

A Habitat & Bat Survey Report
on behalf of

Mr. Jason Cox
for
Land off Elwyn Drive
Elwyn Drive
Twynnyroddyn
Merthyr Tydfil
CF47 0NJ



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Project Overview

Client	Mr. Jason Cox
Site / Job	Land off Elwyn Drive, Elwyn Drive, Twynyrodyn. Merthyr Tydfil, CF47 0NJ
Report Type	Habitat and Bat Survey Report
Report Reference	LT076-EBS
Grid Refence	SO 05575 05958
Survey Date	September 2023
Lead Surveyor(s)	Nic Aldridge

Versioning and Quality Assurance

Version	Status	Date	Author(s)	Reviewed by
1	Published	08.10.2023	Nic Aldridge	Sam Haycock

Limitations

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The assessments made assume that the site(s) and facilities will continue to be used for their current purpose without significant change. The conclusions and recommendations contained in this Report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested. Information obtained from third parties has not been independently verified by Little Wing Ecology (CYF).

Executive Summary

Summary	Little Wing Ecology (CYF) was commissioned to undertake a Preliminary Ecological Appraisal (PEA), Preliminary Roost Assessment (PRA) and Bat Activity Survey (BAS), of a site known as, 'Land off Elwyn Drive, Elwyn Drive, Twynyrodyn. Merthyr Tydfil, CF47 0NJ.' The survey was undertaken to inform the client of any constraints, and associated planning requirements with regards to protected species, and to inform a planning application. For the purposes of this report, the structure will be referred to as, 'The Site,' and containing, 'Buildings A-C.'
About the Site	This is a commercial site which includes a storage yard and office accommodation for a civil engineering firm. Building A is a block-built commercial building with a pressed steel roof and a pebble-dash finish. Building B is a block-built single garage with a concrete tile roof. Building C is a storage container. The Site is located centrally within the settlement of Twynyrodyn, a suburb of Merthyr Tydfil, and is located ≈0.64km east of the town centre. Elwyn Street occupies an exclusively urban location within the County Borough.
Proposals	Planning permission is sought for the demolition of Buildings A-C and the construction of three new residential units on the Site.
Results	No part of the Site contains, or is within, any statutory sites of nature conservation interest, such as a Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), National Nature Reserves (NNRs) or Local Nature Reserves (LNRs) etc. Therefore, the proposed scheme of works will not impact on any rare or valuable habitats as the works are due to remain within the site boundary. The Preliminary Ecological Appraisal survey recorded four habitat types on-site, and two target notes were made. Low botanical diversity has been recorded on the Site and the nature conservation significance of the Site is considered negligible. During two dusk observations, a total of three species were identified foraging/commuting on or over the Site. Commuting was predominantly north to south and east towards adjacent mature trees. Foraging within the Site boundaries was very limited and transient in nature. No bats droppings were recorded at Buildings A-C. No evidence was recorded of bats using Buildings A-C as a roost and no evidence of protected or priority species interest was recorded during the filed survey or dusk emergence surveys. Bats are considered likely absent from the structures.
Other Ecological Considerations	One inactive nest was recorded to the interior of an open-sided storeroom on the ground floor of Building A. A cautionary approach is recommended.
Recommendations	<u>Recommendation 1 (Encountering a Protected Species)</u> During a PRA and two dusk activity surveys, no evidence was recorded of bats using Buildings A-C as a roost and no evidence of protected or priority species interest was recorded during the filed survey or dusk emergence surveys. Bats are considered likely absent from the structures. If at any point during works a protected species is encountered on-site, it is essential that all work is to cease and that a suitably experienced ecologist is contacted for advice. This report is valid for one year (i.e., September 2024). If works do not start within this time, further survey and assessment will be necessary to qualify the results of this report and its recommendations. <u>Recommendation 2 (Hibernating Bats)</u> As pipistrelle species are known to hibernate in buildings a precautionary approach will be followed. Any works with regards to the stripping of building materials or exposing the wall plate, particularly on the northern and western aspects of the structure, during the winter months (October-April – inclusive), to be supervised by a suitably qualified and experienced bat ecologist under the direction of a method statement. <u>Recommendation 3 (Lighting During Development)</u> If any development is to be conducted between March and September (inclusive), efforts must be made to avoid any adverse impacts on the commuting and foraging of bats near the site. External lighting must be restricted during the development period to that which is necessary for safety and security. This must be kept to a minimum. <u>Recommendation 4 (A Bat Friendly Lighting Scheme)</u> To prevent any adverse impact upon the potential roosting, commuting and foraging habitats, for bats adjacent to Buildings A-C (post development), specifically on the adjacent mature trees, the lighting plan for the site must be functional and directional only and kept to a minimum servicing the public areas of the proposed development (as required for safety and security). <u>Recommendation 5 (Hedgehogs)</u> As European hedgehog have been recorded locally (111m), it is recommended that precautions are incorporated during the construction phase. This will be to create provisions for hedgehogs to escape, in the form of creating slopes or the inclusion of ramps at the end of each working day - from all trenches dug into the ground. Additionally, any pipework left on-site that is greater than 150mm in diameter will need to be planked off. Should this information be strictly adhered to, then the

	development works will not negatively impact this local mammal population. <u>Recommendation 6 (Nesting Birds)</u> If any features associated with nesting birds are required to be altered during the bird breeding season, then a further inspection by a suitably qualified ecologist is required no more than 24 hours before this process commences. If an active nest is found by a site inspection, an exclusion zone around the nest will be necessary to preserve this feature until the chicks have fledged the nest. <u>Recommendation 7 (Finger-tip search)</u> A suitably competent ecologist is required to carry out a careful, detailed check of all features likely to be impacted, no more than 24 hours prior to works commencing at any time of year for hedgehogs, other mammals, and reptiles. Dismantling of stone walls to be undertaken by hand, stones to be lifted not scraped. <u>Recommendation 8 (Enhancements Features)</u> Bats: To encourage bat roosting activity and increase roosting opportunities on-site post-development, it is recommended that an addition of two new roosting opportunities are provided as part of the development (Integrated Eco Bat Box - or similar - or similar). These to be positioned at a height of >3m on the western elevation of the proposed new units. This will enable the new roosts to maximise solar gain (Appendix). Birds: Two Schwegler 1SP Nest Boxes (or similar) to be fitted at a height of >3m on the eastern elevation of the proposed new unit (Appendix). Hedgehogs: Enhancement for the local hedgehog population to be provided in the form of; No1 Vivara Pro WoodStone Hedgehog House (or similar) at the southern corner of the Site*¹. No1 Eco Hedgehog Hole Plate (or similar) to be fitted at the base of each new garden fence*¹ to mitigate against defragmentation locally (Appendix).
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This Executive Summary is intended to provide an overview of the assessment of the proposed development site based on information received by Little Wing Ecology (CYF) at the time of production. This Executive Summary should be read in conjunction with the full report.

¹ The location of these enhancement features to be identified under the direction of a suitably qualified ecologist.



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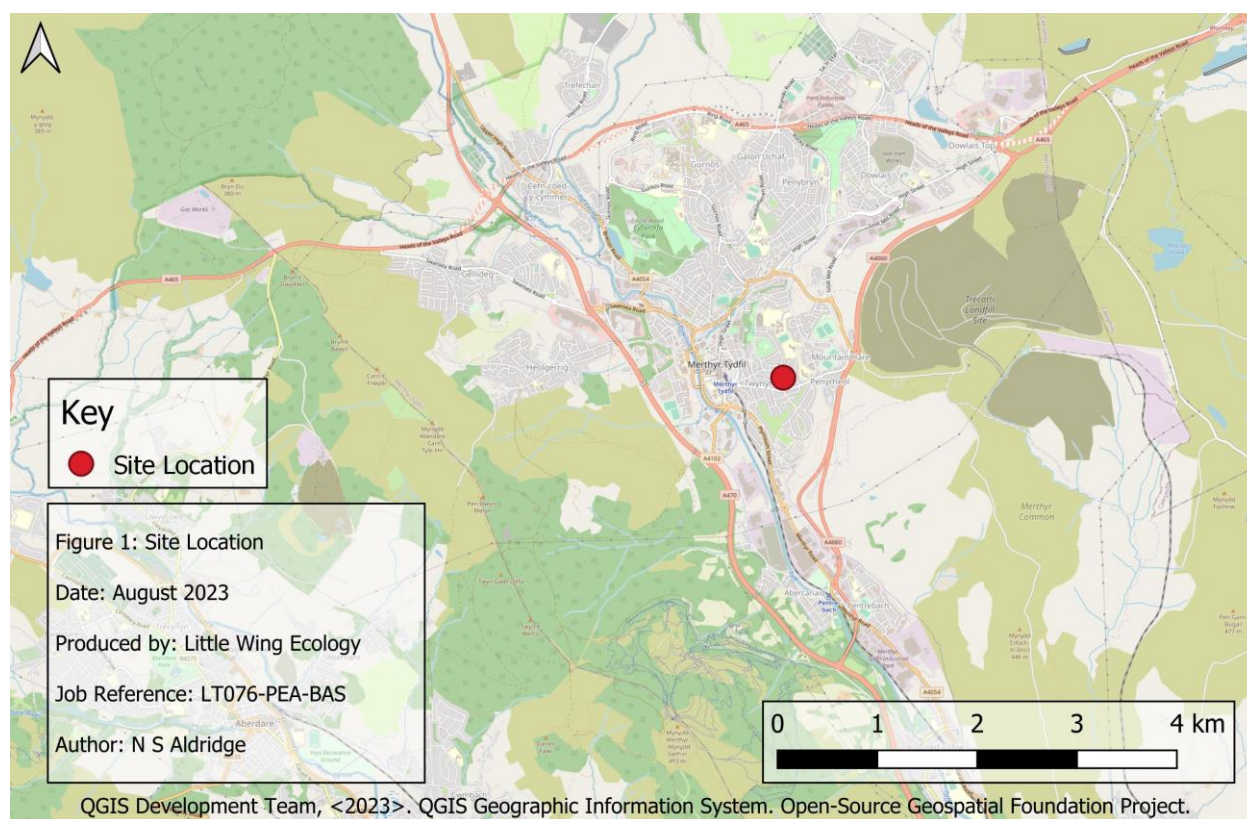
SECTION ONE: INTRODUCTION

1.1 Background

- 1.1.1 Little Wing Ecology (CYF) was commissioned to undertake a Preliminary Ecological Appraisal (PEA), Preliminary Roost Assessment (PRA) and Bat Activity Survey (BAS), of a site known as, 'Land off Elwyn Drive, Elwyn Drive, Twynnyrobyn. Merthyr Tydfil, CF47 0NJ.' The survey was undertaken to inform the client of any constraints, and associated planning requirements with regards to protected species, and to inform a planning application. For the purposes of this report, the structure will be referred to as, 'The Site,' and containing, 'Buildings A-C.' Grid reference: SO 05575 05958.
- 1.1.2 This report contains the results from a desktop study and field survey. Following these investigations an assessment of the likely impact of proposed works on protected and priority species at the Site was carried out. This report has been prepared with recommendations for enhancement features to improve opportunities for local species post-development.

1.2 Proposed Works

- 1.2.1 Planning permission is sought for the demolition of Buildings A-C and the construction of three new residential units on the Site.



1.3 Site Description

- 1.3.1 This is a commercial site which includes a storage yard and office accommodation for a civil engineering firm. Building A is a block-built commercial building with a pressed steel roof and a pebble-dash finish. Building B is a block-built single garage with a concrete tile roof. Building C is a storage container. The Site is located centrally within the settlement of Twynnyrobyn, a suburb of Merthyr Tydfil, and is located ≈0.64km east of the town centre. Elwyn Street occupies an exclusively urban location within the County Borough.

- 1.3.2 Habitat in the immediate vicinity is exclusively urban and includes residential properties, man-made surfaces. Further afield, the A4060 is located $\approx 560\text{m}$ to the east. This is a tree lined road providing a degree of connectivity north and south and mark the boundary of the settlement. The River Tâf is located $\approx 650\text{m}$ to the west. This is a significantly important feature in the landscape providing excellent foraging and connectivity to the wider landscape.



1.4 Policy and Legislation

- 1.4.1 Under Regulations 9 (1 & 5) of the Habitat Regulations, local authorities have a duty to have regard for the requirements of the Habitats Directive. This includes maintaining populations of European Protected Species in “favourable conservation status”, and potential for such protected species (for example, bats) should be considered when carrying out a preliminary assessment.
- 1.4.2 The framework for this protection is provided within several pieces of legislation from the Government of Wales and the UK Government. Furthermore, several pieces of legislation exist that are specifically relevant to individual species. These include:
- Conservation of Habitats and Species Regulations 2010.
 - The Conservation of Habitats and Species Regulations (2017) - as amended.
 - The Environment (Wales) Act 2016.
 - The Wildlife and Countryside Act (1981) - as amended.
 - Natural Environment and Rural Communities Act 2006.
 - Conservation of Habitats and Species Regulations 2017.
- 1.4.1 Additional information on the legal scope of these acts can be found in the Appendix and a link to the full documentation can be found in, ‘References and Bibliography.’
- 1.4.2 In Wales, all bat species and their roosts are legally protected, by both domestic and international legislation. This means you may be committing a criminal offence if you:

- Deliberately take, injure, or kill a wild bat.
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats.
- Damage or destroy a place used by bats for breeding or resting (roosts) (even if bats are not occupying the roost at the time).
- Possess, advertise, sell, exchange a bat of a species found in the wild in the EU (dead or alive) or any part of a bat.
- Intentionally or recklessly obstruct access to a bat roost.

1.5 Survey Aims and Objectives

1.5.1 Considering the legal framework and local planning requirements, the objectives of this survey were to:

- Consider the Site's position in relation to local habitat features, connectivity, and the wider environment.
- Establish any potential direct or indirect effects upon the Site by the proposed development.
- Provide an informed overview of the habitat(s) on the Site.
- Identify the potential use of the Site by protected/priority species through the identification of supporting habitat features, field signs, or other relevant information.
- Determine the presence/likely absence of bat roost(s) at Buildings A-C.
- Determine the species of bat present.
- Determine the type of roost present (maternity, day roost etc).
- Identify any bat foraging or commuting behaviour in relation to the location.
- Consider if there will be impacts on bats from the proposed works.
- Consider if nesting birds are present which might be affected by the development proposals.
- Consider if protected/priority species are present which might be affected by the proposed development.
- Consider if there will be impacts on protected/priority species from the proposed works.
- Provide solutions to enhance the development by suggesting features to create a net-gain for biodiversity.
- Gather sufficient information to be able to make appropriate recommendations, inform mitigation and licencing and further species-specific survey (if necessary).

SECTION TWO: THE SURVEY METHOD

2.1 Desktop Survey: Local Records

- 2.1.1 A review of aerial photography was undertaken to assess the provision of suitable foraging and commuting habitat within proximity to the Site. This information was used in combination with a review of statutory designated sites, via the MAGIC website, including Special Areas of Conservation (SAC) and Sites of Special Scientific Interest (SSSI), to help in confirming the presence of protected and priority species locally.
- 2.1.2 Prior to visiting the Site, pre-existing information relevant to the location was assessed as part of the desktop survey. Good practice guidelines recommend a desktop survey to incorporate data from the local biodiversity records centre. To this end, a request was placed with the South East Wales Biodiversity Records Centre (SEWBRc) for records of protected and priority species within the local vicinity of the development site, along with records of statutory and non-statutory sites (within 1km).
- 2.1.3 This data was supplemented with a search of several online resources for the 10km square containing the Site. This included, but was not limited to:
- The utilisation of the Magic Map, incorporating some habitats and protected sites e.g., special areas of conservation, sites of special scientific Interest etc.
 - Study of OS maps and aerial photography through Google Maps.
 - The website of Natural Resources Wales (NRW) for details on designation reasons of protected sites.

- An assessment of known data relating to previous surveys within the vicinity of the Site (by Little Wing Ecology and others) was also carried out. Only those species records occurring within the last ten years were considered relevant although consideration was taken of earlier records.

2.1.4 Some species, such as bats and reptiles, are considered cryptic species and it can be difficult to confirm whether they are present or not. Although the provision of a Local Environmental and Biological Records would provide a range of information, such records can only be relied upon as relative, where they are reasonably recent and when supplied by an experienced ecologist and/or bat surveyor. Due to the nature and proximity of the Site to local habitat features, care was taken to identify foraging and commuting potential and identify connectivity with the surrounding habitat.

2.2 Preliminary Habitat Assessment

2.2.1 A habitat assessment was made using standard phase 1 habitat techniques as the guiding principle. The surveyor(s) walked a rough zig-zag style pattern, making notes systematically and methodically of the habitat and conditions of the Site. This was then followed by a circuit/loop of the relevant site boundaries with additional notes being made where necessary. Photographs were taken of the Site's boundaries along with areas of interest and areas that characterised the habitat present on Site.

2.2.2 During the survey, the potential for protected species was assessed and any signs and/or evidence of its use was noted. This included, but was not limited to:

- Nesting potential for birds at the time of the survey, with the surveyor(s) looking for signs of bird activity, nests, nest building, feeding at nest sites, and evidence of collections of bird droppings, feathers, or any other indications of use by birds.
- Features such as piles of rubble, banks or tree roots that could be used as refugia or hibernacula for reptiles and hedgehogs.
- Water bodies that could provide opportunities for amphibians and/or reptiles.
- Physical signs of other relevant species (if seen), such as droppings and/or latrines, footprints, hair, food remains or foraging marks.
- Features that could be utilised by bats e.g., hollows in trees, peeling bark etc.
- Any flora or fauna that may be endangered or protected under the Countryside Act.
- Identify potential commuting and foraging corridors, and suitable foraging sites. This enables the suitability of the Site for bats to be determined.

2.3 Preliminary Nest and Roost Assessment

2.3.1 A potential nest and roost assessment survey was carried out on the interior and exterior of Buildings A-C by a suitably experienced ecologist and Natural Resources Wales (NRW) licenced bat worker. The external fabric of the structure was methodically inspected using close-focusing binoculars and a high-powered torch for potential access points such as gaps in the fabric of the building, beneath lifted roof materials or other gaps in the roof. Loose flashing, smudge marks and droppings on walls directly below eaves and gables etc were also searched for. A description of the buildings, including construction material and current condition was recorded. Internally, the buildings were searched using a high-powered torch to identify possible links to exterior roost entrances and clear signs of presence via urine staining, feeding remains, odour, piles of droppings, live bats, and bat carcasses. The space was also examined in the dark to identify areas where the presence of light would identify potential entry points for birds and bats. The aim of this survey was to determine the actual or potential presence of bats and the need for further survey and/or mitigation. During the field survey, an assessment of the habitats on-site and beyond the site boundary was undertaken. The aim of this was to identify potential commuting and foraging corridors, and suitable foraging sites. This enabled the suitability of the location for bats to be determined.

2.3.2 Nesting birds were also considered at the time of the survey, with the surveyor looking for signs of bird activity, nests, nest building, feeding at nest sites, and evidence of collections of bird droppings, feathers, or any other indications of use by birds.

2.4 Limitations of the Survey Method

- 2.4.1 A record was made of any constraints that limited the results of this survey report (Section 3).

2.5 Activity Surveys

- 2.5.1 Following guidelines set out in, 'Bat Conservation Trusts Good Practice Guidelines (Collins, J. (Ed.) (2016-2023-Transition),' Buildings A-C will be categorised for the level of risk of supporting bats and recommendations made as to the requirement (if any) for dusk activity surveys to determine the presence/likely absence of roosting bats, species identification, population size, roost type, and the requirement for any associated mitigation. If required, dusk survey(s) for bats will be conducted no less than 14 days apart. During any subsequent activity surveys, sufficient surveyors will be required to adequately cover all features identified during the PRA. Nocturnal bat surveys can be undertaken May–mid September, inclusive. Taking a precautionary approach, and dependent on the outcome of these surveys, additional survey work may be required, but only if higher than expected activity is recorded. Details of our surveyors and their experience is recorded in the Appendix.

Equipment (Activity Surveys)

- 2.5.2 The equipment used for dusk activity surveys provides high quality recordings of bat calls which are analysed using BatSound and AnalookW software. Recordings are annotated by the surveyors to provide contextual information on bat behaviour and flight patterns. At Little Wing Ecology (CYF) we use Pettersson D240x time expansion bat detector and Tascam DR-05X Portable Digital Recorder, Peersonic RPA3B full spectrum recorders and Anabat SD2 Frequency Division detectors. As a night vision aid (NVA) we use a MELCAM Video Camera Camcorder 1080P IR Night Vision Digital Camera. Audio for this is provided by an Anabat SD1. In addition, we use Audiomoth – a full-spectrum acoustic logger, based on the Gecko processor range from Silicon Labs.

SECTION THREE: THE DESKTOP SURVEY

3.1 Sources of Information

- 3.1.1 LERC Reference: 0234-488

3.2 Designated Sites

- 3.1.1 The survey location was examined by consulting Magic Map. No part of the Site contains, or is within, any statutory sites of nature conservation interest, such as a Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), National Nature Reserves (NNRs) or Local Nature Reserves (LNRs). The nearest statutory sites are; 'Cwm Glo a Glyndyrys,' (SSSI) at ≈1.1km, 'Cwm Cadlan,' (SSSI & SAC) at ≈9.5km, 'Aberbargoed Grasslands / Glaswelltiroedd Aberbargoed,' (SAC) at ≈ 12.2km, 'Cwm Tâf Fechan Woodland,' (SSSI) at ≈2.4km, 'Blaen Cynon,' (SAC) at ≈10.4km, and, 'Merthyr Mawr Warren,' (NNR) at ≈7.5km.etc.
- 3.1.2 There are 5 designated sites within 1km of the proposed development. A summary of these is presented here. There are no statutory sites on or adjacent to the proposed development. There are two designated SINC; 'Afon Tâf,' at ≈630m and, 'Glynmill,' at ≈900m. There is a small ancient semi natural woodland at ≈900m and a restored ancient woodland ≈800m bot west of the Site.

3.3 Satellite Imagery and Habitat Records

- 3.3.1 There are records for 21 habitat types within 1km of the proposed development site. The closest and most significant records are summarised here.
- 3.3.2 There are several areas of semi-improved neutral grassland within the settlement, the closest to the Site being >200m to the south-east.

- 3.3.3 There are five very small and fragmented examples of semi-improved acid grassland, 22 examples of small and fragmented areas of dense scrub, one small example of wet heath/acid grassland mosaic, eight examples of planted broadleaved woodland, 11 areas of semi-natural broadleaved woodland, six areas of running water (the nearest of which is Afon Tâf, at ≈630m) and two examples of freestanding water, both at > 850m from the Site. There is little connectivity between the Site and these habitats.

3.4 Species Records

- 3.4.1 The local biodiversity records returned 593 species records, of these 79 were within 500m of the Site. Some of these were too old to be considered viable. The closest and most significant records are summarised here.
- 3.4.2 **Amphibians:** There are 20 species records within 1.5km of the Site. The nearest record to the site is for common frog (*Rana temporaria*) at 617m. In addition, there are local records for common toad (*Bufo bufo*) at 824m, palmate newt (*Lissotriton helveticus*) at 920m, and, great crested newt (*Triturus cristatus* – 500m).
- 3.4.3 **Birds:** There are 282 species records within 2km of the Site and 40 within 500m. Of these 122 records are for Category 1 species including 20 records within 500m e.g., house sparrow (*Passer domesticus*) – the nearest being at 401m. There are 155 records for Category 2 species, including 19 within 500m e.g., swift (*Apus apus*) – the nearest being at 192m. There was a record for a Category 3 species; nightingale (*Luscinia megarhynchos*), but this was dated 1951. There are four records for a Cat 4 species Canada goose (*Branta canadensis*) the nearest of which was at 867m. including one within 500m of the Site.
- 3.4.4 **Crustaceans:** There was one record available within 2km of the Site for *Crangonyx pseudogracilis/floridanus*, dated 2010.
- 3.4.5 **Fish:** There were no records available within 2km of the Site.
- 3.4.6 **Fungi:** There were no records available within 2km of the Site.
- 3.4.7 **Insect:** There are 117 species records within 2km of the Site and nine within 500m. The nearest records was for harlequin ladybird (*Harmonia axyridis*). There are four bumblebee species recorded within 500m; white-tailed bumblebee (*Bombus lucorum*), at 401m, red-tailed bumblebee (*Bombus lapidarius*), at 401m, buff-tailed bumblebee (*Bombus terrestris*), at 427m and common carder bee (*Bombus pascuorum*), at 427m.
- 3.4.8 **Terrestrial Mammals:** Local biological records returned 86 species records within 2km of the Site including 10 within 500m. The two nearest records at 111m and 227m are both for European hedgehog (*Erinaceus europaeus*). There are four records for hedgehog within 500m and a total of nine within 1km. In addition, there are two records for common pipistrelle (*Pipistrellus pipistrellus*), at 250m, one for soprano pipistrelle (*Pipistrellus pygmaeus*), at 464m, and three for unidentified bats. Of additional interest are records for brown long-eared bat (*Plecotus auritus*) at 577m, otter (*Lutra lutra*) at 500m and lesser horseshoe bat (*Rhinolophus hipposideros*) at 848m.
- 3.4.9 **Roost Records (bats):** There are no roost records within 500m of the Site. There is a 'summer roost,' for brown long-eared bat at 280m, and 'occasional roost,' for a pipistrelle species at 660m and a roost for an unidentified species at 564m and 732m.
- 3.4.10 **Reptiles:** There were no records available within 2km of the Site.
- 3.4.11 **Flowering Plants:** There are 64 species records within 2km of the Site and 20 within 500m. There was one record for a CAT1 species with 500m, this was for bluebell (*Hyacinthoides non-scripta*), at 483m. Of the remaining nearby records, 18 were for CAT 4 species including Japanese Knotweed (*Fallopia japonica*), at 139m, and Butterfly-bush (*Buddleja davidii*) at 429m.

3.5 Boundaries

- 3.5.1 The majority of the Site is bordered by a wooden fence. Along the northern boundary this runs along the top of a concrete block retaining wall.

SECTION FOUR: RESULTS OF THE FIELD SURVEY

4.1 Survey Details

A phase 1 habitat survey and preliminary roost assessment was conducted on 19th July 2023 and a Preliminary roost assessment on 4th August 2023 by Nic Aldridge (author). Weather conditions during the survey were recorded and details are presented in the appendix in addition to details of the surveyor's experience.

Following the initial surveys, two dusk emergence surveys, for bats, were undertaken on 29th August and 12th September, by Little Wing Ecology (CYF).

4.2 Preliminary Roost Assessment (PRA)

PRA	Evidence
Building A: This structure is predominantly block built with sheet steel cladding. The structure has an uninsulated steel roof. The majority of external block walls are finished in pebble-dash. Offices are present on the first floor while the ground floor is used for storage. One of these storage areas is open sided providing access to the interior. To the first floor are several offices with a suspended ceiling. All rooms are well-maintained, well-sealed with no access to the exterior. Above a suspended ceiling is an uninsulated, empty cavity (50cm). Access was limited as the ceiling was not load-bearing, but visibility was adequate from a ladder. There was light penetration at the eaves of this steel roof. The space was drafty with no evidence of bats recorded. There is a single storey lean-to along the western elevation and a second at the eastern corner of the southern elevation. These rooms are used for storage. Both rooms lack a roofing membrane, and both have a sheet metal roof, well-sealed to the interior. The lean-to along the western elevation has gaps in the mortar providing small cavities – unsuitable for roosting by providing limited access between the interior and exterior. Between the main structure and the western lean-to, several gaps are present in the brickwork and around the door frame. This again provides some limited access to the interior space.	No live bats, droppings or nests recorded.
Building B: A block-built single garage with a concrete tile, pitched roof over a bitumen roofing membrane. Gaps were present at the eaves, particularly behind bargeboards on the southern elevation, and a large gap was recorded at the eastern end of this bargeboard. These gaps give access to a cavity of unknown proportion with potential to access the cavity between the bitumen membrane and the roof tiles. The eastern elevation was close to the boundary wall. Vegetation blocks potential flight paths on a portion of the southern elevation and at the north east corner of the eastern elevation. The interior was used for storage but clean and well maintained with no evidence of bat activity. No droppings were found.	No live bats, droppings or nests recorded.
Building C: Steel storage container. Fully sealed. No evidence recorded and no opportunities for roosting present.	No live bats, droppings or nests recorded.

Table 4.1: PRA

4.4 Results of Preliminary Roost Assessment

- 4.4.1 Following guidelines set out on Bat Conservation Trusts Good Practice Guidelines (Collins, J. (Ed.) (2016/2023-Transition), Building A has been categorised as being of low risk, requiring a dusk survey for bats on one occasion, Building B been categorised as being of moderate risk, requiring a dusk survey for bats on two occasions, and Building C of negligible risk, requiring no additional survey work. These surveys must be conducted no less than 14 days apart. These surveys represented the minimum recommended number of visits to give confidence in a negative result for structures.

4.5 Suitability for Commuting and Foraging Bats

- 4.5.1 The impact of artificial lighting on the interior of the site is moderate and connectivity between the Site and the wider landscape is low. The most significant feature is a corridor of mature trees which are located near the eastern boundary. These trees provide a degree of connectivity to neighbouring gardens but are fragmented from the wider habitat.

4.6 Suitability for Hibernating Bats

- 4.6.1 The features identified within the PRA are considered to offer a low risk at providing the hibernating conditions that bats prefer. No cellars/underground spaces were recorded during the surveys. As pipistrelle species are known to hibernate in buildings, this will need to be taken into consideration, particularly in the winter shaded areas on the north and west sides of structures.

4.7 Activity Survey Recordings

- 4.7.1 On 29.08.23, no evidence was recorded of bats using Building A-C as a roost. Of the 21 recordings made, 18 were of common pipistrelle, one soprano pipistrelle, one noctule bat and one unidentified (bat). The majority of behaviour consisted of commuting north to south and west to east over the Site. Limited foraging was recorded on or adjacent to the Site and this was all transitory in nature. Most commuting was associated with a mature treeline running east, away from the Site.
- 4.7.2 On 12.09.23, no evidence was recorded of bats using Building A-C as a roost. Of the 6 recordings made, 4 were of common pipistrelle, one (identified by heterodyne) was a pipistrelle species and one was unidentified (weak signal/recording). The majority of behaviour consisted of commuting north to south over the Site. Only one animal was recorded foraging on-site, and this was transitory in nature.

4.8 Infrared Video Survey

- 4.8.1 In addition to active monitoring using bat detectors, an infrared camera was deployed on the dusk activity surveys.



Figure 3: Infrared Monitoring (Image quality)

- 4.8.2 Buildings A-C are considered to offer a low risk at providing the hibernating conditions that bats prefer. No cellars/underground spaces were recorded during the surveys. As pipistrelle species are known to hibernate in buildings, this will need to be taken into consideration.

4.9 Evidence of Nesting Birds

- 4.9.1 One inactive nest was recorded to the interior of an open-sided storeroom on the ground floor of Building A.

4.10 Habitat Assessment

Phase 1 Habitat	Category	Field Notes
Disturbed ground / Amenity land (J1.2)	A managed amenity grassland / urban plot	The Site is currently used as offices and storage for a civil engineering firm. The land has been cleared and is predominantly bare ground with a range of successional species colonising the edges. The remains of large conifers (<i>Larix laricina</i>) were stored in a pile, centrally along the southern boundary.
Fence (J2.4)	Boundaries	A timber fence separates the plot from an adjacent property to the south.
Wall (J2.5)	Boundaries	A block-built retaining wall (topped with a timber fence) makes the northern boundary of the Site.
Building (J3.6)	Boundaries	Three buildings were recorded on the plot (A-C).

Table 4.2: Preliminary Habitat Assessment

- 4.10.1 Habitat in the immediate vicinity is exclusively urban and includes residential properties, man-made surfaces, although a corridor of mature trees provides a level of connectivity to neighbouring gardens. A small woodland is present ≈150m to the east and mature broadleaved trees dominate Thomastown Park, ≈280m to the north. Connectivity to these features is limited.
- 4.10.2 The Site was identified as being species poor with negligible ecological interest and very negligible connectivity to features of interest. A species list is presented in the appendix.
- 4.10.3 The impact of artificial lighting on the interior of the Site is moderate and connectivity between the Site and the wider landscape is low. The most significant feature is a corridor of mature trees which are located near the eastern boundary. These trees provide a degree of connectivity to neighbouring gardens but are fragmented from the wider habitat.

4.13 A Summary of Evidence

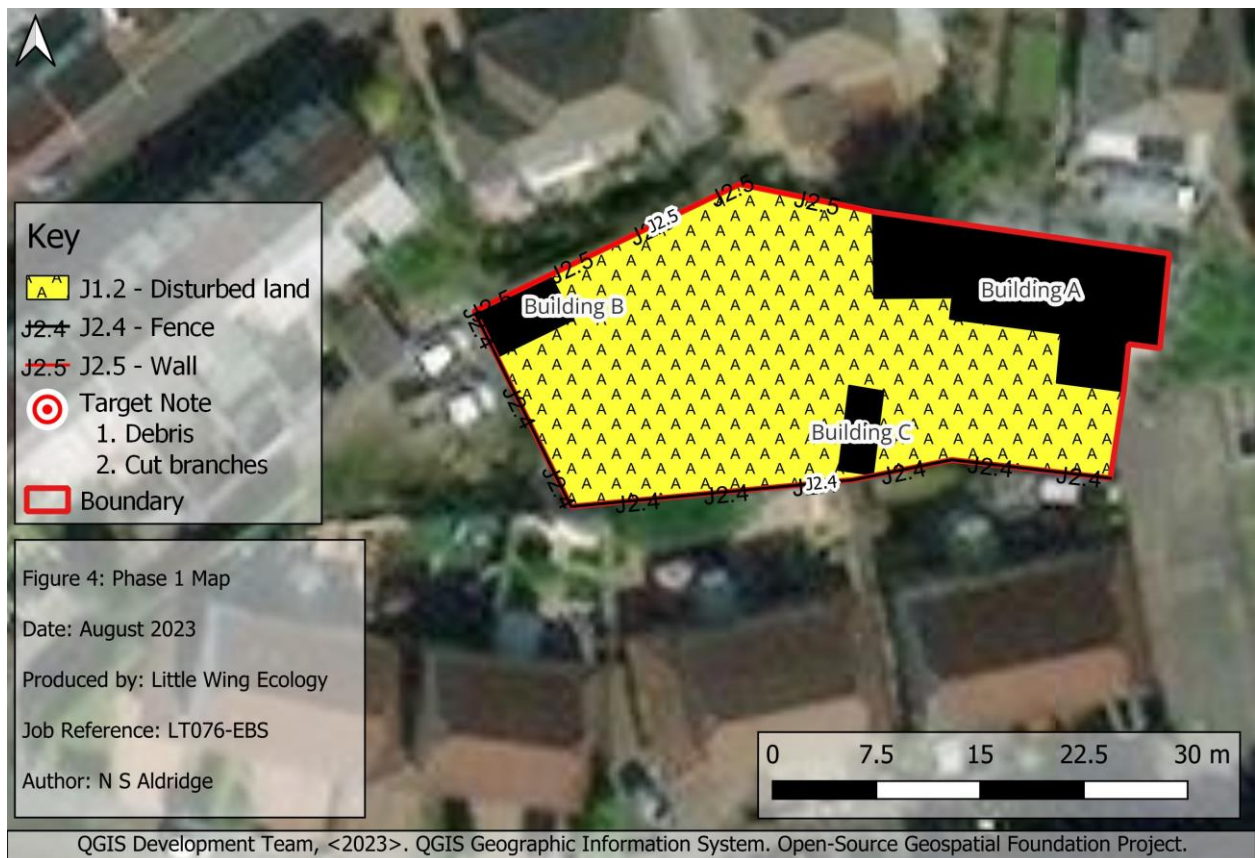
Survey Location	Species (Recorded)	Notes
Building A	Common pipistrelle Noctule Soprano pipistrelle	Protected/Priority Species: No evidence of protected or priority species was recorded during the field survey or dusk emergence surveys. Droppings: No bats droppings were recorded at Buildings A-C. Live sightings: During two dusk observations, a total of three species were identified foraging/commuting on or over the Site. Commuting was predominantly north to south and east towards adjacent mature trees. Foraging within the Site boundaries was very limited and transient in nature.

		Roost Type: During two dusk observations, no evidence was recorded of bats using Buildings A-C as a roost.
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Table 4.3: Summary of Evidence

4.14 Target Notes

- 4.14.1 **Target Note 1:** Debris and storage equipment. These present a limited potential at offering shelter for priority species (hibernacula/refugia).
- 4.14.2 **Target Note 2:** Cut branches: The remains of several mature Laylandii trees are stored centrally, at the southern boundary. This feature offers potential for overwintering animals such as hedgehogs (hibernaculum).
- 4.14.3 Photographic evidence is presented in the appendix.



4.15 Additional Ecological Constraints

- 4.15.1 At any given time of year, it is not possible to identify all plant species by conducting a single visit, as different species emerge and flower at different times of the year. The sward height, management regime and weather conditions can hinder the identification of specimens. This being said, it is possible to classify habitats and identify many species throughout the year in most circumstances.
- 4.15.2 The baseline conditions described in this report were accurate at the time at which the survey was undertaken.
- 4.15.3 No constraints impacted the field survey. Access was available to all parts of the Site.

4.16 Field Survey Details & Weather Conditions

Date	Timings (BST)		Notes, Sunset Times	Weather Conditions		
	Start	End		Variable	Start	End
19.07.23	10.15	11.45	PEA - Habitat	Temp (°C)	20.3	27.5
				Cloud Cover (Oktas)	4	4
				Precipitation	Nil	Nil
				Beaufort Scale	F2	F2
04.08.23	10.20	11.30	PRA - Bats	Temp (°C)	18.0	20.7
				Cloud Cover (Oktas)	7	7
				Precipitation	Nil	Nil
				Beaufort Scale	F3	F2
29.08.23	19.50	21.20	BAS & Dusk Activity Survey Sunset: 20.08hrs	Temp (°C)	16.0	9.7
				Cloud Cover (Oktas)	0	0
				Precipitation	Nil	Nil
				Beaufort Scale	F1	F0
12.09.23	19.20	20.45	BAS & Dusk Activity Survey Sunset: 19.36hrs	Temp (°C)	19.3	15.0
				Cloud Cover (Oktas)	7	7
				Precipitation	Nil	Nil
				Beaufort Scale	F1	F1

Table 4.4: Field Survey Details and Weather Conditions

SECTION FIVE: IMPACT ASSESSMENT & CONCLUSIONS

5.1 Impact Assessment

5.1.1 Based on current known plans for the Site, and considering the results from the desktop survey, field survey and other available data, the following will likely apply:

Impact	Conclusions
Short-Term Impacts (during development)	Two dusk emergence surveys returned a negative result for bats using buildings A-C as a roost and bat roosts are considered likely absent for the Site. Direct disturbance to foraging bats is unlikely unless artificial lighting is used at night during the development. In addition, due to low levels of connectivity, additional protected species are considered likely absent from the Site and are therefore not likely to be impacted upon by the proposed development. Priority species are considered likely absent from the Site and are therefore not likely to be impacted upon by the proposed development. However, features identified in the target notes provide potential shelter and foraging habitat for hedgehogs and therefore a precautionary approach will be required. The disturbance of nesting birds is considered to be moderate, during the nesting season (February-August) as evidence of nesting was identified at the ground floor of Building A.
Long-Term Impacts	Post-development impacts are considered negligible, and the development has the

(post-development)	potential to increase the biodiversity by enhance nesting/roosting opportunities for bats, birds and insects if enhancement features are adopted. The development improves the Site for the local community while the impact of the development on local habitat connectivity is considered to have a negligible impact. It is considered that the adoption of enhancement features (Section 6) would provide a net-gain for biodiversity at the Site. A local habitat feature (wildlife corridor; adjacent mature trees) is located near the east of the Site. This feature is fragmented in the landscape but offers connectivity to neighbouring gardens. There is a limited potential that the proposed development would negatively impact on this feature if it were exposed to additional artificial lighting. Impacts will be mitigated if no direct artificial lighting/light spill is introduced to the southern boundary.
Wider Impact	It is not expected that the planned development will have an impact on the wider landscape or that this impact will be negligible.

Table 5.1: Impact Assessment

5.2 Impacts on Protected Species from the Proposed Works

5.2.1 No evidence was recorded for protected or priority species on-site during the survey. Based upon the results from the desktop survey, field survey, the uncompensated re-development impacts have been summarised as follows:

Protected Species	Evaluation	Impact Assessment
Amphibians	Amphibians are considered likely absent from the Site and the Site is considered unsuitable for breeding animals. There are limited opportunities for hibernation on-site and a lack of connectivity to suitable waterbodies. There is a record for a priority species locally; common frog and common toad).	Negligible; Cautionary
Nesting Birds	There are no historic records for protected and/or priority species on or adjacent to the Site. The disturbance of nesting birds is considered to be moderate within undercover storage areas (February-August).	Moderate
Invertebrates	There are no historic records for a protected and/or priority species on or adjacent to the Site. The Site offers potential for breeding, foraging and hibernating.	Low
Mammals	Badgers: There are no historic records for badger (<i>Meles meles</i>) on or adjacent to the Site. The Site does not offer any suitable habitat for this species.	Nil
	Bats: There are no historic records for bat species on or adjacent to the Site but 27 records were made during two dusk emergence surveys (August/September 2023). During two dusk observations, a total of three species were identified foraging/commuting on or over the Site. Commuting was predominantly north to south and east towards adjacent mature trees. Foraging within the Site boundaries was very limited and transient in nature. Bat roosts are considered likely absent.	Moderate (roosting) Low (foraging and commuting)
	When the nature conservation significance of the site is considered against recognised criteria (Bat Mitigation Guidelines 2004 and Good Practice Guide: NRW Approach to Bats and Planning October 2015 and IUCN Red List of Threatened Species), the nature conservation status of the site is assessed to be low. Three species were recorded commuting/foraging near the Site including common pipistrelle, soprano pipistrelle, and noctule (Least Concern	Negligible/low (Hibernation)

	– IUCN Red List). A cautionary approach will be recommended to mitigate impacts on commuting and foraging bats.	
	Dormouse: There are no historic records for hazel dormouse (<i>Muscardinus avellanarius</i>) on or adjacent to the Site. The Site does not offer any suitable habitat for this species.	Nil
	Otters: There are no historic records for European otter on or directly adjacent to the Site. There is a record at ~500m from the Site, however this location represents a different habitat type. The Site does not offer any suitable habitat for this species.	Nil
	Hedgehogs: There are four records for hedgehog within 500m and a total of nine within 1km. The site offers limited foraging habitat for hedgehog and debris/ materials (including cut branches) offer suitable hibernating conditions.	Moderate (Hibernation)
Reptiles	There are no historic records for reptiles on or adjacent to the Site.	Negligible
Plants	Low botanical diversity has been recorded on the Site and the nature conservation significance of the Site is considered negligible.	Negligible

Table 5.2: Evaluating the Impact on Protected Species

5.3 Impacts on Designated Areas

5.3.1 Based upon the results from the desktop survey and field survey the uncompensated re-development impacts on local sites have been summarised as follows:

Protected Species	Evaluation	Impact Assessment
SSSI	No part of the Site contains, or is within, any statutory sites of nature conservation interest, such as a Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC) or National Nature Reserves (NNRs) etc.	Nil
NRW Priority Area	No part of the Site contains, or is within, any statutory sites of nature conservation interest, including Natural Resources Wales (NRW) Priority Areas.	Nil
Wildlife Site / SINC (adopted)	No part of the Site contains, or is within, any non-statutory sites of nature conservation interest, such as a Site /Important for Nature Conservation (SINC – Adopted) or Local Nature Reserves (LNRs).	Nil

Table 5.3: Evaluating the Impact on Designated Areas

5.4 Conclusions

- 5.4.1 With a focus on the aims of this report as set out in Section 1, the following conclusions have been drawn: No part of the Site contains, or is within, any statutory sites of nature conservation interest, such as a Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), National Nature Reserves (NNRs) or Local Nature Reserves (LNRs) etc. Therefore, the proposed scheme of works will not impact on any rare or valuable habitats as the works are due to remain within the site boundary.
- 5.4.2 The Preliminary Ecological Appraisal survey recorded four habitat types on-site, and two target notes were made. Low botanical diversity has been recorded on the Site and the nature conservation significance of the Site is considered negligible.

- 4.10.4 The impact of artificial lighting on the interior of the site is moderate and connectivity between the Site and the wider landscape is low. The most significant feature is a corridor of mature trees which are located near the eastern boundary. These trees provide a degree of connectivity to neighbouring gardens but are fragmented from the wider habitat.
- 5.4.3 There are no historic records for a protected and/or priority species within the boundaries or adjacent to the Site. Local biological records returned 86 species records within 2km of the Site including 10 within 500m. The two nearest records at 111m and 227m are both for European hedgehog (*Erinaceus europaeus*).
- 5.4.4 There are no roost records within 500m of the Site. There is a 'summer roost,' for brown long-eared bat at 280m, and 'occasional roost,' for a pipistrelle species at 660m and a roost for an unidentified species at 564m and 732m. Building A has been categorised as being of low risk, requiring a dusk survey for bats on one occasion, Building B been categorised as being of moderate risk, requiring a dusk survey for bats on two occasions, and Building C of negligible risk, requiring no additional survey work.
- 5.4.5 During two dusk observations, a total of three species were identified foraging/commuting on or over the Site. Commuting was predominantly north to south and east towards adjacent mature trees. Foraging within the Site boundaries was very limited and transient in nature. No bats droppings were recorded at Buildings A-C. No evidence was recorded of bats using Buildings A-C as a roost and no evidence of protected or priority species interest was recorded during the filed survey or dusk emergence surveys. Bats are considered likely absent from the structures.
- 5.4.6 The features identified within the PRA are considered to offer a low risk at providing the hibernating conditions that bats prefer. No cellars/underground spaces were recorded during the surveys. As pipistrelle species are known to hibernate in buildings, this will need to be taken into consideration, particularly in the winter shaded areas on the north and west sides of structures.
- 5.4.7 All bat species and their places of rest are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The legal protection for bats concerns impacts from disturbance, loss of roost locations, modifications to roosts and loss of access or obstruction to roost locations. As bats are considered likely absent from Buildings A-C a European Protected Species (EPS) licence will not be required from Natural Resources Wales (NRW).
- 5.4.8 One inactive nest was recorded to the interior of an open-sided storeroom on the ground floor of Building A. A cautionary approach is recommended.
- 5.4.9 Amphibians are considered likely absent from the Site and the Site is considered unsuitable for breeding animals. There are limited opportunities for hibernation on-site but a lack of connectivity to suitable waterbodies. Due to the presence of a priority species locally (common frog and common toad) a cautionary approach is recommended.
- 5.4.10 As there are four records for European hedgehog <500m and nine <1km, a precautionary approach must be followed.

SECTION SIX: RECOMMENDATIONS & ENHANCEMENTS

Based on the results of this report, it is recommended that the following conditions be included in the plans. These recommendations include enhancement features. These enhancement features are designed to support 'net gain' for biodiversity onsite, or off-site (if the proposed development cannot accommodate such requirements *in-situ*).

Recommendation 1 (Encountering a Protected Species)

During a PRA and two dusk activity surveys, no evidence was recorded of bats using Buildings A-C as a roost and no evidence of protected or priority species interest was recorded during the filed survey or dusk emergence surveys. Bats are considered likely absent from the structures. If at any point during works a protected species is encountered on-site, it is essential that all work is to cease and that a suitably experienced ecologist is contacted for advice. This

report is valid for one year (i.e., September 2024). If works do not start within this time, further survey and assessment will be necessary to qualify the results of this report and its recommendations.

Recommendation 2 (Hibernating Bats)

As pipistrelle species are known to hibernate in buildings a precautionary approach will be followed. Any works with regards to the stripping of building materials or exposing the wall plate, particularly on the northern and western aspects of the structure, during the winter months (October-April – inclusive), to be supervised by a suitably qualified and experienced bat ecologist under the direction of a method statement.

Recommendation 3 (Lighting During Development)

As a European Protected Species, disturbance of bats during foraging/commuting, even if accidental, is to be avoided. It is therefore recommended that the use of artificial lighting during the development of the site is avoided. External lighting must be restricted during the development period to that which is necessary for safety and security. This must be kept to a minimum.

If any development is to be conducted between March and September (inclusive), efforts must be made to avoid any adverse impacts on the commuting and foraging of bats near the site. External lighting must be restricted during the development period to that which is necessary for safety and security. This must be kept to a minimum.

Recommendation 4 (A Bat Friendly Lighting Scheme)

To prevent any adverse impact upon the potential roosting, commuting and foraging habitats, for bats adjacent to Buildings A-C (post development), specifically on the adjacent mature trees, the lighting plan for the site must be functional and directional only and kept to a minimum servicing the public areas of the proposed development (as required for safety and security). It must be achieved using baffles and screens, if necessary, to ensure no light spill on any retained or planted vegetated (including off-site vegetation - e.g., there is a potential to impact animals using the nearby habitat features).

- A sensitive lighting scheme is recommended and must be created. The sensitive lighting scheme must follow advice details in 'Bats and Artificial Lighting in the UK: Technical Guidance Note 08/23' (2023) and comprise of:
- Light fixtures, filaments, light spill and artificial light must be directed away from bat roost entrances, both existing and those to be created as part of the mitigation.
- Luminaires are to be LED only, due to their sharp cut-off, lower intensity, good colour rendition and dimming capability. Luminaires must have a warm white spectrum (ideally <2700 Kelvins), reducing the blue light component and increasing the red-light component.
- Luminaires must feature peak wavelengths high the 550nm to avoid the component of light most disturbing to bats.
- Heights of fixtures must be carefully considered to minimise light spill. Only luminaires with an upward light ratio of 0% and with good optical control must be used.
- Luminaires must always be mounted on the horizontal, i.e., no upward tilt.
- Any external security lighting must be set on motion sensors and short (15 second) timers.
- As a last resort, accessories such as baffles, hoods or louvres must also be used, and directed away from any natural features and must not encroach outside the Site boundaries, particularly the surrounding trees, hedgerows, and other vegetation in the landscape.

Recommendation 5 (Hedgehogs)

As European hedgehog have been recorded locally (111m), it is recommended that precautions are incorporated during the construction phase. This will be to create provisions for hedgehogs to escape, in the form of creating slopes or the inclusion of ramps at the end of each working day - from all trenches dug into the ground. Additionally, any pipework left on-site that is greater than 150mm in diameter will need to be planked off. Should this information be strictly adhered to, then the development works will not negatively impact this local mammal population.

Recommendation 6 (Nesting Birds)

All nesting birds, their chicks' eggs and active nests are protected under the Wildlife and Countryside Act 1981 (as amended). If a nest is discovered during works and is active, it must be left undisturbed until all the chicks have fledged. If any features associated with nesting birds are required to be altered during the bird breeding season,

then a further inspection by a suitably qualified ecologist is required no more than 24 hours before this process commences. If an active nest is found by a site inspection, an exclusion zone around the nest will be necessary to preserve this feature until the chicks have fledged the nest.

These measures will allow the development to conform to current protective legislation as laid out in the Wildlife and Countryside Act 1981 (plus amendments).

Recommendation 7 (Finger-tip search)

A suitably competent ecologist is required to carry out a careful, detailed check of all features likely to be impacted, no more than 24 hours prior to works commencing at any time of year for hedgehogs, other mammals, and reptiles. Dismantling of stone walls to be undertaken by hand, stones to be lifted not scraped.

Recommendation 8 (Enhancements Features)

Under the Environment (Wales) Act 2016, public authorities (including local councils and the National Parks), 'must seek to maintain and enhance biodiversity in the exercise of functions in relation to Wales, and in so doing promote the resilience of ecosystems, so far as consistent with the proper exercise of those functions.' This replaces the section 40 duty in the Natural Environment and Rural Communities Act 2006 (NERC Act 2006), in relation to Wales, which states that; 'All public authorities have a statutory duty to conserve biodiversity in all of their functions.'

Local authorities are legally required to make efforts to protect and enhance wildlife and its habitat and this is executed, in part, through the requirement of an ecological assessment for planned development sites and, therefore, we recommend the following principles of design must be followed:

Bats: To encourage bat roosting activity and increase roosting opportunities on-site post-development, it is recommended that an addition of two new roosting opportunities are provided as part of the development (Integrated Eco Bat Box - or similar - or similar). These to be positioned at a height of >3m on the western elevation of the proposed new units. This will enable the new roosts to maximise solar gain (Appendix).

Birds: Two Schwegler 1SP Nest Boxes (or similar) to be fitted at a height of >3m on the eastern elevation of the proposed new unit (Appendix).

Hedgehogs: Enhancement for the local hedgehog population to be provided in the form of; No1 Vivara Pro WoodStone Hedgehog House (or similar) at the southern corner of the Site*¹. No1 Eco Hedgehog Hole Plate (or similar) to be fitted at the base of each new garden fence*¹ to mitigate against defragmentation locally (Appendix).

SECTION SEVEN: ADDITIONAL INFORMATION

7.1 ENCOUNTERING A PROTECTED SPECIES DURING WORKS

- 7.1.1 If at any point during works a protected species is encountered on-site, it is essential that all work is to cease and that a suitably experienced ecologist is contacted for advice.

7.2 EXPIRATION OF THIS REPORT

- 7.2.1 This report is valid for one year (i.e., September 2024). If works do not start within this time, further survey and assessment will be necessary to qualify the results of this report and its recommendations.

¹ The location of these enhancement features to be identified under the direction of a suitably qualified ecologist.

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A. Site Photographs

Building A



Building B



Site Photography



B. Target Notes

Target Note 1 – On-site debris



Target Note 2 – Cut branches



C. Legislation in Wales

Policy	Description
The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019	Bats are specifically protected by (The Habitat Regulations). The Habitat Regulations are the way in which EU legislation is transposed into UK law. All species protected via this legislation are defined as 'European Protected Species.' The Habitat Regulations make it an offence to deliberately capture, kill, disturb, or trade in European Protected Species (i.e., those listed on Schedule 2), of which all UK bats are included. However, these actions can be made lawful through the granting of a license by Natural Resources Wales (NRW). Licenses may be granted for a number of purposes but only after the LPA and NRW is satisfied that there are no satisfactory alternatives and that such actions will have no detrimental effect on the wild populations of bats.
The Environment (Wales) Act 2016	Section 7 of the Environment (Wales) Act 2016 requires all statutory authorities including Local Planning Authorities (LPA) to have due regard for living organisms and types of habitats that are of key significance to sustain and improve biodiversity in relation to Wales. Furthermore, the LPA have a duty under the Act to take all reasonable steps to maintain and enhance the living organisms and types of habitats included on any list published under Section 7 and to encourage others to take such steps.
Wildlife and Countryside Act 1981 (as amended)	The Wildlife and Countryside Act 1981 (as amended) (The WCA 1981) is the principal legislation by which most species are protected in Wales. Bats are protected under Schedule 5 of the WCA 1981, which makes it an offence to damage or destroy a bat roost; intentionally or recklessly disturb a bat or a roost, or intentionally or recklessly obstruct access to a roost. The interpretation of a bat roost is "any structure or place which any wild [bat]...uses for shelter or protection". Because bats tend to reuse the same roosts, the legal opinion is that the roost is protected whether or not the bats are present at the time. In relation to birds, the WCA 1981 makes it an offence to intentionally kill, injure or take any wild bird; take, damage, or destroy the nest of any wild bird while that nest is in use or being built. Schedule 1 of the WCA Act 1981 includes bird species for which addition the additional offence of disturbing these species at their nests or their dependent young.

D. Meet our Survey Team

Nic Aldridge (NA) is an ecologist with Little Wing Ecology and the author of this report. He is a licensed bat worker with over 20 years' experience in education and conservation and over five years' experience surveying built-structures, open habitats, and woodlands for bats. Following a degree in Botany and Zoology, Nic completed an MSc in Wildlife Management, Conservation and Control, at the University of Reading. He has practical experience in field-based research with a focus on invertebrate and vegetation diversity and producing phase 1 habitat surveys and habitat management plans. He has carried out the ringing of Daubenton's bats as part of a multi-year project on the species and has undertaken monitoring work on several important lesser horseshoe bat roosts. He has attended courses with the Bat Conservation Trust to improve his knowledge and skills and has led voluntary projects to develop habitats and collect species data. Nic founded Little Wing Ecology in 2021 as a social enterprise, to use the skills and expertise of an ecological consultancy to work with the local community, support local conservation projects and provide training and education for the next generation of ecologists and conservationists.
Elizabeth Winstanley (LW) is a Nature Recovery Officer with the large Conservation Organisation and a wildlife surveyor with Little Wing Ecology. She has over seven years' experience working in practical conservation. Following a degree in Outdoor Education, Liz volunteered with a Wildlife Trust before taking on her current responsibilities. She has held her current position since 2015. During this time, Liz has undertaken numerous surveys and monitoring projects, including work on butterfly transects, phase 1 habitat surveys, reptile and amphibian surveys, upland monitoring, BTO bird box round, dormouse training and recording, bumblebee conservation – bee walks and many more. Currently Liz is responsible for the management of seven Nature Reserves including four SSSI 's. Liz has also attended several training sessions to develop her knowledge, understanding and practical skills in bat monitoring and bat ecology.
Tracey Cotterell (TC) is a Learning Coach with Blaenau Gwent Learning Zone (Coleg Gwent) and a wildlife surveyor with Little Wing Ecology. Tracey has a lifelong love of nature and enjoys spending her spare time volunteering with organisations such as The Welsh Wildlife Trusts, Blaenavon Heritage and Coleg Gwent Equine department. She enjoys being outdoors, whether in a working capacity or for personal interest such as running, riding, or surfing. She has volunteered throughout her life in roles as varied as an NHS First Responder, to working for the Wildlife Trust. During this time, she has gained skills in volunteering with environmental conservation matters, and through being a signaller in a search and rescue team. Tracey enjoys the responsibility of conserving the surrounding environment, learning, and helping to regulate human activities to minimise direct and indirect negative impacts on both flora and fauna. Tracey has also attended several training sessions to develop her knowledge, understanding and practical skills in bat monitoring and bat ecology.
Yvette Amos (YA) is a civil servant with Companies House and a wildlife surveyor with Little Wing Ecology. She has a lifelong love of nature and enjoys spending her spare time and vacations centred around nature and wildlife focused destinations. Yvette enjoys being outdoors, where she expresses her love of photography along with her interest in the natural world. She is experienced in data collection at a high level, having formerly worked for Cardiff University, School of Social Sciences and Computer Science. Yvette has attended several training sessions to develop her knowledge, understanding and practical skills in bat monitoring and bat ecology and is dedicated to gaining experience in nature conservation, wildlife management and ecology.
Libby Cotterell (LC) is a full-time student and a wildlife surveyor with Little Wing Ecology. She has a lifelong love of nature and the outdoors and enjoys learning new skills and engaging in practical work, in order to have a positive impact on local conservation issues. Libby has attended several training sessions with Little Wing Ecology to develop her knowledge, understanding and practical skills in bat monitoring and bat ecology.
Elise Winstanley (ELW) is a full-time student and a wildlife surveyor with Little Wing Ecology. She runs a college newspaper and is committed to community engagement. Elise is currently studying law, psychology and criminology at A Levels, and has a keen interest in nature and habitat preservation. Libby has attended several training sessions with Little Wing Ecology to develop her knowledge, understanding and practical skills in bat monitoring and bat ecology.
George Harley (GH) is a full-time student and a wildlife surveyor with Little Wing Ecology. He has a love of the outdoors and enjoys learning new skills and engaging in practical work. George has attended several training sessions with Little Wing Ecology to develop his knowledge, understanding and practical skills in bat monitoring and bat ecology.

Reviewer(s)

Phil Morgan (PM) has over 40 years' experience of undertaking building, tree and cave surveys for all bat species (S091084/1; expiry April 2024). In addition, he has undertaken foraging and flight line surveys using heterodyne and other echo-location equipment, and in 1991 made a significant contribution to a Bristol University run project, which established the methodology used in the National Bat Monitoring Programme. Phil has also undertaken numerous radio tracking exercises on both lesser horseshoe and Daubenton's bats. He holds Natural Resources Wales licence for other protected species including dormice, otter, and great crested newt. Phil was the previously the Conservation Officer with Dŵr Cymru Welsh Water, with an all-Wales remit, before leaving to start the Just Mammals Consultancy, where he was Principal Ecologist for 21 years. Phil is a Chartered Environmentalist, with the Society for the Environment (CEnv), and a full Member of the Chartered Institute for Ecology and Environmental Management (MCIEEM).
Sam Haycock (SH) is a founding director of Little Wing Ecology and a commercial assurance executive with a national company. Sam has over 20 years' experience in the education sector and four years' experience managing two rural enterprise companies, of which she was a director for three years. She brings a broad range of interdisciplinary skills to her role at Little Wing Ecology where she has responsibility for editing, reviewing, data management and finances. In 2021, Sam became a founding director of Little Wing Ecology, as a social enterprise, that aims to use the skills and expertise of an ecological consultancy, to work with the local community, support local conservation projects and provide training and education for the next generation of ecologists and conservationists.

E. Biodiversity Enhancement Features

Enhancement / Supporting Features	Information
	<u>Integrated Eco Bat Box</u> The Nestbox Company Accessed 20/11/2022. Available at: www.nestbox.co.uk N.B. this is given as an example only. Many other suitable products are available.
	<u>1SP Schwegler Sparrow Terrace</u> NHBS Accessed 20/11/2022. Available at: www.nhbs.com N.B. this is given as an example only. Many other suitable products are available.
	<u>Eco Hedgehog Hole Plate</u> Available from: The NestBox Company* Accessed on 27/11/2021. Available at: https://www.nestbox.co.uk/ N.B. this is given as an example only. Many other suitable products are available.
	<u>Vivara Pro WoodStone Hedgehog House</u> NHBS Accessed 20/11/2022. Available at: www.nhbs.com N.B. this is given as an example only. Many other suitable products are available.

F. Activity Survey – Recordings (Raw data)

DATE	Time (start)	Time (end)	SPECIES (COMMON)	No	Surveyor's Position	OBSERVER'S NAME	COMMENT	CLASS OF SITE
29.08.23	20.35	20.35	Bat	1	West	Nic Aldridge	Commuting	Commuting
29.08.23	20.49	20.49	Common pipistrelle	1	East	Yvette Amos	Commuting	Commuting
29.08.23	20.34	21.07	Common pipistrelle	6	East	Yvette Amos	Heard-not-seen	
29.08.23	20.35	20.49	Common pipistrelle	1	South-east	Libby Cotterell	Commuting	Commuting
29.08.23	20.40	20.48	Common pipistrelle	2	South-east	Libby Cotterell	Heard-not-seen	
29.08.23	20.32	20.32	Common pipistrelle	3	West	Nic Aldridge	Foraging	Foraging
29.08.23	20.30	20.56	Common pipistrelle	1	West	Nic Aldridge	Commuting	Commuting
29.08.23	20.35	20.35	Common pipistrelle	1	West	Nic Aldridge	Heard-not-seen	
29.08.23	20.30	20.31	Common pipistrelle	2	Central	Tracey Cotterell	Foraging	Foraging
29.08.23	20.33	20.33	Common pipistrelle	1	Central	Tracey Cotterell	Commuting	Commuting
29.08.23	20.40	20.40	Noctule	1	Central	Tracey Cotterell	Foraging	Foraging
29.08.23	20.26	20.26	Soprano pipistrelle	1	East	Yvette Amos	Heard-not-seen	
12.09.23	20.13	20.13	Bat	1	Building A	Tracey Cotterell	Heard-not-seen	
12.09.23	20.01	20.01	Common pipistrelle	1	Building A	Tracey Cotterell	Foraging	Foraging
12.09.23	20.13	20.13	Common pipistrelle	1	Building A	Tracey Cotterell	Commuting	Commuting
12.09.23	20.23	20.25	Common pipistrelle	2	Building A	Tracey Cotterell	Commuting	Commuting
12.09.23	20.23	20.23	Pipistrelle spp.	1	Building A	Nic Aldridge	Commuting	Commuting

F: Species List

Common Name	Scientific name	Disturbed Land / Amenity Grassland
Bent (grass)	<i>Agrostis spp.</i>	X
Black medic	<i>Medicago lupulina</i>	X
Bramble (European blackberry)	<i>Rubus fruticosus</i>	X
Butterfly bush	<i>Buddleja davidii</i>	X
Buttercup (Creeping)	<i>Ranunculus repens</i>	X
Dandelion (common)	<i>Taraxacum officinale</i>	X
Dock (Broad-leaved)	<i>Rumex obtusifolius</i>	X
Hedge mustard	<i>Sisymbrium officinale</i>	X
Herb Robert	<i>Geranium robertianum</i>	X
Ivy (Common)	<i>Hedera helix</i>	X
Maple (Sycamore)	<i>Acer pseudoplatanus</i>	X
Moss (Feather)	<i>Hypnales spp.</i>	X
Moss - Silky wall feather moss	<i>Homalothecium sericeum</i>	X
Nettle (Common)	<i>Urtica dioica</i>	X
Plantain (Broad leaved)	<i>Plantago major</i>	X
Ragwort sp.	<i>Senecio spp.</i>	X
Rye grass	<i>Lolium</i>	X
Thistle (Spear)	<i>Cirsium vulgare</i>	X
Willowherb (Broad-leaved)	<i>Epilobium montanum</i>	X
Willowherb (Great)	<i>Epilobium hirsutum</i>	X
Willowherb (Rosebay)	<i>Chamaenerion angustifolium</i>	X
Grasshopper	<i>Chorthippus spp.</i>	X
Red admiral	<i>Vanessa atalanta</i>	X
Buff-tail bumblebee	<i>Bombus terrestris</i>	X
Red tail bumblebee	<i>Bombus lapidarius</i>	X
wasp (common)	<i>Vespula vulgaris</i>	X
Pineappleweed	<i>Matricaria discoidea</i>	X
Spiny sowthistle	<i>Sonchus asper</i>	X

*X = Present at this location