



Epsom Hospital, Surrey

Preliminary Roost Assessment

Guild Living

Job Number	9324.1			
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Version	Checked by	Approved by	Date	Type
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1.1			11/05/2020	FINAL

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Summary of Key Issues

The Ecology Consultancy was commissioned by Morgan Sindall on behalf of Guild Living to carry out a Preliminary Roost Assessment to determine the status of bats and any likely constraints to the re-development arising at, Epsom Hospital, Surrey. The main findings are as follows:

- The proposals for the site are for the demolition of four existing buildings on site to facilitate the construction of new buildings and associated landscaping.
- The site comprised four buildings formally part of Epsom hospital and semi-natural habitats comprising introduced shrubs and scattered trees which are connected to the wider peri-urban areas via private gardens and woodlands.
- A Preliminary Roost Assessment of the buildings and trees was carried out on 4 December 2019.
- In line with current survey guidelines buildings assessed as having moderate potential (Rowan House) to support roosting bats were subject to a dusk emergence survey and a separate dawn re-entry survey. Buildings assessed as having low potential to support roosting bats (Boiler House, Woodcote Lodge, and York House) were subject to a single dusk emergence survey
- No bats were recorded emerging or re-entering from Rowan House, Boiler House, Woodcote Lodge, and York House during the surveys on site. However, common pipistrelle, soprano pipistrelle and *myotis* species were recorded commuting / foraging adjacent to the southern boundary of the site during both the dawn re-entry and dusk emergence surveys.
- Recommendations on mitigation measures against disturbance on bats during construction and post development works are also included.
- Recommendations to enhance the site for biodiversity, including sensitive lighting strategy and new planting to enhance the commuting and foraging habitats bats.

1 Introduction

BACKGROUND TO COMMISSION

- 1.1 The Ecology Consultancy was commissioned by Morgan Sindall on behalf of Guild Living in December 2019 to undertake a Preliminary Bat Roost Assessment to assess the status of bats within buildings and trees and any likely constraints to development at Epsom Hospital, Surrey.
- 1.2 This assessment follows on from a Preliminary Ecological Appraisal carried out by Arcadis in September 2018 (Arcadis, 2018). Potential roosting features were identified during the survey, as such a bat roost assessment and inspection of affected trees and buildings before any works was recommenced, subsequently further surveys were carried out by Arup between July and December 2019 (Arup, 2019).
- 1.3 This report is an updated issue (version 2) to include the results of the emergence / re-entry surveys carried out in May after submission of the initial building inspection which was carried out in December 2019.

SCOPE OF REPORT

- 1.4 The primary aims are, through a process of investigation and assessment, to determine if any bat roosts are present, what the type of roost may be, the species using them, their status and relative conservation importance and any likely impacts that could occur as a result of the proposals. Where impact is identified, appropriate mitigation and compensation measures are provided as supporting information to inform the planning application.
- 1.5 The assessment of a site for bats is based on the following sources of information, including that obtained from third parties and the results of surveys:
 - a desk study including:
 - a data search for bat records within a 2km radius of the site;
 - an assessment of the surrounding habitats for their likely importance to bats;
 - the presence of any protected areas cited for their bat populations; and
 - the location and status of any nearby European Protected Species Mitigation licensed sites for bats.
 - a Preliminary Roost Assessment comprising a detailed building inspection;

- a Preliminary Ground Level Roost Assessment of any trees scheduled for removal or remedial works;
 - DNA analysis of any bat droppings found; and
 - emergence and re-entry surveys.
- 1.6 The elements listed above comprise the individual parts of the process that underlie the assessment. If, at preliminary assessment, the buildings and or trees do not provide any potential for a roost, the assessment can be stopped at this stage. If potential for a roost is identified, a suite of emergence/re-entry surveys will be required to confirm presence or likely absence, to determine the species present, and to characterise any roosts located. In cases where no roosts are identified or suspected during these surveys, the assessment can be halted. Where roosts are found to be present then an evaluation of the conservation value of the species concerned is made and the impacts of the development identified and addressed.
- 1.7 The survey covers all structures and trees within the planning application site boundary (hereon referred to as 'the site') as indicated on the plan provided by the client Guild Living).
- 1.8 This assessment has been prepared with reference to best practice guidance published by the Bat Conservation Trust (Collins, 2016) and as detailed in BSI Standards Publication 42020:2013 *Biodiversity – Code of Practice for Biodiversity and Development* (British Standards Institution, 2013) and BSI 8956:2015 *Surveying for Bats in Trees and Woodland* (British Standards Institution, 2015).
- 1.9 This report provides supporting information in the appendices with a georeferenced map of the survey results in Appendix 1, and cross-referenced photographs in Appendix 2.

SITE CONTEXT AND STATUS

- 1.10 The proposed development is located on Woodcote Green Road in Epsom, at approximate National Grid reference TQ203 599. The site comprised of four buildings, areas of hard standing, introduced shrub, and scattered trees. The site is bound by Woodcote Green Road to the South, by residential back gardens to the west and by the other hospital buildings and associated hard standing to the north and east.
- 1.11 Open space, including the grounds of a sports club, were present locally. A small wood and pond were adjacent to the site in the south by Woodcote Green Road. Nearby

areas of semi-natural green space include Epsom Common Local Nature Reserve (LNR) and Site of Special Scientific Interest (SSSI) located 400metres (m) west of the site.

DEVELOPMENT PROPOSALS

- 1.12 The proposed development includes the demolition of Rowan House, Woodcote Lodge, York House and the Boiler House to facilitate the construction of a new 'Later Living' complex of residential apartments, care facilities and amenities (Morgan Sindall, 2019).

RELEVANT LEGISLATION AND PLANNING POLICY

- 1.13 The following key pieces of nature conservation legislation are relevant to this assessment, with a more detailed description of this legislation provided in Appendix 4:
- The Conservation of Habitats and Species Regulations 2017 (as amended);
 - The Wildlife and Countryside Act 1981 (as amended); and
 - Natural Environment and Rural Communities Act 2006.
- 1.14 The actions that could result in an offence occurring under the above legislation include: the disturbance of bats within a roost; loss or damage of a roost; blocking a roost entrance; or modification of a roost. If development proposals are likely to result in an offence, then a European Protected Species Mitigation (EPSM) licence must be obtained from Natural England prior to works to provide a derogation from the legislation. Alternatively, where no more than three low conservation significance roosts are present and are used by low numbers of bats of no more than three of the (qualifying) species that EPSM licences are most commonly applied for, it may be possible to register the site under the Bat Mitigation Class Licence (BMCL) scheme. No like for like bat compensation is required for most of the species covered by BMCL.
- 1.15 The National Planning Policy Framework (Department of Communities and Local Government, 2019) requires local authorities to avoid and minimise impacts on biodiversity and to provide net gains in biodiversity when taking planning decisions. In addition, in England, under Section 40 of the Natural Environment and Rural Communities Act 2006, all public bodies are required to have regard to biodiversity conservation when carrying out their functions. This is commonly referred to as the 'biodiversity duty'.

- 1.16 Other planning policies at local level which are of relevance to this development include: Epsom and Ewell Borough Council Development Management Policies Document 2015 and Epsom and Ewell Borough Council Biodiversity Action Plan Document 2016 (Epsom and Ewell Borough Council, 2015).

2 Methodology

DESK STUDY

- 2.1 A desk study was conducted to obtain data relating to bats within a 2km radius of the site, as made available by the Surrey Bat Group.
- 2.2 Additional contextual information was compiled from publicly available data sources:
- MAGIC (<http://www.magic.gov.uk>) – the Government's on-line mapping service. Information was sought concerning: the presence of ancient semi-natural woodland (ASNW); statutory designated nature conservation sites¹; and extant or historic European Protected Species Mitigation licences for bats; and
 - Ordnance Survey mapping and publicly available aerial photography to determine any features such as: running and standing water; woodland; tree lines; hedgerows; railway corridors; and the surrounding landscape uses.

BAT SURVEYS

Personnel

- 2.3 The survey was led by George Siskos BSc (Hons) ACIEEM, an Ecologist with over five years commercial bat survey experience.

Equipment

- 2.4 The surveys listed below made use of some or all the following equipment:
- an extendable ladder;
 - a video endoscope;
 - a handheld LED torch;
 - a high-powered torch for illuminating features at height;
 - close focussing binoculars;
 - bat dropping (DNA) collection kit;
 - Bat Box Duet, frequency division and heterodyne detector;
 - Canon XA30 Infrared video camera and 500w IR light;
 - Elekon Bat Scanner, frequency division detector;

¹ Statutory designations include Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR).

- Elekon bat logger M, full spectrum detector; and
- Anabat Express, Zero Crossing Analysis.

Aims and Objectives

- 2.5 The aim of the survey methodologies outlined below is to establish the presence/likely absence of bat roosts within the trees and buildings within the site boundary. Once presence has been established the secondary aim is to obtain enough information to characterise the type of roost according to criteria set out in the current guidelines (Colins, 2016). This includes determining the function/s of the site by bats for maternity or hibernation roosts, transitional roosts, foraging and commuting. The gathered information is then used to inform an assessment of the potential impacts of the development proposals and to devise an appropriate and proportionate mitigation strategy.

Field surveys

- 2.6 The survey methodologies below follow best practice guidelines (Mitchell-Jones & McLeish, 2004; Collins, 2016, The British Standards Institution, 2015). A standard recording form was completed for each building within the site boundary and for each tree that is likely to be impacted by the proposals. This included recording the main structural features and layout, any potential access points and roost features and photographs. The criteria used as a framework to assess the potential for structures or trees to support roosting bats are provided in Appendix 5. This section provides methodologies for the primary survey types used to assess the status of bats at a site, depending on the particulars of the site and the commission, not all these survey types may be carried out.

Preliminary Roost Assessment - Buildings

- 2.7 The survey comprised an external inspection of each building, involving a detailed search of all accessible architectural features for bat droppings, urine staining, scratch marks, staining around suitable crevices and feeding remains. Window panes and other external surfaces were visually checked for droppings or other secondary evidence. A high-powered torch was used to illuminate recesses and crevices at height, and these were inspected using close focusing binoculars. This included external features, such as soffit boxes, roof tiles, hanging tiles, ridge areas and window casements. Any features that could potentially provide access into internal areas such as roof voids and cavity walls were noted.
- 2.8 During the internal inspection the surveyor worked through the roof voids of the building in logical progression searching each adjoining void in turn as well as all small

storage areas such as dormer rooms and water towers. Within the roof voids all surfaces including floor areas were checked for discarded feeding remains and bat droppings. The beam from a high-powered torch was shone along the length of each individual rafter, where appropriate to the roof type, looking for bats, staining and droppings. The roofing material was also inspected for areas of overlapping materials, holes and potential access points into the ridge area. Any open water tanks were inspected for the presence of bat corpses.

DNA analysis

- 2.9 If present, a sample of each different type of bat dropping, differentiated by size and morphology, may be collected by an ecologist with gloved hands and then placed into clean, dry, containers. These droppings are then sent for laboratory analysis within 48hrs of collection or stored in a dry, cool location for later dispatch..

Emergence and Re-entry Surveys

- 2.10 A suitable number of surveyors were used to allow clear views of all potential roost entry/exit points identified during the preliminary roost assessments. The dusk surveys commenced 15 minutes before sunset and continued for up to 90 minutes after sunset. The dawn survey commenced 120 minutes before sunrise and continued until fifteen minutes after. Each of the surveyors noted down details of any bat activity including; bat passes, species, numbers, location, emergence or re-entry, foraging and commuting, recording details to a data sheet and a map. The surveyors employed a combination of heterodyne bat detectors for aural ID in the field, and/or, full spectrum or zero crossing detectors for sound analysis post survey.

Survey Area

- 2.11 The surveys covered the buildings and trees within the red-line boundary of the site (see Figure1, Appendix 1).

Post-Survey Analysis

- 2.12 The audio recordings may be analysed post survey using one or more of the following software: Analook™ V3.3q., or Bat Explorer™ to confirm species identification and the timing of any passes. Any passes likely to have originated from one of the myotis species were determined to genus level only due to the complexity of differentiating between these species.

Roost Characterisation

- 2.13 The results from the preliminary roost assessments and the emergence/-re-entry surveys are used to characterise any roosts that may be confirmed within the site. This follows standard criteria for roosts, classifying roost type² as described in the Natural England bat EPSM licence application form. Also included are variables such as: species; abundance; likely use; and importance throughout the year.

EVALUATION AND IMPACT ASSESSMENT

Evaluation

- 2.14 The conservation status of those species found to be roosting within the site or for which the site provides a measurable supporting function is drawn from published sources with the conservation significance of any roost provided according to accepted criteria³.
- 2.15 If emergence and re-entry surveys were carried out, then the foraging and commuting activity recorded during those surveys is summarised along with an outline interpretation of the function the site may provide for these activities.
- 2.16 The ecological importance of the site for bats has been assessed broadly following guidance issued by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) which ranks nature conservation importance according to a geographic scale of reference: international and European; national; regional; metropolitan, county vice-county or other local authority-wide area; local or of value at the site scale. The following factors are considered when making this evaluation: nature conservation designations; rarity; vulnerability; distribution; and the conservation significance of any roosts.

Impact Assessment

- 2.17 An assessment is provided on the likely impacts of the development proposals on any bat roosts located within or immediately adjacent to the site boundary. This assessment is made with reference to Section 6⁴ of the Bat Mitigation Guidelines (Mitchell-Jones & McLeish, 2004) and Natural England's standing advice⁵ and includes a summary of the scale of impact according to roost type and development effect. This

² Day, Night, Feeding Perch, Transitional, Satellite, Maternity, Hibernation, Foraging Area, Commuting Route, Swarming Site.

³ Figure 4. *Guidelines for proportionate mitigation*, the Bat Mitigation Guidelines (Mitchell-Jones & McLeish, 2004) which assigns conservation significance to different types of bat roost on a sliding scale from Low to High

⁴ *Predicting the Impact of Development*, the Bat Mitigation Guidelines (Mitchell-Jones & McLeish, 2004), assigns scale of impact to the favourable conservation status of bats according to type and extent of construction effect

⁵ *Bats: surveys and mitigation for development projects*, first published 28 March 2015

section considers types of construction impact to bats and their roosts including; disturbance, loss, modification and fragmentation in relation to duration and timing. For the site, a statement is made on the geographic scale at which impact is deemed to be significant, following CIEEM guidance (CIEEM, 2018).

Data validity and Limitations

- 2.18 It is important to note that even where data is held, a lack of records for a defined geographical area does not necessarily mean that there is a lack of ecological interest; the area may be simply under-recorded. Bats are highly mobile animals and can move roost sites both within and between years. Where surveys are not spread throughout the bat active season is possible that they could miss roosts that are occupied earlier or later in the year. However, where undisturbed, evidence of bats inside a building is likely to be detectable throughout the year. The detection of small numbers of crevice dwelling species may remain problematic in some cases, such as where droppings accumulate within an inaccessible void. Data from bat surveys should be valid for a period of 18 months, unless there are any gross changes to the buildings or other habitats within the site.
- 2.19 It is often very difficult to confirm likely absence of a hibernation roost even if surveys have been completed. This is because features that hibernating bats tend to use (such as cavity walls) are not always accessible or visible during an internal inspection. Static hibernation surveys are not feasible at this site due to the inaccessibility of some of the loft spaces. There is also a risk that hibernation surveys may disturb bats if present (Collins, 2016).
- 2.20 As stated in Bat survey guidelines (Collins, 2016) if a structure has been classified as having low suitability for bats, an ecologist should make a professional judgment on how to proceed based on all the evidence available. Our professional judgement is to devise a precautionary method of work during the construction phase to ensure demolition is outside of hibernation period.
- 2.21 The dawn re-entry survey of Rowan House was carried out at the end of April, not strictly within the main bat survey season (May to September inclusive), as stated by Good practice guidance (Collins, 2016). The survey was however carried out in optimum conditions during a period of unseasonably warm April temperatures and no rain or wind was recorded during the survey. Surveys have also been spread out at least two weeks apart as per the Good practice guidance (Collins, 2016), with second survey carried out in May. Finally, as bat activity during the dawn survey was

consistent with levels recorded during May's survey it has been assessed that the findings of the survey are an accurate representation of how bats utilise the site.

- 2.22 Identification of *Myotis* bat species to species level from acoustic surveys is unreliable and therefore are identified to genus level as *Myotis* species. This limitation has been dealt with by presuming the species present is one of a higher conservation status (Whiskered, Brandt's) rather than more common *Myotis* species (Natterer's and Daubenton's).

3 Results

DESK STUDY

Data search

- 3.1 The data search returned 43 records of bats or bat roosts, of seven different bat species; common pipistrelle, soprano pipistrelle, brown long eared, noctule, serotine, Natterer's and Daubentons' bat from 1991 to 2018. There were two historic EPSM licences within a 2km radius of the site, and no statutory sites designated for bats within 2km. A summary of the most pertinent results is presented in Table 3.1 and Table 3.2 below.

Table 3.1: Summary of most pertinent data search results from the local environmental records centre

Species	Distance & Orientation	Date	Roost type	Notes
Serotine	0.13km south west	24/05/1991	Grounded bat	Hyland Road, Epsom
Serotine	0.17km east	05/06/2016	Grounded bat	Pine Hill, Epsom
Soprano pipistrelle	0.42km north	01/08/2011	Grounded bat	The Greenway, Epsom
Pipistrelle species	0.4km south	04/08/2011	Bat droppings	Hambledon Hill, Epsom
Unidentified bat species	0.4km south	04/08/2011	Bat droppings	Hambledon Hill, Epsom
Brown long eared	0.53km north west	18/07/2009	Grounded bat	Ebbisham Road, Epsom
Natterer's bat	0.66km south east	03/07/2005	Bat droppings	Ashley Road, Epsom
Pipistrelle species	0.9km west	29/06/2004	Bat droppings	Milburn Walk, Epsom
Brown long eared	1.06km north east	10/08/2011	Grounded bat	The Derby Square, Epsom
Brown long eared	1.14km south west	01/10/2015	Bat droppings	Oak Way, Ashted
Common pipistrelle	1.1km north west	07/09/2016	Grounded bat	Church Side, Epsom
Common pipistrelle	1.3km south west	26/07/2011	Grounded bat	Farm lane, Ashted
Unidentified bat species	1.71km north west	29/06/2009	Roost; peak count 2	Middle Lane, Epsom
Serotine	1.72km north west	26/07/2011	Grounded bat	Middle Lane, Epsom
Common pipistrelle	1.7km north	21/06/2012	Roost; peak count 109	Hook Road, Epsom

Table 3.1: Summary of most pertinent data search results from the local environmental records centre

Species	Distance & Orientation	Date	Roost type	Notes
Common pipistrelle	1.89km west	24/08/2004	Roost; peak count 3	Overdale, Ashtead
Pipistrelle species	1.96km south	15/10/2007	grounded	Rosebery Road, Langley Vale

Table 3.2: Summary of extinct/ extant EPSM licences within 2km of site

Species	Distance & Orientation	Date	Record type	Notes
Common pipistrelle	1.6km north east	2014	Non-breeding	EPSM2013-6826 Licence allows destruction of a resting place.
Common pipistrelle	2km south west	2016	Non-breeding	2016-22154-EPS-MIT Licence allows destruction of a resting place.

Surrounding habitat

- 3.2 Immediately adjacent to the site, the habitat is predominantly roads, buildings, a small woodland with pond, and residential gardens, which includes scattered trees. High lighting levels were recorded throughout the site.
- 3.3 The wider area includes habitats optimal for bats including Epsom Common LNR and SSSI 400 m west of site and Ashtead Common National Nature Reserve (NNR) 1.1 km west of site which is designation is due to a large number of ancient oak located.
- 3.4 While the site itself is relatively small it provides some connectivity between various larger areas with good roosting and foraging value for bats.

FIELD SURVEYS

Overview

- 3.5 The PRA covered four buildings and trees on site, the results are detailed individually below with a site plan provided in Appendix 1, survey proformas in Appendix 2 and supporting photographs in Appendix 3.
- 3.6 No evidence of roosting bats was recorded during the PRA or during the dusk emergence surveys and dawn re-entry survey undertaken of buildings on site with bat roosting potential.

- 3.7 Common pipistrelle, and soprano pipistrelle bats were recorded commuting / foraging adjacent to the site during the dawn re-entry survey and recorded during with typical re-entry times.

Weather Conditions

- 3.8 The PRA, and emergence / re-entry surveys were carried out in optimal weather conditions:
- 3.9 *PRA::* 4 December 2019, 7°C, light breeze (Beaufort 2), 2/8 okta⁶ cloud cover and no rain. Survey commenced at 09:30 and continued until 14:30.
- 3.10 *Dawn Re-entry Survey 1: 22 April 2020*, 14°C at dusk and 9°C at dawn, light breeze (Beaufort 1), 0/8 okta cloud cover, no rain and 87% humidity. Sunrise was at 05:50 and the survey commenced at 03:50 and continued until 06:05.
- 3.11 *Emergence Survey 2: 4 May 2020*, 12°C, light breeze (Beaufort 3), 0/8 okta cloud cover, no rain and 70% humidity. Sunset was at 20:29 and the survey commenced at 20:14 and continued until 22:00.
- 3.12 *Emergence Survey 3: 5 May 2020*, 11°C, light breeze (Beaufort 3-4), 0/8 okta cloud cover, no rain and 70% humidity. Sunset was at 20:31 and the survey commenced at 20:15 and continued until 22:01.
- 3.13 *Emergence Survey 4: 6 May 2020*, 11°C, no breeze (Beaufort 0), 0/8 okta cloud cover, no rain, 60% humidity. Sunset was at 20:33 and the survey commenced at 20:17 and continued until 22:03.

Preliminary Roost Assessment - Buildings

Rowan House (Building N) Description:

- 3.14 A three to four-storey brick building constructed around the 1930s which once housed the nurse's quarters but is now vacant. The building was roughly H-shaped with both pitched and flat roof sections (Appendix 2, Photograph 1).
- 3.15 The pitched roofs were complex and contained both hip / valley and gabled sections. The pitched sections were clad in clay tiles with the exception of north eastern and south eastern roof sections which were clad in slate tiles. The north eastern section of

⁶ An okta is a unit of measurement for cloud cover, based on an estimate of how many eighths of the sky are obscured by cloud.

the building also contained four dormer windows on the 1st storey. Two flat roof sections were present in the north western, and the south eastern section of the building and were constructed with bitumen.

- 3.16 Four brick-built chimneys; one on the gable end of the north western section of the building and three on the ridge of the central pitched section were present (Appendix 3, Photograph 2). Timber soffit boxes, window frames and doors were all in a fair state of repair. Lead flashing was also present around the chimneys, dormer windows and slate tiled roofs.
- 3.17 Internally, the central pitch and western pitched sections were accessible through a single loft hatch and were split into 10 sections separated by open doors and contained brick walls. The voids were approximately 3m in height and contained UPVc water tanks. The roof was constructed from metal structural beams, timber ceiling joists, concrete and plasterboard floor. The voids contained a layer of Strammit board directly below the roofing tiles (Appendix 3, Photograph 3).
- 3.18 *Building N Results.* No bats or evidence of bats such as urine staining, or droppings were recorded within the building. However, numerous features with the potential to support roosting bats were identified. These are shown on Figure 1, Appendix 1 and included lifted/slipped roofing tiles, hole in soffit box, missing brickwork, gap in window frame, missing mortar, and gap in ridge tile. (Appendix 3, Photograph 4, 5 & 6). Internally, there were crevices between roofing tiles and Strammit board, and soffit boxes which could be utilised by crevice dwelling bat species. Furthermore, there was light spillage from the outside and defunct pigeons' nests which would indicate that access into the loft void was possible.
- 3.19 Based on the above, Building N has been assessed as having **moderate potential** to support roosting bats in the summer and **low potential** to support hibernating bats.

Woodcote Lodge (Building M) Description:

- 3.20 A three-storey brick building constructed in the 1980s which currently houses hospital staff. The building was rectangular in design with a pitched roof (Appendix 3, Photograph 7).
- 3.21 The pitched roof was Mansard in design and clad in slate tiles with vented uPVC ridge tiles. uPVC soffit boxes, window frames and doors were all in a good state of repair. Lead flashing was present around the third-floor windows.

- 3.22 Internally, there were multiple loft voids which were divided by individual apartments. The void was approximately 1.5m in height. The roof was constructed from timber structural beams, timber ceiling joists, timber floorboards and contained fibreglass. The voids contained layer of bitumen felt directly below the roofing tiles (Appendix 3, Photograph 8).
- 3.23 *Building M Results.* No bats or evidence of bats such as urine staining, or droppings were recorded within the building. However, a number of features with the potential to support roosting bats were identified. These are shown on Figure 1, Appendix 1 and included lifted/slipped roofing tiles, and missing mortar (Appendix 3, Photograph 9). Internally, there were crevices between roofing tiles and bitumen felt, which could be utilised by crevice dwelling bat species.
- 3.24 Based on the above, Building M has been assessed as having **low potential** to support roosting bats in the summer and **low potential** to support hibernating bats

York House (Building J) Description:

- 3.25 A two-storey brick building with cavity walls constructed around the 1930s which was previously used as a training centre but is now vacant. The building was L-shaped with a pitched roof (Appendix 3, Photograph 10 and 11).
- 3.26 The pitched roof was cross hipped in design and clad in clay tiles with clay ridge tiles. Building J contained two brick-built chimneys: one on the gable end of the south western section and one in the middle of the building. Timber soffit boxes, window frames and doors were all in a good state of repair. Lead flashing was present around the chimneys.
- 3.27 Internally, there was a single loft void accessible via a fold out ladder. The void was approximately 2m in height and contained three water tanks. The roof was constructed from timber structural beams, timber ceiling joists, timber floorboards. The voids contained layer of bitumen felt directly below the roofing tiles (Appendix 3, Photograph 12).
- 3.28 *Building J Results.* No bats or evidence of bats such as urine staining, or droppings were recorded within the building. However, a number of features with the potential to support roosting bats were identified. These are shown on Figure 1, Appendix 1 and included lifted/slipped roofing tiles, and hole in soffit box (Appendix 3, Photograph 13). Internally, there were crevices between roofing tiles and bitumen felt, and soffit boxes which could be utilised by crevice dwelling bat species.

- 3.29 Based on the above, Building J has been assessed as having **low potential** to support roosting bats in the summer and **low potential** to support hibernating bats.

Boiler House (Building K) Description:

- 3.30 A two-storey brick building constructed around the 1930s which was is currently used as a boiler house. The building is roughly rectangular in design with a pitched roof (Appendix 3, Photograph 14).
- 3.31 The pitched roof was hipped in design and clad in slate tiles with concrete ridge tiles. Adjacent to Building K was the 130-foot cylindrical brick-built chimneys. Vents were present in the north and south elevation leading into the boiler house as well as a barn hatch from dormer on the northern elevation. Timber soffit boxes, and doors were all in a good state of repair.
- 3.32 Internally, the building did not contain any loft voids and was entirely open. The building contained a large number of industrial machinery and was very well lit from the outside (Appendix 3, Photograph 15).
- 3.33 *Building K Results.* No bats or evidence of bats such as urine staining, or droppings were recorded within the building. However, a small number of features with the potential to support roosting bats were identified externally. These are shown on Figure 1, Appendix 1 and included missing mortar and gaps into chimney (Appendix 3, Photograph 16, 17). Internally, there were crevices between roofing tiles and bitumen felt, and soffit boxes which could be utilised by crevice dwelling bat species.
- 3.34 Based on the above, Building K has been assessed as having **low potential** to support roosting bats in the summer and **low potential** to support hibernating bats

Preliminary Ground Level Roost Assessment – Trees

- 3.35 The site contained mature and semi mature trees, species included Scots pine, Norway maple, common beech, ash and silver birch.
- 3.36 The Arcadis reported a standing dead wood tree on the western boundary of the site contained several PRF's such as rot holes and flaking bark which offered moderate potential to support roosting bats (Arcadis, 2018). However this tree was felled on health and safety grounds prior to any surveys conducted.
- 3.37 All other trees on site were assessed as having negligible potential to support roosting bats.

Dawn Re-entry Survey: 4 May 2020

- 3.38 The survey concentrated on Rowan house only. No bats were suspected as re-entering any of the features during the dawn survey. Detailed survey proformas can be found in Appendix 2.
- 3.39 A total of five bat passes were recorded⁷ by two surveyors, from two bat species; common pipistrelle, and soprano pipistrelle.
- 3.40 The last bat recorded was a soprano pipistrelle by surveyor 1 commuting west along the tree line offsite to the south of Rowan House at 05:27 (23 minutes before sunrise). Foraging and commuting soprano pipistrelles were recorded twice during the survey between 05:15 and 05:27 by surveyors 1.
- 3.41 Foraging and commuting common pipistrelles were recorded three times during the survey between 05:04 and 05:16 (34 minutes before sunrise) by surveyors 1 and 2.
- 3.42 No bat activity was recorded by surveyors 3, 4 and 5 who were surveying the western and northern elevation throughout the entire duration of the survey.
- 3.43 *Sound Analysis:* All calls were clear enough to be identified to species level.

Dusk Emergence Survey: 4 May 2020

- 3.44 The survey concentrated on Boiler House and York House only. No bats were suspected as emerging any of the sections of the building during the dawn survey. Lighting units on the buildings were switched on for the duration of the survey.
- 3.45 No bats were recorded by any of the surveyors throughout the duration of the survey.

Dusk Emergence Survey: 5 May 2020

- 3.46 The survey concentrated on Woodcote Lodge only. No bats were suspected as emerging any of the sections of the building during the dawn survey.

⁷ A number of these calls are likely to be duplicates of the same bat pass recorded at different surveyor locations and have been grouped when considering the number of registrations for each species.

3.47 No bats were recorded by any of the surveyors throughout the entire duration of the survey

Dusk Emergence Survey: 6 May 2020

3.48 The survey concentrated on Rowan House only. No bats were suspected as emerging from any of the sections of the building during the dusk survey.

3.49 A total of 17 calls were recorded by the surveyors, from up to three bat species: common pipistrelle, soprano pipistrelle, and *myotis* species.

3.50 The first bat recorded was a common pipistrelle at 20:40 (seven minutes after sunset). Foraging and commuting common pipistrelles were recorded a total of nine times during the survey from 20:40 until 21:48 by surveyors 1 and 2.

3.51 Foraging and commuting soprano pipistrelle was recorded a total of seven times during the survey from 20:59 (29 minutes after sunset) to 21:55 by surveyors 1 and 2.

3.52 A single commuting myotis species was recorded by surveyor 1 at 21:36 (96 minutes after sunset).

3.53 *Sound Analysis*: One record for Myotis species wasn't possible to identify to species level.

4 Evaluation and Impacts

EVALUATION

- 4.1 Although the desk study identified six roosts within 2km of the site, during the 2020 emergence / re-entry surveys no bats were seen emerging from or re-entering the buildings surveyed. However, bats were recorded either foraging or commuting adjacent to the site with no bats recorded utilising the site itself. Common and soprano pipistrelle were however recorded during their respective emergence times for the species indicating that the presence of roosts nearby to the site. As a result of the surveys on site roosting bats are likely absent from Rowan House, Boiler House, Woodcote Lodge, and York House.

Foraging and commuting habitats

- 4.2 The proposals for the site include the demolition and construction of new buildings with associated landscaping on site. The surveys undertaken demonstrate there is a likely absence of bats in the PRFs available. Foraging / Commuting activity by a small number of common pipistrelle, soprano pipistrelles and *myotis* species were recorded during the dawn re-entry and dusk emergence survey offsite to the south of the site. No bats were recorded commuting through the site itself throughout any of the surveys which may be attributed to the high levels of artificial lighting present throughout the site.

Site

- 4.3 There was low amount of activity recorded adjacent to the south of the site during the surveys by three bat species, however, no bats were recorded utilising any habitats on site. As none of the bats recorded during the survey were recorded using the site itself, bats are unlikely to be dependent on the habitats on site due to the abundance of higher quality foraging / commuting habitats in the locality. However boundary habitat on the southern and western boundary do offer limited foraging and commuting habitat. The site has therefore been assessed as having value at Site level for bats.

IMPACT ASSESSMENT

Roosting Bats

- 4.4 Due to the likely absence of roosting bats during surveys undertaken in 2020, it is considered the proposed demolition of Rowan House, Boiler House, Woodcote Lodge, and York House, will have negligible impact upon roosting bats.

Foraging and commuting habitats

- 4.5 The development proposals will result in the permanent removal of introduced shrub, and a small number of scattered trees, which provide low value foraging habitat. This could result in a minor effect at a Low scale of impact.
- 4.6 Currently lighting levels throughout the majority of the site are high which is likely to deter bats from utilising habitats on site. Lighting (both during the construction phase, and operational lighting post-development) should be designed sensitively to improve the conditions for bats, especially the western and southern boundaries which is adjacent Woodcote Green woodland and pond. Furthermore, new tree and shrub planting must not be directly lit which will ensure any new commuting and foraging habitats will be of value to bats.

5 Summary and Recommendations

SUMMARY OF FINDINGS

- 5.1 This section summarises the data gathered during the surveys and the likely impacts on bats and supporting habitats that are present on the site, as described in previous sections of this report
- 5.2 The following ecological constraints have been identified:
- No bats were recorded emerging or suspected to have emerged from Rowan House, Boiler House, Woodcote Lodge, and York House which are scheduled for demolition. Therefore, roosting bats are considered likely absent from any of the buildings on site.
 - There is habitat on site to support foraging bats, measures should be taken to retain / protect / enhance these habitats where possible. Measure must also be taken do protect the optimal habitats adjacent to the southern boundary of the site.

RECOMMENDATIONS

- 5.3 Measures must be taken to ensure a sensitive lighting strategy is developed to minimise the impact during construction and operational phase of works during dusk and dawn directly illuminate any proposed landscaping and newly installed roosting habitat on site to improve the site for both foraging and commuting bats.

Timing

- 5.4 As buildings on site were assessed as having low potential to support hibernating bats works to the existing roof and cavity walls will need to be started after the winter bat hibernation season, November to March.

Trees

- 5.5 Mature beech, sycamore and scots pine trees which were assessed as having negligible potential to support roosting bats were also present on site (Arcadis, 2018). These trees are however of value to foraging and commuting bat and will likely be felled to facilitate the redevelopment of the site.
- 5.6 Working under the principle of net gain the loss of trees on site should be avoided, where this is not practicable then replacement habitat should be provided.
- 5.7 Some more generic proposals for, compensation and enhancement measures are provided in Appendix 6.

Lighting

- 5.8 While different species of bat react differently to night-time lighting, research has found that bats overall are sensitive to artificial lighting. Excessive and/or poorly directed lighting may delay bats in emerging from their roosts; shortening the time available for foraging, as well as causing bats to move away from suitable foraging grounds, movement corridors or roosting sites, to alternative dark areas (Jones, 2000).
- 5.9 To minimise indirect impacts from lighting associated with any proposed changes to the site it is recommended that artificial lighting is only directed where necessary for health and safety reasons. Lighting on site should be kept to a minimal with particular attention to the pond and woodland to the south of the site (where light sensitive *myotis* species was recorded) and any new / retained landscape planting. Lighting should only be used for the period of time for which it is required (Jones, 2000). This can be achieved by following accepted best practice (Fure, 2006; Institute of Lighting Engineers 2018 Bat Conservation Trust 2011):
- The level of artificial lighting including flood lighting should be kept to an absolute minimum and be directional, dimmable and be installed with motion sensors where possible;
 - Where this does not conflict with health and safety and/or security requirements, the site should be kept dark during peak bat activity periods (0 to 1.5 hours after sunset and 1.5 hours before sunrise);
 - Lighting required for security or safety reasons should use a lamp of no greater than 2000 lumens (150 Watts) and should comprise sensor-activated lamps;
 - Lights utilising LED technology are the preferred option as these lights do not emit on the UV spectrum, are easily controllable in terms of direction/spill and can be turned on and off instantly;
 - Avoid the use of sodium or metal halide lamps, these gas lamps require a lengthy period in which to turn off and the diffuse nature of the light emitted makes light spillage a significant problem.
 - Lights required for night time deliveries or security patrols could be set to activate with pressure activated sensors set into the ground;
 - Lighting should be directed to where it is needed to minimise light spillage. This can be achieved by limiting the height of the lighting columns and by using as steep a downward angle as possible and/or a shield/hood/cowl/ that directs the light below the horizontal plane and restricts the lit area;

- Artificial lighting should not directly illuminate any confirmed or potential bat roosting features or habitats of value to commuting/foraging bats. Similarly, any newly planted linear features or compensatory bat roosting features should not be directly lit; and
- Lighting design computer programs can be used to predict the potential impacts of light spillage.

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Appendix 1: Map of Survey Results

Figure 1: Building Inspection

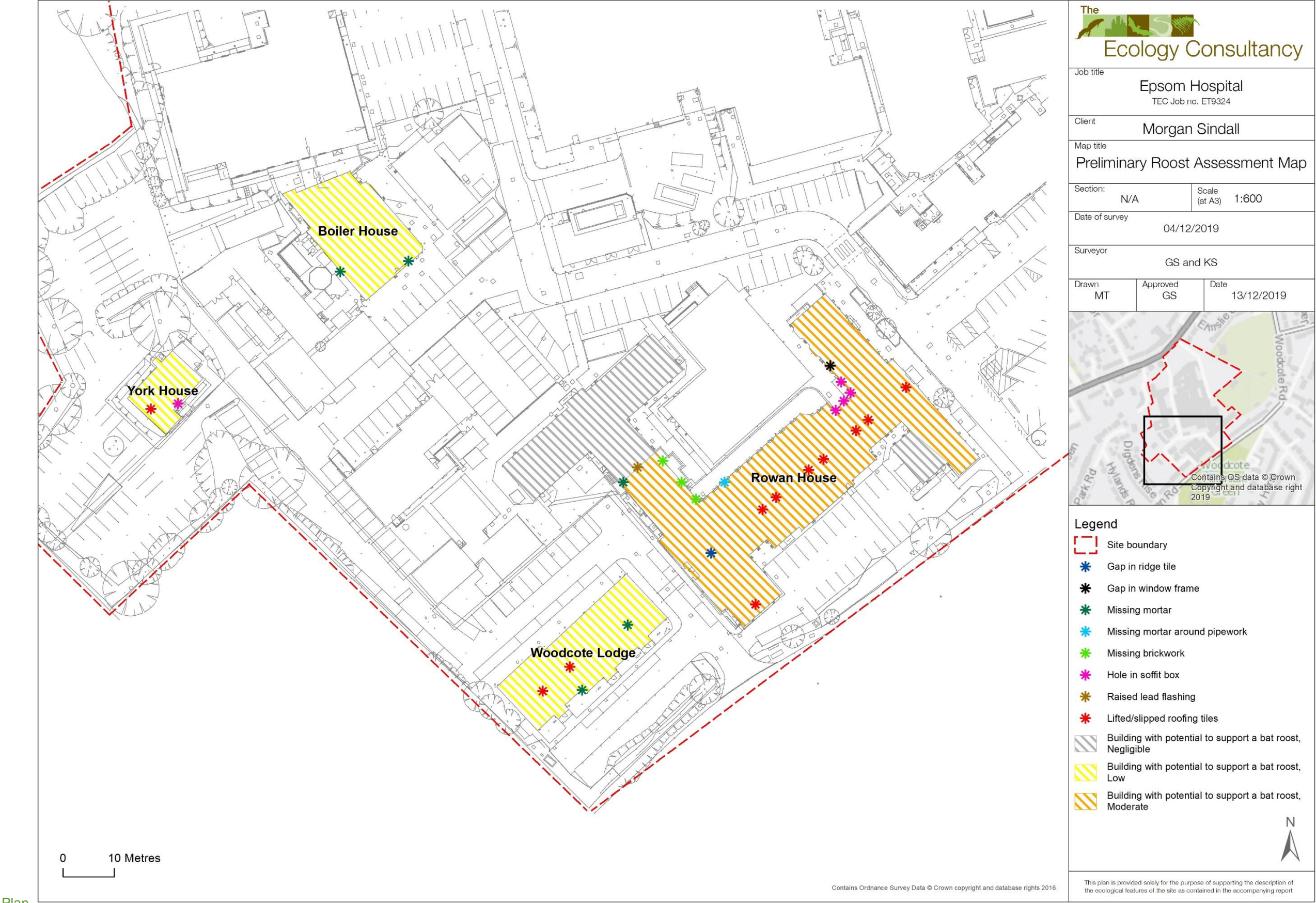


Figure 2: Dawn Re-entry Plan. 22 April 2020

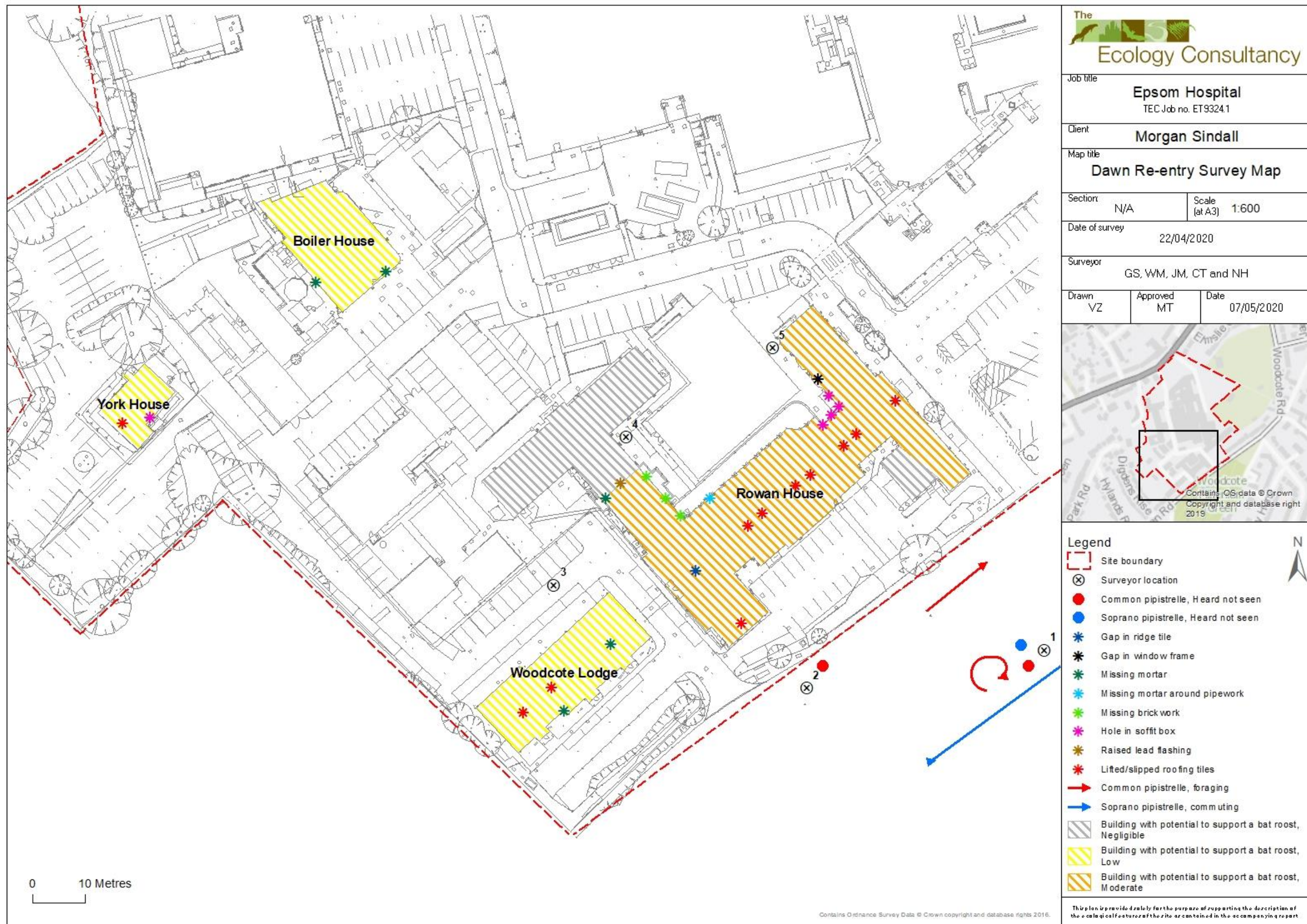
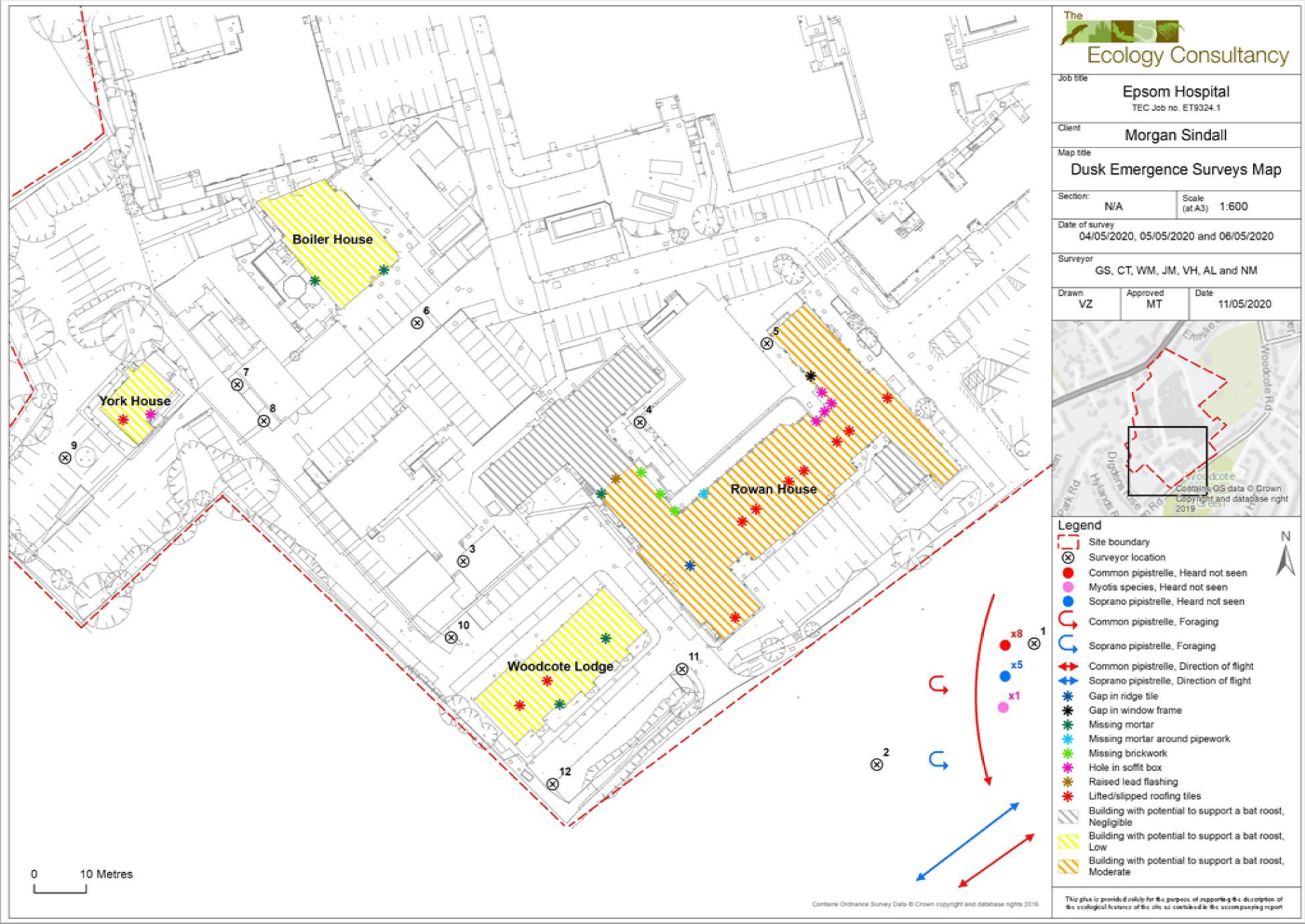


Figure 3: Dusk Emergence Survey, 4, 5, 6 May 2020



Appendix 2: Survey Proformas

Dawn Re-entry survey Rowan House: 22/04/2020

Dawn to Dusk Survey, Rowan House, 22/04/2020

Project		9324.1 - Epsom Hospital		Building reference		Rowan House	
Surveyor		George Siskos (1)		Date		22/04/2020	
Survey no		One		Survey start/end times		03:50 – 06:05	
Sunset/rise time		05:50		Equipment reference		BATLOGGER M 1612-2411	
Surveyor-Easting, Northing				Surveyor location		South east Rowan House	
General weather conditions		Chilly, calm, clear morning with 87% humidity					
Temperature (start and end)	14 at dusk, 8 to 9 at dawn	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	0	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
05:09	Common pipistrelle	1	Seen	Foraging	South	Foraging around edge of woodland	
05:15	Soprano pipistrelle	1	Not seen	Foraging		Note seen - brief pass	
05:16	Common pipistrelle	1	Not seen	Foraging		Note seen - brief pass	
05:27	Soprano pipistrelle	1	Seen	Commuting	South to West	Along tree line	

Project		9324.1 - Epsom Hospital		Building reference		Rowan House	
Surveyor		John Myerscough (2)		Date		22/04/2020	
Survey no		1		Survey start/end times		03:50 – 06:05	
Sunset/rise time		05:50		Equipment reference		BATLOGGER M 1717-2833	
Surveyor-Easting, Northing				Surveyor location		South-west Rowan House	
General weather conditions		Chilly, calm, clear morning with 87% humidity					
Temperature (start and end)	14 at dusk, 8 to 9 at dawn	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	0	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
05:04	Common pipistrelle	1	Not seen	Commuting	Unknown	Brief, distant pass	
05:09	Common pipistrelle	1	Seen	Foraging	East	Brief foraging pass over the pond, flying west to east	

Project		9324.1 - Epsom Hospital		Building reference		Rowan House	
Surveyor		Wendy McFarlane (3)		Date		22/04/2020	
Survey no		1		Survey start/end times		03:50 – 06:05	
Sunset/rise time		05:50		Equipment reference		BATLOGGER M 1717-2833	
Surveyor-Easting, Northing				Surveyor location		South-west Rowan House	
General weather conditions		Chilly, calm, clear morning with 87% humidity					
Temperature (start and end)	14 at dusk, 8 to 9 at dawn	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	0	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
03:50 - 05:50						No bats heard or seen throughout the length of survey. Large number of lights were permanently on in the carpark.	

Project		9324.1 - Epsom Hospital		Building reference		Rowan House	
Surveyor		Charlotte Toon (4)		Date		22/04/2020	
Survey no		One		Survey start/end times		03:50 – 06:05	
Sunset/rise time		05:50		Equipment reference		BATLOGGER M 1612-2404	
Surveyor-Easting, Northing				Surveyor location		North west Rowan House	
General weather conditions		Chilly, calm, clear morning with 87% humidity					
Temperature (start and end)	14 at dusk, 8 to 9 at dawn	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	0	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
						No bats seen or heard.	

Project		9324.1 - Epsom Hospital		Building reference		Rowan House	
Surveyor		Natalie Murray (5)		Date		22/04/2020	
Survey no		One		Survey start/end times		03:50 – 06:05	
Sunset/rise time		05:50		Equipment reference		BATLOGGER M 1533-2239	
Surveyor-Easting, Northing				Surveyor location		North east Rowan House	
General weather conditions		Chilly, calm, clear morning with 87% humidity					
Temperature (start and end)	14 at dusk, 8 to 9 at dawn	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	0	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
						No bats seen or heard.	

Dusk Emergence survey Boiler House and York House: 04/05/2020

Project		9324.1 - Epsom Hospital		Building reference		Boiler House	
Surveyor		Verity Heard (6)		Date		04/05/2020	
Survey no		1		Survey start/end times		20:14 – 22:00	
Sunset/rise time		20:29		Equipment reference		BATLOGGER M	
Surveyor-Easting, Northing				Surveyor location		South elevation Boiler House (6)	
General weather conditions		Cold breeze, clear, sunny, 70% humidity					
Temperature (start and end)	12 -10	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	3	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:14 – 22:00						No bats heard or seen throughout the duration of survey. Large number of lights were permanently on illuminating the car park and building	

Project	9324.1 - Epsom Hospital		Building reference	Boiler House			
Surveyor	George Siskos (7)		Date	04/05/2020			
Survey no	1		Survey start/end times	20:14 – 22:00			
Sunset/rise time	20:29		Equipment reference	BATLOGGER M			
Surveyor-Easting, Northing			Surveyor location	West elevation Boiler House (7)			
General weather conditions	Cold breeze, clear, sunny, 70% humidity						
Temperature (start and end)	12 -10	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	3	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:14 – 22:00						No bats heard or seen throughout the duration of survey. Large number of lights were permanently on illuminating the car park and building	

Project	9324.1 - Epsom Hospital		Building reference	York House			
Surveyor	Andrew Lewis (8)		Date	04/05/2020			
Survey no	1		Survey start/end times	20:14 – 22:00			
Sunset/rise time	20:29		Equipment reference	BATLOGGER M			
Surveyor-Easting, Northing			Surveyor location	South elevation -York House (8)			
General weather conditions	Cold breeze, clear, sunny, 70% humidity						
Temperature (start and end)	12 -10	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	3	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:14 – 22:00						No bats heard or seen throughout the duration of survey. Large number of lights were permanently on illuminating the car park, however there was some foraging habitat on site.	

Project	9324.1 - Epsom Hospital		Building reference	York House			
Surveyor	Charlotte Toon (9)		Date	04/05/2020			
Survey no	1		Survey start/end times	20:14 – 22:00			
Sunset/rise time	20:29		Equipment reference	BATLOGGER M			
Surveyor-Easting, Northing			Surveyor location	West elevation -York House (9)			
General weather conditions	Cold breeze, clear, sunny, 70% humidity						
Temperature (start and end)	12 -10	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	3	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:14 – 22:00						No bats heard or seen throughout the duration of survey. Large number of lights were permanently on illuminating the car park, however there was some foraging habitat on site.	

Dusk Emergence survey Woodcote Lodge: 05/05/2020

Project	9324.1 - Epsom Hospital		Building reference	York House			
Surveyor	Wendy McFarlane (10)		Date	04/05/2020			
Survey no	1		Survey start/end times	20:15 – 22:01			
Sunset/rise time	20:31		Equipment reference	BATLOGGER M			
Surveyor-Easting, Northing			Surveyor location	North elevation Woodcote Lodge (10)			
General weather conditions	Cold breeze, clear, sunny, 70% humidity						
Temperature (start and end)	11 - 8	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	3 – 4	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:14 – 22:00						No bats heard or seen throughout the duration of survey. Large number of lights were permanently on illuminating the car park and building.	

Project	9324.1 - Epsom Hospital		Building reference	Woodcote Lodge			
Surveyor	John Myerscough (11)		Date	04/05/2020			
Survey no	1		Survey start/end times	20:15 – 22:01			
Sunset/rise time	20:31		Equipment reference	BATLOGGER M			
Surveyor-Easting, Northing			Surveyor location	South west elevation Woodcote Lodge (11)			
General weather conditions	Cold breeze, clear, sunny, 70% humidity						
Temperature (start and end)	11 - 8	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	3 – 4	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:14 – 22:00						No bats heard or seen throughout the duration of survey. Large number of lights were permanently on illuminating the car park and building.	

Project	9324.1 - Epsom Hospital		Building reference	Woodcote Lodge			
Surveyor	John Myerscough (11)		Date	04/05/2020			
Survey no	1		Survey start/end times	20:15 – 22:01			
Sunset/rise time	20:31		Equipment reference	BATLOGGER M			
Surveyor-Easting, Northing			Surveyor location	South east elevation Woodcote Lodge (11)			
General weather conditions	Cold breeze, clear, sunny, 70% humidity						
Temperature (start and end)	11 - 8	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	3 – 4	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:14 – 22:00						No bats heard or seen throughout the duration of survey. Large number of lights were permanently on illuminating the car park and building.	

Project	9324.1 - Epsom Hospital		Building reference	Woodcote Lodge			
Surveyor	Charlotte Toon (12)		Date	04/05/2020			
Survey no	1		Survey start/end times	20:15 – 22:01			
Sunset/rise time	20:31		Equipment reference	BATLOGGER M			
Surveyor-Easting, Northing			Surveyor location	South west elevation Woodcote Lodge (12)			
General weather conditions	Cold breeze, clear, sunny, 70% humidity						
Temperature (start and end)	11 - 8	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	3 – 4	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:14 – 22:00						No bats heard or seen throughout the duration of survey. Large number of lights were permanently on illuminating the car park and building.	

Dusk Emergence Survey, Rowan House, 06/05/2020

Back Emergence Survey, Rowan House, 06/05/2020

Project		9324.1 - Epsom Hospital		Building reference		Rowan House	
Surveyor		Charlotte Toon (1)		Date		06/05/2020	
Survey no		Four		Survey start/end times		20:15 - 22:00	
Sunset/rise time		20:30		Equipment reference		BATLOGGER M 1612-2404	
Surveyor-Easting, Northing				Surveyor location		South east Rowan House (1)	
General weather conditions		Chilly, calm,					
Temperature (start and end)	11	Cloud cover (0-8)	0/8	Wind (Beaufort 0-12)	0	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:51	Common pipistrelle	1	Not seen	Commuting	Unknown		
20:53 – 22:00	Common pipistrelle	1	Not seen	Commuting	Unknown	Numerous passes until the end of the survey, becoming slightly less frequent towards the end	
20:59	Soprano pipistrelle	1	Not seen	Commuting	Unknown		
21:02	Common pipistrelle	1	Seen	Foraging	Unknown	Circling over pond for 5 minutes, see map	
21:04	Soprano pipistrelle	1	Seen	Foraging	Unknown	Few passes, over pond, see map	
21:10	Common pipistrelle	1	Seen	Commuting	South	See map	
21:20	Soprano pipistrelle	1	Not seen	Commuting	Unknown	Couple passes	
21:24	Common pipistrelle	1	Not seen	Socialising	Unknown		

21:25	Common pipistrelle	1	Not seen	Socialising	Unknown	
21:28	Common pipistrelle	1	Not seen	Socialising	Unknown	
21:36	Myotis	1	Not seen	Commuting	Unknown	
21:40	Soprano pipistrelle	1	Not seen	Commuting	Unknown	Several passes over 8 minutes.
21:46	Soprano pipistrelle	1	Not seen	Socialising	Unknown	
21:48	Common pipistrelle	1	Not seen	Socialising	Unknown	
21:55	Soprano pipistrelle	1	Not seen	Commuting	Unknown	2 passes

Project		9324.1 - Epsom Hospital		Building reference		Rowan House	
Surveyor		Andrew Lewis		Date		06/05/2020	
Survey no		Two		Survey start/end times		20:17 – 22:03	
Sunset/rise time		20:33		Equipment reference		BATLOGGER M	
Surveyor-Easting, Northing				Surveyor location		South West elevation Rowan house (2)	
General weather conditions		Cool, dry, slight breeze					
Temperature (start and end)	12	Cloud cover (0-8)	0	Wind (Beaufort 0-12)	1	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:40 – 21:30	CP & SP	Constant	S	Foraging		Constant foraging by multiple bats along edge of woodland and over pond	

Project		9324.1 - Epsom Hospital		Building reference		Rowan House	
Surveyor		Wendy McFarlane		Date		06/05/2020	
Survey no		Two		Survey start/end times		20:17 – 22:03	
Sunset/rise time		20:33		Equipment reference		BATLOGGER M	
Surveyor-Easting, Northing				Surveyor location		West elevation Rowan house (3)	
General weather conditions		Cool, dry, slight breeze					
Temperature (start and end)	12	Cloud cover (0-8)	0	Wind (Beaufort 0-12)	1	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:17 – 22:03						No bats heard or seen throughout the length of survey. Large number of lights were permanently on in the carpark.	

Project		9324.1 - Epsom Hospital		Building reference		Rowan House	
Surveyor		Natalie Murray		Date		06/05/2020	
Survey no		Two		Survey start/end times		20:17 – 22:03	
Sunset/rise time		20:33		Equipment reference		BATLOGGER M	
Surveyor-Easting, Northing				Surveyor location		North west elevation Rowan house (4)	
General weather conditions		Cool, dry, slight breeze					
Temperature (start and end)	12	Cloud cover (0-8)	0	Wind (Beaufort 0-12)	1	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:17 – 22:03						No bats heard or seen throughout the length of survey. Large number of lights were permanently on in the carpark.	

Project		9324.1 - Epsom Hospital		Building reference		Rowan House	
Surveyor		Verity Heard		Date		06/05/2020	
Survey no		Two		Survey start/end times		20:17 – 22:03	
Sunset/rise time		20:33		Equipment reference		BATLOGGER M	
Surveyor-Easting, Northing				Surveyor location		North east elevation Rowan house (5)	
General weather conditions		Cool, dry, slight breeze					
Temperature (start and end)	12	Cloud cover (0-8)	0	Wind (Beaufort 0-12)	1	Rain (0-5)	0
Species - (CP=common pipistrelle, SP=soprano pipistrelle, LE=long-eared, N=Noctule, S=Serotine, M=Myotis, U=Unknown)							
Activity type - (E = Emergence, R = Return to roost, C = Commuting, F = Foraging, S = Socialising)							
Time	Species	Number of bats	Seen/not seen (S/NS)	Activity type	Direction of flight	Notes (inc map ref)	
20:17 – 22:03						No bats heard or seen throughout the length of survey. Large number of lights were permanently on in the carpark.	

Appendix 3: Photographs

Photograph 1
Rowan House,
southern elevation



Photograph 2
Rowan house,
northern elevation of
main building section
and western elevation
of slate tiled section.



Photograph 3
Rowan house –
internal view of
one of the loft voids.



Photograph 4
Rowan House - PRF,
missing mortar
around pipework and bird
droppings



Photograph 5

Rowan House:
PRF – Missing
mortar



Photograph 6

Rowan House:
PRF – Hole in
soffit box



Photograph 7

Woodcote Lodge -
northern elevation



Photograph 8
Woodcote Lodge -
internal view of one
of the loft voids



Photograph 9
Woodcote Lodge –
PRF: raised roofing tile



Photograph 10
York house - southern
and eastern elevation.



Photograph 11
York house - internal
view of loft void



Photograph 12
York house - PRF:
missing roofing tile



Photograph 13
York house - northern elevation
and mature Scots pine and
standing dead wood tree (circled)



Photograph 14
Boiler house -
Southern elevation



Photograph 15
Boiler house -
internal view



Photograph 16
Boiler house – PRF:
missing mortar.



Photograph 17
Boiler house – PRF:
Gap leading into chimney cavity.



Appendix 4: Legislation

Important Notice: This section contains details of legislation applicable in Britain only (i.e. not including the Isle of Man, Northern Ireland, the Republic of Ireland or the Channel Islands) and is provided for general guidance only. While every effort has been made to ensure accuracy, this section should not be relied upon as a definitive statement of the law.

NATIONAL LEGISLATION AFFORDED TO BAT SPECIES

The objective of the EC Habitats Directive⁸ is to conserve the various species of plant and animal which are considered rare across Europe. The Directive is transposed into UK law by The Conservation of Habitats and Species Regulations 2017 (formerly The Conservation (Natural Habitats, &c.) Regulations 2010 (as amended) and The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended).

The Wildlife and Countryside Act 1981 (as amended) is a key piece of national legislation which implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and implements the species protection obligations of Council Directive 2009/147/EC (formerly 79/409/EEC) on the Conservation of Wild Birds (EC Birds Directive) in Great Britain.

Explanatory notes relating to all bat species protected under The Conservation of Habitats and Species Regulations 2017 are given below.

- In the Directive, the term 'deliberate' is interpreted as being somewhat wider than intentional and may be thought of as including an element of recklessness.
- The Conservation of Habitats and Species Regulations 2017 does not define the act of 'migration' and therefore, as a precaution, it is recommended that short distance movement of animals for e.g. foraging, breeding or dispersal purposes are also considered.
- In order to obtain a European Protected Species Mitigation (EPSM) licence, the application must demonstrate that it meets all of the following three 'tests': i) the action(s) are necessary for the purpose of preserving public health or safety, or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequence of primary importance for the environment; ii) that there is no satisfactory alternative and iii) that the action authorised will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range.

⁸ Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora

All species of bat are fully protected under The Conservation of Habitats and Species Regulations 2017 through their inclusion on Schedule 2. Regulation 41 prohibits:

- Deliberate killing, injuring or capturing of Schedule 2 species (all bats)
- Deliberate disturbance of bat species as:
 - a) to impair their ability:
 - (i) to survive, breed, or reproduce, or to rear or nurture young;
 - (ii) to hibernate or migrate³
 - b) to affect significantly the local distribution or abundance of the species
- Damage or destruction of a breeding site or resting place
- Keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

Bats are also currently protected under the Wildlife and Countryside Act 1981 (as amended) through their inclusion on Schedule 5. Under this Act, they are additionally protected from:

- Intentional or reckless disturbance (at any level)
- Intentional or reckless obstruction of access to any place of shelter or protection
- Selling, offering or exposing for sale, possession or transporting for purpose of sale.

How is the legislation pertaining to bats liable to affect development works?

An EPSM licence issued by the relevant countryside agency (e.g. Natural England) will be required for works liable to affect a bat roost or for operations likely to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (survive, breed, rear young and hibernate). The licence is to allow derogation from the relevant legislation but also to ensure appropriate mitigation measures be put in place and their efficacy to be monitored.

Though there is no case law to date, the legislation may also be interpreted such that, in certain circumstances, important foraging areas and/or commuting routes can be regarded as being afforded *de facto* protection, for example, where it can be proven that the continued usage of such areas is crucial to maintaining the integrity and long-term viability of a bat roost⁹.

⁹ Garland & Markham (2008) Is important bat foraging and commuting habitat legally protected? Mammal News, No. 150. The Mammal Society, Southampton.

Appendix 5: Assessment Criteria for Preliminary Roost Assessments

ASSESSMENT CRITERIA – PRELIMINARY ROOST ASSESSMENT – STRUCTURES

The potential for structures to support roosting bats, ranging from negligible to the presence of a confirmed roost, is assessed using the findings of the survey and the desk study. The following criteria were used to determine the level of potential of the buildings for roosting bats:

- **Negligible potential** – While presence cannot be absolutely discounted there were no significant visible features that could be used by bats for roosting.
- **Low** – Small number of potential roosting features such as could be utilised by individual opportunistic roosting bats. Site situated within isolated habitat that could be used by foraging bats but which is not connected by prominent linear features such as woodland edge, hedgerows and tree lines.
- **Moderate** – Several potential roosting features in the buildings or other structures. There is surrounding habitat such as woodland, scattered trees, hedgerows suitable to support foraging and roosting bats. The site is connected with the wider landscape by linear features such as woodland edge, hedgerows and tree lines that could be used by commuting bats.
- **High** – Buildings or other structures, such as mines, caves, tunnels, ice houses and cellars, with numerous features of potential significance for roosting bats. Surrounding landscape has high value habitat for roosting, foraging and commuting that is contiguous with on-site habitats. The site is connected with the wider landscape by strong linear features and may be close to known roosts or other potentially valuable habitat resources.
- **Confirmed roost** – Evidence indicates a building or other structure is used by bats, for example:
 - bats seen roosting or observed flying from a roost or freely in the habitat;
 - droppings, carcasses, feeding remains;
 - bats heard 'chattering' inside on a warm day or at dusk.

ASSESSMENT CRITERIA – GROUND LEVEL ROOST ASSESSMENT – TREES

All trees that may have a level of potential for a roost are assessed using the Cowan Scale (Cowan, 2006). The following values are assigned in considering the availability of suitable features for roosting bats:

- **0 – negligible potential** – No visible features that could be used by bats for roosting
- **1 – low potential** – One or two minor features, possible associated with feeding or night-time roosts, such as:
 - sparse ivy *Hedera helix*;
 - minor branch splits or fissures;
 - small areas of loose bark;
 - features less than ten years old.
- **2 – moderate potential** – Features that may provide a more secure site for individuals or small groups of bats, such as:
 - dense ivy;
 - significant branch splits;
 - small cavities such as woodpecker holes;
 - features present for between 10 and 30 years.
- **3 – high potential** – Features of particular significance, suitable for high priority roost such as maternity roosts and likely to be used by larger groups of bats, such as:
 - features that provide rare or uncommon conditions in the local area;
 - large cavities or extensive branch or trunk splits;
 - multiple features in the same tree;
 - features present for more than 30 years that could have been used by several generations of bats.
- **4 – confirmed roost** – Evidence indicating use by bats, such as:
 - droppings, carcasses, feeding remains;
 - bats heard 'chattering' inside on a warm day or at dusk;
 - bats seen roosting or observed flying from a feature.

Appendix 6: Standard Guidance for Mitigation, Compensation and Enhancement

Bat tubes, bat bricks and bat boxes

To compensate for the loss of roosts used by crevice dwelling species or to provide enhancement measures thought should be given to utilising proprietary products from recognised manufacturers such as: Bird Brick Houses, The Nest Box Company, Schwegler, Habibat, Causa and Vincent. Bat tubes and integrated bat bricks are artificial roost features that can be incorporated into building structures. Bat boxes are generally fitted externally to mature trees or structures. The site's value to bats could be enhanced by installing any of these features. Any bat tubes and bat bricks used for enhancement would need to be in addition to any required to compensate for the loss of the roosts.

Bat tubes, bat bricks or bat boxes should be located at least 5m above ground level facing southeast – southwest and to allow for clear flight paths and should not be directly lit by artificial lighting. Bat boxes should be woodcrete designs as they are long lasting compared to wooden boxes and insulate occupants from extremes of temperature and condensation.

Breathable roof membrane

Breathable roof membranes (BRMs) have been shown to entangle roosting bats, leading to mortality, sometimes of entire colonies. Therefore it is recommended that only bitumen roofing felt that does not contain polypropylene filaments (e.g. bitumen felt type 1F) should be used to reduce the risk of bat mortality.

Bats and Lighting

While different species of bat react differently to night time lighting, research has found that bats overall are sensitive to artificial lighting. Excessive and/or poorly directed lighting may delay bats in emerging from their roosts; shortening the time available for foraging, as well as causing bats to move away from suitable foraging grounds, movement corridors or roosting sites, to alternative dark areas (Jones, 2000).

To minimise indirect impacts from lighting associated with the proposed development it is recommended that artificial lighting is only directed where necessary for health and safety reasons. Lighting should only be used for the period of time for which it is required (Jones, 2000). This can be achieved by following accepted best practice (Fure, 2006; Institute of Lighting Professionals, BCT, 2018;& Jones, 2000) which is summarised Appendix 5. Lighting should not illuminate any trees on-site, or suspected or confirmed bat roosting sites, including Building 7 to the south of the site which has a confirmed bat roost. Disturbance from works vehicles etc should also be minimised around Building 7, to avoid disturbance to any roosting bats that may be present.

Planting for wildlife - foraging and commuting habitats for bats

It is acknowledged that using native species in planting schemes attract insects and provide a potential food source for bats (BCT, 2009). Landscaping proposals should seek to enhance the value of the site for foraging and commuting bats by including such species.

Shrubs and herbaceous perennials should comprise night scented plants and those that flower such as honeysuckle, night scented stock, evening primrose and Nottingham catchfly to attract moths and other night flying insects which in turn provide a valuable food source for bats on site. A lists of plants of value to bats can be found at <https://www.rhs.org.uk/advice/pdfs/plants-for-bats.pdf> and at <http://www.suffolkwildlifetrust.org/attracting-bats>.

Provision of roosting bat opportunities

Bat boxes (at least two) should be installed on site post development to provide additional roosting opportunities for bats in the area. The boxes should be installed at least 4m off the ground on either buildings or trees, away from artificial lighting and facing south-east to south-west. Woodcrete boxes such as those manufactured by Schwegler Ltd, are recommended as they include a broad range of designs, are long lasting compared to wooden boxes and insulate occupants from extremes of temperature and condensation.



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