Gladman Developments Ltd

Dover Road, Deal, Kent

BAT SURVEY REPORT

November 2017

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1.0 SUMMARY

1.1 A suite of bat surveys were undertaken on a site comprising grazed and ungrazed horse paddocks with a block of immature woodland located on the eastern section of the site.

1.2 Ground based trees surveys were undertaken on the 11th November 2016 and three trees (T1, T2, and T3) were identified as having low to negligible potential to support roosting bats. No evidence of roosting bats was found however, due to the transient nature of bats roosts it is recommended that should any arboricultural works be required a soft fell technique be used. Should any other trees be affected by the development proposals then further survey work would be required.

1.3 On the 11th November the four stable buildings within the site were surveyed for their potential to support roosting bats, all were found to lack suitable features and further surveys are not considered necessary.

1.4 Activity surveys for bats were conducted within the site involving walked transects and automated static monitoring techniques. Surveys were conducted in May, July and September 2017 to cover the spring, summer and autumn activity periods, in line with published guidance and during suitable weather conditions.

1.5 Activity surveys indicated that widespread and common bat species utilise the site for foraging and commuting across the wider landscape, although only in low numbers and with generally low levels of activity overall. Common pipistrelle *Pipistrellus pipistrellus* was the most frequently recorded species, followed by serotine *Eptesicus serotinus*, Nathusius's pipistrelle *Pipistrellus nathusii,* soprano pipistrelle *Pipistrellus pygmaeus*, *Nyctalus* species*,* with low levels of use by brown long-eared *Plecoyus auritus* and *Myotis* species bats.

1.6 The transect surveys recorded the highest activity levels along the woodland edge and in the north west of the site where mature scattered trees are within the field.

1.7 Given the low activity levels suggesting low significance of the site for bats overall, and the proposed retention and buffering of the features that are of greatest importance in the context of the site, the proposed development is not likely to impact the favourable conservation status of bats locally.

1.8 The provision of open space, retention and creation of woodland and hedgerows, along with the recommended sensitive lighting scheme and provision of bat boxes will provide for bats post-development with the potential to improve the Favourable Conservation Status of the local bat population.

2.0 INTRODUCTION

2.1 This report has been produced by FPCR Environment and Design Ltd for Gladman Developments Ltd and provides details of bat surveys undertaken at a site at Deal, Kent.

2.2 The approximate 4.06ha site, centred on grid reference TR 367 495, comprised grazed and ungrazed horse paddocks separated by fences and a block of immature woodland, with Dover Road bordering the site to the west. The northern boundary is immediately adjacent to residential gardens. The site is located to the south of Walmer town and north of Ringwould. The town of Deal is located 2.6km to the north east and the coastline is located 1.2km to the east. The wider area to the east and west is largely rural and comprises arable fields and pasture. To the north the surrounding area is residential, whilst to the south there is additional pasture, a small reservoir and commercial buildings.

2.3 Ground based tree surveys, building inspections and bat activity surveys were undertaken at the site. The objective of the building inspections and ground based tree surveys was to establish whether any bat roosts were present within the buildings or on-site trees that are likely to require removal or arboricultural works as part of the proposals.

2.4 Bat activity surveys were undertaken at the site to assess the use of the site by bats and gather data on the species, abundance and utilisation of various areas and features of the site. The survey involved two techniques; the use of walked transects and static monitoring. Activity surveys for bats were undertaken in May, July and September (i.e. assessing activity in the spring, summer and autumn periods) during 2017. The methodology and results of all bat surveys are provided in this report.

Proposed Development

2.5 The proposed development comprises up to 85 new dwellings, with associated infrastructure and landscaping.

3.0 LEGISLATION

Bats

3.1 All bats and their roosts are afforded full legal protection under the Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife & Countryside Act 1981 *(*as amended). The purpose of the legislation is to maintain and restore protected species to a situation where their populations are favourable.

3.2 Under Regulation 41 of the Conservation of Habitats and Species Regulations 2010 (*as amended*) it is illegal to deliberately capture, injure or kill; deliberately disturb (including intentionally or recklessly) all UK bat species. This includes disturbance which impairs their ability to: breed and rear young; migrate; and hibernate, or affects their local distribution and abundance. Under the Wildlife and Countryside Act 1981 (as amended) it is illegal to:

- Recklessly or intentionally kill, injure or take any wild animals included in Schedule 5;
- Recklessly or intentionally damage or destroy, or obstruct access to any structure or place which any wild animal included in Schedule 5 uses for shelter or protection;

- Recklessly or intentionally disturb any such animal while it is occupying a structure or place which it uses for shelter or protection.

3.3 Foraging habitat and commuting routes used by bats are not protected as such, but impacts that could prevent bats from using a resource or commuting to or from a valued roosting site may be considered as an indirect impact on a roost or a significant disturbance effect and would therefore also need to be avoided or prevented.

3.4 Some British bats (soprano pipistrelle, brown long-eared, noctule *Nyctalus noctula*, Bechstein's *Myotis bechsteinii*, greater horseshoe *Rhinolophus ferrumequinum* and lesser horseshoe *Rhinolophus hipposideros*) are listed 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 which advises that when determining planning applications, Local Planning Authorities 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;

4.0 METHODOLOGY

4.1 During the extended Phase 1 habitat survey on 11th November 2016, all trees within and bordering the site were assessed from ground level for their suitability to support roosting bats, by a suitably experienced ecologist from FPCR. The methodology and results of this survey are provided in the Ecological Appraisal (FPCR April 2017) with a summary of the findings detailed in the results section.

4.2 Trees were classified into general bat roost potential groups based on 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[1].

4.3 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.

[1] Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust

Table 1: Classification and Survey Requirements for Bats in Trees

Classification of Tree	**Description of** Category and Associated Features **(based on** Potential Roosting Features **listed above)**	**Likely Further Survey work / Actions**
Confirmed Roost	Evidence of roosting bats in the form of live / dead bats, droppings, urine staining, mammalian fur oil staining, etc.	A Natural England derogation licence application will be required if the tree or roost site is affected by the development or proposed arboricultural works. This will require a combination of aerial assessment by roped access bat workers **and** / **or** nocturnal survey during appropriate period (May to August) should be used to inform on the licence. Replacement roost sites commensurate with status of roost to be provided. Works to be undertaken under supervision in accordance with the approved good practice method statement provided within the licence. **However,** where confirmed roost site(s) are not affected by works, work under a precautionary good practice method statement may be possible.
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** / **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, a precautionary working method statement is likely to be required. If roost sites are confirmed a licence from Natural England will be required.

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey work / Actions
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, a precautionary working method statement may be required. If a roost site/s is confirmed a licence from Natural England will 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 limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes.	No further survey required but a precautionary working method statement may be required.
Negligible/No potential	Negligible/no habitat features likely to be used by roosting bats	None.

* The Conservation of Habitats & Species Regulations 2010 (as amended) affords protection to "breeding sites" and "resting places" of bats. The EU Commission's Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC, February 2007 states that these are places "where there is a reasonably high probability that the species concerned will return".

4.4 During the extended Phase 1 habitat survey, on 11th November 2016, the buildings on site were assessed for their potential to support roosting bats, by a suitably experienced ecologist from FPCR. The methodology and results of this survey are provided in the Ecological Appraisal (FPCR April 2017) with a summary of the findings detailed below where appropriate.

Desk Study

4.5 To support the initial extended Phase 1 habitat survey of the site (November 2016) and further compile existing baseline information relevant to the site, ecological information was sought from third parties. This included records of protected or notable species from 1km from the site, including bats. Organisations contacted included Kent and Medway Biological Record Centre (KMBRC).

4.6 The Multi Agency Geographic Information for the Countryside (MAGIC) website[2] has been reviewed for the presence of any statutory designated sites for bats of international (Special Area of Conservation (SAC), national (Site of Special Scientific, (SSSI)) or local nature conservation importance (Local Nature Reserves (LNR)) within 5km of site.

Nocturnal Activity Surveys

Transect Survey

4.7 The site was considered to provide low potential for foraging and commuting bats and therefore one dusk and two dawn transect surveys were undertaken during 2017, one in May to assess bat activity in Spring, one in July to assess bat activity in summer, and one in September to cover the autumn season. The objective of the transect surveys was to identify foraging areas, commuting routes and to gain understanding of species utilisation of the site.

4.8 The transect routes were determined prior to survey in order to sample all areas of the site with those identified as having higher suitability being the main focus, as well as including point count stops to identify activity levels around these features of potential value to bats. Each point count was between 5 and 10 minutes long, during which time all bat activity was recorded. The point counts were strategically located throughout the site to ensure a comprehensive coverage of habitats present. Figures 1, 2 and 3 show the transect route and location of point count stops.

4.9 The dusk transects commenced at sunset, and continued for two to three hours. The dawn surveys commenced two hours before sunrise and finished at sunrise.

4.10 The surveys were undertaken by appropriately experienced ecologists from FPCR. Each transect was walked at a steady pace 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. 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.

4.11 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.

4.12 Transect surveys were undertaken during suitable conditions (i.e. when the ambient air temperature exceeded 10ºC and there was little wind and no rain) on 30th May, 14th July and 21st September 2017.

4.13 Post-survey, where necessary, bat calls were analysed using the AnalookW software package (Titley Electronics) and BatSound (version 4), by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. This analysis was completed by a suitably experienced ecologist. From this, the level of bat activity across the site in relation to the abundance of individual species foraging and commuting along habitats was assessed.

[2] http://magic.defra.gov.uk/ [accessed 17.02.17]

Static Monitoring

4.14 Passive monitoring was undertaken using an automated logging system (Song Meter® SM4BAT FS, Wildlife Acoustics Inc.) with its output saved to an internal storage device. This information was used to supplement transect survey data and derive an index of activity and species composition within the site. One SM4BAT FS device was positioned at points along the western boundary during spring and summer, and one SM4BAT FS device was positioned on the eastern side of the site, along the western edge of the immature woodland during autumn (Figure 4). These were set up to record bat contacts for five consecutive nights in suitable weather conditions (little no rain/wind and temperatures above 10°C). The detectors was programmed to activate 30 minutes before dusk and recorded continuously until 30 minutes following sunrise. The output from this detector was subjected to computer analysis using the AnalookW software package (Titley Electronics). Analysis was undertaken by suitably experienced bat ecologists from FPCR. Static bat detectors were deployed within the site from 25st to 30th of May, 13th to 18th of July and 20th to 25th of September 2017.

4.15 The analysis of the SM4BAT FS files recorded can highlight the presence of more than one bat if they are recorded simultaneously on the same sound file. However, it is not possible to determine whether consecutive sound files have been recorded as the result of a single bat passing the detector as it commutes across the landscape or by one bat repeatedly triggering the detector as it forages in close proximately for an extended period. Therefore, each sound file is counted as a single bat registration. The number of bat registrations does however reflect the relative importance of the location of the detector by calculating the bat registrations per hour.

4.16 Table 2 below provides the survey timings and weather conditions for the bat activity surveys.

Table 2: Nocturnal Bat Survey Timings and Conditions

Date	Survey type	Timing/ Weather conditions
25th – 30th May 2017	Static survey (spring period)	Weather conditions suitable for time of year
30th May 2017	Transect (spring period)	20:58 to 22:58 (sunset 20:58) Min. temp during survey: 15°C, 5% cloud cover, light breeze, no rain.
14th July 2017	Transect (summer period)	02:55 to 04:55 (sunrise 04:55) Min. temp during survey: 15°C, 80% cloud cover, light breeze, no rain.
13th – 18th July 2017	Static survey (summer period)	Weather conditions suitable for time of year
21st September 2017	Transect (autumn period)	04:38 to 06:38 (sunrise 06:38) Min. temp during survey: 15°C, 40% cloud cover, moderate breeze, no rain.
20th to 25th September 2017	Static survey (autumn period)	Weather conditions suitable for time of year

Limitations

4.17 During the autumn static detector survey, the minimum overnight temperature dropped to 7°C for one of the recording nights. While these conditions are below optimum for bat surveying, they are

representative for the time of year and would not therefore have significantly influenced bat activity. Therefore, it is considered that the data collected is sufficient to inform the application and its potential impacts upon bats.

4.18 In the case of the building inspections, internal access was not possible due to the presence of horses, however given the potential and features observed, this is not considered to be a constraint to determination of the level of bat potential.

5.0 RESULTS

Desk Study

5.1 KMBRC returned bat records from Kent Bat Group for locations within 5km of the site. The only one of these within 1km of it was a common pipistrelle record from 2000 located approximately 500m east. There was also a 1999 record of a brown long-eared bat located in an adjacent tetrad to that of the site. The records did not indicate whether this was a bat roost record or an individual bat sighting (Ecological Appraisal, FPCR April 2017).

Tree Assessment

5.2 Of the two mature trees noted within the site both were considered to have low potential to support bat roosts. A third tree located just outside of the boundary wall on the north western site boundary was also considered to have low bat roost potential. These are summarised in Table 3 (below). A brief description of the possible roost features and the category for level of bat roost potential is provided in Table 3.

Table 3: Results of Ground Level Tree Assessments for Potential Bat Roosts.

Tree reference	Species	Category (See Table 1)	Comments
1	Sycamore	Low	Split limb, but resulting crevice facing upwards / open to elements
2	Sycamore	Negligible	Small upward facing cavity on broken limb
3	Sycamore	Low	Ivy covered stem; small fissures in bark

5.3 None of the other trees located within or at the boundaries of the site required aerial inspection, as all can be retained and unaffected by the proposed development.

Building Assessment

5.4 None of the buildings, which comprise stabling, present within the site were considered to have any potential to support roosting bats and no evidence of bats was recorded. These are summarised in Table 4 (oveleaf).

Table 4: Building Assessment for Potential Bat Roosts.

Ref	Picture	Description	Potential
B1		B1 was a single-storey, wooden clad stable building with a pitched corrugated metal roof. Features of note were the gable ends. No evidence of bats was observed.	Overall, the building appeared to be well sealed with no obvious access points so was considered to have negligible potential to support a bat roost.
B2		B2 was a single-storey, wooden clad stable building with a pitched corrugated metal roof with a metal ridge. There was a single storied extension on its southern aspect, with a flat felted roof, and partially weather-boarded sides. Potential access points were limited to occasional gaps under the roof and the weatherboarding. No evidence of a bat roost was observed.	The features present within B2 were of limited value, internally the building appeared to have no roof void or underboarding and was considered to be too light and airy to be used as a bat roost and therefore had negligible potential to support a bat roost.
B3		B3 was a single-storey, wooden clad stable building with a pitched corrugated metal roof. Features of note were gable ends, and wooden barge boards. No evidence of bats was observed.	Overall, the building appeared to be well sealed with no obvious access points so was considered to have negligible potential to support a bat roost.
B4		B4 was a single-storey, wooden clad storage building with a pitched corrugated metal roof. Features of note were gable ends, and eaves-level vents at the western aspect. The western aspect had a large opening covered by a plastic curtain. No evidence of bats was observed.	Access points were limited to the vents on the western aspect. Due to the large opening on the western side the building was considered to be light and airy and was considered to have negligible potential to support a bat roost.

Transect Surveys

5.5 The following is a summary of the nocturnal transect survey data. Full details of bat contacts are provided on the relevant figures. The transect route and locations of where bats were recorded are provided on Figures 1 to 3.

5.6 The first transect survey was conducted on 30th May 2017 during suitable weather conditions. During the survey a total of two contacts were recorded during the walked transect and six during the point counts. Common pipistrelle was the species mostly recorded, with one *Nyctalus* species recorded during the survey. Bat activity was recorded sporadically throughout the site in association with the woodland and the south and western boundaries. The maximum number of bats recorded at any one time was one common pipistrelle.

5.7 The second transect survey was conducted on 14th July 2017 during suitable weather conditions. During the survey a total of six contacts were recorded during the walked transect and six during the point counts. Common pipistrelle was the only species recorded throughout the survey. Bat activity was recorded in the north east and north west corners of the site in association with the mature trees, scrub and woodland edge. The maximum number of bats recorded at any one time was one common pipistrelle.

5.8 The third transect survey was conducted on 21st September 2017 during suitable weather conditions. During the survey a total of four contacts were recorded during the walked transect and one during the point counts. Common pipistrelle was the only species recorded throughout the survey. Bat activity was recorded along the south and east boundaries of the site in association with the woodland edge and the semi improved grassland margin. The maximum number of bats recorded at any one time was one common pipistrelle.

Static Monitoring

5.9 A summary of the static monitoring data obtained across the survey seasons is provided in Table 5, with the full data provided in Appendix A. The locations of the static detector units is shown in Figure 4.

Spring (May 2017)

5.10 One SM4BAT FS bat detector was situated along the western boundary, which borders Dover Road, from 25th to 30th May 2017. The unit recorded a total of 232 bat registrations over the 46 hour survey period with common pipistrelle the most frequently recorded species. Nathusius's pipistrelle, soprano pipistrelle, brown long-eared and N*yctalus species* were also recorded.

Summer (July 2017)

5.11 One SM4BAT FS bat detector was situated along the western boundary, which borders Dover Road, from 13th to 18th July 2017. The unit recorded a total of 1530 bat registrations over the 46 hour survey period with common pipistrelle the most frequently recorded species. Serotine, soprano pipistrelle, N*yctalus* species, *Pipistrelle* species and M*yotis* species were also recorded.

Autumn (September 2017)

5.12 One SM4BAT FS bat detector was situated on the woodland edge on the east of the site from the 20th to 25th September 2017. The unit recorded a total of 348 bat registrations over the 70 hour

survey period with common pipistrelle the most frequently recorded species. Serotine, soprano pipistrelle, Nathusius's pipistrelle, *Nyctalus* species, brown long-eared, *Pipistrelle* species and *Myotis* species were also recorded.

5.13 Table 3 provides a summary of all of the static bat detector survey results.

Table 5: Static Bat Detector Survey Results

Survey Period	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
May 2017 (spring)	5.08	232	Common pipistrelle (220)	Nathusius's pipistrelle (6) Soprano pipistrelle (3) *Nyctalus* sp. (2) Brown long-eared (1)
July 2017 (summer)	32.95	1530	Common pipistrelle (1519)	*Nyctalus* sp. (4) Serotine (3) Soprano pipistrelle (2) *Myotis* sp. (1) *Pipistrellus* sp. (1)
September 2017 (autumn)	4.89	343	Common pipistrelle (233)	Serotine (54) Soprano pipistrelle (13) Nathusius's pipistrelle (12) *Nyctalus* sp. (20) Brown long-eared (7) *Pipistrellus* sp. (6) *Myotis* sp. (1)

Static Monitoring Summary

5.14 Common pipistrelle bats accounted for the vast majority of bat activity within the site, comprising 93.5% of the total bat registrations recorded over the whole survey season. Relative usage of the site, as shown by percentage of all bat registrations recorded over the duration of the static monitoring period is shown in Table 6, below.

Table 6: Breakdown of Species Recorded

Species	% of Total Bat Registrations
Common Pipistrelle	93.5
Serotine	2.7
Nyctalus Species	1.2
Nathusius's pipistrelle	0.9
Soprano Pipistrelle	0.9
Brown long-eared	0.3
Pipistrelle Species	0.3
Myotis Species	0.1
Social call	0.1

5.15 Overall, the July static bat detector survey recorded more activity than the surveys in May and September. Activity was variable throughout the site and even along the same habitat features on different survey occasions.

5.16 Considering the habitats present within and adjacent to the site, the recorded levels of activity are not considered to be exceptional with the vast majority of bat contacts recorded from species that are common and widespread within the local area.

Note

5.17 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* genus 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 Analook data analysis software package and taking in to account the geographical location of the site and the habitats present. It was therefore considered that *Myotis* species bats were likely to be whiskered/Brandt's or Natterers bats.

Notable Species Recorded

5.18 One notable species of bat, Nathusius's pipistrelle, was recorded in low numbers during the static bat detector surveys in May and September 2017. Nathusius's pipistrelle were recorded on site 6 times during the May survey with the SM4BAT FS detector located on the western boundary. They were also recorded 12 times during the September survey with the SM4BAT FS detector located on the woodland edge.

5.19 One notable species of bat, Serotine, was recorded the static bat detector surveys in July and September 2017. Serotine were recorded on site 3 times during the July survey with the SM4BAT FS detector located on the western boundary. During the September survey they were recorded 54 times with the SM4BAT FS detector located on the woodland edge.

6.0 DISCUSSION AND RECOMMENDATIONS

6.1 All bat species and their habitats are protected under the Wildlife and Countryside Act 1981 (*as amended*) and the Conservation of Habitats and Species Regulations 2010 (*as amended*). In summary these make it an offence to damage, destroy or obstruct any place used by bats for breeding and shelter, disturb a bat, or kill, injure or take a bat. The following sections take into account survey results to provide overall conclusions and recommended mitigation measures.

Roosts

6.2 A roost assessment was undertaken from the ground on the mature trees within the site on 11th November 2016 by a suitably experienced ecologist. During this survey three trees were recorded on site which provided low or negligible bat roosting opportunities. Should these trees need to be removed they should be felled using a soft fell technique as a precautionary measure, to avoid killing or injuring bats, should they utilise this feature subsequently.

6.3 The survey work undertaken on all trees complies with the current recognised survey guidance and was undertaken during the appropriate time of year and in suitable weather conditions. It is

therefore considered there are no statutory constraints to the proposed removal of these trees from the presence of roosting bats. However, in the unlikely event that roosting bats are found during works, all operations on the tree(s) should immediately cease and the advice of a suitably qualified ecologist sought.

6.4 None of the four stable buildings within the site were considered suitable for roosting bats due to the lack of suitable features. No further surveys are considered necessary. However, in the unlikely event that roosting bats are found during works, all operations on the building(s) should immediately cease and the advice of a suitably qualified ecologist sought.

Species Recorded

6.5 Bat activity was recorded within the site during the transect and static bat detector surveys with at least seven species/species groups recorded; common pipistrelle, soprano pipistrelle, Nathusius's pipistrelle, serotine, brown long-eared, *Nyctalus species*, and *Myotis* species. Common pipistrelle were by far the most frequently recorded species recorded during the transect and static detector surveys, with serotine, Nathusius's pipistrelle, soprano pipistrelle, *N*yctalus species, brown long-eared, and *Myotis* species recorded occasionally.

6.6 Nathusius's pipistrelle were recorded during the May and September surveys with less than 15 registrations for each survey period, with the highest number recorded during the September SM4BAT FS survey with 12 registrations. During the whole survey period a total of 18 registrations of Nathusius's pipistrelle were recorded.

6.7 Studies have suggested that Nathusius's pipistrelle migrate to mainland Britain from continental Europe to avoid the harsh winter climate (Russ *et al.* 1998)[3] with individuals specifically entering Britain in autumn to the then return to the European Continent the following spring (Russ *et al.* 2001)[4]. The data gathered from the surveys on the site, in addition to the sites location, would suggest that the Nathusius's pipistrelle bats recorded were potentially migrating as they were recorded during the spring and autumn surveys and the site is located 1.2km west of the coastline.

6.8 Serotine were recorded during the July and September surveys with three registrations during the summer survey period, and 54 during the September SM4BAT FS survey. During the whole survey period a total of 57 registrations of Serotine were recorded.

6.9 The National Bat Monitoring Programme (NBMP) suggests populations are stable[5], although, in Kent there is still a decline[6]. Serotine bats were mainly recorded during the autumn static detector survey, with three calls being recorded during the summer survey, and 54 registrations of serotine being recorded during the autumn survey. They were recorded on four of the five nights the SM4BAT FS detector was deployed and calls were recorded between the hours of 19:00 and 20:00 suggesting there could be a roost nearby.

6.10 On the 20th September 13 calls were recorded and on the 21st September six calls were recorded. No serotine bats were recorded on the 22nd and then on the 23rd this went up to 23

[3] Russ, J.M *et al.* (1998) Nathusius's pipistrelle bats (*Pipistrellus nathusii,* Keyserling & Blasius 1839) bredding in Ireland. Journal of Zoology, Vol. 245. Pp 345-349.
[4] Russ, J.M *et al.* (2001) The status of Nathusius's pipistrelle (*Pipistrellus nathusii* Keyserling & Blasius, 1839) in the British Isles. Journal of Zoology, Vol 254. Pp 91-100.
[5] Serotine Trends for Great Britain (2016) http://www.bats.org.uk/pages/-serotine-827.html [accessed 23.10.17]
[6] The Status of Kent's Wildlife (2011) http://www.kentbap.org.uk/images/uploads/Kents_Wildlife _Book.pdf [accessed 23.10.17]

calls followed by 12 on the 24th September. No serotine bats were recorded during the transect surveys and their use of the site was not consistent throughout the seasonal survey period.

6.11 The analysis of the SM2BAT+ files recorded can highlight the presence of more than one bat if they are recorded simultaneously on the same sound file. However, it is not possible to determine whether consecutive sound files have been recorded as the result of a single bat passing the detector as it commutes across the landscape or by one bat repeatedly triggering the detector as it forages in close proximately for an extended period.

6.12 Bat activity was considered to be low overall and the assemblage and level of use of the site unexceptional given the site's rural edge setting and the mixture of habitats present along the site boundaries. The highest level of activity recorded during the transect surveys was along the eastern boundary in association with woodland edge. Activity was recorded in this area across all three of the transect surveys. The north western boundary had bat activity recorded on most transects in association with the mature trees.

6.13 The static detector survey in spring recorded very little activity associated with the boundary along Dover Road. During the summer activity levels were higher along the same boundary, however the activity levels were unexceptional and dominated by common pipistrelle. During the autumn static detector survey numbers of bat calls where low considering the location of the static bat detector along the woodland edge. Serotine bats are a high flying species, found foraging at around tree top height[7] and so the development should not impact on their Favourable Conservation Status (FCS). It is however important to minimise the effects of the development upon the bats with lighting being kept to a minimum around the woodland edge as per sections 6.18 and 6.19 within this document.

6.14 Overall, the levels of activity and assemblage of species indicate that the site is not likely to be of great significance for the local bat population, although the boundaries do provide a resource for low number of bats. It is therefore considered that the proposed development of the site would therefore not impact detrimentally on the Favourable Conservation Status (FCS) of bats locally, especially given that the features of greatest interest, hedgerows, mature trees and woodland block are to be retained and buffered from the built development.

6.15 Furthermore, the creation of additional green links through the site will improve connectivity for bats and the sustainable drainage features may provide additional foraging opportunities. An attenuation pond and associated SUDS required as part of the drainage proposals create an opportunity to provide additional wetland features. The retained hedgerows and mature trees should be buffered from residential development, and its enhancement should be incorporated into landscaping proposals, which will keep connectivity to areas such as the woodland to the east intact. Enhanced habitat connectivity will be achieved through the planting of tree belts, hedgerow and scrub and it is recommended that an appropriate lighting scheme is devised and implemented.

6.16 The habitats including hedgerows, tree lines, and woodland connect the site to larger woodland blocks to the south and therefore provide potential for use by bats. The site consists of semi-improved grassland of negligible value, though some individual common pipistrelle were observed foraging over this field, a hedgerow, and an immature woodland plantation. Common pipistrelle is a widespread species that is commonly associated with the habitat types within the

[7] Serotine Bat Factsheet (BCT, 2010) www.bats.org.uk [accessed: 23/10/2017]

application site and surrounding landscape. New habitat creation proposals aim to increase the diversity of habitats present and provide structural diversity, with scrub, trees, informal and formal grassland areas.

6.17 The proposals will result in the loss of the grassland habitats within the core of the site. The removal of a small section of the boundary will be required to facilitate an access road through to Dover Road, which is unlikely to affect bats adversely, as the break in the boundary will be kept to a minimum, and there was an unexceptional amount of bat activity along it. It will however be important to ensure that dark corridors are maintained along connectivity features to avoid impacts on bats. Lighting mitigation is discussed below.

Lighting

6.18 Some more sensitive species of bat are known to be deterred by artificial lighting and it can adversely influence invertebrate distribution and life cycles in turn affecting the availability of prey for bats. In order to avoid impacts associated with light spill on potential roost locations, bat commuting flight-lines or foraging habitat, the following measures should be implemented:

- 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.

6.19 The above measures will minimise light spill onto potential commuting / foraging routes and minimise potential disturbance caused through the lighting of corridors. This mitigation would ensure that the overall impact caused by lighting the site is negligible.

Enhancements

6.20 To enhance the value of the site for bats and provide additional roosting features to complement the retained and created habitat and open space, it is recommended that nine bat boxes are installed on retained trees around the boundary of the site. A range of boxes could be installed to provide for a range of bat species such as pipistrelle and *Nyctalus species*. Boxes should be positioned at least 3m from the ground. Lighting of natural roosting features and bat boxes must be avoided.

6.21 Roosting opportunities for bats could be enhanced by the provision of bat bricks incorporated into the built fabric of residential dwellings. Bat bricks could be positioned on the southern, eastern and western elevations of buildings at least 4m from the ground. Bat bricks should be arranged around the development in different locations so that a number of different aspects are covered to provide a variety of alternative roost sites.

6.22 It is considered that with the implementation of the above recommendations the Favourable Conservation Status of bats in the local area will be enhanced through the provision of extensive green space and bat roosting provision replacing the currently poor foraging and commuting habitats currently present.

7.0 NON TECHNICAL SUMMARY

7.1 The level of bat activity identified on site during the 2017 survey period was generally unexceptional and not considered to be significant. Several commuting and foraging routes for bats have been identified on site comprising of boundary features such as the woodland edge, trees along the boundary to the west and the scattered trees in the north west of the site. The majority of these features are to be retained within the development proposals, with small sections of the western boundary to be lost to facilitate access through site.

7.2 Whilst two notable species of bat were identified on site (Nathusius's pipistrelle and serotine) none of these species were confirmed to be using the site significantly. The species assemblage using the site is not exceptional or unexpected given the geographical location and the existing habitats within the site boundary or the wider area.

7.3 The grazed and ungrazed pasture land which dominates the site is of negligible value for bats and although the hedgerow, mature trees and woodland present on site provide some value for foraging and commuting, these are to be largely retained and buffered and enhanced within the development proposals.

7.4 No evidence of bat roosts within the site was found. Three trees were considered to have low bat roost potential. If any of these trees are to be lost or isolated due to the development, then further surveys will be required to establish the presence of bat roosts.

7.5 In conclusion if the mitigation and enhancements proposed are implemented within the development, this will ensure the 'favourable conservation statuses' of all species identified using the site over the survey will be maintained. The proposals may properly be considered to accord with the requirements of the Conservation of Habitats & Species Regulations 2010 (as amended) and the NPPF (2012).

APPENDIX A: STATIC BAT DETECTOR DATA SUMMARY

Recording Period	Unit Number	Survey Dates	Survey Hours	Total Avg.per hour	Total Registrations	Common Pipistrelle			Serotine			Nyctalus Species			Nathusius' pipistrelle			Soprano Pipistrelle			Brown Long-eared			Common / Nathusius' Pipistrelle			Myotis Species			Common / Soprano Pipistrelle			Social Call		
						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	Avg.per hour	Peak Count	Period Total
Spr	21	25/05/2017 - 30/05/2017	45	5.08	231	4.81	70	219	0.00	0	0	0.04	1	2	0.13	3	6	0.07	2	3	0.02	1	1				0.00	0	0	0.00		0	0.00	0	0
Sum	0	13/07/2017 - 18/07/2017	46	33.19	1530	32.95	950	1519	0.07	3	3	0.09	2	4	0.00	0	0	0.04	1	2	0.00	0	0				0.02	1	1	0.02		1	0.00	0	0
Aut	0	20/08/2017 - 25/09/2017	70	4.89	343	3.32	100	233	0.77	23	54	0.29	8	20	0.17	9	12	0.19	4	13	0.10	6	7				0.01	1	1	0.01		1	0.03	1	2
		Total	162	12.98	2104	12.16	950	1971	0.35	23	57	0.16	8	26	0.11	9	18	0.11	4	18	0.05	6	8	0.00	0	0	0.01	1	2	0.01	0	2	0.01	1	2

Please note the above refers to the number of bat registrations and not the number of individual bats.

Survey dates may appear one night short of those indicated elsewhere in the report as the table above gives the date that each overnight period started as opposed to the full survey period. E.g. where date is stated as 24/07/2017 this is the night of the 24th July including overnight into the early morning of 25th July.

APPENDIX B: TRANSECT SURVEY RESULTS

Key:

- Site Boundary
- Start point
- Finish point
- Point Count (with ref.)
- Transect Route
- Flight Path

Bat Contacts

- Common Pipistrelle
- Nyctalus Species

Point Count	Contact Ref	Time	Species	Passes	Behaviour
A		20:58 -21:03			
B		21:08 -21:13			
C	See Ref 1	21:26 -21:31			
	1	21:27	Common Pipistrelle	Continuous	Forage
	2	21:32	Common Pipistrelle	2	Pass
D	See Ref 3	21:37 -21:42			
	3	21:41	Common Pipistrelle	2	Pass
E		21:50 -21:55			
F	See Ref 4	22:00 -22:05			
	4	22:01	Common Pipistrelle	2	Pass
	5	22:05	Common Pipistrelle	3	Pass
G		22:12 -22:17			
	6	22:22	Common Pipistrelle	1	Pass
H	See Ref 7	22:25 -22:30			
	7	22:27	Common Pipistrelle	4	Pass
	8	22:30	Nyctalus Sp.	2	Pass
I		22:40 -22:45			
J		22:50 -22:55			
Finish		22:58			

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BAT TRANSECT PLAN (30/05/17)

scale @ A3: 1:1,800 | drawn: PJP | issue: 24/10/2017

drawing / figure number: Figure 1 | rev: 7573-E-01

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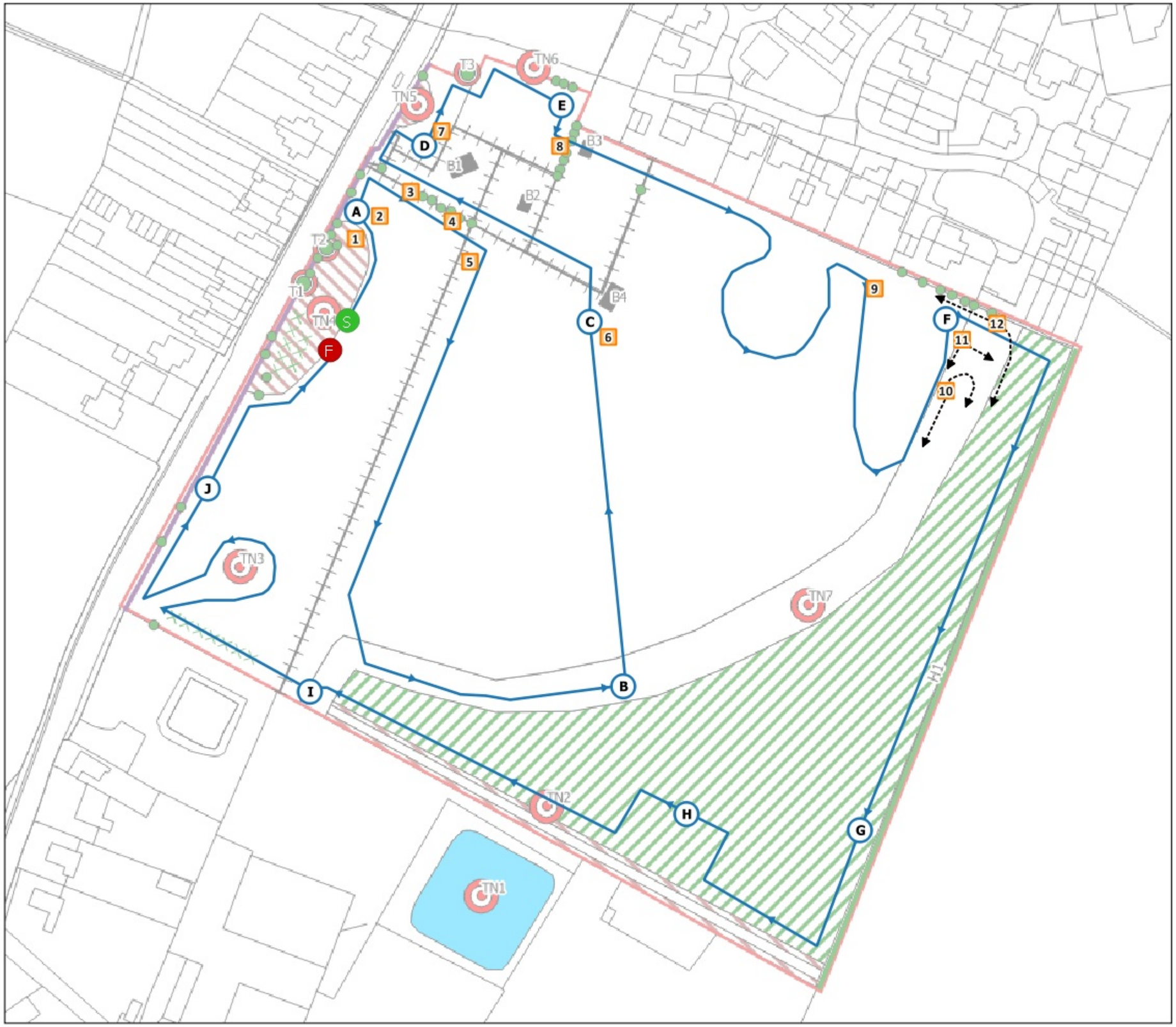

Key:

- Flight Arrow
- Point Count Locations

Bat Contacts
- Common Pipistrelle

Start & Finish Points
- Start point
- Finish point
- Site Boundary
- Transect Route

Point Count	Contact Ref	Time	Species	Passes	Behaviour
Start		02:55			
A	See Ref 1,2	02:56-03:01			
	1	02:56	Common Pipistrelle	1	Pass
	2	03:00	Common Pipistrelle	1	Pass
	3	03:03	Common Pipistrelle	4	Forage
	4	03:06	Common Pipistrelle	1	Pass
	5	03:09	Common Pipistrelle	1	Pass
B		03:15-03:20			
C	See Ref 6	03:26 -03:31			
	6	03:29	Common Pipistrelle	2	Pass
D	See Ref 7	03:38-03:43			
	7	03:40	Common Pipistrelle	2	Pass
E		03:47-03:52			
	8	03:53	Common Pipistrelle	1	Pass
	9	03:58	Common Pipistrelle	3	Pass
	10	04:03	Common Pipistrelle	Continuous	Forage
F	See Ref 11	04:05-04:10			
	11	04:05	Common Pipistrelle	Continuous	Forage
	12	04:10	Common Pipistrelle	Continuous	Forage
G		04:16-04:21			
H		04:26-04:31			
I		04:35-04:40			
J		04:49-04:54			
Finish		04:55			

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BAT TRANSECT PLAN (14/07/17 Dawn)

scale @ A3: 1:1,800 | drawn: PJP | issue: 24/10/2017

drawing / figure number: Figure 2 | rev: 7573-E-02

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Legend

- Site boundary

Start & Finish Points

- Start point
- Finish point
- Point Count Locations
- Transect Route
- Flight Arrow

Bat Contacts

- Common Pipistrelle/ Pipistrelle sp.

Point Count	Contact Ref.	Time	Species	Passes	Behaviour
Start		04:38			
A		04:48-04:53			
	See Ref 1				
	1	04:49	Common Pipistrelle	1	Pass
	2	04:54	Pipiestrelle Species	2	Pass
	3	04:56	Common Pipistrelle	1	Pass
B		04:59-05:04			
C		05:11-05:16			
D		05:22-05:27			
E		05:31-05:36			
F		TBA			
G		06:03-06:08			
	4	06:09	Common Pipistrelle x2	Continuous	Forage
H		06:14-06:19			
I		06:23-06:28			
J		06:29-0634			
Finish		06:38			

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0 25 50 75 100 m

client: Gladman Developments Ltd.

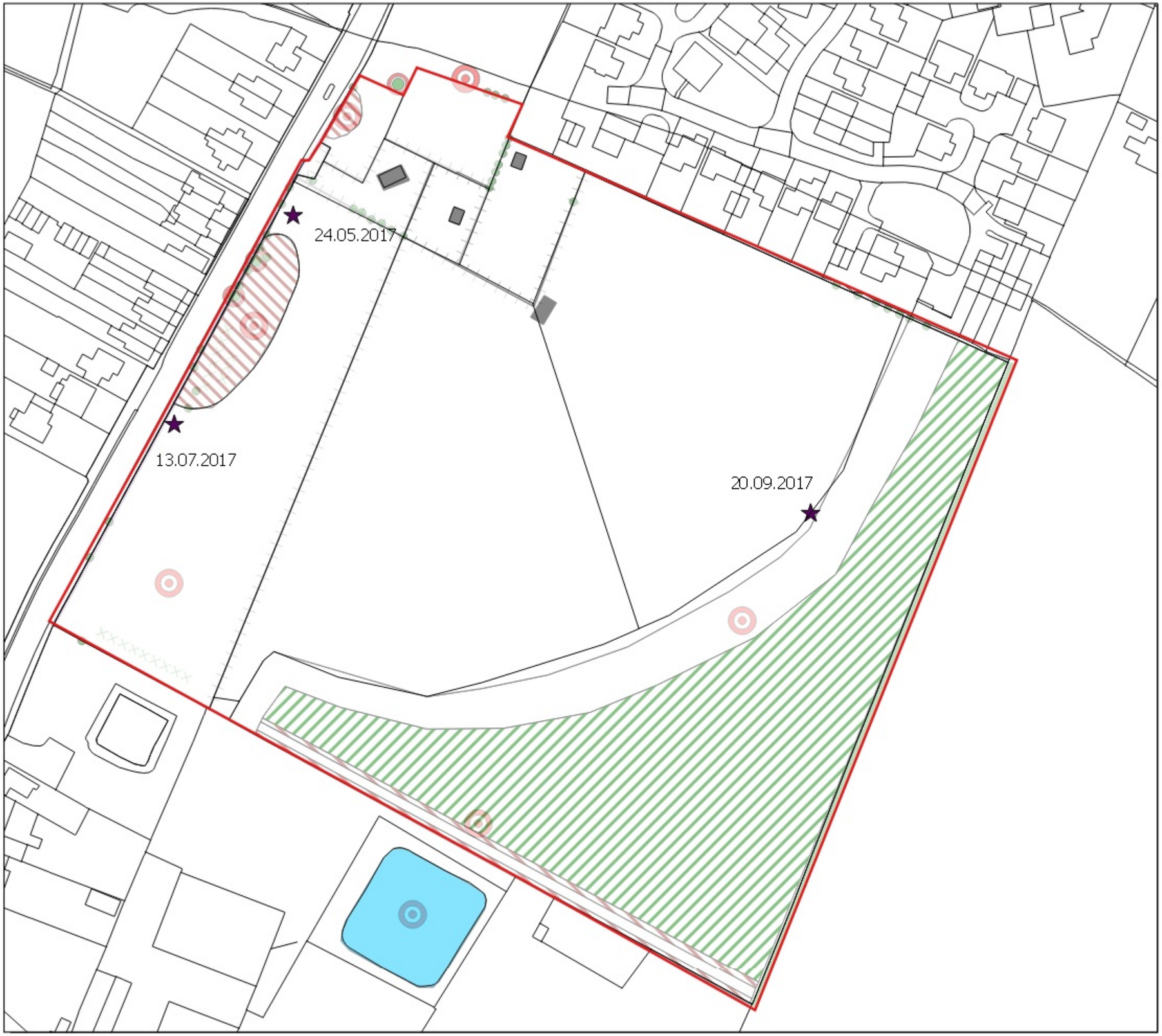
project: Dover Road, Deal

drawing title: BAT TRANSECT PLAN (21.09.17)

scale: 1:1 | drawn: BKN | issue: 7/11/2017

drawing / figure number: Figure 3 | ref: 7573-E-03

P:\7000\7573\QGIS\Plans\7573-E-03 Bat Transect (21.09.17)



Legend

- Site boundary
- Static Bat Detector Location

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0 25 50 75 100 m

client: Gladman Developments Ltd.

project: Dover Road, Deal

drawing title: Static Bat Detector Location Plan

scale: 1:1,800 | drawn: BKN | issue: 7/11/2017

drawing / figure number: Figure 4 | rev: 7573-E-04

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