

**BAT ROOST POTENTIAL
SURVEY REPORT**

at
**46 Henry Street
Manchester
Greater Manchester
M4 5DD**

**Client:
Mere Development Group**

**Client Address:
651A Mauldeth Rd West
Chorlton
Manchester
M21 7SA**

**JCA Ref:
20401/EG**

**Date of Report:
13/03/2023**



Quality Assurance

Version	Desktop Survey Completed:		Site Surveyed:		Report Completed:		Reviewed:	
	Date	Name	Date	Name	Date	Name	Date	Name
Planning	09/03/23	Eve Goodwin	08/03/23	Eve Goodwin	13/03/23	Eve Goodwin	14/03/23	Audrey Bourdais Paull
							20/03/23	Adam West

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

JCA Ltd was commissioned by **Mere Development Group** to provide ecological advice to inform works at **46 Henry Street**, hereafter referred to as 'the site'. The site is located at **Manchester, Greater Manchester, M4 5DD**, Ordnance Survey (OS) National Grid Reference **SJ 84813 98641**.

The purpose of this report is to present the findings of the survey, an interpretation of the findings and to provide recommendations for undertaking the proposed works in accordance with relevant legislation.

Bats and their roosts are protected under UK law. Development works that are likely to affect bats or their roost sites must be completed under licence from the statutory conservation body, in this case Natural England (NE).

The field survey was undertaken on 07/03/2023 to identify any bat roost potential of the existing building on site. The survey found limited potential roosting features including missing mortar, missing render and gaps above the roller shutter. The survey found the building to hold low potential to support roosting bats.

An evaluation of the site, likely impacts of the scheme upon bats and recommendations for proceeding with works in compliance with legislation are presented in Chapters 4, 5 and 6 of this report.



Contents

1. Introduction	5
1.1 Background	5
1.2 Details of Proposed Development.....	5
1.3 Site Location.....	5
1.4 Scope of Works	5
1.5 Survey and Report Aims.....	6
1.6 Legislative Context	6
2. Methodology.....	8
2.1 Desktop Study	8
2.2 Field Surveys.....	8
3 Results	11
3.1 Desktop study results	11
3.2 Field Survey Results.....	12
4 Interpretation of Survey Results.....	13
4.1 Bat Records.....	13
4.2 BRP Survey	13
4.3 Impacts of the Proposed Development	13
5 Recommendations	14
6 References.....	15
Appendix 1: Legislation Pertaining to the Protection of Bats.....	17
Appendix 2: Site Plan Showing Bat Roost Potential.....	18
Appendix 3: Proposed Development Plan	20
Appendix 4: Photographic Evidence	22
Appendix 5: Bat Survey Calendar	23
Appendix 6: Glossary	24
Appendix 7: Author Qualifications	26

1. Introduction

1.1 Background

1.1.1 In February, JCA Ltd was commissioned by **Mere Development Group** to undertake a Bat Roost Potential (BRP) survey of a site located at **Henry Street, Manchester, Greater Manchester, M4 5DD** hereafter referred to as 'the site'.

1.1.2 A BRP survey is required where development proposals include demolition of a structure or where a structure will be modified in such a way that bats or their roosts could be directly impacted if present. This survey type may also be needed where bats roosting in a structure could be indirectly impacted by development activities outside the roost.

1.2 Details of Proposed Development

1.2.1 The scheme is the development of a new food outlet by means of modification to the existing building including repairs to the south eastern wall, a new façade located on Henry Street, the construction of a stairwell and raising the existing level of the roof.

1.3 Site Location

1.3.1 The site is located at Ordnance Survey (OS) National Grid Reference **SJ 84813 98641**, with nearby postcode **M4 5DD**. The site is bordered to the east by a residential block of apartments and in all other directions by commercial properties.

1.4 Scope of Works

1.4.1 The following elements of work were included in the bat survey programme:

- Desktop study – a review of historical records of bats in the surrounding area, including the results of recent ecological surveys in the area.
- Field surveys – a field survey in daylight hours to assess whether features are present within the buildings/trees on site which bats may roost in.



- Ecological report – detailing the survey results, implications for the disturbance of the buildings/trees and recommendations.

1.5 Survey and Report Aims

1.5.1 The main aim of the BRP survey was to locate and map features which bats could use for entry/exit and roosting and to search for signs of bats.

1.5.2 The BRP survey aims to:

- Identify if actual or potential roosts are present (and if so, where).
- Locate bat roost access points
- Identify where bat roost are located and how bats get to them from the access points.
- Identify the species and numbers of bats potentially present.
- Determine the type of roost (e.g. maternity roost, transitional roost, hibernation site, etc).
- Gain sufficient information to allow the potential impacts on bats of the proposed works to be assessed and for appropriate avoidance, mitigation and/or compensation measures to be designed.

1.5.3 The aims of the report presented are to:

- Outline the legislative protection given to bats.
- Report on the findings of a desk-based study undertaken to identify any existing records for bats which are relevant to the site.
- Summarise the findings of the BRP survey and provide an assessment of the potential ecological constraints to the proposed works at the site.
- Provide recommendations for further survey, avoidance, mitigation and/or enhancement where appropriate.

1.6 Legislative Context

1.6.1 In the UK all species of bat and their roosts are fully protected under Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, with additional protection offered under Schedule 5 of the Wildlife and Countryside (WCA) Act 1981 (as amended). This makes it an offence to:

- Deliberately or recklessly capture, injure or kill a bat;

- Deliberately or recklessly disturb in a way that would affect their local distribution or abundance, or affect their ability to survive, breed or rear young;
- Damage or destroy a bat roost (this is an 'absolute' offence);
- Intentionally or recklessly obstruct access to a bat roost; and/or
- Possess, control, transport, sell, exchange or offer for sale/exchange any live or dead bat or any part of a bat.

1.6.2 Under this legislation a roost is determined as any structure or place used for shelter. As bats tend to re-use the same roosts, the roost is protected whether the bats are present at the time or not.

1.6.3 Please see Appendix 1 for a more detailed overview of the UK legislation protecting bats.



2. Methodology

2.1 Desktop Study

- 2.1.1 A desktop study has been undertaken in order to obtain any relevant records of bats from Greater Manchester Local Records Centre (GMLRC) within a 2km radius of the site.

2.2 Field Surveys

- 2.2.1 The field survey was planned and conducted with reference to Bat Surveys: Good Practice Guidelines 3rd Edition (Collins, 2016). The survey was conducted in February.
- 2.2.2 The site was surveyed by Eve Goodwin (Graduate Ecologist, JCA Ltd), under the guidance of Adam West (Principal Ecologist, JCA Ltd; NE Level 2 bat survey class licence registration number 2016-24724-CLS-CLS) for foraging, commuting and roosting potential. A detailed search of the building on site was conducted during daylight hours in order to identify potential bat roosting sites and look for evidence of bat activity and photographic evidence was taken (please refer to **Appendix 2**).
- 2.2.3 The survey was conducted by an experienced surveyor using the following equipment to ensure an accurate assessment; a printed site map, camera, a 1 million candlelight torch, binoculars, and ladders.
- 2.2.4 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.
- 2.2.5 During the bat scoping survey, the building on site was subject to an external and internal survey to establish the suitability of the structure to support roosting bats in accordance with Collins (2016). The criteria

for assigning a roost suitability category are presented in Table 1 below:

Table 1: Guidelines used for assessing the bat roosting suitability of a site (taken from Collins, 2016)

Roosting Suitability	Potential Roosting Features (PRFs) 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.

2.2.6 The category of roosting suitability assigned to a feature is used to determine what further survey effort is required to ascertain the presence/likely absence of bats within that feature, as shown in Table 2 below:

Table 2: Recommended minimum number of survey visits for presence/likely absence surveys (taken from Collins, 2016).

Negligible roost suitability	Low roost suitability	Moderate roost suitability	High roost suitability
No further survey required	One survey visit. One dusk emergence or dawn	Two separate survey visits. One dusk emergence and a separate	Three separate survey visits. At least one dusk emergence and a separate dawn re-entry survey. The



	re-entry survey (structures). No further surveys required (trees).	dawn re-entry survey.	third visit could be either dusk or dawn.
--	---	-----------------------	---

2.3 Survey Constraints

- 2.3.1 It must be highlighted that the absence of any signs of bat presence (droppings, feeding remains, etc.) 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. 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.
- 2.3.2 The site was surveyed in March 2023 on a clear, dry day with good visibility.
- 2.3.3 There were no perceived limitations that would significantly impact on the conclusions and recommendations given within this report.
- 2.3.4 The southern and eastern aspects of the building were obscured from view due to the nature of the surrounding buildings being high rise in nature. This does not pose a significant constraint to the findings of this report, as reasonable assumptions can be made based on the features that were visible. The south eastern wall is approximately 250mm away from the adjacent building, it is in a state of disrepair and is currently covered by plastic sheeting, which obscured part of the wall. This does not pose a significant constraint to the findings of this report, as reasonable assumptions can be made based on the features that were visible.
- 2.3.5 The details of this report will remain valid for 18 months. Beyond this period, if the proposed works have not commenced, a new review of the ecological conditions must be undertaken.

3 Results

3.1 Desktop study results

3.1.1 Local Data Centre Records: GMLRC 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 bat species are absent from the search area. Please see **Table 3** below for a summary of the bat records from the last ten years obtained from GMLRC. **Table 4** summarises all bat roost records within 2km of the site received from GMLRC.

Table 3 Summary of bat records from the last ten years held by GMLRC within 2km of the site.

Common Name	Scientific Name	On site	Within 500m	500-1000m	1001-2000m	Notes
Noctule	<i>Nyctalus noctula</i>	x	✓	x	x	One record from 2020 of commuting bat.
Unidentified bat of the genus <i>Pipistrellus</i>	<i>Pipistrellus</i> sp.	x	x	x	✓	One record from 2018 of grounded male bat.
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	x	✓	✓	✓	34 records between 2013 and 2020.
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	x	x	x	✓	One record from 2019 of injured bat.
Brown long-eared bat	<i>Plecotus auritus</i>	x	x	x	✓	One record from 2013.
Unidentified bat	<i>Vespertilionidae</i>	x	x	x	✓	One record from 2014.

Table 4 Summary of bat roost records held by GMLRC within 2km of the site.

Common Name	Scientific Name	On site	Within 500m	500-1000m	1001-2000m	Notes
Unidentified bat of the genus <i>Myotis</i>	<i>Myotis</i> sp.	x	x	✓	x	One roost recorded in 2015 through an endoscope survey.
Unidentified bat of the genus <i>Pipistrellus</i>	<i>Pipistrellus</i> sp.	x	✓	✓	✓	13 roosts recorded between 2003 and 2016, including one maternity roost with 100 individuals.
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	x	✓	✓	✓	40 roosts recorded between 2006 and 2020 including four within 500m of site.



Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	x	x	✓	x	One record of multiple roosts within same building from 2013.
---------------------	------------------------------	---	---	---	---	---

3.2 Field Survey Results

3.2.1 Habitats Present

The site contains one building, which is enveloped by buildings on all sides with the exception of the north eastern aspect, located on Henry Street.

3.2.2 Building Assessment

Building One

The building is a two-storey red brick construction, typical of the Greater Manchester area (**Appendix 4, Photo 1**). The roof is flat and made out of corrugated metal, there is no loft space present, with the ceiling of the first floor being clad in PVC sheets, on top of which the roofing structure is directly sat.

The building has been previously used as a commercial cleaning premises. It is evident that the building has not been used in some time, with rodent droppings visible on the ground floor and evidence of rodent damage to the internal partition walls.

PRFs PRESENT: Four types of potential roosting feature were identified (**Appendix 2**).

On the north eastern aspect there is a roller shutter present which has a large gap present along the top, with insulation material visible (**Appendix 4, Photo 2**).

On the western corner there is an area of missing mortar, located at a high level above the adjoining building (**Appendix 4, Photo 3**).

The eastern wall is located approximately 250mm away from the adjacent building. It is in a state of disrepair with missing render and mortar; however the wall is entirely covered by plastic sheeting (**Appendix 4, Photos 4 & 5**).

Internally on the ground floor at the south eastern corner there was a hole in a bulkhead, leading to the space below the first floor with insulation visible (**Appendix 4, Photos 6**).

4 Interpretation of Survey Results

4.1 Bat Records

- 4.1.1 Seven species of bat have been recorded within 2km of the site, three within 500m, suggesting that bats are roosting, foraging and commuting in the local vicinity.

4.2 BRP Survey

- 4.1.2 A number of features were identified on site in which bats may roost. Please refer to Section 3.2 and Appendix 1 for further details.
- 4.1.3 Based on the proximity of roost records, the type of PRFs present and the proximity of high quality bat foraging habitat, this site is considered to have **low** potential for supporting roosting bat species during their active period between May and September. Please see **Tables 1 and 2** above 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.

4.3 Impacts of the Proposed Development

- 4.3.1 A number of features were identified on site in which bats may roost. Please refer to **Section 3.2 and Appendix 1** for further details.
- 4.3.2 Based on the number and type of PRFs present, the proposed works will reduce the number of roosting opportunities for bats.
- 4.3.3 The proposed development has the potential to cause injury and/or death to bats, and to damage/destroy bat roosts.



5 Recommendations

5.1.1 The following must be undertaken:

5.1.2 One bat survey is required for the building, consisting of dusk emergence survey augmented with night vision aids (NVAs). The survey must be carried out between 1st May to 31st August in suitable weather conditions.

5.1.3 If roosting bats are found during the survey, two further surveys to characterise the roost type will be required. For the roost which will be impacted by the proposed works, a Mitigation Licence must then be obtained from NE before works proceed.

5.1.4 If no roosting is identified during the surveys, alternative roosting provision must be provided as compensation for the loss of potential roosting features.

5.1.5 The lighting design of the proposed scheme should follow guidance from the Bat Conservation Trust and Institute of Lighting Professionals (2018). A key point is the avoidance of internal and external light spill. Where possible, lighting should be timed, or on sensors and avoid the hours between sunset and sunrise, when bats are out foraging.

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.
- A warm white spectrum (<2700 kelvin) to reduce blue light.
- 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 References

Bat Conservation Trust and Institute of Lighting Professionals (2018) *Guidance Note 08/18: Bats and artificial lighting in the UK*. ILP, Rugby

Mitchell-Jones, A.J. (2004) *Bat Mitigation Guidelines*. English Nature, Peterborough

Mitchell-Jones, A.J. & McLeish, A.P. (2012) *The Bat Workers' Manual*. Pelagic Publishing, Exeter.

Collins (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* 3rd edition, Bat Conservation Trust, written 2016

Relevant Legislation:

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

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.
<https://www.legislation.gov.uk/ukdsi/2019/9780111176573>

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: Legislation Pertaining to the Protection of Bats

All bat species have, for some time, been protected under schedule 5 of the Wildlife & Countryside Act 1981. However, the effective protection for bats now comes from Schedule 2 of the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) Regulations 2019, which defines "European protected species of animals". Changes to legislation, and devolution, mean the law is difficult to summarise succinctly across the UK, but the strong legal protection for bats and roosts remains.

It is an offence across the UK to:

- deliberately or recklessly capture, injure or kill a bat
- deliberately or recklessly disturb in a way that would affect their local distribution or abundance, or affect their ability to survive, breed or rear young
- damage or destroy a bat roost (this is an 'absolute' offence)
- intentionally or recklessly obstruct access to a bat roost
- possess, control, transport, sell, exchange or offer for sale/exchange any live or dead bat or any part of a bat

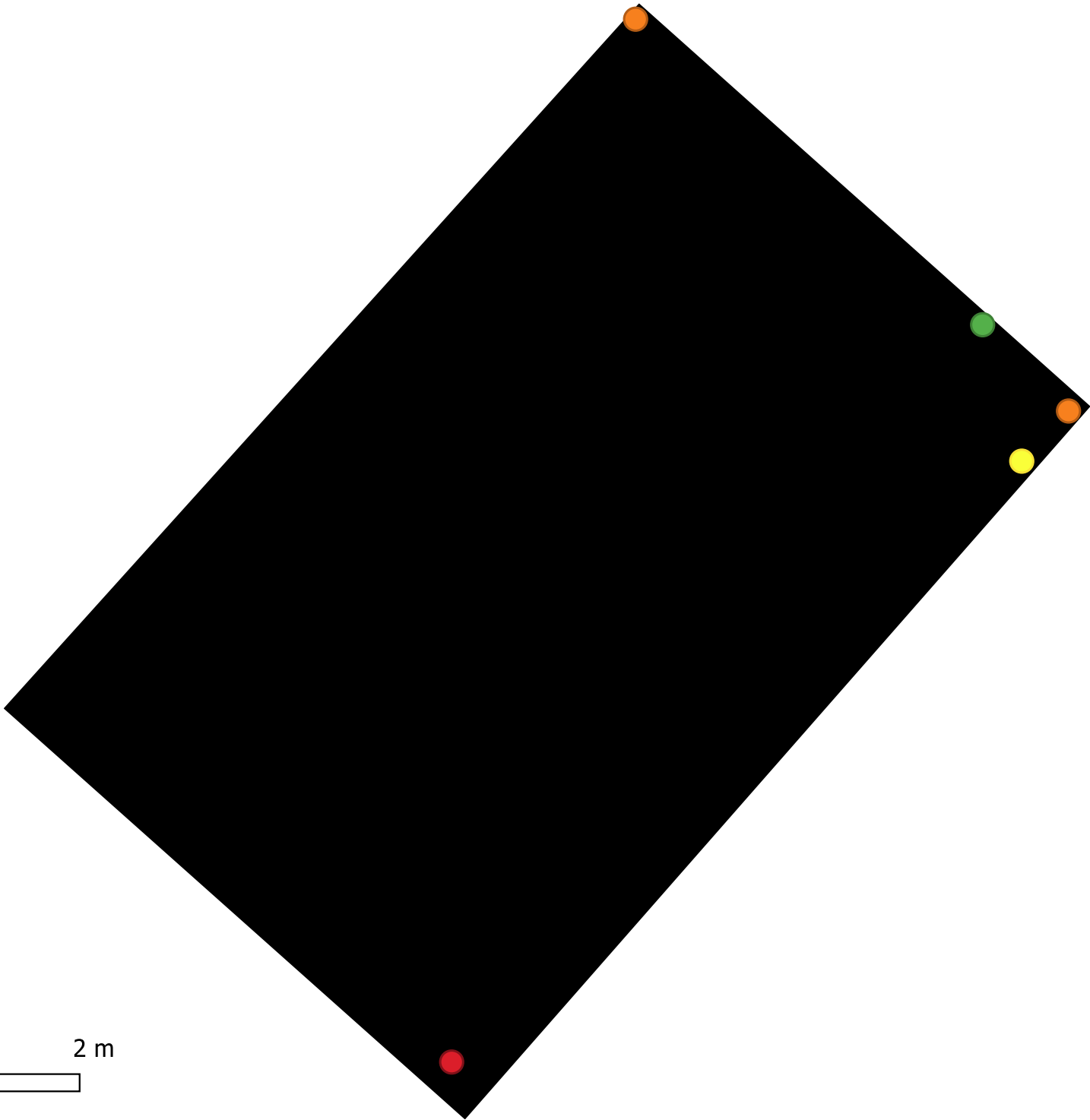
'Deliberately' in this context may be interpreted as someone who, although not intending to capture/injure or kill a bat, performed the relevant action, being sufficiently informed and aware of the consequence his/her action will most likely have.

In this interpretation, a bat roost is "any structure or place which any wild [bat]...uses for shelter or protection". Because bats tend to reuse the same roosts, legal opinion is that the roost is protected whether or not the bats are present at the time.



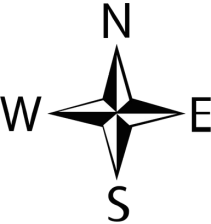
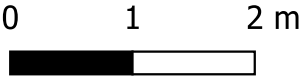
Appendix 2: Site Plan Showing Bat Roost Potential

Potential Roosting Features; 46 Henry Street, Manchester



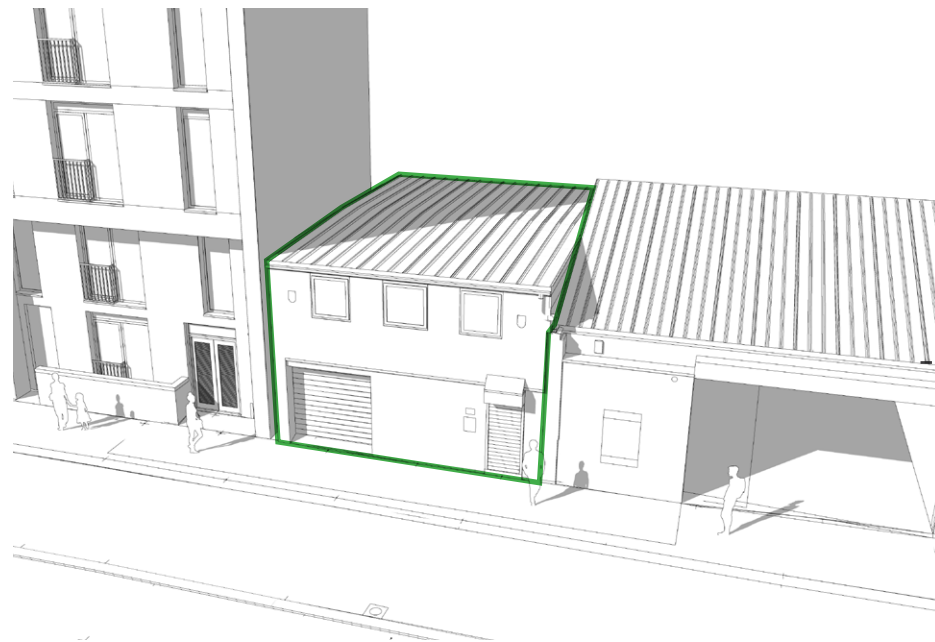
Legend

- Surveyed building
- Potential Roosting Features
 - Gap above roller shutter
 - Missing mortar
 - Missing render
 - Hole in bulkhead (internal)



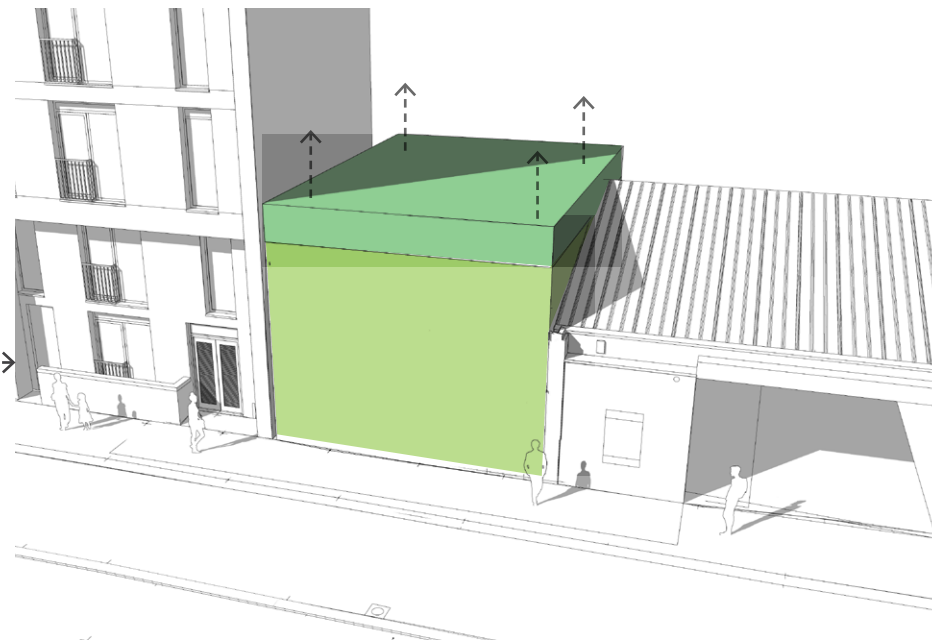
Appendix 3: Proposed Development Plan

Design Development



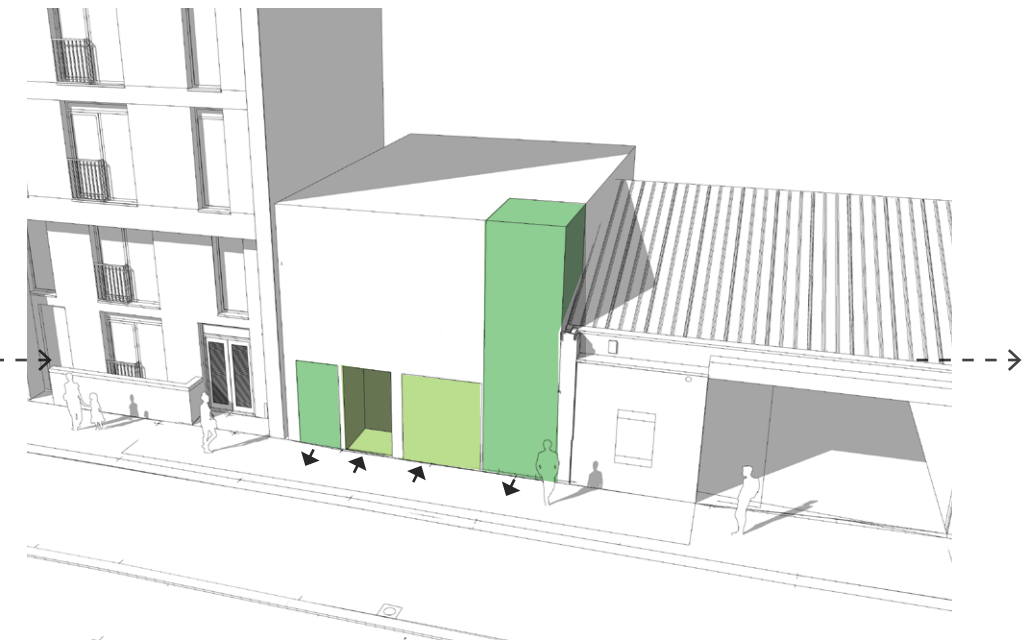
Existing Site

The existing red brick non historical facade with corrugated sheet metal roof.



Mass Replicated with Flat Roof

The mass is replicated, albeit raised slightly as per historical imagery and to improve vertical efficiency of the first floor space. A flat roof is proposed to mimic the original historical massing and to improve energy efficiency as well as room for M&E plant.



Stair, Circulation & Servicing

The site is relatively unique in the respect that it's only accessible elevation is fronting the highway. Therefore bins, takeaway hatch, main entrance and the emergency escape route from the stair all need to be serviced from the one elevation. Refuse collection is situated next to the neighbouring developments bin store for ease, the takeaway hatch is to be recessed to prevent obstruction of the highway by people waiting and the main entrance is situated in the central plan.

Design Development



Extrusion for Seperation, Diffrentation & Access

As per the concept, the stair core area is extruded to allow for ladder access to the flat roof. This in turn creates the “chimney” mass, the addition creates separation from the neighbouring garage as well as interest within the street scene.

Reflective & Traditional Rhythm

The “chimney feature” is differentiated from the rest of the facade through the use of both contrasting and complementing materials referencing the industrial heritage of the area. The main mass has a shop front to the ground floor as per the majority of units within the area. The first floor references the traditional arched top floor windows of the surrounding warehouses.

Articulation & Branding

The branding and detailing play a big part within the buildings refinement. i.e. the signage and sheet metal panelling to the “chimney” and fenestration detailing to the windows.

Appendix 4: Photographic Evidence



Photo 1: View of the north eastern aspect of the building on Henry Street.



Photo 2: Gap above roller shutter with insulation material visible.



Photo 3: Missing mortar and brick on western corner of the building.



Photo 4: Large piece of PVC sheeting located on the eastern side of the building.



Photo 5: Missing mortar and render on the eastern elevation, covered by PVC sheeting.



Photo 6: Internal hole in bulk head at south eastern corner.

Appendix 5: Bat Survey Calendar

Figure 1: 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

Adam West, Principal Ecologist

BSc (Hons) Animal and Wildlife Management.

Adam joined JCA to lead the expanding ecology department. Having returned to education as a mature student, Adam studied Countryside Management for two years before undertaking a Bachelor's degree in Animal and Wildlife Management, for which he was awarded First Class Honours. Adam has many years' experience in ecological consultancy, working on projects ranging from individual planning applications to national infrastructure projects. Adam holds a Natural England Level 1 great crested newt survey class licence and a Natural England Level 2 bat survey class licence.

Eve Goodwin, Graduate Ecologist

BSc (Hons) Plant Biology, Qualifying CIEEM Member

Eve gained her Royal Society of Biology accredited undergraduate degree in 2019 from Aberystwyth University in Plant Biology. She has good plant identification skills which were developed through her academic studies and field work. She has since worked as a CAD technician and has joined JCA in 2022 where she hopes to develop her field skills further.

Audrey Bourdais Paull, Graduate Ecologist

BSc (Hons) Zoology.

Audrey joined JCA in 2022 after graduating in Zoology from the University of Leeds. Audrey volunteered for many years with various wildlife conservation and rescue organisations, as well as working on various projects to develop a variety of field survey techniques, report writing and data analysis skills. Audrey is looking forward to developing her ecology consultancy experience with JCA, as well as combining her previous dog training and detection work with ecology to expand into ecology detection dogs.

The information and advice 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



.....
Eve Goodwin

13/03/2023

Reviewed by



.....
Audrey Bourdais Paull

14/03/23

Reviewed and authorised by



.....
Adam West *ACIEEM*

20/03/2023



For and on behalf of **JCA Ltd**

Registered Office:

**Unit 80
Bowers Mill
Branch Road
Barkisland
Halifax
HX4 OAD**

Tel. 01422 376335

Fax. 01422 376232

Email: jon@jcaac.com

Web: www.jcaac.com



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



HEAD QUARTERS

Unit 80 Bowers Mill,
Branch Road,
Barkisland
Halifax, HX4 0AD

Company Reg No: 05005041
VAT No: 686 4674 78

