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James Blake Associates Ltd

Bat Activity Survey

of

Land at Long Lawford (Phase 4), Warwickshire

on behalf of

Bloor Homes South Midlands

November 2017

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Over 30 Years of Service, Value and Innovation

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Revision	Purpose	Originated	Checked	Authorised	Date
		SR	HW	JBA	November 2017
Job Number: JBA 17/099		Title: Bat Activity Survey - Land at Long Lawford (Phase 4), Warwickshire 			

Disclaimer

James Blake Associates Ltd. have made every effort to meet the client's brief. However, no survey ensures complete and absolute assessment of the changeable natural environment. The findings in this report were based on evidence from thorough survey: It is important to remember that evidence can be limited, hard to detect or concealed by site use and disturbance. When it is stated that no evidence was found or was evident at that point in time, it does not mean that species are not present or could not be present at a later date: The survey was required because habitats are suitable for a given protected species, and such species could colonise areas following completion of the survey.

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0 NON TECHNICAL SUMMARY

Site:	Land at Long Lawford Phase 4, Rugby, Warwickshire
Grid Reference (from the centre of the site)	SP 473 756
Report Commissioned by:	Bloor Homes South Midlands
Date of Survey:	23 rd June to 5 th September 2017

Considerations	Description	Potential impacts and timings
Roosts Identified	No definite bat roosts identified on the proposed development site, however six trees with low to high bat roost potential exist on site.	External lighting to be directed away from these trees.
Foraging and commuting bats	<p>Common pipistrelle, soprano pipistrelle and noctule foraging and commuting activity across the site.</p> <p>Occasional brown long-eared bat and <i>Myotis</i> species foraging activity recorded.</p> <p>Bats recorded using hedgerows for foraging and commuting</p>	<p>Proposed access road and footpaths within existing hedgerows could cause fragmentation of commuting routes for some species, eg brown long-eared bat, <i>Myotis</i> species and pipistrelle bats</p> <p>Lighting minimization scheme to be implemented to avoid impact to foraging and commuting bats.</p>
Precautionary measures:	None required	None required
Additional surveys which may be dependent on layout:	Climb and inspect bat inspection on all trees with moderate and high bat roost potential, if tree would be removed or impacted by the proposed development	Any time of year

1 INTRODUCTION

Background to the study

- 1.1 James Blake Associates Ltd was commissioned by Bloor Homes South Midlands to undertake bat activity surveys of the site at Land at Long Lawford (Phase 4), Rugby, Warwickshire. Grid ref: SP 473 756 (taken from the centre of the site).
- 1.2 All UK bat species are protected under European and UK law (Conservation of Habitats and Species Regulations 2010; Wildlife and Countryside Act 1981), and some are species of principal importance (SPI) in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Protected and principally important species are a consideration under the National Planning Policy Framework (NPPF) 2012. The NPPF places responsibility on Local Planning Authorities to aim to conserve and enhance biodiversity and to encourage biodiversity in and around developments.

Site Description

- 1.3 The site was located to the north of Coventry Road in the village of Long Lawford near Rugby, Warwickshire. Residential housing bordered the northern, eastern and western boundaries. The large town of Rugby was approximately 1.5km to the east. The River Avon ran east to west to the north of Long Lawford. The remaining wider landscape was predominantly arable fields interspersed with fragmented woodland and villages (see Figure 1).
- 1.4 The site itself was a grazing field of improved grassland. Mixed hedgerows with mature trees lined the site boundary, with two hedgerows and associated dry ditches divided the site. There was a small seasonal pond (approximately 230m²) in the south of the site. The northern boundary lay along a construction site for residential housing development. Back Lane and the A428 lay along the eastern and southern boundary respectively. Gardens from residential houses backed onto the western boundary.

Aims and objectives

1.6 The aims of the surveys were to:

- Determine bat use of the site, including the species, amount and type of activity.
- Assess the risk of impact on bats, bat roosts and local bat conservation status from the proposed development and, if necessary, design appropriate precautionary measures, compensation or mitigation measures.

2 SITE SURVEY AND ASSESSMENT

Desk Study

- 2.1 A desk study was submitted to Warwickshire Biodiversity Records Centre for protected species. The desk study included records of bat species (*Chiroptera*) within a 2km search radius of the site.
- 2.2 Lack of species records does not necessarily indicate that they are absent from the surrounding area, and can be due to a lack of survey efforts in the area.
- 2.3 The table below summarizes data contained within the desk study.
- 2.4 There were three records from 2012 that were specific to the proposed development site. There were a large number of records of bat species within 2km, however. Some records were of known roosts.

Table 1: *Chiroptera* records within 2km of the site.

Bat Species	Protection	Number of records	Year of Record
Noctule	European Protected, WCA5, LBAP	2 records (field observation)	2011
		1 record (field observation)	2014
Brown long-eared bat	European Protected, WCA5, LBAP, SPI	10 records (field observations)	2005-2015
		3 records (roosting in barn building)	2010-2011
		9 records (maternity roost) – 692m north of site	2006
Soprano pipistrelle	European Protected, WCA5, LBAP, SPI	6 record (field observation)	1996-2009
Common pipistrelle	European Protected, WCA5	36 records (field observations)	2005-2015
		4 records on site (field observations)	2012
Pipistrelle Species (Unspecified)	European Protected, WCA5	1 record (maternity roost)	2006
		1 record (maternity roost)	1999

Status of Bats in the Local/ Regional Area

Species Status in Warwickshire			
Value	Common/Frequent <i>(Common and Soprano pipistrelle, Nathusius' pipistrelle, Noctule, Brown long-eared, Daubenton's, Whiskered, Brandt's)</i>	Uncommon/Scarce <i>(Natterer's, Leisler's, Serotine, Lesser horseshoe)</i>	Very Rare <i>(Barbastelle, alcaethoe whiskered, bechstein's)</i>

- 2.5 Common pipistrelle are the most common bat in the UK, and are widespread throughout Warwickshire as well as being common locally to the site.
- 2.6 Brown long eared bats are widely distributed where there is suitable foraging habitat close to roost sites. Within Warwickshire they are widespread and relatively abundant, although not often encountered outside of roost sites. Brown long eared bats are a SPI under Section 41 of the NERC Act and a local BAP species.
- 2.7 *Myotis* species are group of species and consist of five species: Daubenton's bat, Natterer's bat, Whiskered bat, Brandt's bat and Bechstein's bat. Daubenton's and Brandt's are frequent in Warwickshire. Natterer's bats are uncommon in Warwickshire. Barbastelle and Bechstein's bat are very rare in Warwickshire. Both species are rare in the UK in general and both species can be found roosting in trees. Both bat species are also an Annex II species, due to their rarity.

Survey Methods

Assessment of bat roost potential trees

- 2.7 The survey was undertaken in line with the guidelines: Bat Workers Manual (2004), Bat Mitigation Guidelines (2004) and the Bat Surveys: Good Practice Guidelines for Professional Ecologists (2016).
- 2.8 A preliminary bat roost assessment of the trees on the site was undertaken at the same time as the initial Phase 1 Habitat Survey on 18th April 2017. The survey was undertaken by Crystal Acquaviva BSc (Hons) MSc MCIEEM (Natural England Bat Survey Licence, WML-CL19 & WML-CL20) and Isaac Stirling BSc (Hons).
- 2.9 The trees were assessed for their potential to support bat roosts and were classified as high, moderate, low or negligible trees.
- 2.10 High potential trees are defined as those which were mature (particularly oak, beech and ash), and had numerous cracks, crevices and woodpecker holes, loose bark and the tree had major limbs and were covered with dense ivy.
- 2.11 Moderate potential trees are defined as those which were semi-mature and had some cracks and crevices, old woodpecker holes, but these were not as extensive as a high potential tree, were covered in ivy but not extensive.
- 2.12 Low potential trees are defined as those with some potential to support roosting bats, and negligible trees are those with no potential.
- 2.13 All trees along the boundaries, and within the development site, were assessed for their bat roost potential.

Field Surveys

- 2.14 Four activity surveys were undertaken between June and September 2017, comprising of one dawn activity survey, two dusk activity surveys and one back-to-back dusk activity/dawn activity survey. The surveys were undertaken within the optimal survey window for bat activity. For clarity, the optimal survey window for bat activity is April to September inclusive.
- 2.15 The dusk activity and dawn activity surveys were carried out by suitably experienced ecologists, Hetty Wakeford (Natural England Bat Survey Class Licence, level 2, WML-CL18) to survey for bats, Samantha Rigg BSc (Hons),

Adam Dayman BSc (Hons), Sean Doyle BSc (Hons) MSc and Isaac Stirling BSc (Hons).

2.16 The survey methodology followed standard techniques and designs recommended by Natural England and the Bat Conservation Trust. The transect routes are shown in Appendix A. The dates of the surveys carried out is shown in Table 2 below:

Table 2: Survey dates and weather conditions

Date	Dusk /Dawn	No. Of surveyors	No. Of remote monitoring points	Weather
23/06/17	Dawn	2	1	Cloud cover 20%, no rain, wind (Beaumont scale) 1, temperature 13°C
20/07/17	Dusk	2	1	Cloud cover 90%, no rain, wind (Beaumont scale) 0, temperature 15°C
07/08/17	Dusk	2	1	Cloud cover 100%, no rain, wind (Beaumont scale) 0, temperature 18°C
04/09/17	Dusk	2	0	Cloud cover 90%, no rain, wind (Beaumont scale) 1-2, temperature 18°C
05/09/17	Dawn	2	0	Cloud cover 100%, light rain and misty, wind (Beaumont scale) 1-2, temperature 17°C

2.17 Most surveys were conducted in optimal weather conditions (mild, dry, little wind). There was light rain on 5th September (dawn survey). However, as there was no heavy rain and some bat foraging activity was recorded on the survey, it was considered that this was not a survey constraint. Dusk activity surveys started at sunset and continued for approximately two hours after sunset. Dawn activity surveys started approximately two hours prior to sunrise and finished at sunrise.

2.18 Equipment used included Wildlife Acoustics EM3+ detectors and Batbox duet frequency division detectors. A static bat detector (SM2) was left on site

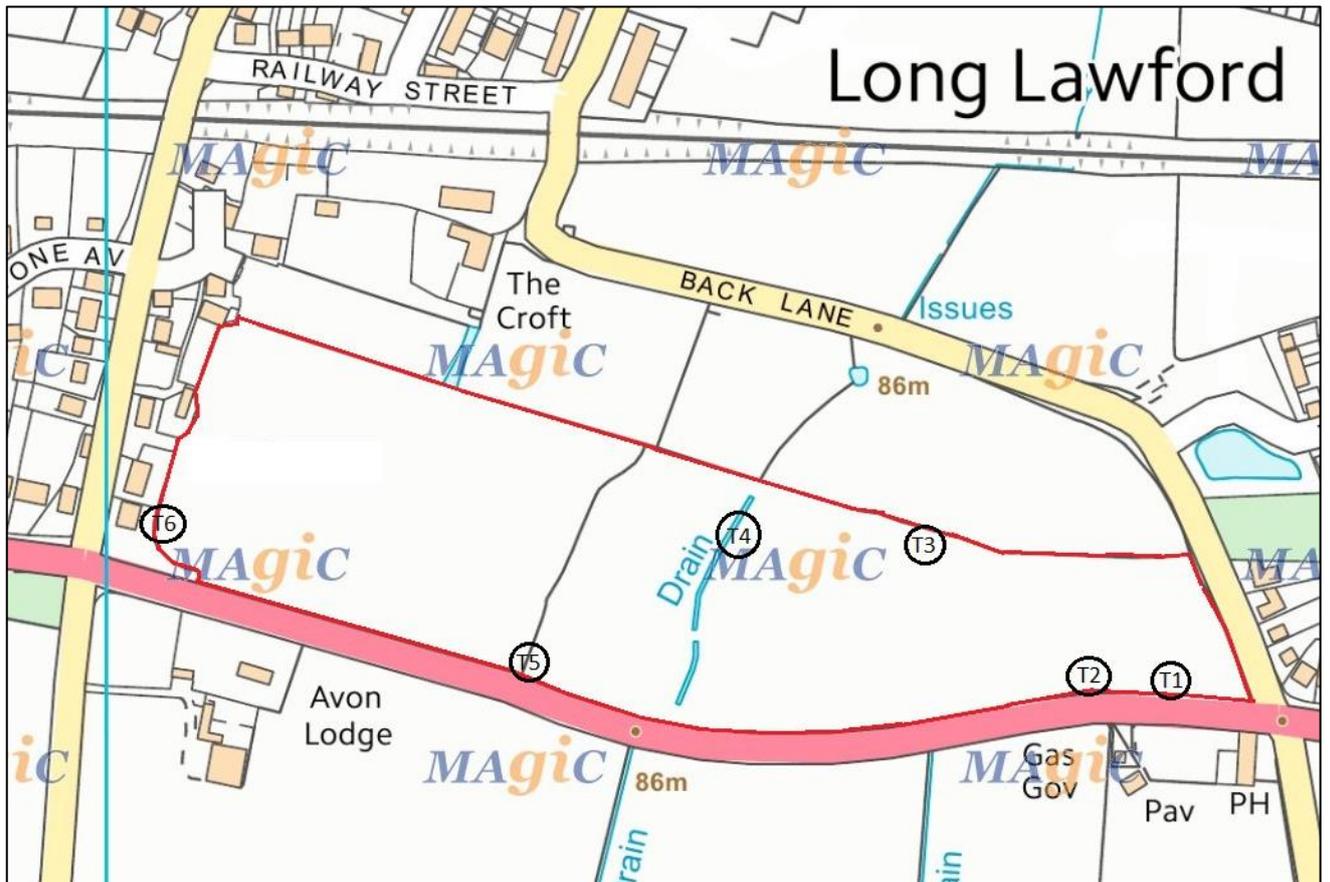
overnight to record all bat activity on the first three surveys. Recordings were analysed using BatSound software.

3 RESULTS AND EVALUATION

Bat roost assessment of trees

- 3.1 Tree 1 was a mature oak tree and was located on the southern boundary of the site. The tree was considered to have a moderate bat roost potential due to a split in the tree, broken limbs and ivy cover. It also had other minor cavities.
- 3.2 Tree 2 was a mature oak with low bat roost potential. Tree 2 was located on the southern boundary of the site to the left of Tree 1. The tree had low BRP due to minimal ivy cover.
- 3.3 Tree 3 was a mature oak located on the northern boundary of the site. The tree was considered to have moderate bat roost potential due to features present such as cracks and peeling bark.
- 3.4 Tree 4 was a mature oak located on one of the dry ditches that ran through the centre of the site. The tree was considered to have high bat roost potential due to dead limbs, large holes and cracks.
- 3.5 Tree 5 was a mature oak which was located to the south of the second dry ditch on site and fragmented hedgerow which ran through the centre of the site. The tree was considered to have high bat roost potential due to cracks near the previous pollard point.
- 3.6 Tree 6 was a mature oak located in the hedgerow on the south western boundary of the site. It was considered to have low bat roost potential due to having heavy ivy cover with no other features present.
- 3.7 The locations of the trees with bat roost potential are shown in Figure 2 below.
- 3.8 Other trees on the proposed development site were not considered to have any bat roost potential. This was based on the fact that they were young or had no features present.

Figure 2: Location of trees with bat roost potential



Dusk activity surveys

3.9 Time past sunset bat foraging activity commenced on site and flight lines would suggest that there were common pipistrelle and *Myotis* bat species roosts nearby. Remote monitoring detectors recorded similar information to that recorded by surveyors during the surveys. The first activity of each bat species on each survey, and the approximate time after sunset is provided in Table 3.

Table 3: First bat activity recorded per bat species on dusk activity surveys

20th July 2017		Sunset: 21:12
Time recorded (time past sunset)	Bat species	Activity
21:39 (27 minutes)	Noctule	Foraging activity recorded in the centre of site near dry ditch.
21:50 (38 minutes)	Common pipistrelle	Bat pass on northern boundary of site.

7th August 2017		Sunset: 20:46
Time recorded (time past sunset)	Bat species	Activity
21:08 (22 minutes)	Common pipistrelle	Heard but not seen. Surveyor was on southern boundary.
21:41 (55 minutes)	Noctule	Foraging activity recorded in the centre of site near dry ditch.

4th September 2017		Sunset: 19:46
Time recorded (time past sunset)	Bat species	Activity
20:05 (19 minutes)	Common pipistrelle	Foraging activity along the southern hedgerow.
20:16 (30 minutes)	<i>Myotis</i> species	Foraging activity along north western hedgerow.
20:24 (38 minutes)	Noctule	Foraging activity back and forth between site and main road at south western boundary.
20:58 (72 minutes)	Soprano pipistrelle	Foraging activity on eastern hedgerow towards centre of site.

3.10 Pipistrelle bats usually emerge within 15-20 minutes after sunset. They will usually forage in habitats around the roost before commuting to other feeding

areas or other roosts such as a night roost. Pipistrelle bats typically roost under roof tiles of where there are suitable gaps, around window sills, behind barge boards, under soffits or above doorways. They can roost in trees, usually behind loose bark. Common pipistrelles were recorded on every dusk survey and the dawn survey at times to suggest there is a nearby roost. Soprano pipistrelle bats were recorded on the back to back dusk and dawn survey (4th and 5th September). Recording times for soprano pipistrelles did not imply there was a roost nearby.

3.11 Noctule bats usually emerge at the time of sunset and have been known to emerge a few minutes before sunset. They will usually forage in large open habitats. Noctule bats rarely roost in buildings and typically roost in trees, often in rot holes and woodpecker holes. Noctule bats were recorded on every dusk survey and on one dawn survey (5th September) at least 27 minutes after sunset. This does not imply there is a roost nearby as noctule bats have been recorded to fly far distances from roost to feeding areas.

3.12 *Myotis* bats usually emerge within 30-60 minutes after sunset. *Myotis* bat species were recorded on the dusk and dawn survey in September (5th and 4th), at a time to suggest there is a roost nearby. The first *Myotis* species to emerge is usually whiskered bat and brandts bat (28-32 minutes), followed by other species such as daubenton's (30-45 minutes). Other *Myotis* species, such as natterer's bat emerge much later, usually 40-60 minutes after sunset. Whiskered and brandts bat can roost in loft spaces of buildings whilst daubenton's will often roost under bridges and natterer's bat can be found roosting in loft spaces and old traditional barns with traditional timber beams. Bechstein's bat is strongly associated with trees. Timings the *Myotis* species were recorded could suggest the species being whiskered or brandts and suitable habitats for these species are in the surrounding area.

Dawn activity surveys

3.13 The first activity of each bat species on the dawn surveys, and the approximate time before sunrise is provided in Table 4.

Table 4: First bat activity recorded per bat species.

23rd June 2017		Sunrise: 04:43
Time recorded (time before sunrise)	Bat species	Activity
03:06 (97 minutes)	Common pipistrelle	Bat pass on southern boundary of site.

5th September 2017		Sunrise: 06:23
Time recorded (time before sunrise)	Bat species	Activity
04:54 (89 minutes)	Brown Long-eared	Foraging activity at north western boundary.
05:07 (76 minutes)	<i>Myotis</i> species	Foraging activity on hedgerow on eastern boundary.
05:43 (40 minutes)	Noctule	Bat pass on northern boundary. Bat flying to the south of site.
05:54 (29 minutes)	Soprano pipistrelle	Foraging activity at the north of site using the hedgerow.

3.14 Brown long-eared bats usually emerge within 40-60 minutes after sunset. A single brown long-eared bat was recorded approximately 89 minutes before sunrise on 5th September. This could suggest that there is a roost nearby as this species usually returns to their roost 90-60 minutes before sunrise. . However there have been records of brown long-eared bat roosts within 2km of the site in 2010-2011 and a maternity roost in 2006 which was recorded 692m north of the site. Brown long-eared bats tend to roost in buildings such as barns, churches and older buildings and buildings with large roof voids. They do not usually forage too far from the roosts and use hedgerows and tree lines to commute.

Foraging / commuting bats

3.15 Foraging activity on the site was dominated mainly by common pipistrelle bats and noctule bats.

3.16 Bats were recorded using hedgerows on the boundaries of the site for foraging as well as commuting. The majority of the bat foraging activity appeared to be on the northern and southern boundary of the site. On multiple surveys

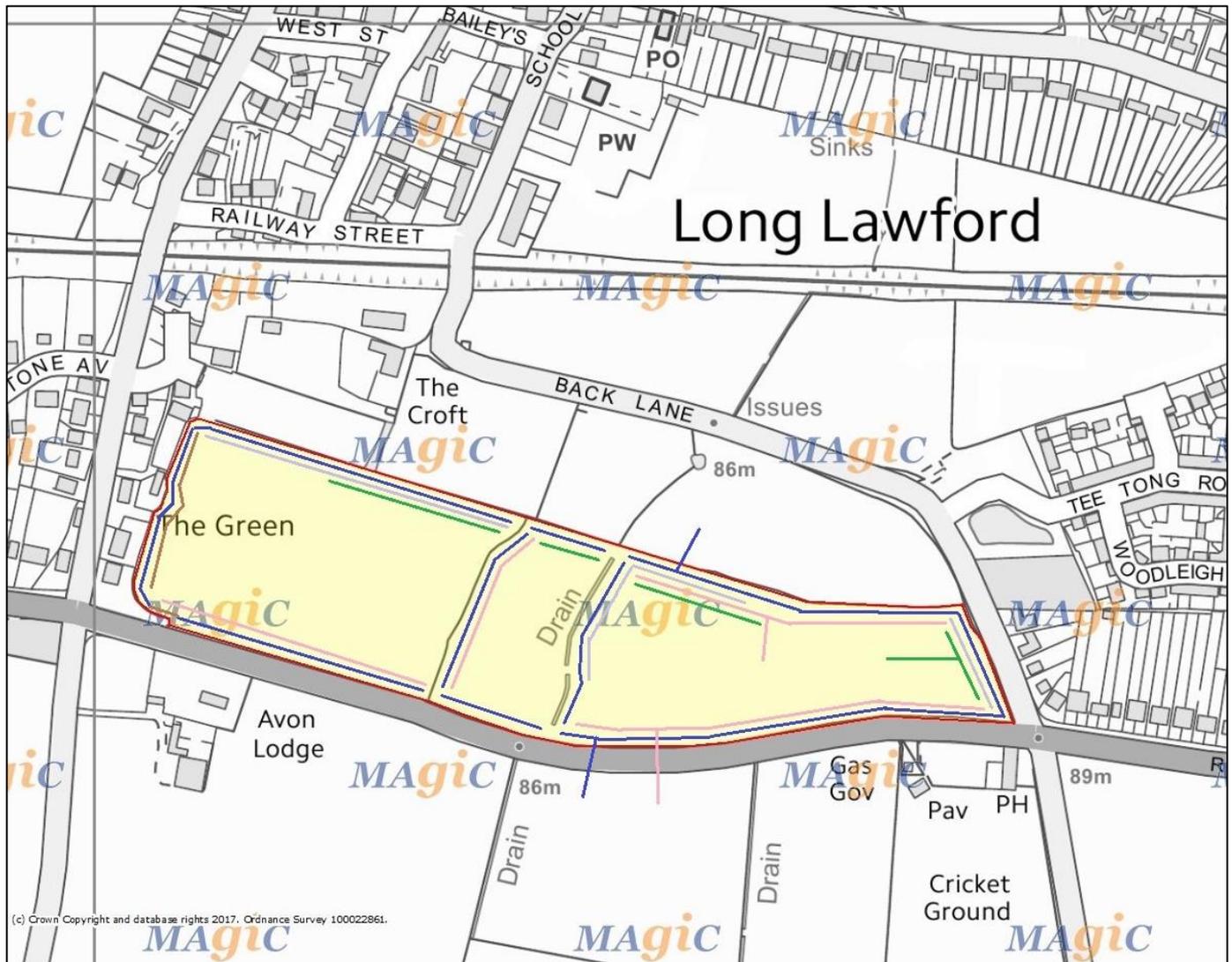
surveyors observed bats using the current development site adjacent to the northern boundary as well as using the main road (A428) and arable fields adjacent to it. There were far fewer bats recorded to the western boundary of the site than the eastern boundary.

- 3.17 One remote automated detector (SM2) was used on the 23rd June, 20th July and the 7th August. The SM2 was placed on in the middle of one of the dry ditches which ran through the centre of the site.
- 3.18 The remote automated detector recorded mostly common pipistrelle bat passes as well as noctule bat passes. A *Myotis bat* species was recorded on 23rd June at 02:18 and on the 7th August a brown long-eared bat was recorded at 22:08.
- 3.19 A figure showing the locations where bats were recorded foraging or commuting are shown in the Figure 3 below.

Survey Constraints

- 3.20 The first dusk survey which was carried out on the 20th July, was not conducted on the same transect route as the other surveys. This was due to restless cattle on the site. The survey transect followed the hedgerows but did not follow the dry ditches running through the centre of site. However, due to the other four surveys following the same transect route it was considered that there were no major constraints to the survey.

Figure 3: Location of foraging and commuting bats



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	Red line boundary
	Foraging and commuting areas of common pipistrelle on the majority of the activity surveys.
	Foraging activity and commuting areas of brown long-eared bats
	Foraging activity and commuting areas of <i>Myotis</i> species
	Foraging activity and commuting areas of soprano pipistrelle
	Foraging activity and commuting areas of noctule

4 IMPACT ASSESSMENT

- 4.1 Based on the plans for the creation of new dwellings with associated infrastructure and access roads on the proposed development site and the results of the bat surveys the following assessment has been made of the likely impacts of the proposed development on bats in the absence of appropriate mitigation.

Roosting Bats

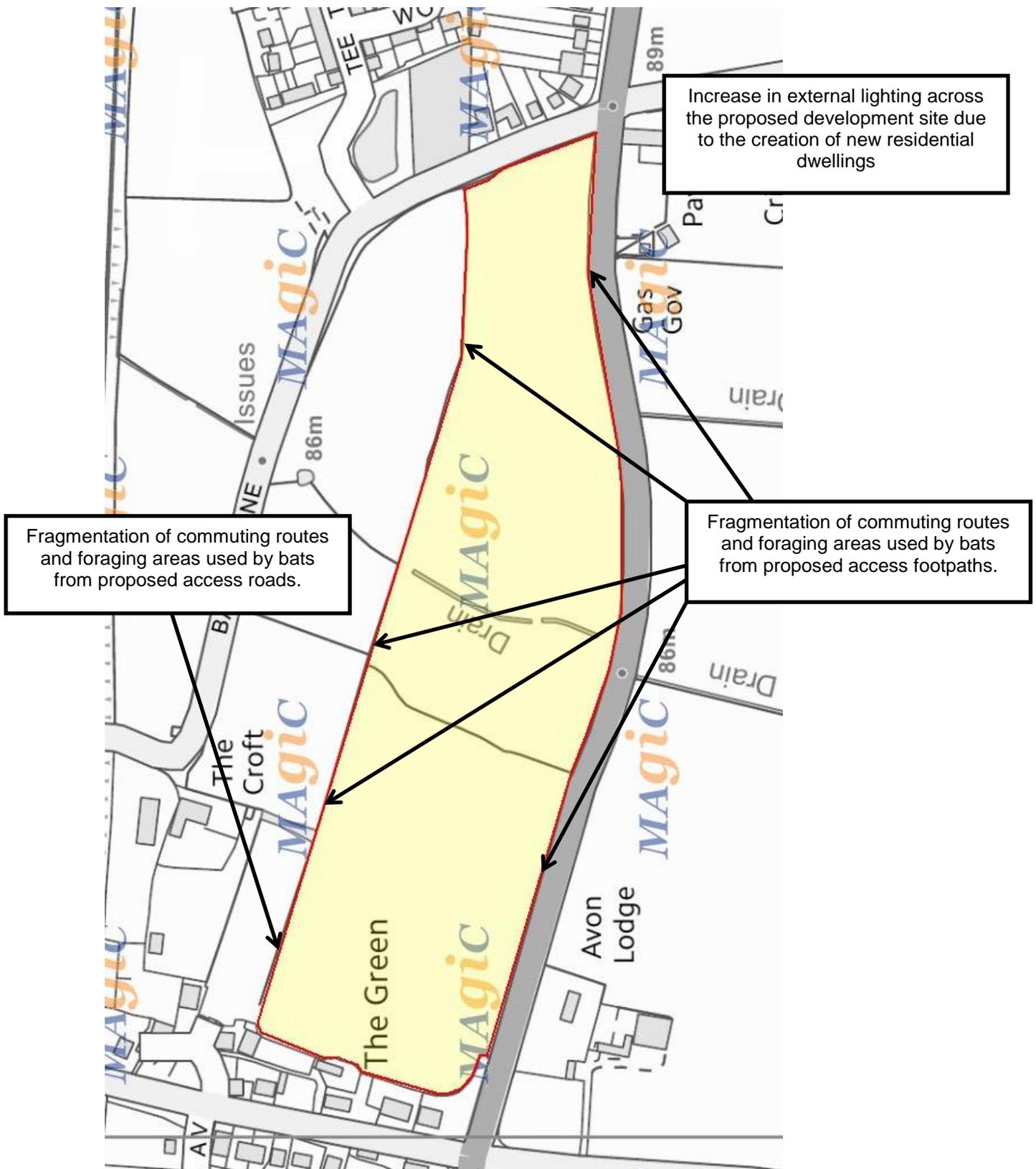
- 4.2 The current plan shows that the trees with low to high bat roost potential will be retained, as part of the proposed development. However, if the trees would be removed, the proposed development could result in the loss, damage or modification of a bat roost as well as potential killing, injury and disturbance to individual bats if a bat roost was present in one of the trees.
- 4.3 The current draft layout shows that there is one new access road proposed through the hedgerow on the northern boundary towards the north east of the site. There are also five new potential access footpaths proposed; two through the southern hedgerow and three through the northern hedgerow.

Foraging and Commuting Bats

- 4.4 The proposed works could without appropriate mitigation cause the following impacts:
- Long term fragmentation of commuting routes such as hedgerows known to be used by bats
 - Long term increase in external lighting and noise levels around the site following the change to residential use.
 - Disturbance to foraging and commuting bats if the development was undertaken at a time of year when bats were active (April to September inclusive).
 - Increase in risk of mortality from cat predation.

- 4.5 Bats were recorded using the hedgerows along the proposed new access roads and footpaths for foraging. It was considered that in the absence of appropriate mitigation, creating new gaps in the existing hedgerows could cause fragmentation of commuting routes, particularly for those species which fly close to hedgerows, eg brown long-eared bat and some *Myotis* species. In addition, the impacts of lighting from new access roads could have a negative impact on commuting bats.
- 4.6 Creating new gaps in existing hedgerows which are known to be used by bats for commuting routes could cause fragmentation between roosts, particularly brown long-eared bats.

Figure 4: Impacts on foraging bats (in the absence of appropriate mitigation)



5 RECOMMENDATIONS

- 5.1 The following recommendations are made to comply with current legislation, planning policy and best practice as recognised by the various statutory authorities.

Work to bat roost potential trees

- 5.2 If any of the six trees identified to have bat roost potential are to be removed or works undertaken to the trees, climb and inspect surveys, possible further emergence surveys and appropriate mitigation would be required. If a bat roost was identified in one of the trees to be removed, a European Protected Species Mitigation Licence would be required.
- 5.3 Trees with moderate to high bat roost potential would require climb and inspect surveys which can be carried out all year round and would involve a detailed, visual survey of any trees with bat roost potential which are scheduled to be felled. The survey will be carried out by a Natural England Bat Licence holder, with NPTC CS38 tree climbing/aerial rescue certificate. This could eliminate further bat survey work if no signs of bats are found.
- 5.4 If signs of bats were found during the climb and inspect surveys, further dusk emergence surveys would be required.
- 5.5 Trees with low bat roost potential will not require climb and inspect surveys but will need to be felled using a soft-fell approach under the supervision of a bat licenced ecologist.

Restrictions in external lighting

- 5.6 External lighting would have a negative impact upon foraging and roosting bats, and on bat roosts if present within onsite trees. The use of lights near a known bat roost, or an area known to be used by bats that results in disturbance to bats and their normal patterns of behaviour is likely to be unlawful. Therefore the implementation of a lighting minimization scheme is recommended.

5.7 To minimise risk of disturbance to foraging and commuting, and potentially roosting bats on the site, the follow lighting minimisation precautions are recommended for the development:

- No works on site should be conducted after sunset and if security lighting is required then this should be kept to the minimal level (as necessary for safety and security).
- Post development lighting should be directed away from boundary and onsite trees and hedgerows that are to be retained.
- Any external lighting which is required for access (particularly where these occur along hedgerows) should be positioned low down (no higher than 1m from the ground) and the lights should be covered with a hood.
- Installation of lighting columns at the lowest practical height level with box shield fittings will minimise glare and light spillage.
- Lux level of lamps should be as low possible and be high pressure sodium (rather than metal halide, or other) with covers made from glass rather than plastic as this minimises the amount of UV light, reducing the attraction effects of lights on insects.
- Security lights should be set on short timers, and be sensitive to large moving objects only.

5.8 Please refer to the publication, *Bats and Lighting in the UK* for more information.

Avoidance and compensation measures for the loss of and fragmentation of commuting routes

5.9 We recommend that the existing gaps in hedgerows are used for the proposed access roads. This would reduce the requirement for creating new gaps in the hedgerows.

5.10 If this is not possible, we recommend that the existing gaps in the hedgerows should be plug-planted up with native species. These should be planted in the

autumn or in the spring. Alternatively, new planting of hedgerows using native species should be incorporated into the proposed development.

6 CONCLUSIONS

- 6.1 Six trees with low to high bat roost potential were identified during an initial assessment on 18th April 2017 (see Figure 2).
- 6.2 The current layout shows that the six trees identified with bat roost potential would be retained. However, if the trees would need to be removed, then a climb and inspect survey is required. If signs of bats are found, further emergence surveys and appropriate mitigation would be required. This would include the provision of a European Protected Species Mitigation Licence.
- 6.3 Trees to be removed that have low bat roost potential should be felled using a soft-fell approach and supervised by a bat licenced ecologist.
- 6.4 A sensitive lighting scheme would be required to ensure that the bats are not affected by an increase in external lighting from new houses.
- 6.5 Common pipistrelle, soprano pipistrelle and noctule bats were recorded foraging around the site, and were recorded using the hedgerows as commuting routes. Brown long-eared bats were recorded foraging on the hedgerows to the north western boundary of the site on one of the dawn activity surveys (5th August 2017). It was recorded at a time which could suggest that there is a roost nearby. *Myotis* bat species were recorded on the back to back duck and dawn survey (4th and 5th September). The common pipistrelle and *Myotis* bats were recorded at times after sunset to suggest that there was possibly a roost nearby. Noctule and soprano pipistrelle bats were recorded at times which suggest there were no roosts nearby.
- 6.6 The current layout shows that the proposed development will involve creating new access roads and footpaths through two of the existing hedgerows at six separate areas. Adequate mitigation and compensation will be required to reduce the impacts of bat commuting routes becoming fragmented, including implementation of a lighting minimization scheme.
- 6.7 Appropriate compensation measures include the planting up of existing gaps with native species, such as oak, hornbeam, blackthorn and hawthorn.
- 6.8 .

- 6.9 If works do not commence within 12 months of the date of these surveys, updated active season surveys will be required to identify any changes which may have occurred in the interim.

7 REFERENCES

Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd edition (2016). Bat Conservation Trust, London.

Bat Mitigation Guidelines, English Nature, 2004

Bats and Lighting in the UK: Bats and the Built Environment Series, BCT.

National Planning Policy Framework (2012) ISBN: 9781409834137

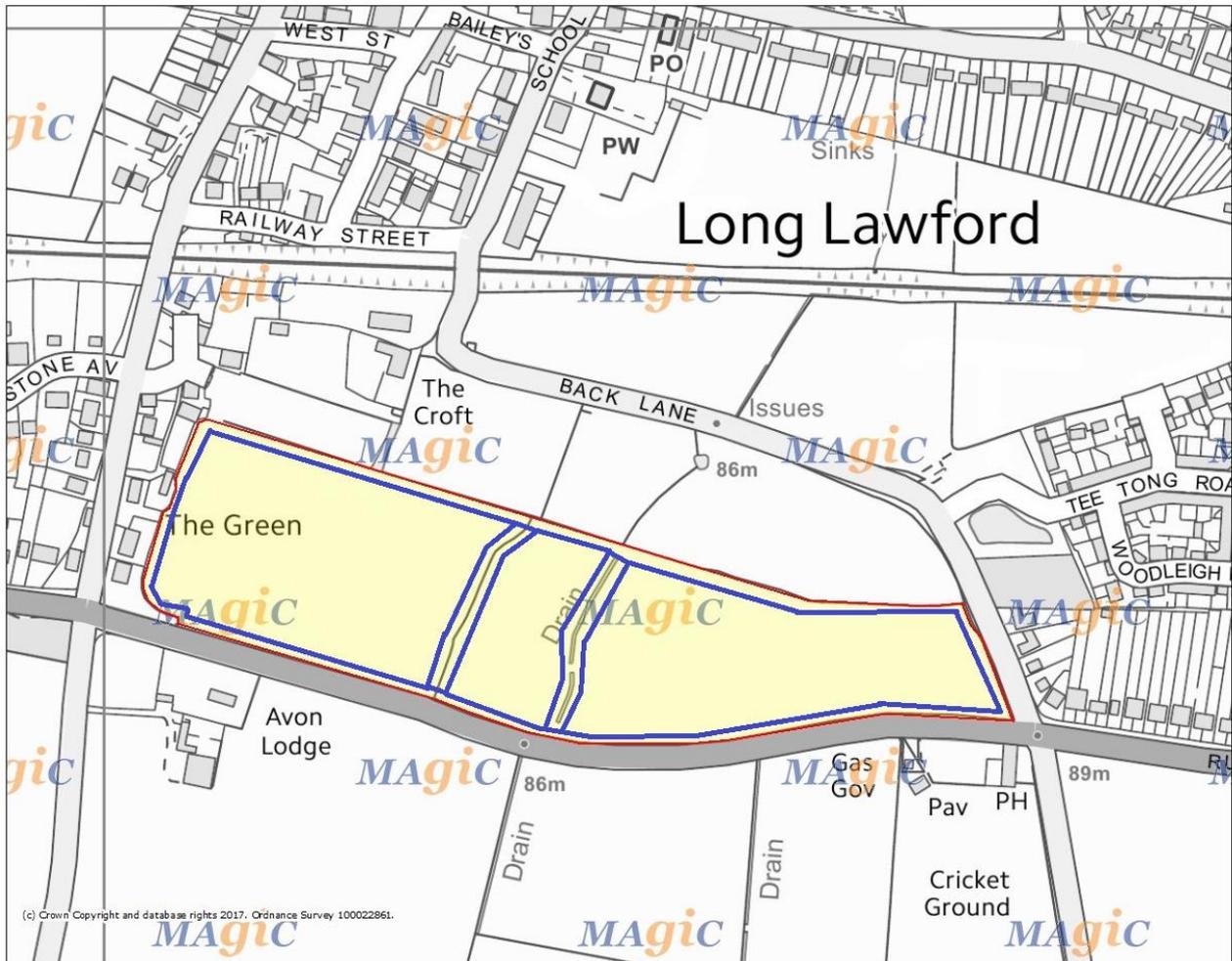
Web references

Natural England online guidance: "Bats: surveys and mitigation for development projects.

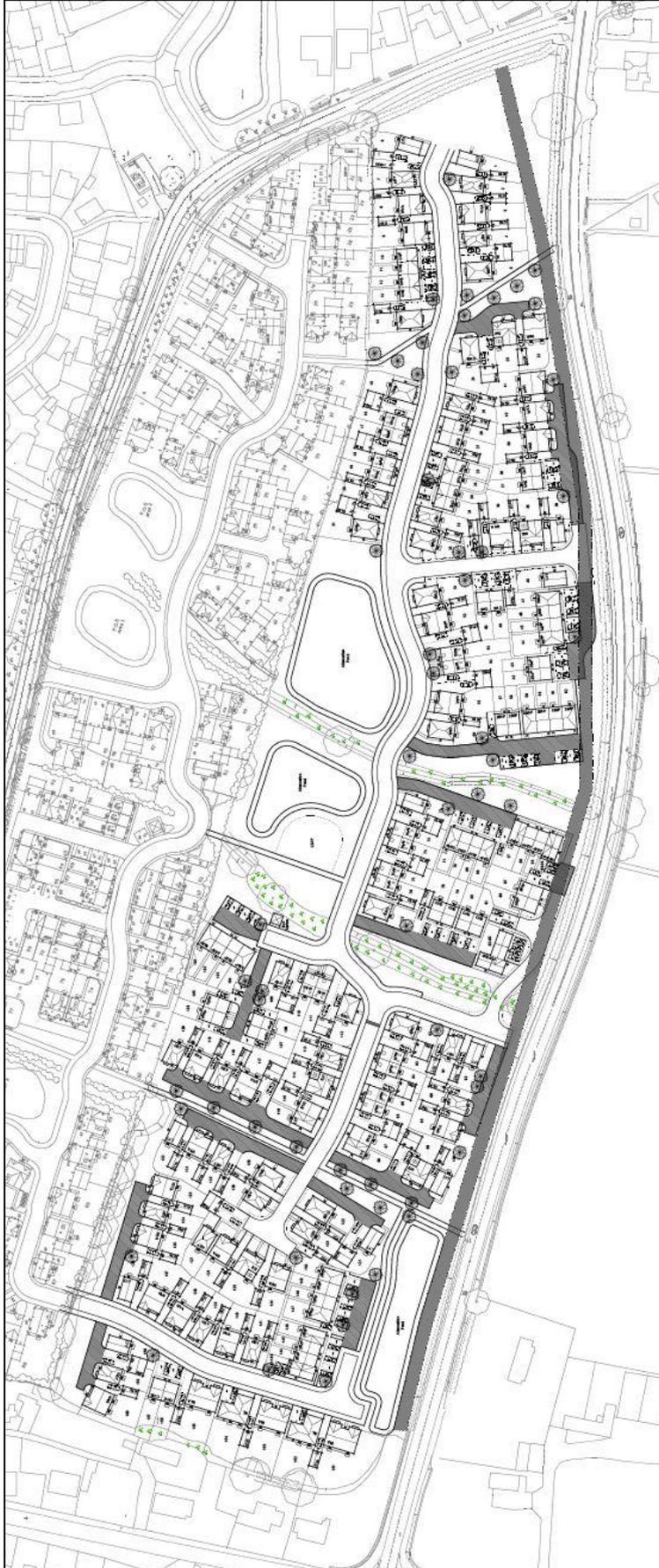
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8 APPENDICES

Appendix A: Transect routes followed on dusk and dawn activity surveys



Appendix B: **Proposed site plan**



Appendix C: Photographs of proposed development site

<p>Tree 1 which was considered to have moderate bat roost potential (see Figure 2).</p>	
<p>Tree 2 which was considered to have low bat roost potential (see Figure 2).</p>	
<p>Tree 3 which was considered to have moderate bat roost potential (see Figure 2).</p>	
<p>Tree 4 which was considered to have high bat roost potential (see Figure 2).</p>	

	
<p>Tree 5 which was considered to have high bat roost potential (see Figure 2).</p>	
<p>Tree 6 which was considered to have low bat roost potential (see Figure 2).</p>	