

Cleator Moor Innovation Quarter

BAT ROOST ASSESSMENT REPORT

784-B029668 Rev 2

Copeland Borough Council

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Prepared on Behalf of Tetra Tech Group Limited.

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EXECUTIVE SUMMARY

Contents	Summary
Site Location	The 'site' is located in Cleator Moor, Cumbria and is centred at Ordnance Survey National Grid Reference NY 01570 15529. The site is approximately 34.9 hectares in size and lies on the north side of Leconfield Street.
Proposals	The Cleator Moor Innovation Quarter (CMIQ) site has been used as an industrial estate since 1980s. It is proposed for re-development into an Innovation Quarter for West Cumbria.
Existing Site Information	Previous reports available for the site: • Tetra Tech (2021) Cleator Moor Innovation Quarter: Ecological Appraisal. On behalf of Copeland Borough Council. Ref: 784-B029668; and • WYG (2020) Leconfield Industrial Estate: Ecological Appraisal Report.
Scope of this Survey(s)	Undertake a bat roost assessment to determine presence / likely absence of roosting bats on the CMIQ site and assess habitat value for foraging and commuting bats.
Results	Tow day roosts of common pipistrelles within buildings B1 and B6 were identified (Site A). These are roosts of Low Conservation Significance. The proposed Masterplan indicated that there will be no works to building B1 and bat roost R1 will be retained. The proposed works to demolish B6 will destroy the identified bat roost R2.
Recommendations	An EPSML must be obtained from Natural England prior to commence of development works at B6. This can be a standard EPSML or site registration under the BMCL. The EPSML can only be gained once full planning consent has been granted and will place reasonable conditions on the development to ensure that no bats are killed / injured during works and that the favourable conservation status of the species present is maintained. An outline mitigation strategy for works has been provided as part of this report; it is proposed that the roost R2 will be replaced with 2 no. bat boxes. Full details of the mitigation strategy will be provided within the EPSML method statement / BMCL site registration form & class licence, and in consultation with the consultants/contractors appointed to undertake the proposed works. No active bat roosts were identified within building B4, B7 B11, B12 and B13 during bat emergence and re-entry surveys. No further survey, licensing or mitigation is required for roosting bats and works can proceed to these buildings without the risk of causing an offence under relevant wildlife legislation.

	No presence / absence surveys were undertaken on buildings B2, B3, B5, B8, B9 and B10. If any works are proposed to these buildings, it is recommended that further nocturnal surveys are undertaken. Three trees with high bat roost suitability, eleven trees with moderate bat roost suitability and thirteen trees with low bat roost suitability were identified on site. There are no works proposed to the trees with bat roost suitability. It is recommended that the site is enhanced for bats through provision of 20 no. new bat boxes and bat friendly planting / landscaping.
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GLOSSARY

BCT	Bat Conservation Trust
BRA	Bat Roost Assessment
CBDC	Cumbria Biodiversity Data Centre
CMIQ	Cleator Moor Innovation Quarter
MCIEEM	Chartered Institute of Ecology & Environmental Management
DEFRA	Department for Environment, Food and Rural Affairs
EPS	European Protected Species
EPSML	European Protected Species Mitigation Licence
MAGIC	Multi Agency Geographic Information for the Countryside
MCIEEM	Member of Chartered Institute of Ecology & Environmental Management
NE	Natural England
NERC Act	Natural Environment and Rural Communities Act 2006
NPPF	National Planning Policy Framework
PRF	Potential Roost Feature

1.0 INTRODUCTION

1.1 BACKGROUND

Tetra Tech was commissioned by Copeland Borough Council to undertake a Bat Roost Assessment of a site known as Cleator Moor Innovation Quarter (CMIQ) in Cleator Moor, Cumbria. This was recommended following an Ecological Appraisal in 2021 (Tetra Tech, 2021).

This report covers the Bat Roost Assessment survey (BRA) of the buildings and trees on Site A and results of the presence / absence (dusk emergence and dawn re-entry) surveys. It has been prepared by Tetra Tech Senior Ecologist Patryk Gruba MCIEEM and the conditions pertinent to it are provided in Appendix A.

1.2 SITE DESCRIPTION

The 'site' is located in Cleator Moor and is centred at Ordnance Survey National Grid Reference NY 01570 15529 – see Figure 1 for site location plan. The Main Leconfield Site A (Site A) comprises the Industrial Estate (17.6ha in size) and lies on the north side of Leconfield Street. Additionally, two expansion areas are present; these comprise Expansion Site B (Site B) to the north-east and Expansion Site C (Site C) to the south-east of the main site. At the time of survey there was no access to Site B, therefore this expansion area is not included within the remit of this survey.

Site A comprises 13 industrial / commercial buildings with associated hard standing, roads and amenity grassland. These are surrounded by pockets of habitats that include broadleaved and mixed woodland, plantation / screen planting, scattered trees, scrub, semi-improved neutral grassland, marshy grassland, swamp and tall ruderal vegetation.

Site B comprises agricultural fields predominantly used as open pasture and is divided from Site A by Nor Beck.

Site C comprises a mixture of woodland, allotments and grassland, all of which were located east from the C2C cycle path which divides Site C from Site A.

The surrounding land is a mixture of build-up areas and agricultural fields. Cleator Moor town centre is located approx. 300m southeast of the site.

1.3 DEVELOPMENT PROPOSALS

Outline planning permission is sought for light industrial-led mixed-use development on the existing Leconfield Industrial Estate and adjacent land parcels to the north and east at Cleator Moor. Quantum, use, scale and access are sought for approval with all other matters reserved. The description of the proposed development is as follows:

“Provision of 44,350 sqm (GEA) floorspace for light industrial, general industrial and storage & distribution (Class E(g), B2, B8), Hotel (Class C1) and Student Accommodation (Sui Generis) with ancillary food/beverage (Class E(b)), education and community facility uses (Class F1(a & e)) with internal accesses, parking, service yards, attenuation basins, electricity substations and associated infrastructure, earthworks and landscaping.”

The majority of the buildings within Site A will be retained with some refurbishment as part of the redevelopment; however, Buildings B6 and B7 are proposed to be demolished (See Figure 2 for locations and building references) and the masterplan showing the proposed site plan is shown in Appendix B (Drawing Reference: ZZ-DR-A-90004_SITE PLAN PROPOSED – LABELLED).

Small areas of woodland will be lost to facilitate access and internal roads – these are indicated on the Proposed Site Plan and include narrow sections in the northwest and northeast of Site A; a narrow section between Sites A and B; and two narrow sections between Site A and C.

1.4 PURPOSE OF THE REPORT

This report provides the results of bat surveys undertaken in 2021, completed with the following objectives:

- Outline the legislative protection given to bats;
- Identify buildings within Site A that have potential to be used by bats;
- Identify buildings and trees within Site A and Site C that have potential to be use by bats;
- Summarise the findings of the bat surveys and report on the presence or otherwise of bat species at Sites A and C; and
- Provide an assessment of the potential ecological constraints to and impacts from the development and recommendations for avoidance, mitigation and enhancement where appropriate.

Note that scientific names are provided at the first mention of each species and common names (where appropriate) are then used throughout the rest of the report for ease of reading.

2.0 METHODOLOGY

2.1 DESK STUDY

2.1.1 Previous Reports

The following reports were reviewed:

- Tetra Tech (2021) Cleator Moor Innovation Quarter: Ecological Appraisal. On behalf of Copeland Borough Council. Ref: 784-B029668
- WYG (2020) Leconfield Industrial Estate: Ecological Appraisal Report.

2.1.2 Local Ecological Records Centre

Information was requested from the Cumbria Biodiversity Data Centre (CBDC) for information on non-statutory nature conservation designations and records of protected and notable bird species records within 2 km of the site. The data search covered all bat species occurring in the county.

2.1.3 Online Resources

A search for relevant information was made on MAGIC (www.magic.gov.uk) - DEFRA's interactive, web-based database. This search identified information on any EPSML applications relating to bats that have been granted in the local area.

2.2 FIELD SURVEYS

The surveys were completed in accordance with current best practice guidelines given in BCT's *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016), hereafter referred to as the BCT Guidelines.

2.2.1 Bat Roost Assessment - Trees

A preliminary bat roost assessment of the buildings within Site A was undertaken on 8th June 2021 by Patryk Gruba, Tetra Tech Senior Ecologist and Natural England Class 2 survey licensed ecologist (reference number 2015-11080-CLS-CLS). This included an external bat inspection of all thirteen buildings shown in Figure 2 (Building B1 – b13).

The exteriors of the buildings were systematically inspected during daylight and any features suitable for bats were noted, such as weatherboarding, hanging tiles, soffit boxes, gaps in brickwork, cracks, crevices, slipped or broken tiles and gaps around ridge tiles and lead flashing. Roof coverings were viewed from the ground using close-focussing binoculars. Any potential bat access points were identified and inspected for signs of bats using a high-powered torch (Clulite CB2 1M candle power); signs of bats include:

- Bat droppings beneath / around the access point;
- Feeding remains (in association with droppings);
- Audible signs of bats;
- Smell of bats;
- Live bats, bat corpses or skeletons; and
- Oily marks (from fur) or localised clean spots around possible access points and roost areas.

The interiors to the buildings were not accessed and surveyed as part of the survey; see Section 2.3 – Limitations.

The following system based on the BCT Guidelines has been used to categorise the bat roost suitability of any features found.

Table 1: Categories of Bat Roost Suitability (BCT Guidelines)

Suitability	Typical Roosting Features
Negligible	Negligible habitat feature on site likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis & potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

2.2.2 Bat Emergence and Re-Entry Surveys

Further surveys were requested by the client for the buildings B1, B4, B6, B7, B11, B12 and B13 only.

Dusk emergence and dawn re-entry surveys were completed on site in between July and September 2021 in order to cover all elevation / aspects of buildings B1, B4, B6, B7, B11, B12 and B13. Due to the size of B1, it was not possible to cover all of the elevations / potential roosting features during a single survey; therefore, the survey effort was divided into two surveys. Additional roost characterisation surveys were complete for buildings B1 and B6.

The dusk emergence surveys commenced 15 minutes before sunset and continued for 1.5 hours after sunset. The dawn re-entry surveys commenced 1.5 hours before sunrise and continued until 15 minutes after sunrise. The date, type and personnel involved in each of the surveys are provided in Table 2.

Table 2: Date, Survey type and Personnel for the Surveys

Survey	Date	Survey Type	Building Surveyed	Lead Surveyor	Other Surveyors
1	12.07.21	Dusk Emergence	B12	Patryk Gruba (NE Class 2 licensed bat surveyor, reference 2015-11080-CLS-CLS)	Elizebeth Wilcox Alex Blackburn
2	13.07.21	Dusk Emergence	B11	Patryk Gruba	Elizebeth Wilcox Suzie Collinson
3	15.07.21	Dusk emergence	B13	Elizebeth Wilcox	Suzie Collinson
4	20.07.21	Dusk emergence	B4	Patryk Gruba	Elizebeth Wilcox Suzie Collinson Jaime Zarza Bell
5	21.07.21	Dusk Emergence	B7	Elizebeth Wilcox	Jaime Zarza Bell
6	22.07.21	Dusk Emergence	B1	Patryk Gruba	Daniel Burrows Penny Ward Suzanne Collinson Elizebeth Wilcox

Survey	Date	Survey Type	Building Surveyed	Lead Surveyor	Other Surveyors
7	29.07.21	Dusk Emergence	B6	Patryk Gruba	Penny Ward Suzanne Collinson Elizebeth Wilcox
8	03.08.21	Dusk Emergence // Roost characterisation	B1	Patryk Gruba	Elizebeth Wilcox Daniel Burrows Jaime Zarza Bell Suzanne Collinson
9	10.08.21	Dawn Re-entry	B11	Elizebeth Wilcox	Suzanne Collinson
10	18.08.21	Dawn Re-entry	B12	Elizebeth Wilcox	Daniel Burrows Jaime Zarza Bell
11	01.09.21	Dawn Re-entry / Roost characterisation	B6	Elizebeth Wilcox	Suzanne Collinson
12	10.09.21	Dawn Re-entry / Roost characterisation	B1	Elizebeth Wilcox	Suzanne Collinson
13	15.09.21	Dusk Emergence / Roost characterisation	B6	Patryk Gruba	Elizebeth Wilcox

Table 3 summarises the survey times and weather conditions. Surveyor locations are shown on Figure 3.

Table 3: Dates, Times and Weather Conditions for the Surveys

Survey	Date	Sunset / Sunrise	Start	Finish	Start Temp (oC)	End Temp (oC)	Rain	Wind	Cloud (% cover)
1	12.07.21	21:45	21:30	23:15	16	16	None	1	65%
2	13.07.21	21:43	21:28	23:18	16	14	None	2	25%
3	15.07.21	21:45	21:30	23:15	18	15	None	1	0%
4	20.07.21	21:34	21:19	23:04	22	18	None	1	0%
5	21.07.21	21:34	21:19	23:05	21	18	None	2	0%
6	22.07.21	21:32	21:17	23:02	25	22	None	1	25%
7	29.07.21	21:20	21:05	22:50	16	15	None	2	100%
8	03.08.21	21:10	20:55	22:40	16	14	None	2	50-100%
9	10.08.21	05:42	04:12	05:57	13	15	None	1	100%
10	18.08.21	05:56	04:26	06:11	15	15	None	3	100%
11	01.09.21	06:21	04:51	06:36	14	14	None	2	0%
12	10.09.21	06:38	05:08	06:53	18	21	None	1	100%

Survey	Date	Sunset / Sunrise	Start	Finish	Start Temp (oC)	End Temp (oC)	Rain	Wind	Cloud (% cover)
13	15.09.21	19:30	19:15	21:00	17	16	Light Rain towards the survey end	1	80-100%

Bat detectors used during the surveys were Elekon Batlogger M, which is a real time, full-spectrum detector, with recording and automatic species identification functions. The recording function was utilised to allow post-recording computer analysis of the bat calls recorded using BatExplorer software, where necessary. *British bat calls: A guide to species identification (Russ, J., 2012)* book was used to aid the bat call sound analysis.

2.2.1 Bat Roost Assessment - Trees

A ground level tree assessment was undertaken on 8th June 2021 and 16th July 2021 by Patryk Gruba, Tetra Tech Senior Ecologist and Natural England Class 2 survey licensed ecologist (reference number 2015-11080-CLS-CLS).

During the daytime, the trees within the scheme boundary (Sites A and C) were assessed from the ground for potential bat roosting features or any evidence of roosting bats, using high powered torches (LED Lenser P17.2 Torch) and binoculars (Opticron Discovery 8x42).

According to the BCT Guidelines potential roost features (PRFs) that may be used by bats include:

- Woodpecker holes;
- Rot holes;
- Hazard beams;
- Other vertical or horizontal crack and splits (such as frost-cracks in stems or branches);
- Partially detached flaky bark;
- Knot holes arising from naturally shed branches, or branches previously pruned back to the branch collar;
- Man-made holes (e.g. cavities that have developed from flush cuts) or cavities created by branches tearing out from parent stems;
- Cankers (caused by localised bark death) in which cavities have developed • Other hollows or cavities, including butt-rots;
- Double-leaders forming compression forks with included bark and potential cavities;
- Gaps between overlapping stems or branches;
- Partially detached ivy with stems diameters in excess of 50mm; and
- Bat or bird boxes.

Where accessible from the ground level, PRFs and trees' exteriors were inspected for signs of bats such as:

- Presence of bats;
- Presence of droppings in, around or below PRF;
- Smell of bats;
- Scratch marks on the bark / smooth areas around PRF;
- Presence of ectoparasites around the PRF entrance;
- Clear (of cobwebs etc.) or stained areas around any holes / PRFs; • Audible squeaking at dusk or in warm weather.

The BCT Guidelines use the following criteria to categorise value trees for use by roosting bats and these have been used to characterise the value of this site:

Table 4: Categories of Trees Suitability for Roosting Bats (BCT Guidelines)

Suitability	Typical Roosting Features
Negligible	A tree with no PRFs and negligible likelihood to be used by roosting bats.
Low	A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A tree with one or more potential roost features that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only).
High	A tree with one or more potential roost features that are obviously suitable for use by large numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

The trees on site were grouped into separate woodland blocks (W1 – W8) and trees within each separate block were assessed for their suitability to support roosting bats.

2.2.2 Habitat Value for Foraging and Commuting Bats

The BCT Guidelines use the following criteria to categorise the potential value of habitats and features for use by foraging and commuting bats and these have been used to characterise the value of this site:

Table 5: Categories of Habitat Suitability (BCT Guidelines)

Suitability	Typical Foraging & Commuting Features
Negligible	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

2.3 LIMITATIONS

No internal inspections of the buildings were conducted as no access was permitted, however the majority of buildings on site were either flat roof structures or had prefabricated steel roofs which

appeared to have no suitable internal loft voids present. Buildings B11 and B12 were considered likely to contain an internal void; however, it is considered that presence / absence surveys (dusk emergence and dawn re-entry) provided sufficient evidence to inform bat assessment for these two buildings.

The BCT Guidelines recommends that. 'Preliminary ground level ground level roost assessments of trees are best carried out in winter (after the leaves have fallen and before new ones replace them – around December to March)'. The ground level preliminary bat roost assessment was conducted in June and July when leaf cover and foliage was present. However, this is not considered to be a significant constraint as even with the leaf cover present the majority of trees on site where young to middle age with most of the tree trunks and branches were visible from the ground. It was not possible to access the most southern section of the woodland block W2 due to the presence of dense and tall scrub. Current masterplan indicates that trees within the woodland block W2 will be retained; however, if any trees are proposed for removal within this area, further surveys may be required.

Further surveys were request by the client for the buildings B1, B4, B6, B7, B11, B12 and B13 only as it was initially thought that these buildings will be impacted. Presence / likely absence surveys were not undertaken on buildings B2, B3, B5, B8, B9 and B10 due to these buildings being retained and likely not affected by the proposals for Site A.

The dusk emergence / dusk re-entry surveys were completed with the assistance of bat detectors. All survey techniques are subject to bias, and bat detector surveys may under-record species with weak echolocation calls, such as brown long-eared bats *Plecotus auritus*. However, these biases were considered when interpreting the results.

Details of this report are considered to remain valid for one year (i.e. 15th September 2022). Update surveys may be required if works to the buildings have not commenced by this date or if the development proposals upon which this assessment was made change. It should be noted that an application for an EPSML will need to be supported by relevant survey data from the current/ most recent bat survey season; therefore, if the EPSML application is to be submitted after April 2022 additional roost characterisation surveys are likely to be required.

3.0 BASELINE CONDITIONS

3.1 DESK STUDY

The desk study found records for a variety of bat species with a 2 km radius of the CMIQ site from the past 10 years, they are displayed in Table 6.

Table 2: Desk study bat results (only records post 2010 are shown)

Species	No. of records	Date	Recording	Distance & Direction
Natterer's bat <i>Myotis nattereri</i>	1	2017	1 count	2 km S
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	1	2011	5 count	1.6 km NE
Noctule <i>Nyctalus noctula</i>	1	2011	1 count	0.9 km SE
Common pipistrelle <i>Pipistrellus pipistrellus</i>	2	2011	1 count	1.3 km NE
		2012	Count of more than 5 bats	1.8 km S
Unidentified bat	1	2016	Not specified	1.3 km N

There was one bat EPSML granted within 2 km of the site. The licence was for the destruction of a resting site for whiskered bat, Natterer's bat & Brandt's bat *Myotis brandti* in 2013, located approximately 0.4 km west of the CMIQ site.

3.2 FIELD SURVEYS

3.2.1 Bat Roost Assessment – Buildings

Table 7: Summary of the Building BRA (Site A)

Building	Description	Photographs
Building B1	B1 comprised a large single storey industrial structure consisting of multiple sections / blocks. The walls were brick-built with exception of the north-east elevation of the northern block / warehouse which comprised of corrugated steel profile sheeting. The roof of the southern block had multiple double-pitched 'crest' covered with corrugated asbestos cement profile sheeting. The roofs of the three northern sections were flat with bitumen and steel finish. A number of features with potential to be used by roosting bats were identified within B1, these are shown and described in Appendix C. No bat droppings / signs of bat occupancy were noted on the exterior of B1. B1 was considered to offer low suitability for use by roosting bats during the active season but was unlikely to be suitable for use by maternity colonies or hibernating bats. Some sections of the building (including north-east elevation of the northern warehouse) were considered to be of negligible suitability for bats.	
Building B2	B2 comprised a large single storey brick building with a three-pitch corrugated steel roof. The building had PVC doors and windows along the southern and northern elevation and small flat roof lean-to along the eastern elevation. A number of features with potential to be used by roosting bats were identified within B2, these are shown and described in Appendix C. No bat droppings / signs of bat occupancy were noted on the exterior of B2. B2 was considered to offer low suitability for use by roosting bats	

Building	Description	Photographs
	during the active season but was unlikely to be suitable for use by maternity colonies or hibernating bats.	
Building B3	B3 comprised large warehouse building with brick walls and steel flat roof and corrugated steel panelling predominantly along the northern and western elevations. The building had several single-storey flat roof lean-to structures adjacent along all off the elevations; these comprised garages / warehouses with steel metal doors / window or office blocks with PVC doors and windows. The windows along the northern elevations were boarded at the exterior. A number of features with potential to be used by roosting bats were identified within B3, these are shown and described in Appendix C. No bat droppings / signs of bat occupancy were noted on the exterior of B3. B3 was considered to offer low suitability for use by roosting bats during the active season but was unlikely to be suitable for use by maternity colonies or hibernating bats.	
Building B4	B4 comprised a single-story brick building with a slight single pitch facing north. The upper section of the southern elevation had wood panelling above the row of single-glazed windows with timber frames. The northern elevation comprised several steel garage doors with steel shutters covering doors and windows. A number of features with potential to be used by roosting bats were identified within B4, these are shown and described in Appendix C. No bat droppings / signs of bat occupancy were noted on the exterior of B4.	

Building	Description	Photographs
	B4 was considered to offer low suitability for use by roosting bats during the active season but was unlikely to be suitable for use by maternity colonies or hibernating bats.	
Building B5	B5 comprised a single-storey brick building with flat roof and corrugated steel panelling along the top external walls (most elevations). Along the southern elevation, several large steel garage doors were present large single-glazed windows were located along the upper section of the elevation (interlaced with the steel panelling). Two corrugated steel lean-to structures adjoined the B5 along the southern elevation. Few features with potential to be used by roosting bats were identified within B5, these are shown and described in Appendix C. No bat droppings / signs of bat occupancy were noted on the exterior of B5. B5 was considered to offer low suitability for use by roosting bats during the active season but was unlikely to be suitable for use by maternity colonies or hibernating bats.	
Building B6	B6 comprised a tall brick-built building with a slight double pitched roof covered with finished with bitumen. The building had large steel garage door along the western elevation and smaller (regular size) doors along the southern, western and northern elevations. There was a small storey brick structures adjoining B6 along the north-east elevation; this was linked with B6 through the open walk-trough section with concrete roof. A number of features with potential to be used by roosting bats were identified within B6, these are shown and described in Appendix C.	

Building	Description	Photographs
	No bat droppings / signs of bat occupancy were noted on the exterior of B6. B6 was considered to offer low suitability for use by roosting bats during the active season but was unlikely to be suitable for use by maternity colonies or hibernating bats.	
Building B7	B7 comprised a brick-based building / garage with a corrugated profiled asbestos cement roof . The building appeared to have a concrete frame and some steel panelling along the western elevation. A number of features with potential to be used by roosting bats were identified within B7, these are shown and described in Appendix C. No bat droppings / signs of bat occupancy were noted on the exterior of B7. B7 was considered to offer low suitability for use by roosting bats during the active season but was unlikely to be suitable for use by maternity colonies or hibernating bats.	
Building B8	Comprised a large warehouse building with brick-build walls and mixture of corrugated steel and glass roof covering. There was a single storey brick-build and flat roof office extension along the eastern elevation of B8 and two brick-built flat roof lean-to structures along the northern elevation. Corrugated steel and glass warehouse extension were adjacent along the eastern elevation. A number of features with potential to be used by roosting bats were identified within B8, these are shown and described in Appendix C. No bat droppings / signs of bat occupancy were noted on the exterior of B8.	

Building	Description	Photographs
	B8 was considered to offer low suitability for use by roosting bats during the active season but was unlikely to be suitable for use by maternity colonies or hibernating bats.	
Building B9	B9 comprised a brick-based structure with a corrugated metal roof / frame overlapping south and north elevations. Few features with potential to be used by roosting bats were identified within B9, these are shown and described in Appendix C. No bat droppings / signs of bat occupancy were noted on the exterior of B9. B9 was considered to offer low suitability for use by roosting bats during the active season but was unlikely to be suitable for use by maternity colonies or hibernating bats.	
Building B10	B10 comprised a tall, brick-built garage with a flat roof. The southern and eastern elevation comprised predominantly of a profiled steel panels / frame. Two single-storey flat roof extension were adjacent along the northern and western elevation of B10. A number of features with potential to be used by roosting bats were identified within B10, these are shown and described in Appendix C. No bat droppings / signs of bat occupancy were noted on the exterior of B10. B10 was considered to offer low suitability for use by roosting bats during the active season but was unlikely to be suitable for use by maternity colonies or hibernating bats. The building is unlikely to be suitable for use hibernating bats.	

Building	Description	Photographs
Building B11	Comprised brick-built nursery building with tiled hip roof . The building was single storey with wooden cladding along the upper elevations. The roof appeared to have an internal roof space and long wooden soffits along all elevations. A number of features with potential to be used by roosting bats were identified within B101, these are shown and described in Appendix C. No bat droppings / signs of bat occupancy were noted on the exterior of B11. B11 was considered to offer moderate suitability for use by roosting bats during the active season with potential suitability for maternity roosts within the roof area. The building is unlikely to be suitable for use hibernating bats.	
Building B12	Comprised brick-built office building with tiled hip roof . The structure of the B12 was very similar to B11 with the exception that B12 was several meters longer. A number of features with potential to be used by roosting bats were identified within B12, these are shown and described in Appendix C. No bat droppings / signs of bat occupancy were noted on the exterior of B12. B12 was considered to offer moderate suitability for use by roosting bats during the active season with potential suitability for maternity roosts within the roof area. The building is unlikely to be suitable for use hibernating bats.	

Building	Description	Photographs
Building B13	B13 comprised a warehouse building brick-built base and double pitched steel roof and steel wall cladding. The exterior of B13 was considered to offer negligible suitability for use by roosting bats. However, since there was no access to the interior, it was not possible to completely rule out likelihood of bats using the internal area of the building therefore it was upgraded to low suitability so that this limitation could be addressed through nocturnal survey	

All of the buildings within Site A and their potential to support roosting bats are summarised in Table 8 below.

Table 8: Summary of the Bat Roost Assessment for the buildings within Site A

Building	Building description	Bat Roost Suitability
B1	Large single storey industrial building comprising multiple sections. Walls predominantly brick-built with mixture of flat and pitched roofs finished with corrugated steel and concrete sheets.	Low
B2	Single-storey brick building with three separate double pitched roofs finished with corrugated steel.	Low
B3	Large warehouse building – predominantly brick built with some metal cladding.	Low
B4	Single storey brick building with a slight single pitch.	Low
B5	Single storey brick building with flat steel roof and steel cladding.	Low
B6	Tall brick building with slight double pitched roof covered with bitumen.	Low
B7	Single storey brick building with double pitched corrugated concrete roof.	Low
B8	Large warehouse building with a single storey brick-built extension / annex at the north-west.	Low
B9	Brick building with metal roof.	Low
B10	Brick building with metal / bitumen flat roofs and steel cladding.	Low
B11	Brick nursery building with tiled hip roof.	Moderate
B12	Brick office building with tiled hip roof.	Moderate
B13	Warehouse with brick built base and double pitched steel roof and wall cladding.	Low

3.2.2 Bat Emergence and Re-Entry Surveys

Dusk emergence survey B12 – 12th July 2021

During the dusk emergence survey no bats were recorded emerging from B12.

Low levels of common pipistrelle *Pipistrellus pygmaeus* commuting and foraging activity were recorded along the treeline to the north and between the buildings on the southern face.

The first common pipistrelle was recorded northwest of the building at 22:12 (25 minutes after sunset). Continuous foraging activity was observed between 22:16 and 22:22 with bats coming over the building from the north flying south. A single bat was observed commuting north at 22:24. Two bats were observed foraging between buildings and trees at 22:31 and 22:40. Continuous foraging and commuting was observed south, southwest, and southeast of the building (a single bat) at 22:26, 22:32, 22:34, 22:36, 22:47, 22:54, and 22:56.

Dusk emergence survey B11 – 13th July 2021

During the dusk emergence survey no bats were recorded emerging from B11.

Low levels of common and soprano pipistrelle *Pipistrellus pygmaeus* commuting and foraging activity were recorded along the treeline to the northwest, along the road to the east, and between the buildings.

The only soprano pipistrelle recorded was the first bat recorded and was observed flying southeast parallel to the treeline at 22:06 (23 minutes after sunset). Common pipistrelles were observed within and around the treeline northeast of the building at 22:13, 22:17, 22:19, 22:20, 22:21, and 22:22. Common pipistrelles were then observed foraging above the road to the east of the building at 22:21, 22:22, and 22:24. A single bat was observed southwest of the building at 22:27, 22:29, 22:38, 22:39, 22:42, 22:46, 22:51, 22:54, and 23:07.

Dusk emergence survey B13 – 15th July 2021

During the dusk emergence survey no bats were recorded emerging from B13.

Low levels of common pipistrelle commuting and foraging were recorded along the northeast treeline, southwest face of the building, northwest face of the building, and southeast face of the building.

The first common pipistrelle was observed flying at low height along the northeast face of the building at 22:22 (42 minutes after sunset). A common pipistrelle was observed foraging and commuting to the west and southwest of the building at 22:28, 22:30, 22:34, 22:42, 22:56. A common pipistrelle was observed commuting southwest parallel to the building at 22:44, 22:47, 23:02, 23:08.

Dusk emergence survey B4 – 20th July 2021

During the dusk emergence survey no bats were observed emerging from B4.

Low levels of common pipistrelle commuting and foraging were recorded on every face of the building, with activity observed on the road to the southeast and southwest faces. Activity was also observed to the north of the building. A single noctule bat pass was recorded at 21:47 (13 minutes after sunset) and was the first bat recorded.

The first common pipistrelle was recorded northwest of the building at 21:55. A single common pipistrelle was observed north of the building at 22:02, 22:09, 22:19, 22:29, 22:26, 22:40, and 22:42. A single common pipistrelle was observed commuting north parallel to the building at 22:59. A single common pipistrelle was recorded southeast of the building at 22:29 and 22:45.

Dusk emergence survey B7 – 21st July 2021

During the dusk emergence survey no bats were recorded emerging from B7.

Low levels of common pipistrelle, soprano pipistrelle and noctule commuting and foraging were recorded on the north, west, and south side of the building.

The first common pipistrelle was recorded commuting between buildings on the northwest face of the building at 22:04 (30 minutes after sunset); subsequently the foraging activity in this area continued on and off until the end of the survey. Almost continuous commuting and foraging for common pipistrelle and soprano pipistrelle was observed on the southeast of the building at. A single noctule bat was recorded commuting at 23:02.

Dusk emergence survey B1 – 22nd July 2021

During the dusk emergence survey, a single common pipistrelle bat was observed emerging from the gap behind the PVC fascia along western elevation of B1 at 22:08, 36 minutes after sunset. (See Figure 3 – Roost R1 and Photograph 1 below).



Photograph 1 – Roost 1, Building B1

Moderate common pipistrelle activity involving between one and three bats was observed along the western elevation throughout the survey.

Low levels of common pipistrelle and soprano pipistrelle commuting and foraging were recorded on the northeast and southwest, and courtyard of the building.

The first common pipistrelle was recorded northwest of the building at 21:50. Subsequent observations were made of foraging northwest of the building at 22:01, 22:15, 22:18, 22:30, 22:42, and 22:50. Soprano pipistrelle was recorded foraging northwest at 22:40 and 22:50. Foraging and commuting was observed within the fenced off yard to the southwest at 22:07, 22:15, and 22:16. Foraging and commuting was recorded southwest of the building at 22:18, 22:21, and 22:56.

Dusk emergence survey B6– 29th July 2021

During the dusk emergence survey, a single common pipistrelle bat was observed emerging from the gap between the brick wall top and the wooden fascia / bitumen roof overlap on the southern corner of B6 at 21:42, (22 minutes after sunset. (See Figure 3, Roost R2 and Photograph 15 below).



Photograph 2 – Roost 2, Building B6

Moderate to low common pipistrelle and soprano pipistrelle activity was observed throughout the survey with majority for the activity concentrated east and north of the building (near the young woodland W4).

Common pipistrelle continuous foraging activity was recorded east and north of the building between 21:43 and 22:43. Soprano pipistrelle individual passes were recorded south of the building at 22:18 and 22:34 and north of the building at 21:52 and 22:43.

Dusk emergence / roost characterisation survey B1 – 3rd August 2021

During the dusk emergence survey no bats were recorded emerging from B1. No emergence was observed from the roost identified on 22nd July (Figure 3, Roost 1).

Low levels of common pipistrelle commuting and foraging were recorded on the northwest, southeast, and south of the building.

The first common pipistrelle was recorded northwest of the building at 21:40 (30 minutes after sunset), with subsequent activity at 21:45, and 22:13. Activity to the east of the building was recorded at 21:42 with continuous activity until 22:23. Activity within a gated courtyard between buildings had foraging recorded at 21:45. Foraging and commuting was recorded to the southeast of the building at 22:00 with continuous activity until 22:36.

A single soprano pipistrelle pass was recorded northwest of the building at 22:13 and a noctule pass was recorded north east of the building 22:19 and 22:23.

Dawn re-entry survey B11 – 10th August 2021

During the dawn re-entry survey no bats were recorded as entering B11.

Low levels of common pipistrelle commuting and foraging were recorded on the northeast and southwest of the building.

The first common pipistrelle was recorded commuting and foraging along the treeline northeast of the building at 04:32, with subsequent continuous activity at 04:37, 04:42, 04:55, and 05:02, with the last bat being heard at 05:11. A single common pipistrelle was recorded as commuting on the southwest of the building at 04:47.

Dawn re-entry survey B12 – 18th August 2021

During the dawn re-entry survey no bat were recorded as entering B12.

Low levels of common pipistrelle commuting and foraging were recorded south of the building.

The first common pipistrelle was recorded at 04:25 on the south of the building, with subsequent activity at 05:15 and the last bat being heard at 05:21.

Dawn re-entry / roost characterisation survey B6 – 1st September 2021

During the dawn re-entry survey a single common pipistrelle re-entered a gap along the southern corner of the roof of building B6 at 06:09 (12 minutes before sunrise). This was the same roost location as identified during the dusk emergence survey on 29th July (Figure 3, Roost R2).

Low levels of common pipistrelle commuting and foraging were recorded south of the building.

The first common pipistrelle recorded was at 04:58. Commuting and foraging was recorded south of the building, with a single common pipistrelle commuting / foraging south and east of the building between buildings, at 05:29, 05:30, 05:48, 05:51, 05:53 and 06:00 before entering the roost at 06:09.

Dawn re-entry / roost characterisation survey B1 – 10th September 2021

During the dawn re-entry survey no bats no bats were recorded entering B1 building. No re-entry was observed at the roost identified on 22nd July (Figure 3, Roost R1).

Low levels of common pipistrelle and soprano pipistrelle commuting and foraging were recorded along the northwest of the building.

The first bat was recorded on the northwest side of the building at 05:13. Further foraging activity was observed on the northwest side of the building at 05:27, 06:01, and 06:14, with the last bat being heard at 06:19.

Dusk emergence / roost characterisation survey B6 – 15th September 2021

During the dusk emergence survey no bats were recorded emerging from B6. No emergence was observed from the roost identified on 29th July and 1st September (Figure 3, Roost R2).

Low levels of common pipistrelle commuting and foraging were recorded south and east of the building. The activity involved a single common pipistrelle bat foraging on site between 20:06 and 20:20 and single bat passes at 20:27, 20:29, 20:33 and 20:44.

3.2.3 Bat Roost Assessment – Trees

All of the trees on site have been grouped into separate woodland blocks; trees within each block were assessed for their suitability for roosting bats. The results of the bat roost assessment survey have been summarised in the Table 9 below and are depicted in Figure 4. Detailed description of the trees providing suitability for roosting bats is included in Appendix D.

Table 9: Summary of the Bat Roost Assessment for the trees

Woodland Block	Description	Bat Roost Assessment Summary
W1	Screen planting along the northern section of Site A. Including trees along the Nor Beck.	Several trees with low roosting suitability recorded
W2	Screen planting along the western section of Site A.	Multiple trees with low to high roosting suitability recorded
W3	Young willow car in the western section of Site A	No trees with PRFs identified
W4	Young wet woodland in the southern section of Site A	No trees with PRFs identified

Woodland Block	Description	Bat Roost Assessment Summary
W5	Mixture of young wet woodland / willow car and scrub south east of Site A	No trees with PRFs identified
W6	Trees / screen planting along the eastern boundary of Site A / west of the C2C cyclepath / footpath	Individual trees with moderate roosting suitability
W7	Mixed woodland within Site C – east of the C2C cycle path / footpath	Multiple trees with low to high roosting suitability recorded

4.0 RELEVANT PLANNING POLICY & LEGISLATION

4.1 LEGISLATION

All British bat species are given special protection within England by their inclusion on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended) and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). As a result, it is an offence to:

- Deliberately capture, injure or kill a bat;
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
- Damage or destroy a bat's roosting place (even if bats are not occupying a roost at the time);
- Possess or advertise, sell or exchange a bat (dead or alive) or any part of a bat; and
- Intentionally or recklessly obstruct access to a bat roost.

With specific reference to the offence of disturbance, Regulation 41(1) of the Conservation of Habitats and Species Regulations 2017 (as amended) states that a person commits an offence if they:

"...deliberately disturb wild animals of any such species [i.e. a European Protected Species] in such a way as to be likely significantly to affect:

- (i) *the ability of any significant group of animals of that species to survive, breed, or rear or nurture their young; or*
- (ii) *the local distribution or abundance of that species".*

Where development will result in damage to, or obstruct access to, any bat roost (whether occupied or not) or risks harming or significantly disturbing bats, a European Protected Species Mitigation Licence (EPSML) is required from Natural England to allow the development to proceed. Bats are also afforded more general protection in England (and Wales) within the Natural Environment and Rural Communities Act (NERC) 2006. This imposes a duty on all public bodies, including local authorities and statutory bodies, in exercising their functions, *"...to have due regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity"* [Section 40 (1)]. It notes that *"conserving biodiversity includes restoring or enhancing a population or habitat"* [Section 40 (3)]. Consequently, attention should be given to dealing with the modification or development of an area if aspects of it are deemed important to bats, such as roosts, flight corridors and foraging areas. Section 41 (S41) of this Act requires the Secretary of State to publish a list (in consultation with Natural England) of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as public bodies including local and regional authorities, when carrying out their normal (e.g. planning) functions. The S41 list includes 65 habitats of principal importance and 1,150 species of principal importance.

Seven species of bats (soprano pipistrelle, brown long-eared bat, greater horseshoe bat *Rhinolophus ferrumequinum*, lesser horseshoe bat, *Rhinolophus hipposideros* barbastelle *Barbastella barbastellus*, Bechstein's bat *Myotis bechsteinii* and noctule) are listed under Section 41 of the NERC Act 2006.

4.2 LOCAL BIODIVERSITY ACTION PLAN

Local Biodiversity Action Plans (LBAPs) identify habitat and species conservation priorities at a local level (typically County by County) and are usually drawn up by a consortium of local Government organisations and conservation charities. Although they are no-longer managed at a national level many are still reviewed and updated at a local level.

The Cumbria Biodiversity Action Plan (CBAP) list bats (all species occurring in Cumbria) as the SPI for the county.

5.0 DISCUSSION

5.1 BAT ROOST ASSESSMENT – BUILDINGS

All thirteen buildings were subject to an external inspection.

Buildings B11 and B12 were assessed to offer **moderate** suitability for roosting bats during the bat active season due to the potential presence of internal voids / loft areas within these structures that may offer suitability for use by breeding bats. The external egress points to these features included lifted tiles and gaps within the wooden soffits (see Appendix C).

Buildings B1, B2, B3, B4, B5, B6, B7, B8, B9 and B10 were assessed to offer **low** roost suitability for bats during the bat active season due to external potential roost features (namely gaps within the soffits, gaps under roof overlaps and crevices within the external brickwork- see Appendix C). However, these buildings were not considered to offer potential for use by maternity colonies.

Building B13 was assessed to have negligible suitability for roosting bats. However, due to the lack of internal access, a single presence / absence (dusk emergence survey) was conducted on this building.

None of the surveyed buildings were considered to be of suitability for hibernating bats.

No evidence of bat roosting on site was recorded during the daytime bat roost assessment and external inspections.

Only those buildings that had potential suitability to support roosting bats and which would be affected by the development proposals were taken through to presence / likely absence nocturnal surveys. Further surveys were requested by the client for the buildings B1, B4, B6, B7, B11, B12 and B13 only as it was initially thought that these buildings will be impacted. However, the final CMIQ Masterplan shows that only buildings B6 and B7 will be impacted / demolished.

Presence / likely absence surveys were not undertaken on buildings B2, B3, B5, B8, B9 and B10 due to these buildings being retained and likely not affected by the proposals for Site A.

If any works are proposed to these buildings, it is recommended that further nocturnal surveys are undertaken in order to provide information on the presence / likely absence of roosting bats, characterise the roosts (if present) and to assess any impacts from the proposed demolitions works.

This should include one presence / absence survey visit (dusk emergence or dawn re-entry) between May and August.

5.2 BAT EMERGENCE AND RE-ENTRY SURVEYS

Active common pipistrelle day roosts were identified within buildings B1 and B6:

- Roost R1 is located behind the PVC fascia board along western elevation of B1, with the single egress point through the gap between the brick wall and fascia board. A single common pipistrelle was observed using this roost on one occasion (during the dusk emergence survey on 22nd July 2021) (see Photograph 1 and Figure 3).
- Roost R2 is located at the southern roof corner to B6, with a single egress point gap between the brick wall top and the bitumen roof overlap. A single common pipistrelle was observed using this roost on two occasions (during the dusk emergence survey on 29th July 2021 and during the dawn re-entry survey on 10th September 2021) (see Photograph 2 and Figure 3).

Roosts used by individual bats / small numbers of common species (not maternity or hibernation sites) are relatively low in significance to local populations and their status is identified to be 'low' (Mitchell-

Jones A. J., 2004, Chapter 7.2, Figure 4). No active bat roosts were identified within building B4, B7, B11, B12 and B13 during bat emergence and re-entry surveys.

5.2.1 Potential Impacts

The proposals to demolish B6 will destroy the identified common pipistrelle day roost; there is a risk of harm / death to low number of common pipistrelles during the demolition works.

There are no works proposed to building B1; therefore, the roost R2 will be retained (the initial plans suggested this building may be impacted by the works). No further survey, licensing or mitigation is required for roosting bats and works can proceed to building B4, B7, B11, B12 and B13 without the risk of causing an offence under relevant wildlife legislation. Should works to these buildings should commence after August 2022, further bat assessment may be required.

5.2.1 Mitigation

As the proposed works will result in the destruction of the common pipistrelle day roost (R1) within building B6, a European Protected Species Mitigation Licence (EPSML) must be obtained from Natural England (NE) prior to commencement of works to B6.

The licence can only be gained once full planning consent has been granted and in order to obtain an EPSML it will be necessary to demonstrate that:

- There are imperative reasons of over-riding public and / or social interest or public health and safety;
- There is no satisfactory alternative to the proposed development;
- The favourable conservation status of the species in the area will be maintained

It should be noted that an application for an EPSML will need to be supported by relevant survey data from the current/ most recent bat survey season.

Mitigation will be required as part of the EPSML to make sure that:

- Bats are not killed or injured during the works; and
- The development is not detrimental to the favourable conservation status of the populations of the species.

Two licensing options are available. The standard EPSML route or the simpler Bat Mitigation Class Licence (BMCL) site registration process. The BMCL could be used as the site supports two low conservation value roosts of used by low numbers of common bat species, only one of which is being impacted.

Full details of the mitigation strategy will be provided within the EPSML method statement or the BMCL site registration and the related class licence conditions, and agreed in consultation with the consultants / contractors appointed to undertake the proposed works. At which point it will be possible to provide detailed information relating to the phasing and delivery of works and relevant associated mitigation required. The detailed mitigation strategy will be based in the following principles:

- Appropriate timing of works and appropriate working methods which minimise negative impacts on bats, and avoid bats being killed or injured; and
- Provision of alternative roosting opportunities for the bat species present.

In accordance with the NE Bat Mitigation Guidelines (Figure 4) (Mitchell-Jones, 2004), the proposed mitigation strategy should be proportionate to the *“type of impact and importance of the population affected”*. As there are only individual / small numbers of common species present roosting on site (not maternity roosts), there is flexibility regarding new roost facilities and timing constraints.

Measures prior to development works starting

Before any works to the building commence, two bat boxes will be erected on retained trees / buildings on or close to the site. This could be in form of standard wooden bat boxes (such as Kent Bat Box) or woodcrete boxes (such as 2F Schwegler Bat Box). These will provide continuous roosting provisions for bats during the conversion works and enhance the site for bats post-works.

Internal and external works conducted under the EPSML

As there is no evidence of breeding bats and negligible potential for hibernacula within the surveyed buildings, the demolition works can commence any time of year in accordance with the bat mitigation guidelines for non-breeding summer roosts.

The identified roost will be subject to endoscopic inspection prior to any works commencing on site. Following the inspection, the identified bat roost will be subject to destructive search / made unsuitable for roosting bats. All of the above works will be conducted under the close supervision of the EPSML / BMCL named ecologist or an accredited agent. The bitumen roof overlap to B6 will be removed by hand in anticipation that bats may be present.

5.3 BAT ROOST ASSESSMENT – TREES

Three trees with high bat roost suitability were identified on site, these include W2-3, W2-7 and W7-11 (see Figure 4 and Appendix D).

Eleven trees with moderate bat roost suitability were identified on site; these include W2-2, W2-4, W2-6, W6-1, W7-2, W7-3, W7-4, W7-5, W7-7, W7-8, W7-9 (see Figure 4 and Appendix D). The CMIQ Masterplan (Appendix B) indicates that all trees with high and moderated will be retained within the woodland belt, as such no further survey to any of the trees is recommended.

However, if the layout should change and any of the trees identified as medium or high suitability, are proposed for removal, the following recommendations are considered necessary to determine the status of each potential bat roost feature prior to removal:

- Detailed PRF inspection surveys. - This type method of inspection can be undertaken at any time of year, although the likelihood of discovering evidence of bats at different times should be considered. The PRF within the tree should be inspected in detail by an NE Class 2 or above licenced bat surveyor using torch and endoscope; if the PRF can't be reached from the ground (or ladder) a climbed aerial inspection by a suitably qualified and licensed ecologist will be required. The aim of this survey is to determine the presence/absence of bats at the time of the survey and the need for further survey and/or mitigation. Following the detailed inspection, the PRFs may be re-classified (downgraded to lower suitability or upgraded to higher suitability).
- Presence / absence nocturnal surveys (Dusk emergence and/or dusk re-entry survey) to be carried in bat active season (May to September inclusive). The surveys would be carried by bat surveyors at dusk or dawn to observe if bats are utilising the PRFs noted. This survey should be conducted if the comprehensive PRF inspection is not possible due to the restricted access / safety issues or the PRFs have moderate to high suitability for bats and the climbed inspection has not ruled out the reasonable likelihood of roosts being present. It is recommended that the surveys should be assisted with infra-red or thermal-camera as the standard nocturnal surveys have low bat detectability in relation to tree roosts (Bat Tree Habitat Key, 2018).
- Roost characterisation survey. When presence of roosting bats is established, then roost characterisation survey needs to be conducted unless sufficient information has already been

collected to inform the impact assessment and mitigation. This can be in form of further detailed inspection or nocturnal surveys (or combination of both).

Thirteen trees with low bat roost suitability were identified on site; these included W1-1, W1-2, W1-3, W1-4, W1-5, W1-7, W1-9, W1-10, W2-5, W7-1, W7-6, W7-10 and W7-12 (see Figure 4 and Appendix D). The CMIQ Masterplan (Appendix B) indicates that all of the above trees will be retained within the woodland belt, as such no further survey to any of the trees is recommended.

However, if the layout should change and any of the trees identified as low suitability, are proposed for removal, these can be felled using reasonable avoidance measures.

- Since bats are most vulnerable to disturbance when hibernating the proposed removal of these trees should be undertaken in temperatures of 8°C or above;
- Endoscopic check of PRFs prior to felling by a licensed ecologist; and
- The sections of trees containing PRFs should be soft felled - removed and gently lowered to the ground where they should be left for at least 24 hours with the PRF(s) facing upwards to allow any bats to safely disperse.

If bats or evidence of bats is found at any point during the works, then works should stop and advice sought from a bat licensed ecologist.

5.4 FORAGING AND COMMUTING BATS

Low numbers of at least three species of bats were recoded using the site or adjacent habitats during the emergence surveys, with common pipistrelle bats frequently commuting through site and foraging along the woodland and scrub edges.

Based on the BCT Guidelines for habitat suitability the current habitats can be considered to offer moderate value for foraging and commuting bats due to the continuous habitat connected to the wider landscape, surrounding woodland habitats (mixed woodland and wet woodland), grasslands, gardens and allotments.

The Master Plan for the site (Appendix B) indicates that the majority of woodland / habitats corridors will be retained post development with some new corridors / hedgerows established and woodland enhancements. Therefore, foraging and commuting bats are unlikely to be significantly affected by the proposal.

However, commuting and foraging bats are highly sensitive to light spill and light pollution. Without a suitable and sensitive lighting strategy, foraging and commuting bats could be adversely impacted. Therefore, it is recommended that that adjacent woodlands on or adjacent to the sites, as well as tree lines, allotments and adjacent residential gardens are protected from light disturbance through implementation of a wildlife sensitive lighting scheme for both the construction and operational phases of the development. The design should avoid and minimise light spill on to habitats used by foraging and commuting bats.. An example of how this may be achieved is through the use of surface down lighters using LED lamps mounted within the under croft or soffit of new builds, low level light bollards or surface / recessed bulkhead LED lights fitted along public walkways and the use of columns with asymmetric optics and shields to reduce light spill. Please note that **lighting schemes should be developed in accordance with the Institute of Lighting Professionals (ILP) Guidance Note 08/8 Bats and artificial lighting in the UK (ILP, 2018).**

5.5 ENHANCEMENT

There is an opportunity to increase the bat roosting provisions on site in accordance with the National Planning Policy Framework (NPPF) in order to *'minimise impacts on biodiversity and provide net gains in biodiversity where possible...'*

It is recommended that 20 no. new bat boxes are incorporated into the proposed new buildings or erected on the existing building or trees. These could be in form of built-in bat boxes (such as Schwegler 2FR Bat Tube or similar) or external bat boxes (such as Schwegler 1FF or similar).

The new planting / landscaping on site should include bat friendly planting at the edge of habitats to increase night flying insects. Planting recommendations are included in Appendix E.

6.0 REFERENCES

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FIGURES

Figure 1 – Site Location Plan

Figure 2 – Location of the Surveyed Buildings

Figure 3 – Bat Roost Summary Map

Figure 4 – Ground Level Bat Tree Assessment Plan



Site Location Plan

CLEATOR MOOR INNOVATION QUARTER

Copeland Borough Council

Legend

Site boundary

Notes:

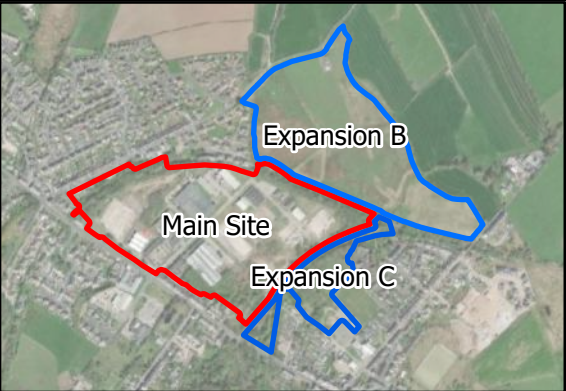
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Checked by: GP
Office: Southampton

Figure No. 1
Revision No. A

0 70 140 210 Meters
Scale 1:5,000 @A3

21 October 2021
NGR: 301752E 515602N

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Botleigh Grange
Office Campus
Hedge End
Southampton
Hampshire, SO30 2AF



Location of the Surveyed Buildings

CLEATOR MOOR INNOVATION QUARTER



Copeland Borough Council

Legend

-  Site boundary
-  Buildings
-  Buildings to be demolished

Notes:

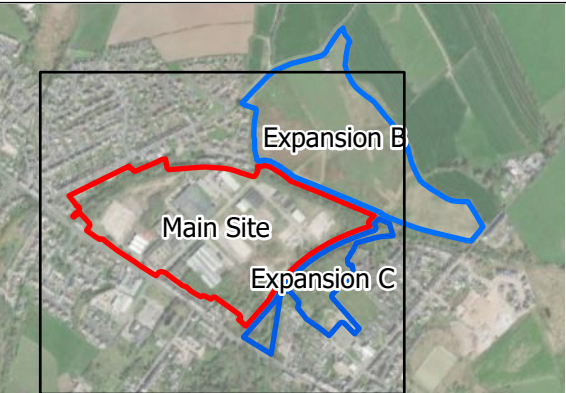
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Office: Southampton

Figure No. 2
Revision No. A

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Scale 1:3,000 @A3

21 October 2021
NGR: 301603E 515488N

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Bat Roost Summary Map

CLEATOR MOOR INNOVATION QUARTER



Copeland Borough Council

Legend

-  Site boundary
-  Buildings
-  Common pipistrelle roost

Surveyor location

-  V1
-  V2
-  V3

Notes:

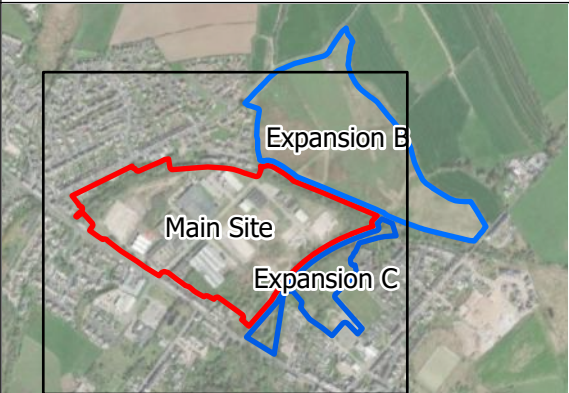
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Figure No. 3
Revision No. A

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Scale 1:3,000 @A3

21 October 2021
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**Ground Level Bat Tree
Assessment Plan**
CLEATOR MOOR INNOVATION QUARTER
Copeland Borough Council



- Legend**
- Site boundary
 - Woodland block
 - High
 - Moderate
 - Low
 - Negligible

Notes:

Drawn by: CL
Checked by: PG
Office: Southampton

Figure No. 4
Revision No. A

050100150

Meters

Scale 1:3,500 @A3

21 October 2021

NGR: 301733E 515466N

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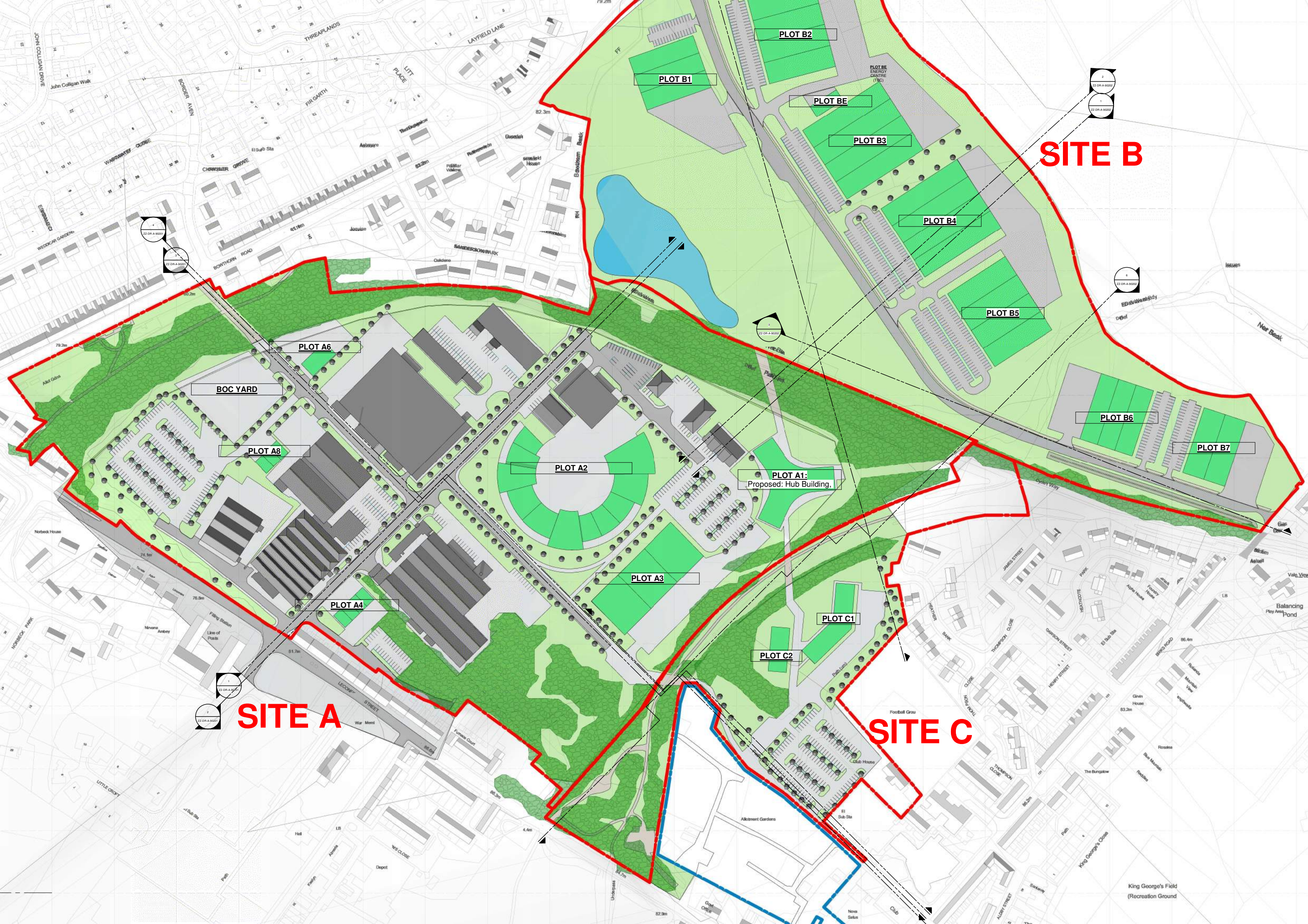
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The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

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APPENDIX B – PROPOSED SITE PLAN (DRAWING REF: ZZ-DR-A-90004_SITE PLAN PROPOSED – LABELLED).



SITE B

SITE A

SITE C

PLOT B1

PLOT B2

PLOT BE

PLOT B3

PLOT B4

PLOT B5

PLOT B6

PLOT B7

PLOT A6

BOC YARD

PLOT A8

PLOT A2

PLOT A1:
Proposed: Hub Building,

PLOT A3

PLOT A4

PLOT C1

PLOT C2

King George's Field
(Recreation Ground)

APPENDIX C – BUILDING ASSESSMENT RESULTS

Building Reference	Roosting Features / Description	Photo
B1	Gaps behind wooden fascia boards – multiple elevations. Low suitability.	
B1	Gaps behind bitumen roof overlaps – multiple elevations. Low suitability.	
B1	Gaps behind PVC fascias – western and eastern of the northern warehouse. Low suitability	

Building Reference	Roosting Features / Description	Photo
B1	Occasional gaps in the brickworks – all elevations. Low suitability.	
B2	Potential gaps in the brick at the wall tops (access gaps present under overhanging roof) – north elevation. Low suitability	
B2	Gaps behind steel roof overlaps, some boxed in. All elevations. Low suitability	

Building Reference	Roosting Features / Description	Photo
B3	Gaps behind the PVC fascia – lean-to structures adjacent western and southern elevations. Low suitability.	
B3	Potential gaps at the wall tops, behind the steel roof overlap – southern elevation. Low suitability.	
B3	Gap along the concrete lintel above the steel garage door – southern elevation. Low suitability.	

Building Reference	Roosting Features / Description	Photo
B3	Gaps behind the PVC fascias / soffits to the lean-to – eastern elevation. Gaps located predominate at the corners. Low suitability	
B3	Gaps behind the PVC fascia to the main building – eastern elevation; Low suitability.	
B3	Northern lean-to structure – gaps behind PVC fascia (predominantly at the corners) and gaps behind window boards. Low suitability.	

Building Reference	Roosting Features / Description	Photo
B4	Ventilation gaps and occasional gaps in the brickwork – all elevations. Low suitability	
B4	Occasional gaps behind wood panelling and dilapidated window frames – southern elevations. Low suitability.	
B5	Gap behind metal roof overlaps and occasional gaps in the brickwork – all elevations. Low suitability.	

Building Reference	Roosting Features / Description	Photo
B6	Gaps behind wooden fascias and bitumen roof overlaps; occasional gaps in the brickwork – all elevations. Low suitability.	
B6	Potential gaps in the brickworks / roof top concealed by ivy along the northern elevation. Low suitability	
B6	Small extension to the east. Occasional gaps in the brickworks and above the doors; ventilation gaps and few areas with gaps behind flashing overlap. Low suitability.	

Building Reference	Roosting Features / Description	Photo
B7	Gaps in the brickwork (cavity appeared to be present in places, gaps behind metal boards, gaps behind asbestos roof overlaps – all elevations, Low suitability.	
B7	Gaps around concrete wall tops and guttering at the corners – all elevations. Low suitability.	
B8	Office extension along the east – gaps behind bitumen roof overlaps and metal facias / panelling at the front. Gap within the wood panelling above the main access door. Low suitability	

Building Reference	Roosting Features / Description	Photo
B8	Gaps underneath the porch to the warehouse access doors – eastern elevation. Low suitability.	
B6	Gaps within boxed-in soffits and around corner flashing; all elevations; Low suitability	
B8	Northern elevation with two brick lean-to structures. Potential gaps behind wooden fascias to the main warehouse, fascias and roof overlaps to the lean-to's and brickwork. Low suitability.	

Building Reference	Roosting Features / Description	Photo
B8	Gaps in the brickworks around the chimney – north elevation. Low suitability.	
B9	Gaps behind the steel roof / shell overlap – eastern and western elevations. Low suitability.	
B10	Lean-to structure along the northern elevation – gaps behind wooden fascias / around the corners. Low suitability.	

Building Reference	Roosting Features / Description	Photo
B10	Lean-to structure along the western elevations – gaps behind fascias / around the corners; gaps behind wooden window boards. Low suitability.	
B10	Gaps between slate blocks around the main access door to the western lean-to. Low suitability.	
B10	Gaps behind steel wall top overlaps to the main building– northern and western elevation. Low suitability.	

Building Reference	Roosting Features / Description	Photo
B11	Roof areas – potential loft space within the roof. Gaps with access under ridges, tiles and ventilation gaps at the ridge ends. Wooden boxed-in soffits with occasional gaps – all elevations. Moderate suitability.	
B11	Occasional gaps within wood panelling around the windows. Low suitability.	
B12	Roof areas – potential loft space within the roof. Gaps with access under ridges, tiles and ventilation gaps at the ridge ends. Wooden boxed-in soffits with occasional gaps – all elevations. Moderate suitability.	

Building Reference	Roosting Features / Description	Photo
B12	Occasional gaps within wood panelling around the windows. Low suitability.	
B13	Occasional gaps within the steel wall / roof overlaps. Negligeble suitability.	

APPENDIX D – TREE ASSESSMENT RESULTS

Woodland Block	Tree Reference	Species	Grid Ref. (OSGB)	PRFs	Risk / Suitability	Photo
W1	W1-1	Ash	NY0166315666	Shallow wounds and cankers on the stem	Low	
W1	W1-2	Ash	NY0173715636	Shallow wounds and cankers on the stem	Low	

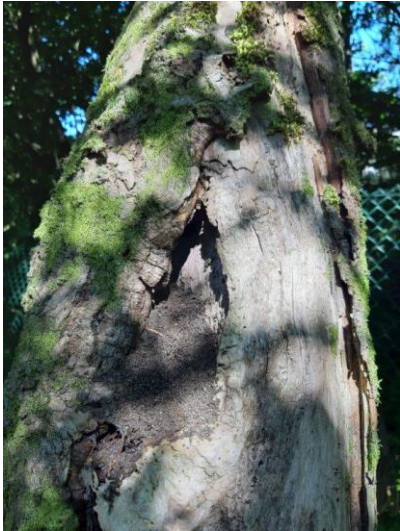
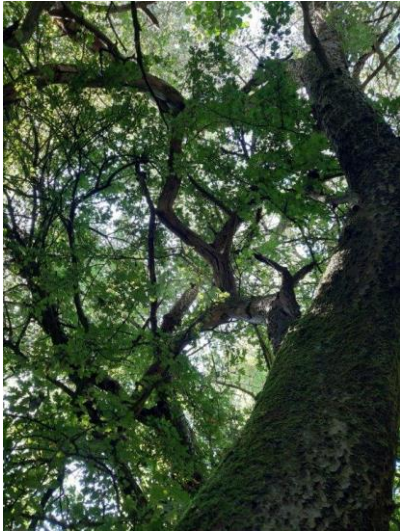
W1	W1-3	Ash	NY0174215634	Shallow tear out features on the main stem	Low	
W1	W1-4	Ash	NY0174815628	Shallow wounds and cankers on the stem	Low	

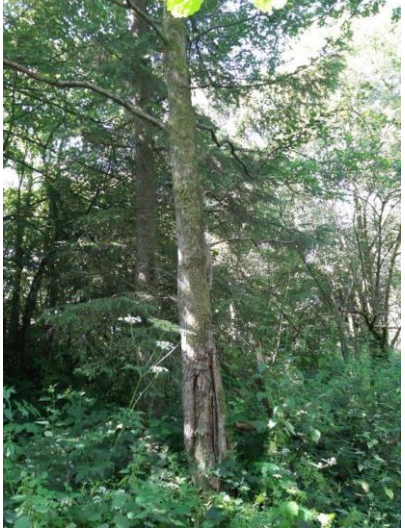
W1	W1-5	Ash	NY0182815594	Shallow wounds, cankers and flaking bark on the main stem	Low	
W1	W1-6	Ash (Dead)	NY0187315574	Shallow desiccation fissures within dead wood	Negligible	

W1	W1-7	Ash	NY0190415575	Shallow lighting strike wound on the main stem.	Low	
W1	W1-8	Wych Elm	NY0188315585	Shallow tear-out on the lower section of the stem.	Negligible	

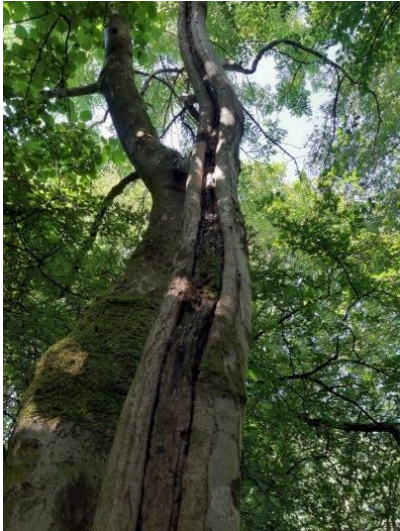
W1	W1-9	Ash	NY0169315664	A shallow lightning strike wound along the northern elevation, approximately 5m long towards the base.	Low	
W1	W1-10	Goat willow	NY0193915567	Multistem with a tear out feature on the stem facing south – with a shallow crevice at the top of the feature.	Low	

W2	W2-1	White Poplar	NY0147315667	A shallow hole in the north leaning stem.	Negligible	
W2	W2-2	Goat willow	NY0144915665	A vertical split on the lower section of the main stem, east facing and approximately 10cm deep and 40cm long.	Moderate	

W2	W2-3	White poplar	NY0144515675	A cavity is extending upwards on the south facing stem approximately 1.7m high. Debris	High	
W2	W2-4	White poplar	NY0143315679	Desiccation fissures within dead branches approximately 5m above the ground, most shallow but some appeared to be deeper	Moderate	

W2	W2-5	White poplar	NY0142515664	Desiccation fissures within dead branches	Low	
W2	W2-6	Alder	NY0141115658	A northwest facing rot/ crack in the main stem extending slightly upwards.	Moderate	

W2	W2-7	White Poplar	NY0139715653	Large tear-out on the northeast stem, facing northeast, approximately 1m long starting at 1m up with a cavity extending 30-40cm upwards. Knothole at 1.5m up with a 7cm diameter and cavity extending up and facing east.	High	
W6	W6-1	White Poplar	NY0195415531	Two tear-outs, small gaps at the top on different stems with one being 2m up and the other being 1.5m facing northwest.	Moderate	

W7	W7-12	Ash	NY0179915370	Dead wood/ rotten side with desiccation fissures. Very shallow cavity at the top of the tree.	Low	
W7	W7-11	Ash	NY0180815416	Lightning strike extending from 1m up to 7m on the eastern stem.	High	

W7	W7-10	Ash	NY0180215372	Small tear-out with the gap extending upwards; 5cm long and 2cm wide.	Low	
W7	W7-9	Alder	NY0180715363	Tear-out on the northern stem, 50cm up, with a fork at the same height.	Moderate	

W7	W7-8	Ash	NY0181315366	Tear-out on the northeast face extends from the bottom upward by 2m, with a cavity of 5cm.		
W7	W7-7	Ash	NY0180715375	Lightning strike on the east side which extends 3m upwards, with a cavity all the way up.	Moderate	

W7	W7-6	Ash	NY0181015381	Trunk is ivy clad with stem diameters in excess of 50mm, may be obscuring potential features. Small tear-out on the south face approximately 4m up.	Low	
	W7-5	Alder	NY0191915478	Tear-out on the southwest face approximately 50cm long, with a very narrow cavity extending upwards.	Moderate	

W7	W7-4	Wild cherry	NY0188115457	Tear-out on the south facing stem with a 20cm narrow cavity extending upwards.	Moderate	
W7	W7-3	Grey Willow	NY0180815438	Tear-out facing up on the northwest stem extending upwards by 5cm, and is 20cm long.	Moderate	

W7	W7-2	Ash	NY0175015369	Rot hole/ tear-out on the main stem (facing down) approximately 30cm from the ground, extending 15cm inside.	Moderate	
W7	W7-1	Willow	NY0178315422	Shallow desiccation fissures in dead wood.	Low	

APPENDIX E – WILDLIFE BENEFICIAL PLANTING

Table E1 Shrub species of native origin or generally thought to be beneficial to wildlife

(Source: 'Gardening with wildlife in mind', Natural England, 2008)

Common name	Scientific name
Hazel	<i>Corylus avellana</i>
Elder	<i>Sambucus nigra</i>
Goat willow	<i>Salix caprea</i>
Hawthorn	<i>Crataegus monogyna</i>
Dog rose	<i>Rosa canina</i>
Butterfly bush	<i>Buddleia davidii</i>
Guelder rose	<i>Viburnum opulus</i>
Gorse	<i>Ulex europaeus</i>
Broom	<i>Cytisus scoparius</i>
Wayfaring tree	<i>Viburnum lantana</i>
Shrubby cinquefoil	<i>Potentilla fruticosa</i>
Raspberry	<i>Rubus idaeus</i>
Alder buckthorn	<i>Frangula alnus</i>
Wild privet	<i>Ligustrum vulgare</i>
Barberry	<i>Berberis × stenophylla</i>
Barberry	<i>Berberis vulgaris</i>
Bell heather	<i>Erica cinerea</i>
Bilberry	<i>Vaccinium myrtillus</i>
Black currant	<i>Ribes nigrum</i>
Blackthorn	<i>Prunus spinosa</i>
Buckthorn	<i>Rhamnus catharticus</i>
Butcher's-broom	<i>Ruscus aculeatus</i>
Cherry laurel	<i>Prunus laurocerasus</i>
Cowberry	<i>Vaccinium vitis-idaea</i>
Cross-leaved heath	<i>Erica tetralix</i>
New Zealand holly	<i>Olearia macrodonta</i>
Daphne	<i>Daphne odora</i>
Dogwood	<i>Cornus sanguinea</i>
Field rose	<i>Rosa arvensis</i>
Firethorn	<i>Pyracanthus angustifolia</i>
Flowering Currant	<i>Ribes sanguineum</i>
Gooseberry	<i>Ribes uva-crispa</i>
Hebe 'Midsummer Beauty'	<i>Hebe species</i>
Hedgehog Rose	<i>Rosa rugosa</i>
Himalayan honeysuckle	<i>Leycesteria formosa</i>
Holly	<i>Ilex aquifolium</i>
Japanese quince	<i>Chaenomeles japonica</i>
Lilac	<i>Syringa vulgaris</i>
Mexican orange	<i>Choisya ternata</i>
Mezereum	<i>Daphne mezereum</i>
Midland Hawthorn	<i>Crataegus laevigata</i>
Oregon Grape	<i>Mahonia aquifolium</i>
Osier	<i>Salix viminalis</i>
Portugal laurel	<i>Prunus lusitanica</i>
Privet	<i>Lustrum ovalifolium</i>
Purple Willow	<i>Salix purpurea</i>

Common name	Scientific name
Snowy Mespilus	<i>Amelanchier canadensis</i> , <i>Amelanchier lamarckii</i>
Spindle	<i>Euonymus europaeus</i>
Spurge laurel	<i>Daphne laureola</i>
Sweet briar	<i>Rosa rubiginosa</i>
Wild privet	<i>Ligustrum vulgare</i>

Table E2 Tree species of native origin or generally thought to be beneficial to wildlife

(Source: 'Gardening with wildlife in mind', Natural England, 2008)

Common name	Scientific name
Pedunculate oak	<i>Quercus robur</i>
Ash	<i>Fraxinus excelsior</i>
Wych Elms	<i>Ulmus glabra</i>
Whitebeams	<i>Sorbus aria</i> agg.
Rowan	<i>Sorbus aucuparia</i>
Aspen	<i>Populus tremula</i>
Apple	<i>Malus domestica</i>
Bird Cherry	<i>Prunus pirus</i>
Common Alder	<i>Alnus glutinosa</i>
Crab apple	<i>Malus sylvestris</i>
Crack Willow	<i>Salix fragilis</i>
Downy Birch	<i>Betula pubescens</i>
False Acacia	<i>Robinia pseudoacacia</i>
Field Maple	<i>Acer campestre</i>
Hornbeam	<i>Carpinus betulus</i>
Juniper	<i>Juniperus communis</i>
Large-leaved lime	<i>Tilia platyphyllos</i>
Small-leaved lime	<i>Tilia cordata</i>
Pear	<i>Pyrus communis</i>
Scots Pine	<i>Pinus sylvestris</i>
Sessile oak	<i>Quercus petraea</i>
Silver birch	<i>Betula pendula</i>
Sweet chestnut	<i>Castanea sativa</i>
Wild Cherry	<i>Prunus avium</i>
Wild service-tree	<i>Sorbus torminalis</i>
Yew	<i>Taxus baccata</i>

Table E3 Gardening for bats

Aim at having flowers in bloom throughout the year, including both annuals and herbaceous perennials. Below are some suggestions, but this is not an exhaustive list. Flowering times are approximate, varying dependent on region. Regular dead-heading extends flowering period in many flowers.

A=annual, HA= hardy, annual, HHA=half-hardy annual, P=perennial, W=wild flower.

Flowers for borders			
St. John's Wort	<i>Hypericum</i>	P	March
Marigolds	<i>Calendula</i>	H/A	March-October
Aubrietia	<i>Aubrietia deltoidea</i>	P	March-June
Honesty	<i>Lunaria rediviva</i>	HB	March
Forget-me-not	<i>Myosotis</i> sp.	A/P	March-May
Elephant ears	<i>Bergenia</i>	P	April
Wallflowers	<i>Erysimum</i>	B	April-June
Cranesbills	<i>Geranium</i> sp.	P	May-September
Yarrow	<i>Achillea</i>	P	May-
Poppies	<i>Papaver</i> sp.	A	May- July
Dames violet	<i>Hesperis matronalis</i>	P	May-August
Red Valerian	<i>Centranthus ruber</i>	P	May-Sept
Poached egg plant	<i>Limnanthes</i>	HA	June-August
Knapweed	<i>Centaurea nigra</i>	P	June-September
Phacelia		HA	June-September
Ox-eye daisy	<i>Leucanthemum vulgare</i>	P	June-August
Evening primrose	<i>Oenothera biennis</i>	B	June-September
Candytuft	<i>Iberis umbellata</i>	HA	June-September
Sweet William	<i>Dianthus barbatus</i>	B	June-July
Blanket flowers	<i>Gaillardia</i>	P	June -
Verbena	<i>Verbena bonariensis</i>	HHA	June-October
Scabious	<i>Knautia arvensis</i>	P	July-August
Night-scented stock	<i>Mattiola bicornia</i>	HA	July-August
Pincushion flower	<i>Scabious</i> sp.	A/P	July-September
Cherry pie	<i>Heliotrope</i>	HHA	July-October
Mexican aster	<i>Cosmos</i> sp.	A/P	July-October
Cone flower	<i>Rudbeckia</i> sp.	A/P	August-November
Mallow	<i>Lavatera</i> sp.	P	August-October
Michaelmas daisy	<i>Aster</i> sp.	P	August-September
Ice plant 'Pink lady'	<i>Sedum spectabile</i>	P	September
Herbs – both leaves and flowers are fragrant			
Fennel	<i>Foeniculum vulgare</i>		July-September
Bergamont	<i>Monarda didyma</i>		June-September
Sweet Cicely	<i>Myrrhis odorata</i>		April-June
Hyssop	<i>Hyssopus officinalis</i>		July-September

Feverfew	<i>Tanacetum parthenium</i>	June-September	
Borage	<i>Borago officinalis</i>	May-September	
Rosemary	<i>Rosmarinus officinalis</i>	March-May	
Lemon balm	<i>Melissa officinalis</i>		
Coriander	<i>Coprianrum sativum</i>	June-August	
Lavenders	<i>Lavendula</i> sp.		
Marjoram	<i>Origanum</i> sp.		
Trees, shrubs and climbers important to insects			
Oak	<i>Quercus</i> sp.	large gardens only	
Silver birch	<i>Betula pendula</i>		
Common alder	<i>Alnus glutinosa</i>	Suitable for coppicing	
Hazel	<i>Corylus avellana</i>	Suitable for coppicing	
Elder	<i>Sambucus nigra</i>	Small	
Goat willow	<i>Salix caprea</i>	Suitable for coppicing	
Hawthorn	<i>Crataegus monogyna</i>	Suitable for coppicing	
Honeysuckle	<i>Lonicera</i> sp.	Grow a variety for succession	
Dog rose	<i>Rosa canina</i>	Climber	
Bramble	<i>Rubus fruticosus</i>	Climber	
Ivy	<i>Hedera helix</i>	Climber	
Buddleia	<i>Buddleija davidii</i>	Shrub	
Guelder rose	<i>Vibernum opulus</i>	Shrub	
Gorse	<i>Ulex</i> sp.	Shrub	
Plants for pond edges and marshy areas			
Purple loosestrife	<i>Lythrum salicaria</i>	W	June-August
Meadow sweet	<i>Filipendula ulmaria</i>	W	June-September
Lady's smock	<i>Cardamine pratensis</i>	W	April-June
Water mint	<i>Mentha aquatica</i>	W	July-September
Angelica	<i>Angelica sylvestris</i>	W	July-September
Hemp agrimony	<i>Eupatorium cannabinum</i>	W	March-May
Marsh marigold	<i>Caltha palustris</i>	W	June-September
Creeping Jenny	<i>Lysimachia nummularium</i>	W	May-August
Fringed water lily	<i>Nymphoides peltata</i>	W	June-September
Water forget-me-not	<i>Myosotis scorpioides</i>	W	June-September

Allow part lawns to grow long in summer and cut in autumn, removing the clippings. Avoid using fertilisers. Compost heaps are food producers of insects too.
(Source: 'Encouraging bats, Bat Conservation Trust, 2010)