



Gladman Developments Ltd

South Newington Road, Bloxham

Ecological Appraisal

March 2019

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CONTENTS

1.0	SUMMARY	3
2.0	INTRODUCTION	4
3.0	METHODOLOGY.....	5
4.0	RESULTS.....	14
5.0	DISCUSSION AND RECOMMENDATIONS	28

FIGURES

Figure 1: Site Location and Desk Study Results Plan

Figure 2: Phase 1 Habitat Plan

Figure 3: Reptile Refugia Location Plan

Figure 4: Transect Result Plan – 04.10.2016

Figure 5: Transect Result Plan – 22.05.2017

Figure 6: Transect Result Plan – 21.06.2017

TABLES

Table 1: Classification and Survey Requirements for Bat in Trees

Table 2: Bat Transect Survey Timings

Table 3: Bat Activity Survey Weather Conditions

Table 4: HSI Scores as a Measure of Pond Suitability

Table 5: Aquatic Survey Visit Schedule and Weather Conditions

Table 6: Summary of Protected/Notable Species within 1km of the Site

Table 7: Hedgerow Survey Summary

Table 8: Nights of 4th – 9th October 2016 SM2 Survey Results

Table 9: Nights of 23rd –28th May 2017 SM2 Survey Results

Table 10: Table 10: Nights of 19th – 24th July 2017 SM2 Survey Results

Table 11: Breakdown of Species Recorded

Table 12: Trees with Bat Potential

Table 13: Great Crested Newt Presence / Absence Survey Results

Table 14: Date, Weather Conditions and Reptile Sightings

PHOTOGRAPHS

Photograph 1: Off-site broad-leaved woodland along the disused railway line, viewed from the east

Photograph 2: T1, Storm damaged crack willow.

Photograph 3: Hedgerow H6 viewed from the north.

APPENDICES

Appendix A – Botanical Species List

Appendix B: Static Bat Detector Results

Appendix C: Habitat Suitability Index (HSI) Assessment

1.0 SUMMARY

- 1.1 The site comprises two fields of poor semi-improved grassland, a small area of tall ruderal vegetation, a small streams and a low number of scattered mature trees. The field boundaries are formed by a number of hedgerows leading into areas of off-site broadleaved woodland.
- 1.2 Development of the site is not expected to negatively impact on any statutory or non-statutory designated sites located in proximity to the site.
- 1.3 All hedgerows would be retained within the scheme and will be buffered from the effects of development by their incorporation within green corridors.
- 1.4 The woodland habitats along the northern and western boundaries of the site are Habitats of Principal Importance and will be protected from adverse impacts of the proposed development.
- 1.5 An extensive area of Public Open Space is proposed to the west of the site, which will protect the offsite woodland habitats to the north and west from adverse impacts of the proposed development.
- 1.6 Further surveys for great crested newts have recorded a medium population great crested newt, 430m north of the site boundary. Great crested newts were found to be absent from a pond 230m from the site boundary. Access was not possible for a number of 3rd party ponds. However, it is considered that great crested newts, should they be present are unlikely to commute over 200m over partial barriers to dispersal to use the sub-optimal habitats within the site.
- 1.7 Seasonal bat activity surveys have found that bat activity within the application site (and surrounding habitat) is consistent with the urban edge/intensively managed farmed habitat. The recorded level of activity does not suggest that the application site forms a particularly important resource for the species recorded at any more than a site level. Overall, the scheme retains the features of most note and substantial new greenspace is expected to provide significant enhancements. As such, it is considered that the overall scheme will not result in any significant net loss of habitat value to bat populations.
- 1.8 Reptile presence/absence surveys were carried out as the margins of the site provide suitable habitat and there are records of common lizard within 500m. No reptiles were recorded within the site and this group are not considered a constraint.
- 1.9 Precautionary measures have been recommended that would prevent harm to breeding birds, should they be present.
- 1.10 The report identifies a number of potential ecological enhancements which are discussed throughout Section 5.
- 1.11 These include the broadening of species diversity throughout the site through the enhancement of retained hedgerows and creation of new green space, including a specifically designed wildlife pond. Whilst these will provide inherent enhancements, they will also provide new foraging habitat, corridors of movement and places of rest or shelter for a wide range of faunal species. Further enhancements have also been recommended through the provision of a range of new bird and bat boxes.

2.0 INTRODUCTION

- 2.1 The following report has been prepared by FPCR Environment and Design Ltd on behalf of Gladman Developments Ltd. It provides the results of an updated Extended Phase 1 Habitat survey and Protected Species surveys undertaken at a site in Bloxham, Oxfordshire (central grid reference SP 4236 3532) during 2016 and 2017 with an updated ecological walkover conducted during 2018 to ascertain any significant on-site habitat changes since 2016.
- 2.2 The objective of the survey was to gain an understanding of the baseline ecology of the site and immediate surrounding area and to determine whether the site supports or has the potential to support protected species. This investigation involved a desk study, Extended Phase 1 habitat survey, a badger *Meles meles* survey, reptile presence/absence survey and ground-level assessment of buildings and trees for potential to support roosting bats.

Site Location and Context

- 2.3 The site comprises approximately 5.9ha of poor semi-improved grassland managed as pasture for cattle, located to the south of Bloxham, Oxfordshire. The landscape beyond the site is predominantly rural, comprising largely arable land and pasture. Residential areas associated with Bloxham are located to the north and a recreation ground is adjacent to the site to the north-east. A public right of way runs along the site's northern boundary before crossing diagonally across the centre of the site to the western boundary.

Development Proposals

- 2.4 The proposals are up to 95 residential dwellings, associated access, infrastructure and a retention basin, with the west of the site being set aside for public open space to include woodland and scrub planting and the creation of a wildlife pond.

METHODOLOGY

Desk Study

2.5 To support the field survey and further compile existing baseline information relevant to the site, ecological information was sought from third parties, including records of protected or notable species and sites designated for nature conservation interest. Organisations contacted included:

- Thames Valley Environmental Records Centre (TVERC)

Online sources of ecological data were also sought including:

- Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk);

2.6 Further inspection of colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk) was also undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.

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

- Sites of international significance – Ramsar sites, Special Areas of Conservation (SAC), Special Protection Area, etc – 5km from site
- Sites of national significance – Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR's), – 2km from site
- Sites of local significance –sites with local designations such as Local Wildlife Sites (LWS), Local Nature Reserves (LNRs) etc and species records (e.g.: protected, UK BAP or notable species).– 1km from site

Field Survey – Habitats/Flora

Extended Phase 1 Survey

2.8 The site was surveyed 7th September 2016 with an updated Extended Phase 1 survey conducted on 9th April 2018.

2.9 Extended Phase 1 habitat survey is a survey technique recommended by Natural England that largely follows JNCC 2010¹, with the scale of recording of habitat parcels adjusted to provide more detail for smaller sites. The survey comprised a walkover of the site, mapping the principal habitat types present and identifying the dominant or characteristic plant species present within them. The abundance of species was quantified using the DAFOR scale, ranging from Dominant (>75%) to Abundant (75-51%), through Frequent (50-26%) and Occasional (25-11%) to Rare (10-1%).

¹ JNCC, (2010), Handbook for Phase 1 habitat survey - a technique for environmental audit, ISBN 0 86139 636 7

Hedgerows

- 2.10 Hedgerows were surveyed using the wildlife and landscape criteria of the Hedgerow Evaluation and Grading System (HEGS)². This method of assessment includes noting down canopy species composition, associated ground flora and climbers, structure of the hedgerow including height, width and gaps, associated features including number and species of mature trees, banks, ditches and grass verges.
- 2.11 Each hedgerow is given a grade using HEGS with the suffixes '+' and '-', representing the upper and lower limits of each grade respectively. These grades represent a continuum on a scale from 1+ (the highest score and denoting hedges of the greatest nature conservation priority) to 4- (representing the lowest score and hedges of the least nature conservation priority) as follows:
- Grade 1 – High to very high value
 - Grade 2 – Moderately high to high value
 - Grade 3 – Moderate value
 - Grade 4 – Low value
- 2.12 Hedgerows graded 1 or 2 are considered to be a priority for nature conservation.
- 2.13 The hedgerows were also assessed against the Wildlife and Landscape criteria contained within Statutory Instrument No: 1160 – The Hedgerow Regulations 1997³ to determine whether they qualified as 'Important Hedgerows' under the Regulations. This was achieved using a methodology in accordance with both the Regulations and DEFRA guidance.

Field Survey – Fauna

Badgers

- 2.14 Land within the development area was surveyed on 7th September 2016 following the methodology outlined by Harris *et al* (1989)⁴. This involves a walkover of the site searching for field signs which would indicate the presence of badgers as follows:
- Setts: including earth mounds and evidence of bedding and or runways between identified setts
 - Latrines: often located close to setts; at territory boundaries or adjacent to favoured feeding areas
 - Prints and established track or runways;
 - Hairs caught on rough wood or fencing;
 - Other evidence: including snuffle holes, feeding and playing areas and scratching posts. The identification of these latter signs on their own does not necessarily provide conclusive evidence of the presence of badgers. A number of such signs need to be seen in conjunction before badgers can be confirmed as being present.

² Clements, D.K. & Tofts, R.J. (1992) Hedgerow Evaluation and Grading System (HEGS): A methodology for the ecological survey, evaluation and grading of hedgerows.

³ DEFRA (1997) *The Hedgerow Regulations 1997: A Guide to the Law and Good Practice*, London, HMSO

⁴ Harris, S., Cresswell, P. & Jefferies, D. 1989. Surveying for badgers. Occasional Publication of the Mammal Society No. 9. Mammal Society, Bristol.

Bats

External Building Assessment

- 2.15 External aspects of the buildings were examined to determine any potential access points and roost sites on 7th September 2016. Structural features with the potential for use by roosting bats were recorded and suitable access points such as small gaps under eaves/soffit boards, raised or missing ridge tiles and gaps at gable ends were identified. Evidence that potential access points were used by bats was also recorded where found. Such evidence includes staining from urine and/or fur and the presence of bat droppings in and around features. Indicators that potential access points had not recently been used included the presence of heavy cob-webbing and general detritus around these points.

Assessment of Trees

- 2.16 Tree assessments were undertaken from ground level, with the aid of a torch and binoculars (where appropriate). During the survey Potential Roosting Features (PRF) for bats such as the following were sought (Based on P16, British Standard 8596:2015 *Surveying for bats in trees and woodland*, October 2015⁵):
- 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.
 - 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.
 - Other suitable places of rest or shelter.
- 2.17 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.

⁵ British Standard 8596:2015 *Surveying for bats in trees and woodland*, October 2015

- 2.18 Trees were classified into general bat roost potential groups based upon the presence of these features. Table 1 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*.
- 2.19 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
Confirmed Roost	Evidence of roosting bats in the form of live bats, droppings, urine staining, mammalian fur oil staining, etc.	A Natural England derogation licence application will be undertaken. This will require a combination of aerial assessment by roped access bat workers and nocturnal survey during appropriate period (May to August). Replacement roost sites commensurate with status of roost to be provided. Works to be undertaken under supervision using a good practice method statement.
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 longer periods of time 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). Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc.	A combination of aerial assessment by roped access bat workers and nocturnal survey during appropriate period (May to August). Following additional assessments, a tree may be upgraded or downgraded based on findings. After completion of survey work, some good practice removal operations likely to be required.
Moderate Potential	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). Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc.	A combination of aerial assessment by roped access bat workers and /or nocturnal survey during appropriate period (May to August). Following additional assessments, a tree may be upgraded or downgraded based on findings. After completion of survey work, some good practice removal operations likely to be required.
Low Potential	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. Examples include (but are not	No further survey required but some good practice removal operations may be required

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey work
	limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes.	
Negligible/No potential	Negligible/no habitat features likely to be used by roosting bats	None.

* The Conservation of Habitats & Species Regulations 2017 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”.

- 2.21 In combination with the above, all trees within the site were visually assessed for the existence of large cavities with the potential for use by nesting or roosting barn owl. Additional signs, such as pellets and faecal splashing were also searched for on or around potential perches.

Transect Surveys

- 2.22 Three dusk transect surveys were undertaken on 4th October 2016, 22nd May 2017 & 21st June 2017, to cover the autumn, spring and summer activity periods respectively. Transects were undertaken considering current best practice guidelines (Natural England⁸, Bat Conservation Trust⁹ and JNCC¹⁰). The primary objective of the transect surveys was to identify foraging areas, commuting routes and to gain understanding of species utilisation of the site.
- 2.23 The transect route was predetermined prior to surveys in order to comprehensively cover all areas of the site and included twelve point count stops (each approximately 5 minutes in duration) to identify activity levels around the features of potential value to bats and those that are most likely to be affected by proposals (i.e. hedgerows and/or tree lines scheduled for removal). The transect start position was changed for each survey occasion in order to obtain sample data at various times across the site and avoid bias. Two laps of the route were undertaken per survey occasion. Figures 4, 5 and 6 show the transect route and location of point count stops. The transect route of the spring walked transect had to be altered mid survey due to safety concerns about the cattle present within the fields, the result being that a full second lap of the site was not completed. However, it is not considered that this constitutes a significant constraint as the altered route covered the majority of the site.
- 2.24 Each transect was walked at a steady pace and when a bat passed by, the species, time noted and behaviour was recorded on a site plan. This information provides a general view of the bat activity present on site and identifies the key foraging areas and commuting routes. Each transect was completed using Wildlife Acoustics Inc. Echo Meter Touch® bat detectors in conjunction with Echo Meter Touch® app and Apple Inc. iPad® to provide back-up information and enable identification of bats encountered. Post-survey, bat calls recorded were analysed using BatSound

⁸ English Nature 2004. *Bat Mitigation Guidelines*

⁹ Collins, J. (ed.) 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

¹⁰ JNCC 1999. *Bat Workers Manual*

(version 4) and AnalookW (Titley Electronics) by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. Analysis was undertaken by suitably experienced bat ecologists from FPCR. The results of these surveys were used to assess the level of bat activity across the site in relation to the abundance of individual species foraging and commuting.

- 2.25 The transects commenced at sunset, and were approximately two hours in duration. The timings of these surveys are outlined in Table 2 below.

Table 2: Bat Transect Survey Timings

No.	Transect date	Sunset Time	Start time	End Time
1	04/10/2016	18:30	18:30	20:30
2	22/05/2017	21:03	21:05	23:07
3	21/06/2017	21:29	21:29	23:32

- 2.26 Transect surveys were undertaken during suitable conditions (i.e. when the ambient air temperature exceeded 10°C and there was little wind and no rain). Table 3 below provides the survey timings and weather conditions.

Table 3: Bat Activity Survey Weather Conditions

No.	Transect date	Start temp (°C)	End temp (°C)	Wind (BF)	Rain	Cloud cover
1	04/10/2016	15	13	3	0	20%
2	22/05/2017	17	15	0	0	40%
3	21/06/2017	24	23	2	0	40%

Static Monitoring

- 2.27 Static (passive) monitoring was undertaken using an automated logging system (Echo Meter SM2BAT+ logging bat detectors) with its output saved to an internal storage device. Single Static recording devices were positioned at different locations within the site to record bat registrations at those static locations for five consecutive nights, in accordance with newly published guidance⁶. This information was used to supplement transect survey data and derive an index of activity and species composition at different points within the site. SM2 devices were placed along features considered to be of value to bats, such as hedgerows, scrub, woodland edge and tree lines (Figures 3 and 4 show the location of the static detectors). Devices were placed in each location during suitably mild weather conditions and were programmed to activate 30 minutes before dusk and record continuously until 30 minutes following sunrise. The data output was subjected to computer analysis using BatSound (version 4) and AnalookW© software (Titley Electronics).
- 2.28 Single static detectors were deployed within the site from the 4th to the 9th October 2016, 23rd May to the 28th May 2017 and the 19th to the 24th July 2017.

Great Crested Newt Habitat Suitability Index (HSI) Assessment

- 2.29 All accessible ponds within the site or within 500m of the site boundary were evaluated using the HSI scoring system developed by Oldham *et al*¹¹
- 2.30 The HSI scoring system produces a single index value of habitat suitability, derived from individual scores achieved under the following categories:
- Location within the UK
 - Pond area
 - Frequency of pond drying
 - Water quality
 - % shade
 - Presence of water-fowl
 - Presence of fish
 - Number of other ponds within 1km
 - Quality of surrounding terrestrial habitat
 - % cover by macrophytes
- 2.31 A score is assigned according to the most appropriate criteria level set within each attribute and a total score calculated of between 0 and 1. Pond suitability is then determined according to the scale shown in Table 4.

Table 4: HSI Scores as a Measure of Pond Suitability

HSI score	Pond Suitability
<0.5	Poor
0.5 - 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

Great Crested Newt Aquatic Survey

- 2.32 Survey work followed best practice guidance¹² and was undertaken by surveyors who hold current Natural England great crested newt survey licences.
- 2.33 Great crested newt survey guidelines state that aquatic presence/absence surveys should be carried out in the season mid-March to mid-June with half of all survey visits in the ‘peak season’ from mid-April to mid-May. Surveys are to be undertaken under suitable weather conditions when the ambient air temperature exceeds 5°C, and bottle traps should be removed from the ponds sufficiently early in the morning before temperatures rise considerably to prevent overheating and reduced oxygen levels in the water inside the traps. Strong winds and heavy rain can make torchlight survey difficult.
- 2.34 Waterbodies were initially surveyed on four separate visits, which is increased to a total of six visits within ponds where great crested newt are found to be present, in order to allow the determination of the population size-class (as per the Great Crested Newt Mitigation Guidelines). Where possible, a combination of three of the following survey methods were used on all survey visits, with bottle trapping, egg searching and torchlight survey being the favoured methods;

11 Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000) Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). Herpetological Journal 10(4), 143-155pp

12 English Nature (2001) Great Crested Newt Mitigation Guidelines, English Nature, Peterborough.

- **Egg searching:** Newts lay eggs singly on leaves of aquatic plants or other suitable pliable material, after which the material is folded over the egg to protect it. Great crested newt eggs can be distinguished from those of the other newts by their size, shape and colour. Submerged and floating vegetation and leaf litter is examined for folded leaves containing newt eggs. Once a great crested newt egg is identified at the waterbody, no further egg searching takes place, as evidence of breeding has then been confirmed (to minimise disturbance).
- **Torchlight surveys:** carried out after dark using 1,000,000 candlepower torches. Surveyors slowing walk around the perimeter of each waterbody and searched by torchlight for amphibians in the shallows and the deeper areas used by great crested newt for courtship display.
- **Bottle trapping:** involves the placement of traps, comprising inverted two-litre plastic bottles fixed in place with bamboo canes, at an average of one every 2 metres around the margins of the pond. The traps are partially submerged with an air bubble trapped inside. The traps are then checked for the presence of amphibians early the next morning, with any captive animals released back into the pond and the traps removed.
- **Netting:** using a long-handled dip-net the pond edges are swept for approximately 15 minutes per 50m of shoreline. This technique is one of the least effective for capturing adult newts, and cannot be used to estimate a population size-class, although can be very effective for detecting newt larvae, especially later in the season.

2.35 The population size-class estimate is the peak adult count (from any survey method) summed across all ponds where regular interchange can be expected, for a single survey occasion. The population is classed as follows:

- **Small** for maximum counts up to 10
- **Medium** for maximum counts between 11 and 100
- **Large** for maximum counts over 100

2.36 The dates of each survey visit and the weather conditions are provided in Table 5. The pond locations and reference numbers is shown in Figure 1.

Table 5: Aquatic Survey Visit Schedule and Weather Conditions

Survey Visit	Date	Air Temperature (°C)		Weather Conditions During Torchlight Survey
		PM	AM	
1	03/04/2017	14	8	Calm with no rain
2	12/04/2017	14	10	Light breeze with no rain
3	23/04/2017	13	9	Calm with no rain
4	29/04/2017	13	12	Calm with no rain
5	14/05/2017	10	11	Calm with no rain
6	28/05/2017	19	16	Calm with no rain

Reptile Presence / Absence Survey

- 2.37 A reptile presence / likely absence survey was undertaken within areas of suitable habitat within the site. The survey was undertaken based on the methodology detailed in published guidance¹³
¹⁴ Methods involved a search for basking reptiles on or under naturally occurring and strategically positioned artificial refugia, comprising approximately 0.5m² tiles of bitumen roofing felt. These were placed in locations that offered the most suitable habitat for common reptile species, i.e. around, structurally diverse grassland habitats with areas of bare ground/short vegetation. A total of 35 refugia were placed along hedgerows and woodland edges and around tall ruderal vegetation. The indicative location of artificial refugia is shown in Figure 3.
- 2.38 After a one week 'bed-down' period these were checked on seven subsequent occasions during suitable weather conditions when the ambient air temperature was between 9°C and 18°C and avoiding periods of heavy rain.
- 2.39 During surveys, refugia were approached from downwind and care was taken to avoid casting a shadow, so as not to disturb any basking animals. Refugia were always lifted with care so as to avoid any potential harm to animals underneath them. On each survey general observations were also made around the patches rubble and debris scattered through the site.
- 2.40 All of the surveys were undertaken between September and October 2016 (inclusive) by suitably experienced ecologists. The prevailing weather conditions, including relative wind speed, cloud cover, ambient temperature and any other notable conditions were recorded for each survey visit.

3.0 RESULTS

Desk Study

- 3.1 The locations of designated sites and faunal records discussed in the following section are illustrated on Figure 1-Site Location and Desk Study Results.

Statutory Designated Sites

- 3.2 No designated sites of international nature conservation importance are located within 5km of the survey site.
- 3.3 No designated sites of national nature conservation importance are located within 2km of the survey site.

Non-Statutory Designated Sites

- 3.4 No non-statutorily designated sites for nature conservation interest were identified within the 1km search area.
- 3.5 The Slade Nature Reserve is located adjacent to the sites northern boundary and is not subject to any statutory or non-statutory designation. The reserve includes areas of wet woodland, marshy grassland, a stream and secondary woodland along a disused railway line. The location of the Slade Nature Reserve is mapped on Figure 1.

13 Gent, A.H. and Gibson, S.D 1998. Herpetofauna Workers Manual. Peterborough, Joint Nature Conservation Committee.

14 Froglife 1999. Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

Protected Species

- 3.6 Records of protected and priority faunal species derived from the desk study consultees are provided in Table 6 below. Species records have been filtered to comprise protected and / or notable species within 1 km of the site boundary from the last 20 years.

Table 6: Summary of Protected/notable species within 1km of site boundary

Species	Conservation Status	Total Number of Records within 1km	Location / Minimum distance of records from site boundary
Mammals –Bats			
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	Regs, WCA, Sch5	5	Records ranging from 2002-2005 the closest being within the site boundary, associated with the adjacent Slade Nature Reserve
Daubenton's Bat <i>Myotis daubentonii</i>	Regs, WCA, Sch5	1	One record from 2003 located 60m N within The Slade Nature Reserve
Soprano Pipistrelle <i>Pipistrellus pygmaeus</i>	Regs, WCA, Sch5,	1	One record from 2002 located within the site boundary, associated with the adjacent Slade Nature Reserve
Whiskered Bat <i>Myotis mystacinus</i>	Regs, WCA, Sch5,	1	One record from 2002 located within the site boundary, associated with the adjacent Slade Nature Reserve
Unidentified bat Species	Regs, WCA, Sch5,	14	Records ranging from 2007-2010, with all records being from 600m NE
Mammals			
Badger <i>Meles meles</i>	PBA	3	Three records of badger activity of which the locations are confidential.
Brown Hare <i>Lepus europaeus</i>	NERC	3	Three records from 1986 associated with the Slade Nature Reserve
Polecat <i>Mustela putorius</i>	Regs Sch4, WCA sch6, NERC	2	Records ranging from 2007-2014, the closest being 600m NE.
Hedgehog <i>Erinaceus europaeus</i>	NERC	36	Records ranging from 2005-2010 with all records being from Bloxham 600m NE.
Bird Species			
Bullfinch <i>Pyrrhula pyrrhula</i>	Bocc Amber NERC	9	Records ranging from 2003-2009, the closest located 60m N within The Slade Nature Reserve.
Cuckoo <i>Cuculus canorus</i>	BoCC Red NERC	3	Records all within the Slade Nature Reserve.
Dunnock <i>Prunella modularis</i>	Bocc Amber NERC	3	Records ranging from 2003-2008, the closest located 60m N within The Slade Nature Reserve.
Fieldfare <i>Turdus pilaris</i>	Bocc Red WCA Sch1	3	Records ranging from 2004-2009, the closest located 60m N within The Slade Nature Reserve.
Herring Gull <i>Larus argentatus</i>	Bocc Red NERC	1	One record from 2009 from 60m N with The Slade Nature Reserve.

Species	Conservation Status	Total Number of Records within 1km	Location / Minimum distance of records from site boundary
Hobby <i>Falco subbuteo</i>	WCA Sch1	1	One record from 2006 approximately 600m north-west of the site.
House Sparrow <i>Passer domesticus</i>	Bocc Red NERC	2	Records ranging from 2006-2007 the closest being 60m N within The Slade Nature Reserve.
Lapwing <i>Vanellus vanellus</i>	BoCC Red NERC	7	Most recent record from 2006 associated within the Slade Nature Reserve.
Lesser Redpoll <i>Acanthis cabaret</i>	Bocc Red NERC	1	One record from 2006, located within the grid square containing the site.
Lesser Spotted woodpecker <i>Dendrocopos minor</i>	BoCC Red NERC	1	One record located within The Slade Nature Reserve
Marsh Tit <i>Poecile palustris</i>	Bocc Red NERC	5	Records ranging from 2006-2009 the closest being 60m N within The Slade Nature Reserve.
Red Kite <i>Milvus milvus</i>	WCA Sch1	2	The closest record located within The Slade Nature Reserve.
Red-backed Shrike <i>Lanius collurio</i>	BoCC Red WCA Sch1 NERC	1	One record from 1986 located within The Slade Nature Reserve.
Redwing <i>Turdus iliacus</i>	Bocc Red WCA Sch1	3	Records ranging from 2006-2009 the closest being 60m N within The Slade Nature Reserve.
Reed Bunting <i>Emberiza schoeniclus</i>	Bocc Amber NERC	2	Two records from 2006, located within the grid square containing the site.
Skylark <i>Alauda arvensis</i>	BoCC Red NERC	2	Two records from 1984-5 located within The Slade Nature Reserve.
Song Thrush <i>Turdus philomelos</i>	Bocc Red NERC	4	Records ranging from 2003-2006 the closest being 60m N within The Slade Nature Reserve.
Starling <i>Sturnus vulgaris</i>	BoCC Red NERC	13	All records from within The Slade Nature Reserve.
Turtle Dove <i>Streptopelia</i>	BoCC Red NERC	1	One record from within The Slade Nature Reserve.
Woodlark <i>Lullula arborea</i>	WCA Sch1 NERC	1	One record from 2009, located 60m N within The Slade Nature Reserve.
Yellow Wagtail <i>Motacilla flava</i>	BoCC Red NERC	1	One record from The Slade Nature Reserve.
Yellowhammer <i>Emberiza citrinella</i>	Bocc Red NERC	4	Records from 2006 the closest located onsite.
Amphibians			
Common Toad <i>Bufo bufo</i>	WCA Sch5 NERC	2	Records from 2006 the closest being within the site boundary.

Species	Conservation Status	Total Number of Records within 1km	Location / Minimum distance of records from site boundary
Great Crested Newt <i>Triturus cristatus</i>	Regs WCA Sch5 NERC	1	One record from 2015 located 700m E.
Reptiles			
Grass Snake <i>Natrix helvetica helvetica</i>	NERC WCA Sch5	1	Record within The Slade Nature Reserve.

Status Key: Regs = The Conservation of Habitats and Species Regulations 2017. WCA = Wildlife and Countryside Act 1981 (as amended). Sch1 = Schedule 1 of WCA, Sch6 = Schedule 4 of WCA Sch5 = Schedule 5 of WCA. NERC = Natural Environment and Rural Communities Act (2006), Section 41 list of Priority Species, Sch1 Schedule 1 of the Wildlife and Countryside Act, 1981, BoCC Red = Birds of conservation concern red list, BoCC Amber = Birds of conservation concern amber list, BoCC Green = Birds of conservation concern green list. PBA Protection of Badgers Act 1992.

- 3.7 MAGIC mapping indicates that there are no European Protected Species licence applications (for GCN, reptiles or bats) within 1km of the site.

Previous Ecological Survey Work Undertaken Locally

- 3.8 In 2013, an Ecological Appraisal was produced by Aspect Ecology¹⁵ to support a neighbouring application. Data from this publically-available information showed that surveys for reptiles found a small population of common lizard *Zootoca vivipara* to be present within the former quarry located 380m north of the site boundary. Great crested newt presence/absence surveys were conducted during spring 2012 on two waterbodies located within the search area (pond P6 and wet ditch WD1), recording a medium population of great crested newts within pond P6, located 450m north of the site boundary (see Figure 2).

Habitats

- 3.9 The habitats described below correspond to those mapped on Figure 2. Plant species lists for the habitats are provided in Appendix A.

Semi-natural Broad-leaved Woodland

- 3.10 Bordering the site to the north, an area of off-site semi-natural broadleaved woodland was recorded along a disused railway line. Frequent ash *Fraxinus excelsior* and occasional pedunculate oak *Quercus robur* formed an open canopy, with a dense understory characterised by frequent hawthorn *Crataegus monogyna* with occasional field maple *Acer campestre*, elder *Sambucus nigra* and blackthorn *Prunus spinose*; the latter being locally frequent to the east. The ground flora corresponded with NVC community W8: *Fraxinus excelsior* - *Acer campestre* - *Mercurialis perennis* woodland and featured frequent wood avens *Geum urbanum*, common nettle *Urtica dioica* and bramble *Rubus fruticosus* agg. with locally frequent patches of meadowsweet *Filipendula ulmaria* and rosebay willowherb *Chamerion angustifolium*, particularly

15 Aspect Ecology(2013 Tadmarton Road, Bloxham - Ecological Assessment (submitted in support of 13/00496/OUT)

at the margins of the habitat. Occasionally recorded species in this area included false brome *Brachypodium sylvaticum*, hedge woundwort *Stachys sylvatica*, giant fescue *Schedonorus giganteus* and herb-robert *Geranium robertianum*.

- 3.11 A narrow strip of woodland established over a partially wet ditch forms the majority of the western boundary of the site. The canopy featured frequent ash with occasional crack willow *Salix fragilis* and rarely goat willow *Salix caprea*, with an understory of frequent hawthorn with occasional blackthorn. The field layer was characterised by an abundance of ivy *Hedera helix* and common nettle. Species more indicative of established woodland habitat, such as wood dock *Rumex sanguineus* and herb-robert are present but generally not in any great abundance. In places, where the woodland was left unfenced to allow the cattle access to the ditch, the ground flora was heavily poached.

Continuous Scrub

- 3.12 On the site's eastern boundary, located between hedgerow H4 and the residential property to the north was an area of continuous scrub associated with the garden of the off-site property. Hawthorn was the most frequently occurring species with elder, ash and pedunculate oak present occasionally. The ground flora was limited to abundant ivy with frequent patches of common nettle

Scattered Scrub

- 3.13 Individual scattered hawthorn and dog-rose *Rosa canina* shrubs were recorded at the northern extent of hedgerow H1.



Photograph 1: Off-site broad-leaved woodland along the disused railway line, viewed from the east

Poor Semi-improved Grassland

- 3.14 The majority of the site comprised two fields of poor semi-improved grassland on level ground. The fields have previously been grazed by cattle, resulting in a low sward with localised patches of tall ruderal vegetation. Key components of the grass composition are Yorkshire-fog *Holcus lanatus* and perennial rye-grass *Lolium perenne*, which are constant throughout; with creeping bent *Agrostis stolonifera*, cock's-foot *Dactylis glomerata*, timothy *Phleum pratense* and false-oat grass *Arrhenatherum elatius* appearing at lower frequencies. The diversity of forbs was limited and comprised common and widespread species with only dandelion *Taraxacum officinale* agg., lesser celandine *Ficaria verna* and white clover *Trifolium repens* being recorded in any

abundance. Localised patches of common nettle and germander speedwell *Veronica chamaedrys* were scattered through the habitat, particularly within the eastern field, with dove's-foot crane's-bill *Geranium molle*, chickweed *Stellaria media* and sweet violet *Viola odorata* being recorded as rare.

Tall Ruderal Vegetation

- 3.15 Along the southern boundary of the site, adjacent to building B1 was an area of tall ruderal vegetation associated with a large manure pile. Spear-leaved orache *Atriplex prostrata* and common couch *Elytrigia repens* were frequent with common nettle being locally abundant. Occasionally recorded species include creeping thistle *Cirsium arvense* and nipplewort *Lapsana communis*.

Standing Water

- 3.16 A partially wet ditch was recorded within the woodland strip on the sites western boundary. To the south the ditch comprises a shallow, just a few centimetres deep section with very little emergent vegetation, becoming dry to the north.

Running Water

- 3.17 A small stream approximately 0.5m in width, forming part of a drainage system, was located along H1 and turned east towards T1. The bed was shallow supporting a few centimetres of slow moving water flowing south to north, before the stream bent to flow west to east. No aquatic vegetation was present.

Mature Trees

- 3.18 A mature, storm damaged crack willow was recorded towards the north-east of the site adjacent to hedgerow H1. A mature field maple and two mature ash trees, were recorded on the south-west boundary of the site. A number of early mature tree species were recorded along the boundary of the recreation ground, with species recorded including a row of Lombardy poplar *Populus nigra 'italica'*; and individual standards of pedunculate oak, damson *Prunus insititia* and an acacia *Acacia sp.*. All mature trees were assessed for potential to support roosting bats, which is discussed later in the report.



Photograph 2: T1, Storm damaged crack willow.

Hedgerows

- 3.19 A total of seven hedgerows were recorded within and bordering the site. Generally, the hedgerows were managed with few tree standards and were relatively species rich, characterised by an abundance of elm *Ulmus sp.* along with frequent hawthorn with blackthorn. Ground ivy *Glechoma hederacea*, common nettle, false oat-grass and ivy were amongst the species recorded in the ground flora and bittersweet *Solanum dulcamara* was a commonly recorded climber.
- 3.20 Under the HEGS assessment hedgerows H1, H5, H6 and H7 have moderately high to high conservation value (Grade 2); with hedgerows H2, H3 and H4 having moderate conservation value (Grade 3). The lower values of hedgerows H2-H4 are attributed to fewer end connections and slightly lower species diversity.
- 3.21 Hedgerow H6 had a wide and outgrown structure, including a mature field maple standard with seven woody species per 30m sample. The hedgerow also featured less than 10% gaps, a dry ditch along its length. As a result hedgerow H6 qualifies as 'Important' under the Wildlife and Landscape criteria of the Hedgerows Regulations 1997.
- 3.22 Further information regarding the quality and ecological value of the hedgerows is provided below in Table 7.

Table 7: Hedgerow Survey Summary

Ref	Canopy Sp.(from most abundant to least abundant)	Height / Width (m)	Length (m)	Sp. per Av. 30m†	Notes	HEGS Grade	Important Hedgerow
H1	<i>Cm, Ul, Ps, Sn, Ac, Rc, Rf, Ca</i>	2-4/2-3	188	5	Mixed dominance, <10% gaps, no tree standards, three end connections, Dry ditch	2	No
H2	<i>Cm, Ul, Rf, Rc, Sn, Ca, Fe</i>	2-4/2-3	39	5	<10% gaps, three end connections. Parallel hedge.	3+	No
H3	<i>Cm, Ul, Ac, Rc, Rf</i>	2-4/1-2	64	3	No gaps, two end connections, No tree standards. Parallel hedge.	3+	No
H4	<i>Cm, Ul, Rc</i>	2-4/2-3	27	3	No gaps, two end connections, No tree standards	3+	No
H5	<i>Cm, Rf, Sn, Ul, Rc, Ac, Ps, Fe</i>	2-4/2-3	144	4.5	No gaps, three end connections, no tree standards.	-2	No
H6	<i>Ps, Cm, Ul, Rf, Ac, Sn, Fe, Rc, Sc</i>	2-4/3>	58	7	No gaps, two end connections, two tree standards, dry ditch.	2+	Yes
H7	<i>Cm, Ul, Qr, Rf</i>	2-4/1-2	141	2.5	<105 gaps, four end connections, one tree standard, parallel hedge.	-2	No

Species Key: *Ac* *Acer campestre* – field maple, *Ca* *Corylus avellana* – Hazel, *Cm* *Crataegus monogyna* – hawthorn, *Fe* *Fraxinus excelsior* – ash, *Ps* – *Prunus spinosa* – blackthorn, *Qr* *Quercus robur* – Oak, *Rc* *Rosa canina* – dog-rose, *Rf* *Rubus fruticosus* agg. – bramble, *Sc* – *Salix caprea* – goat willow, *Sn* *Sambucus nigra* – elder, *Ul* *Ulmus sp.* – an elm.



Photograph 3: Hedgerow H6 viewed from the north.

Fauna

Breeding Birds

- 3.23 The hedgerows, mature trees recorded on-site provide potential nesting habitat for use by a limited range of bird species. The adjacent broad-leaved woodland, which was of varied composition and structure, also supplied potential breeding opportunities for woodland specialists.

Badgers

- 3.24 Whilst it was considered that the grassland and adjacent woodland habitats may provide suitable foraging habitat for this species, during the survey no signs attributable to badgers such as setts, latrines, hairs or footprints were recorded within the site or its immediate surrounds (where accessible).

Bats

Habitat Assessment

- 3.25 The open areas of the poor semi-improved grassland fields were considered to offer very few opportunities for foraging and commuting bats. However, the hedgerows, mature trees, tall ruderal vegetation and adjacent woodland and scrub habitats offer generally suitable foraging habitat as well as the potential for the hedgerows and woodland edges within the site to serve as corridor habitats.

Transect Survey

- 3.26 The transect route, locations of where bats were recorded and the tabulated results are provided in Figures 4, 5 & 6.

4th October 2016

- 3.27 During the autumn transect survey two bat species were recorded: common pipistrelle and a *Myotis* species, with a total of 13 bat contacts during the survey. The majority of bat activity was

focussed on the peripheries of the site, particularly the woodland on the western boundary and along the margins of The Slade Nature Reserve. The first bat contact was recorded at 19:13, 43 minutes after sunset and was a common pipistrelle pass within the offsite field to the south. Twelve of the thirteen bat contacts were common pipistrelle with the remaining contact being *Myotis* species recorded along the margins of The Slade Nature Reserve. All bat contacts comprised single species, with the exception of a single instance where two common pipistrelle were observed constantly foraging along the margins of The Slade Nature Reserve

22nd May 2017

- 3.28 During the spring transect survey two bat species were recorded: common pipistrelle, and noctule *Nyctalus noctule*, with a total of 11 bat contacts during the survey. Bat activity was predominantly focused around the southern boundary of the site with a number of contacts around the mature trees to the south-west. Bat activity in these areas was predominately from individual common pipistrelles, with a single contact with two common pipistrelles foraging along the northern boundary of the site. The first bat recorded during the survey was non-visual contact of a common pipistrelle recorded to the west of the site, 24 minutes after sunset (21:29). Ten of the eleven bat contacts of which were common pipistrelle, with the remaining contact being of a Noctule foraging above the site in the south-western corner.

21st June 2017

- 3.29 During the summer transect survey bat activity was recorded in all areas of the site, with the activity again focussed around the southern boundary and the margins of the Slade Nature Reserve. Four bat species were recorded: common pipistrelle, soprano pipistrelle *Pipistrellus pygmaeus*, noctule and brown long-eared bat *Plecotus auritus*, with a total of 22 bat contacts during the survey. The first bat recorded during the survey was a noctule, which was recorded social calling close to hedgerow H5 at 22:13, 44 minutes after sunset. 14 of the 22 bat contacts recorded were common pipistrelle, with six noctule contacts in total also being noted. Recorded bat activity was generally from individual bats with one instance of two noctule bats observed foraging and social calling together.

Transect Summary

- 3.30 Activity levels were reasonably consistent during the spring and autumn periods, with a peak in activity in the summer. Overall, given the habitats present within the site, the activity levels were considered to be unexceptional. All of the bat contacts were common and widespread species with common pipistrelle being overwhelmingly the most frequently recorded species with seven noctule, one contact each for soprano pipistrelle, noctule and brown long-ear.
- 3.31 The results of the transect surveys indicate that bats utilise all of the linear features within the site for foraging and commuting. Activity along the central hedgerow H1, was low throughout the suite of surveys, with a total of four contacts, three of which were common pipistrelle. The transect results indicate that peak bat activity was associated with the woodland habitats recorded on the western boundary, the margins of The Slade Nature Reserve and the mature trees in the south-west corner.

Static Detector Monitoring

- 3.32 A summary of the static bat detector monitoring is provided in Tables 8, 9 and 10. Full details of the static bat detector data can be found in Appendix A. The locations of the static detector units are shown on Figures 2, 3 and 4.

Autumn

- 3.33 A single static bat detector was deployed from 4th to 9th October 2016. The unit was positioned along hedgerow H1 and confirmed the presence of five species; common pipistrelle, noctule, a *Nyctalus* species, a pipistrelle species and a *Myotis* species. (Table 8). The most commonly occurring species was common pipistrelle with 91.6% of the total registrations over the survey period with a peak of 40 on the night of 4th/5th. Noctule was the second most commonly recorded species with a peak count of 2 on the nights of 4th/5th and 7th/8th.

Table 8: Nights of 4th – 9th October 2016 SM2 Survey Results

Location	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
Hedgerow H1	1.26	95	Common pipistrelle (87)	Noctule (4), <i>Myotis</i> sp. (2), <i>Nyctalus</i> (1), <i>Pipistrelle</i> sp (1)

Spring

- 3.34 A single static bat detector was deployed from 23rd to 28th May 2017. The unit was positioned along hedgerow H3, close to the intersection with hedgerow H4. The unit confirmed the presence of eight species; common pipistrelle, Noctule, brown long-eared, *Myotis* sp., *Nyctalus*, soprano Pipistrelle, Common / Nathusius pipistrelle and *Pipistrelle* sp. By far, the most commonly occurring species was common pipistrelle with over 81% of the total registrations over the survey period with a peak of 81. There were 16 noctule species registrations accounting for a little over 9% of the registrations.

Table 9: Nights of 23rd –28th May 2017 SM2 Survey Results

Location	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
Hedgerow H3	3.75	173	Common pipistrelle (141)	Noctule (16), Brown long-eared (8), <i>Myotis</i> sp. (5), <i>Nyctalus</i> (1), Soprano Pipistrelle (1), Common / Nathusius' pipistrelle (1), <i>Pipistrelle</i> sp. (1)

Summer

- 3.35 A single static bat detector was deployed from 19th to 24th July 2017. The unit was positioned within the centre of the site along hedgerow H1. The unit recorded; common pipistrelle, noctule *Myotis* species, brown long-eared, soprano pipistrelle, *Nyctalus* species, common/nathusius pipistrelle and common/soprano pipistrelle. By far, the most commonly occurring species was common pipistrelle with over 88% of the total registrations over the survey period with a peak of

180. There were 28 registrations for *Myotis* species, twelve for noctule and seven for soprano pipistrelle.

Table 10: Nights of 19th – 24th July 2017 SM2 Survey Results

Location	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
Hedgerow H1	10	474	Common pipistrelle (420)	<i>Myotis</i> sp. (28), Noctule (12), Soprano Pipistrelle (7), Brown long-eared (5), <i>Nyctalus</i> (1), Common / Nathusius' pipistrelle (1), Common / Soprano pipistrelle (1)

Static Monitoring Summary

3.36 Activity levels were low throughout all survey periods, but with higher numbers of bats recorded along the hedgerow H1 in summer than from the same location during the autumn survey period. Up to eight different bat species were recorded utilising the site. Common pipistrelle accounted for the majority of bat activity within the site, comprising 87.3% of the total bat registrations recorded over the whole survey period. *Myotis* species were the next most frequently recorded species within the site accounting for 4.7% of the total bat registrations recorded. Relative usage of the site per species, as shown by percentage of all bat registrations recorded over the duration of the static monitoring period is shown in Table 11, below.

Table 11: Breakdown of Species Recorded

Species	Percentage
Common pipistrelle	87.3
<i>Myotis</i> species	4.7
Noctule	4.3
Brown long-eared	1.7
Soprano pipistrelle	1.1
<i>Nyctalus</i> species	0.4
Common / Nathusius' pipistrelle	0.3
Common / Soprano pipistrelle	0.3

Note

3.37 Where calls could not be identified to species level, for example due to the lower quality of those recordings or where there are similarities between species echolocation calls (particularly for *Myotis* and *Nyctalus* species bats) making a definite identification difficult, a likely species identification is provided. This is based on the features displayed by the calls when analysed using the Anlook data analysis software package and taking in to account the geographical location of the site and the habitats present. It was therefore considered that:

- Pipistrelle species bats were either common or soprano pipistrelle;
- *Nyctalus* species bats were likely to be noctule;
- *Myotis* species bats were likely to be whiskered/Brandt's *Myotis mystacinus / brandtii*, Natterer's *Myotis nattereri* or Daubenton's *Myotis daubentoni*.

Assessment of Trees

- 3.38 Three mature trees present within and bordering the site supported features that were considered potentially suitable for roosting bats. No evidence of roosting bats, such as droppings or staining, was identified in association with the trees. The details of trees with bat roost potential are provided in Table 12 below, and indicative locations are shown on Figure 2

Table 12: Trees with Bat Potential

Tree Ref	Description	Bat Roost Potential Category
T1	Mature storm damaged crack willow with significant exposed butt rot at ground level to 2m high, has smaller exposed cavities within. A vertical split in the trunk on a SE aspect 1m high	Low Potential
T2	Mature field maple with one branch socket cavity 3m high east facing. A knothole on a branch 4m high, west facing.	Low Potential
T3	A mature ash with one small knothole on a branch 4m high on a westerly aspect. One 2m long diagonal split along a branch 7m high south-west facing Large upward-facing branch tear-out, 5m high east facing Horizontal crack/occluded union, 6m high east facing	Moderate Potential

Visual Building Assessment

- 3.39 One building on-site was inspected for its potential for roosting bats, the location of this building is illustrated on Figure 2.
- 3.40 Building B1 was a large, open-sided timber framed cattle shed with pitched fibreboard roof. The walls were constructed from a single layer of spaced out timber slats. The building lacked any voids, fascia's or other features of interest to roosting bats and was largely open and exposed. As a result, Building B1 was considered to provide negligible bat roosting potential.

Great Crested Newts

Habitat Assessment

- 3.41 The poor semi-improved grassland habitat, which comprises the majority of the site, is considered predominantly sub-optimal terrestrial habitat for great crested newts. However, the tall ruderal vegetation and localised areas associated with the margins of the woodland, scrub and hedgerows; do provide some suitable terrestrial habitat for the species.

Aquatic Surveys

- 3.42 Examination of the 1:25000 OS map identified eight ponds and a wet ditch located less than 500m from the site (Figure 1). Access permission was granted by landowners for FPCR to undertake great crested newt aquatic surveys on Ponds P1 and P6. Wet ditch WD1 had shallow flowing water which was considered to be unsuitable to support great crested newts. Therefore, WD1 was discounted from the survey. Access permission was not granted to survey ponds P2, P3, P4, P5, P7 & P8.
- 3.43 Pond P1 was located 230m west of the site boundary and was shallow with hawthorn and willow scrub along the margins. The HSI score was calculated as 0.61 (average) which equates to a predicted presence of up to 55%. Ponds P2-P5 were located to the east of the site beyond South Newington Road, with the closest pond being P2 located 205m from the site boundary. Pond P6 was a lined pond within the grounds of Bloxham Church of England Primary school, 430m to the north of the site boundary and featured a good diversity of aquatic and marginal vegetation including mint *Mentha sp.*, marsh marigold *Caltha palustris* and water plantain *Alisma plantago-aquatica*. The HSI score was calculated as 0.72 (Good) which equates to a predicted presence of up to 79%. Ponds P7 and P8 were located within a small quarry site located 420m north of the site and previous assessment by Aspect Ecology indicate these ponds are occasionally used to hold large numbers of farmed waterfowl.

Aquatic Surveys & Population Size Class Assessment

- 3.44 Great crested newt(GCN) were recorded within pond P6, with great crested newt eggs also found within the pond indicating that the species is breeding in this water body. Smooth newt *Lissotriton vulgaris* was also recorded within pond P6.
- 3.45 GCN or smooth newt were not recorded in P1 during the surveys.
- 3.46 A summary of the results of the great crested newt presence/absence surveys is provided in Table 13 below. Survey occasions where the peak adult count was recorded are shown in red.

Table 13: Great Crested Newt Presence / Absence Survey Results

Pond Ref.	Survey Methods		Survey Occasion					
			1 03/04/17	2 12/04/17	3 23/04/17	4 29/04/17	5 14/05/17	6 28/05/17
		Species	Peak count per pond, per survey occasion					
P1	Bottle trap, Torchlight, Egg search	GCN	-	-	-	-	-	-
		Smooth newt	-	-	-	-	-	-
P6	Bottle trap, Torchlight, Egg search	GCN	34♂ 9♀	12♂ 19♀	9♂ 2♀	9♂ 6♀	12♂ 9♀	3♂ 2♀
		Smooth newt	1♂	2♀	2♂ 2♀	3♂ 2♀	6♂ 5♀	8♂ 2♀

Key: ♂ - Male; ♀ - Female.

- 3.47 The offsite pond P6 had a population size class estimated as 'medium' based on a peak adult count of 43.

Reptiles

- 3.48 The poor semi-improved grassland habitat recorded across the majority of the site is not considered suitable to support reptile species. However, the areas of tall ruderal vegetation and localised areas associated with the margins of the woodland and hedgerows could provide the structural diversity required to support individuals from local reptile populations.
- 3.49 Presence / likely absence surveys were undertaken on seven occasions as shown in Table 14. All survey visits were conducted under suitable weather conditions, in either the morning or early evening. During these surveys, no evidence of any reptile species was recorded.

Table 14: Date, Weather Conditions and Reptile Sightings

Survey Visit	Date	Survey Start Time	Temp. (°C)	Weather	Rain	Reptile Sightings
1	22/09/16	16:18	16	Sunny, light breeze	No	None
2	30/09/16	14:20	16	Sunny, Scattered clouds	No	None
3	04/10/16	17:33	17	Sunny, light breeze, scattered clouds	No	None
4	06/10/16	10:30	12	Sunny, with some cloud cover.	No	None
5	10/10/16	14:00	13	Sunny, with some cloud cover, light breeze	No	None
6	17/10/16	11:51	14	Sunny, light breeze	No	None
7	24/10/16	15:00	13	Sunny, with some cloud cover, light breeze	No	None

Water Voles

- 3.50 The partially wet ditch associated with the strip of woodland to the west of the site was deemed unsuitable for water vole as it supported narrow channels with very shallow water depths and little opportunity for foraging. No evidence of water vole was recorded within the site boundary.

Additional Protected Species

- 3.51 No evidence of or potential for other protected species was observed on site at the time of surveying.

4.0 DISCUSSION AND RECOMMENDATIONS

Statutory and Non-statutory Sites

- 4.1 The degree to which designated sites receive consideration under the planning system and legislative protection depends on the designation itself and its level of importance and value. This ranges from sites of international importance protected by UK legislation that transposes European directives, to protection under UK legislation or national and local planning policy.
- 4.2 No statutory or non-statutory sites are located within the local area. Therefore, development of the site is not expected to have a negative impact on any statutory or non-statutory designated sites.
- 4.3 The undesignated Slade Nature Reserve is located adjacent to the site boundary to the north. The site comprises woodland, marshy grassland and a stream; and is accessible from the proposed development via a permissive footpath located on the sites northern boundary. Due to the proposed development being adjacent to this reserve, it is considered that it may experience increased visitor pressure if access to the reserve is maintained through the proposed development. However, given that recreational use is actively encouraged within the reserve and that current disturbance effects appear to be successfully minimised through clearly marked, well maintained footpaths; it is expected that an increase in visitors passing through the reserve is unlikely to significantly impact upon the habitats and species present. There are also other public footpaths in close proximity to the site, so the Slade Nature Reserve would not necessarily receive all of the extra visitor usage. Likewise, the provision of an extensive area of open space within the site western half of the site and the presence of a large recreation ground located to the north-east of the site will mean that a significant proportion of activities such as dog walking, exercise and recreation to be undertaken away from The Slade Nature Reserve.
- 4.4 Proposals should ensure that the current hydrological regime of the local area is maintained to ensure that there is no change to the hydrology of the local nature conservation sites as some of these are designated due to wet grassland compartments. By ensuring the current hydrology is maintained the biodiversity of these sites should not be negatively affected. Any hedgerows or trees bordering the site should be protected via maintained fenced Root Protection Areas (RPAs) to prevent damage to woodland and trees within the nature reserve.

Habitats

- 4.1 Embedded within the NPPF is the premise of '*presumption in favour of sustainable development*' and within the NPPF there are clear objectives for conserving and enhancing the natural environment:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

- protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and*

other benefits of the best and most versatile agricultural land, and of trees and woodland;

- *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
- *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate”.*

- 4.2 The poor semi-improved grassland and tall ruderal habitats were considered to be of low nature conservation value and no rare or notable plant species were confirmed in these habitat types. Consequently, loss of this land is unlikely to be a significant ecological constraint to development of the site botanically.

Semi-natural Broad-leaved Woodland

- 4.3 The semi-natural broad-leaved woodland recorded off-site along the sites northern and western boundaries increases the diversity and connectivity through the local area and provides structural diversity and opportunity for sheltering and foraging wildlife. Both areas would be considered as Lowland Mixed Deciduous woodland Habitat of Principal Importance as the canopy is composed predominately of native trees; with the ground flora containing many of the species typically associated with established semi-natural woodland.
- 4.4 The woodland is to be protected from adverse impacts of development through retention of a generous buffer zone along the length of the sites northern and western boundaries and through recommendations detailed in BS5837 Trees in Relation to Construction. Further enhancements to the woodland are to be made through additional planting of native trees and shrubs appropriate to the local area within this buffer zone. This area would protect the woodland from any disturbance during the construction stage and increase the structural diversity of the site providing a variety of habitats.

Mature Trees

- 4.5 Although localised within the site, the mature trees provide potential habitats for invertebrates, nesting birds and other local wildlife in addition to providing structural diversity and continuity of habitat and are proposed for retention within the sites green infrastructure. It is recommended that all trees being retained should be protected from damage and from soil compaction during works by maintaining fenced Root Protection Areas (RPAs) in accordance with current best practice and guidelines.

Hedgerows

- 4.6 All seven hedgerows within and bordering the site are greater than 20m in length and comprised native species. As a result, all hedgerows qualify as a habitat of Principal Importance under the NERC Act 2006. Four hedgerows (H1, H5, H6 & H7) were assessed as being of moderately high to high conservation value (Grade 2) using HEGS methodology and thus considered a priority for nature conservation. Hedgerow H6 was also deemed to be 'Important' under the Hedgerow Regulations; as a result, any removal should be agreed with the local council and suitable mitigation for the loss of any sections of this hedgerow should be provided within the development.
- 4.7 The network of hedgerows within the application site is intact with very few gaps. This network provides suitable habitat for many species, but is likely to be of particular importance to farmland birds and commuting and/or foraging bats. The network also provides a strong connectivity through the site and with the wider adjacent landscape. The Development Framework reflects the importance of hedgerows within the site with the retention of the entire network forming a key element of the Framework. It is also recommended that hedgerows are retained and protected from adverse impacts from development in accordance with BS5837 Trees in Relation to Construction. Inclusion of existing hedgerows into residential gardens should be avoided where possible as this can lead to partial removal, mis-management and gradual deterioration in quality and connectivity value of the habitat.
- 4.8 Currently, the development framework plan indicates that small sections of hedgerows H1, H3 and H4 will be lost in order to facilitate access. Compensation for this loss will be achieved through the planting of species rich hedgerow to the south of the site. Over time, this would create functional green corridor between hedgerows H2 and H3. Further enhancements to the hedgerow network will be achieved through the gapping up of hedgerows H1 and H2 and the proposed planting of standard sized trees immediately adjacent to hedgerows H1 and H5. Any hedgerow planting should include species similar to those currently present such as wych elm *Ulmus glabra*, hawthorn, blackthorn, elder and field maple.
- 4.9 Enhancement to the structure of the retained hedgerows would be achieved by adoption of an appropriate long term sympathetic management plan with the aim to increasing the height and width of the hedgerows, as well as maintaining a continuous supply of fruits and flowers for foraging wildlife.

Protected Species

- 4.10 Principal pieces of legislation protecting wild species are Part 1 of the Wildlife and Countryside Act 1981 (as amended) (WCA) and the Conservation of Habitats and Species Regulations 2017. Some species, for example badgers, also have their own protective legislation (Protection of Badger Act 1992). The impact that this legislation has on the Planning system is outlined in ODPM 06/2005 Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System.
- 4.11 This guidance states that as the presence of protected species is a material consideration in any planning decision, it is essential that the presence or otherwise of protected species, and the extent to which they are affected by proposals is established prior to planning permission being granted. Furthermore, where protected species are present and proposals may result in harm to the species or its habitat, steps should be taken to ensure the long-term protection of the species, such as through attaching appropriate planning conditions.

- 4.12 In addition to protected species, there are those that are otherwise of conservation merit, such as species of principal importance for the purpose of conserving biodiversity under the Natural Environment and Rural Communities (NERC) Act 2006. These are recognised in the National Planning Policy Framework (NPPF), which advises that when determining planning applications, LPA's should aim to conserve and enhance biodiversity by applying a set of principles including:
- *If significant harm resulting from a development cannot be avoided....., adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
 - *Development proposals where the primary objective is to conserve or enhance biodiversity should be encouraged.*
- 4.13 The potential implications that various identified species or those that are thought reasonably likely to occur may have for developmental design, planning and programming considerations are discussed below:

Birds

- 4.14 All wild bird species are protected while nesting by the Wildlife and Countryside Act 1981 (as amended). This legislation protects wild birds and their eggs from intentional harm, and makes it illegal to intentionally take, damage, or destroy a wild bird nest while it is in use or being built.
- 4.15 Where removal of woody vegetation is required, it is recommended that this is carried out outside of the nesting season (March – August inclusive) as all birds are protected whilst on the nest under the Wildlife and Countryside Act 1981 (as amended). If removal outside the nesting season is not feasible, all vegetation to be removed should be checked by an experienced ecologist for the presence of active nests. Should active nests be discovered, detailed advice would be provided by the supervising ecologist. Advice is likely to include a buffer zone around any located nests until the nest until all young have fledged.
- 4.16 A change of land use of the site as a result of development is likely to alter the assemblage of species utilising the site, with fewer typical farmland species and more garden and urban edge species, although as the site is set in an expansive wider rural environment, the general area will continue to support farmland species. The retention of existing hedgerows and the adjacent woodland; and creation of an open space element to the development will help to maintain opportunities for bird foraging and nesting.
- 4.17 Consultation with TVERC returned a single record of woodlark from February 2009, from within The Slade Nature Reserve. Woodlark are listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) meaning it is an offence to intentionally or recklessly disturb the species, on or near an 'active' nest. The proposed development site does not provide suitable habitat for woodlark, which are usually associated with lowland heath or similar open habitats such as clear fell woodland. Therefore, it is considered highly unlikely that woodlark would utilise the site or the adjacent habitat for breeding and so this species is not considered a constraint to development.

Badgers

- 4.18 Badgers and their active setts are protected under the Protection of Badgers Act 1992, making it an offence to kill, injure or take badgers or to damage or obstruct access into a badger sett. The Act also prohibits disturbance of a badger whilst it is occupying a sett.
- 4.19 Consultation with TVERC returned three records of badger activity. No evidence of the presence of badger was recorded within the site or its immediate surroundings during the survey and subsequently badgers are not considered to pose a constraint to development of the site.
- 4.20 As badgers are known to be present in the surrounding area, a badger survey is recommended immediately prior to works commencing. Where any active setts are identified and disturbance impacts are considered significant, mitigation will be put in place for any affected setts and may be ratified under licence by Natural England. This is likely to involve either supervised and licensed sett closure and / or the use of protective badger fencing where appropriate.

Bats

- 4.21 All species of bats and their roosts are listed on the Conservation of Habitats and Species Regulations 2017 making it illegal to deliberately disturb any such animal or damage / destroy a breeding site or roosting place of any such animal. Bats are also afforded full legal protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under this legislation it is illegal to recklessly or intentionally kill, injure or take a species of bat or recklessly or intentionally damage or obstruct access to or destroy any place of shelter or protection or disturb any animal whilst they are occupying such a place of shelter or protection. Some bat species, including soprano pipistrelle, are species of principal importance under the NERC Act.
- 4.22 Twenty records of common pipistrelle, Daubenton's bat, soprano pipistrelle, whiskered bat and unknown bat species were returned from within the search area.

Bat Activity

- 4.23 During the transect surveys, bat activity was recorded across all areas of the site, with peak activity being associated with the margins of The Slade Nature Reserve, the woodland on the western boundary of the site and the mature trees to the south-west. The species assemblage recorded during transects within the site comprised in order of decreasing abundance; common pipistrelle (c.76% of total activity), noctule (c.16%), *Myotis* species (c.2%), soprano pipistrelle (c.2%) and Brown long eared (c2%).
- 4.24 Activity recorded using this survey technique was higher in the summer when compared with the spring and autumn.
- 4.25 The static monitoring survey also found activity levels to be higher during summer, with the number of registrations recorded along hedgerow H1 increasing from 95 during autumn to 474 from the same location during the summer survey period. Registrations recorded on static bat detectors could potentially relate to either several passes of one bat or single passes of several bats and cannot be reliably distinguished. Therefore, these results need to be interpreted with reference to other survey occasions and methods. Bat activity during the transect surveys recorded low numbers of individual bats foraging/commuting along hedgerows. As such, it is considered likely that the increased number of registrations recorded during the static survey in spring was the result of individual or low numbers of bats foraging for extended periods of time and thus resulting in high numbers of registrations.

- 4.26 Up to eight bat species were recorded during static detector surveys of the site, comprising; common pipistrelle, *Myotis* species, noctule, brown long-eared bat, soprano pipistrelle, *Nyctalus* species, common / nathusius pipistrelle and common / soprano pipistrelle. The species and composition of bats recorded are broadly similar to those recorded during the transect surveys with common pipistrelle overwhelmingly the most frequently recorded species. Common pipistrelle is a common and widespread species that is frequently associated with the habitat types within the application site and surrounding landscape. The levels of activity associated with this species and also *Myotis* species and noctule are consistent with their known abundance at a regional and national scale and is not considered to be significant.
- 4.27 Bat activity recorded within the site during the transect and static bat detector surveys was unexceptional considering the sites rural-edge setting and the habitats present both within and adjacent to the site which do offer foraging and commuting opportunities.
- 4.28 Although some of the features of the site provide an important foraging resource for low numbers of foraging bats, the overall bat activity recorded within the site was considered unexceptional given the sites rural-edge setting and habitats present within and adjacent to the site with all bat activity comprising common and widespread species.

Mitigation Measures and Enhancement

- 4.29 Proposals will result in the loss of one field of poor semi-improved grassland and a section of an additional poor semi-improved grassland field compartment. However, these habitats are considered to provide suboptimal value for foraging bats and their loss is considered unlikely to have a significant negative impact upon the Favourable Conservation Status of local bat populations, as recorded bat activity was primarily associated with the field boundary woodland edges / hedgerows. To minimise potential impacts of development, the development framework has sought to retain all areas of higher value habitat resources such as hedgerows and mature trees. This will maintain connectivity for bats through the development and into the wider countryside from offsite roost sites identified during the desktop study.
- 4.30 The margins of the adjacent woodland habitats and the mature trees to the south-west provide a locally important foraging resource to local bat populations. The majority of the western extent of the site is to be retained as public open space and enhanced through additional native tree and shrub planting, which will improve foraging and commuting habitats for local bat populations. The creation of a wildlife pond to the north-west of the site and a SuDS in the north of the site will also provide an additional foraging resource for bats post-development.
- 4.31 All existing hedgerows are proposed to be retained, although gap creation to facilitate road access will be required through hedgerows H1, H3 and H4. Given the low levels of activity along H1 and H4 during both the static and transect surveys and use of the site by mostly widespread species less sensitive to gap creation, these access breaks are unlikely to significantly affect the use of these hedgerows by bats.
- 4.32 Creating dark corridors and semi-natural habitats along retained boundary features will be important to maintaining value for bats as sources for invertebrate prey and commuting and dispersal routes through the landscape. The hedgerow network, mature trees and woodland edge habitats will remain a key habitat resource for local bat populations and care should be taken to avoid artificially lighting these habitats.

- 4.33 Illumination either by external lighting or light spill from the development may impact on bats potentially commuting and foraging over and around the site. The lighting and layout of the proposed development should be designed to minimise light-spill onto habitats both within and adjacent to it that are used, or potentially used, by the local bat population foraging or commuting. This will be achieved by ensuring that the design of lighting is based upon guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers 'Bats and Artificial Lighting in the UK - Bats and Built Environment Series'¹⁶. Therefore, the lighting scheme will include the following:
- The strategic use of landscaping and planting to avoid light spill on sensitive habitats, such as hedgerows.
 - The avoidance of direct lighting of existing trees, woodland and proposed areas of habitat and green corridor creation;
 - The street lighting should avoid the use of mercury or metal halide lamps as these are the most disruptive for bats and their prey;
 - Lighting columns should in general be as short as possible, although in some locations taller columns may allow reduced horizontal spill, and
 - Lighting lux levels should be as low as guidelines permit and only used where required for public safety.
- 4.34 It is recommended that bat boxes are placed on suitable retained trees around the Site. The bat boxes should be a variety of designs to encourage different environmental conditions. However all the boxes should be suitable for both common pipistrelle but also a wide range of British species, both common and uncommon. Therefore the following boxes and quantities are suggested:
- Schwegler 2F boxes (or similar), good for smaller British bats such as common pipistrelle.
 - Schwegler 1FF (or similar), good for a wide range of bat species.
 - Schwegler 2FN boxes (or similar), good for both smaller bat species and attracting larger species such as Leisler's.
- 4.35 The boxes should be placed on trees on the periphery of the development and not within the centre of built development to minimise disturbance. The boxes should be placed at least 3m from the ground suitable aspect i.e. south, east or west and away from lighting to ensure roosting behaviour is not affected (good practice lighting is outlined in another section below).
- 4.36 It is also recommended that where possible bat boxes / bat tubes should be incorporated into the development. These are bat boxes which can be incorporated into buildings and are maintenance free. The small size of the box means they are more suitable for smaller colonies, so no issues with mess from large numbers of bats is anticipated. The following boxes (or similar) are recommended:
- Schwegler 1F bat tube, good for a wide range of bat species.
 - Ibstock bat brick B (or similar), as above, good for a wide range of bat species.

¹⁶ Institution of Lighting Professionals & Bat Conservation Trust (2018) *Bats and artificial Lighting in the UK*.

- 4.37 The tubes will be placed within suitable walls at least 4m from the ground on a suitable aspect i.e. south, east or west and away from lighting to ensure roosting behaviour is not affected. The tubes should be placed on buildings on the site periphery, adjacent tree lines or hedgerows for cover once the bats have emerged. These measures are suitable for a wide range of British bat species.
- 4.38 With the implementation of the mitigation proposed above, residual effects on the local population of bats are likely to be negligible.

Bat Roosts in Buildings

- 4.39 One building was identified on-site, which was a large open-sided timber framed cattle shed which was considered to provide negligible potential for roosting bats. Current proposals indicate that building B1 is to be removed to facilitate works. As building B1 was assessed as providing negligible bat roost potential, it is considered that its removal does not pose a constraint from roosting bats.

Bats in Trees

- 4.40 Three mature trees recorded within the site were considered to provide features that could potentially be used by roosting bats (Figure 2). Proposals indicate that these trees and the neighbouring connective habitats are to be retained within areas of public open space. Should, proposals change and the trees are affected by proposals, either directly (i.e. removal or arboricultural remediation works to facilitate proposals), indirectly (i.e. isolation through removal of connecting hedgerows) or be subject to direct lighting; then the presence or likely absence of roosting bats should first be ascertained via either detailed climbing inspection to internally view all cavities, or if not possible, using emergence/return to roost surveys. If bats or evidence of bats is found within the tree's features, impacts to the roost would need to be avoided, or a licence would need to be obtained from Natural England to disturb the bats or remove the roost. Appropriate mitigation measures would also need to be implemented.

Great Crested Newts

- 4.41 Great crested newts are afforded full protection as a species listed under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) and under the Conservation of Habitats and Species Regulations 2017. Under Regulation 41 of the Conservation of Habitats and Species Regulations 2017 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 of 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.
- 4.42 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.
- 4.43 Great crested newts are also included on the list of species which are of Principal Importance for the Conservation of Biodiversity in England as required under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. The S41 list is used to guide decision makers, including local planning authorities, in implementing their duty under Section 40 of the Act, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.
- 4.44 Consultations with TVERC returned a single record for great crested newt within 1km of the site boundary, from a pond located 700m to the east. In addition great crested newt aquatic surveys were conducted on pond P6 and WD1 in 2012 by Aspect Ecology to support a separate planning application. These surveys recorded a medium population of great crested newts to be present within pond P6 and confirmed absence within WD1.
- 4.45 The majority of the site is considered predominantly sub-optimal terrestrial habitat for great crested newts, with the suitable habitat limited to localised areas associated with the margins of the woodland, scrub, hedgerows and tall ruderal.
- 4.46 A medium population of great crested newt was recorded within P6, which is located 430m north of the site boundary. Wet ditch WD1, the closest water body to the site, was assessed as being unsuitable for breeding great crested newt as the ditch featured shallow, flowing water. Great crested newts were found to be absent from pond P1, which is the closest suitable breeding habitat, which shares good connectivity to the site. Unfortunately, as access permission was not granted by the landowners, it was not possible to survey the additional seven waterbodies located within 500m of the study boundary (see Figure 1; ponds P2, P3, P4, P5, P7 and P8).
- 4.47 The complex of ponds (P2, P3, P4 & P5) located to the east of the site, the closest of which is Pond P2 is located 205m from the site boundary, are separated from the site by a number of grassland fields and a busy A-road, which is a partial barrier to dispersal of newts between the ponds and the site. Suitable terrestrial habitat for amphibians is also present within close proximity to this complex of ponds, in the form of mature hedgerows and scrub along the field margins.
- 4.48 Research conducted by English Nature (now Natural England) in 2004 (English Nature Research Report Number 576) to assess the value of different habitats for GCN states in the non-technical summary that: -

'By far the most captures were recorded within 50 m of ponds and few animals were captured at distances greater than 100 m.'

4.49 It also goes on to say:

'Captures on fences (and by other methods) at distances between 100 m and 200 – 250 m from breeding ponds tended to be so low as to raise serious doubts about the efficacy of this as an approach, although a small number of projects did report captures on significant linear features at distances approximately 150 – 200 m from ponds.'

4.50 Based upon the above research in combination with the distance of the site from any pond with a confirmed breeding population (P6), or potential great crested newt population (P2, P3, P4 & P5) and the poor suitability of the on-site terrestrial habitat. It is considered reasonably unlikely that any great crested newt present within any off-site waterbody would migrate to and utilise the predominantly poor habitats within the site. As such it is considered that this species does not pose a statutory constraint to development.

Reptiles

4.51 All British reptiles are protected from killing and injury under the Wildlife and Countryside Act 1981 (as amended) and are listed as species of principal importance for the conservation of biodiversity under the NERC Act, indicating that public bodies, such as the Local Planning Authority, have a duty to have regard to the conservation of these species.

4.52 Consultation with TVERC returned no recent records of reptiles from within the search area. However, there is an historical record of grass snake from 1986 located within The Slade Nature Reserve. Additionally, reptile presence/absence surveys, undertaken in 2013 by Aspect Ecology to support a neighbouring application, recorded a small population of common lizard to be present within a former quarry located 380m north of the site boundary.

4.53 The areas of tall ruderal vegetation and localised areas associated with the margins of the woodland and hedgerows provide suitable habitat for reptiles, with the area of discarded rubble to the north of hedgerow H1 providing excellent cover and basking spots for common reptile species.

4.54 The reptile presence/absence survey was carried out at an appropriate time of year and under suitable weather conditions. No reptiles were recorded within the site and therefore reptiles are not considered to pose a constraint to development.

4.55 As habitats at the peripheries of the site are potentially suitable for reptiles and because habitat connectivity is present to areas off-site, in the highly unlikely event that reptiles are recorded during works, activities should cease immediately and FPCR Environment and Design Ltd contacted for further advice.

Water Vole

4.56 There are no records of water vole from the search area. The partially wet ditch associated with the woodland strip to the east of the site is considered not suitable to support this species, due to the limited water levels, the lack of connectivity to more-suitable habitat and the extremely limited levels of emergent vegetation. Further survey for water vole is therefore not considered necessary and this species should not pose a constraint to development of the site.

Biodiversity Enhancements

4.57 In line with NPPF, it is recommended that the development of the site results in a gain in value for wildlife by incorporating biodiversity in and around the development via the use of ecological enhancement measures. In addition to the recommendations with respect to individual species and habitats outlined above, opportunities exist within the scheme for general biodiversity enhancements to be undertaken; the following are recommended for this specific site:

- A pond specifically designed to be suitable for wildlife (i.e. designed to retain water all year round and to include marginal planting of native species) is proposed to be created in an area of open space.
- Soft landscaping using native and ecologically valuable species would enhance the site, avoid using non-native species with overly complex flower structure or those of an invasive nature such as cotoneasters;
- Small gaps could be left under or in the corners of garden fences to permit access for wildlife such as hedgehog, badger and fox;
- A variety of types of bat and bird boxes could be installed on new buildings adjacent to retained and created open space to increase availability of roosting and nesting sites.
- Deadwood piles could be created in areas of retained open space to provide a habitat niche for amphibians and small mammals as well as deadwood for invertebrates such as saproxylic beetles;
- The proposed sustainable drainage should be designed to provide optimal habitat for wildlife as well as serving drainage functions, for example attenuation and storage ponds designed to hold water all year round and to have edge habitat with marginal vegetation;

APPENDIX A – BOTANICAL SPECIES LIST

Species recorded are mainly dominant, conspicuous or characteristic species. Species lists are therefore not exhaustive of all flora present in each habitat type.

Abundance is described on the DAFOR scale.

D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare. (L = Locally)

Semi-natural Broad-leaved Woodland to the north

Common Name	Scientific Name	DAFOR
Canopy		
Ash	<i>Fraxinus excelsior</i>	F
Pedunculate oak	<i>Quercus robur</i>	O
Understory		
Hawthorn	<i>Crataegus monogyna</i>	F
Elder	<i>Sambucus nigra</i>	O
Field maple	<i>Acer campestre</i>	O
Blackthorn	<i>Prunus spinosa</i>	O/LF
Dog rose	<i>Rosa canina</i>	R
Buckthorn	<i>Rhamnus cathartica</i>	R
Holly	<i>Ilex aquifolium</i>	R
Ground flora		
Bramble	<i>Rubus fruticosus agg.</i>	F
Wood avens	<i>Geum urbanum</i>	F
Common nettle	<i>Urtica dioica</i>	F
Meadowsweet	<i>Filipendula ulmaria</i>	LF
Rosebay willowherb	<i>Chamerion angustifolium</i>	LF
Hedge woundwort	<i>Stachys sylvatica</i>	O
Giant fescue	<i>Schedonorus giganteus</i>	O
False brome	<i>Brachypodium sylvaticum</i>	O
Herb-robert	<i>Geranium robertianum</i>	O
Bush vetch	<i>Vicia sepium</i>	O
Creeping thistle	<i>Cirsium arvense</i>	R
Wood dock	<i>Rumex sanguineus</i>	R
Common hogweed	<i>Heracleum sphondylium</i>	R
Upright hedge-parsley	<i>Torilis japonica</i>	R

Semi-natural Broad-leaved Woodland to the west

Common Name	Scientific Name	DAFOR
Canopy		
Ash	<i>Fraxinus excelsior</i>	F
Crack willow	<i>Salix fragilis</i>	O
Goat willow	<i>Salix caprea</i>	R
Understory		
Hawthorn	<i>Crataegus monogyna</i>	F
Bramble	<i>Rubus fruticosus agg.</i>	O
Blackthorn	<i>Prunus spinosa</i>	O
Apple	<i>Malus pumila</i>	R
Dog rose	<i>Rosa canina</i>	R
Ground flora		
Common ivy	<i>Hedera helix</i>	A
Common nettle	<i>Urtica dioica</i>	F
Wood dock	<i>Rumex sanguineus</i>	O
Cow parsley	<i>Anthriscus sylvestris</i>	R
Ground-ivy	<i>Glechoma hederacea</i>	R
Herb-robert	<i>Geranium robertianum</i>	R

Common Name	Scientific Name	DAFOR
Wood avens	<i>Geum urbanum</i>	R

Poor Semi-improved Grassland

Common Name	Scientific Name	DAFOR
Meadow-grass sp.	<i>Poa sp.</i>	R
Annual Meadow-grass	<i>Poa annua</i>	R
Broad-leaved dock	<i>Rumex obtusifolius</i>	OR
Cleavers	<i>Galium aparine</i>	F
Cock's-foot	<i>Dactylis glomerata</i>	O
Common chickweed	<i>Stellaria media</i>	OR
Common mouseear	<i>Cerastium fontanum</i>	O
Common nettle	<i>Urtica dioica</i>	R-LF
Cow parsley	<i>Anthriscus sylvestris</i>	LF
Creeping bent	<i>Agrostis stolonifera</i>	O
Creeping buttercup	<i>Ranunculus repens</i>	FR
Creeping thistle	<i>Cirsium arvense</i>	R-LF
A Daffodil	<i>Narcissus sp.</i>	R
Daisy	<i>Bellis perennis</i>	R
Dandelion	<i>Taraxacum officinale agg.</i>	AF
Dove's-foot crane's-bill	<i>Geranium molle</i>	O
False oat-grass	<i>Arrhenatherum elatius</i>	O
Field bindweed	<i>Convolvulus arvensis</i>	R
Garlic mustard	<i>Alliaria petiolata</i>	O
Germander speedwell	<i>Veronica chamaedrys</i>	LA
Greater plantain	<i>Plantago major</i>	LF
Ground-ivy	<i>Glechoma hederacea</i>	R
Hogweed	<i>Heracleum sphondylium</i>	R
Knotgrass	<i>Polygonum aviculare</i>	LF
Lesser celandine	<i>Ficaria verna</i>	A
Lords-and-Ladies	<i>Arum maculatum</i>	LF
Meadow buttercup	<i>Ranunculus acris</i>	R
Perennial rye-grass	<i>Lolium perenne</i>	F
Red clover	<i>Trifolium pratense</i>	R
Red dead-nettle	<i>Lamium purpureum</i>	O
Ribwort plantain	<i>Plantago lanceolata</i>	R
Shepherd's-purse	<i>Capsella bursa-pastoris</i>	R
Silverweed	<i>Potentilla anserina</i>	LF
Soft rush	<i>Juncus effusus</i>	R
Spear thistle	<i>Cirsium vulgare</i>	R
Speedwell sp.	<i>Veronica sp.</i>	O
Sweet violet	<i>Viola odorata</i>	R
Timothy	<i>Phleum pratense</i>	O
Vetch sp.	<i>Vicia sp.</i>	R
Wavy bitter-cress	<i>Cardamine flexuosa</i>	R
White clover	<i>Trifolium repens</i>	O-LF
Yellow bristle-grass	<i>Setaria pumila</i>	R
Yorkshire-fog	<i>Holcus lanatus</i>	A

Tall Ruderal

Common Name	Scientific Name	DAFOR
Spear-leaved orache	<i>Atriplex prostrata</i>	F
Common nettle	<i>Urtica dioica</i>	LA
Creeping thistle	<i>Cirsium arvense</i>	O
Nipplewort	<i>Lapsana communis</i>	O
Broad-leaved dock	<i>Rumex obtusifolius</i>	R

Hedgerows and scattered trees

Common Name	Scientific Name
An acacia	<i>Acacia sp.</i>
An elm	<i>Ulmus sp.</i>
Apple	<i>Malus pumila</i>
Ash	<i>Fraxinus excelsior</i>
Bittersweet	<i>Solanum dulcamara</i>
Blackthorn	<i>Prunus spinosa</i>
Bramble	<i>Rubus fruticosus agg.</i>
Butterfly-bush	<i>Buddleja davidii</i>
Common ivy	<i>Hedera helix</i>
Common nettle	<i>Urtica dioica</i>
Cow parsley	<i>Anthriscus sylvestris</i>
Crack willow	<i>Salix fragilis</i>
Cyclamen	<i>Cyclamen sp.</i>
Damson	<i>Prunus insititia</i>
Dog rose	<i>Rosa canina</i>
Elder	<i>Sambucus nigra</i>
Field maple	<i>Acer campestre</i>
Goat willow	<i>Salix caprea</i>
Ground-ivy	<i>Glechoma hederacea</i>
Hawthorn	<i>Crataegus monogyna</i>
Hazel	<i>Corylus avellana</i>
Hedge bindweed	<i>Calystegia sepium</i>
Hedge woundwort	<i>Stachys sylvatica</i>
Lime	<i>Tilia x europaea</i>
Lombardy poplar	<i>Populus nigra 'italica'</i>
Pedunculate oak	<i>Quercus robur</i>
Wood avens	<i>Geum urbanum</i>

APPENDIX B: STATIC BAT DETECTOR DATA RESULTS

Recording Period	Unit Number	Survey Dates	Survey Hours	Total Average per hour	Total Registrations	Common Pipistrelle			Myotis Species			Noctule			Brown Long-eared			Soprano Pipistrelle			Nyctalus Species			Common / Nathusius' Pipistrelle			Common / Soprano Pipistrelle					
						Avg. per hour	Peak Count	Period Total	Avg. per hour	Peak Count	Period Total	Avg. per hour	Peak Count	Period Total	Avg. per hour	Peak Count	Period Total	Avg. per hour	Peak Count	Period Total	Avg. per hour	Peak Count	Period Total	Avg. per hour	Peak Count	Period Total	Avg. per hour	Peak Count	Period Total	Avg. per hour	Peak Count	Period Total
Spr	16	23/05/2017 - 28/05/2017	46	3.75	173	3.05	81	141	0.11	2	5	0.35	8	16	0.17	4	8	0.02	1	1	0.02	1	1	0.02	1	1	0.02	1	1	0.02	1	1
Sum	2	19/07/2017 - 24/07/2017	47	10.00	474	8.86	180	420	0.59	14	28	0.25	6	12	0.11	3	5	0.15	6	7	0.02	1	1	0.02	1	1	0.02	1	1	0.02	1	1
Aut	21	04/10/2016 - 09/10/2016	75	1.26	95	1.15	40	87	0.03	2	2	0.05	2	4	0.00	0	0	0.00	0	0	0.01	1	1							0.01	1	1

total	168	4.42	742	3.86	180	648	0.21	14	35	0.19	8	32	0.08	4	13	0.05	6	8	0.02	1	3	0.01	1	2	0.02	1	3	0.02	1	3
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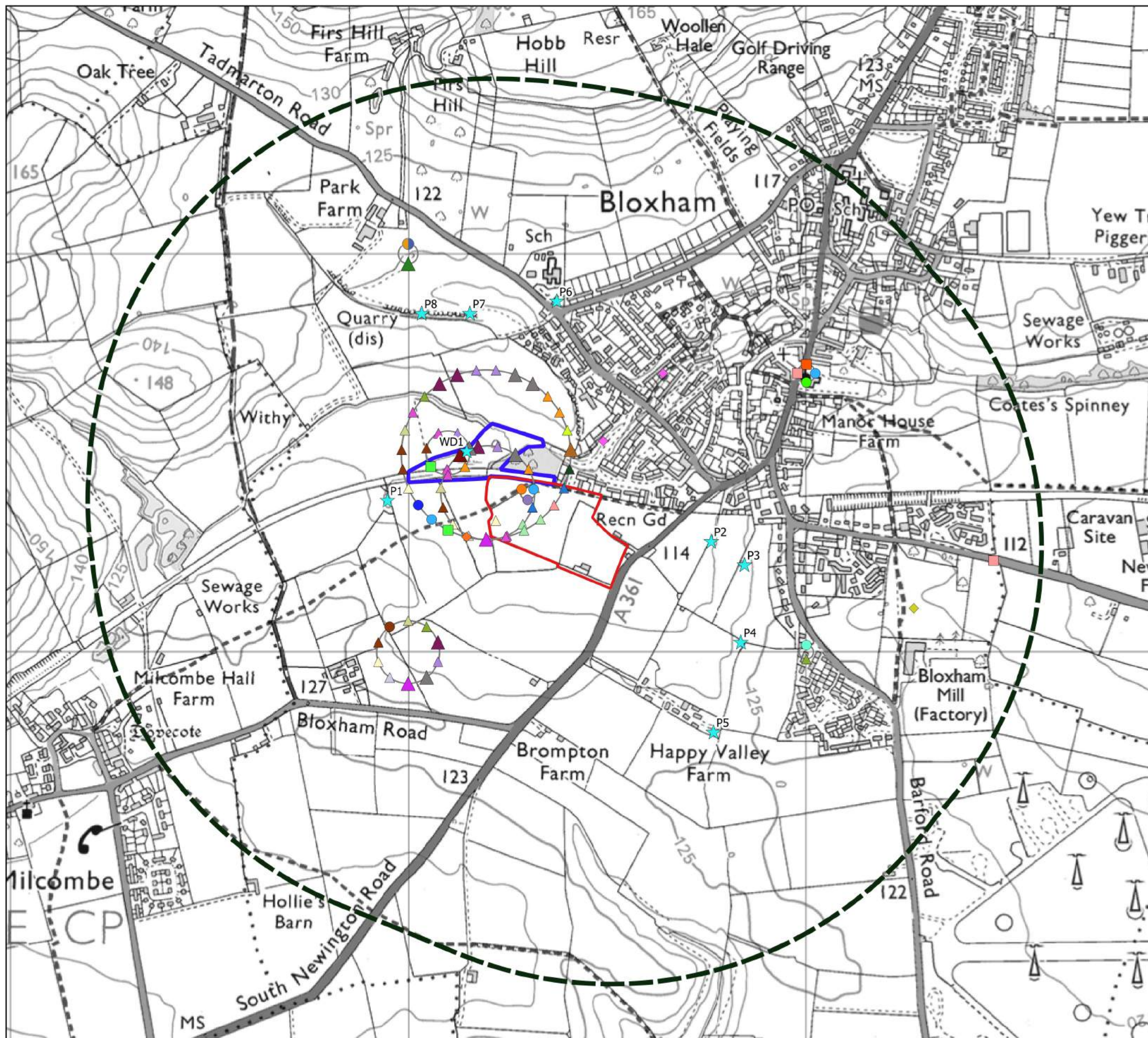
Please note the above refers to the number of bat registrations and not the number of individual bats.

APPENDIX C: HABITAT SUITABILITY INDEX (HSI) ASSESSMENT

Pond	SI -1		SI -2		SI -3		SI -4		SI -5		SI -6		SI -7		SI -8		SI -9		SI -10		HSI score	Pond suitability	Predicted presence
	geographical location		pond area		pond drying		water quality		shade (perimeter)		fowl		fish		ponds		terrestrial habitat		macrophytes				
	Field result (A,B,C)	SI score	Field result (m2)	SI score	Field result	SI score	Field result	SI score	Field result (% cover)	SI score	Field result	SI score	Field result	SI score	Field result	SI score	Field result	SI score	Field result	SI score			
1	A	1	100	0.2	Sometimes	0.5	Poor	0.3	80	0.6	Absent	1	Absent	1	23	1	Moderate	0.7	20	0.5	0.61	Average	55%
6	A	1	30	0.1	Never	0.9	Good	1	20	1	Absent	1	Absent	1	23	1	Good	1	50	0.8	0.72	Good	79%

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Key

- | | |
|--------------------------|---------------------------|
| Site Boundary | Lesser Spotted Woodpecker |
| 1km Buffer | Marsh Tit |
| The Slade Nature Reserve | Pipistrelle Bat species |
| Brown Hare | Polecat |
| Bullfinch | Red Kite |
| Common Pipistrelle | Red-backed Shrike |
| Common Toad | Redwing |
| Cuckoo | Reed Bunting |
| Daubenton's Bat | Skylark |
| Dunnock | Song Thrush |
| Fieldfare | Soprano Pipistrelle |
| Grass Snake | Starling |
| Great Crested Newt | Turtle Dove |
| Herring Gull | Unidentified Bat Species |
| Hobby | West European Hedgehog |
| House Sparrow | Whiskered Bat |
| Lapwing | Woodlark |
| Lesser Noctule | Yellow Wagtail |
| Lesser Redpoll | Yellowhammer |
| | Ponds (with reference) |

Gladman Developments Ltd
South Newington Road,
Bloxham
Site Location and Desk Study Results Plan

Scale: 1:10,000
TL/ABS
14/5/2018



Figure 1

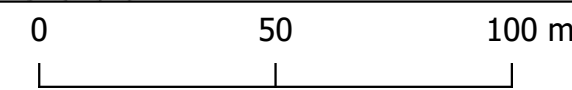
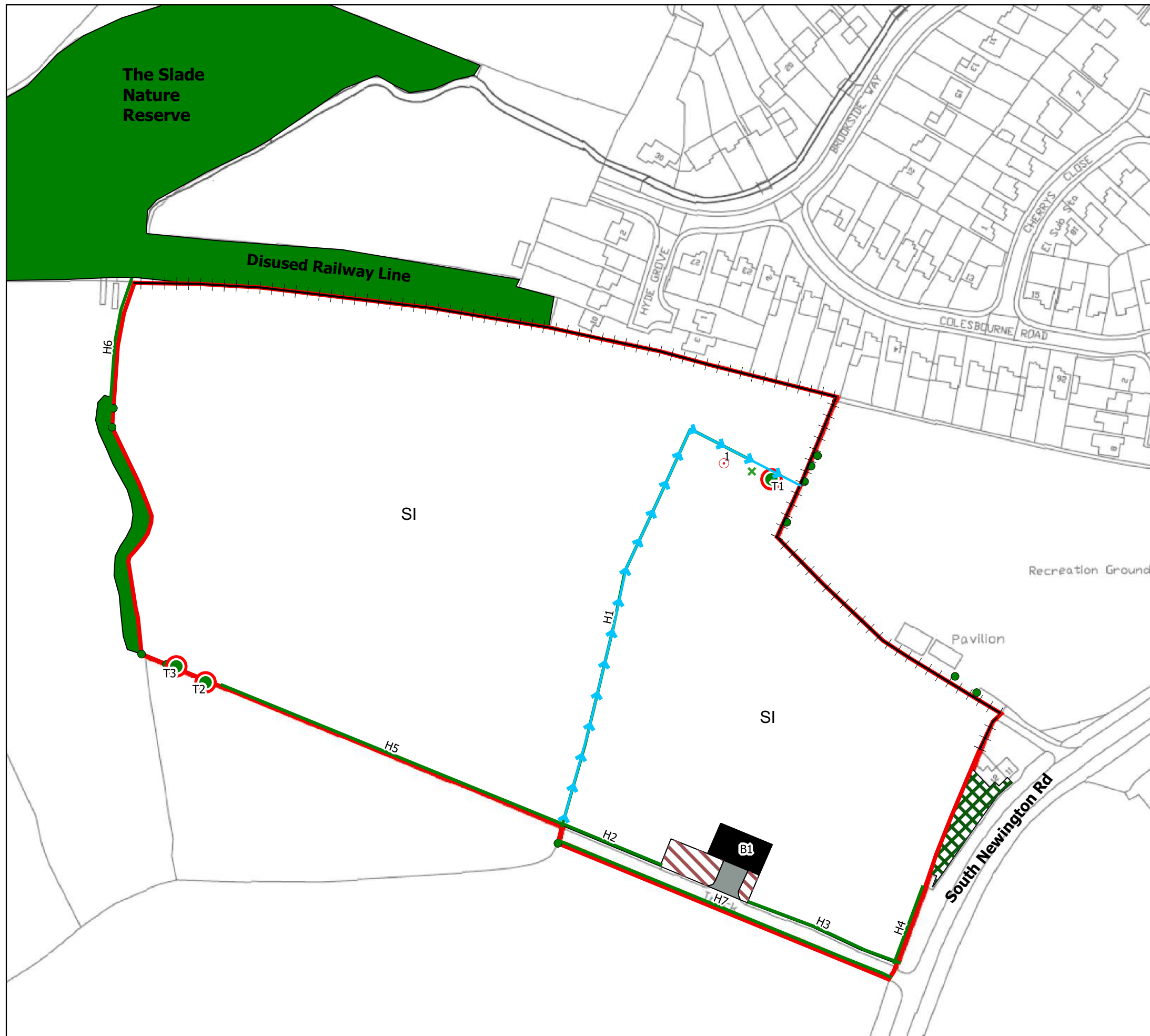
7503-E-01

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Legend

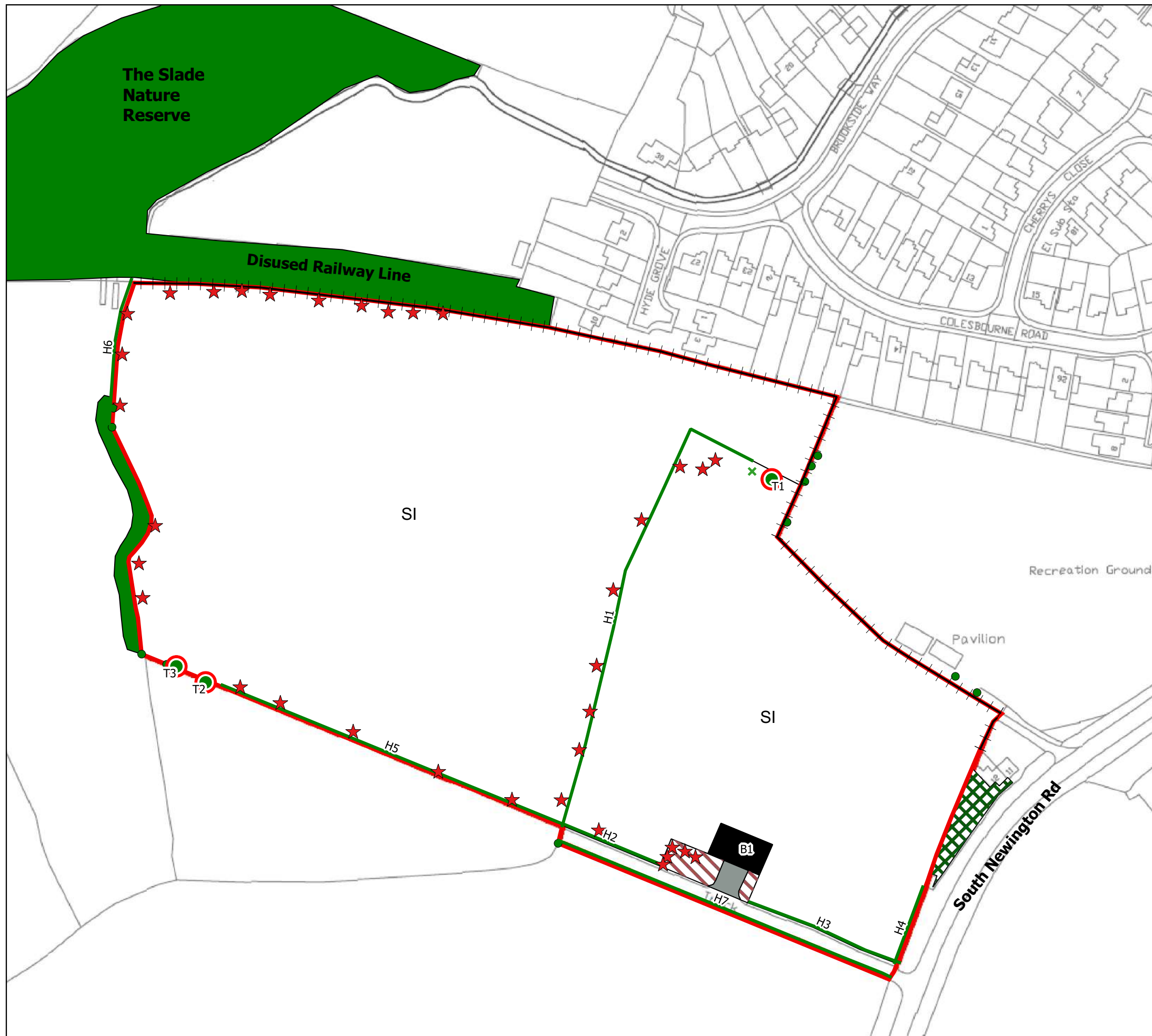
- Site Boundary
 - Built Environment: Buildings/hardstanding
 - Buildings
 - Broadleaved woodland - semi-natural
 - Scrub - dense/continuous
 - Tall Ruderal Vegetation
 - SI Poor semi-improved grassland
 - ▶ Running water
 - Hedgerow (with reference)
 - Fence
 - × Scrub - scattered
 - Broadleaved tree
 - Tree with Bat Potential
 - Target Note (with reference)
1. Rubble pile



client: Gladman Developments Ltd
 project: South Newington Road, Bloxham
 drawing title: PHASE 1 HABITAT PLAN

1:1,600
 drawing / figure number: **Figure 2**
 LG / IH
 issue: 14/5/2018
 rev: **7503-E-02**

J:\7500\7503\QGIS 2.14\Plans\Phase 1 plans\7503-E-02 Phase 1 Habitat Plan.qgs



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Legend

- Site Boundary
- ★ Reptile Refugia Location



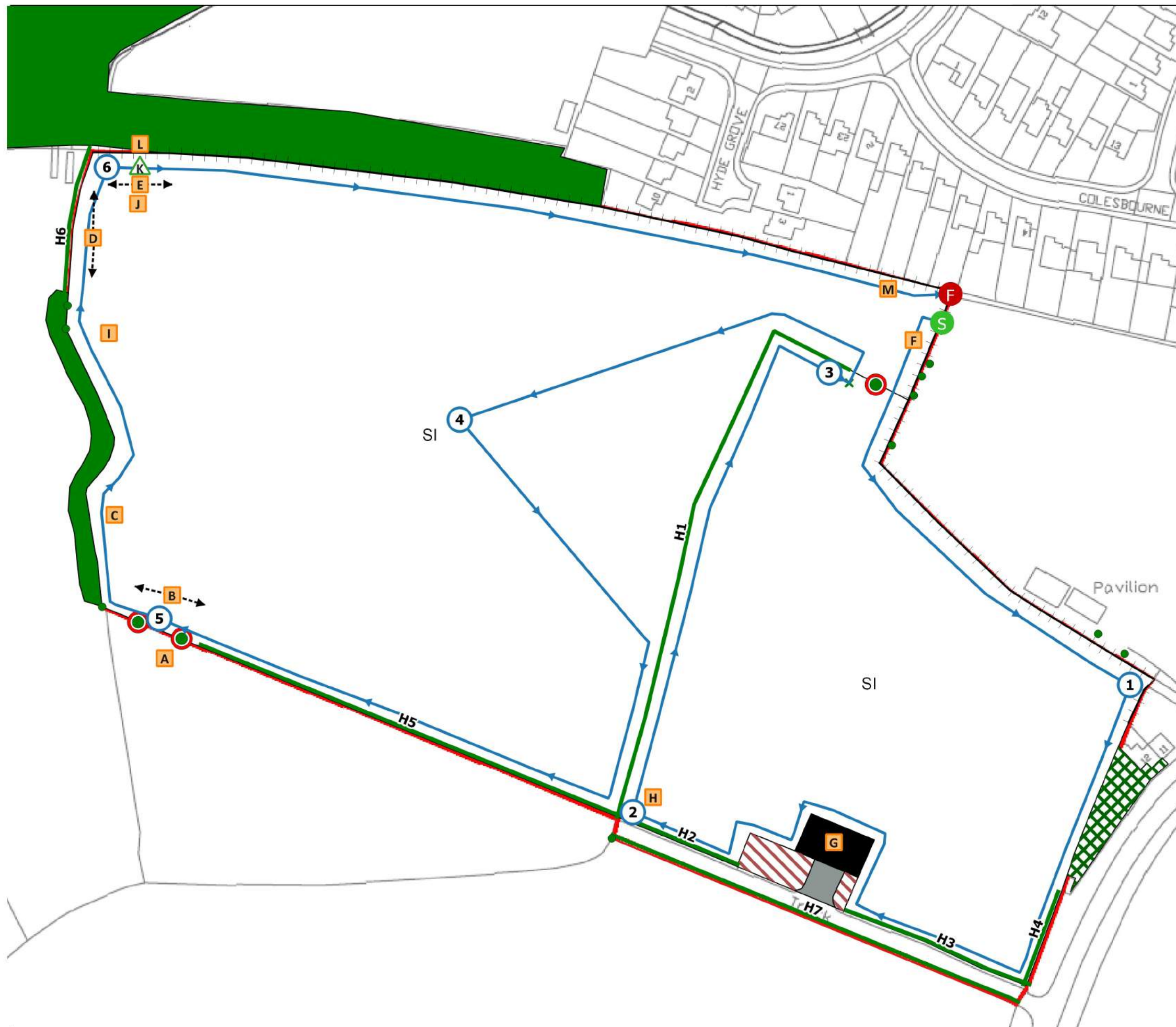
client
Gladman Developments Ltd

project
South Newington Road,
Bloxham

drawing title
REPTILE REFUGIA LOCATION PLAN

drawn LG / IH issue 30/1/2017

drawing / figure number **Figure 3** rev **7503-E-03**



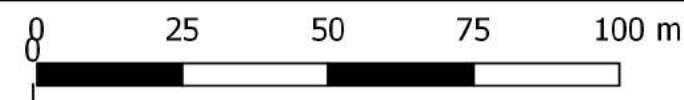
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Key:

- Site Boundary
 - S Start point
 - F Finish point
 - Flight Arrow
 - 0 Point Count Locations
 - Transect Route
- Bat Species (contacts)**
- Common Pipistrelle
 - ▲ Myotis Species

Ref No.	Time	Species	Behaviour	Passes
S - PC1	18:30 - 18:34	No Bats		
PC1	18:34 - 18:39	No Bats		
PC1 - PC2	18:39 - 18:44	No Bats		
PC2	18:44 - 18:49	No Bats		
PC2 - PC3	18:49 - 18:53	No Bats		
PC3	18:53 - 18:58	No Bats		
PC3 - PC4	18:58 - 19:01			
PC4	19:01 - 19:06	No Bats		
PC4 - PC5	19:06 - 19:10	No Bats		
PC5	19:10 - 19:15			
A	19:13	C.pip	Pass	1
B	19:15	C.pip	Foraging	Constant
PC5 - PC6	19:15 - 19:21			
C	19:16	C.pip	Pass	1
D	19:19	C.pip	Foraging	6
PC6	19:21 - 19:26			
E	19:21	C.pip x2	Foraging	Constant
PC6 - S	19:26 - 19:30	No Bats		
		Lap 2		
S - PC1	19:30 - 19:35			
F	19:31	C.pip	Pass	1
PC1	19:35 - 19:40	No Bats		
PC1 - PC2	19:40 - 19:46			
G	19:44	C.pip	Foraging in Barn 2	
PC2	19:46 - 19:51			
H	19:46	C.pip	Foraging	3
PC2 - PC3	19:51 - 19:54	No Bats		
PC3	19:54 - 19:59	No Bats		
PC3 - PC4	19:59 - 20:02	No Bats		
PC4	20:02 - 20:07	No Bats		
PC4 - PC5	20:07 - 20:10	No Bats		
PC5	20:10 - 20:15	No Bats		
PC5 - PC6	20:15 - 20:20			
I	20:17	C.pip	Pass	1
PC6	20:20 - 20:25			
J	20:20	C.pip	Pass	2
K	20:22	Myo	Pass	2
L	20:24	C.pip	Foraging	1
PC6 - F	20:25 - 20:30			
M		C.pip	Pass	1



Client: Gladman Developments Ltd
 Project: South Newington Road, Bloxham
 Drawing Title: Transect Result Plan (04.10.2016)

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drawn: IH
 date: 25/7/2017

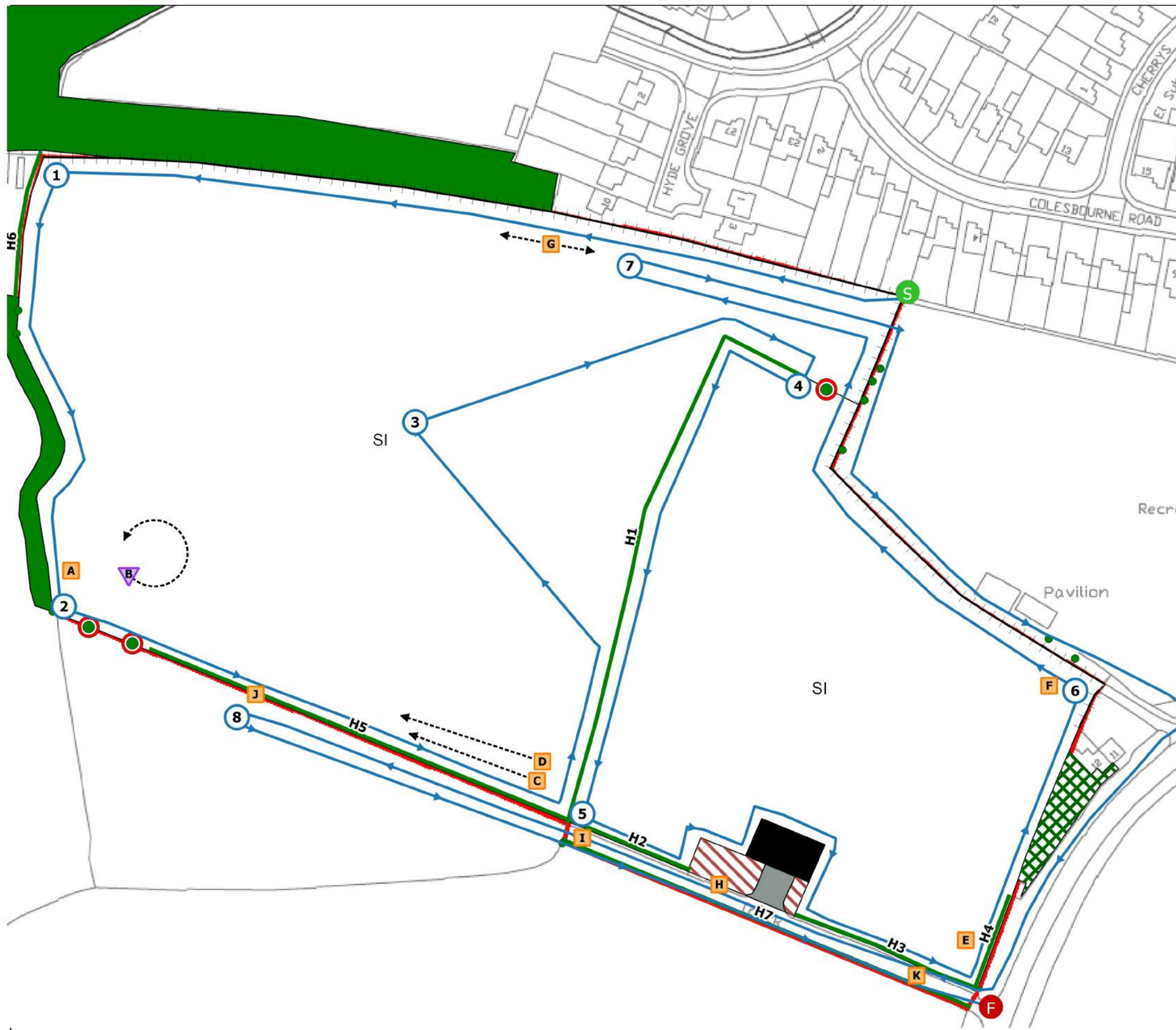
drawing / figure number: **Figure 4**
 rev: -

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Key:

- Site Boundary
 - > Flight Arrow May
 - S Start point
 - F Finish point
 - 1 Point Count Locations
 - Transect Route
- Bat Contacts**
- Common Pipistrelle
 - ▼ Noctule



Ref No.	Time	Species	Behaviour	Passes
S - PC1	21:05 - 21:19	No Bats		
PC1	21:19 - 21:24	No Bats		
PC1 - PC2	21:24 - 21:27			
PC2	21:27 - 21:32			
A	21:29	C.pip	Foraging	2
B	21:31	Noctule	Foraging	Constant
PC2 - PC3	21:32 - 21:37	No Bats		
PC3	21:37 - 21:42	No Bats		
PC3 - PC4	21:42 - 21:46	No Bats		
PC4	21:46 - 21:51	No Bats		
PC4 - PC5	21:51 - 21:56	No Bats		
PC5	21:56 - 22:01			
C	21:56	C.pip	Commuting	1
D	21:01	C.pip	Commuting	1
PC5 - PC6	22:01 - 22:15			
E	22:08	C.pip	Commuting	2
PC6	22:15 - 22:20			
F	22:19	C.pip	Commuting	4
PC6-PC7	22:20 - 22:26	No Bats		
PC7	22:26 - 22:31			
G	22:28	C.pip x 2	Foraging	Constant
PC7-PC8	22:31 - 22:55			
H	22:46	C.pip	Foraging	3
I	22:49	C.pip	Foraging	4
PC8	22:55-23:00			
J	22:56	C.pip	Pass	
PC8-End	23:00-23:08			
K	23:07	C.pip	Foraging	3



Client: Gladman Developments Ltd
 Project: South Newington Road, Bloxham
 Drawing Title: Transect Result Plan (22.05.2017)

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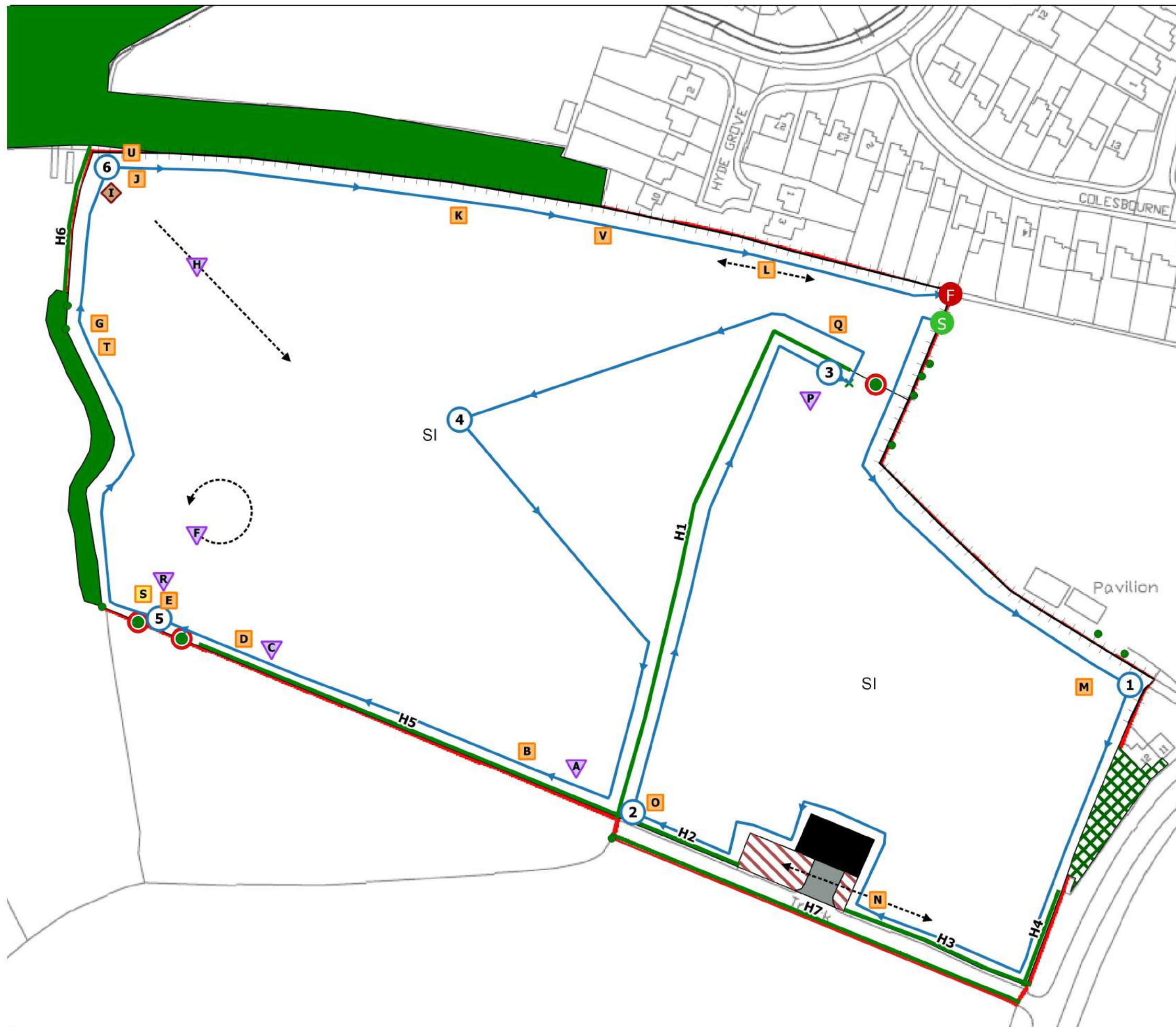
drawn: IH
 date: 26/7/2017
 drawing / figure number: **Figure 5**
 rev: -

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Key:

- Site Boundary
- Start point
- Finish point
- Point Count Locations
- Transect Route
- Common Pipistrelle
- Soprano Pipistrelle
- Brown Long-eared
- Noctule



Ref No.	Time	Species	Behaviour	Passes
S - PC1	21:29 - 21:33	No Bats		
PC1	21:33 - 21:38	No Bats		
PC1 - PC2	21:38 - 21:45	No Bats		
PC2	21:45 - 21:50	No Bats		
PC2 - PC3	21:50 - 21:53	No Bats		
PC3	21:53 - 21:59	No Bats		
PC3 - PC4	21:59 - 22:02	No Bats		
PC4	22:02 - 22:10	No Bats		
PC4 - PC5	22:10 - 22:17			
A	22:13	Noctule	Social Call	1
B	22:14	C.pip	Pass	1
C	22:16	Noctule	Pass	1
D	22:16	C.pip	Pass	1
PC5	22:17 - 22:23			
E	22:17	C.pip	Pass	2
F	22:19	Noctule x 2	Foraging / Social Call	Constant
PC5 - PC6	22:23 - 22:27			
G	22:25	C.pip	Pass	1
PC6	22:27 - 22:32			
H	22:27	Noctule	Pass	1
I	22:31	BLE	Pass	1
J	22:31	C.pip	Pass	1
PC6 - S	22:32 - 22:37			
K	22:33	C.pip	Pass	1
L	22:36	C.pip	Foraging	5
			Lap 2	
S - PC1	22:37 - 22:41	No Bats		
PC1	22:41 - 22:46			
M	22:43	C.pip	Pass	1
PC1 - PC2	22:46 - 22:52			
N	22:47	C.pip	Foraging	5
PC2	22:52 - 22:57			
O	22:54	C.pip	Foraging	5
PC2 - PC3	22:57 - 22:59	No Bats		
PC3	22:59 - 23:04			
P	23:03	Noctule	Pass	1
PC3 - PC4	23:04 - 23:06			
Q	23:05	C.pip	Pass	1
PC4	23:06 - 23:11	No Bats		
PC4 - PC5	23:11 - 23:15	No Bats		
PC5	23:15 - 23:20			
R	23:19	Noctule	Pass	1
S	23:19	S.pip	Pass	1
PC5 - PC6	23:20 - 23:23			
T	23:21	C.pip	Pass	2
PC6	23:23 - 23:28			
U	23:25	C.pip	Pass	2
PC6 - F	23:28 - 23:32			
V	23:30	C.pip	Pass	1

Client: Gladman Developments Ltd
 Project: South Newington Road, Bloxham
 Drawing Title: Transect Result Plan (21.06.2017)

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 drawing / figure number: **Figure 6**
 drawn by: IH
 issue: 25/7/2017