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BAT: NOCTURNAL SURVEYS REPORT
One YMCA, Welwyn Garden City

September 2019

BMD19.048.RPE/P2.802.-.Bat Nocturnal

DOCUMENT HISTORY

Project Number: 19.048		Document Reference: BMD.19.048.RPE/P2.802.-.Bat Nocturnal			
Revision	Purpose of Issue	Originated	Technical Reviewed	Approved	Date
-	Planning application	MH	JP	HSM	25/09/2019

Declaration of compliance with professional code of ethics or conduct
The information which we have prepared and provided is true and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bonafide opinions.

Every reasonable attempt has been made to comply with the relevant best practice guidelines and BS42020:2013 (Biodiversity: Code of practice for planning and development).

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EXECUTIVE SUMMARY

Client.....	One YMCA
Consultant.....	Bradley Murphy Design Ltd.

SITE

Location	YMCA, Peartree Lane, High Wycombe, Hertfordshire. AL7 3UL
National Grid Reference	Approx. centre TL 244 126
Over-view.....	The Site comprises a 125-bed hostel with communal facilities, maintenance facilities, office space and car parking
Landscape context	The Site is located in an urban environment within Welwyn Garden City.

DEVELOPMENT & PLANNING BACKGROUND

Proposed works	Development proposals comprise replacing the 125-bed hostel with new apartment buildings to provide 43 residential units with associated car parking and landscaping. A 5 storey block will be erected at the rear of the Site and a three storey private apartment block erected at the front of the Site.
Planning stage.....	Initial Planning Stage.

ECOLOGICAL BACKGROUND

General	BMD conducted a Preliminary Ecological Assessment and Initial Bat Assessment of the Site in August 2019 (BMD.19.048.RPE/801.Ecology & Bat). The report concluded that three of the buildings had 'low' bat roosting potential and the remaining five 'negligible' bat roosting potential. Further surveys were recommended to determine the status of the species group on Site.

SURVEY

Objectives	To provide baseline data pertaining to the likelihood of bat roosts being present in buildings on Site and determine the types of roosts where present. To inform the detailed planning applications and level of mitigation required to ensure favourable conservation status of bats at the Site as a result of the proposed development.
Approach.....	Nocturnal (dusk emergence survey) survey of buildings classified as having 'low' bat roosting potential.
Date	04/09/2019.
Results.....	No bats were observed emerging from the buildings and low levels of bat activity was recorded in the locality.
Conclusions	The Site supports low levels of bat activity with no emergence from the buildings observed during the survey. There are not considered to be any roosts within the buildings. A development bat license is not considered necessary based on current knowledge of the Site. Precautionary working methods for the proposed works are provided.

RECOMMENDATIONS

A precautionary approach is advised for demolition of the building, including: Tool box talks, an inspection of the potential roost features prior to works commencing and a soft strip of potential roost features.

Should works be delayed beyond summer 2020 further survey may be necessary

CONTENTS

TABLES & FIGURES

1. INTRODUCTION

1.1 Background Information

1.1.1 Bradley Murphy Design (BMD) was commissioned by One YMCA in 2019 to undertake a nocturnal bat survey of their Site at the One YMCA, Peartree Lane, Welwyn Garden City, Hertfordshire. The Site, hereafter referred to as 'the Site', is approximately centred on national grid reference TL 244 126.

1.1.2 The nocturnal bat surveys were initially recommended following a Preliminary Ecological Appraisal and Initial Bat Survey in August 2019 (BMD, BMD.19.048.RPE-P1.801.-Ecology & Bat) of the Site. Please refer to this previous document for the baseline upon which the current report is based.

1.1.3 This report presents the approach, results and evaluation of the bat surveys undertaken at the Site in order to determine the value and use of the Site by bats. The data will further inform the detailed planning applications and level of mitigation required to ensure favourable conservation status of bats at the Site is maintained as a result of the proposed development. The data will also inform any necessary European Protected Species Licence applications.

1.2 Proposed Development

1.2.1 Development proposals comprise replacing the 125 room YMCA hostel with new apartment buildings to provide 43 residential units with associated car parking and landscaping. The one and two storey buildings onsite will be demolished and a 5 storey block erected at the rear of the Site and a three storey private apartment block erected at the front of the Site

1.3 Site Context

Historic Context

1.3.1 The historic County Series Maps indicate that the Site was part of a large agricultural field parcel associated with Peartree Farm throughout the 1800's until the 1930's. By 1938 the Site had been developed for residential use and a youth hostel established on site. A large residential development had been developed to the east of the Site and Industrial/commercial businesses to the west. By 1960 these developments had expanded significantly. The Site itself however remains relatively unchanged since 1938 aside from minor extensions and additions to the built footprint.

Present Context

1.3.2 The Site comprises a 125 room hostel with communal facilities, maintenance facilities and office space. A network of predominantly two storey buildings accommodate these facilities with two small internal green space courtyards and several car parking facilities.

1.3.3 The Site is located on the transition between the residential area of Peartree to the east and the predominantly commercial/industrial area to the west. Immediately to the east of the Site is Peartree Road with residential properties and associated gardens beyond. Immediately to the south of the Site is

a residential home, associated car park and a small area of trees and scrub. Immediately to the north is a mix of industrial units and residential land use with associated car parking and residential gardens

1.3.4 The broader landscape was dominated by industrial units to the north, residential to the east and south and the city centre of Welwyn and residential developments to the west beyond the commercial/industrial area.

Ecological context

1.3.5 The initial bat assessment of the Site identified a number of features on or within buildings onsite that could be used by bats for roosting. Different species of bat have different roosting preferences; Table 1.1 provides a summary of bats that have potential to occur on Site and the roost locations they are typically associated with.

Table 1.1 Summary of roosting opportunities on Site important to different bat species that have potential to occur on Site based on their geographical range (adapted from Collins, 2016)

Bat species	Summer roosts				Winter roosts			
	Trees	House/ buildings	Barn-type buildings	Bat boxes	Caves/ mines	Buildings	Walls/ cavity	Trees
Brown-long-eared	■		■	■	■	■		■
Common/ soprano pipistrelle	■	■		■		■		
Daubenton's	■	■			■			■
Leisler's	■	■		■	■	■		■
Nathusius' pipistrelle		■			■	■	■	■
Natterer's		■	■	■	■			
Noctule	■	■		■		■		■
Serotine	■	■			■		■	
Notes	■ *Primary locations*							
	■ *Secondary locations, i.e. only sometimes found in such locations*							

1.4 Compliance with National Policy and Legislation

1.4.1 A summary of national planning policy and wildlife legislation relating to development projects and bats in England is provided in Appendix A. The protocols, evaluations and recommendations contained within this report were made in accordance with these policies and legislation.

2. APPROACH

2.1 Introduction

2.1.1 This report has been produced with reference to current guidelines for bat surveys (Collins, 2016). Reference was also made to BS42020:2013: Biodiversity – Code of Practice for Planning and Development.

2.1.2 Full survey methodologies are provided in Appendix B and summarised below. Details of dates, surveyors, weather conditions and a review of survey limitations are provided in Appendix C. Definitions of technical terms used in this report are provided in the Glossary in Section 8. Common names of species are used throughout the report with scientific names provided in Section 8.3.

2.2 Nocturnal Surveys

2.2.1 Nocturnal bat surveys were undertaken on all buildings classified, during the Initial assessments, as at least low roost potential, to determine the bat use of the buildings on Site. The surveys enabled the following questions to be answered:

- Are bats present or what is the likelihood of bats being present?
- What bat species use the Site?
- What is their level of activity?
- How are they using the Site?

2.2.2 The surveys were conducted in line with current best practice and professional judgement with a minimum of one survey undertaken on each building.

2.2.3 The survey was conducted in early September and local conditions were suitable for bats to be active despite it being outside the optimal period stated in the guidance: May to August is considered to be optimal to detect maternity colonies, males and non-breeding females in summer roosts (Collins, 2016).

2.2.4 The dusk emergence survey commenced approximately 15 minutes before sunset and continued up to approximately 1.5 hours after sunset:

- September 4th 2019: 1926 – 2111 hrs (sunset: 1941 hrs BST hrs as recorded on http://www.metoffice.gov.uk/).

2.2.5 Weather and seasonal conditions can influence bat behaviour during surveys; these are detailed in the survey conditions and metadata; Appendix C.

2.3 Limitations

2.3.1 The surveys were conducted within the recommended survey period (May – September) and the Site was fully accessible. However, it is acknowledged that the optimal period stated in the guidance is May-August. Local conditions were suitable for bats to be active and as such this is not considered a limitation to the survey conclusions.

2.3.2 A summary of all limitations considered is provided in Appendix C.

2.4 Evaluation and review

2.4.1 Following field surveys:

- The buildings were categorised in terms of their bat roost potential (see the Glossary for definitions).
- Which bat species are using the Site were determined.
- How many and what types of bats roosts are present within the Site were determined.

3. RESULTS

3.1.1 Two surveyors and two static detectors were positioned around the buildings at the following locations to ensure all key features identified during the initial bat assessment were covered:

- Location A: Static detector in western courtyard with mic directed at western aspect of B4.
- Location B: Static detector in eastern courtyard with mic directed at eastern aspect of B4.
- Location C: Surveyor in north corner of eastern courtyard covering northern aspect of B3 and eastern aspect of B4.
- Location D: Surveyor in south corner of eastern courtyard covering B2.

3.1.2 Three species of bat were confirmed during the survey: common pipistrelle, soprano pipistrelle and noctule alongside unidentified bat calls and an unspecified pipistrelle species.

3.1.3 The survey visibility was good for the dusk survey. The Site was at least partially lit by security lights throughout the survey period. Ambient light levels, resulting from light spill from the surrounding urban environment, were considered moderate with Site lightning coming on approximately 15 minutes after sunset.

3.1.4 A total of eighteen passes were recorded across the survey, the first bat recorded was a common pipistrelle and was not noted to have emerged from the building. The bat was recorded before the typical emergence period but just as a faint, single detection was recorded with no other calls in close succession. Bats were recorded intermittently across the survey however no bats were directly observed.

3.1.5 The majority of activity was registered in the eastern courtyard with only three passes recorded in the western courtyard (indicating low levels of bat activity in that area).

3.1.6 See Appendix D for detailed survey results and a summary chart at Figure 1.

Common pipistrelle

3.1.7 Although the first record (in the western courtyard) of common pipistrelle occurred just before the typical emergence time the recording was faint, indicative of the bat not being in close proximity to the detector. No further common pipistrelles were recorded at this location.

3.1.8 A further four passes were recorded during the survey in the eastern courtyard. Three of which were at the latter end of the typical emergence period, however, none were noted to have emerged from the buildings.

Soprano pipistrelle

3.1.9 There was one pass by a soprano pipistrelle, recorded at 20:24 hrs; the call was faint and brief suggesting it was distant from the detectors. No bats were observed emerging from any of the buildings.

Noctule

3.1.10 Five noctule passes were recorded, the first was noted at 20:40 hrs long after the typical emergence time for the species and no bats was observed emerging for any of the buildings. While the bats were not seen it is anticipated, based on the recordings, that these were high-flying bats, briefly passing over the Site.

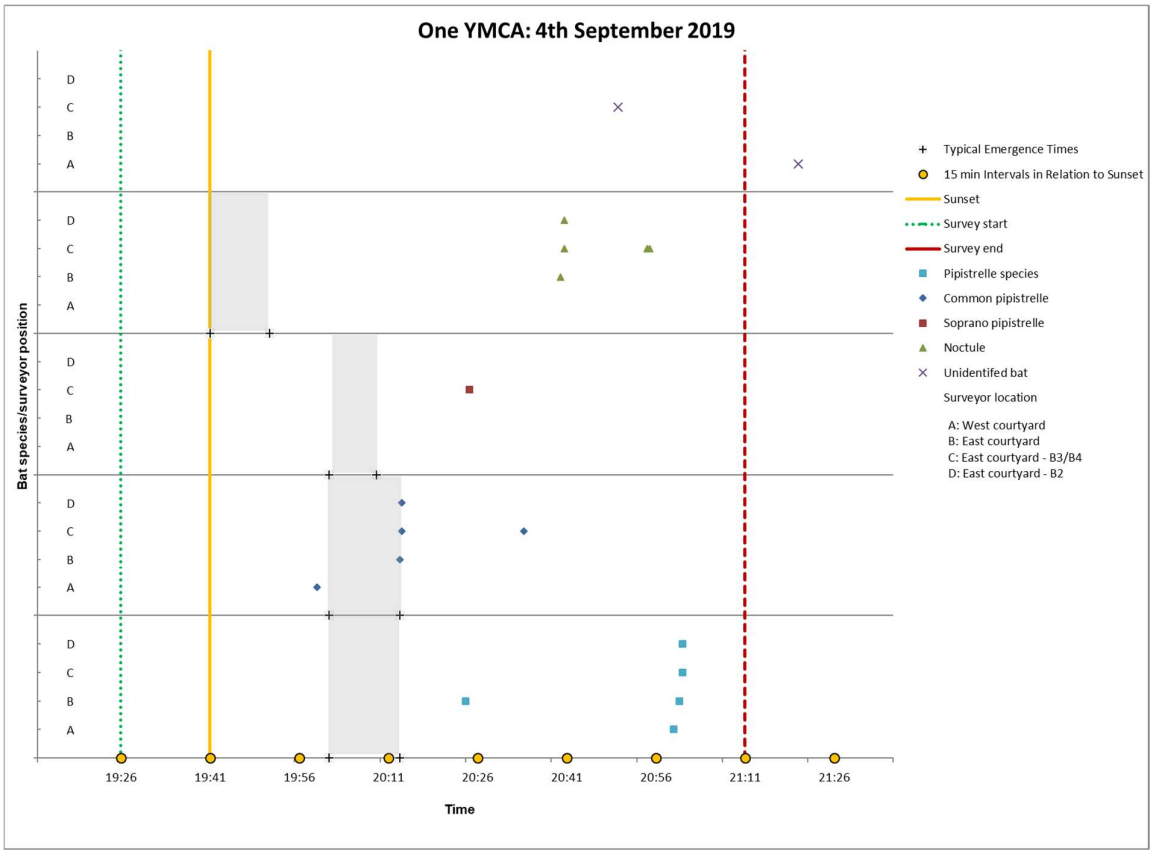
Pipistrelle species

3.1.11 Unspecified pipistrelle species were recorded between 20:24 – 21:00 hrs with a total of five passes. The species was first recorded outside of the typically emergence time for the species group and no bats were observed emerging from any of the buildings.

Unspecified bat species

Two unidentified bats were recorded during the survey at 20:49 and 21:20 hrs.

Figure 3.1 Bat activity recorded on 04/09/2019 by species



4. EVALUATION

4.1 Introduction

4.1.1 This section summarises the evidence to date in response to the four elements of the objective of the current study pertaining to bat activity.

4.2 Are bats present / what is the likelihood of bats being present?

4.2.1 Bats were recorded but not observed during the dusk survey confirming that bats are present in the vicinity of the buildings surveyed.

4.2.2 Despite good visual conditions, no bats were noted to have emerged from any the buildings.

4.3 What bat species use the Site?

4.3.1 The following species were recorded during the surveys:

- Common pipistrelle
- Soprano pipistrelle
- Noctule
- Pipistrelle species
- Unspecified bat species.

4.4 What is their level of activity?

4.4.1 The activity level was relatively low for all species with a total of eighteen bat passes recorded intermittently during the survey period. The activity noted primarily comprised individual bats briefly commuting as they passed through or adjacent to the Site, predominately registered in the eastern portion of the Site.

4.5 How are they using the Site?

4.5.1 There was no evidence to suggest any of the bat species noted during the surveys are using any of the buildings or the immediate surround for roosting. There was evidence to indicate that the Site is used for low level foraging and commuting likely associated with the mature trees along the eastern boundary of the Site.

4.5.2 The bat passes recorded were generally brief and weak suggesting that the bats were not in close proximity to the detectors or persistently using the Site. The recordings were intermittent throughout the survey period suggesting that the Site is not a key foraging or commuting route for bats in the local area.

5. CONCLUSIONS

5.1.1 The Preliminary Ecological Assessment undertaken in August 2019 survey identified a number of features on the buildings in the Site that would indicate there was potential for bats to occur.

5.1.2 Bat activity recorded during the September 2019 dusk survey was low and confined to eighteen brief and generally distant passes by three species and an unidentified species of bat. No emergence from any of the buildings of interest was observed and as such the Site is not considered to represent an important resource for bats in the area and buildings are unlikely to support significant bat roosts.

5.1.3 As there are features that are typically associated with bat roosts, there remains a low possibility that they may be used by individual bats for short periods of time, notably during their active season.

5.1.4 It is highly unlikely that the proposed development will impact on protected species and no further surveys are recommended. As a result, a European Protected Species Licence will not be required for this development.

6. RECOMMENDATIONS

6.1.1 A precautionary approach is recommended during the demolition of the buildings with low bat roosting potential (B2, B3ii and B4, see plan at Appendix):

- Immediately prior to works commencing:
  - Erection of three bat boxes, suitable for pipistrelle species, within or in close proximity to the Site, e.g. on the mature trees away from the main building. These should be attached to a single tree at approximately 120^0 so providing a range of potential roosts with different micro-conditions. (Purpose: to ensure a safe place for bats should they be found during the works)
  - Tool box talk to on-site workers on bats. (Purpose: to ensure on-site workers are aware of the possibility (albeit low) of individual bats and what to do should they find one during the works. To ensure the works and workers do not breach current legislation)
  - Inspection of potential roost features where possible to identified any bats, if present, utilising the features
  - Soft strip of the potential roost features prior to demolition
- If bats or evidence of bats are found at any stage:
  - All works MUST stop and not re-commence until advice has been received from an appropriately qualified ecologist.
  - Liaison with Nature England may be necessary.
- In such a scenario, a European Protected Species Licence may be necessary before works can re-commence.

6.1.2 In addition, the following best practice recommendations are made in relation to the works:

- Avoid significant increase, compared with current baseline, in external light and minimise noise, light and vibrations during and post-development.
- Avoid additional lighting along the eastern edge of the Site during and post-construction.
- Adhere to former Pollution Prevention Guidelines (PPG) (or more recent guidance where available), in particular PPG1 Basic good environmental practices; PPG3 Use and design of oil separators in surface water drainage systems; PPG6 construction and demolition sites.

6.1.3 The following opportunities for enhancement and biodiversity gain are recommended:

- Provision of built in roosts as part of the proposed building.

7. REFERENCES AND BIBLIOGRAPHY

Bradley Murphy Design (2019). BMD.19.048.RPE-P1 *Ecological Assessment (Including initial Bat Assessment)*

CIEEM (2017). *Guidelines on Ecological Report Writing* (2nd edn). Winchester: CIEEM.

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

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Joint Nature Conservation Committee (2001) *Habitat management for bats. A guide for land managers, land owners and their advisors*.

Mitchell-Jones, A.J. & McLeish (2004). *Bat Workers' Manual*, 3rd edition, JNCC, Devon.

Russ, J. (2012) *British Bat Calls: A Guide to Species Identification*. Pelagic Publishing; 1st edition

Russ, J, (2014) http://www.nathusius.org.uk/index.htm [accessed 01/10/2018)

The Bat Conservation Trust (2014). *The State of the UK's Bats 2014*.

The Conservation of Habitats and Species Regulations 2010, as amended.

The Wildlife and Countryside Act, 1981 (as amended).

8. GLOSSARY

8.1 Scientific Terms and Acronyms

Big bat / big bat group Refers to bats of the *Nyctalus* genus and serotine bats.

CIEEM Chartered Institute of Ecology and Environmental Management, the professional organisation and provider of professional codes of conduct for ecological consultancy.

LBAP Local Biodiversity Action Plan.

Notable species A species which is listed as a UK Priority Species, carries an unfavourable conservation status (e.g. scarce, rare, threatened, Red-listed), is invasive or is otherwise worthy of note from an ecological perspective.

PRF Potential Roost Feature. A feature on a building or tree that has potential to support roosting bats.

Protected species A species protected under specific UK or European legislation, including Habitats Directive, Wildlife and Countryside Act.

UK Priority Habitat / species A habitat or species identified as a priority for conservation in accordance with Section 41 of the Natural Environment and Rural Communities Act (2006). Section 40 of the Act places a duty on public authorities to have regard for the conservation objectives of these habitats / species. (Also known as Section 41 (S41) habitats/species).

8.2 Bat Specific Terminology

8.2.1 The following categories are used to describe the level of roosting potential of buildings and trees; these are based on current best practice (adapted from Table 4.1, p. 35; Collins, 2016):

- Negligible: Negligible features within the building likely to be used by roosting bats.
- Low: A structure with one or more PRFs 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 habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).

  A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.
- Moderate: A structure or tree with one or more PRFs 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.
- High: A structure or tree with one or more PRFs 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.
- Confirmed Roost: Presence of bats or evidence of use by bats.

8.2.2 Bats have different types of roost at different stages in their life cycle and at different times of year. Table 8.1 details terms are used to describe types of bat roosts. These descriptions are based on current best practice (Collins, 2016 and Hundt, 2012).

Table 8.1 Description of different types of roosts used by bats

Roost type	Period when used	Used by	Other comments
Transitional/ occasional	April – September/October a few days prior or following hibernation	A few individuals (occasional small groups) for (generally) short periods of time.	Used prior to hibernation or when wake for short periods during hibernation. Roosts are generally cool.
Maternity	May – August	Breeding females (females & dependent young).	Males rarely present, although male long-eared bats, Daubenton's, Natterer's, horseshoe bats have been found in maternity roosts with numbers increasing through the active season.
Satellite	May – August	Females. A few to small groups.	Located near maternity roosts & used by females as an alternative roost site.
Mating	Late summer to through winter	Mating individuals.	Used by males of some species that defend a territory and display/call females to mate.
Hibernation	October - March	All. May get different species using same roost.	Cool, constant temperature with high humidity.
Night	March – November	Single individual on occasion or regularly used by a colony to rest/shelter during the night.	May be of high value to some species, such as lesser horseshoe, providing key resting places with forging areas.
Day	March – November (rarely found by night in summer)	Single bat or few individuals (males) for resting/shelter during the day.	Bats may have several day roosts, regularly used, switching daily or one used for several weeks at a time.
Feeding	May – November	Single bat or few individuals or a colony for resting/feeding at night. Rarely present during the day.	Often used by long-eared and horseshoe bats.
Swarming Sites	Late summer/autumn	Large numbers of different species (both sexes) gather.	Generally, around caves & mines. Often dominated by Myotis bats. Potentially important mating sites with bats travelling many kilometers to use. Some bats may remain to hibernate.

8.3 Scientific Names

8.3.1 Scientific names of species mentioned in this report are outlined in Table 8.2.

Table 8.2 Scientific names of species mentioned within this report

English Name	Scientific Name
Brown long-eared bat	*Plecotus auritus*
Common pipistrelle	*Pipistrellus pipistrellus*
Daubenton's bat	*Myotis daubentonii*
Leisler's bat	*Nyctalus leisleri*
Nathusius' pipistrelle	*Pipistrellus nathusii*
Natterer's bat	*Myotis nattereri*
Noctule	*Nyctalus noctula*
Serotine	*Eptesicus serotinus*
Soprano pipistrelle	*Pipistrellus pygmaeus*

APPENDICES

PLANS

Drawing BMD.19.048.DRE.901: Building Plan.

NOTES:
1. THIS DRAWING IS BASED ON OS TOPOGRAPHICAL SURVEY
2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER ECOLOGY DRAWINGS AND DOCUMENTS
3. THIS DRAWING IS NOT INTENDED FOR CONSTRUCTION
4. DO NOT SCALE FROM THIS DRAWING
5. ANY DISCREPANCIES WITHIN THIS DRAWING OR BETWEEN THIS DRAWING AND ANY OTHER INFORMATION IS TO BE REPORTED TO BMD FOR CLARIFICATION

SITE BOUNDARY (OFFSET FOR CLARITY)

1 BUILDINGS (INC REFERENCE)

SUITABILITY FOR BAT ROOSTS

NEGLIGIBLE

LOW

NOTABLE FEATURES (EXTERNAL)

ACCESS POINT

PUCK HOLE

GAP

NOTABLE FEATURES (INTERNAL)

HOLE/GAPS IN BRICK WORK

Rev	Description	Date
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Purpose of Issue
PLANNING

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Client
SAUNDERS PARTNERSHIP

Project
ONE YMCA, WELWYN GARDEN CITY

Drawing Title
BUILDINGS PLAN

Drawn	Checked	Approved	Date
SB	MH	JP	29/08/2019
Job No. 19.048	Scale 1:1000	Sheet Size A3	Revision -

Drawing Number
BMD.19.048.DRE.901

A. NATIONAL POLICY AND LEGISLATION

A.1.1 Bats are protected under European (Conservation of Habitats and Species Regulations 2017 – Schedule 2) and UK (Wildlife and Countryside Act 1981 (as amended): Schedule 5, Section (9)(4b, 4c) and (5)) wildlife legislation. Some species are also a Priority Species (Natural Environment and Rural Communities Act (2006) – Section 40, listed in accordance with Section 41).

A.1.2 Key planning policies / documents are:

- The National Planning Policy Framework (2019); and
- The Natural Environment and Rural Communities (NERC) Act (2006).

B. ASSESSMENT METHODOLOGIES

B.1 Dusk Emergence Surveys

B.1.1 Surveyors were in place 15-20 minutes prior to sunset, remaining in place for 1.5 – 2 hours. A sufficient number of surveyors was utilised to observe Potential Roost Features (PRFs) identified during the initial survey in August 2019. Surveyors employed handheld bat detectors and recording equipment to aid in identification of any bats observed. Each surveyor monitored PRFs for the presence of emerging bats flying away from the PRFs at dusk. A general observation of bat activity within the area was also recorded in order to determine the usage of the area by bats.

B.2 Timing of Surveys

B.2.1 Nocturnal surveys were undertaken during suitable conditions within the accepted season (April to mid-October inclusive with May to August inclusive considered optimal). Suitable conditions were considered to be nights where temperatures were above 10°C and there was an absence of heavy rain or strong wind (Beaufort scale 6 or greater).

B.3 Sonogram Analysis

B.3.1 All bat registrations (passes) recorded during the bat survey work were analysed using Analook W v.3.7 (for analysis of ZC files) and Kaleidoscope v4.3.2 (for conversion of files and analysis of full Spectrum WAV files) to verify the species recorded during survey work. Registration verification was undertaken by a suitably experienced ecologist with reference to known sonogram parameters for each species (Russ, 2012; Barataud, 2015) and a record kept of original and verified identifications. Additional data such as the presence of 'feeding buzzes' and social calls, which suggest foraging and multiple bats respectively, were noted during sonogram analysis. Where recordings could not be reliably attributed to species level (such as Myotis species) or where overlaps in sonogram parameters between otherwise distinguishable species occur (such as in *Pipistrellus* species with a peak frequency of around 40 kHz or 50 kHz), registrations were identified to genus level. In the case of calls which could not be distinguished between *Nyctalus* species and serotine, these were labelled as 'unidentified big bat' species. However, professional judgement was made where possible to refine identification to species level using factors such as: associated habitats, geographical location as well as other records throughout the survey period/season and desk study data.

B.3.2 Following verification of sonograms to species level, bat passes were totalled for each species per deployment session.

B.3.3 It is important to note that a bat pass is an index of bat activity rather than an estimation of the number of individual bats. Fifty passes could be one bat passing 50 times, or it could be 50 individual bats. Collins (2016) suggests the likelihood is something between the two of these options.

C. METADATA, SURVEY CONDITIONS AND LIMITATIONS

C.1 Metadata

Factor	Detail
Data	Bat registrations recorded on Anabat Express bat detectors were recorded in zero crossing format. Bat calls were analysed using Analook W v.3.7 (for analysis of ZC files). EM Touch Pro detectors were used in conjunction with IPhone6 and analysed using Kaleidoscope Viewer.
Reason for collection	To provide baseline data pertaining to bats. To inform appropriate mitigation in relation to proposed development.
Location	One YMCA, Peartree Lane, Welwyn Garden City, Hertfordshire. AL7 3UL. Approximate central grid reference: TL 244 126
Date	Nocturnal survey: 04/09/2019
Method of collection	Nocturnal surveys using bat detectors following current best practice (Collins, 2016) Bat detectors: Anabat Express and Echometer Touch (2 pro) were used.
Who collected	James Pamore CEnv MCIEEM (Class 2 bat licence; lead surveyor) Matt Harper (experienced surveyor)

C.2 Survey Conditions

Date	Time	Preceding days	Temperature	Cloud (%)	Wind (Beaufort)	Precipitation
04/09/2019	19:26	Clear, mild	18	80	F3	No

C.3 LIMITATIONS REVIEW

Consideration	Comment
Survey & data	
Personal competence, i.e. qualifications, training, skills, understanding, experience	All survey works were undertaken by or directly supervised by personnel experienced in ecological surveying and licensed to undertake bat surveys (see meta data; Section C1). James Patmore CEcol CEnv MCIEEM has over 16 years' experience in ecological consultancy, including an extensive amount of experience performing and directing the survey work and assessments undertaken at the Site. Matt Harper has four years of experience in the consultancy sector and extensive experience undertaking ecological fieldwork over five survey seasons. This includes a suitable level of experience with all surveys undertaken at the Site.
Resources (equipment and/or personnel)	Appropriate resources and suitably qualified personnel were used. Anabat Express bat detectors were used and calls recorded in zero crossing format. EM Touch detectors were used.
Time spent surveying	Sufficient time was spent on site to determine if the buildings were being used as active roosts. The method used for the nocturnal surveys including the number of surveys and time spent on each survey accorded with best practice guidelines as published by the Bat Conservation Trust (Collins 2016)
Data (e.g. arising from incomplete or inappropriate surveys)	The data collected were sufficient for the purpose of the works.

Consideration	Comment
Lack of statistical robustness and higher uncertainties	Statistical analysis of data was not deemed necessary for the purpose of the current works.
Old and out of date data	All surveys have been conducted in the current bat season and are considered in-date.
Timing or seasonal constraints and suboptimal survey periods	The nocturnal survey was conducted in September 2019; this is the recommended survey period although just outside the optimal period: May to August is considered to be appropriate to detect maternity colonies, males and non-breeding females in summer roosts (Collins, 2016).
Partial use of and/or departures from good practice guidelines	All surveys accorded with the relevant best practice guidelines.
Site conditions & other factors	
Adverse weather conditions	No significantly adverse weather conditions were encountered during the survey work undertaken at the Site that would be considered to have significantly adversely impacted the reliability and accuracy of data collected.
Restricted access to site or part of site	There was sufficient access for the purpose of the survey.
Unrealistic deadlines	No restrictions on survey data collected or analysed to date are as a result or unrealistic deadlines.
Unproven or untested measures for mitigation and compensation	N/A
Evaluation of conservation value and impacts	The evaluation of the conservation value of habitats and species associated (or potentially associated) with the site and impacts of the development, are based on the current information available. This evaluation will need to be reviewed and updated as necessary should a considerable period of time (12 months) elapse and/or more data from other survey work (on and within 1 km of the site) becomes available.

D. DETAILED SURVEY RESULTS

Location	Bat species	*Bat activity*	*Time*
Western courtyard	Common pipistrelle	Heard not seen	19:59
Eastern courtyard	Common pipistrelle	Heard not seen	20:13
Eastern courtyard	Common pipistrelle	Heard not seen	20:13
Eastern courtyard	Common pipistrelle	Heard not seen	20:13
Eastern courtyard	Pipistrelle species	Heard not seen	20:24
Eastern courtyard	Soprano pipistrelle	Heard not seen	20:24
Eastern courtyard	Common pipistrelle	Heard not seen	20:33
Eastern courtyard	Noctule	Heard not seen	20:40
Eastern courtyard	Noctule	Heard not seen	20:40
Eastern courtyard	Noctule	Heard not seen	20:40
Eastern courtyard	Unidentified bat	Heard not seen	20:49
Eastern courtyard	Noctule	Heard not seen	20:54
Eastern courtyard	Noctule	Heard not seen	20:54
Western courtyard	Pipistrelle species	Heard not seen	20:59
Eastern courtyard	Pipistrelle species	Heard not seen	21:00
Eastern courtyard	Pipistrelle species	Heard not seen	21:00
Eastern courtyard	Pipistrelle species	Heard not seen	21:00
Western courtyard	Unidentified bat	Heard not seen	21:20