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Bat Activity Survey Report

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Cornamaddy Phase 4: Large-scale Residential Development (LRD), Athlone, Co. Westmeath Marina Quarter Ltd.

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1. INTRODUCTION



1.1 Quality Assurance and Competence

Enviroguide Consulting is a multi-disciplinary consultancy specialising in the areas of Environment, Waste Management and Planning. All consultants have scientific or technical qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training and continued professional development.

Professional memberships include the Chartered Institution of Wastes Management (CIWM), and Chartered Institute of Ecology and Environmental Management (CIEEM).

All surveying and reporting have been carried out by qualified and experienced ecologists and environmental consultants. AW, professional bat Ecologist with Ash Ecology and Environmental Ltd. undertook the 2022 and 2021 on-site bat surveys. ROH, Ecologist with Enviroguide Consulting conducted the 2023 bat surveys. AC, Ecologist with Enviroguide Consulting authored this report.

AW, M.Sc. MCIEEM is trading as Ash Ecology & Environmental Ltd. Qualifications include M.Sc. (Dist) in Biodiversity and Conservation (TCD) and B.Sc. (Hons) Zoology (NUIG), a diploma in Applicated Aquatic Science (GMIT) and a Certificate in Applied Biology (GMIT). AW has over 15 years of experience providing environmental consultancy and environmental assessment services. AW has written numerous Ecological Impact Assessments (EcIA), Screening for Appropriate Assessment (AA) Stage I and Stage II Natura Impact Statements (NIS), chapters for EIAR, Badger Surveys, Bat Surveys, Bird and Habitat Surveys. AW is a licenced bat ecologist (example of recent licences: DER/BAT 2020 – 46 EUROPEAN, DER/BAT 2020 – 48 EUROPEAN, DER/BAT 2021 – 89 EUROPEAN, DER/BAT 2022 – 12 EUROPEAN) and a member of Bat Conservation Ireland. In addition, AW has completed several bat courses to continue her training and CPD with the most recently (May 2021) a Lantra-accredited course, developed by the Bat Conservation Trust and supported by the Arboricultural Association to access bat tree roost features. Over the past 15 years AW has completed hundreds of bat surveys providing her with more than adequate experience in the profession.

ROH, Project Ecologist with Enviroguide, has a M.Sc. (Hons.) in Ecological Assessment from University College Cork, and a B.Sc. (Hons.) in Environmental Science from the University of Galway. ROH has a wealth of experience in desktop research, literature scoping-review, and report writing, as well as practical field experience (Habitat surveys, invasive species surveys and bird surveys). ROH has extensive experience in compiling Biodiversity Chapters of EIARs, EcIAs, AA screening and NIS reports, and in the overall assessment of potential impacts to ecological receptors from a range of developments.



AC is an experienced general Ecologist with Enviroguide Consulting; AC is an Associate member of CIEEM (ACIEEM) with an MSc in Ecological Management and Conservation Biology from Queen's University, Belfast. AC has a wealth of experience authoring and reviewing Screenings for AA, Natura Impact Statements (NIS), Ecological Impact Assessments (EcIA) and Biodiversity Chapters for Environmental Impact Assessment Reports (EIAR). Subsequently, AC is very familiar with the process of ecological assessment and the relevant legislation. AC is knowledgeable in a range of survey techniques, including conducting bat, mammal, bird, newt, invasive species and habitat surveys.

1.2 Site Location & Description

The proposed development is situated in Cornamaddy, Athlone, Co. Westmeath. The Proposed Development will consist of a residential development and public open space comprising the following:

- Amendments to permitted application WMCC reg Ref. 14/7103/ ABP Ref. PL25.244826 for the removal of 38 no. permitted units (not constructed) to be replaced by: Construction of 70 no. residential units comprising: 4 no. 2 bed terraced houses (78 sq.m), 60 no. 3 bed semi-detached (96-116 sq.m) and 6 no. 4 bed semidetached houses (147 sq.m) with associated private gardens.
- The creche facility, public open spaces, landscaping, roads layouts, car parking, boundary treatment works, public lighting and all associated site works associated with the 87 no. remaining units retained as permitted under WMCC Reg Ref. 14/7103 ABP Ref. PL25.244826 will remain unchanged.
- All pedestrian and vehicular access roads and footpaths including a section of the planned east/west distributor road connecting to a sections of the distributor road permitted under WMCC Reg. Refs 14/7103/ ABP Ref. PL25.244826 and 22/253 to the east of the site.
- All associated site development works, services provision, drainage works, public open space (c.1.03ha), landscaping, boundary treatment works, public lighting, associated ESB substation cabinets, bin stores, car and bicycle parking provision.
- This development will form part of a larger/future phase of the development.





FIGURE 1: SITE LOCATION



2. RELEVANT LEGISLATION



In view of their sensitive status across Europe, all species of bat have been listed on Annex IV of the EC 'Habitats and Species Directive', while the Lesser-Horseshoe bat is given further protection and listed on Annex II of the Directive. The Habitats Directive was transposed into Irish law as the European Communities (Natural Habitats) Regulations, 1997, and combined with the Wildlife Acts 1976 (as amended), which ensures that individual bats, their breeding sites and resting places are fully protected in Irish law. This has important implications for those who own or manage sites where bats occur.

All bat species are protected under the Wildlife Acts 1976 as amended, which makes it an offence to wilfully interfere with or destroy the breeding or resting place of these species however, the Acts permit limited exemptions for certain kinds of development which would require a derogation licence to be obtained from the NPWS with input from a qualified Bat Specialist. All species of bats in Ireland are listed on Schedule 5 of the 1976 Act, and are therefore subject to the provisions of Section 23, which make it an offence to:

- 1. Intentionally kill, injure or take a bat,
- 2. Possess or control any live or dead specimen or anything derived from a bat,
- 3. Wilfully interfere with any structure or place used for breeding or resting by a bat,
- 4. Wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose.

3. METHODOLOGY

3.1 Desk Study

3.1.1 Existing Bat Records

A desk-based review of all relevant available information concerning bats was undertaken on the 6th of October 2023. Information contained on the websites of the National Parks and Wildlife Service (NPWS) and the National Biodiversity Data Centre (NBDC) was also reviewed. The following guidance documents were also reviewed and consulted to inform the compilation of this report:

- Bat Conservation Ireland (BCI) website. Available at: <u>https://www.batconservationireland.org/irish-bats</u>
- Bat Conservation Trust (BCT) (2018) *Bats and artificial lighting in the UK*. Bats and the Built Environment series.
- Kelleher, C. & Marnell, F. (2020) *Bat Mitigation Guidelines for Ireland*, Version 2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition. BCT.
- Collins, J. (ed) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines 4th edition. BCT.



- BCI (2010) Bats & Lighting Guidance Notes for: Planners, engineers, architects, and developers.
- Russ, J. (2012) British Bat Calls A Guide to Species Identification. Pelagic Publishing

Additionally, the NBDC website (<u>www.nbdc.ie</u>) was also interrogated for historical fecords of bats within the N04 10km grid square.

3.1.2 Landscape Suitability

The Bat Conservation Ireland Landscape Suitability Model (Lundy *et al.*, 2011) provides a habitat suitability index for bat species across Ireland. The model divides the country into 1 km grid squares and ranks the habitat within the squares according to its suitability for various bat species. The scores are divided into five qualitative categories of suitability, namely:

- 0.0000000 13.000000: Low
- 13.000001 21.333300: Low Medium
- 21.333301 28.111099: Medium
- 28.111100 36.444401: Medium High
- 36.444402 58.555599: High

The area encompassing the Proposed Development Site was checked to determine the landscape suitability score for all bat species. The results are included below in section 4.1.2.

3.2 Field Surveys

3.2.1 Potential Bat Roost Assessment

Potential Bat Roost (PBR) and commuting/foraging habitat suitability surveys were conducted by two Enviroguide ecologists during the day of the 18th of May 2023.

Daytime inspections were undertaken of all of the trees within the Proposed Development area in order to assess features that may provide suitable bat roost habitat. Inspections were undertaken visually from the ground, with the aid of a strong torch beam where required. Trees within the survey area were assessed for Potential Roost Features (PRFs) which were used to determine their potential bat roost value as per Table 4.1 in the Bat Conservations Trust's 4th edition of *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016 and 2023).

Evidence of bat usage includes observations of bats (visible or audible), bat droppings, urine staining, grease marks (oily secretions from glands present on stonework), claw marks and feeding signs. In addition, the presence of bat fly pupae (bat parasite) also can indicate that bat usage of a crevice, for example, has occurred in the past. PRFs can be defined in four broad terms of suitability as detailed below:

- Negligible No suitable features observed.
- Low A structure with one or more roost features as used by individual bats or a tree of sufficient size to contain roost features but none observed from the ground.
- Moderate A structure or tree with one or more roost features and able to support one or more bats but unlikely to support a roost of high conservation status.



• High - A structure or tree with one or more roost features that are obviously suitable for use by a larger number of bats on a regular basis, and potentially for longer periods of time.

1.2.1 Habitat Suitability Assessment

The Site was also assessed in relation to potential bat foraging habitat and potential bat commuting routes on the 18th of May 2023. Bat habitats and commuting routes identified were considered in relation to the wider landscape to determine landscape connectivity for local bat populations through the examination of aerial photographs.

Habitat suitability is assessed qualitatively from Negligible to High as described below:

- Negligible No suitable foraging or commuting habitats on Site.
- Low Suitable but isolated habitats that could be used by small numbers of commuting and/or foraging bats, such as poorly connected gappy hedgerows, lone trees, unvegetated streams, etc.
- Moderate Suitable continuous habitat connected to the wider landscape that could be used by commuting and/or foraging bats, such as treelines, scrub, grassland, water, etc.
- High Continuous high-quality habitat that is well-connected to the wider landscape, and is likely used regularly by commuting and/or foraging bats, such as river valleys, broadleaved woodland, woodland edge, grazed parkland, etc.

3.2.2 Dusk Roost Emergence Survey

A bat emergence survey was conducted on the 23rd of August 2023 by Enviroguide surveyors situated in locations that gave good views of the treeline noted as containing Moderate potential bat roosts during the potential bat roost assessment in May 2023. The focus of this emergence survey was on trees to be retained outside the Site boundary, but within the applicant's landholding, and either noted as having bats emerge during the 2021 and 2022 transect surveys of the Site, noted to hold high bat roost potential (trees T916, T917, T918, T919, T920, T921, T922, T923 and T924) or with elevated bat activity during the May 2023 survey. A summary of the tree removal assessment is given in Appendix I (Charles McCorkell, 2023), while a map of the trees assessed and those proposed for removal are shown in Appendix II.

The methodology of the emergence survey followed best practice guidelines (Collins, 2016 and 2023 and Marnell et al., 2022) with the dusk survey commencing 15 minutes before sunset and lasting until approximately 1.5 hours after sunset. A summary of the weather conditions and timing of the emergence survey are given in Table 1 below, while a map of the surveyor locations and target treeline is presented in Figure 2.

Date	Survey type	Survey duration	Weather at start	Weather at finish
23/08/2023	Emergence	Survey began at 20.25 (sunset was 20.42) and ended at 22.15	Wind: Beaufort 1 Precipitation: Dry Temperature: 15°	Wind: Beaufort 1 Precipitation: Dry Temperature : 12 °

TABLE 1. DUSK EMERGENCE SURVEY EFFORT





FIGURE 2. DUSK EMERGENCE SURVEY: SURVEYOR LOCATIONS (AUGUST 2023)

3.2.3 Dusk Transect Activity Surveys

Dusk transect bat activity surveys were carried out within the Site of the Proposed Development on 18th May 2023 by two Enviroguide surveyors, and across the applicant's landholding on 28th July 2022 and 29th September 2021 by ecologists from Ash Ecology and Environmental. Survey methodologies followed those of the Bat Conservation Trust *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016 and 2023). As per the best practice guidelines, activity surveys should be conducted in the period from May to September. Surveys in March, April and October may be possible if weather conditions allow. The transect route for the surveys conducted in 2023 is shown in Figure 3 and a summary of the weather conditions and timing of all transect surveys are given in Table 2.

Date	Survey type	Survey duration	Weather at start	Weather at finish
18/05/2023	Transect	Survey began at 21:25 (sunset was 21.29) and ended at 23:30	Wind: Beaufort 1 Precipitation: Dry Temperature: 16°	Wind: Beaufort 1 Precipitation: Dry Temperature : 11 °
28/07/2022	Transect	Survey began at 21:05 (sunset was 21:35) and ended at 23:30	Wind: Beaufort 1 Precipitation: Dry Temperature: 15°	Wind: Beaufort 1 Precipitation: Dry Temperature: 15 °

TABLE 2. DUSK TRANSECT BAT ACTIVITY SURVEY EFFORT



Date	Survey type	Survey duration	Weather at start	Weather at finish
29/09/2021	Transect	Survey began at 18:45 (sunset was 19:13) and ended at 21:15	Wind: Beaufort 1 Precipitation: Dry Temperature: 14 °	Wind: Beaufort 1 Precipitation: Dry Temperature: 12°



FIGURE 3. DUSK TRANSECT BAT ACTIVITY SURVEY ROUTE (2023)

3.3 Analysis

The bat data collected by the bat detector was analysed by a suitably qualified Enviroguide ecologist using Elekon's BatExplorer software (Version 2.1.10.1). Bat data was analysed and species were assigned to each record, with reference to species identification guides such as Russ (2012). Each record i.e., a sequence of bat calls/pulses, is noted as a bat pass; to indicate the level of bat activity for each species recorded. Each bat pass does not correlate to an individual bat but is representative of bat activity levels. Some bats such as pipistrelle species (e.g., common pipistrelle (*Pipistrellus pipistrellus*)) may continuously fly around a habitat or feature, therefore, it is possible that a series of bat passes within a similar time frame is representative of an individual bat. On the other hand, Leisler's bats (*Nyctalus leisleri*) tend to travel through an area quickly, and as such, an individual sequence or bat pass is more likely to be indicative of individual bats.



3.4 Limitations

While not considered a significant limitation, the surveys for this Site were undertaken prior to the release of the most up-to-date guidance (Collins, 2023), and as such, survey specifications followed those outlined in Collins (2016).

In addition, for clarification, the small parcel of land to the southeast, included within this Proposed Development boundary, was initially surveyed for its potential to support bats, and was found to be of Negligible roosting, foraging and commuting potential, and thus was not surveyed any further.

4. RESULTS

4.1 Desk Study Results

4.1.1 Existing Bat Records

A desktop review was carried out to identify previous records of bat species from within the vicinity of the Site in question. The Site is located within the 10km² Grid Square N04. The NBDC website (<u>www.nbdc.ie</u>) was interrogated for historical records of bats within the N04 grid square on 6th October 2023. The results are summarised in Table 3.

Species Name – Common	Species Name – Latin	Last Documented Record
Brown long-eared bat	Plecotus auritus	03/04/2002
Daubenton's bat	Myotis daubentonii	29/07/2009
Leisler's bat	Nyctalus leisleri	29/07/2009
Pipistrelle sp.	Pipistrellus pipistrellus sensu lato	21/08/2013
Soprano pipistrelle	Pipistrellus pygmaeus	21/08/2013

TABLE 3. HISTORICAL BAT RECORDS FROM THE 10KM² GRID SQUARE N04 (NBDC).

4.1.2 Landscape Suitability

According to the NBDC's bat suitability index (Lundy et al. 2011), which provides a visual map of the broad-scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species; the area encompassing and surrounding the Site of the Proposed Development carries an overall bat suitability score of 41.22 (High suitability). The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The species with the highest individual suitability scores for the area encompassing the Site are Common Pipistrelle with 58, followed by Leisler's Bat with 55.

Table 4 summarises the suitability of the Proposed Development Site for each of the various nine bat species found in Ireland (extracted from NBDC), while the overall suitability of the Site and surrounding environs is illustrated in Figure 4.

TABLE 4. SUITABILITY OF THE PROPOSED DEVELOPMENT FOR THE BAT SPECIES (ADAPTED FROM LUNDY ET AL., 2011)

Common name	Latin Name	Suitability index	Suitability



All bats	-	41.22	High
Soprano pipistrelle	Pipistrellus pygmaeus	52	High
Brown long-eared bat	Plecotus auritus	53	igh
Common pipistrelle	Pipistrellus pipistrellus	58	High
Lesser-horseshoe bat	Rhinolophus hipposideros	3	Low
Leisler's bat	Nyctalus leisleri	55	High 😽
Whiskered bat	Myotis mystacinus	29	Moderate-High
Daubenton's bat	Myotis daubentonii	43	High
Nathusius' pipistrelle	Pipistrellus nathusii	30	Medium-High
Natterer's bat	Myotis nattereri	48	High



FIGURE 4. BAT LANDSCAPE SUITABILITY MAP (NBDC) WITH A BLACK BOX TO INDICATE THE SITE LOCATION.

4.2 Potential Bat Roost and Habitat Assessment

The roost assessment undertaken in May 2023 focused on the trees at the Site, particularly mature trees and trees proposed for removal. The assessment concluded that the treeline just south of the Proposed Development was of *Moderate* roosting potential for bats, necessitating two roost surveys as per best practice guidelines at the time (Collins, 2016). This is due to the number of potential entryways present and the potential to support a large roost, as per the



roost assessment guidance outlined in the Bat Conservations Trust's Bat Surveys for ECEINED. Professional Ecologists: Good Practice Guidelines (Collins, 2016).

4.3 Dusk Roost Emergence Survey

The dusk emergence survey was undertaken focused on the treeline south of the Site of the Proposed Development, but within the applicant landholding, as shown in Figure 2 A summary of the data collected by the bat detector during the emergence survey is provided Table 6. Non-bat "noise" files have not been included, to allow the bat data to be clearly displayed. In total, three species were recorded at the Site, namely common pipistrelle (Pipistrellus pipistrellus), soprano pipistrelle (Pipistrellus pygmaeus) and Leisler's bat (Nyctalus leisleri).

During the transect bat activity survey of the applicant's landholding in September 2021, Tree T922 was noted with soprano pipistrelle bat emerging. There are no proposals to remove this tree. Tree T914 was noted as having soprano and common pipistrelle emerge during July 28th, 2022, surveys. The tree alongside it, T915 was noted as holding High Bat Roost potential and bats emerging may have been missed during the 2022 survey. An NPWS derogation licence will be required for both T914 and T915 if their removal is required.

No bat emergence was seen for any tree within this treeline on the 23rd of August, however high levels of bat activity were recorded adjacent to T914 and T915 (see Appendix II) and it is noted that bats emerging may have been missed. Three bat species were recorded foraging and commuting along this treeline during the emergence survey in August 2023 and the tabulated results of the bat activity recorded are summarised in Table 5. Bats were observed throughout the night commuting and foraging along this treeline, soprano pipistrelle was the earliest bat recorded at 21.12 and continued to be the most recorded species on the night, closely followed by common pipistrelle. Unlike the previous bat activity survey of the Site, Leisler's bat was the least recorded species on the night of the 23rd of August 2023 with only a single Leisler's bat recorded in August 2023.

Common Name	Latin Name	Total no. bat passes	Total no. calls
Common Pipistrelle	Pipistrellus pipistrellus	41	46.5
Leisler's Bat	Nyctalus leisleri	1	26.9
Soprano Pipistrelle	Pipistrellus pygmaeus	54	56.5

TABLE 5. RESULTS OF THE DUSK ROOST EMERGENCE SURVEY (AUGUST 2023)

4.4 Dusk Transect Bat Activity Survey

During the 2021 and 2022 transect surveys, it was noted that bats tended to pass up and down repeatedly along the treelines, which can suggest there are more bats present than is actually the case. Visual results of the bat surveys on 28th July 2022 and 29th September 2021 are shown in Figure 5 and Figure 6. The activity during the 2021 and 2022 surveys was considered to be Moderate - High, given the optimal weather conditions on both occasions.

The results of the 18th May 2023 survey are illustrated in Figure 7. As expected, activity was largely associated with the field boundaries of the Site of the Proposed Development. Activity hotspots were observed between point 2, point 3 and point 4. Here two Leisler's bats were



summarised below in Table 6.

observed foraging and commuting along this treeline. Although only two Leisler's bats were observed at this location, Leisler's bat tend to commute at high speed at heights of up to 100m so it is acknowledged that additional individuals may have been present but missed by the surveyors.

Bat activity along the remaining transect route was relatively low, with single bats recorded foraging along the route between point 5, point 6 and point 7 (as shown in Figure 7). The Transect survey followed the boundary treeline but also incorporated the drainage ditches transecting the Site to determine if these linear features were being utilised by bats for foraging and commuting. Based off the May 2023 transect survey of the Site, the drainage ditches on Site do not provide important commuting and foraging features for bats. Activity was recorded along one of the drainage ditches at the Site on one occasion (point 5 on Figure 7), with a Leisler's bat recorded commuting here. Very little bat activity was recorded along the northern boundary during the May 2023 survey. This corresponds to the previous surveys undertaken at the Site in 2022 and 2021 as discussed below.

It can be summarized that there is a commuting/foraging corridor for bats along the western Site boundary with bats observed moving from within the Site to the adjacent fields and golf course to the north. The treeline and scrub habitats south of the Proposed Development boundary appear to provide a feeding resource for local bats, with high levels of activity recorded between point 2 and point 3. The boundary treelines and hedgerows provide good commuting and foraging habitat for bats to adjacent suitable habitats and the Site likely forms part of a wider network of bat foraging habitat along with the surrounding lands.

Common Name	Latin Namo					
		Total no. bat passes	Total no. calls			
18 th May 2023						
Common Pipistrelle	Pipistrellus pipistrellus	4	46.5			
Leisler's Bat	Nyctalus leisleri	67	26.9			
Soprano Pipistrelle	Pipistrellus pygmaeus	5	56.5			
28 th July 2022						
Common Pipistrelle	Pipistrellus pipistrellus	19	46.5			
Leisler's Bat	Nyctalus leisleri	2	26.9			
Soprano Pipistrelle	Pipistrellus pygmaeus	22	56.5			
29 th September 2021						
Common Pipistrelle	Pipistrellus pipistrellus	15	46.5			
Leisler's Bat	Nyctalus leisleri	5	26.9			
Soprano Pipistrelle	Pipistrellus pygmaeus	12	56.5			

TABLE 6. RESULTS OF THE TRANSECT BAT ACTIVITY SURVEY AT THE SITE & APPLICANT OWNED LAND

Results of all transect surveys conducted at the Site and surrounding environs are





FIGURE 5. JULY 28TH 2022, BAT ACTIVITY SURVEY RESULTS FOR THE PROPOSED DEVELOPMENT SITE (SOURCE: ASH ECOLOGY & ENVIRONMENTAL, 2023).



FIGURE 6. SEPTEMBER 29TH 2021, BAT ACTIVITY SURVEY RESULTS FOR THE PROPOSED DEVELOPMENT SITE (SOURCE: ASH ECOLOGY & ENVIRONMENTAL, 2023).





FIGURE 7. DUSK TRANSECT BAT ACTIVITY SURVEY RESULTS FOR 2023 (SPECIES POINTS INDICATE BAT PASSES AND NOT NECESSARILY INDIVIDUAL BATS).



5. POTENTIAL IMPACTS

5.1 Construction Phase



The majority of the boundary vegetation on-Site will be retained and has been included in the project design. A small section of the treeline at the northwestern Site boundary will be removed to enable future access to adjacent lands. This section of treeline will only be removed when the construction of the road into the neighbouring Site is required. The treeline along the road adjacent to the smaller Site area will be removed. This treeline is currently wellilluminated and offers low commuting and foraging potential for local bats. As such, there is the potential for impacts via the loss of commuting and foraging habitat for bats that reside within the vicinity of the Proposed Development.

The Proposed Development and the adjacent granted and proposed planning applications will result in an overall loss of suitable commuting and foraging habitat for bats at the applicant's landholding, however, the majority of the boundary vegetation at the applicant's landholding is proposed for retention and will enable bats to continue to commute and forage around the perimeter of the Site to suitable lands to the west and north. The Construction Phase will result in increased lighting levels at the Site associated with human activity, which has the potential to impact upon commuting and foraging bats.

Two trees proposed for removal, according to the Tree Removal Plan (Charles McCorkell, Drg. No. 210811-P-41), were noted to provide low bat roost features according to BCT guidelines (trees of sufficient size and age to contain PRFs but none noted), the remaining trees held negligible bat roost features. As such, the Proposed Development will not result in the significant loss of suitable bat roost features at the Site.

A number of trees to the south of the Proposed Development (within the applicant landholding) were noted to hold potential bat roost features and Tree T922 was noted to have a soprano pipistrelle bat emerging during bat surveys of the Site in September 2021. This tree will be retained according to the most recent Site layout, however, the crown will be reduced by 10% under supervision of an Ecological Clerk of Works (ECoW) or other suitably qualified person to ensure that works on the crown adhere to this 10% reduction. A pre-construction survey should be conducted prior to the commencement of any works on this tree to ensure any bats inhabiting the tree will not be subject to disturbance. Should there be bats present in this tree during reduction works on the crown, a derogation licence will be required, issued by NPWS. Tree T914 was noted as having soprano and common pipistrelle emerge during July 28th, 2022, surveys. The tree alongside it, T915 was noted as holding High roosting potential and may also support roosting bats. No evidence of bat emergence was noted during the trageted emergence survey of this treeline in August 2023, however, bat activity adjacent to this treeline was *High*.

These trees are beyond the boundary of the Proposed Development and will not be impacted by the Proposed Development. Planning permission is currently submitted for development adjacent to the aforementioned tree, and an NPWS derogation licence will be required for both T914 and T915 if removal is deemed necessary or should crown reduction works be required. As good practice, trees should be felled using 'soft felling' techniques under supervision of an ecologist and should be left in situ for 24 hours once felled or section felled.

5.2 Operational Phase

During the Operational Phase, there is potential for disturbance to local pats utilising the general area through night-time light pollution. Excess light spill could render normally dark commuting and foraging routes unsuitable for bats. Bats were recorded commuting and foraging along the trees, treelines and hedgerows at the Site. The lighting alterations to the Site may act cumulatively with other changes to the area associated with housing or other construction.

6. RECOMMENDATIONS

6.1 Bat-Friendly Tree Felling

As good practice, the two 'Low' roosting potential trees (T872 and T874) found on the Site of the Proposed Development are to be felled using 'soft felling' techniques under the supervision of an ecologist and should be left in situ for 24 hours once felled or section felled, before removal off Site. A list of all trees proposed for felling throughout the applicant's landholding is given in Appendix I.

6.2 Bat Roosting Opportunities

To offset the loss of trees on Site, a series of 6 no. bat boxes will be erected on suitably large trees along the boundaries of the Site of the Proposed Development to provide future roosting opportunities. The proposed boxes are 2F Schwegler Woodcrete bat boxes with double-fronted panels or equivalent design (see Figure 8). These boxes will be erected no less than 3m from the ground in an uncluttered environment away from public lighting. Boxes should be arranged in groups of 2-3 or more in suitable locations with two boxes facing south and the remaining boxes orientated in any direction. Bat boxes will be erected prior to any tree felling or building demolition occurring at the Site so as to provide immediate compensatory habitat to affected bats. The guidance of a suitably qualified Bat ecologist will be sought in the placement of the bat boxes; to avoid disturbance from lighting generated by the Proposed Development and maximise the likelihood of their uptake by local bats.



2	SCHWEGLER 2F UNIVERSAL BAT BOX		
	E44.00 C In Stock. Out of stock. Lead time may be up to 2-3 months. We recommend you pre-order online so that stock is reserved by you once it becomes available. Alternatively, you may be interested in 11266		
	Quantity 1 ADD TO BASKET OR ADD TO QUOTE		
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FIGURE 8. SCHWEGLER 2F UNIVERSAL BAT BOX (SOURCE: WILDCARE WEBSITE)

6.3 Bat-Friendly Lighting Measures

6.3.1 Construction

Subject to grant of planning permission, the construction stage lighting plan will be prepared by the main contractor when they are appointed, and this will be reviewed by a bat ecologist to ensure that no night-time light spill on to the boundary treelines at the Site occur as a result of night-time security lighting at the construction site (if such lighting is required). Every effort will be made to ensure that there will be no night-time construction lighting within or directed into vegetated areas and treelines along the Site boundary. To ensure there is no light spill into these areas, the following luminaire specifications, taken from the latest guidance (ILP, 2021), will be adhered to during the Construction Phase:

- A bat ecologist (with lighting expertise) will assess the lighting report for the Site to ensure there is no light spill onto retained treelines/hedgerows. They will advise further lighting mitigation as required.
- Retained treelines will not incur an increase in the current lux level due to the construction activity.
- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights will be carefully considered to minimise light spill. The shortest column height allowed will be used where possible.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e., no upward tilt.

- Any external security lighting will be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce FD.03/77, light spill and direct it only to where it is needed.

6.3.2 Operation

To preserve the commuting potential of the treelines/hedgerows within the Site and along the Site boundaries and to minimise disturbance to bats in the immediate vicinity of the Site, the Operational Phase lighting and layout of the Proposed Development has been designed to minimise light-spill. This will be achieved by ensuring that the design of lighting accords with guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers 'Bats and Lighting in the UK - Bats and Built Environment Series', the Bat Conservation Trust 'Artificial Lighting and Wildlife Interim Guidance' and the Bat Conservation Trust 'Statement on the impact and design of artificial light on bats'.

Bat-friendly lighting measures are incorporated into the project design and associated lighting plan. Dark buffer zones have been effectively used to separate important habitats or features from lighting by forming a dark perimeter around them (ILP, 2018). Buffer zones rely on ensuring light levels within a certain distance of features do not exceed certain defined limits. The buffer zone can be further subdivided into zones of increasing illuminance limit radiating away from the feature.

Night-time lighting across the Site will be kept to a minimum (once satisfying health and safety requirements), through the reduction of light spill from the buildings via windows/entrances, and the reduction of spill/glare from outdoor lighting in place on the building exterior and through the Proposed Development grounds.

The incorporation of appropriate luminaire specifications will have a considerable input in mitigating the potential impact of night-time lighting on local bats. Based on the above guidance documents, the lighting scheme has incorporated the following measures (Morley Walsh, 2023):

- Luminaires will have zero upward light ratio, to minimise light pollution, energy waste and impact on wildlife.
- Lighting will be directional on to the roadways and footways only with minimal spillage of light onto adjoining habitats. To reduce light spillage from luminaries, lights will not emit at angles greater than 70° from the vertical plane.
- Lighting design software will be utilised to predict where light spill will occur.
- LED luminaries will be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- Narrow spectrum bulbs will be used to lower the range of species affected by lighting. Light sources that emit minimal ultraviolet light and avoid the white and blue wavelengths of the light spectrum will be utilised to avoid attracting lots of insects. Lighting regimes that attract lots of insects result in a reduction of insects in other areas like parks and gardens that bats may utilise for foraging.
- Maintain dark zones of 10m in width for foraging bats in areas where lighting is not necessary e.g., along the vegetated boundaries of the Site. However, where lighting



is required, this lighting will be placed at a minimum height using the lowest lux value permitted for public health and safety.

- Motion sensor and timer-activated lighting will be in place at the Site/to ensure minimal light spill occurs during the hours of darkness.
- Where possible, luminaries will be recessed where installed in proximity to windows to reduce glare and light spill.
- The colour rendering of the selected light fittings will be 3000k making the Leb fittings a warmer light, helping to further minimize the impact on the local wildlife.
- Retained treelines will not incur an increase in current lux levels due to the Proposed Development.
- Planting will provide areas of darkness suitable for bats to feed and commute.
- Reflective surfaces will not be placed under lights.

The landscape plan also includes the provision of new tree and hedgerow planting within the proposed parkland that runs along the esker in the centre of the Masterplan area. This parkland area will be maintained with zero to minimal night-time lighting and will act as a dark corridor for bats and other wildlife to forage and commute through the Site during the lifetime of the Proposed Development.

7. CONCLUSIONS

Bat activity was determined to be Moderate at the Site, with three species recorded in total. Foraging/commuting bats are utilising the Site of the Proposed Development, and it is presumed they will continue to do so upon the completion of Construction works. Roosting bats are not present within the Proposed Development Site, but are confirmed as being present within the wider applicant landholding.

Appropriate measures and recommendations have been outlined in *Section 0* to ensure that the Construction Phase will not impact upon roosting, foraging or commuting bats. In addition, measures have also been outlined to minimise the impact of Operational Phase lighting on bats.

The necessity for a derogation licence issued by NPWS was highlighted, should removal of trees supporting confirmed roosts or holding High roosting potential be required, although it is noted that no such trees fall within the Site of the Proposed Development itself and lie within the wider applicant's landholding. Furthermore, works that may cause disturbance to bats, such as crown reduction works on trees supporting roosting bats, may also necessitate a derogation licence issued by NPWS.

Upon the implementation of subsequent mitigation measures appropriate to the potential bat roost status at the Site, the impacts on the local bat population <u>will not be significant</u>.



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APPENDIX I – TREE REMOVAL PLAN (SOURCE: CHARLES MCCORKELL, 2023)

The Tree Removal Plan available at the time of the bat survey (Charles McCorkell, 2023) identified, assessed and described 14 trees, one group and the partial removal of a second tree group for removal to facilitate development of the entire applicant landholding. Of these 14 trees, only two fall within the Proposed Development Site and these were classed as being of Low roosting potential. Two additional trees will require pruning works. These trees were assessed on the 18th of May 2023 for any bat roost potential features along with risk for same and classified, none of the trees identified for removal or requiring works held moderate or high bat roost potential and the Proposed Development will not result in the loss of bat roost trees. An assessment of the affected trees within the entire applicant landholding for bats is provided in the below table.

Tree Number	Species	Recommended works as per arborist report	Bat Roost Potential	Classification of trees for risk of bat roost presence
H817	Elder, haw- thorn, ha- zel	Partial removal of group to con- struction connecting road to neighbouring site.	Negligible	No Risk
T852	Hornbeam	Fell – ground level	Negligible	No Risk
G855	Buddleja, hawthorn, goat willow	Partial removal of group as shown on tree removals plan.	Negligible	No Risk
T872	Ash	Fell – ground level	Low	No Risk
T873	Ash	Fell – ground level	Negligible	No Risk
T874	Ash	Fell – ground level	Low	No Risk
T875	Ash	Fell – ground level	Negligible	No Risk
T876	Ash	Fell – ground level	Negligible	No Risk
Т889	Common beech	Fell – ground level	Negligible	No Risk
Т893	Common beech	Fell – ground level	Negligible	No Risk
T894	Purple beech	Fell – ground level	Negligible	No Risk
Т895	Purple beech	Fell – ground level	Negligible	No Risk
Т896	Common beech	Fell – ground level	Negligible	No Risk
T901	Common beech	Fell – ground level	Negligible	No Risk
T902	Common beech	Fell – ground level	Negligible	No Risk
Т903	Common beech	Lift low canopy – specified extent to 3m above ground level	Negligible	No Risk
Т904	Common beech	Lift low canopy – specified extent to 3m above ground level	Negligible	No Risk
Т905	Common beech	Fell – ground level	Negligible	No Risk

















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