



Gladman Developments Ltd.

Land off Swanstree Avenue, Sittingbourne

BAT SURVEY REPORT

October 2021

This report may contain sensitive ecological information, it is the responsibility of the Local Authority to determine if this should be made publicly available

FPCR Environment and Design Ltd

Registered Office: Lockington Hall, Lockington, Derby DE74 2RH

Company No. 07128076. [T] 01509 672772 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

This report is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of FPCR Environment and Design Ltd.

Rev	Issue Status	Prepared / Date	Approved / Date
-	Draft	HG/AU / 24.08.21	RJS / 02.09.21
A	Final	AU / 05.10.21	RJS / 06.10.21

CONTENTS

1.0	NON-TECHNICAL SUMMARY	2
2.0	INTRODUCTION	3
3.0	LEGISLATION	4
4.0	METHODOLOGY.....	6
5.0	RESULTS.....	11
6.0	DISCUSSION AND RECOMMENDATIONS	16

TABLES

Table 1: Classification and Survey Requirements for Bats in Trees

Table 2: Nocturnal Survey Timings and Weather Conditions

Table 3: Static Detector Survey Dates

Table 4: Desktop Study Results – Bat Species

Table 5: Results of Ground Assessment of Trees for Bat Roost Potential

Table 6: Bat Transect Summary of Results

Table 7: Static Activity Summary

FIGURES

Figure 1: Bat Tree Location Plan

Figure 2: Bat Transect Plan – 11th May 2021

Figure 3: Bat Transect Plan – 8th July 2021

Figure 4: Bat Transect Plan – 8th September 2021

APPENDIX

Appendix A: Static Detector Data – May, June and September 2021

1.0 NON-TECHNICAL SUMMARY

- 1.1 A residential development of approximately 135 units is proposed on a site located to the south of Sittingbourne, Kent.
- 1.2 The site predominantly comprised an arable field with intensively cultivated fruit orchards, small areas of species poor semi-improved grassland, treelines and an isolated hedgerow to the north. A fence line and Swanstree Avenue defined the northern boundary of the site.
- 1.3 Five trees were assessed as moderate bat roosting potential with four trees being assessed as low bat roosting potential, in the southern boundary treelines. The current framework for the site retains these tree lines in entirety and therefore no further surveys have been undertaken. Should the development proposals change, and the trees be affected by loss, pruning or lighting, then further surveys will be required.
- 1.4 In accordance with The Bat Conservation Trust (BCT) guidance, seasonal survey effort was considered appropriate. Bat transects and static detector surveys have been completed in Spring, Summer and Autumn 2021, during which eleven species/species groups were identified as occurring across the site. The bulk of bat activity was confined to the margins of the Site.
- 1.5 The framework makes provision for 2ha of green infrastructure which includes the retention and enhancement of the boundary treelines and hedgerow. These linear habitats will be buffered, strengthening the wildlife corridors around the peripheries of the site to maintain connectivity through the development and into the wider landscape. Structural landscape planting will also be provided to create foraging opportunities within the site, and a sensitive lighting scheme will ensure such habitats remain dark.
- 1.6 Where possible the planting scheme will use native species, with an emphasis on species bearing nectar, berries, fruit, and nuts, to enhance the foraging opportunities available for local invertebrate fauna, which in turn will benefit bats.
- 1.7 Further opportunities to enhance the development for the benefit of the local bat population include the provision of a SUD feature and bat boxes and insect houses, which will increase the available roosting sites and the capacity of the site to support invertebrate prey.

2.0 INTRODUCTION

- 2.1 The following Ecological Appraisal has been prepared by FPCR Environment and Design Ltd on behalf of Gladman Developments Ltd for land south of Swanstree Avenue, Sittingbourne (central OS Grid Reference TQ91216257).
- 2.2 This report should be read in conjunction with the Ecological Appraisal (FPCR, August 2021) for the site, which includes the results of an Extended UKHab Survey. Surveys to inform this assessment comprised a desktop study, an inspection of trees for potential bat roosting features, bat activity transects, and automated static bat detector surveys.
- 2.3 Previous surveys including a Phase 1 habitat, bats, badger, reptile and dormice survey were previously undertaken at the site by FPCR in 2014, for an application which also encompassed the arable fields to east and south of the Site. The red line boundary has been reduced for this new application in 2021 and a walkover survey was undertaken on 11th March to update the baseline information.

Site Location and Context

- 2.4 The 5.9ha site lies on the south-eastern periphery of the town of Sittingbourne, Kent. Arable land surrounds the site to the south and east, with a Local Wildlife Site woodland (LWS) beyond the southern boundary. The northern site boundary is formed by Swanstree Avenue beyond which lies the residential area of Sittingbourne and the A2 road. The site can be accessed via Chilton Manor Farmhouse and shop, which lie immediately to the northwest of the Site off Highsted Road, which separates the site from further residential areas to the west.
- 2.5 The site predominantly comprises a commercial arable field, with intensively managed orchards in the south of the Site. The application site is bound predominantly by fencing, with tall mature treelines along the southern and eastern boundaries and a short section of isolated hedgerow in the north. Other small areas of habitat on site included semi-improved grassland, tall herb/ruderal herb, and ephemeral vegetation.

Development Proposals

- 2.6 The proposals are for a residential development of up to 135 units with associated infrastructure and landscaping (*Development Framework Plan 06302-FPCR-ZZ-ZZ-DR-L-0002*). New access points will be incorporated into the site via Swanstree Avenue along the northern boundary which is marked by a fence line. The majority of treeline extent within the site boundaries will be retained, with provision of approximately 2ha of green infrastructure (GI), to include public open space, orchard trees, play areas, a wildlife pond and additional structural planting (new hedgerows, trees and scrub).

3.0 LEGISLATION

- 3.1 Before any proposals take place, measures must be taken to ensure that the legislation concerning bats is not breached as a result of works. Bats are afforded full protection under the Wildlife & Countryside Act 1981 (as amended)¹ and the Conservation of Habitats and Species Regulations 2017 (as amended)².
- 3.2 Under Regulation 43 of the Conservation of Habitats and Species Regulations 2017 (as amended) it is illegal to:
- Deliberately capture, injure, or kill any wild animal of a European Protected Species (EPS),
 - Deliberately disturb wild animals of an EPS (affecting ability to survive, breed or rear young) – disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young,
 - Deliberately disturb wild animals of an EPS (impairing ability to migrate or hibernate) – disturbance of animals includes in particular any disturbance which is likely to impair their ability in the case of hibernating or migratory species to hibernate or migrate,
 - Deliberately disturb wild animals of an EPS (affecting local distribution and abundance) – disturbance of animals includes in particular any disturbance which is likely to affect significantly the local distribution or abundance of the species to which they belong,
 - Deliberately disturb wild animals of an EPS (whilst occupying a structure or place used for shelter or protection) – intentionally or recklessly disturb any wild animal while it is occupying a structure or place which it uses for shelter or protection,
 - Damage or destroy a breeding site or resting place of a wild animal an EPS.
- 3.3 Under the Wildlife and Countryside Act 1981 (as amended) it is illegal to:
- Recklessly or intentionally kill, injure, or take any wild animals included in Schedule 5.
 - Recklessly or intentionally damage or destroy, or obstruct access to any structure or place which any wild animal included in Schedule 5 uses for shelter or protection,
 - Recklessly or intentionally disturb any such animal while it is occupying a structure or place which it uses for shelter or protection.
- 3.4 If impacts to bats or their roosts cannot be avoided a European Protected Species Licence from Natural England is required in order to allow proposals to derogate from the Legislation (Licences cannot be obtained to provide protection against offences under the Wildlife & Countryside Act 1981 (as amended)). As part of the application process a number of 'Tests' have to be met by the application.
- 3.5 Natural England Guidance Note: European Protected Species and the Planning Process – Natural England's Application of the 'Three Tests' to Licence Applications (March 2011) states:

¹ *Wildlife and Countryside Act 1981 (as amended)* [online] Available at: <https://www.legislation.gov.uk/ukpga/1981/69> [Accessed 6 July 2021].

² *The Conservation of Habitat and Species Regulations 2017 (as amended)* [online] Available at: <https://www.legislation.gov.uk/uksi/2017/1012/contents/made> [Accessed 6 July 2021].

“In determining whether or not to grant a licence Natural England must apply the requirements of Regulation 53^s of the Regulations and, in particular, the three tests set out in sub-paragraphs (2)(e), (9)(a) and (9)(b).

*(1) **Regulation 53(2)(e)** states: a licence can be granted for the purposes of “preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment”.*

*(2) **Regulation 53(9)(a)** states: the appropriate authority shall not grant a licence unless they are satisfied “that there is no satisfactory alternative”.*

*(3) **Regulation 53(9)(b)** states: the appropriate authority shall not grant a licence unless they are satisfied “that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.”*

3.6 Conservation status is defined as “the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its population within its territory”. It is assessed as favourable when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats,
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, or will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

3.7 These tests must not only reach agreement with Natural England when assessing a Licence application, they must also be assessed by the planning authority when determining a planning application.

4.0 METHODOLOGY

Desk Study

4.1 In order to compile existing baseline information, relevant ecological information was requested from the following consultees and sources:

- Kent and Medway Biological Records Centre (KMBRC);
- Multi Agency Geographic Information for the Countryside (MAGIC) website³;
- Colour 1:25,000 OS base maps⁴;
- Aerial photographs from Google Earth⁵.

4.2 The search area for biodiversity information was related to the significance of sites and species and potential zones of influence, as follows:

- 15km around the application area for sites of International Importance (e.g. Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar sites).
- 2km around the application area for sites of National or Regional Importance (e.g. Sites of Special Scientific Interest (SSSIs)).
- 1km around the application site for sites of County Importance (e.g. Biological Heritage Sites (BHS)) and species records (e.g. protected, Local Biodiversity Action Plan (LBAP) or notable species).

Field Surveys

Building Surveys

4.3 There were no buildings present within the Site boundary to assess for roost potential.

Ground-Based Tree Surveys

4.4 During the UKHab survey, trees were assessed for the presence of Potential Roosting Features (PRF) for bats such as the following (Based on P16, British Standard 8596:2015 Surveying for bats in trees and woodland, October 2015):

- Natural holes (e.g. knot holes) arising from naturally shed branches or branches previously pruned back to a branch collar.
- Man-made holes (e.g. cavities that have developed from flush cuts or cavities created by branches tearing out from parent stems).
- Woodpecker holes.
- Cracks/splits in stems or branches (horizontal and vertical).
- Partially detached, loose or bark plates.
- Cankers (caused by localised bark death) in which cavities have developed.

³ [Online]. <http://magic.defra.gov.uk/>

⁴ [Online]. www.ordnancesurvey.co.uk

⁵ [Online]. www.maps.google.co.uk

- Other hollows or cavities, including butt rots.
 - Compression of forks with occluded bark, forming potential cavities.
 - Crossing stems or branches with suitable roosting space between.
 - Ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk).
 - Bat or bird boxes.
- 4.5 Certain factors such as orientation of the feature, its height from the ground, the direct surroundings and its location in respect to other features may enhance or reduce the potential value.
- 4.6 Trees were classified into general bat roost potential groups based upon the presence of these features. *Table 1* (below) broadly classifies the potential categories as accurately as possible as well as discussing the relevance of the features. This table is based upon Table 4.1 and Chapter 6 in *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (J., Collins (Bat Conservation Trust), 2016). The locations of the trees are provided on *Figure 1 Bat Tree Location Plan*.
- 4.7 Although the British Standard 8596:2015 document groups trees with moderate and high potential, these have been separated below (as per Table 4.1 in *The Bat Conservation Trust Guidelines*) to allow more specific survey criteria to be applied.

Table 1: Classification and Survey Requirements for Bats in Trees

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey work / Actions
Confirmed Roost	Evidence of roosting bats in the form of live / dead bats, droppings, urine staining, mammalian fur oil staining, etc.	<p>A Natural England derogation licence application will be required if the tree or roost site is affected by the development or proposed arboricultural works. This will require a combination of aerial assessment by roped access bat workers (where possible, health and safety constraints allowing) and nocturnal survey during appropriate periods (e.g. nocturnal survey - May to August) to inform on the licence.</p> <p>Works to tree undertaken under supervision in accordance with the approved good practice method statement provided within the licence.</p> <p>However, where confirmed roost site(s) are not affected by works, work under a precautionary good practice method statement may be possible.</p>
High Potential	A tree with one or more Potential Roosting Features that are obviously suitable for larger numbers of bats on a more regular basis and potentially for	Aerial assessment by roped access bat workers (if appropriate) and / or nocturnal survey during appropriate period (May to August).

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey work / Actions
	<p>longer periods of time due to their size, shelter protection, conditions (height above ground level, light levels, etc) and surrounding habitat.</p> <p>Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc.</p>	<p>Following additional assessments, tree may be upgraded or downgraded based on findings.</p> <p>If roost sites are confirmed and the tree or roost is to be affected by proposals a licence from Natural England will be required.</p> <p>After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.</p>
Moderate Potential	<p>A tree with Potential Roosting Features which could support one or more potential roost sites due to their size, shelter protection, conditions (height above ground level, light levels, etc) and surrounding habitat but unlikely to support a roost of high conservation status (i.e. larger roost, irrespective of wider conservation status).</p> <p>Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc.</p>	<p>A combination of aerial assessment by roped access bat workers and / or nocturnal survey during appropriate period (May to August).</p> <p>Following additional assessments, tree may be upgraded or downgraded based on findings.</p> <p>After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.</p> <p>If a roost site/s is confirmed a licence from Natural England will be required.</p>
Low Potential	<p>A tree of sufficient size and age to contain Potential Roosting Features but with none seen from ground or features seen only very limited potential.</p> <p>Examples include (but are not limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes.</p>	<p>No further survey required but a precautionary working method statement may be appropriate.</p>
Negligible/No potential	Negligible/no habitat features likely to be used by roosting bats	None.

* The Conservation of Habitats & Species Regulations 2017 (as amended) affords protection to "breeding sites" and "resting places" of bats. The EU Commission's Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC, February 2007 states that these are places "where there is a reasonably high probability that the species concerned will return".

Manual Activity Surveys – Transects

- 4.8 The primary objective of walked transects are to identify foraging areas, commuting routes, species composition, and general species utilisation of the site by local bat populations.

- 4.9 The BCT guidance states that surveys undertaken should be proportional to the predicted impacts of the proposed activities on bats. Factors that influence the type of survey and effort required include the likelihood of bats being present, type of proposed activity, scale of activity, size, nature and complexity of the site, species concerned and number of individuals.
- 4.10 Under this guidance, the site was considered to be of low habitat suitability (*Table 4.1, BCT Guidance 2016*) and fell under the seasonal survey requirements (*Table 8.3 BCT Guidance, 2016*), whereby activity transects and static surveys are required once each season – Spring (April/May), Summer (June/July/August) and Autumn (September/October).
- 4.11 In line with the BCT guidance the transect route was determined prior to survey in order to cover all habitat areas of the site with the focus on those considered to provide greater suitability for bats and included five-minute point count stops, during which time all bat activity was recorded. The point counts were strategically located throughout the site to account for any habitat loss or potential impacts from the proposed development, and to ensure a comprehensive coverage of habitats. Due to the small size of the site two laps of the transect route were completed. The dusk transects commenced at sunset and continued for approximately 2-3 hours. Surveys were undertaken in conditions that were close to optimal as described within the BCT guidance (2016), where sunset temperatures were 10°C or above with no rain or strong winds.
- 4.12 The surveys were undertaken by appropriately experienced/licenced ecologists from FPCR. The transect was walked at a steady pace using an Apple iPad mini with an Echo Meter Touch (Wildlife Acoustics Version 2.0.4). This software identifies and tags sound files that it suggests are bat passes; these surveys are also supplemented by written notes documenting bat activity present on site and identifying any key foraging and commuting routes.
- 4.13 Post-survey, bat calls were analysed using Kaleidoscope Viewer® (Wildlife Acoustics, Inc version 5.1.3) software package, by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. From this, the level of bat activity across the site, in relation to the abundance of individual species foraging and commuting along habitats, was assessed.
- 4.14 The timings of the surveys can be seen in *Table 2* below.

Table 2. Nocturnal Survey Timings and Weather Conditions

Survey Ref/ Date	Survey Type	Start Time	Sunset Time	Finish Time	Weather Conditions (temp °C; cloud cover %; wind; and rain)
Spring Transect – 11.05.2021	Dusk Transect	20:35	20:35	22:49	14°C; 10%; 3-4, 0 rain
Summer Transect - 08.07.2021	Dusk Transect	21:15	21:15	23:17	16°C; 90-100%; 1-2, 0 rain
Autumn Transect - 08.09.2021	Dusk Transect	19:27	19:27	21:27	24°C; 5%; 1-2, 0 rain

- 4.15 The weather conditions and timings of the surveys are considered suitable to provide data which demonstrates a representative sample of bat activity around the site.

Automated Activity Surveys – Static Detectors

- 4.16 Static bat detectors were used to record the passing behaviours of bats from a fixed position. These detectors were deployed on site to supplement the manual transects surveys, with passive recording surveys recommended in guidance produced by the BCT (2016).
- 4.17 Passive monitoring was undertaken using an automated logging system Wildlife Acoustics Inc. SM4Bat FS bat detectors with outputs saved to an internal storage device. Detectors used SMM-U2 microphones and were placed along linear features considered to be of value to bats, such as hedgerows and tree lines.
- 4.18 Devices were placed in a location for an extended period of time of suitable weather conditions (little no rain/wind and temperatures above 10°C). The weather conditions over the course of each recording period were however representative for the timing of each survey. Detectors were programmed to activate 30 minutes before dusk and recorded continuously until 30 minutes following sunrise.
- 4.19 For the purposes of analysis if the static detector was out over five nights the additional nights were only assessed for bat species listed on Annex II⁶ of the Habitats Directive. The recorded data were analysed using Kaleidoscope Viewer[®] (Wildlife Acoustics, Inc version 5.1.3) software package to assess the amount of bat activity on site by recording the number of bat passes.
- 4.20 The SM4BAT FS detector records sound files of up to 12 seconds in length before a new file is created. Analysis of these files can highlight the presence of more than one bat if they are recorded simultaneously on the same sound file. Each sound file is counted as a single bat registration and the number of registrations provides an indication of the relative importance of the site/the detector location for bats.
- 4.21 The timings for static detector surveys undertaken to date are shown in *Table 3* and the static locations are shown on *Figures 2, 3 and 4*.

Table 3. Static Detector Survey Dates

Position	Periods Recorded	Weather Conditions	Area Covered
Figure 2	11 th – 16 th May 2021	Cool temperatures (14°C), light cloud and wind, no rain.	Tree line 3, the southern boundary of the site
Figure 3	15 th – 20 th June 2021	Warm temperatures (21°C), light cloud, no wind or rain.	Fence along the northern boundary of the site
Figure 4	8 th – 13 th September 2021	Warm temperatures (24°C), light cloud, light wind, no rain.	North-western boundary of the site

Limitations

- 4.22 The species data collated for the desk study is derived from records submitted by members of the public and from surveys conducted by specialist volunteer groups. It does not represent a definitive list of species that occur in the local area, and the absence of records does not necessarily imply the absence of such species.
- 4.23 Due to the overlapping properties of bat echolocation calls from *Myotis* and *Nyctalus* species, it is not always possible to identify a series of echolocation calls from bats included in these genera to species level. In the majority of cases, identification to genus level was possible, which is

⁶ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

considered a suitable taxonomic level to allow potential affects to be assessed and appropriate mitigation designed.

- 4.24 The static detector units do not discern between individual bats, or a single bat passing the microphone several times, and therefore the data recorded can only provide an indication of bat activity as bat registrations per unit time.

5.0 RESULTS

Desk Study

Internationally Designated Sites of Nature Conservation Importance

- 5.1 The Site lies within 15km of four sites of international importance for nature conservation, namely: Medway Estuary & Marshes Ramsar site/SPA; Queendown Warren SAC, North Downs Woodlands SAC; and Thames Estuary & Marshes Ramsar Site/SPA. However, none of these are designated for their bat assemblage.

Protected/Notable Species

- 5.2 A number of species records were returned from the KMBRC as summarised in *Table 4* below.

Table 4: Desktop Study Results – Bat Species

Common Name	Conservation Status	Dates	Approximate Location Relative to Site Boundary
Mammals - Bats			
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	Hab Dir, Hab Reg, WCA, NERC	2015 - 2016	Three records, closest 430 m N
Noctule <i>Nyctalus noctula</i>	Hab Dir, Hab Reg, WCA, NERC	2016	One record 755 m NW
Pipistrellus sp. <i>Pipistrellus sp.</i>	Hab Dir, Hab Reg, WCA, NERC	2011 - 2016	Four records, closest 30 m N
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	Hab Dir, Hab Reg, WCA, NERC	2017	Two records, closest 800 m SW
Unidentified Bat sp. <i>Chiropter asp.</i>	Hab Dir, Hab Reg, WCA, NERC	2015	One record 35 m N
Key: NERC S41 – Natural Environment & Rural Communities Act 2006 Section 41, Hab reg Sch2 – Conservation of Habitats & Species Regulations 2017 (as amended) Schedule 2, WCA – Wildlife & Countryside Act 1981			

Field Surveys

- 5.3 The range and quality of habitats within the application site as a whole are considered to be of 'low' value to bats, which can be attributed to the dominant cultivated arable habitat.
- 5.4 Nine mature standards located within the site were identified as having the potential to support roosting bats. The results of the ground level assessment are provided in *Table 5*, and the locations of these standards are identified on *Figure 1: Bat Tree Location Plan*.

Table 5: Results of Ground Assessment of Trees for Bat Roost Potential

Tree Ref	Species	Features of Bat Interest (distance from ground)	Bat Potential
T1	<i>Lombardy-Poplar, Populus nigra</i>	Dead wood in canopy forming vertical crack at the top of trunk.	Moderate
T2	<i>Lombardy-Poplar, Populus nigra</i>	Rotting wood in canopy and knot hole and butt rot lower down showing hollow trunk.	Moderate
T3	<i>Lombardy-Poplar, Populus nigra</i>	Small knot hole, empty and fairly exposed on inspection.	Low
T4	<i>Lombardy-Poplar, Populus nigra</i>	Large cavity in main trunk providing roosting opportunity	Moderate
T5	<i>Lombardy-Poplar, Populus nigra</i>	Small knot hole leading up in fork of tree.	Low
T6	<i>Lombardy-Poplar, Populus nigra</i>	Tree with butt rot present and hollow trunk evident providing potential canopy.	Moderate
T7	<i>Lombardy-Poplar, Populus nigra</i>	Woodpecker hole	Low
T8	<i>Lombardy-Poplar, Populus nigra</i>	Large hole left by branch tear out, with possible large cavity present at 3m east.	Moderate
T9	<i>Lombardy-Poplar, Populus nigra</i>	Dead wood creating cavities in canopy	Low

Manual Activity Transect Surveys

- 5.5 During the May 2021 transect, 13 bat contacts were recorded from four different species/species groups; common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctula* and one unidentified *Nyctalus* species. Bat activity encountered during the July 2021 transect, recorded 17 contacts from four different species/species groups; common pipistrelle, soprano pipistrelle, noctule and one unidentified species. During the September 2021 transect, 26 bat contacts were recorded from common pipistrelle, soprano and noctule. Results for each survey are summarised in Table 6 below, with the distribution of encounters mapped on Figures 2, 3 and 4.

Table 6. Bat Transect Summary of Results May, July and September 2021

Date	Total Contacts	Species Recorded (No. Contacts)	Activity Summary
11 th May 2021 (Spring) <i>Figure 2</i>	13	<p><u>Transect</u> 6 common pipistrelle, 1 soprano pipistrelle, 1 noctule, 1 unidentified <i>Nyctalus</i> species</p> <p><u>Point Count</u> 2 common pipistrelle, 1 soprano pipistrelle, 1 noctule</p>	<p><u>Transect</u> Common pipistrelles made up the majority of contacts during the transects. Most contacts, five out of nine encounters, occurred along the northern boundary of the site parallel to Swanstree Avenue.</p> <p><u>Point Count</u> Contacts were recorded during point counts C, E and F with most of these being from common pipistrelles. One common pipistrelle was recorded foraging during point count E along tree line 3.</p>
8 th July 2021 (Summer) <i>Figure 3</i>	17	<p><u>Transect</u> 6 common pipistrelle, 3 soprano pipistrelle, and 2 noctules</p> <p><u>Point Count</u> 4 common pipistrelle, 1 noctule, 1 unidentified bat sp.</p>	<p><u>Transect</u> Most contacts, five out of eleven, occurred along the northern boundary of the site parallel to Swanstree Avenue. Other contacts occurred along tree lines 1 and 3 to the southern extent of the site. Common pipistrelles were recorded most frequently.</p> <p><u>Point Counts</u> Activity occurred at point counts B, D, E and G with the majority of contacts occurring during point count D, at the northwest extent of the site.</p>
8 th September 2021 (Autumn) <i>Figure 4</i>	26	<p><u>Transect</u> 12 common pipistrelle, 4 soprano pipistrelle, and 5 noctules</p> <p><u>Point Count</u> 2 common pipistrelle, 4 noctules.</p>	<p><u>Transect</u> Most contacts occurred at the eastern boundary and in the north-eastern corner of the site. Other contacts occurred along the northern boundary of Swanstree Avenue and tree lines 1, 2 and 3 to the southern extent of the site. Common pipistrelles were recorded most frequently.</p> <p><u>Point Counts</u> Activity occurred at point counts A, B, C, D, F and G with the majority of contacts occurring during point count C, at the eastern boundary.</p>

- 5.6 Contacts from bats were recorded in low numbers with the majority of contacts being common pipistrelle across the northern boundary of Swanstree Avenue, in the north-eastern corner of the site, at the eastern boundary and at treeline 3 at the southern boundary. Contacts comprised low numbers of passes from individuals recorded commuting with occasional foraging on site.
- 5.7 Contacts from the less commonly recorded bat species/species groups (soprano pipistrelle, noctule, *Nyctalus*) tended to comprise no more than one or two passes in the north and eastern boundaries of the Site.

Automated Activity Surveys

- 5.8 The following paragraphs detail the findings of the automated activity surveys. In this context, the term 'registration' refers to a unique sound file created over the course of a number of seconds. Based on this, numerous 'registrations' does not necessarily refer to multiple bats (unlike the manual activity survey section above, where the number of bats can often be visually identified), as one bat may create a number of registrations, for example an individual foraging in close proximity to the microphone for a sustained period of time.

Overall summary

- 5.9 During the automated surveys completed in May, June and September 2021, eleven species/species groups were recorded, consisting of common pipistrelle (comprising 70.01% of total data), soprano pipistrelle (17.24%), noctule (5.723%), Pipistrelle species (2.60%), *Nyctalus* sp. (1.84%), *Myotis* sp. (0.97%), long-eared species (0.90%), Nathusius' pipistrelle (0.36%), Leisler's *Nyctalus leisleri* (0.18%), serotine *Eptesicus serotinus* (0.10%), and *Nyctalus/Eptesicus* sp (0.03%).
- 5.10 No Annex II species have been identified on-site, with a large proportion of the registrations originating from widespread and relatively commonly occurring bat species.
- 5.11 *Table 7* below summarises the activity levels recorded and the locations on site for each of the units deployed. The May 2021 unit, deployed in treeline 3 at the southern boundary recorded 322 registrations. The June 2021 unit, on the northern boundary fence line with Swanstree Avenue recorded 979 registrations. The September 2021 unit, on the north-western boundary on the corner of Swanstree Avenue and Highsted Road recorded 1457 registrations.
- 5.12 Please see *Figures 2, 3 and 4 Bat Transect Plans* for static detector unit locations and *Table 6* and *Appendix A* for the full results.

Table 7. Static Activity Summary May, June and September 2021

Survey Period	Unit Reference/ Location	Total Registrations Over five nights	Species Recorded (in order of abundance and total number of registrations)	Summary of Activity
11 th – 16 th May 2021	Unit 1: Tree line TL3, the southern boundary of the site	322	5 species/groups: <ul style="list-style-type: none"> • Common pipistrelle (275) • Noctule (30) • Soprano pipistrelle (13) • <i>Nyctalus</i> sp (3) • Long-eared species (1) 	Registrations from common pipistrelles were recorded on all five nights and made up 85% of total recordings. Noctules and soprano pipistrelles were also recorded every night and accounted for 9% and 4% of total recordings, respectively. Unidentified <i>Nyctalus</i> species were recorded only on the first two nights the static was deployed. Single registrations were recorded from unidentified long-eared species.
15 th – 20 th June 2021	Unit 2: Northern boundary of the site, parallel to Swanstree Avenue	979	7 species/groups: <ul style="list-style-type: none"> • Common pipistrelle (912) • Soprano pipistrelle (37) • Noctule (20) • Leisler's bat (5) • Serotine (2) • Long-eared species (2) • <i>Myotis</i> sp (1) 	The vast majority of registrations were made by common pipistrelles, accounting for 93% of all recordings. Soprano pipistrelles were the second most frequently recorded species, making up 3.8% of total registrations. Both soprano and common pipistrelles were recorded on all five nights. Noctules were recorded on the first four nights and made up 2% of registrations. Leisler's bat, serotine, long-eared species and <i>Myotis</i> species were all recorded in small numbers and together accounted for 1% of registrations.
8 th – 13 th September 2021	Unit 2: North-western corner of the site	1457	10 species/groups: <ul style="list-style-type: none"> • Common pipistrelle (743) • Soprano pipistrelle (426) • Noctule (108) • Pipistrelle sp (72) • <i>Nyctalus</i> sp (48) • <i>Myotis</i> sp (26) • Long-eared species (22) • Nathusius' pipistrelle (10) • <i>Nyctalus</i> / <i>Eptesicus</i> (1) • Serotine (1) 	Around half of all the registrations were made by common pipistrelles. Soprano pipistrelles were the second most frequently recorded species, making up 29% of total registrations. Both soprano and common pipistrelles were recorded in high numbers on all five nights. Noctules, <i>Nyctalus</i> sp, <i>Myotis</i> sp and long-eared species were also recorded on all five nights, in very low numbers. Serotine and <i>Nyctalus</i> / <i>Eptesicus</i> species were recorded on only one night and together accounted for 1% of the registrations.

6.0 DISCUSSION AND RECOMMENDATIONS

- 6.1 The following section provides an evaluation of the site and identifies the likely ecological constraints associated with the proposed development. Where appropriate, measures for the avoidance, mitigation, and compensation of any likely potential impacts together with any enhancements are discussed.

Bat Roosts

Trees

- 6.2 Five trees; T1, T2, T4, T6 and T8 within treeline 3 and treeline 2 on the southern and eastern boundaries were assessed as moderate bat roosting potential, with four trees T3, T5, T7 and T9 being assessed as low bat roosting potential. The current framework for the site retains these tree lines in entirety with a 6m buffer offset from TL3 and 12m buffer offset from TL2, in order to alleviate any direct or indirect disturbance to the trees and any bats that might be utilising them. As the trees are to be retained, no further surveys have been undertaken, however, should the development proposals change and the trees be affected by loss, pruning or lighting, then further surveys will be required.
- 6.3 Due to the transient nature of bat roosts, if there is delay in any applications, it is advised that surveys of trees are updated to ensure new features have not developed.

Activity Surveys

- 6.4 The range and quality of habitats on site are considered to be of 'low' value to bats, which can be attributed to the dominant cultivated, arable farmland habitat.
- 6.5 The activity surveys recorded a total of eleven bat species/species groups (listed in order of abundance); common pipistrelle, soprano pipistrelle, noctule, Pipistrelle species, *Nyctalus* sp., *Myotis* sp., long-eared species, Nathusius' pipistrelle, Leisler's *Nyctalus leisleri*, serotine *Eptesicus serotinus* and *Nyctalus/Eptesicus* sp.
- 6.6 Low numbers of registrations, and thus low levels of activity, were recorded from the majority of species/species groups, with most activity recorded on site originating from common and widespread species (common pipistrelle). This is not unexpected given the limited range of suitable habitats present on site.
- 6.7 Based upon the findings of the transect surveys it is considered that the linear boundary features along the northern and southern boundaries (including treelines), and associated edge habitats, provide commuting routes around the peripheries of the site for bats providing some ecological value.
- 6.8 The registration numbers recorded during automated surveys undertaken were all relatively low, with a high of 1457 registrations recorded during the September survey, which was located on the north/western boundary. These static detector surveys provide additional information on bat activity levels around the site that complement the transect surveys; indicating that bat activity on site is generally low with mainly common and widespread species associated with boundary habitats.
- 6.9 Consequently, the bat activity levels are considered not to pose a constraint to the redevelopment of the site, providing existing linkages, corridors to surrounding habitats are retained and buffered.

Mitigation

- 6.10 The retention of the boundary habitats around the peripheries will ensure connectivity is maintained; and the inclusion of 2ha of GI will have a beneficial effect on the local bat assemblages, particularly in the north-west, south and north-east where new foraging and commuting opportunities will be provided with structural planting, open grassland areas and attenuation features proposed for these areas.
- 6.11 The northern boundary is marked by a fence line alongside Swanstree Avenue. An existing field entrance at the north-east of the site will be maintained and a new road entrance from Swanstree Avenue will facilitate access into the development. Native shrub/hedgerow planting is recommended for this boundary to enhance and maintain the commuting corridor. In order to maintain linkages across the gaps created by the road access, 'hop overs' will be created. This will be achieved through management of hedgerows/planting to encourage vertical growth, creating taller hedgerows either side of the access road.
- 6.12 Treelines will be retained in part and treelines 2 and 3 will be retained and buffered by >5m from the development and enhanced through native shrub boundary planting.
- 6.13 To minimise impacts of lighting on bats, proposals will adopt a sensitive external lighting scheme, which will be designed to minimise light spill on retained, and proposed habitats of value to commuting and foraging bats. The lighting scheme will be designed with regards to current guidance provided by the Bat Conservation Trust and the Institution of Lighting Professionals⁷ and adopt the following principles:
- The avoidance of direct lighting of existing trees, hedgerows, scrub, woodland, or proposed areas of habitat creation/landscape planting
 - Buffer zones and GI are not to be illuminated
 - During the construction period, no lighting should be used in proximity to boundary features, if needed lights will be directionally focused/shrouded; and
 - Directional lighting and avoidance of upward lighting and/or light spillage.
- 6.14 Dark corridors will be designed, based on the above principles, to ensure retention, and incorporation, of habitats of value to bats for foraging, potential roosting and commuting into the wider landscape.
- 6.15 Roads and buildings in close proximity to any GI and existing boundary habitats will also have lighting sensitively positioned, so as to avoid illumination of canopies, which can further disrupt the flight patterns of bats.

Enhancements

- 6.16 Additional open spaces included within the landscape design will provide ecological enhancements. GI will include structural planting along the boundaries for buffering the southern boundary, and substantial new tree and scrub planting will be incorporated at the eastern boundary as well as throughout the development. These areas of planting will utilise native tree and shrub species, which will provide new opportunities for various invertebrate species, that will in turn increase the foraging potential for native bat species. Early flowering native shrubs should be used,

⁷ Bats and artificial lighting in the UK: Bats and the Built Environment series. Bat Conservation Trust and Institution of lighting professionals Guidance note 08/18 (2018).

such as hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, hazel *Corylus avellana*, honeysuckle *Lonicera periclymenum*, and ivy *hedera helix* to encourage more invertebrate prey items for bats.

- 6.17 The attenuation proposed for the north-east corner of the site will hold water and be designed specifically to maximise biodiversity value with wide shallow draw down zones, scalloped edges and deep central areas. The waterbody should be planted with locally native marginal and aquatic vegetation including species such as soft-rush *Juncus effusus* and purple loosestrife *Lythrum salicaria* planted around the edges, and tall emergent plants and floating-leaved plants such as yellow water-lily *Nuphar lutea* within the deeper areas of water. Such a resource will provide additional habitats for invertebrates, increasing prey items for the local bat population. The attenuation feature proposed for the north-western corner will not be permanently wet, however it should be seeded with wildflower grassland to again encourage more invertebrate prey for bats.
- 6.18 Management of retained and newly planted hedgerows will be undertaken in an ecologically sensitive manner to enhance their nature conservation value. Such management may include;
- Incorporating traditional hedgerow management methods, such as hedgerow laying to increase the structure and density of the hedgerows; where this cannot be undertaken the hedgerow can be 'topped out' to create structure.
 - A proportion of trees within the hedgerow will be allowed to mature into standard trees that provide nesting and foraging opportunities for local wildlife and create a varied habitat structure; and
 - Grassland along the hedgerow base should be allowed to grow to provide a graduated sward height, increasing the habitat diversity, which is in turn favourable for diverse invertebrate assemblages.
- 6.19 The development will also provide additional refuge opportunities for the local bat population by installing bat boxes or incorporating tubes and/or bricks into the built fabric of residential dwellings. Bat boxes and bricks will be arranged around the development in different locations to ensure coverage of several different aspects, to encourage choice of a variety of alternative roost sites. In combination with bird and invertebrate boxes, at least 50% of the proposed dwellings will include at least one form of integrated wildlife box.



Gladman Developments Ltd.

Land off Swanstree Avenue, Sittingbourne

Static Detector Results Summary

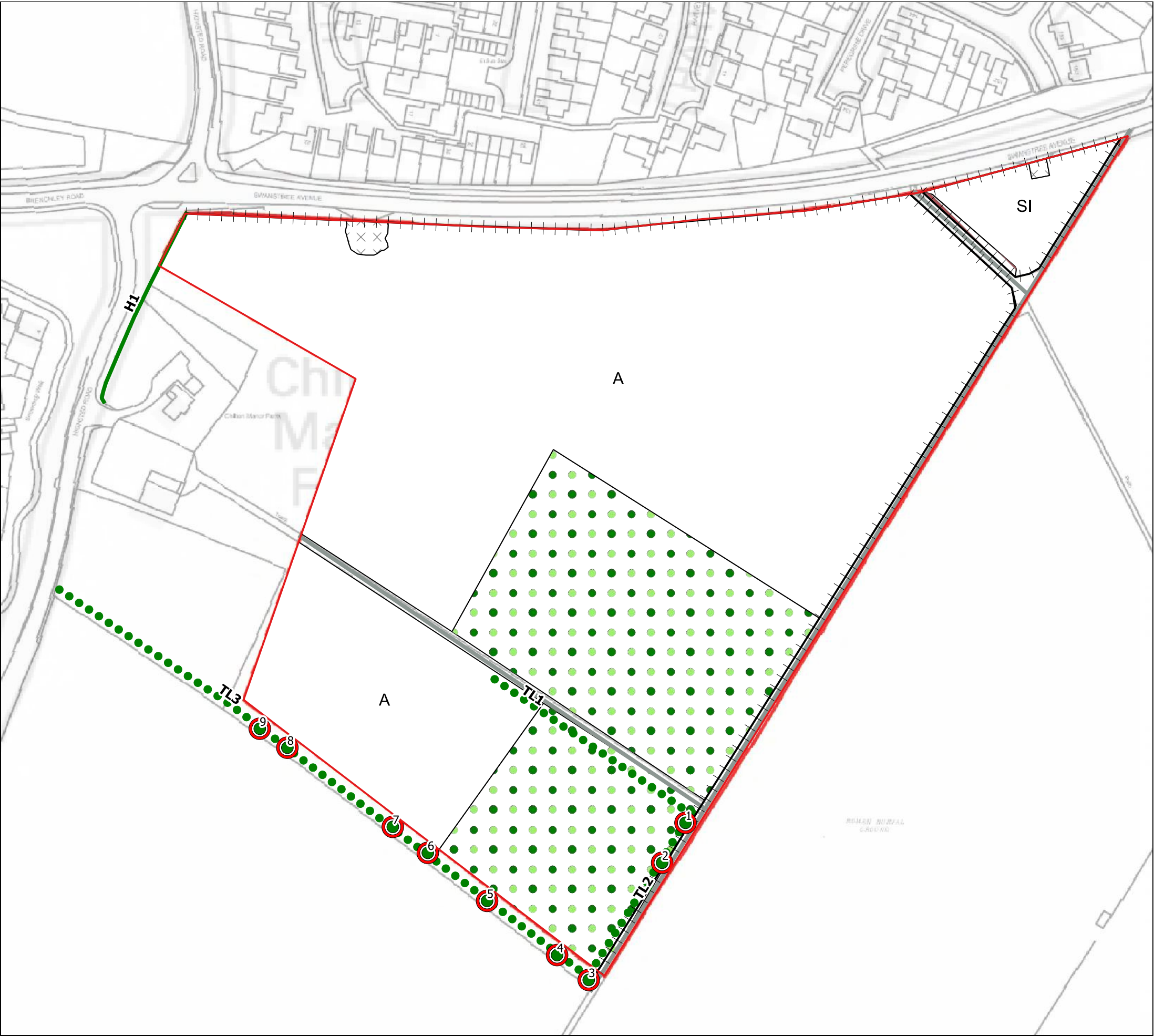
APPENDIX A

October 2021

Appendix A. Static Detector Results Summary – Spring (May), Summer (June), Autumn (September) 2021

Sheet ref.	Recording Period	Unit No.	Start Date	End Date	Survey Hours	Total Av. per hour	Total Registrations	Common Pipistrelle			Soprano Pipistrelle			Noctule			Pipistrelle Species			P
								Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	
Spr1	Spring	17	11/05/2021	16/05/2021	47:06:28	6.835	322	275	112	5.838	13	5	0.276	30	11	0.637	0	0	0.000	
Sum1	Summer	15	15/06/2021	20/06/2021	42:00:09	23.380	982	915	319	21.784	37	16	0.881	20	9	0.476	0	0	0.000	
Aut1	Autumn	20	08/09/2021	13/09/2021	60:36:10	24.042	1457	743	180	12.260	426	307	7.029	108	34	1.782	72	21	1.188	
Totals:					149:42:46	18.442	2761	1933	319	12.911	476	307	3.179	158	34	1.055	72	21	0.481	

r	Nyctalus Species			Myotis Species			Long Eared Species			Nathusius' pipistrelle			Leisler's			Serotine			Nyctalus / Eptesicus		
	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour
0	3	2	0.064	0	0	0.000	1	1	0.021	0	0	0.000	0	0	0.000	0	0	0.000	0	0	0.000
0	0	0	0.000	1	1	0.024	2	2	0.048	0	0	0.000	5	3	0.119	2	2	0.048	0	0	0.000
8	48	15	0.792	26	8	0.429	22	8	0.363	10	7	0.165	0	0	0.000	1	1	0.017	1	1	0.017
1	51	15	0.341	27	8	0.180	25	8	0.167	10	7	0.067	5	3	0.033	3	2	0.020	1	1	0.007



This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey material - Crown Copyright. All rights reserved.
Licence Number: 100019980

Key

Site Boundary

Phase 1 Points

Tree with bat potential

Phase 1 Lines

Fence

Path

Hedgerow

Line of trees

Phase 1 Habitats

Intensive Orchard

Ruderal

Modified grassland

Arable - Horticulture

Ephemeral



Gladman
Land off Swanstree Avenue,
Sittingbourne
BAT TREE LOCATION PLAN

scale
1:1500

drawn
HG

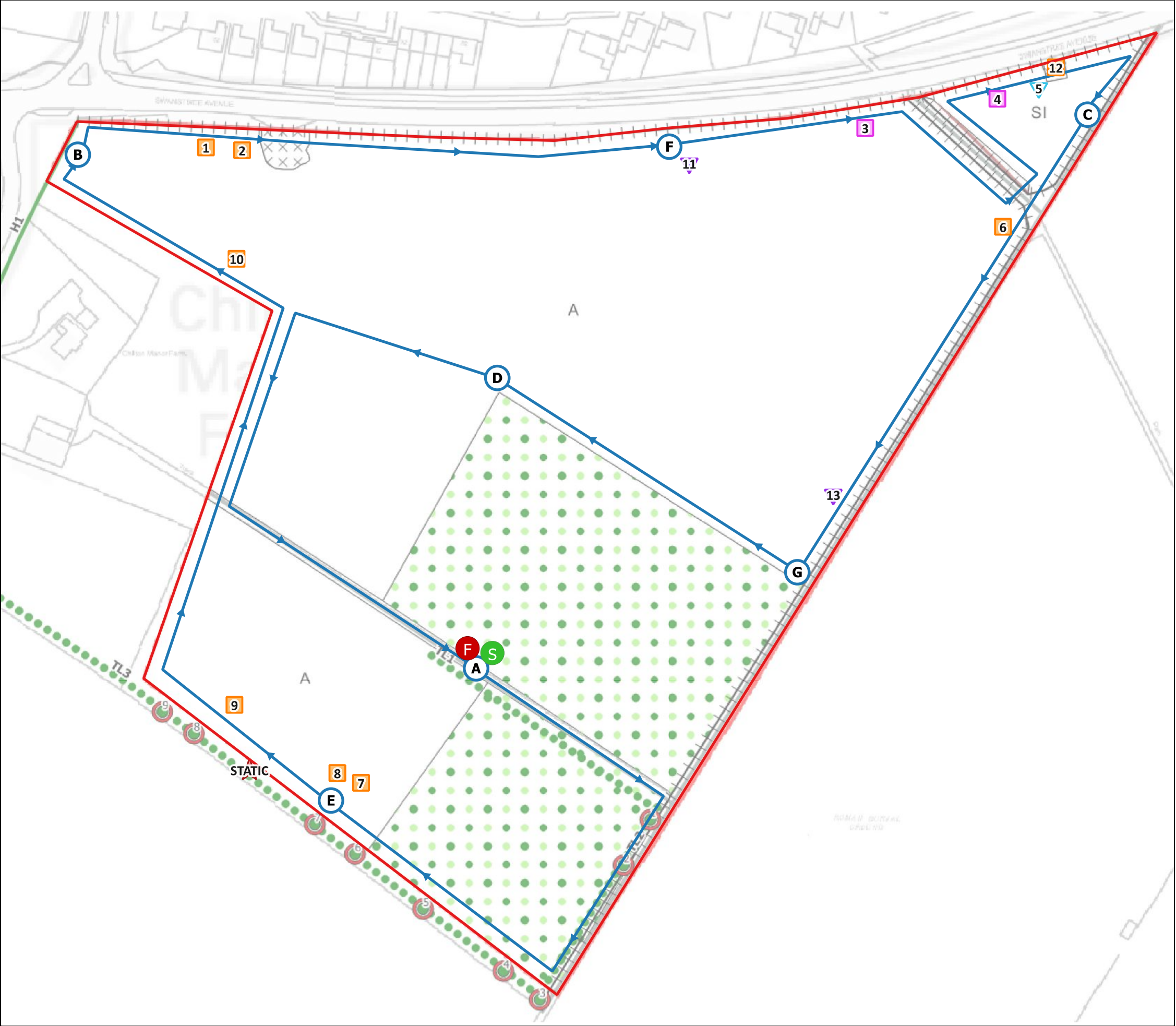
issue
19/8/2021

drawing / figure number

Figure 1

rev

6302-E-01



This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey material - Crown Copyright. All rights reserved.
Licence Number: 100019980

Key:

- Site Boundary

S

 Start point

F

 Finish point

Point Count

Transect Route
- Bat Contacts

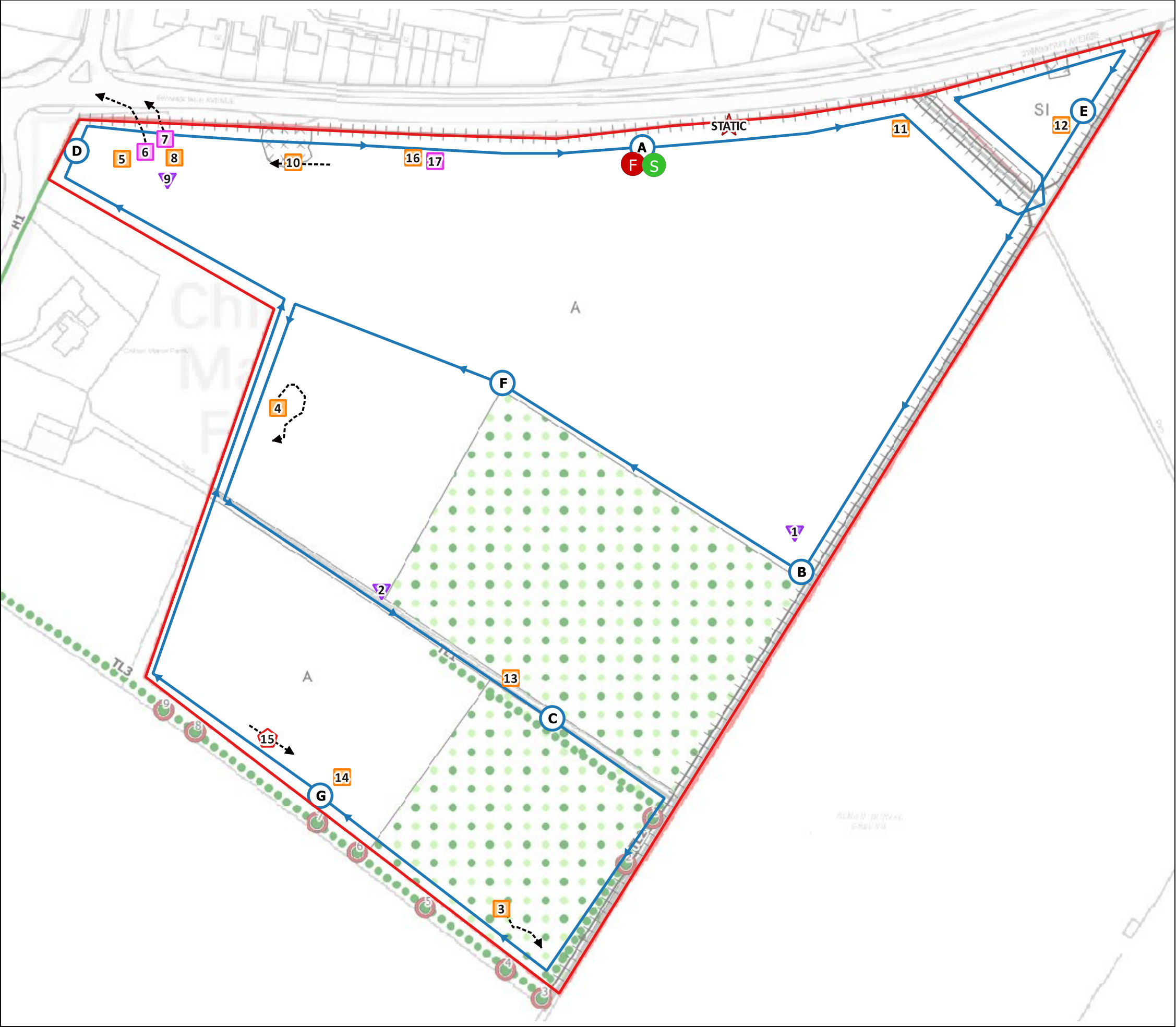
Common Pipistrelle

Soprano Pipistrelle

Nyctalus Species

Noctule

Plan Reference	Time	Species	Passes	Behaviour
Start	20:35			
PCA	20:35 - 20:40			
PCB	21:04 - 21:09			
1	21:13	Common Pipistrelle	Cont.	Foraging
2	21:13	Common Pipistrelle	1	Pass
3	21:24	Soprano Pipistrelle	1	Pass
PCC	21:29 - 21:34			
4	21:33	Soprano Pipistrelle	1	Pass
5	21:37	Nyctalus sp.	1	Pass
6	21:39	Common Pipistrelle	1	Pass
PCD	21:47 - 21:52			
PCE	22:03 - 22:08			
7	22:03	Common Pipistrelle	Cont.	Foraging
8	22:07	Common Pipistrelle	2	Pass
9	22:10	Common Pipistrelle	1	Pass
10	22:18	Common Pipistrelle	1	Pass
PCF	22:21 - 22:26			
11	22:25	Noctule	1	Pass
12	22:30	Common Pipistrelle	Cont.	Foraging
13	22:37	Noctule	1	Pass
PCG	22:39 - 22:44			
Finish	22:49			



This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey material - Crown Copyright. All rights reserved.
Licence Number: 100019980

Key:

- Site Boundary

Start point

Finish point

Point Count (with ref.)

Transect Route

Flight Arrow

Bat Contacts

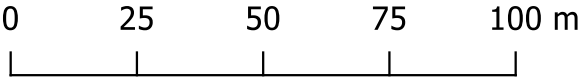
Common Pipistrelle

Soprano Pipistrelle

Noctule

Bat Species

Plan Reference	Time	Species	Passes	Behaviour
Start	21:15			
PCA	21:15 - 21:20			
PCB	21:26 - 21:31			
1	21:28	Noctule	3	Foraging
2	21:33	Noctule	1	Commute
PCC	21:35 - 21:40			
3	21:43	Common Pipistrelle	Cont.	Foraging
4	21:49	Common Pipistrelle	Cont.	Foraging
PCD	21:52 - 21:57			
5	21:55	Common Pipistrelle	2	Pass
6	21:56	Soprano Pipistrelle	1	Commute
7	21:56	Soprano Pipistrelle	1	Pass
8	21:56	Common Pipistrelle	1	Commute
9	21:58	Noctule	2	Commute
10	22:01	Common Pipistrelle	2	Pass
11	22:10	Common Pipistrelle	1	Commute
PCE	22:20 - 22:25			
12	22:25	Common Pipistrelle	1	Commute
PCF	22:35 - 22:40			
13	22:48	Common Pipistrelle	2	Pass
PCG	22:52 - 22:57			
14	22:56	Common Pipistrelle	1	Pass
15	22:57	Bat sp.	1	Commute
16	23:11	Common Pipistrelle	1	Commute
17	23:11	Soprano Pipistrelle	1	Commute
Finish	23:17			



fpcr

scale @ A3
1:1300

drawing / figure number
Figure 3

drawn
HG

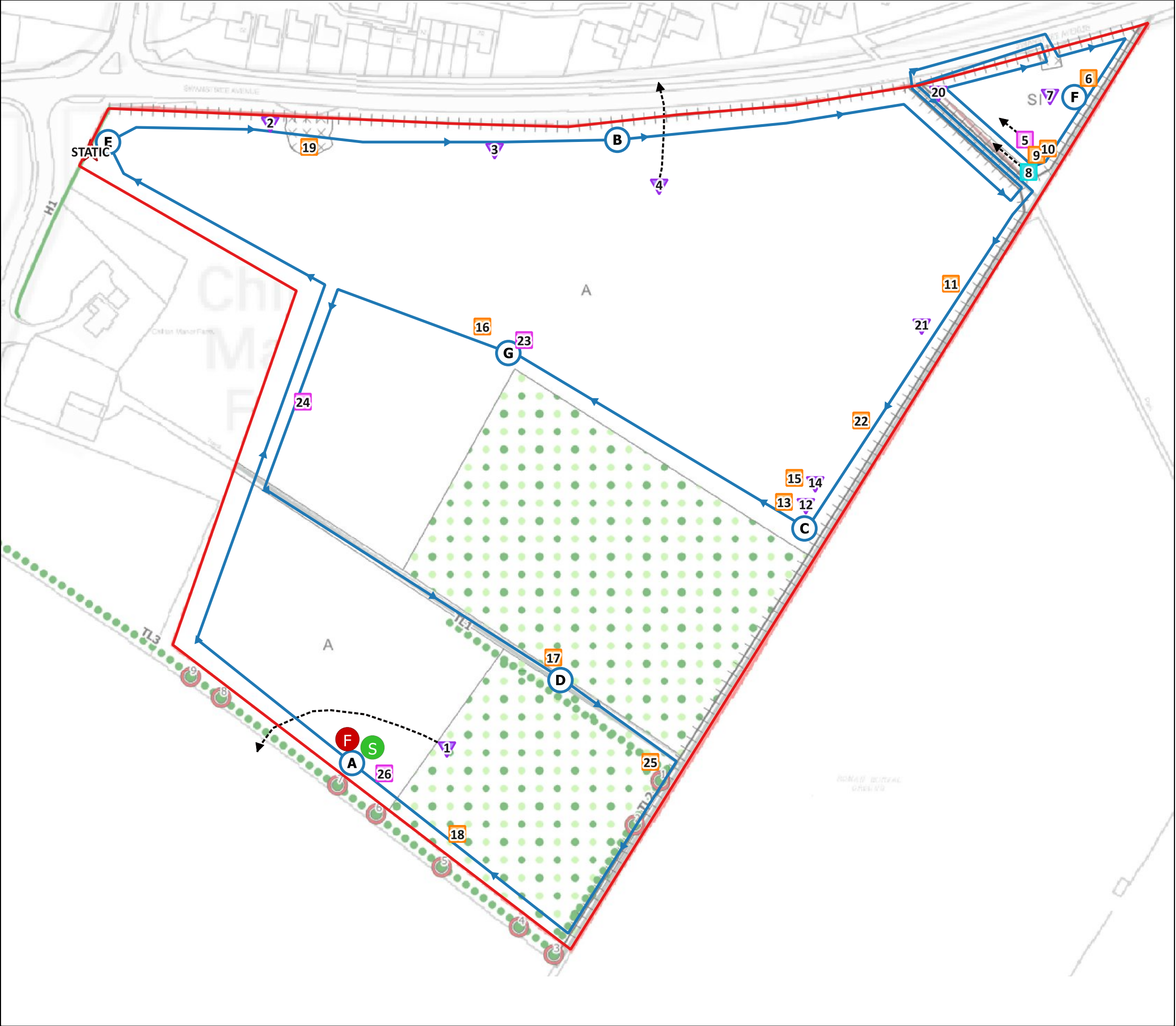
issue
28/9/2021

rev
02

Gladman Ltd.

Land off Swanstree Avenue,
Sittingbourne

BAT TRANSECT PLAN (08.07.21)



This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey material - Crown Copyright. All rights reserved.
Licence Number: 100019980

Key:

- Site Boundary

Start point

Finish point

Point Count (with rel

Transect Route

Flight Arrow

Bat Contacts

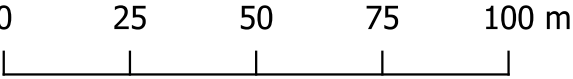
Common Pipistrelle

Soprano Pipistrelle

Pipistrelle Species

Noctule

Plan Reference	Time	Species	Passes	Behaviour
Start	18:27			
PCA	19:27 - 19:32			
1	19:29	Noctule	1	Commute
2	19:41	Noctule	1	Commute
3	19:44	Noctule	1	Commute
PCB	19:45 - 19:50			
4	19:49	Noctule	1	Commute
5	19:55	Soprano Pipistrelle	Cont.	Foraging
6	20:03	Common Pipistrelle	Cont.	Foraging
7	20:08	Noctule	1	Commute
8	20:09	Pipistrelle sp.	Cont.	Foraging/Social
9	20:10	Common Pipistrelle	1	Commute
10	20:10	Common Pipistrelle	Cont.	Foraging/Social
11	20:13	Common Pipistrelle	1	Commute
PCC	20:15 - 20:20			
12	20:16	Noctule	1	Commute
13	20:16	Common Pipistrelle	2	Foraging
14	20:20	Noctule	1	Commute
15	20:20	Common Pipistrelle	1	Commute
16	20:23	Common Pipistrelle	1	Commute
PCD	20:27 - 20:32			
17	20:28	Common Pipistrelle	1	Commute
18	20:34	Common Pipistrelle	1	Commute
PCE	20:41 - 20:46			
19	21:46	Common Pipistrelle	1	Commute
PCF	20:56 - 21:01			
20	21:00	Noctule	1	Commute
21	21:08	Noctule	1	Commute
22	21:10	Common Pipistrelle	1	Commute/Social
PCG	21:13 - 21:18			
23	21:17	Soprano Pipistrelle	1	Commute
24	21:20	Soprano Pipistrelle	1	Commute
25	21:25	Common Pipistrelle	1	Commute
26	21:27	Soprano Pipistrelle	1	Commute
Finish	21:27			



fpcr

N

Gladman Ltd.

Land off Swanstree Avenue,
Sittingbourne

BAT TRANSECT PLAN (08.09.21)

scale @ A3
1:1350

drawn
HG

issue
5/10/2021

drawing / figure number
Figure 4

rev
01