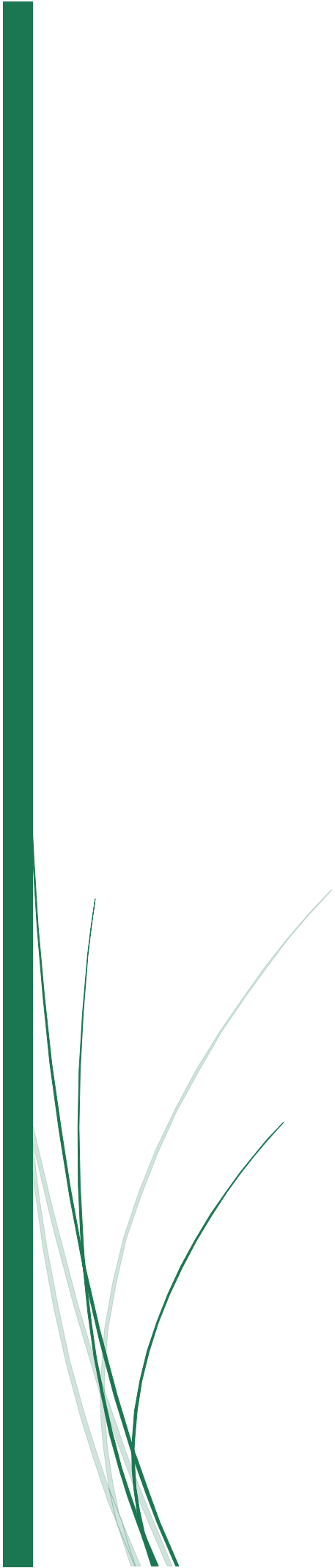




Nether Walstead, East Mascall's Lane, Lindfield, West Sussex, RH16 2QJ

Ecological Assessment

A Report for Mrs T. and Mr E. Ball

July 2026

Nether Walstead, East Mascall's Lane,
Lindfield, West Sussex, RH16 2QJ

Ecological Assessment

Client:	Mrs T. and Mr E. Ball	
Project Ref:	Nether Walstead	
Report Ref:	J24-021567_P2_Rev A	
Author:	Technical Review & Approval:	
Ryan Richardson BSc (Hons) MSc, <i>Assistant Ecologist / Vic Standing ACIEEM RCA Accredited MSc BSc (Hons), Senior Ecologist</i>	Charlotte Bell, BSc (Hons) MCIEEM, <i>Associate Director</i>	
Revision Ref:	Status/ Comment:	Date of Issue:
-	Issued	09.09.2025
A	Final, following confirmation of development impacts	03.10.2025
B	Final, following comments from NatureSpace Partnership	24.07.2026
Disclosure:		
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CONTENTS

1	PROJECT OVERVIEW	1
2	NON-TECHNICAL SUMMARY	2
3	INTRODUCTION	5
3.1	Context	5
3.2	Site Location	5
3.3	Site Description	6
3.4	Legislation and Planning Policy	6
3.5	Objectives of the Survey	6
4	SURVEY METHODOLOGY	8
4.1	Desk Study	8
4.2	UKHab Habitat Survey	8
4.3	Protected and Notable Species	9
4.4	Constraints	14
5	SURVEY RESULTS	16
5.1	Desk Study	16
5.2	UKHab Habitat Survey	17
5.3	Protected and Notable Species	19
6	EVALUATION AND RECOMMENDATIONS	32
6.1	Designated Sites	32
6.2	Ancient Woodland	32
6.3	Habitats and Botanical Species of Interest	32
6.4	Protected and Notable Species	33
7	ECOLOGICAL ENHANCEMENTS	45
8	REFERENCES	47

FIGURES

Figure 1	Habitat Plan
Figure 2	Bat Survey Plan
Figure 3	Trees with suitability for Roosting Bats
Figure 4	Waterbodies within 250m of the Site and GCN results
Figure 5	Tree Protection Measures
Figure 6	Bat Mitigation Plan
Figure 7	Integrated Bat Box Design

APPENDICES

Appendix A	Site Photographs
Appendix B	Legislation and Planning Policies
Appendix C	UKHab Botanical Species List
Appendix D	Bat Droppings DNA Analysis Laboratory Report
Appendix E	Full HSI Calculations
Appendix F	eDNA Laboratory Report

1 PROJECT OVERVIEW

Client:	Mrs T. and Mr E. Ball
Site Address:	Nether Walstead, East Mascall's Lane, Lindfield, RH16 2QJ
Lead Ecologist:	Charlotte Bell BSc (Hons) MCIEEM (Natural England (NE) Bat (Level 2) Class licence holder and registered consultant under the Bat Mitigation Class Licence (BMCL) and Bat Earned Recognition (BER) Class licence (Accreditation Level 2))
Preliminary Roost Assessment (PRA):	24 th July 2024
Preliminary Ecological Appraisal (PEA) & Habitat Suitability Index (HSI):	30 th April 2025
Bat Emergence Surveys:	B1: 1 st August, 22 nd August & 12 th September 2024 B2 & B3: 8 th August, 29 th August & 19 th September 2024 B4: 21 st May & 11 th June 2025
eDNA	3 rd June 2025
Site Proposals:	Internal and external conservation works and alterations to the main house and ancillary buildings, including removal of modern kitchen extension and restoration of catslide roof; alterations and extensions to early 20th-century elements; new dormer; new link-detached billiard room; alterations to courtyard buildings; minor works to garage/barn; improvements to cottage and conversion of adjoining barn; new garage and storage shed; construction of outdoor swimming pool and pavilion; and associated landscape works to enhance the historic character of the site.
Associated Planning Reference Number:	Not yet submitted.

Source of Relevant Documents:

Document:	Source:
Site Location Plan:	Google Earth Pro
Site Plans:	George & James Architects, August 2025.
Desk Study	Magic.gov.uk

2 NON-TECHNICAL SUMMARY

- 2.1 In response to the proposed re-development of Nether Walstead, East Mascal's Lane, Lindfield, West Sussex ('the Site'), an Ecological Assessment, comprising a Preliminary Ecological Appraisal (PEA), a Preliminary Roost Assessment (PRA), bat emergence surveys, a Habitat Suitability Index (HSI) and eDNA survey for great crested newts (GCN), was undertaken.
- 2.2 The Site's potential to support protected species, designated sites and habitats of conservation concern has been assessed and appropriate recommendations have been provided, where required.
- 2.3 Due to the small-scale nature of the works and geographical distance between the Site and all designated sites, no detrimental impacts to sites designated for nature conservation will arise as a result of the proposed improvement works.
- 2.4 A single parcel of ancient woodland (Beech Mead Wood; 25m to the south) is located within 30m from the Site. However, given that guidance from Natural England and the Forestry Commission states that no development should occur within 15m of an ancient woodland, no detrimental impacts to this or any other area of ancient woodland are likely to result from the proposed development.
- 2.5 The Site lies adjacent to the Habitat of Principal Importance (HPI; under the Natural Environment and Rural Communities [NERC] Act 2006) 'Deciduous Woodland'. Measures to minimise the impact of the proposed works have been provided in Section 6 of this report.
- 2.6 The Site and adjacent habitats provide suitable sett creation, foraging and commuting habitat for badger, however, no signs of badgers or their setts were observed during the survey. Given that they are a highly mobile species, an update pre-commencement check immediately prior to works is recommended, as well as standard precautionary measures to be implemented during construction.
- 2.7 The main residential building (B1) supports a 'Confirmed Bat Roost' given the observation of one brown long-eared bat *Plecotus auritus* during the internal inspection, as well as the presence of droppings, confirmed through DNA analysis as being from brown long-eared bat. The Cottage (B2) was identified as having 'High' potential to support roosting bats, the log

- store (B3) was identified as being of 'Moderate' bat roost suitability, and, the Barn (B4) had 'Moderate' suitability within external potential roosting features (PRFs).
- 2.8 Subsequently, in accordance with the Bat Conservation Trust's (BCT) Bat Surveys Good Practice Guidelines (Collins et al., 2023), buildings B1, B2, and B3 were subject to three dusk emergence surveys, in August/September 2024, in order to apply 'reasonable effort' to ascertain the presence/likely absence of roosting bats, and to characterise the roost(s) should they be present. Building B4 was not subject to emergence surveys initially because there were originally no proposed works to the roof or roof lining and, therefore, the PRFs present were not to be impacted. However, the proposal plans have now changed slightly to include some impacts to the Barn (B4) roof, and two emergence surveys were therefore undertaken in May/June 2025.
- 2.9 All observed emergence points / roost locations were recorded and are depicted on Figure 2. A peak count of two common pipistrelles, eight soprano pipistrelles and one brown long-eared bat was recorded emerging from building B1, indicative of summer day roosts of common pipistrelle and brown long-eared bats, and a satellite roost of soprano pipistrelles. A peak count of three common pipistrelle bats was recorded emerging from building B2, indicative of a day roost of the species. No bats emerged from B3 or B4 during the surveys, indicating a likely absence of roosting bats from these buildings.
- 2.10 Without mitigation, the proposed works will result in the loss/damage of the known roosts and therefore no external or loft works to B1 should commence until an appropriate European Protected Species (EPS) licence has been submitted to and approved by Natural England. An overview of the required bat mitigation strategy is provided in Section 6 of this report. It is not currently anticipated that any roof works are required to B2, therefore, these roosts will remain unaffected and do not require a licence. Building B3 and B4 have not been identified as supporting bat roosts and can therefore be undertaken without any further surveys or mitigation in relation to bats.
- 2.11 Potential lighting impacts will be mitigated through the avoidance of external lighting, where possible, and the inclusion of sensitive lighting strategies as detailed in this report, where lighting is absolutely necessary.
- 2.12 A detailed ground-level tree assessment (GLTA) was undertaken of all trees within the Site. However, all trees identified as having bat roost suitability will be retained and protected during construction. Should plans change, further surveys will be required.

-
- 2.13 Suitable bird nesting habitat exists on the Site in the form of mature trees, buildings, and dense garden vegetation. Recommendations regarding timings and methods of best practice for breeding birds have been provided.
- 2.14 Suitable great crested newt (GCN) habitat exists within the Site, however, environmental DNA (eDNA) surveys of suitable accessible waterbodies within 250m of the Site returned a 'negative' result for all waterbodies, indicating that GCN are likely absent from the Site. The implementation of the sensitive working strategy for reptiles below will ensure the welfare of any unlikely GCN within the development area is maintained.
- 2.15 The small areas of unmown and/or tussocky grassland around the Site boundaries and the dense planting beds provide suitable habitat for reptiles. Sensitive timing and methods of clearance/phased habitat manipulation are therefore recommended in Section 6 of this report.
- 2.16 The limited areas of mature shrubs and trees within the garden to be removed to facilitate the proposed re-development, have limited sub-optimal value to dormice and therefore further surveys are not considered proportionate or necessary. Precautionary sensitive clearance measures have, however, been recommended in Section 6 of this report to ensure the welfare of any unlikely dormice present is safeguarded.
- 2.17 The habitats onsite are also suitable for hedgehog, which is a Species of Principal Importance (SPI) under the NERC Act 2006. Sensitive measures for nesting birds and reptiles will ensure their welfare is safeguarded throughout the development.
- 2.18 The likelihood of other protected or notable species to occur within the Site is considered negligible and no further surveys are required. However, should at any point a protected or notable species be identified within the Site then all works should stop and the appointed ecologist consulted on the appropriate manner in which to proceed.
- 2.19 In accordance with the requirements of the National Planning Policy Framework (NPPF) 2024, recommendations to enhance the Site's suitability for wildlife have been provided including the installation of bat, bird, and hedgehog houses and brash piles within the adjacent woodland as well as pollinator-friendly bed planting and wildflower grassland seeding.

3 INTRODUCTION

3.1 Context

3.1.1 In response to the proposed redevelopment works at Nether Walstead, East Mascall's Lane, Lindfield, West Sussex (hereafter referred to as 'the Site'), an Ecological Assessment comprising a Preliminary Ecological Appraisal (PEA), a Habitat Suitability Index (HSI) and eDNA survey for great crested newts, Preliminary Roost Assessment (PRA) of the main building (B1), the Cottage (B2), associated outbuilding (B3), and the barn (B4), and subsequent bat emergence surveys were undertaken. The results of the surveys are presented within this report, depicted on the associated Figures and photographs of the Site are presented in Appendix A.

3.1.2 This Ecological Assessment presents the findings of the UKHab Habitat Survey and Phase 2 protected species surveys, and includes recommendations for avoidance and mitigation of ecological impacts and opportunities to provide biodiversity enhancements, in line with the National Planning Policy Framework (NPPF) 2024.

3.2 Site Location

3.2.1 The Site is located in a rural location on the outskirts of the village of Lindfield, West Sussex, at approximate central National Grid Reference: TQ 36089 24552. The location of the Site is depicted in Image 1.

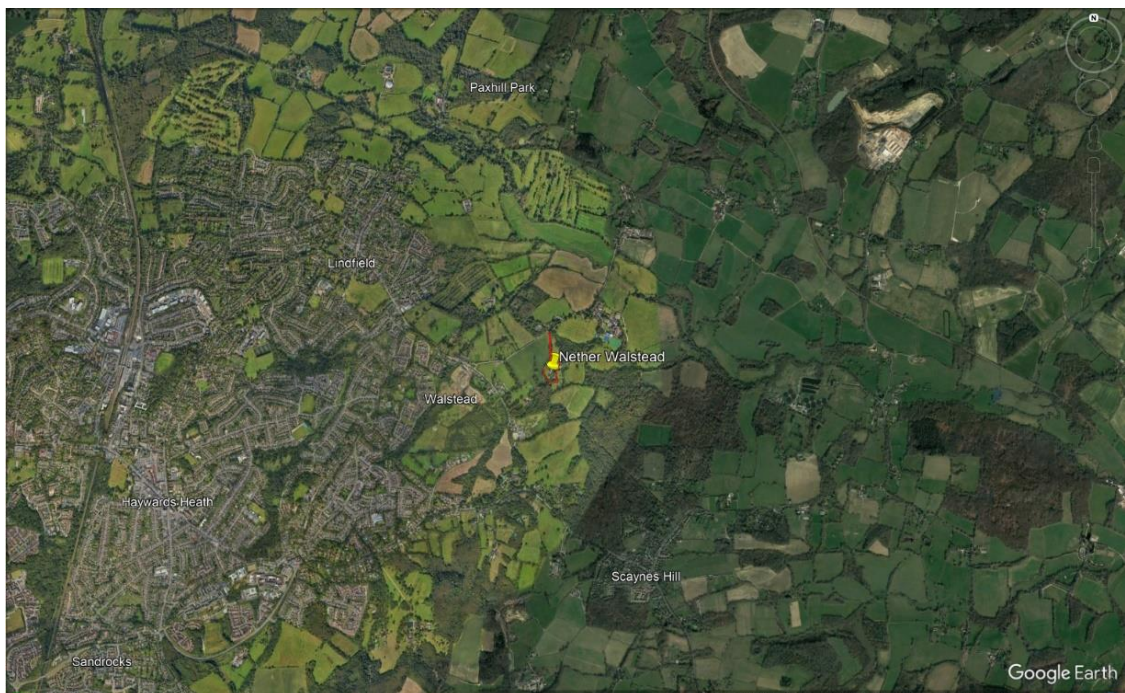


Image 1 – Geographical Location of Nether Walstead ('the Site')

3.3 Site Description

- 3.3.1 The Site occupies approximately 1.25ha and consists of a large Grade II listed residential building (main building; B1) and associated garden, containing amenity grassland, scattered trees and a hardstanding driveway, and a second residential building, the Cottage (B2), an associated outbuilding/log store (B3) and a barn (B4), with associated garden and driveway.
- 3.3.2 The Site is bound by a small access road to the north, agricultural fields and residential properties to the east, a large agricultural field to the west, and an area of agricultural field and broadleaved woodland to the south. The wider landscape comprises agricultural fields demarcated by interconnecting hedgerows and tree lines, small pockets of woodland, and scattered rural residential properties with associated gardens.

3.4 Legislation and Planning Policy

- 3.4.1 Relevant legislation and policies that apply to ecological issues within the Site are:
- [The Conservation of Habitats and Species Regulations 2017 \(as amended\)](#)
 - [The Wildlife and Countryside Act 1981 \(as amended\)](#)
 - [The Natural Environment and Rural Communities \(NERC\) Act 2006](#)
 - [The Hedgerows Regulations 1997](#)
 - [The Protection of Badgers Act 1992](#)
 - [The Wild Mammal \(Protection\) Act 1996](#)
 - [The National Planning Policy Framework \(NPPF\) 2024](#)
 - [Government Circular 06/05](#)
 - [Mid Sussex District Council's Mid Sussex District Plan 2014-2031](#)
- 3.4.2 The above summary serves as guidance only. Further information is presented in Appendix B.

3.5 Objectives of the Survey

- 3.5.1 The objectives of the survey were to:
- Classify the main habitats present within the Site.
 - Evaluate the ecological importance of these habitats.
 - Assess the suitability for protected species and any otherwise notable species to occur within the Site.
 - Complete Phase 2 species-specific surveys where protected species may be impacted by the proposed development.
 - Provide recommendations regarding the retention of features of ecological interest and avoidance of ecological impacts.

- Provide recommendations regarding mitigation and compensation where required based upon the results of the surveys.
- Provide recommendations for appropriate biodiversity enhancements that could be incorporated into the development.

4 SURVEY METHODOLOGY

4.1 Desk Study

4.1.1 A desk study was undertaken in April 2025 to determine the presence of designated sites and habitats of conservation importance, along with existing records of European Protected Species Mitigation Licence (EPSML) sites and great crested newt (GCN) Licence Records & Pond Surveys, of relevance to the Site.

4.1.2 The following bodies were consulted for the desk study:

- Google Earth Pro for waterbody locations and aerial imagery.
- Magic Map (Magic.defra.gov.org) for statutory designated sites and habitats of conservation importance, as well as EPSMLs and GCN licence records.
- OS mapping for waterbodies within 250m of the Site.
- Mid-Sussex District Council Policies Map for non-statutory designated sites.

4.1.3 The desk study involved obtaining the following information:

- International statutory designated sites within 5km.
- National statutory designated sites within 2km.
- Non-Statutory Designated Sites within 1km.
- EPSMLs & GCN records within 1km.
- Waterbodies within 250m.
- Ancient woodland parcels within 30m.
- Habitats of Principal Importance (NERC Act 2006) within or immediately adjacent to the Site.

4.1.4 These search areas are considered sufficient to cover the potential zone of influence of the proposed development.

4.2 UKHab Habitat Survey

4.2.1 The Site was surveyed using the methods outlined in the UK Habitat Classification System (UKHab, 2023). The techniques applied during the survey involve identifying the main plant communities present on the Site and classifying the habitat types following the UKHab methodology. This technique provides an inventory of the basic habitat types present and enables areas of greater botanical interest which may require further, more detailed, surveys to be identified.

- 4.2.2 Any occurrences of recognised invasive non-native species (INNS) as listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were also noted, if present.
- 4.2.3 A map of the habitats and areas of interest is provided in Figure 1. Photographs of features of interest are presented in Appendix A.
- 4.2.4 The habitat survey was undertaken by GES Senior Ecologist Vic Standing ACIEEM RCA Accredited MSc BSc (Hons) on 30th April 2025.

4.3 Protected and Notable Species

- 4.3.1 The survey was 'extended' to consider the suitability of the Site to support protected and notable species. Species considered included those identified during the desk study, or those considered appropriate by the surveyor during the survey. Where required, detailed species-specific surveys were also carried out, as detailed below.

Badger

- 4.3.2 Evidence of badger *Meles meles* activity within the Site (and, where possible, on land within 30m of the Site) was assessed by searching for signs such as:
- Presence of setts, indicated by suitably sized holes or burrows.
 - Evidence of badger latrines, badger hair and/or footprints.
 - Evidence of well-used runs supported by secondary evidence such as foraging signs.

Bats

Preliminary Roost Assessment - Buildings

- 4.3.3 A full external and internal inspection of the buildings (B1-B4) to be affected by the proposed development was conducted in line with current Bat Conservation Trust (BCT) good practice survey guidance (Collins *et al.*, 2023). The external inspection comprised a detailed search, using a high-powered torch, for any potential roosting or access points for bats such as raised fascia boards, warped/slipped weatherboarding, missing/lifted roof tiles, cracks or crevices in brick/blockwork and gaps in timbers and were searched for evidence of use by bats (including staining, droppings, scratch marks, or bats themselves).
- 4.3.4 Following the external inspection, an internal inspection of the building was carried out, using a high-powered torch. This comprised a systematic search of internal features to identify potential access points, roosting places and signs of bat activity.
- 4.3.5 The results of a scoping survey enable the buildings to be categorised as having 'Confirmed roosts' and/or 'High', 'Moderate', 'Low' or 'Negligible' suitability to support roosting bats.

- 4.3.6 In accordance with current BCT good practice guidance (Collins *et al.*, 2023), the level of bat roosting suitability determines whether further dusk emergence surveys are required. Although left to the discretion of the appointed ecologist, in most instances Confirmed roosts and High suitability requires three surveys, Moderate suitability requires two surveys, and Low suitability requires one evening emergence survey.

DNA Analysis

- 4.3.7 Samples of the scattered droppings found within the loft of the main building B1 were collected using gloved hands and a conical 1.5ml microtube sample tube. These samples were sent to Swift Ecology's laboratory (Ecotype Genetics) for DNA analysis, in order to identify the species using the building.

Bat Emergence Survey

- 4.3.8 Dusk emergence surveys were conducted on building B1 during the period 1st August to 12th September 2024; on buildings B2 & B3 during the period 8th August to 19th September 2024; and on B4 during the period 21st May to 11th June 2025. The surveys were completed in accordance with current BCT good practice guidance (Collins *et al.*, 2023). To adequately observe all aspects of the buildings, suitably experienced surveyors and infra-red video recorders were deployed in four survey locations for B1, three survey locations to cover B2 and B3 simultaneously, and two survey locations for B4, during each survey (as detailed in Table 1 below). For clarity, the location of the surveyors is depicted in Figure 1.
- 4.3.9 To account for the varying times at which differing bat species emerge, the emergence surveys commenced 15 minutes before sunset and continued for 1 hour and 30 minutes after sunset (with the exception of two of the surveys which ended a bit early and are explained in more detail in the survey constraints section below).
- 4.3.10 A summary of the weather conditions and survey times is provided in Table 1.

Table 1 – Bat Emergence Survey Times and Weather Conditions

Date	Building	Surveyors	Sunset	Start time	End time	Start weather conditions	End weather conditions
01.08.24	B1	Hana Ketley Chris Bawler Lauren Hook John Tyhurst	20:46	20:31	22:16	18.4°C, 90% cloud, light wind (1BF), light rain to 20:44	17.7°C, 0% cloud, light wind (1BF), dry

08.08.24	B2 & B3	Hana Ketley Hannah Goldenwalla Lauren Hook	20:34	20:19	21:50	18.2°C, 90% cloud, light air (1BF), drizzle	18.7°C, 100% cloud, light air (1BF), heavy rain (see constraints)
22.08.24	B1	Hana Ketley Vic Standing Hannah Goldenwalla Standalone Camera	20:07	19:52	21:07 (rain)	18.4°C, 100% cloud, gentle breeze (3BF), light rain	17.4°C, 100% cloud, gentle breeze (3BF), heavy rain
29.08.24	B2 & B3	Jacob Tassaker Matthew Clark Lauren Hook	19:51	19:36	21:21	17.5°C, 80% cloud, light air (1BF), dry	14.4°C, 0% cloud, calm (0BF), dry
12.09.24	B1	Hana Ketley Chris Bawler Vic Standing Standalone Camera	19:20	19:05	20:50	9.7°C, 10% cloud, light wind (1BF), dry	7.8°C, 10% cloud, no wind (0BF), dry
19.09.24	B2 & B3	Hana Ketley Matthew Clark Chris Bawler	19:04	18:49	20:34	17.2°C, 0% cloud, light breeze (2BF), dry	15.3°C, 0% cloud, light air (1BF), dry
21.05.25	B4	Chris Bawler Vickie Gorst	20:52	20:37	22:22	12.9°C, 10% cloud, no breeze (0BF), dry	10.4°C, 0% cloud, no breeze (0BF), dry
11.06.25	B4	Chris Bawler Vickie Gorst	21:14	20:59	22:44	17.1°C, 0% cloud, light breeze (1BF), dry	14.0°C, 0% cloud, no wind (0BF), dry

4.3.11 To aid audible detection, surveyors were equipped with Elekon Batlogger M and EchoMeter Touch Pro bat detectors. These detectors convert the inaudible echolocation of bats into a frequency audible to the human ear. All calls were digitally recorded, and the sonograms analysed using the latest version of Elekon BatExplorer and or Kaleidoscope.

4.3.12 To aid visible detection, surveyors were also equipped with Nightfox Whisker Night Vision binoculars or infrared Canon XA10 (or similar) camcorders positioned on tripods adjacent to each surveyor location. These cameras were accompanied by Nightfox XC5 infrared torches to improve visibility.

Ground-Level Tree Assessment (GLTA)

4.3.13 Trees within the Site were subject to a ground-level tree assessment (GLTA) on 30th April 2025 in accordance with current BCT good practice guidance (Collins, 2016). Trees were inspected for potential roosting features (PRFs) such as splits, fissures, cavities, delaminated bark, heavy ivy *Hedera* sp. cover and woodpecker holes. Evidence such as droppings, staining and bats themselves were searched for below and in suitable features, where possible, with the use of high-powered torch and binoculars (where necessary). The quality and quantity of PRFs identified were used to categorise each tree as having:

- PRF-I (potential roosting features for individual or small numbers of bats)
- PRF-M (potential roosting features for multiple and/or maternity roosts of bats)
- FAR (further assessment required, cannot fully assess from the ground)
- None

4.3.14 In accordance with current BCT good practice guidance (Collins, 2023), the categorisation of bat roosting suitability determines the requirement or not for further emergence/re-entry surveys and/or elevated inspections.

Breeding Birds

4.3.15 The habitats within the Site were assessed for their suitability to support nesting birds. Factors considered include suitable cover and feeding habitat. Evidence was searched for in the form of any active or disused birds' nests.

Great Crested Newts (GCN)

4.3.16 The Site was assessed for its potential to support great crested newts (GCN) *Triturus cristatus*. Suitable terrestrial habitat for GCN includes long grass, tall ruderal vegetation, woodland and scrub, as well as wood and rubble piles that may provide sheltering and/or hibernating opportunities. Suitable aquatic habitat includes ponds and wet ditches. A search for any such waterbodies within 250m of the Site, that may provide breeding habitat for GCN, was conducted via a review of available OS mapping.

Habitat Suitability Index (HSI)

4.3.17 An assessment of the suitability of each waterbody within 250m of the Site to support GCN was undertaken using a simplified version of the HSI assessment methodology developed by Oldham *et al.* (2000) (ARG, 2010). The HSI incorporates ten suitability indices, all of which are factors considered to affect GCN:

- Location (in Britain)

- Pond area
- Desiccation rate (years out of ten that pond dries)
- Water quality (subjective assessment)
- Percentage of pond shaded
- Presence of waterfowl
- Fish population (subjective assessment)
- Number of ponds within 1km
- Terrestrial habitat quality
- Percentage macrophyte cover

4.3.18 The results of the HSI provide a numerical index of between 0 and 1, whereby 0 indicates unsuitable habitat and 1 represents optimal habitat. The details of the HSI scoring criteria are provided in Table 2. The location of waterbodies within 250m of the Site and those which were subject to survey are shown in Figure 4. The full HSI calculations are provided in Appendix C.

Table 2 – HSI scoring criteria

HSI Score	Pond Suitability for GCN
< 0.5	Poor
0.5 – 0.59	Below Average
0.6 – 0.69	Average
0.7 – 0.79	Good
> 0.8	Excellent

GCN Environmental DNA (eDNA) Survey

4.3.19 Waterbodies that were identified as potentially suitable to support GCN within 250m of the Site were subject to an eDNA survey in June 2025. The locations of the waterbodies are depicted on Figure 4.

4.3.20 Serving to determine the presence/likely absence of GCN, DNA can be collected from the environment in which an organism lives, rather than directly from the plants or animals themselves. In aquatic environments, species such as amphibians and fish shed cellular material into water via their saliva, urine, faeces and skin cells (known as environmental DNA or eDNA). Their DNA may persist for several weeks and can be collected through a water sample which is analysed to determine if the target species of interest has been present in the waterbody. It is this process which the eDNA testing utilises to determine the presence/likely absence of GCN.

- 4.3.21 In accordance with the recognised method for field sampling, water sampling was undertaken by a suitably licensed, trained and experienced surveyor (and assistant) of all waterbodies within 250m of the Site. To collect the samples, a single visit was made to each waterbody on 3rd June 2025, undertaken in suitable weather conditions (dry and bright). The eDNA sample collection requires the surveyors to take 20 samples from each waterbody, covering the entirety of the waterbody. The water samples were stored in a specifically ordered kit which was subsequently sent for laboratory analysis. The laboratory report is provided as Appendix F.

Hazel Dormouse

- 4.3.22 The Site was surveyed for suitable hazel dormouse *Muscardinus avellanarius* habitat, such as the presence of well-connected broadleaved woodland, hedgerows, mature scrub, and suitable food sources such as oak *Quercus sp.*, hazel *Corylus avellana* and other nut-bearing trees, fruiting trees and shrubs, flowers and invertebrates. Evidence of hazel dormouse searched for included woven nests and/or dormouse-gnawed nuts.

Reptiles

- 4.3.23 Suitable habitat for reptiles was recorded including patches of long grass, vegetated boundaries, woodland and scrub borders, as well as wood and rubble piles within the adjacent woodland that provide sheltering opportunities.

4.4 Constraints

- 4.4.1 Any measurements or indications of area provided within this report are estimates and are provided as a guide only.
- 4.4.2 The first B1 dusk emergence survey on 08/08/2024 had to cease 14 minutes early due to heavy rain, and the second B2 dusk emergence survey on 22/08/2024 had to cease after 1 hour after sunset due to heavy rain beginning at 21:00. However, given that the majority of the core emergence period was completed during suitable weather conditions and that bats were active during this time and emergences were observed, and the other surveys were unconstrained, this is not considered a significant limitation to the survey.
- 4.4.3 The results taken from bat detector recordings are biased towards bats that have louder echolocation calls. Therefore, quiet species such as long-eared bats *Plecotus sp.* may be under recorded due to the limited recording range of the equipment. To compensate for this, the surveyors remained vigilant to ensure that any visual cues identifying the presence of long-eared bats were accurately recorded.

- 4.4.4 Every attempt was made to identify bats to species level, and bat calls were interpreted by experienced surveyors using known call parameters (Russ, 2012) and existing literature on the ecology of UK bat species, including distribution, range, habitat associations and behavioural characteristics, in addition to professional judgement. However, it is not always possible to accurately identify to species level bats from the genus *Myotis*, *Pipistrellus* and or *Nyctalus*. This is a widely accepted limitation and in such cases these passes are therefore classified at the Genus level only (i.e., *Pipistrellus* sp., *Myotis* sp., or *Nyctalus* sp.).

5 SURVEY RESULTS

5.1 Desk Study

Designated sites

- 5.1.1 Statutory and non-statutory designated sites identified within the potential zone of influence of the proposed development are presented in Table 3 below.

Table 3 – Designated sites within the potential zone of influence of the Site.

Site Name	Description	Distance and orientation from Site
Statutory Designated Sites		
<i>International importance (SACs, SPAs, Ramsars)</i>		
None within 5km of the Site.		
<i>National importance (SSSIs and NNRs)</i>		
None within 2km of the Site.		
<i>County importance (LNR)</i>		
Eastern Road Nature Reserve (LNR)	<i>The Eastern Road Nature Reserve is 9-acre wildlife oasis on the outskirts of Lindfield, West Sussex. It is home to an impressive array of mammals, birds, trees, flowers, pondlife, mosses, butterflies, liverworts, and much more. The reserve features a variety of habitats, including rough grassland, wetland, woodland, and scrub. Former landfill site.</i>	0.9km north-west
Scrase Valley (LNR)	<i>An area of woodland scrub, carr and open grassland, located within the urban complex of Haywards Heath and Lindfield. The site is important both as a mosaic of semi-natural habitats in a built-up environment and because the marshy grassland supports several plants which are rare in a County context.</i>	1.3km west
Non-Statutory Designated Sites		
Costells, Henfield & Nashgill Woods SNCI	<i>Ancient woodland site, comprising three woodlands. The majority is overgrown birch coppice under oak and occasional ash standards.</i>	0.2km east
Walstead Cemetery SNCI	<i>A small graveyard which supports species-rich hay meadow grassland including green winged orchids.</i>	0.24km north-west

(SPA – Special Protection Area, SAC – Special Area of Conservation, SSSI – Site of Special Scientific Interest, LNR – Local Nature Reserve, NNR – National Nature Reserve, SNCI – Site of Nature Conservation Interest)

SSSI Impact Risk Zones (IRZs)

- 5.1.2 The Site lies within the IRZ of Ashdown Forest, Chailey Common and Ditchling Common SSSIs, and the SPAs/SACs they underpin.

Ancient Woodland

- 5.1.3 A single parcel of ancient woodland (Beech Mead Wood; c. 25m to the south) is located within 30m of the Site.

NERC s41 Habitats of Principal Importance (HPI)

- 5.1.4 There is a single habitat listed under s41 of the NERC Act 2006 adjacent to the Site; 'Deciduous woodland' is present immediately adjacent to the south-western boundary.

*Protected and Notable Species**EPSMLs and GCN Licence records/Pond surveys*

- 5.1.5 Existing records of granted European Protected Species Mitigation (EPSM) licences of relevance to the Site returned by the desk study are presented in Table 4 below.

Table 4 – Relevant records of granted EPSM licences and GCN records within 1km of the Site

Species	Licence ref.	Distance and direction of closest granted EPSM licence from site	Details
Hazel dormouse	2017-31567-EPS-AD2-1	c. 1km west	Damage and destruction of a breeding site and resting place between 2018 and 2023.
Great crested newt	N/A	c. 0.5km south-east	GCN eDNA result = absent

5.2 UKHab Habitat Survey

- 5.2.1 The following habitat types were recorded within the Site and survey area on 30th April 2025.

- Vegetated garden (including and mapped as modified grassland, introduced shrubs and mature woody vegetation)
- Scattered trees
- Hedgerows
- Line of trees
- Pond (non-priority)
- Buildings
- Hardstanding

- 5.2.2 A summary of the key botanical species present within each habitat type are included within the descriptions below. While considering this information reference should be made to the UKHab Habitat Map presented in Figure 1 and photographs presented in Appendix A.

Vegetated Garden

- 5.2.3 The majority of the Site consisted of vegetated garden associated with the two residential properties, predominantly comprising frequently mown 'modified grassland'. Species present included dominant sweet vernal grass *Anthoxanthum odoratum*, with frequent springy turf moss *Rhytidiadelphus squarrosus*, and occasional cocksfoot *Dactylis glomerata*, field wood-

rush *Luzula campestris*, daisy *Bellis perennis*, creeping buttercup *Ranunculus repens*, and selfheal *Prunella vulgaris*. Discrete parcels containing bulbs within the grassland on the boundaries and surrounding the base of some of the scattered trees were unmanaged, with a sward height of around 30-40cm. Additional species in the unmown parcels included occasional bulbs (daffodils *Narcissus pseudonarcissus*, native bluebells *Hyacinthoides non-scripta*, and the Schedule 9 invasive non-native species (INNS) Spanish/hybrid bluebell *Hyacinthoides hispanica*), with locally-dominant native bluebells and occasional nettles *Urtica dioica*, cleavers *Galium aparine*, primrose *Primula vulgaris*, and wood anemone *Anemone nemorosa* in beds adjacent to the woodland on the southern boundary.

- 5.2.4 A series of beds containing a variety of introduced garden plants were present in the eastern half of the Site. The structure in these beds included a mixture of scattered trees, shrubs, and ground cover, with a good proportion of pollinator-friendly flowering species. The Schedule 9 INNS variegated archangel *Lamium galeobdolon subsp. argentatum* was present in two of the beds, depicted as Target Note TN2 on Figure 1.

Scattered trees

- 5.2.5 A mixture of native and non-native semi-mature scattered trees were present throughout the garden, with native species including oak *Quercus robur*, sycamore *Acer pseudoplatanus*, poplar *Populus alba*, sweet chestnut *Castanea sativa*, beech *Fagus sylvatica*, willow *Salix sp.*, silver birch *Betula pendula*, and yew *Taxus baccata*.

Hedgerows

- 5.2.6 Seven short (<30m) lengths of monospecific hedgerows were present in beds surrounding the on-site buildings. Six of these were native, with two hedgerows comprising of yew (H1 & H4), two comprising box *Buxus sp.* (H2 & H3), one comprising garden privet *Ligustrum ovalifolium* (H5), and one comprising beech (H7). The one non-native hedgerow (H6) comprised Leyland cypress *Cupressus x leylandii*.

Line of Trees

- 5.2.7 A single monospecific line of yew trees (TL1) was present to the south of The Cottage (B2).

Pond (Non-Priority)

- 5.2.8 A shallow concrete-lined diamond-shaped pond was present to the east of the main house (WB4 on Figure 3; TN3 on Figure 1). The surface was covered in common duckweed *Lemna minor* and filamentous algae.

Buildings

- 5.2.9 A variety of buildings are present within the Site boundary. These are described in more detail below in the Preliminary Roost Assessment (PRA) results section.

Hardstanding

- 5.2.10 The remaining areas within the Site comprise tarmac driveways, gravel or brick/paved pathways, and a covered open air swimming pool to the south of the main house.

5.3 Protected and Notable Species*Badger*

- 5.3.1 The onsite habitats and adjacent broadleaved woodland provide suitable sett creation, foraging and commuting habitat for badger, however, no signs of badgers or their setts were observed during the survey.

*Bats**Foraging and Commuting Habitat*

- 5.3.2 The mature trees within the Site provide foraging and commuting opportunities for bats. All other habitats are regularly managed and of lower value to bats, however, roosts were identified within the main building (B1) and Cottage (B2), and the Site is well-connected to adjacent areas of broadleaved woodland, grassland, and waterbodies which provide optimal foraging opportunities within the surrounding landscape. The Site was, therefore, identified as having 'Moderate' suitability to support foraging and commuting bats.

Roosting Habitat – Trees

- 5.3.3 A detailed ground-level tree assessment was undertaken of the mature trees potentially to be affected by the proposed development (lighting or felling/arboricultural works) within and immediately adjacent to the Site on 30th April 2025. None of the smaller scattered trees within the Site boundary or the semi-mature trees lining the driveway have any bat roost potential. However, Table 5 below provides a description of each tree within or adjacent to the Site that were identified as having potential roosting features (PRFs) and their locations are depicted on Figure 3.

Table 5 – Trees with bat roost suitability within/adjacent to the Site

Tree Ref	Species	PRFs	Level of Suitability
T1	Oak	Pruning cut on branch 5m high, south-facing. Knot hole and splits on branch 10m high, west-facing. Dense canopy, other PRFs on higher branches may have been obscured.	FAR

Tree Ref	Species	PRFs	Level of Suitability
T2	Sweet chestnut	Knot hole 5m up the trunk, south-facing. Dead limb with rot holes and splits 5m high, north-facing.	PRF-M
T3	Oak	Dead tree with multiple splits/rot holes in the limbs between 10-15m high.	PRF-M
T4	Yew	Large specimen with multiple densely-packed trunks and criss-crossing branches, starting around 5m high.	PRF-I
T5	Sweet chestnut	Two woodpecker holes on branch 10m high, both north-facing. Split limb 15m high, south-facing.	PRF-M
T6	Horse chestnut	Large and deep knot hole 2m high on the trunk, west-facing. Dense canopy, other PRFs on higher branches may have been obscured.	PRF-M
T7	Sweet chestnut	Knot hole on branch 15m high, east-facing.	PRF-I
T8	Sweet chestnut	Split limb 15m high, east-facing.	PRF-I
T9	Oak	Tear-out on branch 25m high, north-facing. Dense canopy, other PRFs on higher branches may have been obscured.	PRF-M
T10	Oak	Large pruning cut on trunk 5m high, west-facing. Knot hole on trunk 10m high, east-facing. Woodpecker hole on branch 10m high, west- and downwards-facing. Split limbs on branches 20m high, north- and west-facing. Veteran tree, likely other PRFs on higher limbs.	PRF-M

Roosting Habitat - Buildings

Building B1

- 5.3.4 Building B1 (Plates 1-8, Appendix A) is a large Grade II listed residential building comprising a mixture of red brick and white-painted weatherboarding walls on the northern elevation, and some small dormer windows with hanging tiles, and red brick on the southern elevation with traditional Tudor-style timber, wattle and daub constructed walls on the south-western gable section and hanging tile clad on the south-eastern gable section, with rendered walls on the western elevation. There is a single-storey extension on the south-eastern part of the house constructed of brick walls and clay tiled roof. The roof is pitched and made of handmade clay tiles. External roosting features include numerous missing and lifted roof tiles on all elevations, as well as hanging tiles on the southern gable end and lifted lead flashing. Furthermore, there are some holes and gaps in and around the black-painted timber frames on the southern elevation.

- 5.3.5 Internally, there are two loft voids: a large main loft void and another lower loft void in the single-storey extension at the rear (south-east section) of the house. The roof lining comprises modern breathable roof membrane (BRM), with rock wool insulation present at floor level. Internal roosting features include a ridge board and rafters. One brown long-eared bat *Plecotus auritus* was observed roosting in the main loft (the approximate location is depicted on Figure 2), with c. 30 bat droppings scattered throughout the loft, as well as c. 15 droppings observed in the lower loft, which were also characteristic of bats. One dropping sample from each loft was collected and sent for DNA analysis. Building B1, therefore, supports a 'Confirmed Bat Roost' and has 'High' suitability for additional bat roosts.

Building B2

- 5.3.6 The Cottage, building B2 (Plates 9-14, Appendix A) is a two-storey residential cottage of brick construction, with white timber cladding on the upper storey. The roof is pitched and made of handmade clay tiles. External roosting features include numerous gaps under roof tiles.

- 5.3.7 Internally there is a loft void. The roof lining comprises traditional felt, with rock wool insulation present on the floor. Internal roosting features include a ridge board, rafters, brick chimney breast, and lots of access at the eaves. No droppings indicative of bats were observed. Building B2 is considered to have 'High' roosting potential.

Building B3

- 5.3.8 The outbuilding (B3; Plates 15-16, Appendix A), used as a log store, is a single-storey barn constructed of single-skinned timber weatherboard walls, and with a pitched clay tiled roof. The roof is unlined and the building is open on the north-east aspect. Although there is a ridge beam present and rafters potentially with small gaps in joints and between wall boards and posts, the bat roost suitability of the building is deemed to be 'Moderate', due to the unstable environmental conditions and lack of a roof lining within this uninsulated building. No evidence of roosting bats was found.

Building B4

- 5.3.9 The barn (B4; Plates 17-18, Appendix A) is a large single-storey building of brick-built construction, with pitched clay tiled roof. Internally it is lined with timber sarking. The potential roosting features are confined to between the roof tiles and the timber lining. The bat roost suitability is considered to be 'Moderate'. No evidence of roosting bats was found.

DNA Analysis

- 5.3.10 DNA analysis of the droppings collected inside the main loft void of building B1 confirmed them as being from brown long eared bats. However, the droppings found in the lower loft void were from pygmy shrew *Sorex minutus* and yellow-necked mouse *Apodemus flavicollis*.

Emergence Surveys

1st August 2024

- 5.3.11 A total of ten bats was recorded emerging from Building B1: eight soprano pipistrelle bats and two common pipistrelle bats. The eight soprano pipistrelles were recorded emerging from a gap in the wall between the timber frame and wattle-and-daub composite to the right of the second-storey window on the southern elevation (Emergence Point A) between 21:08hrs and 21:14hrs, from 22-28 minutes after sunset (Image 2). One of the common pipistrelles emerged from above the same window (Emergence Point B) at 21:08hrs, 22 minutes after sunset (Image 2). The other common pipistrelle emerged from the north-western corner of the building (Emergence Point C) at 21:09hrs, 23 minutes after sunset (Image 3).



Image 2 – The emergence point of 8 x soprano pipistrelle (A) and 1 x common pipistrelle (B) from a gap in the wall between the timber frame and wattle-and-daub composite to the right of a second-storey window on the southern elevation of Building B1



Image 3 – The emergence point of 1 x common pipistrelle (C) from a roof tile on the north-west corner of Building B1 on 01.08.24; and 1 x brown long-eared bat (D) from near the ridge of the roof on the northern extension on 22.08.24

5.3.12 Throughout the survey, species recorded foraging and commuting within the Site included common pipistrelle, soprano pipistrelle, noctule *Nyctalus noctula* and brown long-eared bat.

5.3.13 Bat activity within and around the Site during this survey was considered to be 'Moderate'.

8th August 2024

5.3.14 A total of three common pipistrelle *Pipistrellus pipistrellus* bats were recorded emerging from Building B2 during the survey. All three common pipistrelles emerged from a roof tile beneath the chimney on the southern elevation (Emergence Point H) between 20:23hrs and 20:41hrs, 11 minutes before sunset (Image 4).



Image 4 – The emergence point of 3 x common pipistrelles from a roof tile beneath the chimney on the southern elevation of Building B2

5.3.15 Throughout the survey, no other species were recorded foraging or commuting within the Site.

5.3.16 Bat activity within and around the Site during this survey was considered to be 'Low'.

22nd August 2024

5.3.17 Two bats were recorded emerging from Building B1 during this survey.

5.3.18 One brown long-eared bat emerged from near the ridge of the roof on the northern elevation (Emergence Point D) at 21:13hrs, six minutes after sunset (Image 3).

5.3.19 The other bat to emerge from the building during this survey was a common pipistrelle that emerged from the western elevation of the building (Emergence Point E) at 21:27hrs, twenty minutes after sunset (Image 6).

5.3.20 Throughout the survey, species recorded foraging and commuting with the Site included common pipistrelle and soprano pipistrelle.

5.3.21 Bat activity within and around the Site during this survey was considered to be 'Low'.

29th August 2024

5.3.22 A total of two common pipistrelle bats were recorded emerging from Building B2 during the survey. One common pipistrelle emerged from a roof tile beneath the chimney on the western elevation at 20:06hrs (Emergence Point I), 15 minutes after sunset (Image 5).

- 5.3.23 A second common pipistrelle emerged from the same roof tile beneath the chimney on the southern elevation as in survey 1 at 20:08hrs (Emergence Point H), 17 minutes after sunset (Image 4).



Image 5 – The emergence point of 2 x common pipistrelle from a roof tile next to the chimney on the western elevation of Building B2

- 5.3.24 Throughout the survey, other species recorded foraging and/or commuting within the Site included common pipistrelle, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctula*, serotine *Eptesicus serotinus*, brown long-eared bat *Plecotus auritus* and *Myotis sp.*
- 5.3.25 Bat activity within and around the Site during this survey was considered to be 'Low'.

12th September 2024

- 5.3.26 A total of three bats - one soprano pipistrelle bat, one non-echolocating bat, likely *Pipistrellus sp.*, and one brown long-eared bat - was recorded emerging from the Building B1 during the survey.
- 5.3.27 The first bat, a single soprano pipistrelle, emerged from the same gap in the wall between the timber frame and wattle-and-daub composite to the right of the window on the southern elevation as in Survey 1 (Emergence Point A), at 19:21hrs, 1 minute after sunset (Image 2).
- 5.3.28 One non-echolocating bat emerged from a hole in a timber frame to the left of the same window on the southern elevation (Emergence Point F), at 19:32hrs, 12 minutes after sunset (Image 6). The size and behaviour of the non-echolocating bat are indicative of a *Pipistrellus sp.*

- 5.3.29 A brown long-eared bat emerged from beneath a roof tile on the western elevation (Emergence Point G) at 20:00hrs, 40 minutes after sunset (Image 6).



*Image 6 – The emergence points of 1 x soprano pipistrelle (Emergence Point A), 1 x non-echolocating suspected *Pipistrellus* sp. (Emergence Point F), 1 x common pipistrelle from the western elevation (on 22.08.24) Emergence Point E, and, 1 x brown long-eared bat (Emergence Point G) on the western elevation of the north-south ridge on Building B1*

- 5.3.30 Throughout the survey, other species recorded foraging and commuting within the Site included common pipistrelle, soprano pipistrelle and brown long-eared bat.

- 5.3.31 Bat activity within and around the Site during this survey was considered to be 'Moderate'.

19th September 2024

- 5.3.32 A total of one non-echolocating bat, likely *Pipistrellus* sp., and one common pipistrelle, were recorded emerging from building B2 during the survey. The first bat, a single non-echolocating bat, emerged from the same roof tile beneath the chimney on the southern elevation as in survey 1 and 2 (Emergence Point H), at 19:20hrs, 16 minutes after sunset (Image 4).

- 5.3.33 The second bat, a common pipistrelle, emerged from the same location beneath the chimney on the southern elevation (Emergence Point H), at 19:27hrs, 23 minutes after sunset (Image 2).

- 5.3.34 Throughout the survey, bat species recorded foraging and commuting within the Site included common pipistrelle, soprano pipistrelle, brown long-eared, noctule and serotine.

- 5.3.35 Bat activity within and around the Site during this survey was considered to be 'Moderate'.

21st May 2025

- 5.3.36 No bats were recorded emerging from building B4 during the survey.
- 5.3.37 The first bat recorded was a common pipistrelle bat that was heard not seen at 21:18hrs, approximately 26 minutes after sunset.
- 5.3.38 Throughout the survey, bat species recorded foraging and commuting within the Site included more common pipistrelles, soprano pipistrelles and brown long-eared bats.
- 5.3.39 Bat activity within and around the Site during this survey was considered to be 'Low'.

11th June 2025

- 5.3.40 No bats were recorded emerging from building B4 during the survey.
- 5.3.41 The first bat recorded was a soprano pipistrelle, that was seen and not heard, at 21:39hrs, approximately 25 minutes after sunset
- 5.3.42 Throughout the survey, bat species recorded foraging and commuting within the Site in addition to soprano pipistrelles, were common pipistrelles and a single noctule pass.
- 5.3.43 Bat activity within and around the Site during this survey was considered to be 'Low'.

Emergence Survey Summary

- 5.3.44 The results of the dusk emergence surveys are summarised below in Table 6 and the emergence points identified during the surveys are illustrated on Figure 2 and in Images 2-6 above.

Table 6 – Bat Emergence Survey Results Summary

Date	Building	Bats emerging or returning from/to the building	Roost Location	Bat species recorded commuting/foraging within the site
01.08.24	B1	8 x Soprano pipistrelle emerged	Emergence Point A – Emerged from a gap beside a timber to the right of a second-storey window on the southern elevation	Common Pipistrelle Soprano Pipistrelle Noctule Brown Long-Eared Bat
		1 x Common pipistrelle emerged	Emergence Point B – Emerged from the gap above the same window as A on the southern elevation	
		1 x Common pipistrelle	Emergence Point C – North-western corner of roof	
08.08.24	B2	3 x Common pipistrelle emerged	Emergence Point H – Emerged from a roof tile beneath the chimney on the southern elevation	Common Pipistrelle

	B3	None	N/A	
22.08.24	B1	1 x Brown long-eared	Emergence Point D – near ridge on North-east part of building	Common Pipistrelle Soprano Pipistrelle
		1 x Common pipistrelle	Emergence Point E – Western elevation of building around dormer	
29.08.24	B2	2 x Common pipistrelle	Emergence Point H x 1; and Emergence point I x 1	Common Pipistrelle Soprano Pipistrelle Brown Long-Eared Bat
	B3	None	N/A	
12.09.24	B1	1 x Soprano pipistrelle emerged	Emergence Point A – Emerged from same timber place as on survey 1	Common Pipistrelle Soprano Pipistrelle Brown Long-Eared Bat
		1 x Non-echolocating suspected <i>Pipistrellus sp.</i> emerged	Emergence Point F – Emerged from a hole in the timber to the left of the second-storey window on the southern elevation	
		1 x Brown long-eared bat emerged	Emergence Point G – Emerged from beneath a roof tile on western elevation of the north-south ridge	
19.09.24	B2	1 x Non-echolocating bat emerged (assumed to be common pipistrelle)	H – Emerged from the same roof tile beneath the chimney on the southern elevation as in previous two surveys	Common Pipistrelle Soprano Pipistrelle Brown Long-Eared Bat Noctule Serotine
		1 x Common pipistrelle emerged	H – Emerged from the same roof tile beneath the chimney on the southern elevation as in previous two surveys	
	B3	None	N/A	
21.05.25	B4	None	N/A	Common Pipistrelle Soprano Pipistrelle Brown Long-Eared Bat
11.06.25	B4	None	N/A	Common Pipistrelle Soprano Pipistrelle Noctule

Breeding Birds

5.3.45 No nesting birds were recorded during the surveys, however suitable nesting habitat is present within and adjacent to the Site in the form of broadleaved woodland, scrub, scattered trees, semi-improved grassland, and buildings.

5.3.46 An old barn owl *Tyto alba* nest box was present at the eastern end of the outbuilding/log store (building B3), but there were no pellets or any other signs of barn owl use present. A disused bird's nest was also observed inside building B4.

5.3.47 A barn owl *Tyto alba* was also recorded commuting through the Site during the second and fourth bat surveys in 2024, which flew very close to Building B1, but did not enter, and was foraging in the field to the west of building B1. There is no potential for barn owl to nest in the main house, and no bird nests were found during the PRA survey; however, there may be gaps in the structure suitable to support nesting of small garden birds.

Hazel Dormouse

5.3.48 The trees lining the driveway and the broadleaved woodland adjacent to the northern and southern boundaries of the Site provide good quality hazel dormouse habitat, with some areas offering a dense and structurally diverse understorey; and some of the more mature vegetated garden to the east/north-east of the main house has some suitability for dormouse, albeit limited. However, all lengths of hedgerow within the Site are highly managed and unconnected to other suitable habitats.

Great Crested Newt

Terrestrial Habitat

5.3.49 Suitable terrestrial foraging and refuge habitat for GCN is present on-site in the form of unmown grassland parcels, thick ground cover of foliage within the garden beds, and fallen leaf build-up in areas with established deciduous trees. Many of these parcels are isolated, however, and surrounded by short amenity grassland that is managed continuously via a robotic mower.

Aquatic Habitat

5.3.50 A review of available online OS mapping identified four standing waterbodies within 250m of the Site, as depicted on Figure 4.

5.3.51 Waterbody WB3 was dry at the time of survey and consequently no HSI could be undertaken.

5.3.52 Waterbodies WB1, WB2, & WB4 were subject to HSI assessment. A summary of the survey results is presented in Table 7. The full HSI calculations are presented in Appendix C.

Habitat Suitability Index

5.3.53 One pond within and two adjacent to the Site provide suitable aquatic habitat for GCN. In addition, the adjacent broadleaved woodland and semi-improved grassland provide suitable terrestrial foraging and refuge habitat for GCN.

- 5.3.54 The HSI survey identified water body WB2 adjacent to the Site as excellent suitability for GCN, although WB1 (within the Site) & WB4 (adjacent to the Site) were identified as poor suitability. The results are summarised in Table 7 below.

Table 7 – Habitat Suitability Index Assessment Results for GCN of waterbodies within 250m of the Site

Reference	Description	Distance from Site	HSI Score	HSI Suitability
WB1	Natural W-shaped woodland pond along ditch. Ditch was dry at the time of survey, and the pond was stagnant with common duckweed <i>Lemna minor</i> covering surface	30m	0.49	Poor
WB2	Circular pond with two raised vegetated islands, and both aquatic and riparian planting present. Invertebrates such as dragonflies and water beetles were observed during the survey. Pond is fed by a pipe feeding from the same ditch as WB1, created within the last 5 years	On the Site boundary	0.80	Excellent
WB3	Small triangular scrape, dry at the time of survey. Created within the last 5 years	On the Site boundary	n/a	n/a
WB4	Very shallow diamond-shaped and concrete-lined pond within sunken garden bed, shaded by trees. Stagnant with duckweed covering surface	Within the Site	0.36	Poor

eDNA survey

- 5.3.55 All the waterbodies that were holding water (WB1, WB2 and WB4) were sampled, and sent to a specialist laboratory for testing for the presence of GCN DNA. The results from all three ponds were 'Negative'. The laboratory report is presented as Appendix F.

Reptiles

- 5.3.56 The small areas of unmown and/or tussocky grassland within the garden and the Site boundaries, the denser garden beds, and the woodland edge along the south-eastern boundary provide suitable habitat for reptiles. The majority of the Site is continuously mown grassland (managed at a sward height of c. 5-10cm) or under thick tree canopy cover, and is therefore either too open or too shaded to provide suitable habitat for reptiles, therefore, the Site's suitability is limited.

Other species

- 5.3.57 The habitats recorded within and adjacent to the Site provide foraging and resting places for West European hedgehog *Erinaceus europaeus*, a "Notable" species and SPI listed under s41 of the NERC Act 2006.

5.3.58 Beyond those noted above, the survey identified negligible potential for other species of conservation concern within the Site.

6 EVALUATION AND RECOMMENDATIONS

6.1 Designated Sites

Sites of Special Scientific Interest (SSSIs)

6.1.1 No internationally or nationally designated sites were present within the potential zone of influence of the Site, however, the Site does lie within the Impact Risk Zones (IRZ) for the Ashdown Forest, Chailey Common, and Ditchling Common Sites of Special Scientific Interest (SSSI).

6.1.2 However, the proposed development does not fall within any of the categories which would require consultation with Natural England, and therefore due to the geographical distance between the Site and the SSSIs, and the small-scale nature of the proposals, no detrimental impacts will arise as a result of the proposed re-development works.

Local Nature Reserves (LNRs)

6.1.3 Similarly, when considering the scale of the proposed works, and common and widespread nature of the habitats within the Site/impact areas, no deleterious impacts to the two LNRs within 2km or any other statutory designated site are anticipated to result from the proposed development.

Non-Statutory Designated Sites

6.1.4 There are two SNClIs within 1km of the Site. The closest of these is the woodland site, Costells, Henfield and Nashgill Woods SNCl, which is located approximately 200m to the east of the Site. However, given the small-scale nature of the development it is not considered likely that any adverse impacts to this, or any other locally designated site, will arise as a result of the proposals within the Site.

6.2 Ancient Woodland

6.2.1 A single parcel of ancient woodland (Beech Mead Wood; 25m to the south) is located within 30m of the Site. Guidance from Natural England and the Forestry Commission states that no development should occur within 15m of an ancient woodland. The proposed development lies beyond 15m and, therefore, no detrimental impacts to this or any other area of ancient woodland are likely to result from the proposed development.

6.3 Habitats and Botanical Species of Interest

6.3.1 The NERC s41 HPI, of 'deciduous woodland' is present immediately adjacent to the south-western boundary of the Site. Whilst the actual habitats to be impacted by the works are a mixture of buildings, existing hardstanding access routes, a small amount of mature vegetated

garden area and amenity grassland to account for the close proximity of the woodland HPI, measures to ensure that the proposed development does not result in any adverse impacts upon this woodland, the following measures are recommended:

- To minimise the impacts, where practical, all trees within close proximity to the development area and the woodland edge should be retained and to avoid impacts inclusive of root compaction and collision damage, retained trees should be protected in accordance with the British Standard (BS) '5837:2012 Trees in Relation to Design, Demolition and Construction'. An example of such protection is presented in Figure 5.
- A buffer zone of at least 5m from the woodland will be adhered to, where there will be no plant machinery or materials storage.
- Drainage channels should be dug so that any excess run-off as a result of construction activities will not leach into the woodland.

6.3.2 Implementation of the above measures will ensure that no loss or deterioration of the woodland will result from the proposed development and the works will be conducted in accordance with the requirements of the NPPF and the guidance set out to protect broadleaved woodland sites.

Schedule 9 Plants (Invasive Non-Native Species)

6.3.3 There are two INNS plant species present within the Site that are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). These are Spanish/hybrid bluebell *Hyacinthoides hispanica* and variegated archangel *Lamiastrum galeobdolon subsp. argentatum*. If these species are to be removed during the course of the re-development, this should be undertaken with care to ensure that the works do not cause the species to spread into the wild.

6.4 Protected and Notable Species

Badger

6.4.1 Suitable habitat for badger is present within and adjacent to the Site, however, no evidence of their setts was recorded within the Site, or 30m survey area. However, as badgers are a highly mobile species that will readily colonise new areas, a pre-commencement check for any new badger setts by a suitably experienced ecologist is recommended prior to works.

6.4.2 To ensure the welfare of badgers is maintained, the following sensitive working methodology should be implemented throughout the development:

- To account for the potential for badgers to enter the proposed development area for the purpose of foraging and commuting, all contractors working on the development must be briefed by the appointed ecologist regarding the potential presence of badgers via a 'Toolbox Talk'.
- To prevent badgers becoming trapped in excavations, any trenches or deep pits that are to be left open overnight should be provided with a means of escape should a badger enter. This could be achieved through the construction of a graded bank or the installation of a rough sawn timber board such as a scaffold board or similar, which will allow the badgers to exit of their own accord.
- Any trenches or pits left overnight will be inspected each morning to ensure no badgers have become trapped. In the event a trapped badger is encountered and the insertion of a means of escape proves futile, then the appointed ecologist should be contacted immediately to discuss an appropriate manner in which to proceed.
- Should the development require the installation of culverts and/or large diameter piping, measures to ensure the ends are closed to badgers will be implemented overnight.
- The storage of topsoil or other soft building material must be given careful consideration as badgers will readily adopt such mounds for a sett and should this occur, the mound will be afforded the same level of protection as an established sett, and will require a sett closure licence from Natural England in order to remove it. If mounds of topsoil or soft building materials are required within the Site, they should be subject to daily inspection for the presence of badgers or ring fenced with a badger proof fencing material.

6.4.3 Should at any time badgers or evidence of use by badgers be identified onsite, then all works must **stop**, and the appointed ecologist should be consulted on the appropriate manner in which to proceed.

Bats

Commuting and foraging habitat

6.4.4 The habitats within the Site provide suitable foraging and commuting habitat for bats. Furthermore, the Site is well connected to other areas of optimal habitat in the wider landscape. The Site's habitats were therefore considered to offer 'Moderate' suitability for bats. However, given the limited, small-scale nature of the proposals, and the retention of all the mature trees, bat activity surveys would be disproportionate to the impact and are not required in this instance.

- 6.4.5 However, to ensure the Site's integrity for bats and other nocturnal fauna is maintained during works, where practical, works will be limited to standard daytime hours and where works are required outside of this period (during the bat active season April to October inclusive), suitable screening will be installed to avoid light spill onto the retained boundary habitats and the known/proposed bat roosting buildings.
- 6.4.6 Furthermore, external lighting should be avoided if possible from the completed development/ must be kept to the minimum required for safety and security. Where artificial lighting is unavoidable, this must be designed to be sympathetic to the requirement of bats. It should ensure no direct illumination of the known bat roosts or the proposed tree-mounted bat boxes or building-integrated bat roost features, or any mature trees, tree lines or boundary vegetation leading from them. External lighting should be achieved through the use of highly directional L.E.D. and/or PIR activated lighting with no upward light spill and no ultraviolet component (ideally of a colour temperature of 2700K or less). Details on appropriate lighting products and designs for bats has been produced by the Bat Conservation Trust and the Institution of Lighting Professionals (BCT & ILP, 2023) in their guidance note [GN/08; Bats and Artificial Lighting in the UK](#).

Roosting habitat - Trees

- 6.4.7 A detailed ground-level tree assessment was undertaken of trees within or on the boundary of the Site (including any potential impacts from additional artificial lighting). Six trees were identified as having 'PRF-M' suitability to support multiple roosting bats, three trees were identified as having 'PRF-I' suitability to support individual or small numbers of roosting bats, and one was identified as 'FAR' – further assessment required to fully assess its suitability to support roosting bats. The tree locations are depicted in Figure 3.
- 6.4.8 If to be affected, the PRF-M and FAR trees will require elevated inspection surveys and all the PRF-I trees will require 'soft-felling' techniques to be implemented. However, as all of these trees are to be retained and protected during works, no further surveys are currently anticipated as being required, provided they are protected from artificial illumination from the driveway. Should plans change, and avoidance of impacts to any of these trees is not possible, further advice from a suitably experienced bat ecologist should be sought.

Roosting habitat - Buildings

- 6.4.9 In accordance with current BCT good practice guidelines (Collins *et al.*, 2023), reasonable effort to determine the presence or likely absence of roosting bats has been applied to all the buildings within the Site, and has enabled the roosts present to be fully characterised.

- 6.4.10 Conducted during the core maternity period for bats of May to August (and one survey in September), with a peak count of two common pipistrelle bats, eight soprano pipistrelle bats and one brown long-eared bat, the emergence surveys confirmed the presence of 2 x summer day roosts of male / non-breeding female common pipistrelle, a summer day roost of a male / non-breeding female brown long-eared bat, and a satellite roost of soprano pipistrelle bats in building B1. Furthermore, the observation of a single brown long-eared bat during the internal inspection, as well as the results of the DNA analysis of the droppings collected, further confirmed the presence of an individual brown long-eared bat summer day roost in the main loft.
- 6.4.11 A peak count of three common pipistrelle bats observed during the emergence surveys of B2, also confirmed the presence of a summer day roost of male / non-breeding female common pipistrelle bats of this species in the roof of building B2. No roosts were identified within B3 or B4. The locations of all the emergence points (and surveyor locations) are depicted in Figure 2.
- 6.4.12 Current legislation fully protects bats and their roosts, and the proposed development includes the renovation and extension of buildings B1 & B2. Therefore, given that the proposed works are likely to affect most of the bat roosts present on B1, to ensure the works are conducted lawfully, an appropriate EPS mitigation licence will need to be sought and approved from Natural England prior to the start of any works. It is currently not anticipated that any works are required to the roof of building B2 and, therefore, the identified roosts on this building are not thought likely to be impacted by the proposals. However, should any roof repairs (including any lead flashing, chimney work, soffits/fascias etc.) be required, these works should also be subject to licence. Where possible, emergence points on both buildings should be retained.
- 6.4.13 The licence is a legal document which allows an individual to commit what would otherwise be considered an offence.
- 6.4.14 Works to building B3 & B4 will not affect any known bat roosts and can therefore proceed without licence or any mitigation measures.
- 6.4.15 Although the content of the licence will detail the timeframes and mitigation measures required, a brief overview of the bat mitigation strategy is provided below.
- In accordance with the Bat Mitigation Guidelines (Wray & Reason, 2023) works to sensitive areas of the building B1 (roof tiles, roof lining, lead flashing, hanging tiles,

dormers and door/window frames) will be conducted during the period 1st September – 30th November or late March – 30th April in any given year, during conditions conducive to bats being active (consecutive dusk temperatures of no less than 8°C and no heavy rain). Working in this period will reduce/omit the potential for bats to be present and avoids the periods when bats are most vulnerable to disturbance (i.e. maternity or hibernation periods).

- Prior to the start of any works and following receipt of the approved licence, the contractors working on the project will be subject to a 'Toolbox Talk', to be given by the suitably licensed Ecological Clerk of Works (ECoW). The 'Toolbox Talk' will outline the current legislation related to bats and their roosts, and also the appropriate manner in which to proceed with the licensed works and what to do in the unlikely event that a bat is found when an ecologist is not onsite.
- To ensure continuity of roost sites for bats within the Site during works (and to provide a suitable roost location for any bats found during works to be relocated to), three bat boxes (one per species) will be installed on suitable trees within the Client's land ownership prior to the start of works; it is recommended that 1 x [Schwegler 2FN bat box](#) (or similar), 1 x [Schwegler 1FF bat box](#) (or similar) and 1 x [Schwegler 2FS \(Maternity\) bat box](#) (or similar) . Although multiple locations are available, and appropriate locations have been illustrated on Figure 6, the exact locations and orientations of the boxes will be identified on-site by the ECoW.
- Upon completion of the installation of the bat boxes, works that are likely to impact the sensitive areas for bats will commence.
- The careful, manual removal of materials deemed sensitive to roosting bats (roof tiles, ridge tiles, lead flashing, roof lining, dormers and window/door frames etc.) will be undertaken upon approval of the licence, at the appropriate time of year and under the supervision of the licensed ECoW or an ECoW accredited to the licence, using hand tools only.
- Any bats found will be captured by the ECoW (using gloved hands), checked over for any signs of injury or ill-health, placed into a breathable cloth bag for translocation and (if deemed to be fit and well) will be placed carefully within a tree-mounted bat box. Separate species will be placed into separate boxes. In the highly unlikely event that a bat is found to be injured or underweight it will be placed into a breathable container, with some water and a clean cloth for cover and taken to a BCT-registered bat carer.

- The bat boxes will remain *in situ* to provide long-term enhanced roosting opportunities for the species. and the Favourable Conservation Status of the bat populations onsite will be maintained.
- To provide long-term compensatory roosting opportunities, any individual bat roost emergence points whose loss to facilitate the proposed development is unavoidable will be compensated for through the installation of at least an equivalent number of bat access tiles (such as those available from Tudor roof bat access tiles, or similar) to be incorporated within the roof of the new extensions, to reflect the existing orientations/positions as best as possible. Given that it looks like the soprano pipistrelle satellite roost location (Emergence point A, Figure 2) will be impacted, its loss will be compensated for through the installation and incorporation of an integrated bat box within the proposed renovation of the southern elevation of the building (Figure 7 provides an example of integrated bat box design behind timber cladding, but can work behind nearly any facing). Access to the main loft, or part of the main loft (minimum of 3m wide x 3m wide x 2m high) should be retained for the brown long-eared bat.
- To avoid entanglement, Natural England do not approve licence applications in which the design includes the use of modern breathable roofing membrane (BRM) liners. Although it looks like the existing roof underlining within the building comprises modern BRM, any new roof lining in the extensions, or any replacement lining, will be achieved using either traditional Type 1F bitumastic felt or TLX Bat Safe membrane if felt not possible.
- Furthermore, as above, all external lighting should be kept to a minimum and must be sympathetic to the requirement of bats. It should ensure no direct illumination of the tree-mounted bat boxes or building-integrated bat roost features, or any mature trees, tree lines or boundary vegetation leading from them. External lighting shall be kept to the minimum required for safety and security and should be achieved through the use of highly directional L.E.D. and/or PIR activated lighting with no upward light spill and no ultraviolet component (ideally of a colour temperature of 2700K or less). Details on appropriate lighting products and designs for bats has been produced by the Bat Conservation Trust and the Institution of Lighting Professionals (BCT & ILP, 2023) in their guidance note [GN/08; Bats and Artificial Lighting in the UK](#).

6.4.16 It should be noted that the licence application can only be submitted once full planning permission and Listed Building Consent has been approved and all planning conditions relating to bats that can be discharged, have been discharged.

- 6.4.17 It is suggested that provided the above recommendations are adhered to, the proposed development will be conducted in accordance with the requirements of current legislation and planning policies which serve to protect bats and their roosts.

Breeding Birds

- 6.4.18 Suitable bird nesting habitat exists on the Site in the form of mature trees, buildings, and dense garden vegetation.
- 6.4.19 As all nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended) it is recommended that vegetation clearance be avoided where possible. Where required, this (and any building demolition works) should be conducted outside the core breeding period for birds of late February – August inclusive. Should this timeframe be unobtainable, a thorough search for the presence of breeding birds should be conducted by a suitably experienced ecologist immediately prior to the start of works. Should evidence of nesting birds be recorded, works within 5m of the nest, or works that have the potential to destroy the nest(s), should stop until the eggs have hatched and the chicks fledged, or the nest is deemed by a suitably experienced ecologist to no longer be active.
- 6.4.20 Also, given that barn owl (a Schedule 1 bird species on the WCA 1981) was seen onsite during one of the bat surveys, it is recommended that a barn owl box be installed on one of the mature trees within the Site and that areas of rough grassland are created/increased to enhance opportunities within the Site for this species.

Hazel Dormouse

- 6.4.21 One EPSM licensed dormouse site is present within 1km of the Site, and the broadleaved woodland immediately adjacent to the Site provides suitable habitat for dormice. However, no evidence of this species was observed during the survey, and no habitats on-Site are considered to be optimal for dormice.
- 6.4.22 The proposed protection of the adjacent woodland habitat will ensure that the proposed development will not impact any dormouse populations within the wider area, and given that only a small amount of garden shrubs/smaller trees are to be impacted by the proposed extension to B1 and construction of the garage, further surveys for hazel dormouse are not considered to be required in this instance.
- 6.4.23 However, as a precaution, in order to safeguard the welfare of any unlikely dormice that may be present within the garden habitats, the shrubs/trees to be removed should be subject to the following sensitive clearance methodology:

- To ensure all on-site staff are aware of the working sensitivities to be considered when working near a European protected species, prior to the start of works, the contractors working on the project should be subject to a 'Toolbox Talk' given by a suitably experienced ecologist. The 'Toolbox Talk' would outline the current legislation related to dormice and the appropriate manner in which to proceed with the work.
- As the suitable habitat proposed for removal is linked to suitable habitat on the Site boundaries and the woodland beyond, the displacement of dormice, rather than their translocation, is considered the most appropriate course of action in this instance.
- Given that the suitable dormouse habitats within the Site/to be impacted comprise only woody shrubs and small trees (DBH <15cm), the vegetation clearance can be undertaken in a single stage process, but should be undertaken outside of the core breeding season of dormice and outside of hibernation.
- Therefore, single stage clearance can be undertaken in October/November or in May of any given year. However, if the vegetation can be fully checked for the presence of dormouse and their nests prior to any clearance commencing, then other times of year may be acceptable, upon the advice and guidance of a suitably experienced ecologist.
- Scrub clearance should be undertaken under the supervision of a suitably licensed (or accredited) ecologist.
- Cutting should take place directionally, from inside the Site towards the suitable retained habitats on the boundaries.
- Clearance should be undertaken in a slow and steady manner, as advised by the ecologist, using hand tools (such as chainsaws, strimmers and brush cutters).
- If, at any point, a dormouse or dormouse nest is found during works, vegetation clearance must cease immediately and the appointed ecologist contacted for advice on the appropriate course of action.

Great Crested Newt

- 6.4.24 The desk study identified just one pond record from MAGIC which confirmed the likely absence of GCN 500m south-east of the Site. Habitats within the Site are considered sub-optimal for the species, and habitats directly adjacent to the southern boundary are considered optimal.
- 6.4.25 However, waterbodies WB1, WB2 & WB4 were subject to HSI assessment and eDNA survey (WB3 was dry and therefore considered unsuitable for breeding GCN). Results of the HSI assessment determined WB2 to have 'excellent' suitability to support GCN, and WB1 & WB4 to have 'poor' suitability; but all were found to be 'Negative' for the presence of GCN eDNA.

6.4.26 It is therefore considered highly unlikely that GCN are present within the Site, and no further surveys or mitigation are required in relation to this species.

6.4.27 The implementation of a precautionary sensitive working strategy (similar to that recommended for reptiles below) will ensure the welfare of GCN is maintained in the highly unlikely event that they are present within the Site, as follows:

- Prior to the start of works, all contractors are to be briefed regarding the potential presence of GCN. This briefing will be in the form of a 'Toolbox talk', given by a suitably experienced Ecological Clerk of Works (ECoW). The Toolbox talk will provide the site team with information on the ecology of GCN, the legal protection they receive, the methodology to be followed, and what to do in the unlikely event that a GCN is found during works.
- Where practical, all habitats suitable to support GCN (scrub, tall ruderal, semi-improved grassland, woodland etc.) will be retained.
- The construction areas should be clearly demarcated with a barrier such as HERAS fencing (or similar) to ensure a sufficient working space is available to complete the project, whilst restricting the likelihood of excessive material storage spreading into adjacent habitats suitable for GCN (and reptiles). To ensure the barrier remains *in situ* throughout the development, regular checks should be made by the Site Manager.
- Building materials should be stored on pallets or raised supports, wherever practicable; or on hardstanding, sited well away from suitable retained habitat
- Any stored materials that have remained undisturbed for more than 48 hours should be visually checked before being moved.
- Where removal of suitable terrestrial GCN habitat is required, this will be completed within the active GCN season of April to October inclusive.
- To enable and encourage GCN to disperse outside of the development area and into the adjacent retained habitat, the vegetation cut will commence from inside the development area, working outwards, using hand tools only (trimmer and brush cutters are acceptable).
- The initial cut will be restricted to a height of 10cm from ground level.
- Following a period of 24 hours, the second phase of habitat manipulation will be undertaken in the same direction as the first phase, with vegetation cut to approximately 5cm in height.

- Vegetation will be maintained at a height of less than 10cm throughout construction to prevent further habitat becoming suitable throughout the construction period.
- Should there be any piles of debris, vegetation cuttings, log piles, rocks etc. that require clearance within the construction area, this will be dismantled manually under the supervision of a suitably experienced ECoW.
- Storage of chemicals and hazardous materials should be in line with best practice guidelines, ensuring that they are secure and cannot be accessed or knocked over by roaming animals.
- Any excavations or trenches should either be covered overnight, or if left open overnight should either have at least one graded bank or have a scaffold board (or similar) inserted so as to allow any animals that fall in to climb out.
- Any open trenches/pits should be inspected each morning by the Site Manager to ensure no animals have become trapped overnight. If a trapped animal is encountered, the ECoW will be contacted immediately for further advice.

6.4.28 Should a GCN be identified onsite, at any point throughout the development, works to suitable GCN terrestrial habitat must **stop** immediately and the appointed ecologist contacted for advice on the appropriate manner to proceed (which may entail further surveys and/or EPS licensing).

Reptiles

6.4.29 The small areas of unmown and/or tussocky grassland within the lawn and the Site boundaries and the denser garden shrub beds provide suitable habitat for reptiles. However, the majority of the Site is continuously mown grassland (managed at a sward height of c. 5-10cm) or under thick tree canopy cover, and is therefore considered to be unsuitable habitat for reptiles.

6.4.30 All UK native reptile species are protected under the Wildlife and Countryside Act 1981 (as amended) from killing and injury, amongst other offences. The proposed works will result in the removal of habitats suitable to support reptiles. However, due to the extent of the works and the amount of suitable habitat to be directly affected in this instance the implementation of the following precautionary method of works including sensitive timing and habitat manipulation strategy is considered proportionate and appropriate and will ensure the welfare of any reptiles within the Site is safeguarded.

6.4.31 To encourage reptiles that may reside within the development area to move into suitable retained habitat, the following strategy will be adhered to in full:

- To ensure that any reptiles that may be present within the development area are able to move quickly out of harm's way, the cutting of dense scrub/shrubs or tall grassland will be undertaken during the active season for reptiles (mid-March to mid-October).
- To enable animals to relocate outside of the development area and into the adjacent retained habitat, the vegetation cut will commence from inside the development area, working outwards, using hand tools only (strimmer and brush cutters are acceptable).
- The initial cut will be restricted to a height of 10cm from ground level.
- Following a period of 24 hours, the second phase of habitat manipulation will be undertaken in the same direction as the first phase, with vegetation cut to approximately 5cm in height.
- Vegetation will be maintained at a height of less than 10cm to prevent further habitat becoming suitable throughout the construction period.

6.4.32 Provided the above mitigation strategy is implemented in full then the welfare of reptiles will be maintained, and the development will be conducted in accordance with current legislation and planning policies which serve to protect reptiles.

6.4.33 Should at any point during the phased clearance process, reptile hibernacula inclusive of log/brush/spoil piles be identified, these should be cleared under the supervision of a suitably qualified ecologist to ensure the welfare of reptiles is maintained.

Other species

6.4.34 The adjacent broadleaved woodland with associated fallen deadwood provides refuge opportunities for SPIs, such as hedgehog. Under current proposals, these habitats are to be protected for the duration of the works. Any hedgehogs within the less suitable habitats within the Site that are to be impacted, will be safeguarded from harm provided the above mitigation measures are adhered to for reptiles, dormice and nesting birds.

6.4.35 There were also some rabbit holes noted outside of the Site boundary to the west of the Site, which are therefore well away from the development area. However, should any mammal holes be identified within or within 30m of the development area, advice should be sought from a suitably experienced ecologist. Even if they are not large enough to be suitable for use by badgers, all wild mammals (including foxes and rabbits) are protected under the Wild Mammals (Protection) Act 1996 from unnecessary suffering, such as crushing, asphyxiation or entombing. Therefore, if any rabbit warrens require destruction this should be undertaken using hand tools ensuring any animals to escape without being trapped or crushed inside.

- 6.4.36 Beyond those noted above, there are no obvious and immediate issues regarding other protected or otherwise notable species within the Site and no further surveys to determine the presence of other protected or otherwise notable species are required in this instance.
- 6.4.37 Should at any point during the development a protected or notable species be identified within the Site, then all works should **stop** and the appointed ecologist consulted on the appropriate manner in which to proceed.

7 ECOLOGICAL ENHANCEMENTS

7.1 Opportunities to include biodiversity enhancements within and around the Site exist and in accordance with the requirements of the NPPF 2024, the following recommendations are considered appropriate for the Site:

- The installation of additional bat boxes installed on trees in suitable locations would increase the Site's potential for roosting bats. These boxes should be installed at a height of 3m or more on sunny, sheltered aspects, away from direct illumination by artificial lighting and in a location, which ensures connectivity to foraging habitats within the wider landscape. In this instance, [Schwegler 2FN bat boxes](#) (or similar) are recommended.
- The installation of a range of tree-mounted bird boxes in suitable locations within the Site would increase potential for nesting birds. These boxes should be a mixture of open-fronted and hole-fronted nest boxes such as those available from [Nestbox Company](#). To maximise suitability, boxes should be installed on sheltered aspects close to vegetation at a height of 2-3m, preferably on north, north-east or north-west facing elevations.
- As mentioned, the installation of a barn owl box in a suitable location within the Site would increase opportunities for nesting barn owls (given that one was observed flying over the Site during one of the bat emergence surveys and that barn owls are a Schedule 1 (Wildlife and Countryside Act 1981 (as amended)) species.
- The incorporation of a wildlife-friendly planting scheme within the Site. This could include creating beds with pollinator-friendly species as per the [RHS Plants for Pollinators](#) database, and/or using suitable wildflower seed mixes such as shade-tolerant species (such as '[Woodland/Heavy Shade Wildflower Meadow Seed Mix](#)' from SowSeeds) for woodland-adjacent and grassland parcels under thicker tree canopies, and a general purpose wildflower seed mix sympathetic to the existing neutral grassland species (such as [Folly Farm Meadow Mixture EM12](#) from Emorsgate Seeds) for grassland parcels in more open areas.
- The incorporation of [hedgehog boxes](#) at suitable locations within the adjacent broadleaved woodland and/o on the edge of the garden would provide an enhancement for this species.
- Piles of deadwood/brash (which can be created by any arisings from vegetation clearance required to facilitate the path widening) would provide enhanced opportunities for a range of species including invertebrates such as the stag beetle which has been recorded in the area.

- Any tree planting should be undertaken using native species such as pedunculate oak, small leaved lime *Tilia cordata*, black poplar *Populus nigra*, wild service tree *Sorbus torminalis* or similar.

8 REFERENCES

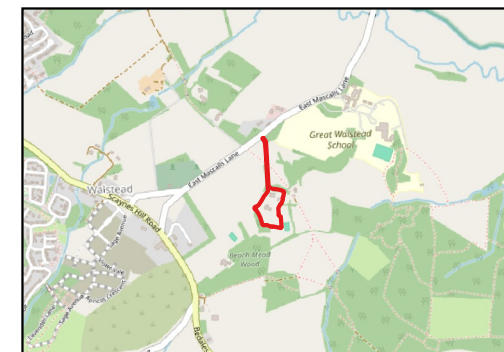
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Figures

J24-021567_P2 Nether Walstead | Figure 1: Habitat Plan

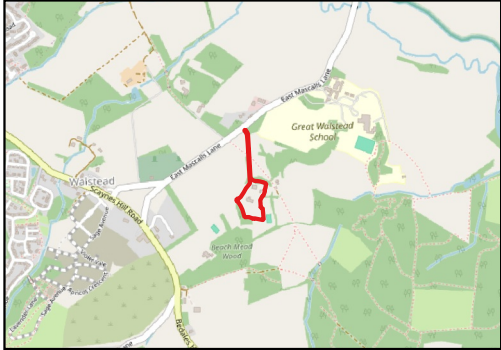
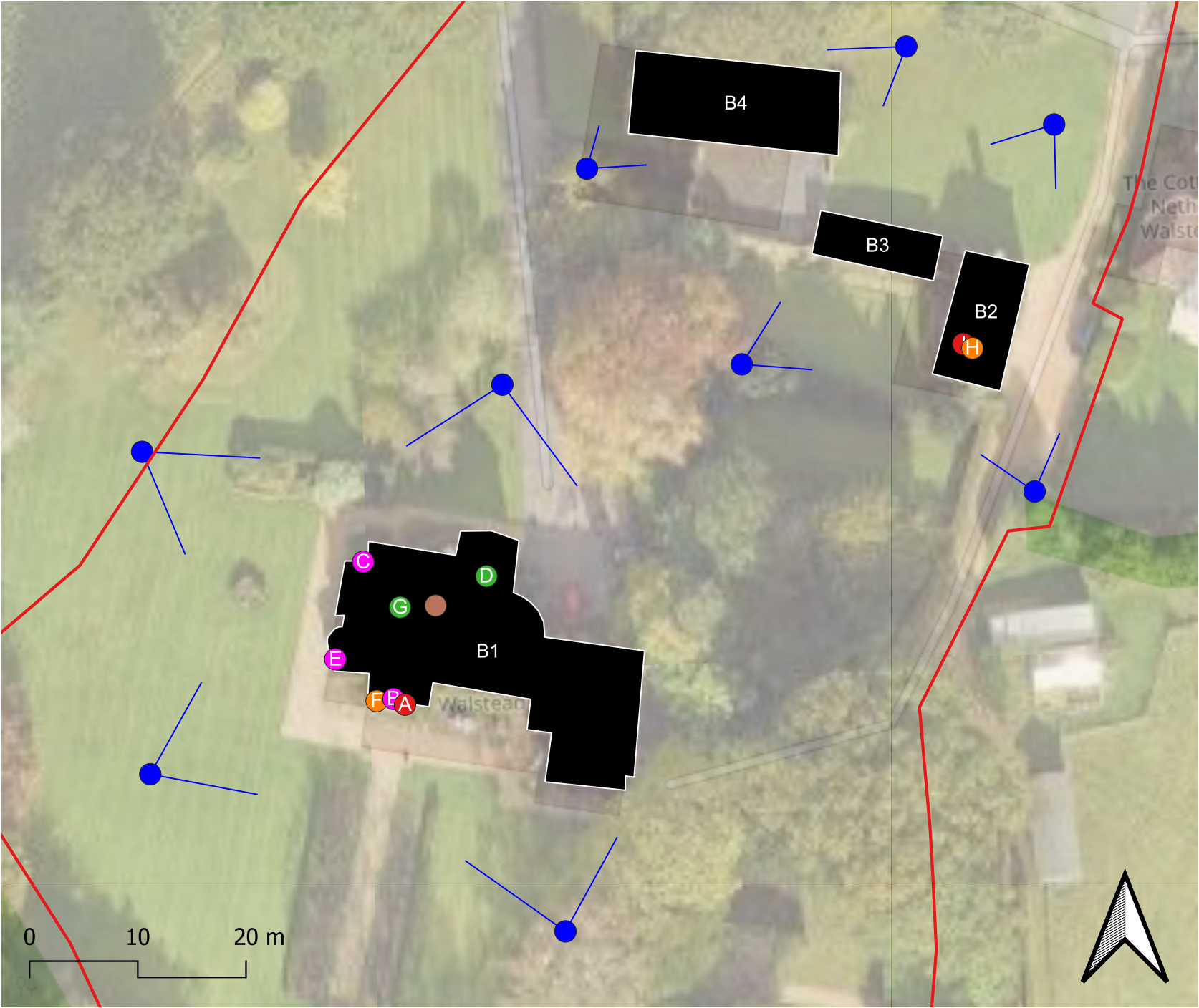


Key	
	Red Line Boundary
	Target Notes
	Trees
	Hedgerow - intact species-poor
	Line of trees - species-poor
	Hedgerow - ornamental non-native
	Modified Grassland (mown)
	Bare Ground
	Hardstanding
	Improved/Modified Grassland (unmown)
	Introduced Shrub
	Woodland - Broadleaved
	Improved/Modified Grassland (unmown, species-poor)
	Mature Garden Vegetation - trees and shrubs
	Buildings

TN1 - Rabbit diggings and attempted holes
 TN2 - Variegated archangel - a Sch. 9 non-native invasive plant
 TN3 - Pond (WB4)

Surveyor: VS
 Survey date: 30/04/2025
 Drawn by: VS
 Date: 21/05/2025
 Reference: J24-021567_P2

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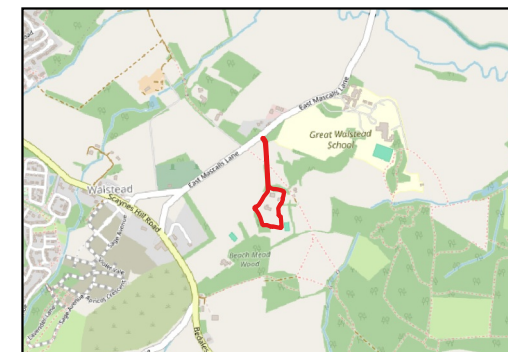
Key

- Red Line Boundary
- Buildings
- Surveyor Locations
- A - SP emergencies- satellite roost (8 on 01/08/24 & 1 on 12/09/24)
- B - Individual CP emergence (01/08/24)
- C - Individual CP emergence (01/08/24)
- D - Individual BLE emergence (22/08/24)
- E - Individual CP emergence (22/08/24)
- F - Individual suspected BLE (non-echolocating) emergence (12/09/24)
- G - Individual BLE emergence (12/09/24)
- H - Individual CP emergence (08/08, 29/08, & 19/09/24)
- I - Individual CP emergence (29/08/24)
- 1 x BLE bat seen in loft during PRA (24/07/24)

CP = common pipistrelle, SP = soprano pipistrelle; BLE = brown long-eared bat

Surveyors: CBe, CBa, VS, LH, MC, HK, HG, JTa, JTy, VG
Survey dates: 24/07/24, 01/08/24, 08/08/24, 22/08/24, 12/09/24, 19/09/24, 21/05/25 & 11.06.25
Drawn by: VS
Date: 07/05/2025
Reference: J24-021567_P2

J24-021567_P2 Nether Walstead | Figure 3: Trees with suitability for Roosting Bats



Key

Red Line Boundary

GLTA Results

FAR

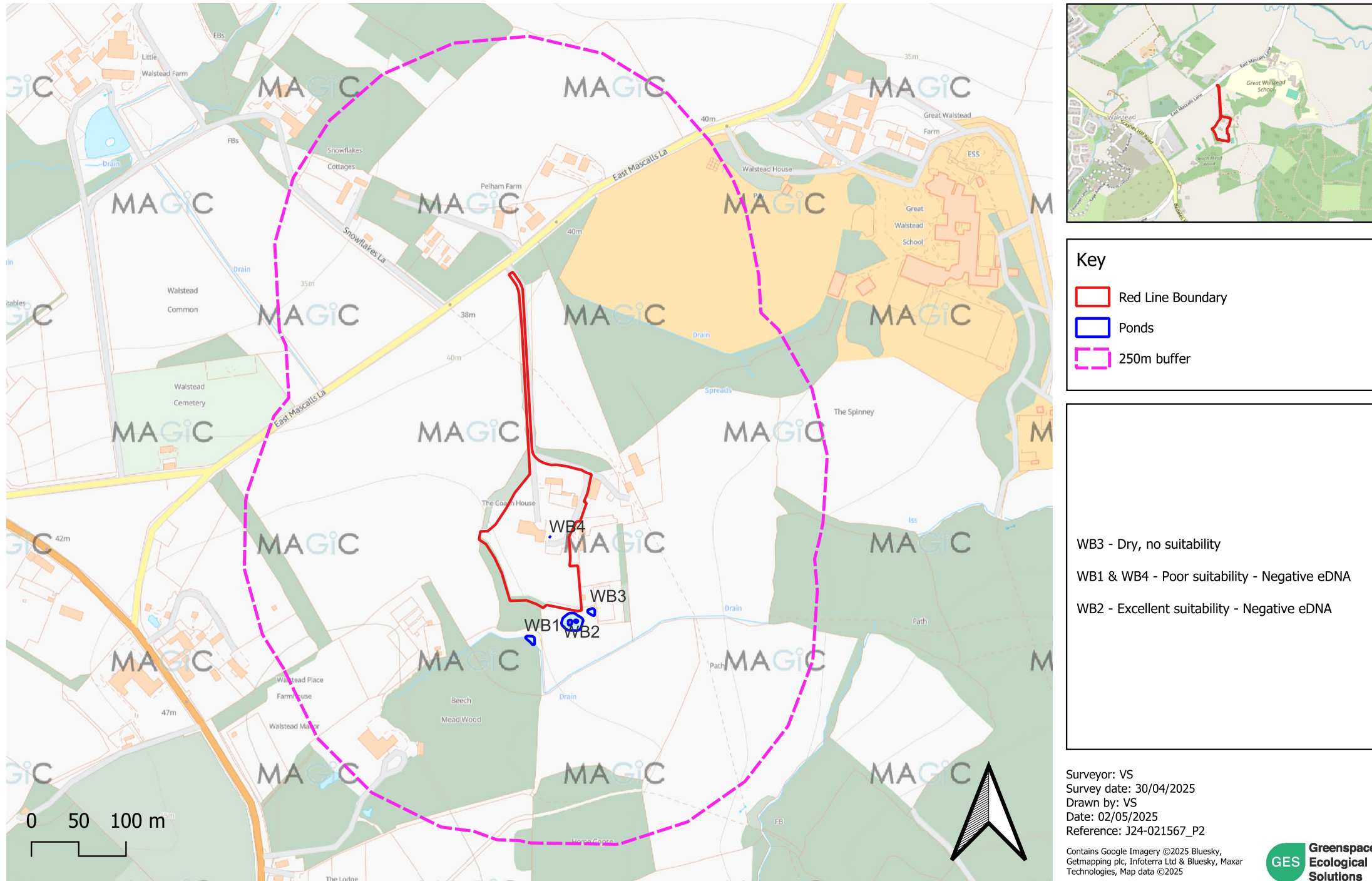
PRF-I

PRF-M

Surveyor: VS
 Survey date: 30/04/2025
 Drawn by: VS
 Date: 01/05/2025
 Reference: J24-021567_P2

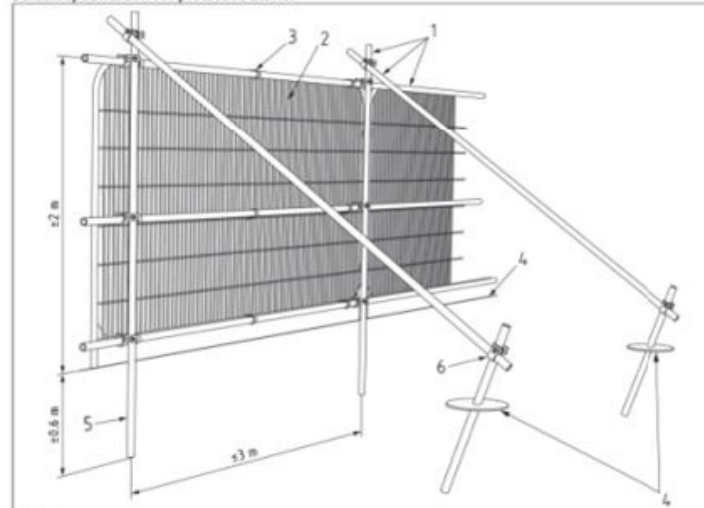
Contains Google Imagery ©2025 Bluesky,
 Getmapping plc, Infoterra Ltd & Bluesky, Maxar
 Technologies, Map data ©2025

J24-021567_P2 Nether Walstead | Figure 4: Waterbodies within 250m of the Site and GCN results



J24-021567_P2 Nether Walstead | Figure 5: Tree Protection Measures

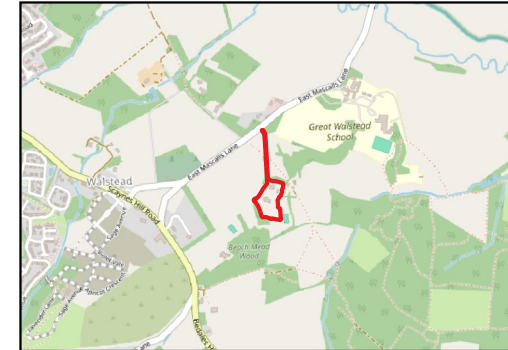
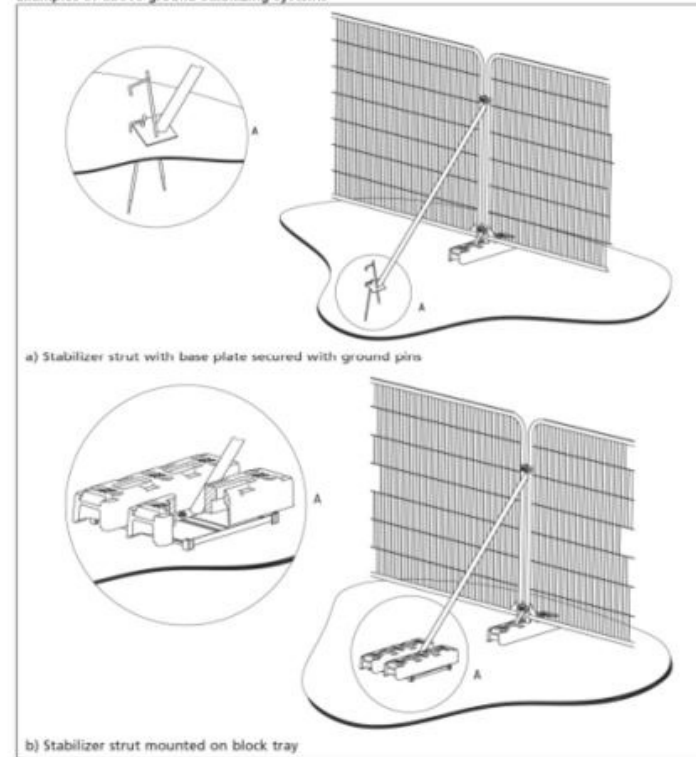
Default specification for protective barrier



Key

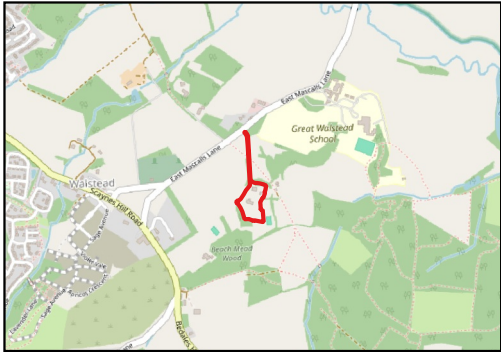
- 1 Standard scaffold poles
- 2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
- 6 Standard scaffold clamps

Examples of above-ground stabilizing systems



Surveyor: n/a
 Survey date: n/a
 Drawn by: VS
 Date: 02/05/2025
 Reference: J24-021567_P2

Contains Google Imagery ©2025 Bluesky,
 Getmapping plc, Infoterra Ltd & Bluesky, Maxar
 Technologies, Map data ©2025



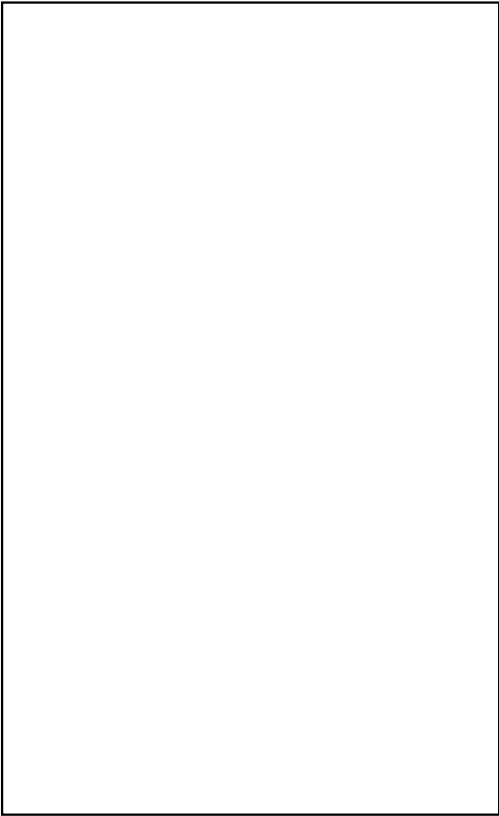
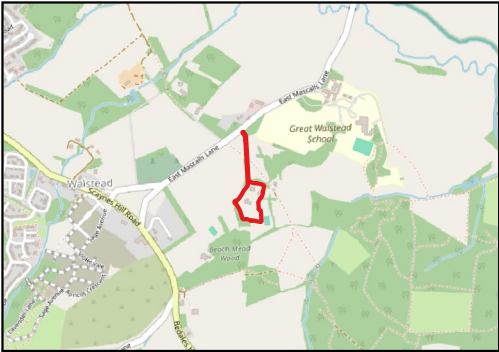
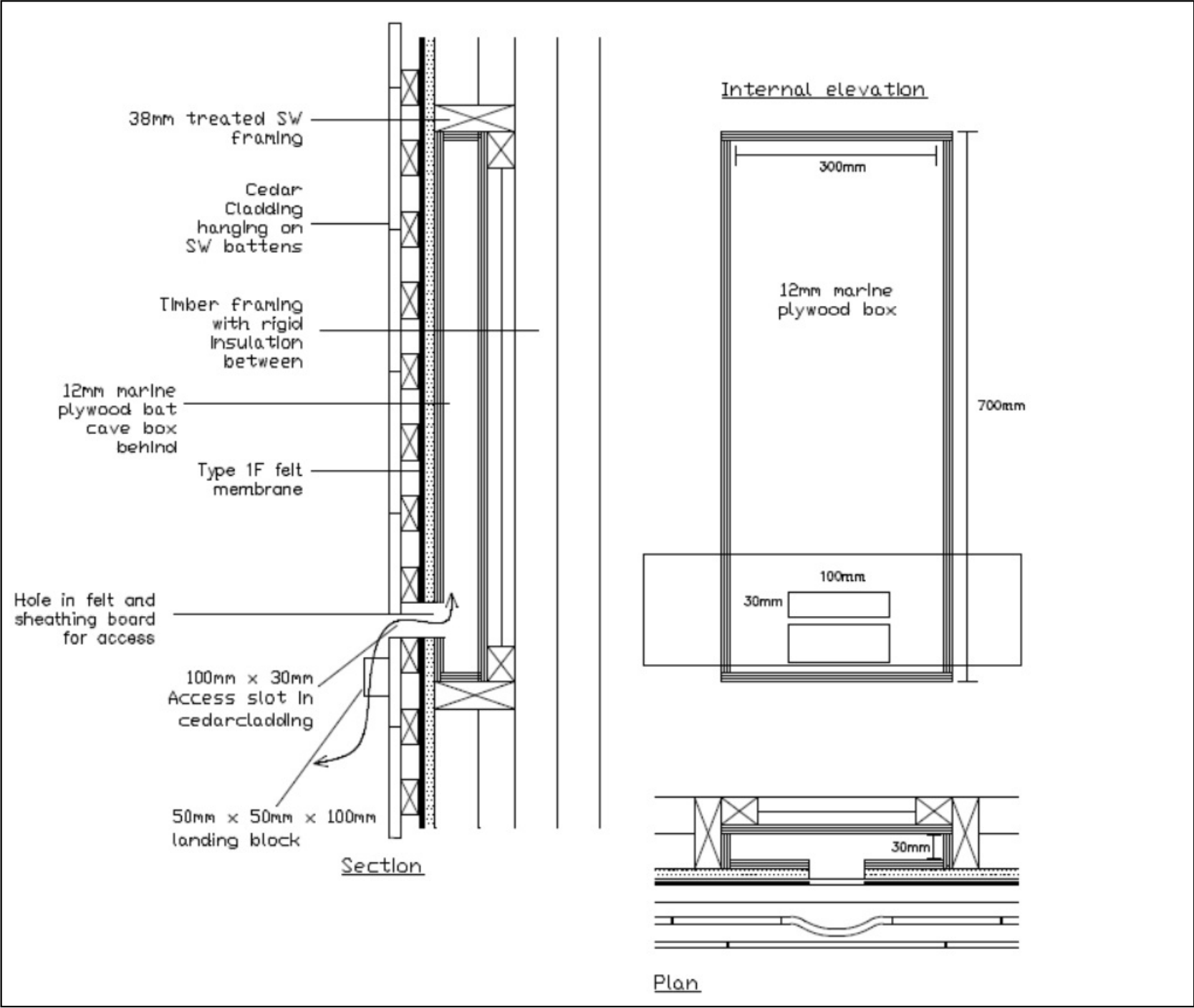
Key

- Bat tiles
- Retained bat loft
- Integrated bat box
- Tree-mounted bat box

Any new roof lining installed must only be traditional type 1F roofing felt, or TLX Bat Safe breathable membrane.

Surveyors: n/a
Survey dates: n/a
Drawn by: VS
Date: 06/05/2025
Reference: J24-021567_P2

Contains Google Imagery ©2025 Bluesky, Getmapping plc, Infoterra Ltd & Bluesky, Maxar Technologies, Map data ©2025



Surveyor: VS
Survey date: 30/04/2025
Drawn by: VS
Date: 02/05/2025
Reference: J24-021567_P2

Contains Google Imagery ©2025 Bluesky,
Getmapping plc, Infoterra Ltd & Bluesky, Maxar
Technologies, Map data ©2025

Appendices

APPENDIX A – Site Photographs



Plate 1. Northern elevation of Building B1 (NE section)



Plate 2. Northern elevation of Building B1 (NW section)



Plate 3. Western elevation of Building B1



Plate 4. Southern elevation of Building B1 (from SW corner)



Plate 5. Southern elevation of Building B1 (from SE corner)



Plate 6. Internal aspect of Building B1's main loft void



Plate 7. Timber frames in main loft void



Plate 8. Brown long-eared bat roosting in main loft void



Plate 9. Eastern elevation of Building B2



Plate 10. Southern elevation (left) and eastern elevation (right) from southeastern corner of Building B2



Plate 11. Western elevation of Building B2



Plate 12. Northern elevation (left) and western elevation (right) from the northwestern corner of Building B2



Plate 13. Internal aspect of Building B2's loft void



Plate 14. Internal aspect of Building B2's loft void



Plate 15. Outbuilding B3 – north-west aspect



Plate 16. Internal view of B3



Plate 17. Barn B4 – south-west aspect



Plate 18. Internal view of B4



Plate 19. Vegetated garden habitat (lawn)



Plate 20. Vegetated garden habitat (beds)



Plate 21. Hardstanding driveway



Plate 22. Line of trees (TL1)



Plate 23. Hedgerow H1



Plate 24. Hedgerows H2 & H3



Plate 25. Hedgerow H4



Plate 26. Hedgerow H5



Plate 27. Hedgerow H6



Plate 28. Hedgerow H7



Plate 29. Pond (WB1)



Plate 30. Pond (WB2)



Plate 31. Pond (WB3)



Plate 32. Pond (WB4)

APPENDIX B – Legislation and Planning Policies

- The Conservation of Habitats and Species Regulations 2017 (as amended) transposes European Union Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law. These regulations provide for the designation and protection of 'European Sites', the protection of 'European Protected Species' and the adaptation of planning controls for the protection of such sites and species. Under the regulations, public bodies have a duty in exercising their functions to have regard to the EC Habitats Directive.
- The Wildlife and Countryside Act 1981 (as amended) provides detail on a range of protection and offences relating to wild birds, other animals, and plants. The level of protection depends on which Schedule of the Act the species is listed on. Licences are available for specific purposes to permit actions that would otherwise constitute an offence in relation to species.
- The Natural Environment and Rural Communities (NERC) Act 2006 imposes an obligation on all public bodies, including local authorities, to consider whether their activities can contribute to the protection of wildlife. The duty is created by section 40(1) of the Act, which states that: "Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity."
- The Hedgerows Regulations 1997 are enforced under the Environment Act 1995, and serves to: restrict the removal of hedgerows, or parts of hedgerows which are over 20m in length. In this case, removal includes digging up and replanting elsewhere, as well as removing from the land completely or destroying in the course of other actions. This includes developments or activities which destroy the roots, causing the vegetation to die.
- The Protection of Badgers Act 1992 exists to protect badgers *Meles meles* from cruelty. Under the act it is a criminal offense to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so, or to intentionally or recklessly interfere with a sett.
- The Wild Mammal (Protection) Act 1996 protects wild mammal species from certain cruel acts, including kicking, beating, nailing, or otherwise impaling, stabbing, burning, stoning, crushing, drowning, dragging or asphyxiation of any wild mammal with intent to inflict unnecessary suffering. Crushing and asphyxiation are most likely to occur as a result of development proposals, should these works collapse any mammal burrows, or encounter wild mammals on site.

National Planning Policy

- The National Planning Policy Framework (December 2024) states (Section 15) that the planning system should identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks; promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity. It also states that local planning authorities should refuse planning on the following principles:
 - If significant harm to biodiversity resulting from a development cannot be avoided, adequately mitigated, or, as a last resort, compensated for.
 - If development is on land within or outside a Site of Special Scientific Interest (SSSI), and is likely to have an adverse effect on it (the exception being where the benefits of the development in the location proposed clearly outweigh its likely impact);
 - If development results in the loss or deterioration of irreplaceable habitats, such as ancient woodland and ancient or veteran trees (unless there are wholly exceptional reasons, and a suitable compensation strategy exists).

Additionally, the NPPF states that development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

- Species and Habitats of Principal Importance for Conservation in England and Wales and priority habitats and species listed in the Mid Sussex District Council local plan are species which are targeted for conservation. The government has a duty to ensure that involved parties take reasonable practice steps to further the conservation of such species under Section 41 of the Natural Environment and Rural Communities Act 2006. In addition, the Act places a biodiversity duty on public authorities who 'must, in exercising their functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity' (Section 40 [1]). Criteria for selection of national priority habitats and species in the UGK include international threat and marked national decline.

Local Planning Policy

- Mid Sussex District Council's Mid Sussex District Plan 2014-2031
Policy DP38: Biodiversity Strategic *Objectives: 3) To protect valued landscapes for their visual, historical and biodiversity qualities; and 5) To create and maintain easily accessible green*

infrastructure, green corridors and spaces around and within the towns and villages to act as wildlife corridors, sustainable transport links and leisure and recreational routes.

Evidence Base: Biodiversity 2020; Biodiversity Action Plan; Biodiversity Opportunity Areas; Green Infrastructure mapping; Habitats and Species Records; Mid Sussex Ancient Woodland Survey; Mid Sussex Infrastructure Delivery Plan; The Natural Choice: Securing the Value of Nature; West Sussex SNCI Register.

Biodiversity will be protected and enhanced by ensuring development:

- Contributes and takes opportunities to improve, enhance, manage and restore biodiversity and green infrastructure, so that there is a net gain in biodiversity, including through creating new designated sites and locally relevant habitats, and incorporating biodiversity features within developments; and*

- Protects existing biodiversity, so that there is no net loss of biodiversity. Appropriate measures should be taken to avoid and reduce disturbance to sensitive habitats and species. Unavoidable damage to biodiversity must be offset through ecological enhancements and mitigation measures (or compensation measures in exceptional circumstances); and*

- Minimises habitat and species fragmentation and maximises opportunities to enhance and restore ecological corridors to connect natural habitats and increase coherence and resilience; and*

- Promotes the restoration, management and expansion of priority habitats in the District; and*

- Avoids damage to, protects and enhances the special characteristics of internationally designated Special Protection Areas, Special Areas of Conservation; nationally designated Sites of Special Scientific Interest, Areas of Outstanding Natural Beauty; and locally designated Sites of Nature Conservation Importance, Local Nature Reserves and Ancient Woodland or to other areas identified as being of nature conservation or geological interest, including wildlife corridors, aged or veteran trees, Biodiversity Opportunity Areas, and Nature Improvement Areas. Designated sites will be given protection and appropriate weight according to their importance and the contribution they make to wider ecological networks.*

APPENDIX C – UKHab Botanical Species List

APPENDIX C: SPECIES LIST

Common Name	Scientific Name	DAFOR	Notes
<u>Lawn - Grassland</u>			
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>	D	
Springy Turf Moss	<i>Rhytidiadelphus squarrosus</i>	F/LD	
Bluebell	<i>Hyacinthoides non-scripta</i>	O/LD	LD in wooded areas
Spanish Bluebell	<i>Hyacinthoides hispanica</i>	O/LF	LF in flower bed areas
Daffodil	<i>Narcissus pseudonarcissus</i>	O	
Field Wood-rush	<i>Luzula campestris</i>	O	
Cock's-foot	<i>Dactylis glomerata</i>	O	
Daisy	<i>Bellis perennis</i>	O	
Creeping Buttercup	<i>Ranunculus repens</i>	O	
Selfheal	<i>Prunella vulgaris</i>	O	
Common Nettle	<i>Urtica dioica</i>	O	Clumped
Primrose	<i>Primula vulgaris</i>	O	Wooded areas
Wood Anemone	<i>Anemone nemorosa</i>	O	Wooded areas
Cleavers	<i>Galium aparine</i>	O	Wooded areas
Bramble	<i>Rubus fruticosus</i> agg.	R	
Pedunculate Oak	<i>Quercus robur</i>	R	Saplings
Thyme-leaved Speedwell	<i>Veronica serpyllifolia</i>	R/LD	
Marsh Thistle	<i>Cirsium palustre</i>	R	
Broad-leaved Dock	<i>Rumex obtusifolius</i>	R	
Common Sorrel	<i>Rumex acetosa</i>	R	
White Clover	<i>Trifolium repens</i>	R/LD	
Changing Forget-me-not	<i>Myosotis discolor</i>	R	
Greater Stitchwort	<i>Stellaria holostea</i>	R	Wooded areas
Annual Meadow-grass	<i>Poa annua</i>	R	By house only
Ground Ivy	<i>Glechoma hederacea</i>	R	Wooded areas
<u>Scattered Trees</u>			
Oak	<i>Quercus robur</i>	F	
Sycamore	<i>Acer pseudoplatanus</i>	O	
Poplar	<i>Populus alba</i>	O	
Sweet Chestnut	<i>Castanea sativa</i>	O	
Beech	<i>Fagus sylvatica</i>	O	
Willow	<i>Salix</i> sp.	O	
Silver Birch	<i>Betula pendula</i>	O	
Yew	<i>Taxus baccata</i>	O	
Lawson Cypress	<i>Chamaecyparis lawsoniana</i>	O	
Ash	<i>Fraxinus excelsior</i>	R	
Scots Pine	<i>Pinus sylvestris</i>	R	
Holly	<i>Ilex aquifolium</i>	R	
<u>Tree Line</u>			
Irish Yew	<i>Taxus baccata</i> 'Fastigiata';	D	

Appendix D - Bat Droppings DNA Analysis Laboratory Report

Samples submitted

Sample Code	Multi-species?	Sample Type	Date Sample Found	Species Group	Site postcode/ post town /grid ref	Site description / comments (Optional)	Suspected identity of species
SEL-2917-1	No	Faecal	24/07/2024	C. Bats	RH16 2QJ	J24-021567 Nether Walstead - main void	BLE
SEL-2917-2	No	Faecal	24/07/2024	C. Bats	RH16 2QJ	J24-021567 Nether Walstead - lower void	BLE

Analysis Results

Sample Code	DNA Extraction Code	Species Identified	ID Method	Ct value	% match
SEL-2917-1	EG-2024-1496	Plecotus auritus (Brown long-eared bat)	qPCR	19	
SEL-2917-2	EG-2024-1497	Sorex minutus (Pygmy shrew) and Apodemus flavicollis (Yellow-		26/25	

		necked mouse) Note: All UK bat species tested for - none detected in this sample. Screened against small mammal qPCR panel.			

What do my results mean?

DNA extraction code - this identifies the DNA extraction sample within our laboratory so that it can be revisited if necessary. We keep these extractions for a minimum of 3 months.

ID method: *qPCR* - These results are obtained using species specific qPCR tests. A positive result indicates the presence of DNA from the species reported.

ID method: *DNA sequencing* - where qPCR fails or is not possible, standard DNA sequencing will be performed. Sequences are then matched against a database.

Ct value - This is a relative measurement of the amount of species DNA in the sample, derived from the qPCR data. The lower the value the more DNA present in the reaction. This helps to predict the abundance of one species relative to another **in the sample**. Note: this relative abundance is not directly transferable to the site the samples were collected from.

% match - this value is the percentage match of sequences derived from DNA sequencing compared to the database. Due to differences in DNA sequence between individuals within a species this match may not always be exactly 100%.

Appendix E - Full HSI Calculations

APPENDIX E - HSI SCORES

Full HSI Scores for accessible waterbodies within 250m

Pond Reference	Pond Location	SI ₁	Pond Area	SI ₂	Pond Drying	SI ₃	Water Quality	SI ₄	Shade	SI ₅	Fowl	SI ₆	Fish	SI ₇	Pond Count	SI ₈	Terrestrial Habitat	SI ₉	Macrophytes	SI ₁₀	HSI Score	Pond Suitability
WB1	Zone A	1.00	<50m2	0.05	Never Dries	0.90	Poor	0.33	96-100%	0.20	Absent	1.00	Absent	1.00	>12	1.00	Moderate	0.67	6-10%	0.40	0.49	Poor
WB2	Zone A	1.00	275m2	0.55	Never Dries	0.90	Moderate	0.67	0-60%	1.00	Absent	1.00	Absent	1.00	>12	1.00	Moderate	0.67	16-20%	0.50	0.80	Excellent
WB3	Zone A	1.00	<50m2	0.05	Dries Annually	0.10	Bad	0.01	0-60%	1.00	Absent	1.00	Absent	1.00	>12	1.00	None	0.01	16-20%	0.50	0.22	Poor
WB4	Zone A	1.00	<50m2	0.05	Sometimes Dries	0.50	Bad	0.01	96-100%	0.20	Absent	1.00	Absent	1.00	>12	1.00	Moderate	0.67	66-80%	1.00	0.36	Poor

Pond Reference	Pond Description
WB1	Natural W-shaped woodland pond along ditch. Ditch was dry at the time of survey, and the pond was stagnant with common duckweed Lemna minor covering surface
WB2	Circular pond with two raised vegetated islands, and both aquatic and riparian planting present. Invertebrates such as dragonflies and water beetles were observed during the survey. Pond is fed by a pipe feeding from the same ditch as WB1, created within the last 5 years
WB3	Small triangular scrape, dry at the time of survey. Created within the last 5 years
WB4	Very shallow diamond-shaped and concrete-lined pond within sunken garden bed, shaded by trees. Stagnant with duckweed covering surface

Index Definitions

Index Number	Index Definition
SI ₁	Location within Britain
SI ₂	Pond area (rounded to nearest 25m ²)
SI ₃	Desiccation rate (years out of ten that pond dries)
SI ₄	Water quality (subjective assessment, using indicators such as invertebrate and plant diversity)
SI ₅	Percentage of perimeter of pond shaded to at least 1m from edge
SI ₆	Level of waterfowl disturbance
SI ₇	Fish populations
SI ₈	Number of ponds within 1km not separated by major barriers
SI ₉	Terrestrial habitat quality (based on percentage of available area)
SI ₁₀	Percentage macrophyte cover

Great Crested Newt HSI Scoring Criteria

HSI Score	Pond Suitability for GCN
< 0.5	Poor
0.5 – 0.59	Below Average
0.6 – 0.69	Average
0.7 – 0.79	Good
> 0.8	Excellent

Appendix F - eDNA Laboratory Report

Folio No: 2144-2025
Purchase Order: J24-021567_P3
Contact: Greenspace Ecological Solutions
Issue Date: 19.06.2025
Received Date: 05.06.2025

GCN Report

Technical Report



SureScreen Scientifics

Folio No: 2144-2025
Purchase Order: J24-021567_P3
Contact: Greenspace Ecological Solutions
Issue Date: 19.06.2025
Received Date: 05.06.2025

GCN eDNA Analysis

Summary

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analyzing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

Results

Lab ID	Site Name	OS Reference	Degradation Check	Inhibition Check	Result	Positive Replicates
R25 0893	Nether Walstead - WB2	TQ 36145 24462	Pass	Pass	Negative	0/12
R25 0894	Nether Walstead - WB1	TQ 36091 24440	Pass	Pass	Negative	0/12
R25 0903	Nether Walstead - WB4	TQ 36124 24542	Pass	Pass	Negative	0/12

Matters affecting result: none

Reported by: Amy Bermudez

Approved by: Lauryn Jewkes

Methodology

The samples detailed above have been analyzed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample tube which then undergoes DNA extraction. The extracted sample is then analyzed using real-time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded. Analysis of eDNA requires attention to detail to prevent the risk of contamination. True positive controls, negative controls, and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added analytical security.

SureScreen Scientifics Ltd is ISO9001 accredited and participates in Natural England's proficiency testing scheme for GCN eDNA testing.

Interpretation of Results

Sample Integrity Check:

When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results. Any samples which fail this test are rejected and eliminated before analysis.

Degradation Check:

Pass/Fail. Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

Inhibition Check:

Pass/Fail. The presence of inhibitors within a sample is assessed using a DNA marker. If inhibition is detected, samples are purified and re-analyzed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result:

Presence of GCN eDNA (Positive/Negative/Inconclusive)

Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.

Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with the WC1067 Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.

Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

Inconclusive: Controls indicate inhibition or degradation of the sample, resulting in the inability to provide conclusive evidence for GCN presence or absence.

