

BAT SURVEY & REPORT

at

**St Pauls Road
Mirfield
West Yorkshire
WF14 8AX**

Client:

Brewster Bye Architects

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JCA Ref:

14607d/JB

Date of Report:

19/07/19



JCA Limited
Arboricultural & Ecological Consultants

Quality Assurance

JCA ref.	Version	Desktop Survey Completed:		Site Surveyed:		Report Completed:		Checked:	
		Date	Name	Date	Name	Date	Name	Date	Name
14607d/JB	Planning Application	28/03/19	Joe Earnshaw	18/03/19 27/06/19 09/07/19 29/05/19	Jenny Butler, Joe Earnshaw	19/07/19	Jenny Butler	22/07/19	Amanda Beck

This report has been prepared and provided in accordance with the *British Standard 42020: Biodiversity – Code of practice for planning and development 2018* and the *CIEEM's Code of Professional Conduct*.

Risk Assessment Completed	
Bio-security Procedure Completed	
Lone Worker Procedure Completed	



Summary

A report is required at **St Pauls Road**, to assess the site's potential for supporting bat species, in the form of roosting sites, foraging habitat and/or commuting routes. The aim of this report is to investigate the potential impact that the proposed development may have on the local/national bat population.

The development proposed on this site is the demolition of the existing buildings and creation of 20 assisted living flats in it's footprint.

All bat species and their roosts in the UK are protected under European and UK law. The main item of legislation protecting UK bats is the Conservation of Habitats and Species 2017. In addition to this, bats and their roosts are also protected in England and Wales under the Wildlife and Countryside Act 1981 and The Countryside and Rights of Way Act 2000.

A desktop study was undertaken on the 28/03/2019 in order to obtain any relevant ecological records that may be present within a 2km radius of the site, including protected and notable species records and nature conservation designations.

The site was surveyed on the 18/03/2019 by Jenny Butler *AMIEnvSc, BSc (Hons)* and Joe Earnshaw *BSc (Hons), MSc, Student CIEEM member*. A thorough site assessment was undertaken following the guidelines set out in the JNCC's *Handbook for Phase 1 habitat surveys*.

Recommendations:

After conducting the emergence/re-entry surveys Common Pipistrelle and Soprano Pipistrelle were found to be roosting within building two on site. As bats have been confirmed to be roosting at **St Pauls Road**, a **Bat Mitigation Licence** should be applied for from Natural England, and a mitigation plan devised so development causes as little impact on local bat populations as possible.

Lighting Design: Inappropriate lighting in the vicinity of bat roosts can cause disturbance to bat populations and individuals and could be constituted as an offence under the Wildlife and Countryside Act 1981. As such, we have prepared guidance in line with the information provided by the Institute of Lighting Professionals (ILP, 2018) to aid in planning lighting schemes with the aim of limiting the impact that lighting may have on local bat populations.

It is important to avoid:

- Uniform levels of luminance across the site.
- Metal halide and florescent lighting.



- Upward tilting lighting that increases skyline luminance.

Instead the following should be installed:

- Dark buffer zones.
- Screening in the form of vegetation, fences and structures.
- Appropriately designated darkened areas.
- Luminaries absent of UV elements.
- LED luminaries with a sharp cut-off, low intensity and good rendition.
- Peak luminaire wavelength at a minimum of 550nm.
- Downward directional luminaires with upward light ratios of 0%.
- Lower light columns to limit light spill.
- Recessed internal light fixtures.
- Window glazing treatments or automated blind systems.

*Please see **Sections 5 and 6, Conclusions and Recommendations** for further information on survey efforts and timings/additional reports required for this site.*



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1. Introduction and Terms of Reference

1.1 Purpose of the Report

- 1.1.1 A report is required at **St Pauls Road**, to assess the site's potential for supporting bat species, in the form of roosting sites, foraging habitat and/or commuting routes.
- 1.1.2 The aim of this report is to investigate the potential impact that the proposed development may have on the local/national bat population.

1.2 Terms of Reference

- 1.2.1 I am instructed by **Brewster Bye Architects** to visit the site and prepare my findings in a report.
- 1.2.2 For this purpose I have been supplied with a site map (drawing:501/01(01)07), and brief details of the proposal. See **Appendix 2** for proposed development plans.

1.3 Scope of the Report

- 1.3.1 This report is compiled in accordance with the Bat Conservation Trust's (BCT) '*Bat Surveys - Good Practice Guidelines*', the Joint Nature Conservation Committee's (JNCC) '*Bat Workers Manual*' (3rd Edition) and Natural England's '*Bat Mitigation Guidelines*'.
- 1.3.2 The results and recommendations contained within this report are considered to be valid for a period of between 18 and 24 months. After this period, an update to the report and re-assessment of the site may be required in order to inform ecological constraints to any developments proposed, and/or to accompany a planning submission. If the proposed development changes significantly or land use alter substantially, updates may be required in advance of the expiry period of the report.

1.4 Details of Proposed Development

- 1.4.1 The development proposed on this site is the demolition of the existing derelict buildings and the creation of 20 flats and associated facilities in its footprint.

1.5 Site Description

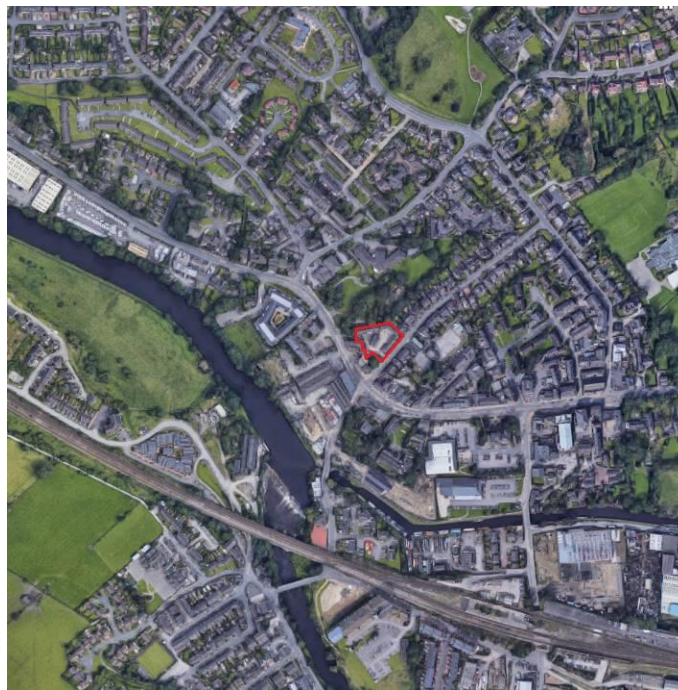
- 1.5.1 **St Pauls Road** is situated 4.7km southwest of Dewsbury Town centre, at grid



reference: SE201198.

- 1.5.2 The site is currently being used as a council storage depot, with the majority of the buildings onsite containing various materials or council owned equipment.
- 1.5.3 The site is surrounded predominantly by residential housing. With commercial properties to the southeast and number of industrial units. To the west and southwest the landscape changes to agricultural fields with recreational grounds in the form of playing fields and parks dotted throughout the landscape, and the site itself backs onto Ings Grove Park to the north. The River Calder runs from the west to the east with the closest section of the river being 150m to the southwest of the site. Huddersfield Road (A644) acts as a major transport link to and from Dewsbury town centre and is located in close proximity to the site. A map of the site in relation to surrounding habitats can be seen below

Figure 1: Google Maps image of **St Pauls Road**, showing the survey site in relation to the surrounding landscape and habitats. Red line indicates site boundary.



Google map image © 2019

1.6 Bats in the UK

- 1.6.1 In the UK there are thought to be 18 native species of bat (17 known to be breeding), and may account for more than a quarter of mammal species present in the UK. Nearly all UK bat species have experienced serious declines



over the last century and all species are protected under UK and European Law.

1.7 Bat Ecology

1.7.1 All species of bat in the UK are insectivorous and have evolved to hunt a different set of insects, present in different habitat types. Preferred bat habitats include woodland, grassland, agricultural land, wetland and rivers.

1.7.2 Bats typically roost close to foraging sites, and use linear features such as hedgerows, tree lines and rivers to navigate. Removal of these linear features is thought to have a significant negative impact on their movement, which could be contributing to their decline.

1.7.3 Bats will roost in a wide range of different sites including built structures, underground sites and mature trees. Due to bats ecology different roost sites will be used at different times of the year. Known roost types include:

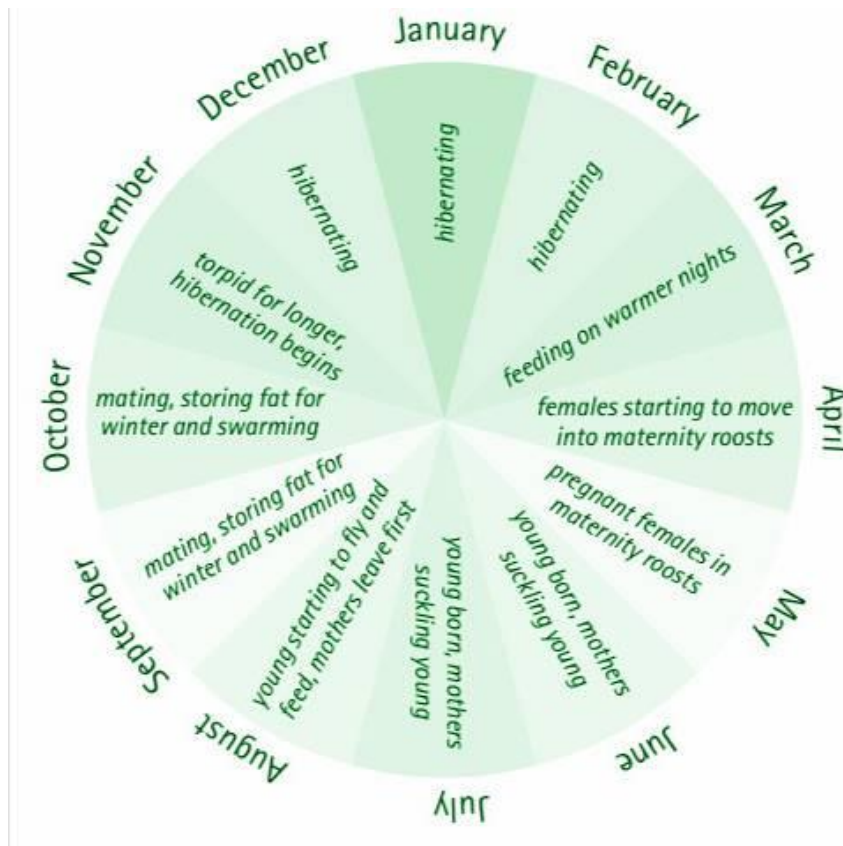
- Night Roosts: A place where individual bats, or sometimes the colony, rest or shelter in the night, but are rarely found in the day. Can be used throughout the year.
- Day Roosts: A place where individual bats, or small groups of males, rest or shelter during the day but are rarely found by night in the summer months.
- Feeding Roosts: A place where individual or a few individuals rest or feed during the night, but are rarely found in the day during the summer months.
- Transitional/Occasional Roosts: Used by a few individuals or occasionally by small groups for short periods of time on waking from hibernation, or in the period prior to hibernation. Usually found during February-April or during September to November.
- Swarming Sites: Where large numbers of males and females gather during late summer to autumn. Appear to be important mating sites. September – November.
- Mating Sites: Where mating takes place from late summer and can continue through the winter. August – March.
- Maternity Roosts: Where female bats give birth and raise their young to independence. May-September.
- Hibernation Roosts: Where bats may be found individually or together during the winter. They have a constant cool temperature and high humidity. December- February.
- Satellite Roosts: An alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of



breeding females throughout the breeding season. May-September.

- 1.7.4 The three main roosts to be considered, with respect to buildings and development, are maternity roosts, satellite and hibernation roosts. Disturbance of these roosts can have significant negative impacts on local bat populations.
- 1.7.5 **Figure 2** below provides a visual representation of the life cycle of a bat; showing the life cycle on a month by month basis.

Figure 2: Diagram of a bat's life-cycle (taken from the BCT: Bat surveys for professional Ecologists, Good Practice Guidelines; 3rd Edition).



1.8 UK Bat Species

- 1.8.1 Within the UK there are 17 species of bat known to be breeding, with a further one species listed as a resident, non-breeding species within the UK. **Table 1** below details the roosting preferences of the breeding species of bats currently listed as being found within the UK.

Table 1: Roosting preferences of the known UK breeding resident bat species (taken from the BCT: Bat surveys for professional Ecologists, Good Practice Guidelines; 3rd Edition).



Species Common Name	Species Scientific Name	Species Roosting Preferences
Greater Horseshoe Bat	<i>Rhinolophus ferrumequinum</i>	During the summer females use large, old, undisturbed buildings including coach houses, stable blocks and barns. This species prefers to fly directly into the roost and to their roosting position and bats hang freely. Maternity sites are often found in large spaces at least 3–4m high, providing a sufficiently large flight area. This species generally uses night roosts to rest whilst foraging, which are found in a variety of structures, for example outbuildings, garages, stables, milking sheds, porches and trees. In winter, both male and female bats choose underground sites for hibernation, including tunnels, mines, caves or cold building basements.
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	Roost sites include attics, chimneys and boiler rooms of buildings, rural houses and outbuildings in the summer, and cellars, tunnels, disused mines and caves for hibernation. Also found in industrial buildings. This species prefers to fly directly into roost sites and into their roosting position. Maternity sites are often found in large roof spaces at least 3–4m high providing a large flight area. A range of conditions is required throughout the year but this may be found in one building with, for example, an attic for the summer and a cellar for the winter. Summer and winter roost sites are generally no more than 5–10km apart. The lesser horseshoe bat also uses alternative roost sites during the night and day.
Daubenton's Bat	<i>Myotis daubentonii</i>	Roosts are found in hollow trees, bridges or sometimes buildings and generally close to water. Nursery roosts are not exclusively female – males may make up 25% or more of the colony and large male-only colonies have also been recorded. This species selected oaks over beech trees and preferred roosts on the edges of woodlands in a study in the Netherlands. Hibernation sites are usually underground including caves, mines and suitable tunnels where bats are found both in crevices and on open walls. They may also hibernate in tree cavities.
Bandt's Bat, Whiskered Bat and Alcatheo's Bat	<i>Myotis Brandtii, Myotis mystacinus, Myotis alcathoe</i>	These species can roost in trees and a wide range of buildings in the summer. These species hibernate in caves or other underground sites, where they can be found in the open or in cracks and crevices.
Natterer's Bat	<i>Myotis nattereri</i>	Roost sites include tree holes and different types of buildings but has also been found in bridges. Usually roost in attics between late May and mid-July and often roosts have enough space for internal flight (Swift, 1997). This species also breeds in bat boxes. Timber-framed barns built between the 12th and 19th centuries may be particularly important to this species, with roosts found in mortise joints in both the summer and winter. Hibernates in cracks and crevices in caves and mines. Other hibernation sites recorded are canal and railway tunnels, ice houses and tree cavities.



Bechstein's Bat	<i>Myotis bechsteinii</i>	Maternity roosts are found in tree holes in the canopy, generally in old trees with dead branches. May be found in woodpecker holes in old oaks. Recorded switching roosts frequently. One study recorded roosts in rot holes, woodpecker holes and in a gap behind thick ivy. A study of ten colonies across the Isle of Wight found 90% of maternity roosts in woodpecker holes in ash trees. Another study found a maternity roost in a woodpecker hole in an oak tree on a golf course. Hibernates in trees and sometimes caves or other underground sites. Chilmark Quarry is an example of Bechstein's bats using an abandoned mine for hibernation.
Noctule	<i>Nyctalus noctula</i>	Roosts almost exclusively in tree holes, but sometimes found in bat boxes or buildings. One Netherlands study found that woodpecker holes are preferred, in trees close to woodland edge. Hibernates in trees but sometimes found in buildings.
Leisler's Bat	<i>Nyctalus leisleri</i>	Roosts in trees, bat boxes and buildings such as houses; for example, around the gable end of lofts, under tiles, under soffit boards and in disused chimneys. Often uses a variety of sites in the summer. Hibernates in tree holes, buildings and sometimes underground sites.
Common Pipistrelle and Soprano Pipistrelle	<i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i>	Maternity colonies are found mainly in buildings, usually roosting out of sight in crevices. Colonies may use a number of sites through the summer but are often loyal to the same sites for many years. Maternity colonies are extremely variable in terms of numbers, from 20 to over 1,000 bats. Soprano pipistrelle colonies tended to be larger than those of the common pipistrelle. Common pipistrelle shift roosts between pregnancy and lactation. Roost selection is based on temperature for common pipistrelle and on surrounding habitats (woodland and water) for both species. Males roost singly or in small groups in the summer, in buildings or trees. Bat boxes are used by both males and females but generally only males use them during the summer. These species do not use underground sites for hibernation but are sometimes found in the cracks and crevices of buildings in the winter.
Nathusius' Pipistrelle	<i>Pipistrellus nathusii</i>	The very few known British nursery roosts are in buildings, with hibernation roosts in hollow trees and crevices in cliffs, walls and caves. One study recorded males roosting under lead flashing and roof tiles.
Serotine	<i>Eptesicus serotinus</i>	Roosts in buildings in small cavities or crevices with high access points such as gables but occasionally also found in trees. Recorded hibernation sites include cavity walls, disused chimneys and occasionally caves.



<p>Barbastelle</p>	<p><i>Barbastella barbastellus</i></p>	<p>In summer, breeding females move regularly between large numbers of different tree roosts. One study found that they preferred dead trees surrounded by holly under-storey and another found them in tree crevices and cavities, between overlapping limbs and behind ivy, on average 6.9m above ground level. Tree roosts are in relatively undisturbed places and frequently in thick cover, although cracks much higher up in trees were used at the time of birth. Bat boxes are also used. Almost all roosts found in two studies were behind loose bark and in mixed locations not always surrounded by under-storey. Winter roosts include deep, hollow trees (usually dead and among holly under-storey) and sometimes buildings or underground sites. Other winter roosts recorded are flaking bark and splits less than 2m above the ground and disused railway tunnels, barns, outbuildings, church porches and lime kilns. Chilmark Quarry is an example of barbastelle bats using an abandoned mine for hibernation. 24 Spring and autumn roosts have been recorded behind loose bark, in dead tree stumps and in splits in limbs mainly less than 2m above ground level.</p>
<p>Brown Long-Eared Bat</p>	<p><i>Plecotus auritus</i></p>	<p>Maternity roosts found in trees, in the voids of large, old buildings and bat boxes in woodland. Usually roosts against wooden beams at the roof apex in attics or farm buildings. Bats often cluster at the highest part of the roof and require enough space for unobstructed, internal flight. Shows high roost fidelity. Commonly uses feeding perches and night roosts in porches or outbuildings separate from the main roost. Hibernates in underground sites, tree holes and buildings.</p>
<p>Grey Long-Eared Bat</p>	<p><i>Plecotus austriacus</i></p>	<p>Frequently roosts on ridge beam in spaces between rafters. Maternity colonies show high roost fidelity. Number of males in maternity colony increases through summer. Many males are, however, solitary.</p>

1.8.2 Greater Mouse-eared bats (*Myotis myotis*) are extremely rare in Britain and little is known about where they roost in the summer or winter. They are listed as a resident, non-breeding species within the UK and this species is currently found at one site in Sussex.

1.9 Bats and the Law

1.9.1 All bat species and their roosts in the UK are protected under European and UK law. The main piece of legislation protecting UK bats is the Conservation of Habitats and Species Regulations 2017.

1.9.2 In addition to this, bats and their roosts are also protected in England and Wales under the Wildlife and Countryside Act 1981 and The Countryside and Rights of Way Act 2000.

1.9.3 Under these legislations, it is an offense to:



- Deliberately capture, injure or kill a bat.
- Deliberately disturb a bat in a way that would affect its ability to survive, breed or rear young (or hibernate or migrate in England, Wales and Northern Ireland) or (significantly in England, Wales and Scotland) affect the local distribution or abundance of the species.
- Damage or destroy a roost (this is an 'absolute' offence).
- Possess, control, transport, sell, exchange or offer for sale/exchange any live or dead bat or any part of a bat.
- Intentionally or recklessly disturb a bat at a roost.
- Intentionally or recklessly obstruct access to a roost.

If it is discovered that development may impact upon bat roosts (thus leading to an offence being committed) a **Mitigation Plan** should be devised and a **Bat Mitigation Licence** applied for from the relevant government department (i.e. Natural England). Gaining a licence will depend on many variables, such as the bat species present, roost type, roost size and its local/regional/national importance.



2. Methodology

2.1 Desktop Study Methodology

- 2.1.1 A desktop study has been undertaken in order to obtain any relevant records of bats from local bat groups and ecology units within a 2km radius of the site.
- 2.1.2 The Multi-Agency Geographic Information for the Countryside (MAGIC) website was used to locate any designated sites, both statutory and non-statutory, such as; Local Nature Reserves (LNRs), Ramsar Sites, Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Sites of Special Scientific Interest (SSSIs) that may be present within 2km of the survey site.

2.2 Scoping Survey Methodology

- 2.2.1 The site was surveyed for foraging, commuting and roosting potential. A detailed search of habitat, buildings structures and trees were conducted during daylight hours in order to identify potential bat roosting sites and look for evidence of bat activity. Potential roost sites and features deemed to be of value to bats were documented on the site map (please refer to **Appendix 1**) and photographic evidence was taken (please refer to **Appendix 2**).
- 2.2.2 All surveys are conducted by experienced surveyors using the following equipment to ensure an accurate assessment; a printed site map, camera, 1 million candlelight torch, binoculars, ladders and frequency division or full spectrum bat detectors.
- 2.2.3 Signs that bats have previously or are currently using a potential roost site include:
- Scratch marks, urine and oil stains around holes in buildings or trees.
 - Droppings, carcasses and/or food remains found around the site.
 - Bats observed flying in/out of a hole in a building or tree.
 - Bats heard 'chattering' within a potential roost site, especially on warm summer days.
- 2.2.4 Limitations: It must be highlighted that the absence of any of these signs is not proof that the site is not being used by bats. Weathering and other factors will often remove any signs of bat activity, especially when present on the exterior of a building or a tree. As previously explained, many bat species will have several roost sites which they regularly move between and therefore an absence during a survey visit does not exclude their presence at a later date.



2.2.5 There were no perceived limitations that would significantly impact on the conclusions and recommendations given within this report.

2.3 Emergence/re-entry Survey Methodology

2.3.1 Emergence re-entry surveys are conducted either 15 minutes before sunset and up to two hours after or up to 2 hours before sunrise and 15 minutes after. Due to the lifecycle of bats emergence surveys are conducted between the months of May through to August and can occasionally run into September. All surveyors used by JCA have experience in conducting bat emergence surveys and an appropriate level of knowledge in bat ecology.

2.3.2 At **St Pauls Road**, it was previously recommended that three surveys should be carried out.

2.3.3 All surveyors are equipped with the following items during each survey; a frequency division and/or full spectrum bat detector, Walkie Talkie, clock, printed site map, note pad and pen.

2.3.4 An initial Scoping survey of the site will highlight all areas of the site that are likely to support bat roost sites. This information will then be used to influence the number of surveyors used and their positions around the site.

2.3.5 Limitations: Detecting bats using bat detectors can be limited. Bat species that produce calls at both a high amplitude (loud) and a low frequency, such as noctules are easier to detect than bats with low amplitude (quiet) and high frequency calls such as the brown long-eared bat and greater horseshoe bats respectively.

Many species of bat in the UK are crevice dwelling, and signs of bats and individual bats can be difficult to find within a building or within areas that are inaccessible, although all possible care has been given to survey for crevice dwelling bats during the initial assessment.

Physical access was available internally and externally to all structures; except where limited by health and safety constraints. Health and safety issues are given by the client and by the surveyor carrying out the assessment. It is up to the discretion and professional judgement of the surveyor whether the property is safe or not to survey. All efforts to comprehensively survey the site have been made, taking into account the safety constraints outlined above.



3. Results

3.1 Desktop Study Results

3.1.1 Local Data Centre Records: West Yorkshire Ecology has been commissioned to provide the records held for bat species within a 2km radius of the survey site. The results have been summarised below. It should be noted that the absence of records should not be taken as confirmation that a species is absent from the search area. Please see **Table 2** below for a summary of the protected and priority species records obtained from the West Yorkshire Ecology Records Centre.

Table 2: Priority and protected species records obtained from West Yorkshire Ecology within a 2km radius of the site boundary.

Taxonomic Group	Common Name	Scientific Name	On site	Within 500m	Within 1km	Within 2km	Notes
Bats	Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	x	✓	✓	✓	Fifty-five records (unknown roost type, droppings, foraging, aural bat detector, injured, transitional roost and field records) from 2005-2017. This is a West Yorkshire BAP species.
	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	x	✓	✓	✓	Three records (foraging and field records) from 2001-2013. This is a UK and local BAP species.
	Unidentified Pipistrelle Species	<i>Pipistrellus sp.</i>	x	✓	✓	✓	Nine records (maternity roost, unknown roost type, possible roost, casualty and field records) from 2004-2013.
	Brown Long-eared	<i>Plecotus auritus</i>	x	✓	✓	✓	Six records (Aural bat detector, unknown roost type, maternity roost and field records) from 2005-2014. This is a UK and West Yorkshire BAP species.
	Noctule	<i>Nyctalus noctula</i>	x	✓	✓	✓	Sixteen records (unknown roost type, foraging, aural bat detector and field records) from 2007-2016. This is a UK and local BAP species.
	Leisler's Bat	<i>Nyctalus leisleri</i>	x	✓	✓	✓	Seven records (foraging, unknown roost type, possible roost, grounded and field records) from 2003-2017. This is a West Yorkshire BAP species.



	Natterer's Bat	<i>Myotis nattereri</i>	x	x	x	✓	One record (unknown roost type) from 2010 of one individual. This is a West Yorkshire BAP species.
	Unidentified Myotis Species	<i>Myotis sp.</i>	x	✓	✓	✓	Three records (unknown roost type and field records) from 2010-2016.
	Unidentified Vesper Species	<i>Vespertilionidae</i>	x	✓	✓	✓	Eighteen records (unknown roost, grounded, excluded roost, maternity roost, within a building, casualty, possible roost and field records) from 1995-2007.

3.2 Desktop Bat Records

3.2.1 The records obtained from the West Yorkshire Bat Group for **St Pauls Road** are as follows:

Table 3: Summary of bat records held by the West Yorkshire Bat Group within 2km of the site.

Taxonomic Group	Common Name	Scientific Name	On site	Within 500m	Within 1km	Within 2km	Notes
Bats	Leisler's Bat	<i>Nyctalus leisleri</i>	x	✓	✓	✓	Seven records (possible roosts, maternity roosts, field record, grounded bat and aural bat detector) from 1993-2017, including one historic record of a maternity roost with 51-100 individuals recorded.
	Natterer's Bat	<i>Myotis nattereri</i>	x	x	x	✓	Two records (unknown roost type and maternity roost) from 2014-2015, including a 2015 record of a maternity roost containing 46 individuals.
	Noctule	<i>Nyctalus noctula</i>	x	✓	✓	✓	One record (field record) from 2013.
	Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	x	✓	✓	✓	Six records (unknown roost type, maternity roost and aural bat detector) from 2011-2017, including one maternity roost with 58 individuals recorded.
	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	x	✓	✓	✓	One record (field record) from 2013.
	Unidentified Pipistrelle Species	<i>Pipistrellus sp.</i>	x	✓	✓	✓	Seven records (unknown roost type, maternity roost, casualty and field records) from 1993-2014, including one maternity roost containing 21-50 individuals recorded.
	Unidentified Vesper	<i>Vespertilionidae</i>	x	x	✓	✓	Thirteen records (unknown roost type, possible roost, maternity



	Species						roost, casualty, grounded bat and field records) from 1993-2006.
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Natterer’s Bat records consist of two recent records of an unknown roost type with five individuals recorded, and one maternity roost containing forty-six individuals. Both records are within 2km of the site; there are no records within 500m of the site. Leisler’s Bat records consist of seven records (recent and historic) of two possible roosts recorded within 2km and 500m of the survey site, one historic field record 1km from the site, one historic maternity roost containing 51-100 individuals 1.1km from the site, one grounded bat recorded within 2km of the site in 2003. Two bats were recently recorded with aural bat detectors, one of which was 277m from the site. Records for Noctule consist of one adult recorded in 2013 within 500m of the site.

Common Pipistrelle records consist of seven records (recent and historic) of a maternity roost containing fifty-eight individuals 1.3km from the site in 2014, two recently recorded unknown roost types one of which is 306m from the site and two bats recorded with an aural bat detector in 2011 and 2017 within 2km of the site. A single Soprano Pipistrelle was recorded within 500m of the site in 2013.

Unknown Pipistrelle Species records consist of seven records (historic and recent) of three maternity roosts within 1km of the site with one being an historic roost with 21-50 individuals recorded. Two unknown roost types and two casualties were also recorded within 2km of the site, with one of the roosts being recorded in 2014 and the rest recorded in 2007.

Unknown Vesper Species records consist of fourteen records (historic and recent) of six unknown roost types with one roost being within 1km of the site, one maternity roost in 2005 within 1km, three historic records of possible roosts within 1km and 500m of the site. Other records are made up of two grounded bats with one recorded in 2003 within 1km of the site and the other in 2003 within 500m, one casualty in 2006 within 2km and one field record in 2003 within 1km of the site.

3.3 Nature Conservation Designations

Statutory Nature Conservation Sites

3.3.1 There are no statutory nature conservation sites within the boundary of the site.

3.3.2 The search revealed one designated conservation site within 2km of the site, which can be seen in **Table 4** below.



Table 4: Statutory designated sites with 2km of the site.

Name	Designation	Description	Distance from Site
Sunny Bank Pond	Local Nature Reserve (LNR)	The reserve is divided into two distinct areas, a small parkland area with mature trees and a short circular path, and two sunken man-made pits that make up the wetland area. The pond area is home to a large population of smooth newts, frogs and toads. Other wildlife attracted to the pond include species of garden birds, Fox (<i>Vulpes vulpes</i>), deer, pipistrelle bats and other small mammals, all of which use the pond as a feeding area. The site contains various levels of fen habitat, nutrient rich standing water and an area of grassland.	1744m North

Non-Statutory Nature Conservation Sites

3.3.3 There are no non-statutory nature conservation sites within the boundary of the site.

3.3.4 The search revealed six non-statutory conservation sites within 2km of the site, which can be seen in **Table 5** below.

Table 5: Non-statutory designated sites with 2km of the site.

Name	Designation	Description	Distance from Site
Briery Bank Wood	Local Wildlife Site (LWS)	This is a replanted ancient woodland with Sessile Oak (<i>Quercus petraea</i>), Silver Birch (<i>Betula pendula</i>), Poplar Species (<i>Populus sp.</i>), Holly (<i>Ilex aquifolium</i>), Hazel (<i>Corylus avellana</i>), Hawthorn (<i>Crataegus monogyna</i>) and Elder (<i>Sambucus nigra</i>) present. The south of the site consists of a wet woodland containing Alder species (<i>Alnus sp.</i>), Silver Birch, Goat Willow (<i>Salix caprea</i>), Hazel, Holly, Meadowsweet (<i>Filipendula ulmaria</i>), Tufted Hair-Grass (<i>Deschampsia cespitosa subsp. cespitosa</i>), Watercress (<i>Rorippa nasturtium-aquaticum</i>), Ramson (<i>Allium ursinum</i>), Wild Angelica (<i>Angelica sylvestris</i>), Yellow Archangel (<i>Lamium galeobdolon</i>) and Bittersweet (<i>Solanum dulcamara</i>).	1139m South South-east
Covey Clough Wood	Local Wildlife Site (LWS)	Similar to W10 acid woodland it contains Ash (<i>Fraxinus excelsior</i>), Sessile Oak and English Oak (<i>Quercus robur</i>). The understorey is sparse with Holly. The ground flora has Bluebells (<i>Hyacinthoides non-scripta</i>), Bramble (<i>Rubus fruticosus agg.</i>), Creeping Soft-grass (<i>Holcus mollis</i>), Broad Buckler-fern (<i>Dryopteris dilatata</i>) and Hypnum Moss (<i>Hypnum cupressiforme</i>). Wood Sorrel (<i>Oxalis acetosella</i>), Lords and Ladies (<i>Arum maculatum</i>) and Wavy Hair-grass (<i>Deschampsia flexuosa</i>) is also present here.	1602m South
Gregory Spring	Local Wildlife Site (LWS)	This is a WD3 species rich acid woodland with a high ground coverage of Bluebell. No further information is available.	1963m South South-east



Liley Wood	Local Wildlife Site (LWS)	Liley Wood is a mixed deciduous replanted ancient woodland. Canopy species include Sycamore (<i>Acer pseudoplatanus</i>), Sessile Oak, Silver Birch, Ash (<i>Fraxinus excelsior</i>) and Common Alder (<i>Alnus glutinosa</i>), the latter being restricted to a south. To the north a flowing stream in a valley becomes deeply incised towards the central and southern parts of the site. The shrub layer varies across the site with Elder being the most constant species. The valley supports old coppice stools of Hazel, stands of Holly, Wych Elm (<i>Ulmus glabra</i>) and Rowan (<i>Sorbus aucuparia</i>) occur in other parts of the site. The ground flora is dominated by a carpet of Bluebell.	1992m South-east
Sunny Bank Pond	Local Wildlife Site (LWS)	The nature reserve covers an area of approximately 1400 m ² and is managed by Kirklees Metropolitan Council and is divided into two distinct areas, a mini parkland area with mature trees and a short circular path, and the two sunken man-made pits that make up the wetland area. The left brick pit houses a pond while the right pit makes up a drier grassland area with willow and tall herbs. Management of the site also forms part of the Kirklees Countryside Volunteers' calendar of events to regulate the growth of fast-growing plants such as Willow, Flag Iris and Bulrush (<i>Typha latifolia</i>). The pond area is home to a large population of Smooth Newts, Common Frogs and Common Toads.	1744m North
Whitley Wood	Local Wildlife Site (LWS)	This replanted ancient woodland site supports predominantly deciduous woodland with Beech (<i>Fagus sylvatica</i>), Sycamore and Sessile Oak being the dominant canopy species. In the central western area is a small patch of mixed woodland with Larch (<i>Larix decidua</i>) and Corsican Pine (<i>Pinus nigra laricio</i>) adding to the canopy. The shrub layer consists mainly of Holly, with Elder and Hawthorn (<i>Crataegus monogyna</i>) adding additional native components. In the northern and southern parts of the site Rhododendron (<i>Rhododendron ponticum</i>) and Laurel have been planted, but are relatively limited in extent. The ground flora supports areas of abundant native Bluebell, but these also have about 5% Spanish Bluebell in the northern part of the wood. In some areas the woodland ground flora is more diverse supporting Ramson, Male Fern (<i>Dryopteris filix-mas</i>), Wood Speedwell (<i>Veronica montana</i>), Wood Anemone (<i>Anemone nemorosa</i>), Yellow Archangel and Dog's Mercury (<i>Mercurialis perennis</i>) however these are generally only rare. Some areas under mature Beech and close to footpaths have relatively sparse ground flora.	1907m SE

3.4 Scoping Survey Results

3.4.1 The site was surveyed on the 18/03/2019 by lead surveyor Jenny Butler BSc (Hons), NE Level 2 Class Licence – 2018-33262-CLS-CLS. Other surveyors included Joe Earnshaw BSc (Hons), MSc, Student CIEEM member. Survey conditions are summarised in **Table 6**.



Table 6: Survey times and weather conditions.

Survey date	Lead surveyor	Temp	Humidity	Wind speed/Direction		Cloud Cover	Precipitation
18/03/2019	Jenny Butler	7°C	72%	9mph	WSW	90%	Light showers

3.4.2 Habitats and Features Present

The site is primarily hard standing with several buildings positioned throughout the site with areas of spoil and refuse-tip located mainly towards the west of the site. Other habitats include scattered young and smooth stemmed broadleaf trees, an area of scattered scrub to the east, walls and metal fences.

The buildings onsite have bat roosting potential, with all other habitats providing negligible potential to support roosting and foraging bats. The vegetative habitats are short, with poor floral diversity.

It is important to note the presence of Ings Grove Park to the northwest of the site. A number of mature trees are located within this adjacent site and may support foraging and roosting bats. The site may also act as a commuting corridor as it provides partial landscape connectivity from the park to the rear gardens of properties to the northeast. Whilst bats may use this area for commuting and foraging it may not be suitable for roosting bats, that may be using the buildings onsite for roosting.

3.4.3 Building Assessment/ Built Structure Assessment

The buildings onsite are council owned and acts as the local storage depot with evidence of materials and equipment found being stored within several buildings. The site and its buildings have fallen into various levels of disrepair with most buildings no longer in use, while one building remains in use on a daily basis.

Various access points for roosting bats were noted and these are highlighted on **Appendix 3, Bat Roosting Potential Plan**. After a scoping survey of all buildings the overall bat roosting potential of the buildings onsite is as follows:

- **Workshop (Building 1)** was assessed as having a **moderate bat roosting potential**.
- **Firehouse (Building 2)** and **Storage Sheds (Building 4)** were assessed as having a **high bat roosting potential**.
- **Outbuildings (Building 3)** and **Canteen (Building 5)** were assessed as having a **low bat roosting potential**.



Workshop (Building 1)

External Inspection: After intermittent use as a workshop over the last two years, this brick three-story building is now disused and suffers little human disturbance. The pointing was generally in good condition, but areas of missing/damaged pointing remained (**See photo 1**) providing access points into this building. The pitched slate roof had lifted tiles both on the westward pitch, roof apex and along two sections where the brickwork meets the roof (**See photo 2**). Two air bricks located at ground level on the west wall (**See photo 3**) also provided access into this building's cellar. Floodlights were positioned around the building, but they are unlikely to be in use currently.

Internal Inspection: The cellar of the building is poorly sealed with gaps evident under and around the external door and air bricks. Visible daylight could be seen when within the cellar area. Gaps were present that provided access into the building's brickwork with missing/damaged brickwork and timbers, utilities entering and exiting the building and large cavities within the timber framework (**See photo 4**).

The ground and first floor are well sealed with no visible gaps, with an intact roof liner and the wooden window frames are in good condition. The timber roof had recently been relined and had a new black breathable roof membrane (**See photo 5**). No timber gaps were noted and no enclosed loft space was present.

Signs of Bat Use: No evidence of bats was found to be present during the time of the survey.

Firehouse and Associated Buildings (Building 2)

External Inspection: This building has been used for several purposes over the years and is currently disused, and therefore has limited disturbance. The pointing was in excellent condition with the majority of the external brickwork being intact, but a number of windows were noted as having missing/broken panes. While a number of these windows had been boarded up, a single window on the second floor within the middle section of the building remained open (**See photo 7**).

The pitched slate roof varied in condition with the west of the building being intact and gaps only present at the eaves of the roof. This however changed towards the east of the building with clear holes and missing tiles visible within the roof. Along the length of the roof lifted tiles were also noted, providing further access into the building. Floodlights were positioned around the building, but it is unknown if they were operational.

Internal Inspection: The west section of the building is two stories in height



with no flooring present between stories. This section had a metal framed roof that was wood paneled, making inspection of the roof not possible. Gaps were noted under external doors (**See photo 8**) and vents/pipes exiting the building, where daylight was visible within them. The roof was of various constructions methods and materials and had clearly been added to over time. From an open metal framed construction this changed to timber beams with sections having a roof membrane (**See photo 9**), while other areas remained unlined.

An open chimney breast on the second floor (**See photo 10**) provided a likely access point for bats within the building and while efforts to board windows were made, gaps remained evident. A loft space at the east end of the building was not accessible due to the condition of the roof and floor (**See photo 11**), however it was noted that there was missing tiles, and the roof was in a state of collapse. No enclosed loft space or cellar is present.

Signs of Bat Use: No evidence of bats was found to be present.

Outbuildings (Building 3) and Storage Sheds (Building 4)

External Inspection: These buildings are single storied and were in use for storing a range of tractor equipment, compost and other materials. Their construction is brick and stone with the pointing being in an excellent condition. The outbuildings had metal roller shutters fitted but remained open during the night creating a light and exposed space within. Both the outbuildings and storage sheds had missing/lifted roof tiles and gaps at the roof eaves (**See photo 12**), with the ridge tiles along the storage sheds noted to have shifted creating further bat access points (**See photo 13**).

Internal Inspection: The roof of the outbuildings is timber framed with wood paneling and slate tiles above. Here gaps and visible daylight could be seen through the paneled roof (**See photo 14**) and voids were noted behind the plasterboard (**See photo 15**). Further gaps were noted through missing tiles and air bricks towards the roof (**See photo 16**).

The storage shed consisted of three sections, all of them having a similar construction of brick walls, slate and timber roofs with no roof liner present except for the middle section. Here an unusual insulation style roof liner was present that was noted to have come away in various sections (**See photo 17**). Large wooden doors allowed entry into the sheds with gaps noted around the entirety of the doors. Two bird nests were found within these storage sheds, one of which was a swallow's nest. Both nests were old and not in use. No enclosed loft space or cellar is present.

Signs of Bat Use: No evidence of bats was found to be present.

Canteen (Building 5)



External Inspection: This is a one storied building that is currently in use as a staff canteen and rest area. It has a pitched slate roof and stone construction, both of which are generally in a good condition with no missing/lifted tiles and has intact pointing within the brickwork. External entry points for bats were noted via airbricks at roof and ground level (**See photo 18 and 19**).

Internal Inspection: The roof space was not visible due to the building being boarded out internally and a false roof having been installed (**See photo 20**). The building was heated with a moderate level of human disturbance and was generally well sealed with no visible gaps noted.

Signs of Bat Use: No evidence of bats was found to be present.

Tree Assessment

The trees present onsite are all small, thin, smooth stemmed specimens. Mostly saplings or self-seeded: Species present include Ash, Sycamore and Willow Species. These trees have negligible bat roosting potential due to the absence of suitable roosting opportunities for bats.

3.5 Emergence Survey Results

3.5.1 The site was surveyed from the 29/05/2019 to the 09/07/2019 by lead surveyor Jenny Butler AMIEnvSc, BSc (Hons), NE Level 2 Class Licence – 2018-33262-CLS-CLS. Survey conditions are summarised in **Table 7**.

Table 7: Survey times and weather conditions.

Survey date	Lead surveyor	Start/Finish		Temp Start/Finish		Humidity	Wind speed/Direction		Cloud Cover	Precipitation
29/05/2019	Jenny Butler	21:00	22:55	11°C	11°C	44%	11mph	S	100%	Light showers
27/06/2019	Jenny Butler	02:50	04:55	10°C	7°C	85%	7mph	E	100%	None
09/07/2019	Jenny Butler	21:20	23:10	15°C	13°C	57%	8mph	SW	20%	None

3.5.2 Emergence Survey 1 results – 29/05/2019

Bat Emergence – At 21:30 five Common Pipistrelles were recorded emerging from the Lime tree within Ings Grove Park to the north of building three. Under the roof hip of building two a single Soprano Pipistrelle emerged at 21:37 with a Soprano Pipistrelle recorded re-entering into the same location at 21:57. A Common Pipistrelle emerged from underneath a ridge tile of the same building at 21:44 (see **Appendix 3: Bat Activity Map 29/05/19**).

Bat Activity - There was a high level of activity from 21:30 to 22:50 within Ings Grove Park to the north of the site, with the majority of the activity being



foraging. Numerous Common and Soprano Pipistrelle bats were recorded foraging amongst the parkland trees, with a single Noctule recorded to the west of building two at 22:39. (see **Appendix 3: Bat Activity Map 29/05/19**).

Along St Pauls Road to the southeast of the site there was a low level of bat activity from 21:24 to 22:45. Species recorded include Common Pipistrelle, Noctule and an unconfirmed Soprano Pipistrelle. The majority of the bats were heard and not seen with only a few individuals visible during the survey. Common Pipistrelles were noted exiting the site close to building five and commuting southeast over the adjacent terraced houses, as well as travelling northeast up St Pauls Road (see **Appendix 3: Bat Activity Map 29/05/19**). Noctule activity was limited but was recorded along the entire length of the southeast boundary of the site.

The site itself offers little in foraging opportunities for the local bat population but does have roosting potential with bats noted emerging from building two. Ings Grove Park adjacent the site offers extensive foraging and roosting opportunities due to the presence of large trees with notable cavities and sections of decay.

Re-entry Survey 2 results – 27/06/2019

Bat Emergence – No bats were seen emerging from the property during the survey.

Bat Activity - There was a low level of activity from 02:58 to 03:50 within the site boundary itself, with the majority recorded around and to the east and north of building one. Species consisted of Common Pipistrelle and Soprano Pipistrelle (see **Appendix 3: Bat Activity Map 27/06/19**).

3.5.3 Emergence Survey 3 results – 09/07/2019

Bat Emergence - Three Common Pipistrelles were seen to emerge from a tree within Ings Grove Park, adjacent to the site boundary at 21:45 to 21:48. No bats were seen to emerge from the property during the time of the survey.

Bat Activity – A high level of bat activity was recorded from 21: 49 to 22:55 within Ings Grove Park. Species consisted of Common Pipistrelle and Soprano Pipistrelle. At 22:02 a Noctule was seen foraging along the tree line between the site and Ings Grove Park. There was a high level of bat foraging activity across the site, between buildings 2 and 3. Species consisted of Common Pipistrelle and Soprano Pipistrelle, with a Noctule foraging along the tree canopies to the rear of building 2 (see **Appendix 3: Bat Activity Map 09/07/19**).



4. Discussion and Analysis of Results

4.1 Bat Records and Nature Conservation Designations

- 4.1.1 No designated nature conservation sites are located within the boundary of the site.
- 4.1.2 There is one statutorily designated conservation area within 2km of the site. Sunny Bank Pond (LNR) consists of two man-made ponds and an area of parkland with mature trees and amenity grassland. The proposed development will not have an impact on this site as there is limited habitat connectivity between the proposed site and Sunny Bank LNR. This LNR is located 1744m north of the proposed development site and is separated by residential housing and road networks.
- 4.1.3 There are six non-statutorily designated sites within 2km of the site. Briery Bank Wood, Covey Clough Wood, Sunny Bank Pond, Gregory Spring, Liley Wood and Whitley Wood are all habitats of various woodland classifications and are designated as LWS.

The proposed development will not have an impact on these sites because they are located a substantial distance from the proposed development site. These sites are also separated from the site by residential housing estates, industrial units and the A644 that serves as a major transport link to and from Dewsbury to the east and the M62 motorway to the west. Further habitat fragmentation for terrestrial species in the area is provided by the presence of the River Calder that flows west to east between the proposed development site and these LWS.

4.2 Scoping Survey

- 4.2.1 The site contains buildings that have the potential to support roosting bat species but does not have habitats or features to support foraging and commuting bats. Please refer to **Section 3.5** for further details.
- 4.2.2 The bat scoping survey highlighted a number of features on site suitable for supporting roosting/foraging/commuting bats. The buildings onsite offer the potential to support roosting bats.

This site has **moderate to high potential** for supporting **roosting bat species**. **Buildings 3 and 5** were assessed as having **low bat roosting potential**, **Building 1** as having **moderate bat roosting potential** and **Buildings 2 and 4** as having **high bat roosting potential**.

Please see **Table 8** below for the guidelines used for assessing the roosting potential of a site. Please note these guidelines are applied using the professional judgement of the licenced bat worker undertaking the assessment.



Table 8: Guidelines used for assessing the bat roosting suitability of a site (taken from the BCT: Bat surveys for professional Ecologists, Good Practice Guidelines; 3rd Edition).

Roosting Suitability	Roosting Features Present
Negligible	No visible features on the site likely to be used by roosting bats. No signs of bats found during the initial assessment.
Low	A structure with one or more potential roosting opportunities that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough shelter, protection, surrounding habitats, or the appropriate conditions to be used on a regular basis by larger numbers of bats e.g. unlikely to support hibernation or maternity roosts. A tree of sufficient size and age to contain features suitable for bat roosting, but with no features seen from the ground. No signs of bat use found during the initial assessment.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to the size of the potential roosting feature which is sufficient to provide: shelter, protection, optimal conditions and surrounding habitats. The feature(s) are unlikely to support a roost of high conservation status. Signs (potential signs) of bat use found during the initial assessment.
High	A structure or tree with one or more potential roost sites that could be used by bats due to the size of the potential roosting feature which is sufficient to provide: shelter, protection, optimal conditions and surrounding habitats. The features have the potential to support large colonies of bats (e.g. maternity or hibernation) for long periods of time. Signs of bat use present.

4.3 Emergence Surveys

4.3.1 The bat emergence survey on the 29/05/19 identified a Common Pipistrelle roost within building two. One Common Pipistrelle emerged from the rear of the building, then dropped towards Ings Grove Park. A Soprano Pipistrelle was also recorded emerging from building two.

4.4 Impacts of the Proposed Development

4.4.1 Provision of habitat (flower mixes and trees) to attract invertebrates will be required as part of the landscaping design for the site, this will provide food for bats locally and reduce the impact of the proposed development on local bat populations, minimising the long term effects of the development on bats locally. Provision of new roosting opportunities - in the form of integral or external bat boxes must be incorporated into the proposed development plans to ensure no long-term net loss of potential roosting sites and provide new roosting opportunities to improve the habitat on site for bats.

4.4.2 Exterior lighting must be pre-approved and agreed upon with the local county



ecologist or project ecologist. The lighting plan must be 'wildlife friendly' and follow guidance given by the BCT to ensure no long-term detrimental impacts on bat commuting and foraging behaviour as a result of the development.

*NB: The overall impact of the proposed development is based upon plans provided by Brewster Bye Architects, see drawing: (501/01(01)07),) as included in **Appendix 2**. This report has been compiled and produced by JCA Ltd, and accounts for and assesses the likely impacts on local wildlife populations and biodiversity that is to occur as a result of the development given in **Appendix 2**. Should these plans change then this report will need revising and the potential impacts re-evaluating.*



5. Conclusions

- 5.1 After conducting a thorough Bat Roost Potential survey and a detailed Desktop Study, we considered **St Pauls Road** to have a moderate to high potential for supporting foraging, commuting and roosting bats.

As the site has been considered to have a moderate to high potential of supporting bat roosting sites, we recommended that dawn/dusk emergence surveys should be carried out to establish the absence/presence of roosting bats at **St Pauls Road**.

Dawn and dusk bat surveys are conducted between May and September and are used to determine whether bats are currently roosting at a site. It can also give you an indication of the level of bat activity at a survey site and any specific foraging patterns. Dawn surveys are started around 1.5 hours before sunrise, when swarming behaviour can be observed around roost sites. Dusk surveys are started around 30 minutes before sunset and up to 2 hours after and look for the emergence of bats from their roost sites. If bats are then confirmed to be roosting on the site, a **Bat Mitigation Licence** may be applied for from Natural England, and a mitigation plan devised so development causes as little impact on local bat populations as possible. It was recommended at **St Pauls Road** that **three** surveys were required. Please refer to **Appendix 4** for bat survey calendar.

It was recommended at St Pauls Road, Mirfield that one survey was required on buildings with low bat roosting potential (Buildings 3 and 5), two surveys on buildings with moderate bat roosting potential (Building 1) and three surveys on buildings with high bat roosting potential (Buildings 2 and 4).

- 5.2 After conducting the emergence/re-entry surveys Common Pipistrelle and Soprano Pipistrelle were found to be roosting within building two on site. As bats have been confirmed to be roosting at **St Pauls Road**, a **Bat Mitigation Licence** should be applied for from Natural England, and a mitigation plan devised so development causes as little impact on local bat populations as possible.

The development of any building or structure has the potential risk of removing bat roosting habitat. Therefore, JCA always recommended that alternative bat roosting opportunities should be provided to replace any that are lost due to building alterations. Should you like advice on putting up bat boxes, or on increasing your site's value to bats through carefully designed planting schemes and habitat creation, JCA can provide this service.

Lighting Design: Inappropriate lighting in the vicinity of bat roosts can cause disturbance to bat populations and individuals and could be constituted as an offence under the Wildlife and Countryside Act 1981. As such, we have



prepared guidance in line with the information provided by the Institute of Lighting Professionals (ILP, 2018) to aid in planning lighting schemes with the aim of limiting the impact that lighting may have on local bat populations.

It is important to avoid:

- Uniform levels of luminance across the site.
- Metal halide and florescent lighting.
- Upward tilting lighting that increases skyline luminance.

Instead the following should be installed:

- Dark buffer zones.
- Screening in the form of vegetation, fences and structures.
- Appropriately designated darkened areas.
- Luminaries absent of UV elements.
- LED luminaries with a sharp cut-off, low intensity and good rendition.
- Peak luminaire wavelength at a minimum of 550nm.
- Downward directional luminaires with upward light ratios of 0%.
- Lower light columns to limit light spill.
- Recessed internal light fixtures.
- Window glazing treatments or automated blind systems.



6. Recommendations

- 6.1 After conducting the emergence/re-entry surveys Common Pipistrelle and Soprano Pipistrelle were found to be roosting within building two on site. As bats have been confirmed to be roosting at **St Pauls Road**, a **Bat Mitigation Licence** should be applied for from Natural England, and a mitigation plan devised so development causes as little impact on local bat populations as possible.

Lighting Design: Inappropriate lighting in the vicinity of bat roosts can cause disturbance to bat populations and individuals and could be constituted as an offence under the Wildlife and Countryside Act 1981. As such, we have prepared guidance in line with the information provided by the Institute of Lighting Professionals (ILP, 2018) to aid in planning lighting schemes with the aim of limiting the impact that lighting may have on local bat populations.

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- Peak luminaire wavelength at a minimum of 550nm.
- Downward directional luminaires with upward light ratios of 0%.
- Lower light columns to limit light spill.
- Recessed internal light fixtures.
- Window glazing treatments or automated blind systems.



7. References

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Bat Survey Guidelines: Good Practice Guidelines (2007). Bat Conservation Trust (BCT).

Bat Workers Manual (3rd Edition 2004). A. J. Mitchell-Jones & A. P. McLeish. Joint Nature Conservation Committee (JNCC).

Websites:

Bat Conservation Trust (BCT). <<http://www.bats.org.uk/>>

Google Maps. <<http://maps.google.co.uk/>>

Multiple-Agency Geographic Information for the Countryside (MAGIC). <<http://www.magic.gov.uk/>>

National Biodiversity Network (NBN) Gateway. <data.nbn.org.uk>

Natural England. <<http://www.naturalengland.org.uk/>>

Nature on the Map. Natural England. <www.natureonthemap.org.uk>

Relevant Legislation:

Wildlife and Countryside Act 1981 <<http://jncc.defra.gov.uk/page-3614>>

The Conservation of Habitats and Species Regulations 2017
<<https://www.legislation.gov.uk/uksi/2017/1012/contents/made>>

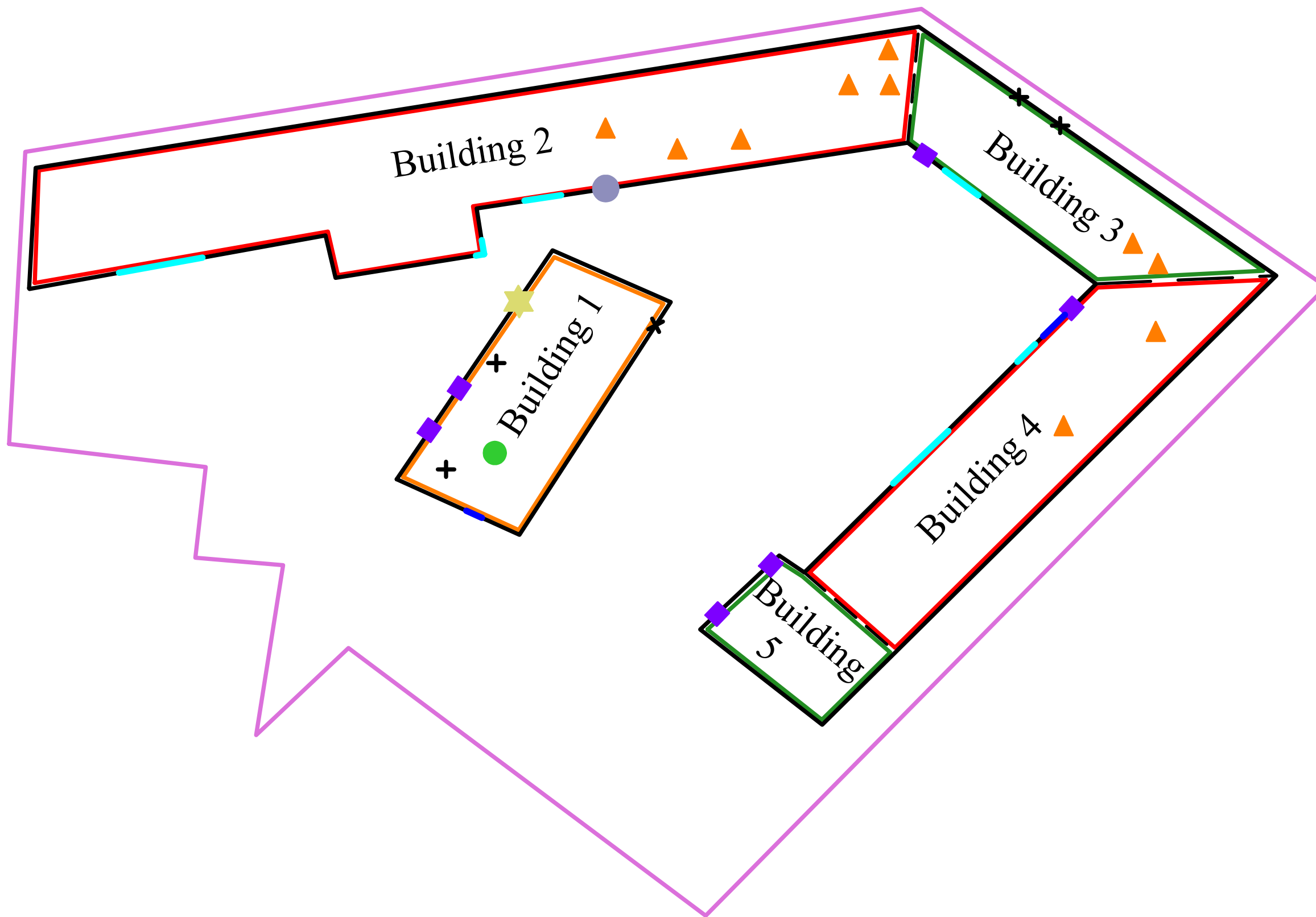
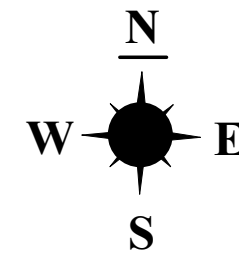
Countryside and Rights of Way Act 2000
<http://www.legislation.gov.uk/ukpga/2000/37/pdfs/ukpga_20000037_en.pdf?view=interweave>



Appendices

Appendix 1: Bat Roosting Potential Plan





Appendix 3: Bat Roosting Potential Plan

Address: St Pauls Road, Mirfield, West Yorkshire, WF14 8AX
JCA Ref: 14607b/JB

NOT TO SCALE

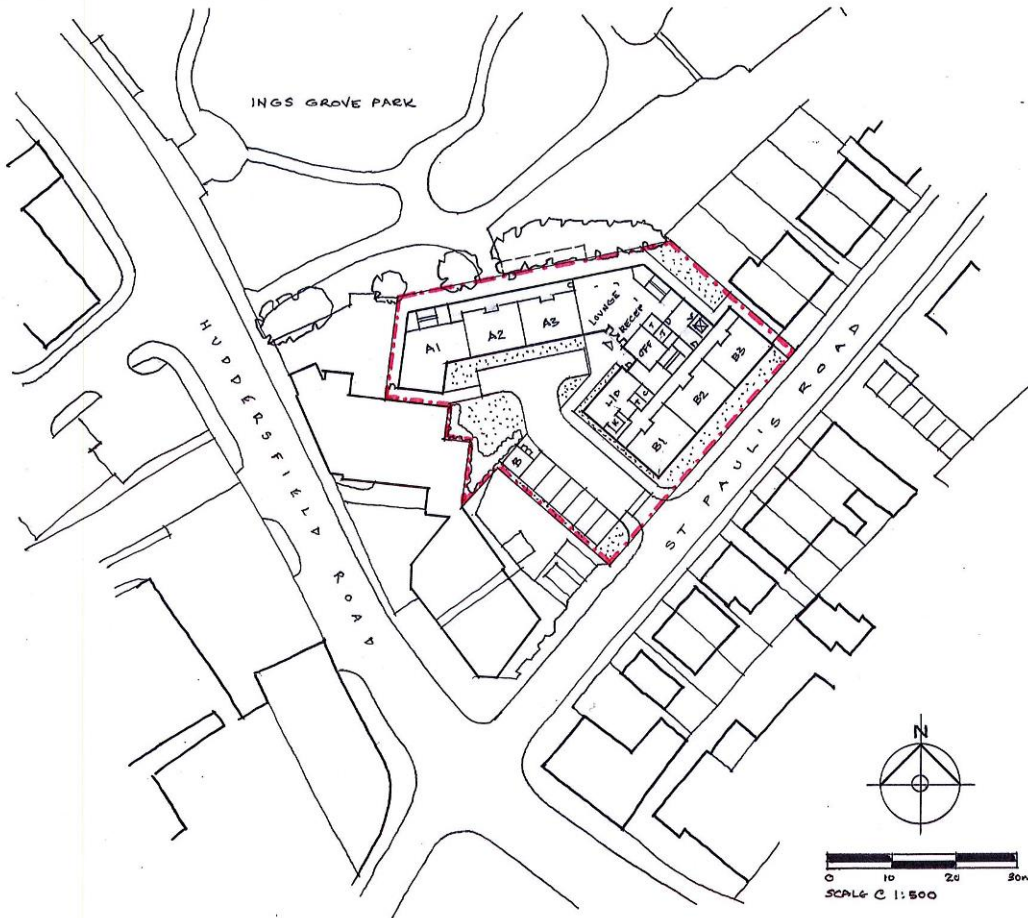
KEY

	Missing roof tile
	Airbrick
	Lifted roof tile
	Damaged/missing pointing
	Crack/crevice
	Broken window
	Lifted roof tiles at eaves
	Gap under door
	Buildings
	Building with low bat roosting potential
	Building with moderate bat roosting potential
	Building with high bat roosting potential
	Proposed development area



Arboricultural & Ecological Consultants

Appendix 2: Proposed Development Plan



ACCOMMODATION

Flats:
 16 No. 1B/2P Flats @ 58.0m² approx.
 2 No. 1B/2P Flats @ 75.0m² approx.
 1 No. 1B/2P Flats @ 68.0m² approx.
TOTAL 20 No. Flats (1221.0m²)

Communal Areas:
 (RECP) Reception Area
 (LOUNGE) Residents' Lounge
 (K) Kitchen
 (D) Lounge/ Dining Room
 (O) Office
 (S/O) Staff Sleepover/Meeting Rm
 (IT) IT Room
 (ST) Store
 (C) Cleaners Store
 (PLANT) Plant Room
 (T) Toilet

Total Floor Area 2290.0m² approx.
 Flats Area 53.3%

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CONNECT HOUSING

Proposed ALD Extra Care
 Residential Development
 at
**ST PAUL'S ROAD,
 MIRFIELD**


GROUND FLOOR PLAN

Drawn: KW/B	Date: Feb 18
Check:	Scale: 1:500 AT A3

brewsterbye architects

5 NORTH HILL ROAD
 HEADINGLEY
 LEEDS
 LS6 2EN

0113 2726000
 0113 2444810
 0113 2444810
 info@brewsterbye.co.uk

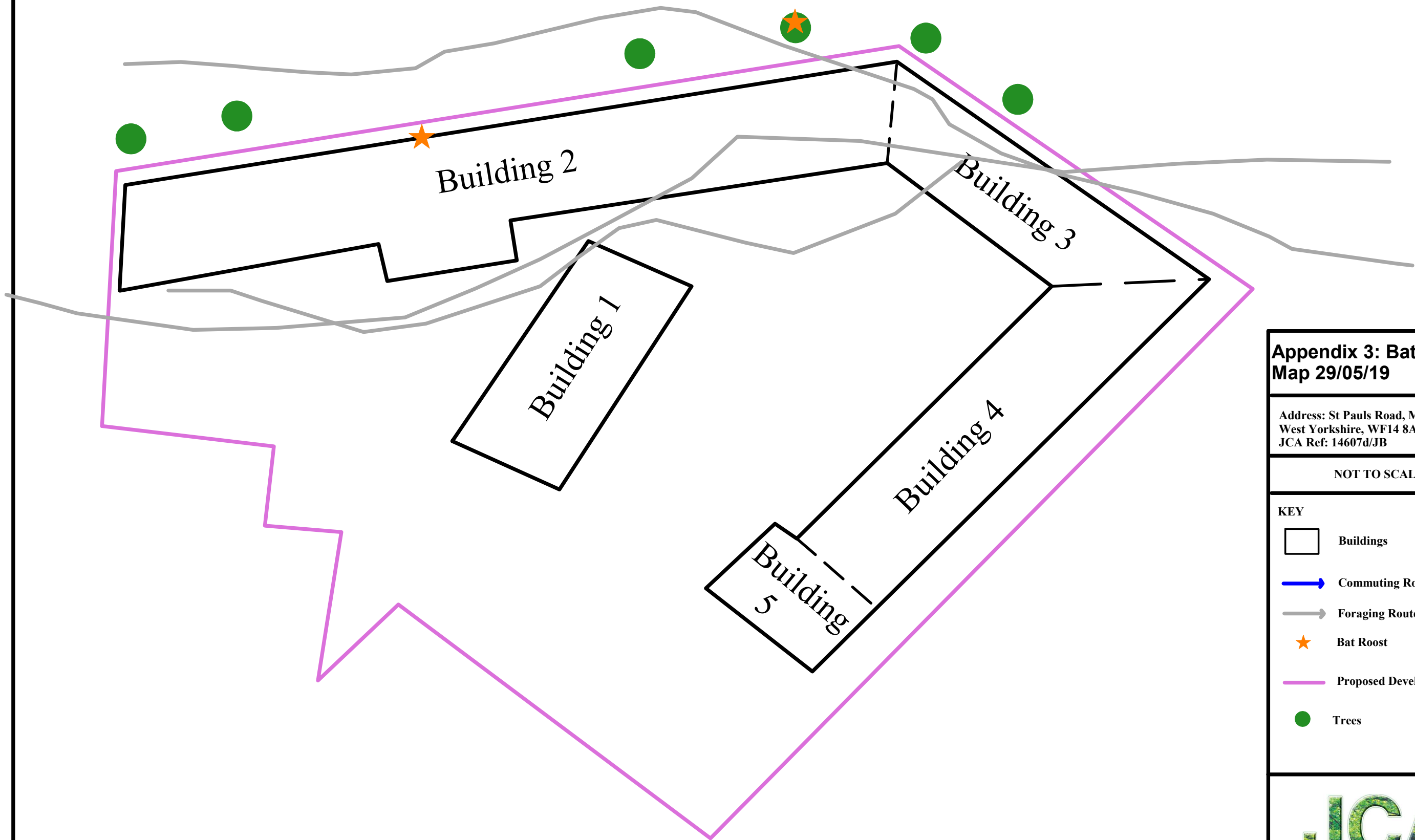
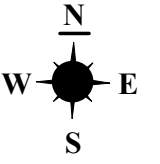


Drawing No. 501/01(01)07



Appendix 3: Bat Activity Map











**Appendix 3: Bat Activity
Map 29/05/19**

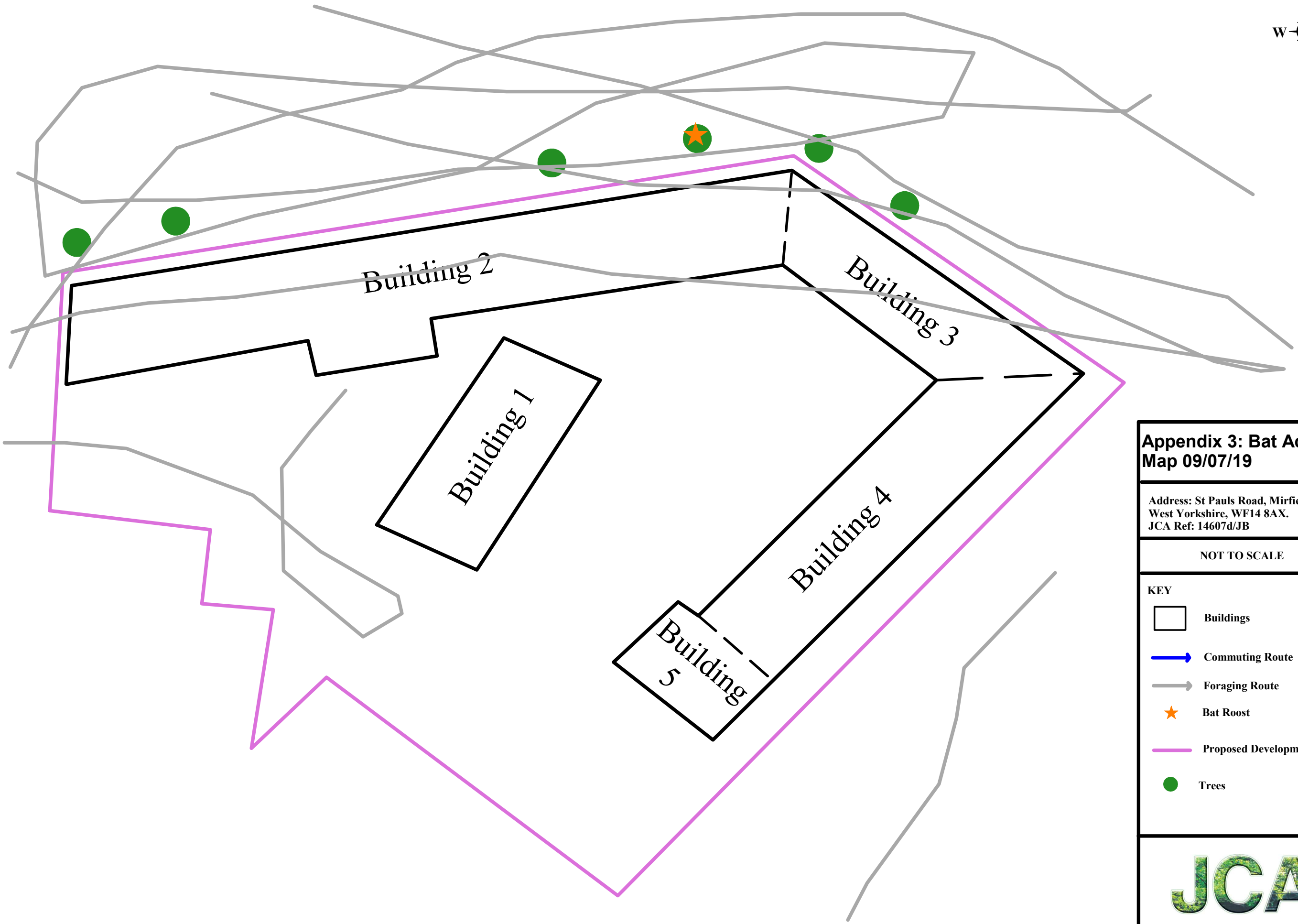
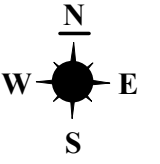
Address: St Pauls Road, Mirfield,
West Yorkshire, WF14 8AX.
JCA Ref: 14607d/JB

NOT TO SCALE

KEY

-  Buildings
-  Commuting Route
-  Foraging Route
-  Bat Roost
-  Proposed Development Area
-  Trees







Appendix 3: Bat Activity Map 09/07/19

Address: St Pauls Road, Mirfield, West Yorkshire, WF14 8AX.
JCA Ref: 14607d/JB

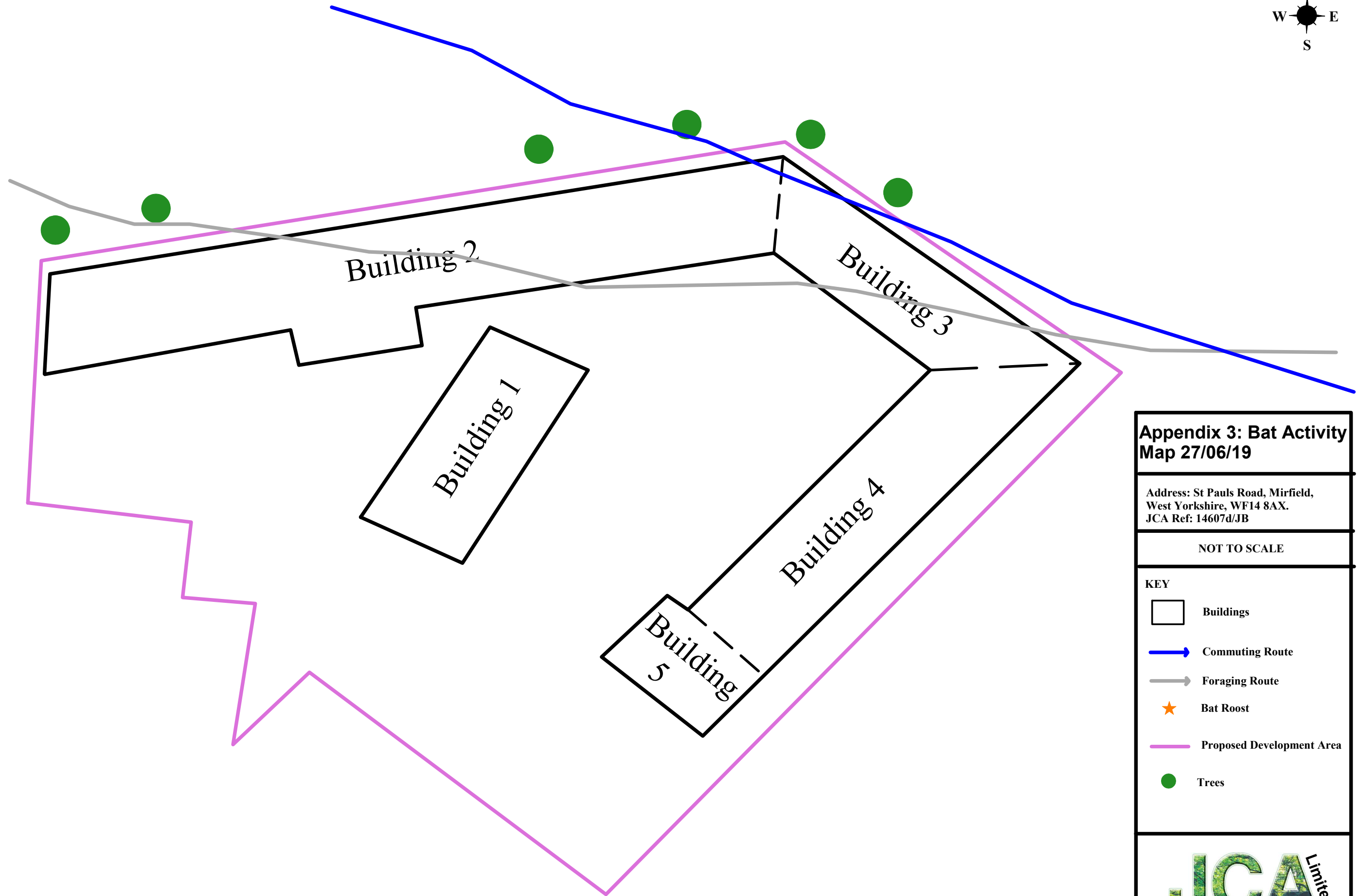
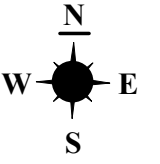
NOT TO SCALE

KEY

-  Buildings
-  Commuting Route
-  Foraging Route
-  Bat Roost
-  Proposed Development Area
-  Trees



Arboricultural & Forestry Consultants




**Appendix 3: Bat Activity
Map 27/06/19**

Address: St Pauls Road, Mirfield,
West Yorkshire, WF14 8AX.
JCA Ref: 14607d/JB

NOT TO SCALE

KEY

-  Buildings
-  Commuting Route
-  Foraging Route
-  Bat Roost
-  Proposed Development Area
-  Trees



Arboricultural & Forestry Consultants

Appendix 4: Photographic Evidence



Photo 1: Missing/damaged pointing on building 1.



Photo 2: Lifted tile along the roof ridge and at the eaves of the roof.



Photo 3: Airbrick at ground level of building 1.



Photo 4: Cavity within timbers in cellar of building 1.



Photo 5: Recently installed roof liner in building 1.



Photo 6: Intact moth within building 1.





Photo 7: Missing window pane on second floor of building 2.



Photo 8: Gap under external door in building 2.



Photo 9: Timber framed roof with roof liner in building 2.



Photo 10: Open chimney breast on second floor of building 2.



Photo 11: Roof in state of collapse with gaps evident in building 2.



Photo 12: Lifted roof tiles at eaves of building 3.





Photo 7: Missing window pane on second floor of building 2.



Photo 8: Gap under external door in building 2.



Photo 9: Timber framed roof with roof liner in building 2.



Photo 10: Open chimney breast on second floor of building 2.



Photo 11: Roof in state of collapse with gaps evident in building 2.



Photo 12: Lifted roof tiles at eaves of building 3.





Photo 13: Lifted ridge tiles on building 3.



Photo 14: Visible daylight through roof of building 3.



Photo 15: Void created behind plasterboard of building 4.



Photo 16: Airbrick and visible daylight in building 4.



Photo 17: falling insulation tiles and roof visible in building 4.



Photo 18: Airbrick towards roof of building 5.





Photo 19: Airbrick towards ground level of building 5.



Photo 20: Fake roof installed within building 5.



Photo 21: Entryway onto site.



Photo 22: Scattered scrub with no access available for detailed inspection.



Photo 23: Hard standing carpark council vehicle storage.



Photo 24: Access into building 4.



Appendix 5: Bat Survey Calendar

Figure 3: Survey timings calendar (taken from BCT: Bat surveys for professional Ecologists, Good Practice Guidelines; 3rd Edition).

Survey type	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Preliminary ecological appraisal - fieldwork												
Preliminary roost assessment – structures ^a												
Emergence/re-entry survey for maternity or summer roosts ^b												
Emergence/re-entry ^c survey for transitional roosts ^b												
Emergence survey for mating roosts ^b												
Hibernation survey – structures ^a												
Preliminary ground level roost assessment – trees ^d												
Potential roost feature (PRF) inspection survey – trees												
Ground level bat activity survey – transects and automated/static												
Pre-, during and post-hibernation – automated/static bat activity survey												
Swarming survey												
Back-tracking survey												
Trapping survey ^e												
Radio tagging and tracking survey ^e												

= optimal period
 = sub-optimal period
 = weather or location dependent (i.e. may not be suitable due to spring and autumn conditions in any one year or in more northerly latitudes). Note that October surveys are not acceptable in Scotland.

^a Not including trees



Appendix 6: Glossary

Activity surveys - are used to assess the level of bat activity at a site. This can be done either by using equipment such as an AnaBat device, or manually walking around a site with a heterodyne detector, documenting the number of bat passes and interceptions.

Dawn surveys - begin around 2 hours before and up to sunrise when bats are returning to their roosts from foraging, and swarming behaviour can be seen close to roost entrances.

Dusk surveys - begin around 30 minutes before sunset and up to 2 hours afterwards. These are done in order to see bats emerging from their roost sites at night.

Echolocation – is a system similar to sonar that allows bats to travel and forage even in total darkness. Bats make a call and then listen to the returning echoes in order to build up a map of their surrounding area. This allows bats to gauge the identity and distance of an object by how long the echo takes to return to them.

Habitat - the ecological or environmental area that is inhabited by a particular species of animal, plant or other type of organism.

Hibernation - is a state of inactivity and metabolic depression characterized by lower body temperature, slower breathing, and lower metabolic rate. Hibernating animals conserve energy, especially during winter when food is short, tapping energy reserves, i.e. body fat, at a slow rate.

Hibernacula - typically consist of underground sites, such as caves and cellars, which remain relatively cold and humid. Bats will hibernate to conserve energy over the winter months when falling temperatures cause a drop in the abundance of insects. These will typically be colonised around November to around March.

Insectivorous – is when an organism feeds exclusively on insects.

Nocturnal - a behaviour characterized by being active during the night and sleeping during the day.

Maternity roosts – colonised around late May early June and consist of mature females and their young. These roosts need to be warm and quiet, and are used up until around August, with females typically leaving first and then the young.

Mating roosts – mating begins around late October to November. Males of most species use special mating calls to attract females. These can include purrs, clicks and buzzing.

Roost – a site where bats live during the day, rear young and hibernate. These can be in man made structures, such as buildings, bridges, tunnels, cellars and mines, or natural features such as mature trees and caves.

Roosts in buildings – many types of buildings will be used by bats. The most likely sites are agricultural buildings (e.g. farmhouses and barns), buildings with exposed wooden beams (greater than 20cm thick), buildings with weather boarding and/or hanging tiles, and buildings close to woodland and/or water.

Roosts in trees – these are typically in mature trees with deep sheltered cracks, under loose sections of bark, or in woodpecker holes.

Species – a group of organisms in which all members can interbreed and produce viable offspring.

Summer roosts (non-breeding) - these are generally occupied by groups of males and immature females during the summer, and are usually only occupied for a short period before the group moves to another location.

Swarming – a behaviour exhibited by bats returning to their roost sites at dawn. Bats can be seen repeatedly flying to and from the roost entrance, making it much easier for consultants to identify where roosts are on a building or structure.

Temporary/Transitory roosts – These are used after hibernation (March – April) before mature females disperse to maternity roosts and male/immature females colonise summer (non-breeding) roosts. Similarly, temporary roosts form before hibernation (August -October).

Underground Roosts – these are typically used during the winter and can be mines, caves, tunnels or cellars.



Appendix 7: Author Qualifications

Principal Consultant and Managing Director

Jonathan Cocking

F.R.E.S., Tech. Cert. (Arbor.A), PDipArb (RFS) FArborA CBiol MSB. MICFor.

Jonathan is a Registered Consultant and Fellow of the Arboricultural Association and sits on its Professional Committee. He has 31 years experience in the Arboricultural profession and served for eight years as Senior Arboriculturist with a large local authority before establishing JCA in 1997. Jonathan has since developed JCA's portfolio of services and its extensive client base. He is a Chartered Biologist, a Chartered Arboriculturalist and an Expert Witness with much experience of litigation work.

Technical Director

Toby Thwaites

BSc (Hons), HND (Arboriculture).

Toby joined JCA in 1998 after graduating in Ecology at the University of Huddersfield and has since graduated in Arboriculture at the University of Central Lancashire. A former JCA team leader and Consulting Arboriculturist, Toby is now Technical Director and oversees all office and on-site activities at JCA and is on hand to offer technical support and advice.

Consulting Staff: Ecology

David Bodenham, Consultant Ecologist

BSc Ind (Hons) Zoology, MSc Biodiversity and Conservation.

David joined JCA as an addition to the expanding ecology department. An advocate of evidence based conservation, he studied Zoology (Ind) at University and moved onto an MSc in Biodiversity and Conservation where he gained the myriad of skills needed as an ecologist. With over 7 years of experience, David specialises in bat and amphibian ecology. David holds Natural England GCN and bat licences and a CSCS card.

Jenny Butler, Consultant Ecologist

AMEnvSc, BSc (Hons) Environmental Science.

Jenny joined JCA's ecology department in 2017, bringing with her a bachelor degree in Environmental Science from Bangor University. Jenny has previously worked as an Environmental Consultant for an Agri-Environment company and as a freelance ecological consultant. Jenny specialises in great crested newt and bat ecology. She holds level 2 Natural England, Welsh and Scottish bat licences, level 2 Natural England, Welsh and Scottish Great Crested Newt licences and is currently working towards her Hazel Dormouse and Natterjack Toad licences. Jenny is a member of the Bat Conservation Trust, Botanical Society for Britain and Ireland (BSBI) and the Arboricultural Association. Jenny is an active volunteer for the West Yorkshire, South Lancashire and Clwyd bat groups, as well as a volunteer for the Shropshire Dormouse Monitors. Jenny holds a CSCS Card and is DBS checked.

Amanda Beck, Ecological Officer

Cert/He in Field Ecology, Diploma Field and Conservation Ecology, CIEEM member.

Amanda joined JCA's ecology department in 2018, previously working as a freelance Ecological Consultant in North Wales and as a trainee Ecologist in South Wales. She has a background surveying for botanical, amphibians, birds, terrestrial and marine mammals along with small mammal trapping and invertebrate research work on SSSI sites. She has practical experience in habitat management and creation while working as a volunteer for North Wales Wildlife Trust and currently volunteers with Yorkshire Wildlife Trust. She is a member of the Butterfly Conservation Trust, Bat Conservation Trust, Clwyd Bat Group and the British Hedgehog Preservation Society. Amanda is DBS checked and holds a Natural England level 1 bat licence.

Joe Earnshaw, Trainee Ecologist

BSc (Hons), MSc Biodiversity and Conservation.

Joe joined the ecology department of JCA in 2018 after taking part in JCA's student training programme. He initially obtained a bachelor degree in Animal Management from Askham Bryan College, York. He has since furthered his education and brings to the company an MSc in Biodiversity and Conservation from the University of Leeds. Joe has expertise in aquatic invasive species identification and control.



The information which we have prepared and provided is true and has been prepared and provided in accordance with the CIEEM's Code of Professional Conduct. We confirm that the opinions expressed are our true and bona fide opinions.

Signed

.....
Jenny Butler *AMIEEnvSc, BSc (Hons) Environmental Science*
19/07/19

Proofread by

.....
Amanda Beck
Cert/He in Field Ecology, Diploma Field and Conservation Ecology, CIEEM member
22/07/19
For and on behalf of **JCA Ltd**

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ECOLOGICAL SERVICES

Ecological Pre-Planning Services

- Phase 1 Habitat Surveys
- Great Crested Newt eDNA Sampling
- Protected species: Bat, Wintering and Nesting Bird, Badger, Amphibian, Otter, Water Vole, White-Clawed Crayfish, Dormice and Reptile Surveys.
- Preparation for Environmental Impact Assessment (EIA)
- Invasive Species Surveys
- Code for Sustainable Homes
- Butterfly & Insect Surveys

Ecological Post-Planning Services

- Biodiversity Enhancement Plans
- Protected Species Mitigation
- Ecological Management (Bat and Bird box installation and inspection)
- Planting Schemes
- Monitoring of bird or bat boxes.

ARBORICULTURAL SERVICES

Guidance for Architects & Developers

- British Standard 5837 Surveys
- Arboricultural Implications Assessments (AIA)
- Arboricultural Method Statements (AMS)

Advice for Engineers, Loss Adjusters and Insurers

- Tree Surveys for Subsidence
- Heave Assessment
- Tree Root Identification

Advice for Local Authorities and Social Housing

- Tree Safety Surveys
- Specialist Decay Detection
- Landscape and Orchard Design

Tree Advice for the Legal Profession

- Subsidence Litigation
- Personal Injury and Accident Investigation
- Expert Witness, Planning Inquiries and Appeals

Veteran Tree Management

- Ancient Woodland Management
- Veteran Tree Management

Tree Health and Pest and Disease Management

- Pest and Disease Surveys
- Tree Health Checks
- Disease Mitigation and Control



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