



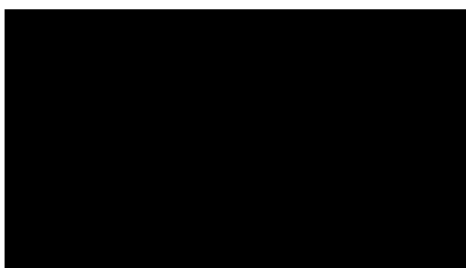
Sundial Planning Ltd

Cinders Lane, Yapton

Bat Survey Report

June 2017

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Executive Summary

Contents	Summary
Site Location and Proposals	The site is 1.75ha, situated on the eastern edge of Yapton village (Ordnance Survey Grid Reference: SU 98123 02611). It consists of a former horticultural nursery with three disused glasshouses and fourteen buildings, three of which are residential. A large proportion of the land within the site comprises dense scrub and bare ground (hardstanding) and the site is bordered by species-poor hedgerows, scattered trees, dry ditches and fencing. The proposed development is for 51 dwellings with associated landscaping and infrastructure.
Previous Reports / Surveys	The extended Phase 1 habitat survey completed by WYG in January 2016 identified site as having low suitability for foraging and commuting bats, and six of the buildings as having low suitability to support roosting bats.
This Survey(s)	Three activity surveys were carried out during the optimal surveying season. Surveyors walked on a transect route that incorporated all areas of the site including all habitats likely to be used by foraging and commuting bats. An automated bat detector was left at the site for at least five nights in each month between April and June. Data from this detector helped to gain further information on the species present and relative amount of activity through the night. Emergence surveys were carried out during the optimal surveying season for the buildings with low suitability for roosting bats.
Results	Two of the activity surveys recorded low bat activity on the site and the survey in May recorded a moderate level of bat activity. Six different bat species were recorded during that survey and included common pipistrelle, Nathusius' pipistrelle, Brandt's bat, a <i>Myotis</i> species, barbastelle and noctule. No bats were confirmed to be roosting within any of the buildings at proposed development site.
Recommendations	The results of the activity survey will remain valid for two years and the results of the dusk emergence survey will remain valid for one year. If works have not commenced within this time, it is recommended that a review of the findings and site conditions is completed to determine whether updated surveys are required. As bats were not confirmed to be roosting within any of the buildings on site, works to the buildings can proceed without further mitigation. To enhance the site for roosting, foraging and commuting bats on site the following measures are proposed to be incorporated within the master plan and proposals:



	✦ Lighting across the development designed to reduce impacts on bat foraging and commuting habitat; ✦ Avoidance of breathable roof membranes; ✦ Enhancement of connectivity between open space areas through hedgerow planting; ✦ Incorporation of grassland areas and planting of native species of value to foraging and commuting bats into landscape plan; ✦ Inclusion of 'pocket park' open space areas; ✦ Incorporation of landscape planting around road features to reduce the risk of traffic collisions. It is recommended that construction activity should cease at sunset to avoid impacts to bats during the construction phase. Additional enhancement measures for the proposed developments include the provision of bat boxes on retained trees within the site. Additional planting across the site will incorporate species of value to foraging and commuting bats.
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1.0 Introduction

1.1 Background

The extended Phase 1 habitat survey completed by WYG in January 2017 identified the potential for bats to utilise the habitat on site for foraging and commuting, and six of the on-site buildings for roosting. WYG were commissioned by Sundial Planning in April 2017 to undertake bat activity and emergence surveys at Cinders Lane, Yapton (here after referred to as 'the site').

Bat surveys were recommended based on:

- ✧ The occurrence of bat records in the local area;
- ✧ The presence of suitable foraging and commuting habitat on site and in the surrounding landscape (hedgerows, grassland, etc.) and;
- ✧ Potential direct / indirect impacts to some of these habitats including buildings as a result of the development proposals.

This report details the findings of bat activity surveys and dusk emergence surveys of buildings and recommends, where necessary; measures to avoid, minimise and offset the potential impacts to roosting, commuting and foraging bats as a result of the proposed development. This report provides information for the proposal of residential development at the site.

This report was prepared by WYG assistant ecologist Dominika Murienova.

1.2 Site Location

The site is 1.75ha and is situated on the eastern edge of Yapton village (centred on OS Grid Reference: SU 98123 02611). The site is bordered to the north by allotments and residential development to the west (the rear gardens of properties fronting Cherry Avenue lie adjacent to the site). An industrial unit lies to the south of the site beyond which lies arable land and arable land also lies to the east.

The site consists of a former horticultural nursery with three disused glasshouses associated with the sites former use utilised for ad-hoc storage of various materials. The remaining land comprises fourteen buildings three of which are residential properties (a bungalow and two static caravans) and a storage yard. Access to site is gained from Bilsham Road (B2123), via a shared private track which



also, serves the Doctor's Surgery fronting Bilsham Road.

A large proportion of the land within the application site boundary comprises dense scrub and bare ground (hardstanding) with areas of tall ruderal vegetation, poor semi-improved grassland, amenity grassland and scattered trees. The site is bordered by species-poor hedgerows, scattered trees, dry ditches and fencing. For the current site layout refer to Extended Phase 1 Report (WYG, 2017).

1.3 Development Proposals

The application is for 51 dwellings with associated landscaping and infrastructure (Drawing Number: HP16098003) (refer to Figure 1, Extended Phase 1 report (WYG, 2017)).

1.4 Survey & Reporting Objectives

Bat survey report consists of the following:

- ✧ Monthly activity surveys (in April, May and June after agreement with the Local Authority Ecologist – refer to section 3.1.1) to record the species present and their activity at the site;
- ✧ Dusk emergence surveys to investigate whether buildings identified as holding bat roosting potential support bats;
- ✧ An assessment of the potential ecological constraints to the proposed works at the site and recommendations for avoidance, mitigation and enhancement where appropriate.



2.0 Planning Policy & Legislation

2.1 National Planning Policy

The National Planning Policy Framework (NPPF) sets out the principles to which Local Planning Authorities (LPA's) should adhere to when considering planning applications. These include:

- » *Planning decisions should be based upon up-to-date information about the environmental characteristics of their areas. These characteristics should include the relevant biodiversity and geological resources of the area. In reviewing, environmental characteristics local authorities should assess the potential to sustain and enhance those resources.*
- » *Planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. In taking decisions, local planning authorities should ensure that appropriate weight is attached to...protected species; and to biodiversity and geological interests within the wider environment.*
- » *The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests. Where granting planning permission would result in significant harm to those interests, local planning authorities will need to be satisfied that the development cannot reasonably be located on any alternative sites that would result in less or no harm. In the absence of any such alternatives, local planning authorities should ensure that, before planning permission is granted, adequate mitigation measures are put in place. Where a planning decision would result in significant harm to biodiversity and geological interests which cannot be prevented or adequately mitigated against, appropriate compensation measures should be sought. If that significant harm cannot be prevented, adequately mitigated against, or compensated for, then planning permission should be refused.*

The NPPF also provides the following advice:

It is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. The need to ensure ecological surveys are carried out should therefore only be left to coverage under planning conditions in exceptional circumstances, with the result that the surveys are carried out after planning permission has been granted. However, bearing in mind the delay and cost that may be involved, developers should not be required to undertake surveys for protected species unless there is a reasonable likelihood of the species being present and affected by the development. Where this is



the case, the survey should be completed and any necessary measures to protect the species should be in place, through conditions and/or planning obligations, before the permission is granted.

2.2 Local Planning Policy

Natural England's standing advice to Arun District follows the principles and advice set out in the NPPF. Where there is a reasonable likelihood that a protected species being present, sufficient information (in the form of species surveys) should be undertaken before the planning application is considered. Policy GEN30 (Protection of Species) recognises a need to protect undesignated sites from the harmful effects of development, and specifies that development which would adversely affect animals protected by law, such as bats, will not be permitted. It further states that if the development is permitted, the developer will be required to take steps to secure the protection of protected animals (ADC 2003).

Barbastelle (*Barbastella barbastellus*), brown long-eared bat (*Plecotus auritus*), noctule (*Nyctalus noctula*), and soprano pipistrelle (*Pipistrellus pygmaeus*) are listed on the Sussex priority terrestrial mammal species list. Animals on the Sussex priority species list are of material consideration in the determination of the planning application.

2.3 Legislation

All 18 British bat species are listed in Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and under Schedule 2 of the *Conservation of Habitats and Species Regulations 2010* (as amended) as European Protected Species. Furthermore, the *Countryside and Rights of Way Act 2000* (Schedule 12, Paragraph 5) has amended Section 9 of the 1981 Act. They are, therefore, fully protected under Section 9 of the 1981 Act and under Regulation 41 of the *Conservation of Habitats and Species Regulations 2010* (as amended) which transposes the Habitats Directive into UK law.

This makes it an offence to:

- ✧ Deliberately capture, injure or kill any bat;
- ✧ Deliberately disturb bats, in particular where it is likely to:
 - Impair their ability to breed or reproduce, or to rear or nurture their young;
 - Impair their ability to hibernate or migrate; or
 - Affect significantly the local distribution or abundance of bats.
- ✧ Intentionally or recklessly damage, destroy or obstruct the access to the place of shelter or protection; and



- ❖ Damage or destroy a bat's breeding site or resting place.

Unmitigated removal of linear corridors such as sections of hedgerows and increases in habitat disturbance (through lighting, noise and vibration impacts) during construction and operational phases of a proposed development could indirectly impact bats that use the site to forage and commute. For example, lighting impacts could potentially sever a commuting route between a nursery roost and foraging ground such that it impairs bat's ability to rear young.

Furthermore, direct impacts to bats may occur through road traffic mortalities in the operational phase of a proposed development.

Such indirect and direct impacts could result in an offence being committed.



3.0 Methodology

3.1 Desk Study

3.1.1 Previous Reports

As part of the extended Phase 1 habitat survey completed by WYG in January 2017 (WYG, 2017), site and species specific information were sourced through direct consultation with the Sussex Biodiversity Records Centre (SxBRC). SxBRC provided information in relation to the presence of protected species, designated sites and areas of particular regional, national or international importance within 2 km of the site.

No European designated sites (RAMSAR, Special Protection Area, Special Area of Conservation) are present within 2km radius from the site. There are nine internationally designated sites present within distance of 15km, mainly wetlands designated for occurrence of overwintering and breeding birds. None of these sites have been specifically designated for bats.

The data search conducted on behalf of the extended Phase 1 report identified some bat records within 2km, although these do not necessarily relate to roosts (refer to Extended Phase 1 Report (WYG, 2017) for the list of these records). Based on the habitat assessment in the Phase 1 report the site was considered to have 'low suitability' for both foraging and commuting bats. A site of this level of suitability based on methodology outlined in the Bat Conservation Trust's (BCT) Bat Surveys for Professional Ecologist: Good Practice Guidelines (Collins, 2016) has a recommended survey effort of three bat activity surveys conducted between March and October with one survey visit per season (spring – April/May, summer – June/July/August, autumn – September/October) in appropriate weather conditions for bats. The deployment of an automated static bat detector is also recommended alongside the suite of surveys conducted on-site (i.e. once per season). The static detector is to be left on-site for a minimum of five consecutive nights in appropriate weather conditions for bats.

It should be noted that with agreement from the Local Authority the suite of bat activity surveys was conducted on a reduced schedule with three bat activity surveys completed monthly between April - June in appropriate weather conditions for bats. The automated static bat detector was also deployed on the same basis (i.e. once per month) for a minimum of five consecutive nights in appropriate weather conditions for bats.



The extended Phase 1 field surveys identified trees at the planning site as having negligible suitability to support roosting bats. Six out of fourteen buildings at the site were identified as having low suitability to support roosting bats. The assessment was based on methodology outlined in the Bat Conservation Trust's (BCT) Bat Surveys for Professional Ecologist: Good Practice Guidelines (Collins, 2016). Based on this, a minimum of one dusk emergence or dawn re-entry survey was recommended for the six buildings assessed as having low suitability to support roosting bats to be conducted between May to August.

3.2 Field Surveys

3.2.1 Bat Activity Surveys

The activity surveys were carried out on 27th April, 15th May and 8th June 2017. Two surveyors were present on site for each survey, with the surveyors walking together on a single transect route. The transect routes incorporated all areas of the site including all habitats likely to be used by foraging and commuting bats including dense scrub, scattered trees, grassland, tall ruderal vegetation and buildings. The surveys commenced 15 minutes prior to sunset and concluded approximately two and three quarter hours after. Weather conditions (temperature, precipitation and wind speed) were recorded on each survey.

All surveys were completed when weather conditions were suitable (i.e. not during heavy rain, low temperatures or strong winds) as recommended within the BCT guidance (Collins 2016) except for the activity survey conducted on 8th June which had to be suspended after approximately 75 minutes due to a thunderstorm (see Limitations). The surveyors made a note of bat activity, using both visual observation and audio bat detectors to identify foraging and/or commuting behaviour. Surveyors recorded the time and a description of any activity. Additionally, where bats could be seen, the patterns/directions of the bats' flight were also recorded. Surveyors were qualified ecologists and were either experienced at undertaking bat surveys or were in training and were supported by experienced surveyors. All surveyors used an Elekon Batlogger (full spectrum). Surveyors walked along the transect routes at a steady pace and stopped in several places along the transect route. The data recorded during the suite of surveys were analysed using the Bat Explorer software. The transect route is shown on Figure 3-5.

3.2.2 Automated bat activity surveys

One automated bat detector, Song Meter SM2, was left at the site for at least five days in each month between April and June. The detector was placed in the same location for each period shown on



Figure 4. Data from this detector was analysed using Analook W to gain further information on the species present and relative amount of activity through the night.

3.2.3 Emergency / Re-entry Surveys of buildings

Emergence surveys were carried out on 15th May (Building 3, 5), 16th May (Building 6, 7) and 31st May (Building 4). Surveyors were positioned appropriately around the buildings so that all potential bat access points or roosting features could be seen. Positions of surveyors around the buildings are shown on Figure 6. Surveyors used an Elekon Batlogger (full spectrum). The dusk emergence survey commenced approximately thirty minutes before sunset and lasted for approximately two hours after sunset.

3.3 Limitations

The bat activity surveys were carried out in April to June, which are the within the optimal survey season for this type of survey and were completed during optimal weather conditions except the last activity transect carried out on 8th June 2017. This survey was not finished due to unfavourable weather conditions of heavy rain developing approximately 75 minutes after sunset. Prior to these conditions a low number of bat passes were recorded. Having recorded bat activity in optimal conditions prior to the survey being suspended, this is not considered to be a significant limitation to informing an assessment of the site for foraging and commuting bats.

One automated bat detector was left at the site each month between April and June for at least five consecutive nights. The only exception was April, when the detector was left out for four nights at the end of the month followed by one night at the beginning of May. The period of five consecutive nights was adhered to and therefore this is not considered a significant limitation. For nights where no bats were not recorded, technical errors with the equipment are not responsible due to the presence of successful recordings on prior nights and log files. The last two nights (5th and 6th June) when no bats were recorded could be explained by unsuitable weather conditions for bat activity such as strong winds and rain.

Some bat species, such as some bats of the *Myotis* genus, are more difficult to detect as their calls are quieter than other bats such as those of the *Pipistrellus* genus. As such, the louder bats are likely to have been identified more often than quieter species, which may have been under recorded.

If the proposed development does not proceed within the next two years (i.e. June 2019) it is recommended that a review of the site conditions is undertaken to determine whether updated surveys are necessary. This will help to establish if bat activity has changed in the interim period and



to inform future mitigation measures, if necessary. For buildings it is recommended that this review takes place in June 2018 if works have not commenced.

3.4 Valuing On-site Bat Population

The assessment of the value of the bat population on site is based on the article in the Institute of Ecology and Environmental Management (IEEM) In Practice magazine – *Valuing Bats in Ecological Impact Assessment*, No. 70, December 2010 (Wray *et al.* 2010). Where bats (species and number) are found using certain habitats (to roost, commute or forage) their population is assigned a relative ecological value. The value to the species is partly based upon how well used a habitat is and upon how rare the bat species is. In the case of commuting routes or foraging areas the number of roosts nearby is also a factor. Once the value of the bat population has been calculated, robust mitigation for any impact on the bats can be determined.

British bat species have been subdivided into groups, dependant on how common they are: common, rarer and rarest. These have been further subdivided based upon the location surveyed. Table 1 presents the rarity categorisation of bats in England. The tables in the following sections have been adapted from *Valuing Bats in Ecological Impact Assessment* (Wray *et al.* 2010). **Table 1:** Categorising bats by distribution and rarity in England

Rarity	Country
	England
Rarest	Greater horseshoe Bechstein's Alcathoe Greater mouse-eared Barbastelle Grey long-eared
Rarer	Lesser horseshoe Whiskered Brandt's Daubenton's Natterer's Leisler's Noctule Nathusius' pipistrelle Serotine
Common	Common pipistrelle Soprano pipistrelle Brown long-eared

The value assigned for rarity is combined with the type of roost found to give a value for bats as an ecological receptor, as detailed in Table 2 below.

**Table 2:** Valuing bat roosts

Geographic Frame of Reference	Roost Types
District, Local or Parish	Feeding perches (common species) Individual bats (common species) Small numbers of non-breeding bats (common species) Mating sites (common species)
County	Maternity sites (common species) Small number of hibernating bats (common and rarer species) Feeding perches (rarer/rarest species) Individual bats (rarer/rarest species) Small numbers of non-breeding bats (rarer/rarest species)
Regional	Mating sites (rarer/rarest species) including well-used swarming sites Maternity sites (rarer species) Hibernation sites (rarest species) Significant hibernation sites for rarer/rarest species or all species assemblages
National/UK	Maternity sites (rarest species) Sites meeting Sites of Special Scientific Interest (SSSI) guidelines
International	Special Areas of Conservation (SAC) sites

To calculate the score for either commuting routes or foraging areas the numerical values from each column below are added together. These are detailed in Tables 3 and 4 below.

Table 3: Valuing commuting routes

Species	Number of Bats	Roosts/Potential Roosts Nearby	Type and Complexity of Linear Features
Common (2)	Individual bats (5)	None (1)	Absence of (other) linear features (1)
		Small number (3)	Unvegetated fences and large field sizes (2)
Rarer (5)	Small number of bats (10)	Moderate number/not known (4)	Walls, gappy or flailed hedgerows, isolated well grown hedgerows, and moderate field sizes (3)
		Large number of roosts or close to a SSSI (5)	Well grown and well-connected hedgerows, small field sizes (4)
Rarest (20)	Large number of bats (20)	Close to or within a SAC for the species (20)	Complex network of mature well-established hedgerows, small fields and rivers/streams (5)

Table 4: Valuing foraging areas



Species	Number of Bats	Roosts/Potential Roosts Nearby	Foraging Habitat Characteristics
Common (2)	Individual bats (5)	None (1)	Industrial or other site without established vegetation (1)
		Small number (3)	Suburban areas or intensive arable land (2)
Rarer (5)	Small number of bats (10)	Moderate number/not known (4)	Isolated woodland patches less intensive arable and/or small towns and villages (3)
		Large number of roosts or close to a SSSI (5)	Larger or connected woodland blocks, mixed agriculture and small villages/hamlets (4)
Rarest (20)	Large number of bats (20)	Close to or within a SAC for the species (20)	Mosaic of pasture, woodlands and wetland areas (5)

Finally, for commuting routes and foraging areas the ecological value is based upon the following scoring system as detailed in Table 5 below.

Table 5: Scoring system for valuing commuting and foraging bats

Geographic Frame of Reference	Score
International	>50
National	41-50
Regional	31-40
County	21-30
District, local or parish	11-20
Not important	1-10



4.0 Survey Results

4.1 Timings and Weather Conditions for Nocturnal Bat Surveys

Table 6 and 7 show the survey dates, times and weather conditions during each of the surveys. Weather conditions during activity transect and emergence surveys were recorded by Elekon Batlogger and noted down at the beginning and at the end of the surveys. Weather conditions during automated bat surveys were taken from www.wunderground.com.

Table 6 Weather conditions during nocturnal activity bat surveys

Survey	Date	Dusk / Dawn Times	Survey Time(s)	Weather at the start/end of survey
Transect Activity Surveys	27/04/2017	20:17	20:02 – 22:32	St: 10.1°C; 100% cloud cover; very light breeze; very light precipitation E: 9.2°C; 100% cloud cover; nil breeze; nil precipitation
	15/05/2017	20:44	20:29 – 22:59	St: 17.1°C; 100% cloud cover; very light breeze; nil precipitation E: 15.6°C; 80% cloud cover; nil breeze; nil precipitation
	08/06/2017	21:13	20:58 – 22:15	St: 16.6°C; 90% cloud cover; very light breeze; nil precipitation E: 15°C; 100% cloud cover; light breeze; heavy rain
Emergence / Re-entry of Buildings	15/05/2017	20:44	20:14 – 22:14	St: 17.1°C; 100% cloud cover; very light breeze; nil precipitation E: 15.6°C; 80% cloud cover; nil breeze; nil precipitation
	16/05/2017	20:47	20:17 – 22:17	St: 17.1°C; 90% cloud cover; very light breeze; nil precipitation E: 16.4°C; 90% cloud cover; nil breeze; nil precipitation
	31/05/2017	21:05	20:35 – 22:35	St: 18°C; <5% cloud cover; very light breeze; nil precipitation E: 14°C; <5% cloud cover; very light breeze; nil precipitation

Table 7 Weather conditions during automated bat surveys

Month	Date	Weather
April	27/04/2017	5°C; wind speed 12km/h; Scattered Clouds
	28/04/2017	8°C; wind speed 12km/h; Scattered Clouds
	29/04/2017	7°C; wind speed 11km/h; Scattered Clouds
	30/04/2017	12°C; wind speed 25km/h; Partly Cloudy
	01/05/2017	11°C; wind speed 21km/h; Light Rain Showers
May	15/05/2017	12°C; wind speed 13km/h; Partly Cloudy



Month	Date	Weather
	16/05/2017	16°C; wind speed 13km/h; Partly Cloudy
	17/05/2017	16°C; wind speed 8km/h; Partly Cloudy
	19/05/2017	12°C; wind speed 11km/h; Partly Cloudy
	20/05/2017	10°C; wind speed 17km/h; Scattered Clouds
	21/05/2017	12°C; wind speed 13km/h; Partly Cloudy
	23/05/2017	14°C; wind speed 14km/h; Scattered Clouds
June	31/05/2017	14°C; wind speed 9km/h; Partly Cloudy
	01/06/2017	14°C; wind speed 7km/h; Partly Cloudy
	02/06/2017	16°C; wind speed 8km/h; Partly Cloudy
	03/06/2017	15°C; wind speed 18km/h; Partly Cloudy
	04/06/2017	12°C; wind speed 18km/h; Partly Cloudy
	05/06/2017	15°C; wind speed 25km/h; Light Rain
	06/06/2017	14°C; wind speed 38km/h; Scattered Clouds

All the bat surveys were carried out between April and June 2017. These timings are within the optimal period for these surveys. Almost all the surveys were carried out during periods of suitable weather conditions (i.e. not during heavy rain, low temperatures or strong winds) as recommended within BCT Guidelines (2012). The only exception was the last activity survey on 8th June, when unfavourable weather conditions of heavy rain developed mid-way through the surveying time. Prior to these conditions, the survey was conducted under optimal weather conditions for bats.

4.2 Activity transects

27th April 2017

Only one record of bat activity, a single pass by common pipistrelle *Pipistrellus pipistrellus*, was recorded. This was at 22:18 at the south-eastern border of the site in area with dense scrub and two solitary trees (Figure 3). The weather conditions were suitable for the bat activity; temperature was above 8°C with no to very light breeze and no to very light precipitation.

15th May 2017

A low level of bat activity was recorded during this survey, albeit with six species recorded: common pipistrelle, Nathusius' pipistrelle *Pipistrellus nathusii*, Brant's bat *Myotis brandtii*, different *Myotis* species that was not identifiable to species level, barbastelle *Barbastella barbastelle* and noctule *Nyctalus noctula*. The first registration of bat activity was recorded at 21:22 when multiple passes were observed by common pipistrelle commuting along scattered trees in north west corner of the site (Figure 4). More common pipistrelle passes were observed in this area commuting between



greenhouses. A single *Myotis* species was recorded at 21:35 from the corner of building 10, however this bat was not seen. A single barbastelle pass was recorded at 22:11. It was heard but not seen but believed to be commuting along the south-east boundary. In this area, few common pipistrelle passes were also recorded. Eleven passes by Brandt's bat were recorded at 22:24 from the south-east corner of the site next to Building 7 in area of dense scrub. These bats were not seen. Single passes of Nathusius' pipistrelle and noctule were recorded from positions between buildings 2, 3 and 14 at 22:37 and 22:46 respectively. All together 41 bat calls were recorded during this survey, most of these (26 recorded passes) were of common pipistrelle.

8th June 2017

Low level of bat activity was recorded during this activity transect. Two common pipistrelle passes were recorded; first one at 21:35 from path on northern side of building 6, and the second one from path at northern side of building 4 (Figure 5). This survey finished earlier due to unsuitable weather conditions, however despite the rain towards the end of surveying period, bat activity was recorded.

4.3 Automated Activity Surveys

The automated bat detector at Cinders Lane site recorded up to four bat species between April and June. Passes recorded were strongly dominated by common pipistrelle, and other species included soprano pipistrelle *Pipistrellus pygmaeus* and *Myotis* species (likely Brandt's or Whiskered bat *Myotis mystacinus*).

Table 3 provides details of bat calls recorded during automated surveys.

Table 8 Automated Bat Detector Survey Results

Month	Date	Species	No. of passes
April	27/04/2017	No bats recorded	
	28/04/2017	Common pipistrelle	39
	29/04/2017	Common pipistrelle	4
	30/04/2017	Common pipistrelle	9
	01/05/2017	Common pipistrelle	3
		<i>Myotis</i> species	2
May	15/05/2017	Common pipistrelle	129
		Soprano pipistrelle	2
	16/05/2017	Common pipistrelle	71
	17/05/2017	Common pipistrelle	8
	19/05/2017	Common pipistrelle	41
	20/05/2017	Common pipistrelle	5



Month	Date	Species	No. of passes
	21/05/2017	Common pipistrelle	53
		Soprano pipistrelle	1
	23/05/2017	No bats recorded	
June	31/05/2017	Common pipistrelle	49
		<i>Myotis</i> species	2
	01/06/2017	No bats recorded	
	02/06/2017	No bats recorded	
	03/06/2017	No bats recorded	
	04/06/2017	No bats recorded	
	05/06/2017	No bats recorded	
	06/06/2017	No bats recorded	

4.4 Dusk Emergence Surveys of Buildings

Building 3

This building was surveyed on 15th May by single surveyor from the path on its northern side focused on wooden fascia above the building's access door and window (Figure 6). Seven common pipistrelle passes were recorded. Two records of commuting pipistrelles to were recorded at 21:02 and 21:05, first towards western boundary of the site and second to north east direction. Then the bats were recorded foraging at 21:28 and 22:09, but they were not seen. All together seven common pipistrelle passes were recorded. **No bats were recorded emerging from Building 3 during the dusk survey.**

Building 5

This building was surveyed on 15th May by single surveyor from the path on its southern side focused on the collapsed door (Figure 6). First record of bat activity was at 21:01 by commuting common pipistrelle from west to east. Another pipistrelle was observed commuting from south to north-east at 21:28. Two brown long-eared bats *Plecotus auritus* were also recorded by surveyor at 22:10, but these calls were very quiet. Most of the recorded activity was not seen and it involved foraging spread throughout the surveying time. All together 24 common pipistrelle passes were recorded. **No bats were recorded emerging from Building 5 during the dusk survey.**

Building 6

This building was surveyed on 16th May by two surveyors, one from the north-western corner and the second from the south-eastern corner of the building (Figure 6). Only common pipistrelle passes were recorded which included mainly feeding and commuting activity. **No bats were recorded emerging from Building 5 during the dusk survey.**

- The surveyor from the north-western corner recorded 15 common pipistrelle passes and none of these was seen, pipistrelles were mainly feeding.
- The surveyor from the south-eastern corner of the building recorded common pipistrelle passes which included mostly commuting and foraging activity. Most of the bat records were



not seen, but bats that were seen were observed at 21:23 and 21:50 which commuted to north-easterly and south-easterly directions respectively.

Building 7

This building was surveyed on 16th May by two surveyors, one from the north-eastern corner and second from the south-western corner of the building (Figure 6). Only common pipistrelle passes were recorded. **No bats were recorded emerging from Building 7 during the dusk survey.**

- 31 common pipistrelle passes were recorded from the north-eastern corner of the building, most of these were not seen and involved commuting and foraging activity. Few bats that were seen were observed flying around the building.
- 21 common pipistrelle passes were recorded by the surveyor at the south-western corner of the building. Most of these recordings were not seen, with the first activity recorded at 21:16 and then regularly throughout the survey. Recordings included foraging activity, with two foraging bats observed, one flying from east to south-west and the other foraging over amenity grassland, arriving and leaving from south of the building.

Building 4

Three surveyors surveyed Building 4 on 31st May. The building was observed from northern side, south-eastern and south-wester side, each by one surveyor (Figure 6). Two species of bats were recorded, mostly common pipistrelle and a single soprano pipistrelle. **No bats were recorded emerging from Building 4 during the dusk survey.**

- The surveyor at the northern side of the building observed three common pipistrelle passes. Two of these passes at 21:36 and 21:46 were commuting individuals, first one down the path towards the building 4, and the second one from south-east to north-west. Third bat pass at 22:02 was not seen. A single brown long-eared bat pass was also recorded at 21:48 but this was not seen.
- The surveyor at the south-eastern side of the building recorded 20 common pipistrelle passes with the first activity recorded at 21:23. Most of the activity included foraging above the dense scrub area to east, and commuting to south and westerly directions. Activity was regular until 22:27.
- The surveyor at south-western side of the building recorded seventeen common pipistrelle passes and one Soprano pipistrelle pass. Most of the recordings were produced by commuting bats from southern side to mainly westerly direction and easterly direction. The activity was regular from 21:23 to 22:27.



5.0 Discussion

5.1 Bat activity surveys

During bat activity transects and automated static surveys, up to seven bat species were recorded within or adjacent to the Site. These included common pipistrelle, Nathusius' pipistrelle, soprano pipistrelle, *Myotis* species (likely Brant's or whiskered bat), barbastelle, brown long-eared bat and noctule. Common pipistrelle was the most frequently recorded species by the automatic bat detector and during transects.

Areas of the site where the most bat activity was recorded included the central patch of with dense scrub and hardstanding (Figure 4). A few bat passes were recorded in the corners of the southern edge of the site. These findings were reinforced by the activity recorded during the dusk emergence surveys of buildings. Activity included mixture of commuting and foraging. Importantly, it was observed that hedges along the drive way were used by bats as commuting features (Figure 4).

There was a mixture of foraging and commuting activity on this site throughout the manual surveys. The majority of bats recorded were common pipistrelles, with twelve passes of *Myotis* species and single Noctule bat and Nathusius' pipistrelle pass in May. According to Table 1 these bats are considered 'rarer'. It is acknowledged that a single pass by Barbastelle, which is a 'rarest' bat, was recorded, but because this was only a single pass (across 25 nights of data) the overall rarity of bats at this site was considered as 'rarer'. Based on the assessment in Table 3, the commuting bat score on site is 19 (rarer species, small number, no roosts, isolated well-grown boundaries). Therefore the commuting bat value on site is considered to be of up to **District, local or parish level**. Based on the assessment in Table 4, the foraging bat score on site is 19 (rarer species, small number, no roosts, small village). Therefore the foraging bat value at this site is considered to be of up to **District, local or parish level**.

5.2 Emergence surveys of buildings

Two bat species were recorded within the vicinity of the surveyed buildings, these included common pipistrelle and soprano pipistrelle. Common pipistrelle was the most commonly recorded, while only single pass by soprano pipistrelle was recorded at building 4. No bats were recorded emerging from the buildings.

Surveys were carried out during optimal conditions for carrying out bat surveys, with temperatures falling to 14°C overnight. No roosts were identified during the course of the emergence surveys of buildings, or during bat activity surveys.



6.0 Potential Impact of the Development on Bats

6.1 Effects on roosts

The bat activity surveys nor the emergence surveys did not confirm the presence of any bat roosts. It is therefore considered that no bat roosts will be impacted by the proposed development.

6.2 Effects on foraging / commuting habitat

The site has been assessed as having value at the district, local or parish level for foraging and commuting bats. The development proposal includes the construction of residential properties with associated access, landscaping, car parking, playground area and allotments. The proposed development will retain valuable boundary features for commuting bats, in particular the mature south-east boundary. Although areas of scrub used by foraging bats will be removed as part of the development, the creation of gardens, along with informal open space and allotments will provide suitable foraging habitat during the occupation phase of the development.

There is also the potential for bats that continue to forage and commute within areas of retained habitat to be impacted by lighting during the construction and operational phases of the development. Some common bats, such as those of the *Pipistrellus* genus, are attracted to certain types of lighting as it attracts their invertebrate prey (Rydell and Racey, 1995). However lighting can also illuminate the bats themselves and make them more vulnerable to being predation. Where inappropriate lighting occurs close to roost sites, bats may abandon their roost or delay their emergence, which limits their foraging opportunities. Lighting a commuting or foraging route may also impact upon the integrity of a roost, even if the roost itself is not directly affected. Several of the bat species recorded on site are more sensitive to lighting impacts and will actively avoid illuminated areas. Bats from the *Myotis* genus are more sensitive to ambient lighting and may be deterred from using areas of the site, if the lighting is not sensitively designed.

Mitigation recommendations to offset the potential development and operational impacts are provided in the following section.



7.0 Recommendations and Mitigation

7.1 Further Work

If the proposed development does not proceed within the next two years (i.e. June 2019) it is recommended that a review of the site conditions is undertaken to determine whether updated surveys are necessary. This will help to establish if bat activity has changed in the interim period and to inform future mitigation measures, if necessary.

No bats were recorded roosting within the Cinders Lane site. It is therefore considered unlikely that these buildings support roosting bats. Should works not commence by June 2018 it is recommended that a review of the findings is undertaken. In the unlikely event that a bat is encountered during the demolition of the building, it is recommended that all works cease and a suitably qualified and licensed bat ecologist is contacted for advice.

7.2 Avoidance

7.2.1 Lighting

Stone (2013) summarises the findings of the Bats and Lighting Research Project to date. This has found that artificial lighting tends to have an adverse effect on bats and recommends a series of measures to avoid or reduce this impact. If lighting is required within the proposed development, it is recommended that it comprise LED lamps, with a low colour correlated temperature – preferably below 3500K (warm white). Lighting should be directed groundward to avoid light spillage, with hoods/shields as necessary. Light spill on boundary features to be used by commuting bats should be a maximum of 1lux. It is recommended that the allotments and informal open space are unlit as these areas are likely to be highly used by foraging bats.

During the construction phase (between April and October), it is recommended that construction activity ceases 30 minutes before sunset, to avoid delaying the emergence of locally roosting bats because of artificial lighting. It is also recommended that construction activity commences again after sunrise to ensure that impacts to bats returning to local roosts does not occur.

7.2.2 Breathable Roof Membranes

In new buildings, best practice should be considered and the use of Breathable Roof Membranes (BRM) avoided. Instead, Type 1F bitumen and hessian under-felt should be considered as an alternative. Ongoing research has confirmed that no BRM are bat-friendly and all pose a risk to bats. As the membranes wear over time the fibres in the membrane become loose. Bats become entangled



in the fibres and, unable to escape, dehydrate, and starve to death. As well as posing a risk to bats, BRMs are also degraded by bats and the efficiency of the membrane is impaired (i.e. the use of BRMs in situations where bats are present is detrimental to the efficient functioning of the BRM as well as to bats. The research is summarized at <http://www.batsandbrms.co.uk/images.php>), further detail is provided in Waring *et al.* (2013).

7.3 Mitigation

7.3.1 Habitat Retention and Replacement

The mature south-east boundary will be retained as part of the proposed development. There will be a loss of scrub during the construction phase of the development however suitable foraging habitat will be created as part of the development in the form of gardens, allotments and informal open space.

It is recommended that a diverse collection of native planting is incorporated into the landscaping design within the proposed development site (refer to Appendix A for recommended 'bat' plants). Structurally diverse vegetation and inclusion of native evening-blooming plants will attract insects which in turn will help to enhance the site for foraging bats.

7.4 7.3.3. Enhancement

Whilst enhancement is not a legal requirement, it is encouraged on site as it helps to meet the government objectives for planning to protect and enhance biodiversity, in accordance with the *National Planning Policy Framework (NPPF)*.

A number of the measures outlined in the mitigation section, such as the planting of 'bat-friendly' plants have the potential to enhance the site for bats.

Additional measures to enhance the site for bats include the provision of five artificial bat roosts, which will be attached to trees that are being retained on the proposed development site and new dwellings. Lighting should be directed away from these new roost sites.

Bat boxes will be located away from footpaths and areas subject to disturbance, which will reduce recreational pressure on these new roosting locations.

Two tree bat boxes will be sited as high as possible (no lower than 3m) and clear of any overhanging branches so that the bats have direct and easy access to them. Ideally several boxes should be erected facing in differing directions around the trunk of the tree, so that if one box gets too hot or



could the bats can move to another. Boxes should be attached to the tree using an aluminium nail or tied in position using wire/leather. A suitable model is the Schwegler 2FN or similar. Three building-mounted boxes will be installed on south-facing walls at a minimum height of 4m. These should be Schwegler 2FE or similar.



8.0 Summary

8.1 Recommendations and mitigation

8.1.1 Further Work

- The results of the bat activity surveys will remain valid for two years and the results of the emergence surveys will remain valid for one year.
- If works have not commenced by that time, it is recommended that the results of the surveys are reviewed to determine any need for updates.

8.1.2 Avoidance

Lighting

- It is recommended that lighting comprises warm white LED lamps to reduce potential disturbance to bats to a minimum.
- Lighting should be directed groundward to avoid light spillage, using light hoods/shields as necessary to keep light spill on boundaries to 1lux.
- During the construction phase (between April and October), it is recommended that construction activity ceases 30 minutes before sunset, if not before and commences again after sunrise.
- The use of Breathable Roof Membranes (BRM) avoided. Instead, Type 1F bitumen and hessian under-felt should be considered as an alternative.

8.1.3 Mitigation

- Ideally, all trees will be retained and protected within the development. Otherwise, they should be replaced with hedgerows to create a continuous bat foraging corridor.
- It is recommended that additional trees are planted within the gardens and areas of public open space.
- It is recommended that a diverse collection of native planting will be incorporated into the landscaping design within the proposed development site (refer to Appendix A for recommended 'bat' plants).



8.1.4 Enhancement

- A number of the measures outlined in the mitigation section, such as the planting of 'bat-friendly' plants have the potential to enhance the site for bats.
- Artificial bat roosts will be attached to trees that are being retained on the proposed development site. Bat boxes will be located away from footpaths and areas subject to disturbance, which will reduce recreational pressure on these new roosting locations.



9.0 References

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- ✧ Wray, S., Welss, D., Long, E. & Mitchell-Jones, T. (2010). Valuing bats in ecological impact assessment. *In Practice*, No 70, pp 22-25.
- ✧ WYG (2017) Cinders Lane, Yapton, Extended Phase 1 Habitat Survey.



FIGURES

Figure 1 – Site Location Plan

Figure 2 – Phase 1 Habitat Plan

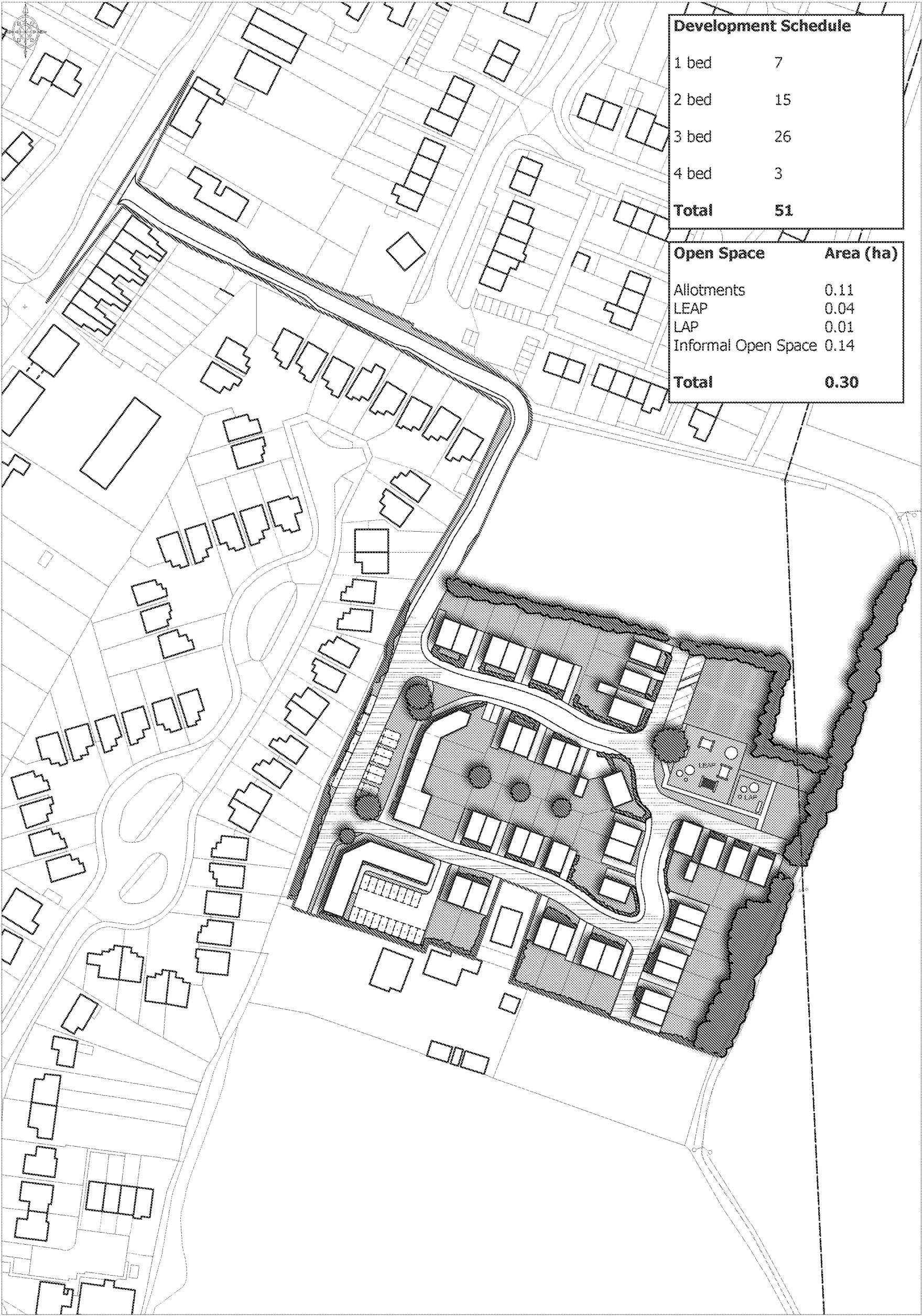
**Figure 3 – Bat activity survey (27th
April)**

**Figure 4 – Bat activity survey (15th
May)**



Figure 5 – Bat activity survey (8th June)

Figure 6 – Dusk emergence surveys of buildings



Land at Cinders Lane, Yapton

CONCEPTUAL LAYOUT

DWG N^o: HP16098 003
Conceptual Layout 003a

Drawn: MA

Checked: JH

Scale: 1:1250 @ A3

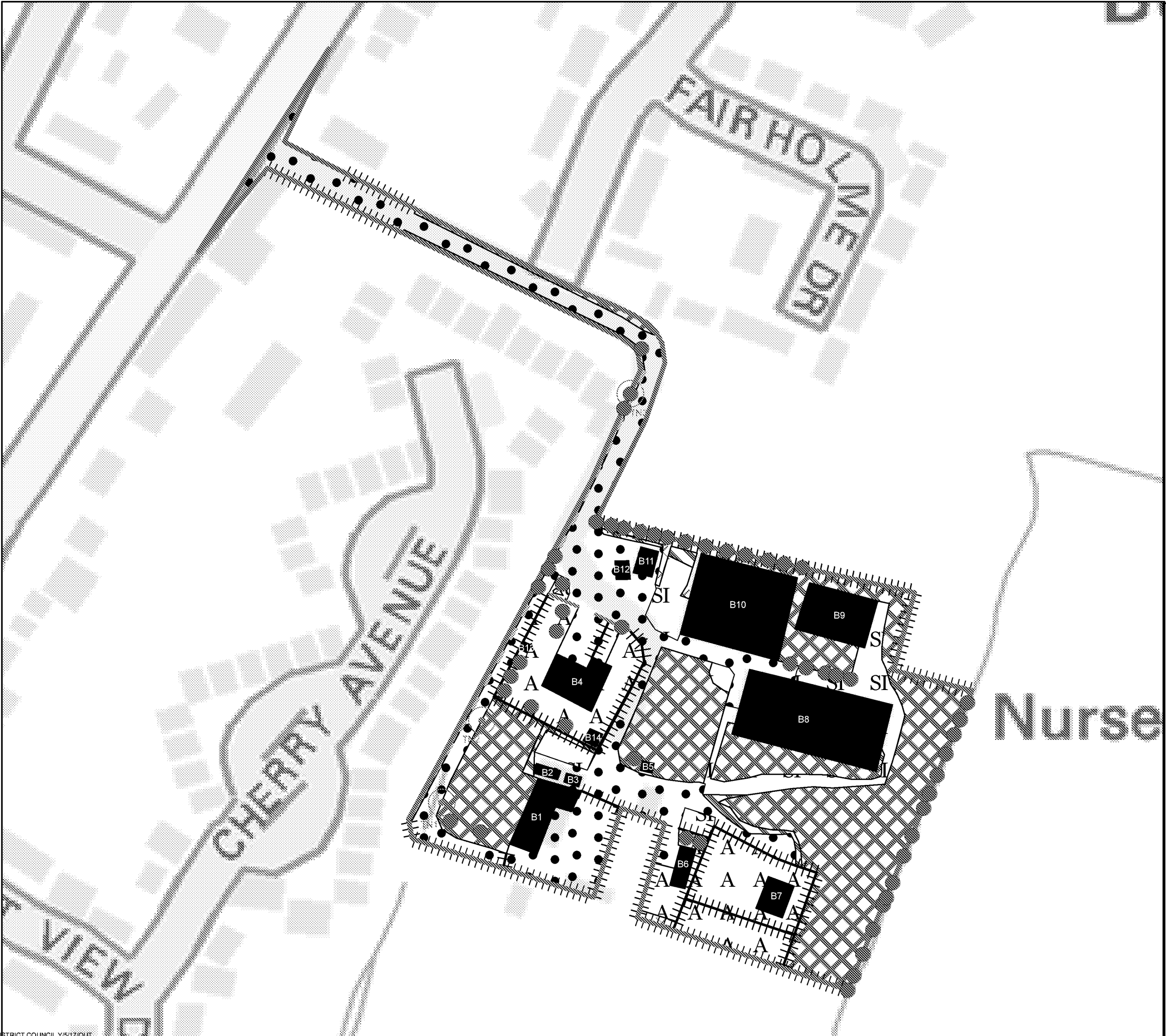
Date: 12/12/2016

Notes:

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This drawing is for illustrative purposes only and is subject to detailed topographical survey and site investigation, including ground conditions, contaminants, drainage, design and planning/ density regulation. The feasibility of the design shown, therefore, must not be relied upon. It has not been considered in respect of the CDM

The Pavilion
1st Floor
Botolph Grange Office Campus
Pledge End
Southampton
Hampshire
SO30 2AF



Legend

- Amenity Grassland
- Bare Ground
- Building
- Dense Scrub
- Dry Ditch
- Fenceline
- Intact Species-poor Hedge
- Scattered Scrub
- Scattered Tree
- Semi-improved Grassland
- Tall Ruderal
- Wall
- Target Note
- Site Boundary



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Hedge End
Southampton
Hants
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Cinders Lane, Yapton

Extended Phase 1 Habitat Survey Plan

		Drawn by: Date:	Checked By: Date:	Approved By: Date:
		BC 05.12.16	PL 17.01.17	CM 23.01.17
Project No:	Office	Type	Drawing No.	Revision
A0100671	45	94	Figure 2	

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Legend

- Common pipistrelle
- Automated detector location
- Transect
- Building
- Site Boundary



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Dusk Activity Survey 27/04/2017

	Drawn by: Date:	Checked By: Date:	Approved By: Date:
	DM 12.06.17	BC 19.06.17	DW 19.06.17
Project No:	Office	Type	Drawing No.
A100671	45	94	Figure 3
			Revision

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Legend

- Noctule
- Nathusius' pipistrelle
- Brant's
- Common pipistrelle
- Barbastelle
- Myotis species
- Automated detector location
- ↔ Common pipistrelle
- Site Boundary
- Building
- Transect



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Dusk Activity Survey 15/05/2017

Project No:		Office		Type		Drawing No.		Revision	
A100671		45		94		Figure 4			

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Legend

- Common pipistrelle
- Automated detector location
- Transect
- Site Boundary
- Building



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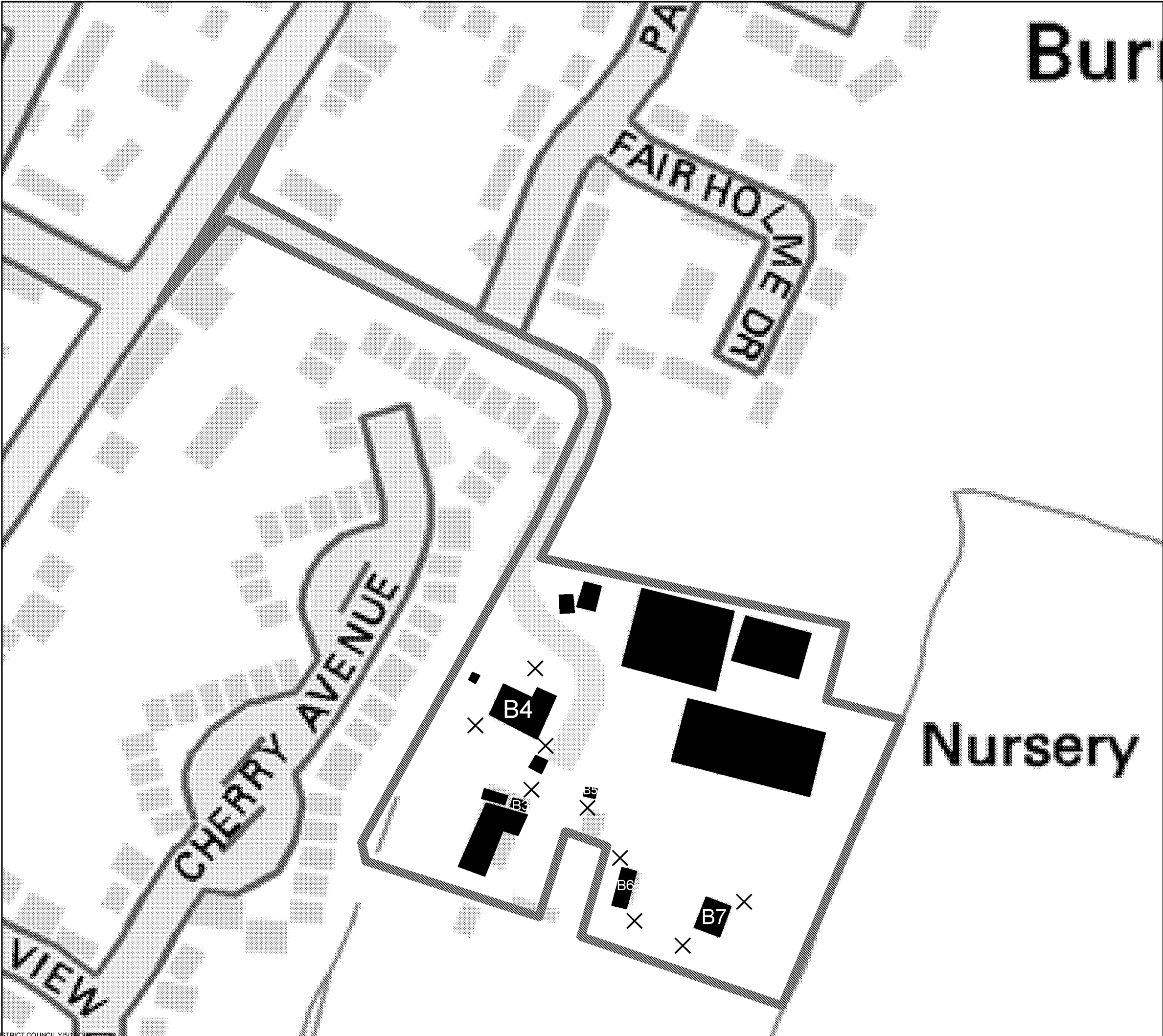
WYG Planning & Environment

Cinders Lane, Yapton

Dusk Activity Survey 08/06/2017

Project No:		Office		Type		Drawing No.		Revision	
A100671		45		94		Figure 5			

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Bur



Legend

- × Surveyor location
- Buildings
- Site Boundary

0 12.5 25 50 Metres

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Location of surveyors during Emergence Surveys

	Drawn by: Date: DM 13/06/17	Checked By: Date: BC 19.06.17	Approved By: Date: DW 19.06.17
Project No: A100671	Office 45	Type 94	Drawing No. Figure 6

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APPENDIX A – Native/Wildlife Friendly Plant Species



Gardening for bats

Aim to have flowers in bloom through the year including both annuals and herbaceous perennials.

Below are some suggestions, but this is by no means an exhaustive list. See what grows well in YOUR garden, and what seems most attractive to insects. Flowering times are approximate, varying in different areas. Regular dead-heading extends flowering period in many flowers. A=annual, HA=half-hardy annual, HHA=half-hardy annual, P=perennial, W=wild flower,

Flowers for borders			
St John's Wort	<i>Hypericum</i>	P	March- April
Marigolds	<i>Calendula</i>	H/A	March - Oct
aubretia	<i>a. deltoidea</i>	P	March-June
honesty	<i>Lunaria rediviva</i>	HB	March
forget-me-not	<i>Myosotis sp.</i>	A/P	March-May
elephant ears	<i>Begonia</i>	P	April
Wallflowers	<i>Erysimum</i>	B	April - June
Cranesbills	<i>Geranium sp</i>	P	May - Sept
Yarrow	<i>Achillea</i>	P	May - July
Poppies	<i>Papaver sp.</i>	A	May - July
Dames violet	<i>Heperia nazarensis</i>	P	May - August
Red valerian	<i>Centranthus ruber</i>	P	May - Sept
Poached egg plant	<i>Limonasias</i>	HA	June - Aug.
Knapsweed	<i>Centaurea nigra</i>	P	June-Sept
Phacelia		HA	June - Sept
Ox-eye daisy	<i>Leucanthemum vulgare</i>	P	June - Aug.
Evening primrose	<i>Oenothera biennis</i>	B	June-Sept
Candytuft	<i>tuca umbellata</i>	HA	June - Sept
Sweet William	<i>Dianthus barbatus</i>	B	June - July
Blanket flowers	<i>Gaillardia</i>	P	June -
Verbena	<i>Verbena</i>	HHA	June - Oct
Scabious	<i>Knautia arvensis</i>	P	July-Aug.
Night-scented stock	<i>matthiola bionnia</i>	HA	July-Aug
Pincushion flower	<i>Scabious sp</i>	A/P	July - Sept
Cherry pie	<i>helebraps</i>	HHA	July - Oct
Mexican aster	<i>Cornus sp.</i>	A/P	July - Oct
Cone flower	<i>Rudbeckia sp.</i>	A/P	August-Nov.
Maline	<i>lavatera sp.</i>	P	August-Oct
Michaelmas daisy	<i>Aster sp.</i>	P	August-Sept
Ice plant 'Pink lady'	<i>Sedum spectabile</i>	P	Sept.
Herbs - both leaves and flowers are fragrant			
Fennel	<i>Foeniculum vulgare</i>		July - Sept
Bergamot	<i>Monarda didyma</i>		June - Sept
Sweet Cicely	<i>Myrris odorata</i>		April - June
Hyssop	<i>Hyssopus officinalis</i>		July - Sept
Feverfew	<i>Tanacetum parthenium</i>		June - Sept
Borage	<i>Borago officinalis</i>		May - Sept

Rosemary	<i>Rosemary officinalis</i>		March - May
Lemon balm	<i>Melissa officinalis</i>		
Coriander	<i>Coriandrum sativum</i>		June - August
Lavenders	<i>Lavandula sp.</i>		
Marjoram	<i>Origanum sp.</i>		
Trees, shrubs and climbers important to insects			
Oak	<i>Quercus sp.</i>		large gardens only
Silver birch	<i>Betula pendula</i>		
Common alder	<i>Alnus glutinosa</i>		Suitable for coppicing
Hazel	<i>Corylus avellana</i>		Suitable for coppicing
Elder	<i>Sambucus nigra</i>		Small
Pussy willow	<i>Salix caprea</i>		Suitable for coppicing
Hawthorn	<i>Crataegus monogyna</i>		Suitable for coppicing
Honeysuckle	<i>Lonicera sp.</i>		grow a variety for succession
Dog rose	<i>Rosa canina</i>		Climber
Bramble	<i>Rubus fruticosus</i>		Climber
Ivy	<i>Hedera helix</i>		Climber
Buddleia	<i>Buddleia davidii</i>		shrub
Gweider rose	<i>Viburnum opulus</i>		shrub
Gorse	<i>Ulex sp.</i>		shrub
Plants for pond edges and marshy areas			
Purple loosestrife	<i>Lythrum salicaria</i>	W	June - Aug
Meadow sweet	<i>Filipendula ulmaria</i>	W	June - Sept
Lady's smock	<i>Carriflora pratensis</i>	W	April - June
Water mint	<i>mentha aquatica</i>	W	July - Sept
Angelica	<i>Angelica sylvestris</i>	W	July - Sept
Hemp agrimony	<i>Eupatorium cannabinum</i>	W	July - Sept
Marsh marigold	<i>Callia palustris</i>	W	March - May
Creeping Jenny	<i>Lysimachia nummularia</i>	W	May - August
Fringed water lily	<i>Nymphaeas peltata</i>	W	June - Sept
Water forget-me-not	<i>Myosotis scorpioides</i>	W	June - Sept

Allow part of your lawn to grow long in summer and cut in autumn, removing the clippings. Avoid using fertilizers.

Compost heaps are good producers of insects too

Add a seat to watch your garden come to life!

