any survey undertaken on a certain date, the data presented within this report provide information at a particular point in time and present a 'snap-shot' of the ecological status of the site. Ecosystems and species behaviour/activity are dynamic and can change over time. Whilst this report presents a characterisation and evaluation of species status at the time of the study, it should not be

taken as an exhaustive representation of the ecological status of the site either at present or into the future.

## 2.2 Bat Activity Surveys

Bat activity surveys of Building F were undertaken to establish presence/absence of roosting bats and to characterise any roosts identified. The bat activity surveys were conducted by two surveyors on the 15<sup>th</sup> August 2019, 3<sup>rd</sup> September 2019 and 25<sup>th</sup> September 2019. For details of the surveyors during each of the surveys please see Table 1.

Table 1. Bat activity survey schedule.

Date	Surveyors
15/08/19	Robbie Birkett <i>MSci</i> Sam Prior
03/06/19	Robbie Birkett <i>MSci</i> Reuben Hayden
25/09/19	Jan-Piet Stuursma Oliver Bevan <i>MEnvSci</i>

Please refer to Table 2 for timings and weather conditions during the bat activity surveys and Figure 2 for the location of surveyors for each survey.

Table 2. Timings and weather conditions during bat activity surveys at Hatch End Industrial Estate.

Date	Timing	Sunset/ Sunrise	Temp (Start)	Temp (Finish)	Weather (at start of survey)
15/08/19	20:17-22:02	20:32	16°C	15°C	Clear (0% cloud cover), dry and with a light air (Beaufort Scale 0)
03/06/19	19:40-22:25	19:55	17°C	15°C	Overcast (100% cloud cover), dry and with a gentle to moderate breeze (Beaufort Scale 3-4)
25/09/19	18:43-20:28	18:58	17°C	14°C	Cloudy (70% cloud cover), with a short early rain shower and light breeze (Beaufort Scale 2)

Notes were made on any emergences from the building, as well as incidental bat foraging and commuting behaviour. All surveyors were equipped with Echometer Touch bat detectors to listen to and record bat calls. The Echometer Touch allows for real-time analysis of sonograms. The bat activity surveys were undertaken in accordance with best practice guidelines (Collins 2016).

During the final activity survey on the 25<sup>th</sup> September 2019 a single bat emergence was noted from Building D by the surveyor positioned to the north-west of Building F.

## 2.3 Daytime Building Inspection

An inspection of Building F's loft space was undertaken immediately prior to the emergence survey on the 15<sup>th</sup> August 2019 by Robbie Birkett *MSci* and Sam Prior. Mr Birkett holds a licence from Natural England to survey bats within all counties of England (WLM-A34-Level 1 2019-39934-CLS-CLS).

A detailed internal survey of the building was undertaken using a 1 million candle-power torch in order to look for bats and/or evidence of bats such as bat droppings. Notes were made on the relative freshness, shape and size of bat droppings, along with location and quantity.





Figure 2. Position of surveyors during the dusk emergence surveys undertaken at Hatch End Industrial Estate. Blue circles denote surveyors during survey on the 15/08/19. Yellow circles denote surveyors during surveys on the 03/09/19 & 25/09/19. Building F outlined in purple.

### 3 Results

#### 3.1 Building Descriptions

Please refer to *Appendix 2* for photographs of the two buildings.

##### 3.1.1 Building F

Building F covers a roughly 'U'-shaped footprint, formed by a main rectangular section with two protruding gables at its eastern elevation. The building is constructed upon a plinth of concrete blockwork with walls of tight-fitting wooden shiplap boarding. Wooden boxed eaves exist at the roof-wall junctions, with gaps observed at the northern and southern gables.

The roof is pitched and covered with concrete pantiles, laid over a bitumen and hessian underfelt. Roof tiling is in a good state of repair with no slipped or missing tiles, although close inspection identified some small gaps between tiles. A single small gap was observed at the north-eastern corner of the roof where an area of missing mortar creates a potential roost feature beneath a roof tile. A central cupola (clock tower) exists within the ridge of the roof and is created from wooden sides with a hipped roof of lead flashing. Lead flashing is also present around the base of the cupola where it joins with the main roof surface.

A single loft void extends over the entire footprint of the building, with this space only interrupted by an enclosed 0.5m x 0.5m cuboidal box which extends through the ceiling below and houses the mechanical workings for the clock on the roof above. The void is uncluttered and exhibits minimal cobwebbing. Walls at the four gable ends are un-lined, with the single skin wooden panelling evident



from within void. The bitumen felt which underlines the roof tiles is visible throughout and is in a variable condition with some large tears noted.

### 3.1.2 Building D

Building D is a converted agricultural barn that is used as an arts and crafts workshop/storage facility. The building is rectangular in shape and set atop a plinth of concrete blockwork. The building's walls are created from tight-fitting wooden shiplap boarding. Wooden boxed eaves exist at the roof-wall junctions of the northern and southern gable ends. A small gap is created at the southern elevation due to a damaged bargeboard. A large hole exists within the northern wall (towards the apex), the hole has been partially sealed by boarding from the inside, however a significant gap remains at the top of the feature providing access into the roof space.

Two accessible loft spaces exist within the roof of Building D and are separated from the workspace below by a wooden panel ceiling. The loft space within the northern section of the building has an approximate floor-ridge height of 1.25m, whereas the void within the southern section is shallower (max 1m). Both spaces contain a thick layer of dirt throughout, with dense accumulations of cobwebbing at the ridge. The underside of the roof is unlined within both loft spaces.

## 3.2 Evidence of Bats

### 3.2.1 Building F

A total of approximately 500 bat droppings were observed within building F's loft void during the inspection carried out on the 15<sup>th</sup> August 2019. The bat droppings were noted to be predominantly scattered throughout the space, with a denser accumulation of approximately 100 droppings present below the point where the ridge boards for the main section and southern gable meet.

All bat droppings observed were of a size and shape indicative of the brown long-eared bat *Plecotus auritus*, with a number of droppings appearing fresh, indicating the presence of bats within the 2019 bat activity period.

### 3.2.2 Building D

No bats or evidence of bats was found in association with Building D during the internal and external inspection of this structure on the 16<sup>th</sup> October 2018.

## 3.3 Bat Activity Surveys

### 3.3.1 Building F

#### 3.3.1.1 15<sup>th</sup> August 2019

Two soprano pipistrelles *Pipistrellus pygmaeus* were seen to emerge from the boxed eaves on eastern gable end of Building F's southern gable (see Figure 3). The soprano pipistrelle emergences were noted at 20:38 and 20:43.

Two brown long-eared bats were recorded emerging from tiles on the eastern pitch of Building F's roof, at a location between the two eastern gables (Figure 3). These emergences were noted between 21:13 and 21:21.

#### 3.3.1.2 3<sup>rd</sup> September 2019

One soprano pipistrelle was recorded emerging from the eaves on the southern gable of Building F. This observation was made at 19:59, with the location of emergence corresponding with those for the two soprano pipistrelles on the previous dusk survey. This observation was made at 19:59.

One brown long-eared bat was seen to emerge at 20:25 from under tiles on the eastern pitch of Building F's roof. Again, the emergence location closely corresponds with the brown long-eared bat emergence locations from the previous activity survey.

### 3.3.1.3 25<sup>th</sup> September 2019

Two soprano pipistrelles were seen to emerge from the eaves on Building F's southern gable between 18:59 and 19:19.

One brown long-eared bat was seen to emerge from an area of tiles close to the cupola, on Building F's western roof pitch. This recording was made at 19:38.



Figure 3. Photograph showing Building F, viewed from the east. White arrow indicates boxed eaves from which soprano pipistrelles were seen to emerge during three bat activity surveys. White circle indicates approximate area of roof from which brown long-eared bats were seen to emerge on the 15/08/19 & 03/09/19.

### 3.3.2 Building D

#### 3.3.2.1 25<sup>th</sup> September 2019

One soprano pipistrelle was seen to emerge from the hole at the apex of Building D's northern gable end (see Figure 4). This recording was made at 19:04 during an emergence survey focused upon Building F.

No further emergences were noted from Building D.



Figure 4. Photograph showing Building D, viewed from the north-east. White arrow indicates emergence location for one soprano pipistrelle on the 25/09/19.

### 3.3.3 Summary

#### Building F

- **Two soprano pipistrelles** and **two brown long-eared bats** seen to emerge from Building F on 15<sup>th</sup> August 2019
- **One soprano pipistrelle** and **one brown long-eared bat** seen to emerge from Building F on 3<sup>rd</sup> September 2019
- **Two soprano pipistrelles** and **one brown long-eared bat** seen to emerge from Building F on 25<sup>th</sup> September 2019

#### Building D

- **One soprano pipistrelle** seen to emerge from Building D on 25<sup>th</sup> September 2019

### 3.3.4 Foraging and Commuting Activity

Moderate levels of bat activity were noted within the site during bat activity surveys, with both foraging and commuting behaviour being most concentrated along the tree line on eastern boundary. The bat species recorded during activity surveys include common pipistrelle, soprano pipistrelle, noctule bat *Nyctalus noctula*, brown long-eared bat, serotine bat *Eptesicus serotinus* and *Myotis* spp..

## 4 Discussion

### 4.1 Constraints on Survey Information

The bat activity surveys carried out at Hatch End Industrial Estate in the summer of 2019 were initially focused on Building F. The observation of one bat emerging from Building D during the third activity survey on the 25<sup>th</sup> September resulted in the status of roosting bats within this second structure also being taken into account in this study.

### 4.2 Assessment of Results

#### 4.2.1 *Building F*

Bat surveys at the site indicate that Building F functions as a regular day roost site for low numbers of soprano pipistrelles (peak count: 2 bats) and brown long-eared bats (peak count: 2 bats).

Soprano pipistrelles appear to be using a cavity within the boxed eaves on the eastern gable end of the southern gable and a roost location. The precise emergence locations varied slightly during activity surveys; however, all bats look to be accessing this cavity via a narrow gap between the timber soffit boards and the shiplap wooden walls.

Brown long-eared bats appear to be either using Building F's loft void or crevices associated with the loft void as a roost location. The scattered droppings observed within the void indicate that the brown long-eared bats are flying within this internal space prior to emergence and following re-entry. Individuals from this species are accessing their roost site via gaps between tiles, and gaps between tiles and lead flashing around the cupola.

There is no evidence to indicate that either species of bat are using Building F for breeding.

#### 4.2.2 *Building D*

Bat surveys at the site indicate that Building D functions as a day roost site for low numbers of soprano pipistrelles (peak count: 1 bat). The bat recorded emerging from this building was seen to fly from a relatively large (and partially boarded up) hole in the northern elevation. This hole leads directly into one of the building's northern loft void and it is considered highly likely that this bat is utilising an internally accessed crevice feature within the fabric of the building's roof.

Building D was initially assessed in 2018 as having negligible bat roost potential due to the very simple nature of its construction, the lack of suitable roost features within its external fabric and the absence of evidence signifying the presence of roosting bats within its internal spaces.

It is considered that the building continues to offer only a very limited number of potential roost features and that these are likely to only be used on an opportunistic basis by low numbers of common crevice dwelling bats. The building is considered to be unsuitable for a larger number of bats and is considered not to provide a roost resource suitable for bat maternity colonies.

#### 4.2.3 *The Soprano Pipistrelle*

The soprano pipistrelle is one of the most common species in the UK and is widely distributed throughout Britain (Bat Conservation Trust, 2017). It is known to be frequent and widespread in the county of Oxfordshire with numerous roosts in rural, urban and suburban areas. The species is associated with wetland habitats and will forage over lakes and rivers. It will also forage around woodland edges, treelines and hedgerows with suburban gardens and parks also exploited. Breeding roosts of soprano pipistrelles are considered to contain the greatest number of bats in terms of UK species, regularly containing over a hundred bats, although maternity colonies can also involve smaller gatherings (10s of bats). The species can use loft spaces for roosting but is typically associated with crevice features within the fabric of a building, often exploiting the smallest of gaps.



The soprano pipistrelle is considered to be common at a local level. Field survey data show statistically significant population increases since 1999, however this is likely to represent only partial recovery from a much greater population decline over the last century. The species is listed as a priority under Section 41 of the NERC Act 2006.

#### 4.2.4 The Brown Long-Eared Bat

The distribution atlas of bats in Britain and Ireland describes brown long-eared bats as being widespread throughout Britain and Ireland except for the Scottish islands. The *State of the UK's Bats 2017* show a statistically significant population decline of 31.3% in hibernation surveys, between 1999 and 2016, whereas the report shows a non-statistically significant 20.1% population increase from roost surveys. The species is considered to be common at a local level and widely distributed throughout the county of Oxfordshire.

Female brown long-eared bats typically gather in small numbers (10-20 bats) within their maternity roosts and they show a relatively high level of roost fidelity, returning to the same location year after year. Brown long-eared bats tend to favour large, uncluttered roof spaces and older buildings for roosting and are a typical species within rural churches. Studies have also shown that they prefer a roost site which has a direct habitat link to suitable foraging habitat, such as woodland. Brown long-eared bats tend to forage mostly within woodland as they glean insect prey from the surface of vegetation and from the canopy of trees. Although common and widespread, the species is listed as a priority for conservation within Section 41 of the NERC Act 2006 due to declining population trends.

#### 4.2.5 Hibernation

Bats will choose to roost within different locations within the summer and winter periods, favouring dark, enclosed, humid and cool locations for hibernation such as caves and cellars. These locations must maintain a constant low temperature (2-8°C), but temperatures must also not go below freezing. Additionally, humidity levels must remain sufficiently high to prevent bats from dehydrating. The roost locations employed by bats within Building F and Building D are considered likely to exhibit temperature fluctuations during the winter period not conducive with hibernating bats.

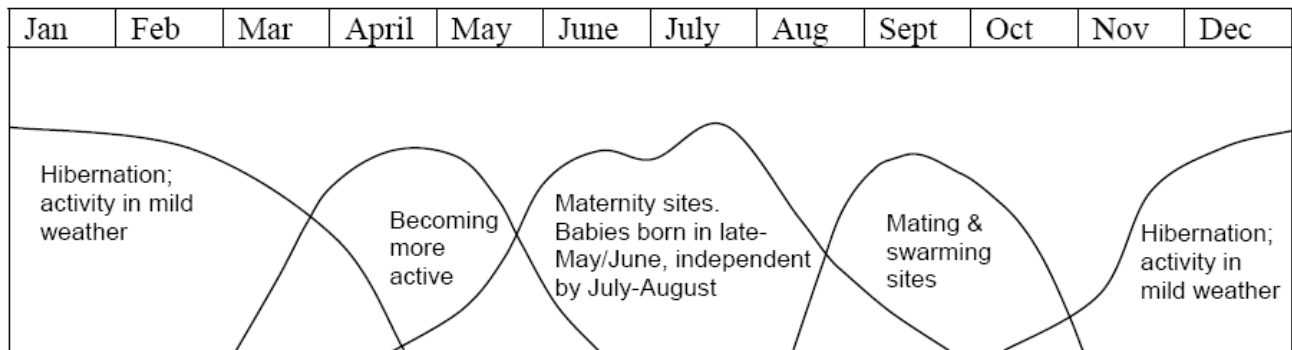


Figure 5. Diagram showing the yearly life cycle of a bat. Taken from the *Bat Mitigation Guidelines* by Mitchell-Jones 2004.

### 4.3 Legislative Context

#### 4.3.1 Protection of Bats

As with many animal species within the UK, declines in the abundance and distribution of many bat species have been documented through recent decades. The reasons for these declines are various and complex but it is considered that the major factors are changes in landuse and agriculture, the loss of woodlands and hedgerows and the loss of suitable roosting sites.

Bats are particularly sensitive to human activity due to the fact that they roost within buildings, trees and underground structures such as mines, and the availability of suitable roost sites is considered

to be a key factor in the conservation of bats within the UK. As a consequence, all species of bat and their roost sites are protected under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000) and under The Conservation of Habitats and Species Regulations 2017. Taken together, these make it an offence to:

- (a) Deliberately capture or intentionally take a bat
- (b) Deliberately or intentionally kill or injure a bat
- (c) To be in possession or control of any live or dead wild bat or any part of, or anything derived from a wild bat
- (d) Damage or destroy a breeding site or resting place of such an animal or intentionally or recklessly damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection
- (e) Intentionally or recklessly disturb any wild bat while it is occupying a structure or place that it uses for shelter or protection
- (f) Deliberately disturb any bat, in particular any disturbance which is likely
  - to impair their ability;
  - (i) to survive, breed, reproduce or to rear or nurture their young; or
  - (ii) in the case of hibernating or migratory species, to hibernate or migrate; or
  - to affect significantly the local distribution or abundance of the species to which they belong

A bat roost may be any structure a bat uses for breeding, resting, shelter or protection. It is important to note that since bats tend to re-use the same roost sites, current legal opinion is that a bat roost is protected whether or not the bats are present at the time.

Although the law provides strict protection to bats, it also allows this protection to be set aside (derogation) under The Conservation of Habitats and Species Regulations 2017 through the issuing of licences. Where a lawful operation is required to be carried out, but which is likely to result in one of the above offences, a licence may be obtained from Natural England (the statutory body in England with responsibility for nature conservation) to allow the operation to proceed. However, in accordance with the requirements of The Conservation of Habitats and Species Regulations 2017, a licence can only be issued where the following requirements are satisfied:

- The proposal is necessary ‘to preserve 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’;
- The proposals ‘will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range’.

These three criteria are often referred to as the ‘three tests’ of the Regulations. All three must be satisfied in order for a licence to be granted.

#### 4.3.2 *Bat Mitigation Class Licence*

In 2015, Natural England launched a new class licence (WML-CL21), which provides a streamlined process to the European Protected Species Licence (EPSL) described above. The Bat Mitigation Class Licence (formerly the Low Impact Bat Class Licence) permits work that has a low or temporary impact on certain bat species and certain roost types, but which still needed to be licensed in order to meet legal requirements. Specifically, the criteria for using the class licence are set out below.

##### *Bat species*

The Bat Mitigation Class Licence can be used for sites where the following species are roosting:

- Common pipistrelle *Pipistrellus pipistrellus*



- Soprano pipistrelle *Pipistrellus pygmaeus*
- Brown long-eared *Plecotus auritus*
- Whiskered *Myotis mystacinus*
- Brandt's *Myotis brandtii*
- Daubenton's *Myotis daubentonii*
- Natterer's *Myotis nattereri*
- Serotine *Eptesicus serotinus*<sup>1</sup>
- Lesser horseshoe *Rhinolophus hipposideros*<sup>2</sup>

#### *Assemblage of bats*

Sites that support a maximum of three bat species listed above can be registered for the class licence. Sites with a more diverse assemblage of bat roosts must apply for an individual European Protected Species (EPS) licence.

#### *Number of bats*

Sites that support individuals or small numbers (in total) of the bat species listed above can register for the Bat Mitigation Class Licence. If more than one bat species will be affected, it is the total number of bats which must be considered. The conservation status of bats varies across regions and must be considered by the ecologist when determining what constitutes 'small numbers'.

#### *Roost type*

The Bat Mitigation Class Licence applies to roosts of low conservation significance, and is regulated to cover the following types of roosts in buildings:

- Feeding roosts
- Night roosts
- Day roosts
- Transitional roosts / occasional roosts

Sites with roosts of higher conservation significance such as maternity roosts, hibernation sites or swarming sites do not qualify.

#### *Number of roosts*

The Bat Mitigation Class Licence is applicable to sites that support no more than three roosts in total (across all structures).

#### *Impacts*

Natural England's Bat Mitigation Class Licence permits activities resulting in the disturbance and/or capture of certain bat species (listed above) and/or the damage or destruction of roosts of low conservation significance.

Natural England's Bat Mitigation Class Licence is held by Registered Ecological Consultants and sites must be registered with, and approved by Natural England before any licensable work can commence. The ecological consultant must apply to Natural England's Sustainable Development Wildlife

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<sup>1</sup> Under Annex C (for use in the following counties Berkshire, Buckinghamshire, Devon, Dorset, East Sussex, Essex, Greater London, Hampshire, Hertfordshire, Kent, Oxfordshire, Somerset, Surrey, West Sussex and Wiltshire) the Bat Mitigation Class Licence also covers damage and destruction of no more than 3 feeding, day, night and transitional serotine bat roosts and the disturbance and capture serotine bats in appropriate small numbers.

<sup>2</sup> Under Annex D (for use in the following counties Cornwall, Devon, Dorset, Gloucestershire, Herefordshire, Somerset and Wiltshire) the low impact bat class licence also covers damage and destruction of no more than 3 low conservation significance day and transitional lesser horseshoe bat roosts and disturb and capture lesser horseshoe bats in appropriate small numbers.

Licensing to register the site with at least 3 weeks (15 working days) notice and no more than 12 weeks before commencement of any licensable activities.

## 5 Impact Assessment

Demolition of Building F and Building D will result in the destruction of bat roosts and a bat licence from Natural England will be required for the proposed works to proceed since the impacts will be significant under the Conservation of Habitats and Species Regulations 2017 & Wildlife and Countryside Act 1981 (as amended). In addition, if bats are present during the works to demolish the buildings, there is the potential for bats to be killed, injured or disturbed.

Given the fact that two common species of bat are using the two structures, in low numbers, and there is no evidence of breeding or suitability for hibernation, the Bat Mitigation Class Licence (BMCL) approach to licencing is applicable in this instance. The licence will allow for the destruction of the bat roosts.

External lighting can have an impact on bats by affecting their activity and behaviour. Certain species of bat have been shown to be attracted to mercury vapour lamps which emit light over a very broad-spectrum including UV light to which insects are particularly sensitive. Insects can be attracted in large numbers to mercury lamps and so can bats of the genera *Nyctalus* and *Pipistrellus*, including noctules *N. noctula* and common pipistrelles *P. pipistrellus* (Rydell and Racey 1993).

Lighting has shown to have an opposite effect on certain other species, such as the lesser horseshoe bat *Rhinolophus hipposideros*, which have been shown to avoid areas of artificial light (Stone *et al.* 2009). External lighting within the re-developed site could therefore have an effect on foraging or commuting bats, if designed in an insensitive manner. It should be noted that activity levels around the site were moderate with activity dominated by common species which were commuting and foraging; there was no frenzied or sustained foraging activity within the immediate confines of the industrial estate.

## 6 Bat Mitigation Strategy

### 6.1 Licencing

The demolition of Building F and Building D will be undertaken under a Bat Mitigation Class Licence from Natural England. This licence will allow for the destruction of day roosts used by small numbers of a non-breeding soprano pipistrelles and brown long-eared bats. A Registered Consultant should be sought to apply for this licence and to register the site (Hatch End Industrial Estate) with Natural England under the low impact scheme (Bat Mitigation Class Licence).

### 6.2 Timing

There is no strict timing in this instance given that no breeding or hibernating bats are considered present.

### 6.3 Loft Inspections

An inspection of the loft spaces within Buildings F and Building D by the Registered Consultant or Accredited Agent will be carried out immediately prior to the commencement of demolition works. If bats are found to be present, then these will be rescued by hand and released at an appropriate time and in a safe place. If release is not possible, the bats will be placed in a pre-erected bat box on a nearby tree.

### 6.4 Careful Work Practices

A 'toolbox talk' delivered by the Registered Consultant will inform contractors about the presence of roosting bats within the two building. Contractors will be made aware of where bats are known to roost and which locations offer the best opportunities for roosting.

Works should proceed in a careful and controlled manner, with the disassembly of the known roost locations being undertaken by hand, including the removal of boxed eaves on Building F's southern gable and the stripping of both buildings' roofs. The Registered Consultant or Accredited Agent will be present on site to advise on which features of the building should be removed by hand and where inspections for bats and evidence of bats should be undertaken.

Contractors will be briefed regarding the fact that bats are a mobile species and the potential presence of small numbers of bats and will remain vigilant for bats and any evidence of bats (droppings) when carrying out the soft demolition works.

If bats are encountered, they will be rescued by the Registered Consultant or Accredited Agent by hand and released at an appropriate time and in a safe place. If release is not possible, the bats will be placed in a pre-erected bat box on a nearby tree.

After the Registered Consultant or Accredited Agent has left, in the unlikely event that bats or significant evidence of bats (for example large accumulations of droppings) are encountered, works will stop, and advice sought from the Registered Consultant.

## 6.5 Roosting Opportunities

The provision of new roosting opportunities for bats will be required to ensure that the favourable conservation status of bats is maintained post development, thereby complying with wildlife legislation and planning policy.

### 6.5.1 Immediate Roost Replacement

Two Schwegler 2F bat boxes (see Figure 6) and one Schwegler 1FS bat box (see Figure 7) will be erected on mature trees within the wider landholding, prior to the commencement of works. These boxes will provide immediate roost capacity and can be used to receive rescued bats, if necessary.



Figure 6. Schwegler 2F bat box.



Figure 7. Schwegler 1FS bat box.

### 6.5.2 Long-term Roost Replacement

At least five new bat roosting features will be incorporated into the proposed new buildings within the site in order to mitigate for the loss of soprano pipistrelle and brown long-eared bat day roost sites. Such features could include bat tubes (Schwegler 1FR Bat Tube) (Figures 7 & 8) which can be rendered into an external wall, leaving a small access slot for bats. Alternatively, externally mounted bat boxes could be mounted on the walls of the new buildings; Schwegler 1FQ Bat Roost is recommended.

New bat roosting features should be installed under the eaves of the new buildings and if possible, should be incorporated within southern and eastern elevations to ensure they receive maximum warming from the sun. External lighting of new bat roosting features should be wholly avoided.



Figure 7. Schwegler 1FR Bat Tube.



Figure 8. Schwegler 1FR Bat Tubes integrated into a wall.

## 6.6 Lighting

External lighting should be minimised within the development proposals, unless it is necessary for reasons of security and safety. In particular, light spillage onto the mature treelines present on the site boundaries should be minimised. Furthermore, light spillage onto and around new bat roost features should be wholly avoided.

If external lighting is required it should be kept at a low level and low intensity with hoods and baffles used to direct the light to where it is required. Luminaires selected should have no UV element and should produce a light within a warm white spectrum to reduce blue light component. Luminaires should be mounted on a horizontal plane with light directed in a downward trajectory (Bat Conservation Trust 2018). Motion triggered luminaires with short cut-off times should be favoured.

## 7 References

Altringham, J., 2003. *British Bats*. Harper Collins.

Bat Conservation Trust, 2018. *Bats and artificial lighting in the UK: Bats and the Built Environment series*. The Bat Conservation Trust, London.

Collins, J. 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> edition)*. The Bat Conservation Trust, London.

Joint Nature Conservation Committee, 2012. *Bat Worker's Manual*. Joint Nature Conservation Committee, Peterborough, UK.

Mitchell-Jones, A., 2004. *Bat Mitigation Guidelines*. English Nature.

Ransome, R., 1990. *The Natural History of Hibernating Bats*. Christopher Helm, London, UK.

Windrush Ecology Ltd, 2018. *Preliminary Ecological Appraisal - Hatch End Industrial Estate, Middle Aston*.



8 Appendix 1. Site Location Plans



Aerial photograph showing the location and extent of Hatch End Industrial Estate (outlined in red) and the wider landholding (outlined in blue). Source: Google Earth Pro



Ordnance Survey map showing the approximate location of Hatch End Industrial Estate (outlined in red) within the local area. Source: <http://www.bing.com/maps/>



9 Appendix 2. Photographs



Photograph 1. Building F viewed from the east



Photograph 2. Building F viewed from the north



Photograph 3. Loft void within Building F



Photograph 4. Accumulation of bat droppings within Building F's loft void



Photograph 5. Building D viewed from the south



Photograph 6. Building D viewed from the north-east

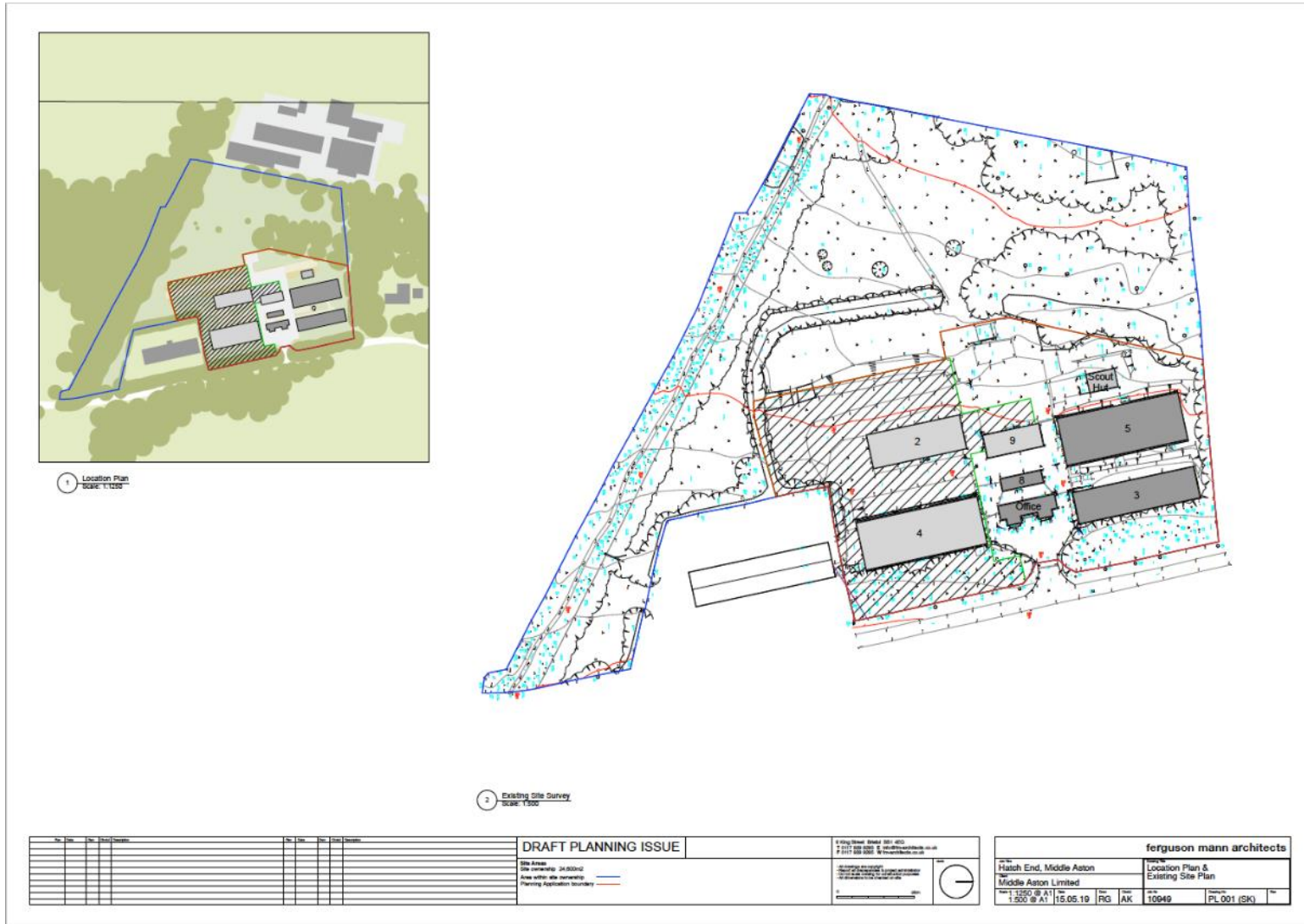


Photograph 7. Partially boarded up hole in northern elevation of Building D.



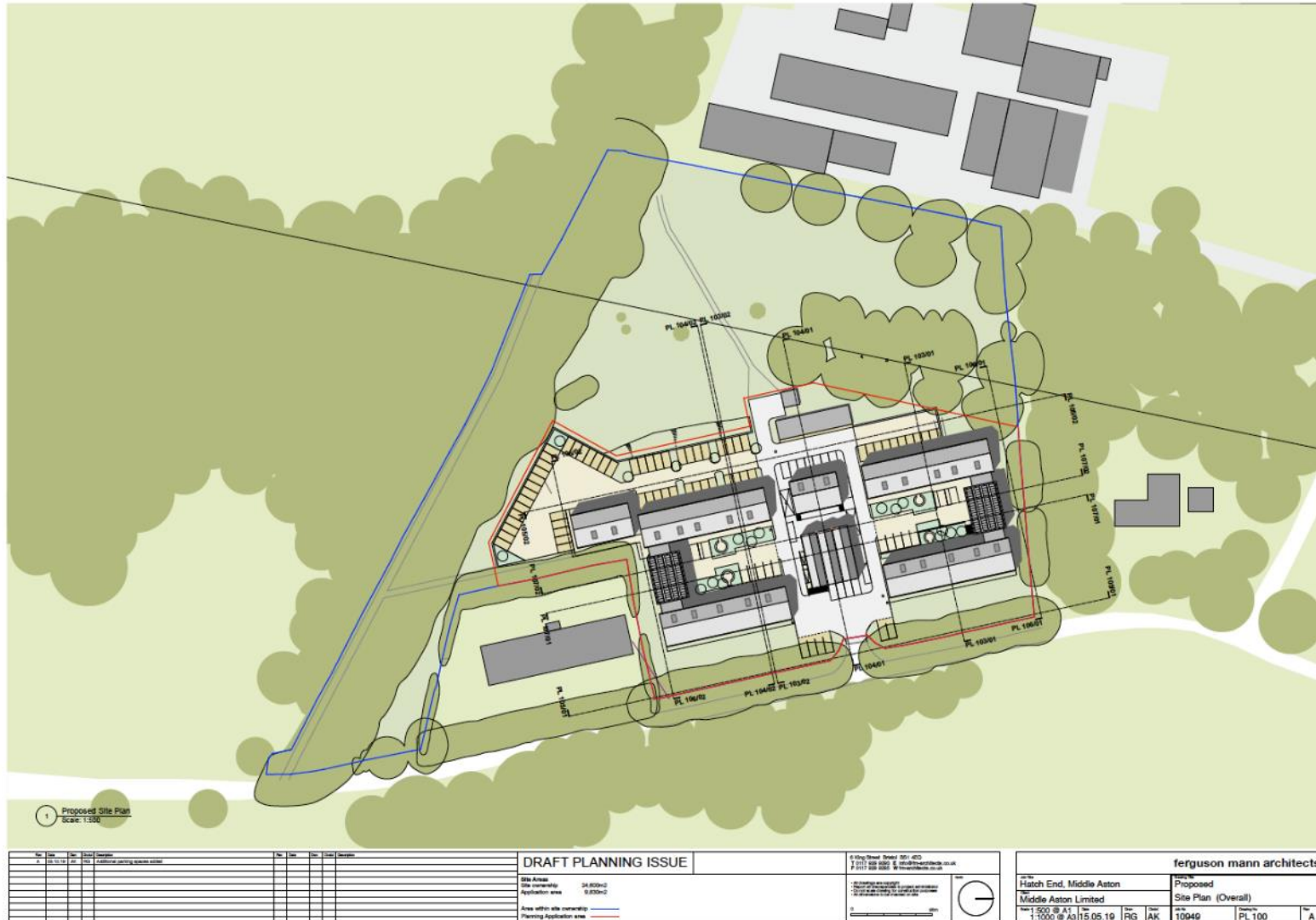
Photograph 8. The loft space within the northern section of Building D.

10 Appendix 3. Existing Site Plan





11 Appendix 4. Indicative Proposals' Plans





1 Proposed Site Plan (Phase A & B)  
Scale: 1:200

No.	Date	Rev.	Drawn	Checked	By	Date	Drawn	Checked	By
1	15.05.19	01	RG	AK					
2	15.05.19	02	RG	AK					

DRAFT PLANNING ISSUE	
1 Site entrance	7 Outside store
2 Central hub building	8 Refuse/recycling
3 New warehouse buildings	9 Cycle store (40 m <sup>2</sup> approx)
4 Fire escape access	10 Sub-station
5 Courtyard garden area	11 Loading bay (2 spaces)
6 Site/working space	12 Disabled parking (4 spaces)

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ferguson mann architects Hatch End, Middle Aston Middle Aston Limited Scale: 1:200 @ A1 Date: 15.05.19 RG AK 10949 PL 101 A		