Bat Survey - Emergence and Activity Surveys

Big Mill, Leek, ST13 8EU

Atique Choudhury

Status	Issue	Name	Date
Draft	1	Charlotte Hammond BSc (Hons) MSc ACIEEM AMIEnvSc GradIEMA – Senior Consultant	18/07/2018
Reviewed	1.1	Jo Gregory BA (Hons) MSc GradCIEEM, Senior Consultant	23/07/2018
Draft	1.2	Charlotte Hammond BSc (Hons) MSc ACIEEM AMIEnvSc GradIEMA – Senior Consultant	24/07/2018
Final	2		

Arbtech Consultant's Contact details:
Charlotte Hammond BSc (Hons) MSc ACIEEM AMIEnvSc GradIEMA
Senior Consultant
Tel: 07988465295 **Email:** charlottehammond@arbtech.co.uk

Arbtech Consulting Ltd
https://arbtech.co.uk

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Executive summary

Arbtech Consulting Ltd. undertook a suite of emergence and activity surveys on Big Mill, Leek, ST13 8EU on 30th May 2018, 20th June 2018 and 12th July 2018. The aim of the assessment was to confirm the presence/likely-absence of a bat roost and to provide a current status on all survey features.

This includes providing evidence for species, numbers and levels of activity, to identify any entrance and egress points, and to gain an understanding of the activity of bats using the site in the local landscape

The development proposals are for the conversion of the building into 44 two-bedroom apartments. A planning application is being prepared for submission to Staffordshire County Council.

Recommendations

Survey feature	**Recommendation**
B1 – Day roost for common pipistrelles and noctules. 12 bats recorded using the building over the three surveys.	An EPSL application to Natural England is required once planning has been awarded prior to any works commencing on site.
B2	No roost present. No further works required. If bats or evidence of bats are found during the works then a bat licenced ecologist must be contacted for advice immediately.

For full justification of these recommendations, please go straight to section 4.0 Conclusions, Impacts and Recommendations. Otherwise, the full report starts below.

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1.0 Introduction and Context

1.1 Background

Arbtech were commissioned by Atique Choudhury to undertake a suite of emergence/re-entry and activity surveys at Big Mill, Leek, ST13 8EU. The assessment is informed by the Bat Conservation Trust publication *Bat Surveys for Professional Ecologists – Good Practice Guidelines* (Collins, J. (Ed) 2016). These surveys were completed following recommendations made in the Preliminary Roost Assessment Survey report (Arbtech Consulting Ltd. May 2018).

1.2 Site Context

The site is located at National Grid Reference SJ 9797 5674 and comprises an area of approximately 0.1ha. There are two buildings within the site boundaries. Buildings B1 and B2 were the subject of the surveys as these will be impacted by the proposed development.

1.3 Scope of the report

This report provides a description of the bat activity observed and recorded during each survey. The aim of the assessment was to characterise any roosts present including species, numbers and access points, roosting locations, timing of use and type of roost, and to gain an understanding of how bats use the site.

Robust data has been collected, following good practice guidelines, to inform an assessment of the potential impacts of the proposed development on bats, and inform mitigation and enhancement. This report provides information on constraints to the proposals as a result of roosting bats, and summarises any mitigation required to achieve planning permission, and statutory consent to comply with wildlife legislation.

To achieve the aims of the assessment, the following steps have been taken:

- A desk study has been carried out, the BRD has not been obtained it MUST be obtained now to support EPSML application
- A field survey has been undertaken, including an external survey and internal inspection.
- An outline of likely impacts on any known roosts has been provided, based on current development proposals.
- Recommendations for further survey and assessment have been made, along with advice on European Protected Species Mitigation Licensing if appropriate.

A survey plan is presented in Appendix 1 showing the location of each surveyor and the bat activity observed and recorded during each survey, the proposed plan is included in Appendix 2 (where available) and a summary of relevant legislation can be found in the Appendix 3.

1.4 Project Description

This report is prepared in support of a planning application for the conversion of the building into 44 flats that is being prepared for submission to Staffordshire County Council. The proposed site plan is included in Appendix 2 (where available).

2.0 Methodology

2.1 Desk Study methodology

Existing bat records relating to the site and a surrounding 2km radius (the study area) are required to conform to national guidelines and these need to be requested from Staffordshire Ecological Record (SER). A review of the landscape structure using aerial images from Google Earth and OS maps, and designated sites, habitat and granted EPSL records held on Magic.gov.uk was completed to inform the Preliminary Roost Assessment (PRA) Survey. Please refer to the PRA Survey report (Arbtech, May 2018).

2.2 Site Survey methodology

The survey methods were informed by the Preliminary Roost Assessment Survey completed by Arbtech Consulting Ltd (June 2016). This survey identified the following survey requirements in line with best practice:

B1: High value for roosting bats – three roost presence/likely-absence surveys required.

B2: Low value for roosting bats – one roost presence/likely-absence survey required.

The surveys involved surveyors positioned around the buildings ensuring that all elevations and roof sections could be clearly observed. Particular attention was paid to the areas of the buildings identified as providing suitable access points to bat roosts. The location of each surveyor during each survey is shown in Appendix 1. Each surveyor was assigned an area of the buildings to observe for the duration of the survey. Surveyors used Heterodyne and Frequency Division bat detectors, and Wildlife Acoustics EM3+ and Echo Meter Touch detectors connected to iPads. Bat echolocation calls recorded during the surveys were analysed using Wildlife Acoustics sound analysis software Kaleidoscope V3.1.7 when required. That is, the Echo Meter Touch includes an Auto ID bat species, however this is not 100% accurate and further post-survey sound analysis is often required to confirm species misidentified by the Auto ID software during the survey. Surveyors also used survey record sheets, pens/pencils, head torches for recording all activity observed during the surveys including foraging and commuting behaviour as well as emergence/re-entries by bats. Surveyors equipped with night vision binoculars and/or thermal imaging equipment are identified by “NV” or “ThIm” in Table 7. All surveyors had hand held radios for communication between surveyors to assist with confirming obscure bat activity e.g. a bat emergence or a bat passing over the building.

In accordance with the latest bat survey guidelines (Collins, J. 2016) dusk emergence surveys commenced 15 minutes before sunset and continued for 1½ - 2 hours after sunset – depending upon bat activity and surveyor visibility. Dawn re-entry surveys commenced 2 hours before sunrise and continued until 15 minutes after sunrise.

Surveys were completed during optimal weather conditions i.e. when temperatures were above 10°C, with no rain or strong winds, as these environmental variables can impact upon bat emergence and foraging behaviour.

2.3 Surveyors

The lead surveyor is Charlotte Hammond BSc (Hons) MSc ACIEEM AMIEnvSc GradIEMA [2016-27302-CLS-CLS] and was assisted by 11 other surveyors over the three visits, all with several years of bat survey experience. Eight surveyors were used to provide sufficient cover of the two buildings during the first survey, six surveyors were used to provide sufficient cover of B1 for the following two surveys. The designated position of each surveyor during each survey is detailed in the tables in Section 3.6 below and shown on the plan in Appendix 1.

2.4 Survey Timings and Weather Conditions

The dates and times of each survey are presented in Table 1, along with sunset/sunrise times as applicable and the weather conditions at the start and end of each survey.

Table 1: Survey schedule and weather conditions

Reference	**Survey date**	**Survey Start and End Times** **Sunset/sunrise time**	**Weather Conditions Start**	**Weather Conditions END**
B1 and B2	30/05/18	21:02 – 23:17 Sunset: 21:17	Temp: 16°C Humidity: 86% Cloud Cover: 100% Wind: 0 m/s Rain: None	Temp: 15°C Humidity: 88% Cloud Cover: 100% Wind: 0.03m/s Rain: None
B1	20/06/18	21:20 – 22:38 Sunset: 23:38	Temp: 12°C Humidity: 63% Cloud Cover: 90% Wind: 0m/s Rain: None	Temp: 11°C Humidity: 73% Cloud Cover: 85% Wind: 0m/s Rain: None
B1	12/07/18	03:31 – 04:56 Sunrise: 04:56	Temp: 14°C Humidity: 90% Cloud Cover: 90% Wind: 0m/s Rain: None	Temp: 13°C Humidity: 91% Cloud Cover: 95% Wind: 0m/s Rain: None

2.5 Limitations – evaluation of the methodology

These surveys follow best practice guidance to confirm presence/absence of roosting bats and where present, characterise the roost. However, this information is collected at finite dates and times, and provides an indication of the conditions on site only. The use of the building/structure/tree, and the site as a whole by bats, at all times cannot be established based on this information.

Due to the height, size and location of the building within the site and its local environment the roof of B1 was not visible from the surveyors' positions, other areas were considered, but these would not have been within the bat detectors ranges. Therefore, it is possible that areas on the roof could have had emergences and re-entries, but that these were not seen. The south eastern elevation of B1 could not be seen from the surveyors' positions, access to this elevation was not possible due to overgrown vegetation. The south western and north western elevations of B2 were not visible due to location within the site and vegetation, therefore the surveyor was positioned in the best position to observe the features identified as being potential access/ egress points.

3.0 Results and Evaluation

3.6 Survey Results

The results of each survey are provided in the tables below.

Table 2: Survey results – Dusk Emergence Survey

Date		30/05/18
Start and End Times		21:02 – 23:17 Sunset: 21:17
Surveyor (position) **As shown in Appendix 1**		**Charlotte Hammond –** Natural England Bat Licence Number [2016-27302-CLS-CLS] (Position 1 – Observing the western corner of the south-western elevation and the north western elevation.) **Craig Stevens** – Two years' experience conducting these types of surveys (Position 2 – Observing the area to the west of the south western elevation). **Kyle Stevens –** Two years' experience conducting these types of surveys (Position 3 – Observing the area to the west of the tower on the south western elevation.) **Luke Ward** – Three years' experience conducting these types of surveys (Position 4 – Observing the area to the east of the tower on the south western elevation) **Ashley Thompson –** Two years' experience conducting these types of surveys (Position 5 – Observing the southern corner of the south west elevation). **Lydia-Rose Cox** – Two years' experience conducting these types of surveys (Position 6 – Observing the area to the east of the tower on the north eastern elevation. **Matt Edwards** - Two years' experience conducting these types of surveys (Position 7 – Observing the area to the north of the tower on the north eastern elevation of B1 and the northern elevation of B2). **Melissa Reid –** One seasons worth of experience conducting these types of surveys (Position 8 – Observing the south east elevations of B2)
Building Reference	**Surveyor Position**	**Notes/observations:**
B1	1	A common pipistrelle was heard only passing overhead , foraging at 21:43, 21:52 and 21:56. A soprano pipistrelle was heard only making continuous passes and foraging around the Surveyor at 21:57. A common pipistrelle was seen foraging to the rear of the building, it flew by the bridge then off away from the building at 21:58. A common pipistrelle was heard only passing overhead at 22:00. A brief pass was heard only by the Surveyor as a brown long-eared bat flew overhead at 22:01 A common pipistrelle was heard foraging at 22:01 and 22:04. A common pipistrelle passed under the bridge at 22:05. ***A common pipistrelle emerged then foraged by the second floor windows on the western elevation at 22:06.*** A common pipistrelle was heard only passing overhead at 22:13.

		A soprano pipistrelle was heard only passing overhead at 22:14. A brown long-eared bat was heard only, faintly, at 22:15. ***A bat was seen only emerging from a window on the 3rd floor in front of the Surveyor at 22:17.*** A faint brief distant pass was made by a pipistrelle bat at 22:19 the pass was too brief to determine species. A common pipistrelle was heard only, foraging at 22:20. A common pipistrelle was heard overhead at 22:24. A common pipistrelle was foraging overhead at 22:26.
B1	2	A common pipistrelle was heard only passing along in front of the Surveyor around the vegetation which was blocking their view, foraging at 21:43. A common pipistrelle was heard only passing overhead at 21:46, 21:47 and 21:50. A common pipistrelle passed towards Surveyor 1 at 21:51. A common pipistrelle was heard only passing overhead at 22:53. A common pipistrelle passed towards Surveyor 1 at 21:56. A common pipistrelle flew past after foraging by the bridge, it flew south away from the building at 21:59. A common pipistrelle was heard only passing overhead at 22:00, 22:01, 22:04 and 22:05. ***A common pipistrelle passed in front of the surveyor after emerging from one of the windows on the third floor of the south western elevation at 22:06.*** A common pipistrelle was heard only overhead at 22:11, 22:13, 22:15, 22:16, 22:18, 22:19, 22:21, 22:24, 22:25 and 23:00.
B1	3	A common pipistrelle was heard only passing along in front of the Surveyor, foraging at 21:43. A common pipistrelle was heard only passing overhead at 21:46, 21:48 and 21:49. A common pipistrelle passed under the bridge at 21:49 and 21:50, foraging. A common pipistrelle was heard only at 21:52, 21:56 and 22:03. Two passes were made by a common pipistrelle whilst foraging around the bridge and tower at 22:03. A common pipistrelle passed by the top left corner of the tower at 22:05. A common pipistrelle was heard only at 22:08 passing behind the surveyor. A common pipistrelle passed under the bridge at 22:09. A common pipistrelle was heard only passing overhead at 22:14, 22:17, 22:21 and 22:30.
B1	4	A noctule was heard only at 21:06 and 21:11. ***A common pipistrelle flew into the building at 21:24, it is thought that the bat could have been foraging inside the building.*** A common pipistrelle was heard only at 21:43, 21:46, 21:47, 21:48 and 21:49. A common pipistrelle passed from east to west at 21:50 and 21:52. A common pipistrelle was heard only foraging at 22:14, 22:15 and 22:16. A common pipistrelle passed from west to east at 22:17. A common pipistrelle was heard only at 22:18 and 22:19. A common pipistrelle passed in front of the surveyor, foraging by the building at 22:19. A common pipistrelle was heard only at 22:26. A noctule was heard only at 22:44.

B1	5	A common pipistrelle was heard only at 21:46, 21:51, 21:52 and 21:57. There was constant activity of common pipistrelle that was heard only from 22:01 until 22:06, this is thought to have been from the south eastern elevation of the building but could not be seen due to the vegetation. A common pipistrelle passed and was foraging overhead at 22:16. A common pipistrelle was heard only at 22:25, 22:26, 22:44, 23:03 and 23:06. A common pipistrelle passed from south to north on the surveyors right at 23:07 A common pipistrelle was heard only at 23:08.
B1	6	A common pipistrelle was foraging and commuting along the tree line to the south east of the building from north to south at 21:43. A common pipistrelle commuted along the tree line from east to west at 21:51. A common pipistrelle was foraging around the vegetation and travelled along the tree line from east to west at 22:01. A common pipistrelle was foraging at 22:06 around the Surveyor and vegetation. A common pipistrelle was seen commuting at 22:46.
B1	7	A common pipistrelle passed at the 1st floor level, flew along the north-western wall of the building and continued towards the south-eastern wall of the building at 21:44. A common pipistrelle passed at the 2nd floor level, flew along the northwest wall of the building heading east and made another pass along the north-western wall before leaving site to the east at 21:47. Likely the same common pipistrelle flying at the 2nd floor level, passed from the north eastern wall heading along the north-western wall and doubled back twice before to the north west. Another bat passed from the north west shortly after and left the site around the north eastern wall. Between 21:52 and 21:54. A common pipistrelle passed at the 2nd floor level, flew from the north-eastern wall of the building heading along the north-western wall, made another pass along the same wall and continued to the north west at 21:56. A common pipistrelle appeared from over the top of the building showing interest in the 4th and 5th windows on the 3rd to 4th floor by making tightly circled and erratic passes indicative of foraging. The bat flew along the north-western wall of the building, made a return pass and then continued to the northwest at 22:01. Two common pipistrelles were observed flying at the 2nd floor level of the building. One entered site from the north west and continued to the north east, and the second bat simultaneously passed and continued in the opposite directions A common pipistrelle passed at the 2nd to 3rd floor level passed from the north eastern wall of the building and continued to the north west at 22:07. A common pipistrelle was heard only at 22:12 and 22:14. Two common pipistrelles were observed flying at the 2nd to 3rd floor level and followed a similar flight path from the north east with a feeding buzz overhead and continued to the north west from 22:15 to 22:16. A common pipistrelle was heard only at 22:20. A common pipistrelle passed at 22:23 at the 2nd floor level, flew from the north-west heading along the north-western wall to the north east. An unidentified bat was observed flying very fast from the north east, flew along the north western wall of the building and continued to the north west at 22:25. A common pipistrelle passed at 22:27 and showed an interest in the same 4th and 5th windows of the 3rd to 4th floor by making tightly circled and erratic passes, indicative of foraging. The bat flew along the north-western wall of the building to the northeast. Constant activity by a common pipistrelle was recorded between 22:47 and 22:53, the bat was heard only, however feeding buzzes could be heard and the Surveyor concluded that foraging over the roof was taking place.

		Numerous common pipistrelles were circling the north-western wall, treeline and roof of the building. Six bat sightings were noted with five of these including a feeding buzz. Bats were echo locating every 3 - 10 seconds. This constant activity was recorded between 22:55 and 23:11.
B2	8	A common pipistrelle passed from the western side of B2 at 21:43. A common pipistrelle flew from the western corner of B1 to the northern corner of B1 at 21:47. A common pipistrelle passed from the western side of B2 at 21:47. A common pipistrelle flew from the northern corner of B2 overhead to the western corner of B1 at 21:51. A common pipistrelle flew from the western corner of B1 to the northern corner of B1 at 21:51. A common pipistrelle passed from the western side of B2 at 21:52. A common pipistrelle passed from the northern side of B2 to the northern corner of B1 at 21:53. A noctule passed at 21:56. A common pipistrelle flew in behind the surveyors in front of B1 from the west to the north, before flying back on itself in front of the surveyors, by B2 back towards the west at 22:01. A common pipistrelle flew from the northern corner of B1 to the western corner of B1 and around the south western side of B1 at 22:04. Constant activity by a common pipistrelle at 22:06 which was flying around the northern side of site and edge of B1. A common pipistrelle passed from the western corner of B1 to the northern corner of B1 at 22:07. A common pipistrelle passed overhead and was heard only at 22:13 and 22:14. A common pipistrelle passed from the western corner of B1 to the northern corner of B1 at 22:16. A common pipistrelle passes between the buildings from the west and was foraging at 22:17. A common pipistrelle passed, flying from the west to north, then back to the west and into the trees on the western boundary of the site at 22:20. A common pipistrelle passed from the west of B1 to the northern elevation of B1 at 22:21. An unidentified bat passed overhead and was seen only at 22:24. ***A common pipistrelle emerged from the north western elevation of B1 from a fifth floor window at 22:26 and flew north.*** A common pipistrelle passed at 22:40 and was heard only. Constant activity from a common pipistrelle was heard only at 22:47. An unidentified bat was heard only at 22:48. Common pipistrelle passes were heard only at 22:50, 22:51 and 22:53. Constant activity by a common pipistrelle was recorded at 23:01, which was flying around near the top of B1, likely to have been foraging.



Photo 1: north western (short side elevation) and south western elevations (long front elevation) of B1 (Common pipistrelle emergence points circled).

Table 3: Survey results – Dusk Emergence Survey

Date		20/06/18
Start and End Times		21:20 – 22:38 Sunset: 23:38
Surveyor (position) **As shown in Appendix 1**		**Charlotte Hammond –** Natural England Bat Licence Number [2016-27302-CLS-CLS] (Position 1 – Observing the western corner of the south-western elevation and the north western elevation). **Sally Hammond** – Three years' experience conducting these types of surveys (Position 2 – Observing the area to the west of the south western and to the west of the tower on the south western elevation). **Luke Ward** – Three years' experience conducting these types of surveys (Position 3 – Observing the area to the east of the tower on the south western elevation) **Robert Hammond –** Three years' experience conducting these types of surveys (Position 4 – Observing the southern corner of the south west elevation). **Charles Ryder** – Two years' experience conducting these types of surveys (Position 5 – Observing the area to the east of the tower on the north eastern elevation.) **Matt Edwards** - Two years' experience conducting these types of surveys (Position 6 – Position 6 – Observing the area to the north of the tower on the north eastern elevation.)
Building Reference	**Surveyor Position**	**Notes/observations:**
B1	1	A common pipistrelle passed from the south western side of the building to the north eastern elevation at 22:48.
B1	2	A common pipistrelle passed in front of the surveyor at 22:55.
B1	3	An unidentified pipistrelle passed around the surveyor at 21:26 and 21:28. A noctule was heard only, thought to have flown over the roof of B1 at 21:30. A common pipistrelle was heard only foraging behind the surveyor at 22:11, 22:37 and 22:56.
B1	4	A common pipistrelle was heard only around the surveyor at 21:27. A soprano pipistrelle was heard foraging behind the surveyor at 22:00. A common pipistrelle was foraging overhead at 22:06 and 22:09. A distant pass was made by a soprano pipistrelle at 22:15. A common pipistrelle was heard only foraging at 22:22, 22:23 and 22:25. A common pipistrelle passed along the south eastern site boundary at 22:29. A common pipistrelle passed overhead at 22:33 and 22:34. A common and soprano pipistrelle were foraging overhead at 22:45. A distant pass by a common pipistrelle was heard only at 22:52. A soprano pipistrelle was heard overhead at 22:57 and 23:04.
B1	5	A common pipistrelle passed along the vegetation at 21:58, 22:00 and 22:02. A common pipistrelle foraged around the eastern corner of the building at 22:03, 22:04, 22:09, between 22:13 and 22:15, 22:21, 22:26 and 22:33. A common pipistrelle passed at 22:49. A common pipistrelle was foraging overhead at 22:52 and 22:57.

		A distant pass was made by a noctule at 23:18.
B1	6	A common pipistrelle was foraging over the vegetation at 22:19. A common pipistrelle was heard only passing at 22:36.

Table 4: Survey results – Dawn Re-entry Survey

Date		12/07/18
Start and End Times		03:31 – 04:56 Sunrise: 04:56
Surveyor (position) **As shown in Appendix 1**		**Charlotte Hammond –** Natural England Bat Licence Number [2016-27302-CLS-CLS] (Position 1 – Observing the western corner of the south-western elevation and the north western elevation.) **Amy Treadwell** – Two years' experience conducting these types of surveys (Position 2 – Observing the area to the west of the south western and to the west of the tower on the south western elevation). **Luke Ward** – Three years' experience conducting these types of surveys (Position 3 – Observing the area to the east of the tower on the south western elevation) **Robert Hammond –** Three years' experience conducting these types of surveys (Position 4 – Observing the southern corner of the south west elevation). **Charles Ryder** – Two years' experience conducting these types of surveys (Position 5 – Observing the area to the east of the tower on the north eastern elevation.) **Matt Edwards** - Two years' experience conducting these types of surveys (Position 6 – Observing the area to the north of the tower on the north eastern elevation.)
Building Reference	**Surveyor Position**	**Notes/observations:**
B1	1	A common pipistrelle passed overhead at 03:35 and 03:45. Two common pipistrelles passed overhead at 03:54. A soprano pipistrelle passed overhead at 03:55. A distant pass by a common pipistrelle was heard only at 03:59. A pass overhead by a common pipistrelle was heard at 04:02. An unidentified bat was seen only at 04:03 foraging on the boundary then by the north western elevation and round to the north eastern elevation. A common pipistrelle was heard only passing from Surveyor 1 to Surveyor 2 at 04:10 and 04:13. An unidentified pipistrelle foraged overhead and passed to Surveyor 2 at 04:15 and 04:17. ***A common pipistrelle was seen emerging from a window on the north western elevation before foraging around the north western elevation of the building then the western corner of the building at 04:18.*** A common pipistrelle passed in front of the surveyor before foraging over the remaining trees on the western boundary and flying off site towards the north west at 04:21. A common pipistrelle was heard only passing overhead at 04:34. A common pipistrelle was heard only foraging overhead at 04:35.

		A soprano pipistrelle was heard only passing overhead at 04:36.
B1	2	A common pipistrelle was heard foraging overhead at 03:44 and 03:53. An unidentified bat was foraging at 03:54, it passed from the building towards the trees on the western boundary of the site. A common pipistrelle passed over the top of the building at 04:01. A common pipistrelle passed behind the surveyor along the inner tree line of the site on the south western boundary at 04:09. An unidentified bat was heard only at 04:11 and 04:13. A common pipistrelle was foraging at 04:13. An unidentified bat was foraging at 04:14 and 04:15. A brown long-eared was heard foraging at 04:15. Two common pipistrelles were foraging below the bridge at 04:17. ***A common pipistrelle re-entered the building through a window to the right of the tower on the fifth floor on the south western elevation after foraging overhead at 04:18.*** An unidentified bat passed between the building and treeline at 04:18. A brown long-eared bat was heard only at 04:19. An unidentified bat was heard foraging at 04:20. A common pipistrelle was seen foraging at 04:20. ***A noctule was seen flying into the building at 04:34 on the south western elevation.*** A common pipistrelle was seen feeding in the trees before flying past the surveyor towards B2 at 04:34.
B1	3	A common pipistrelle passed in front of the surveyor and overhead at 03:54. A common pipistrelle was heard only at 03:55. A common pipistrelle passed behind the surveyor over the remaining vegetation at 03:56. A common pipistrelle passed overhead and over the bushes to the south of the site at 03:57 and 03:59. A common pipistrelle was heard only at 04:10. An unidentified bat was heard only at 04:11. An unidentified bat was foraging passing overhead at 04:14. Two common pipistrelles were foraging below the bridge at 04:17. A common pipistrelle was foraging passing overhead at 04:20 and 04:35.
B1	4	A common pipistrelle was heard only at 03:34 and 03:45. An unidentified pipistrelle flew overhead away from the building at 03:54. An unidentified bat flew overhead and around the vegetation to the southern corner of the site at 03:56 and 03:59. An unidentified pipistrelle was heard only at 04:01 and 04:10. Two soprano pipistrelles were constantly flying back and forth over the vegetation to the south, foraging at 04:11 to 04:21. A soprano pipistrelle was flying over the vegetation remaining in the southern corner of the site, foraging at 04:35.
B1	5	A distant pass by a common pipistrelle that was foraging was recorded at 03:46. ***A common pipistrelle passed the surveyor towards the building and into the building through a broken fifth floor window on the south western elevation at 03:51.*** A noctule passed at 03:59. A common pipistrelle passed and was heard only at 04:01, 04:08, 04:13, 04:16, A common pipistrelle was seen between the second and third floor passing at 04:19.

		A common pipistrelle was heard only passing at 04:28. ***A common pipistrelle re-entered the building in the clock tower on the eastern elevation through a broken window on the second floor at 04:35.***
B1	6	A common pipistrelle passed at 04:00. ***A common pipistrelle re-entered the building at 04:05 on the third floor on the north eastern elevation through a broken window.*** ***A common pipistrelle re-entered the building at 04:10 on the fifth floor at the northern corner of the north east elevation of the building through a broken window.*** Constant activity by a noctule was heard only at 04:20 until 04:33.



Photo 1 – common pipistrelle emergence location on the north west boundary.



Photo 2 – Common pipistrelle re-entry point on the eastern elevation of the tower

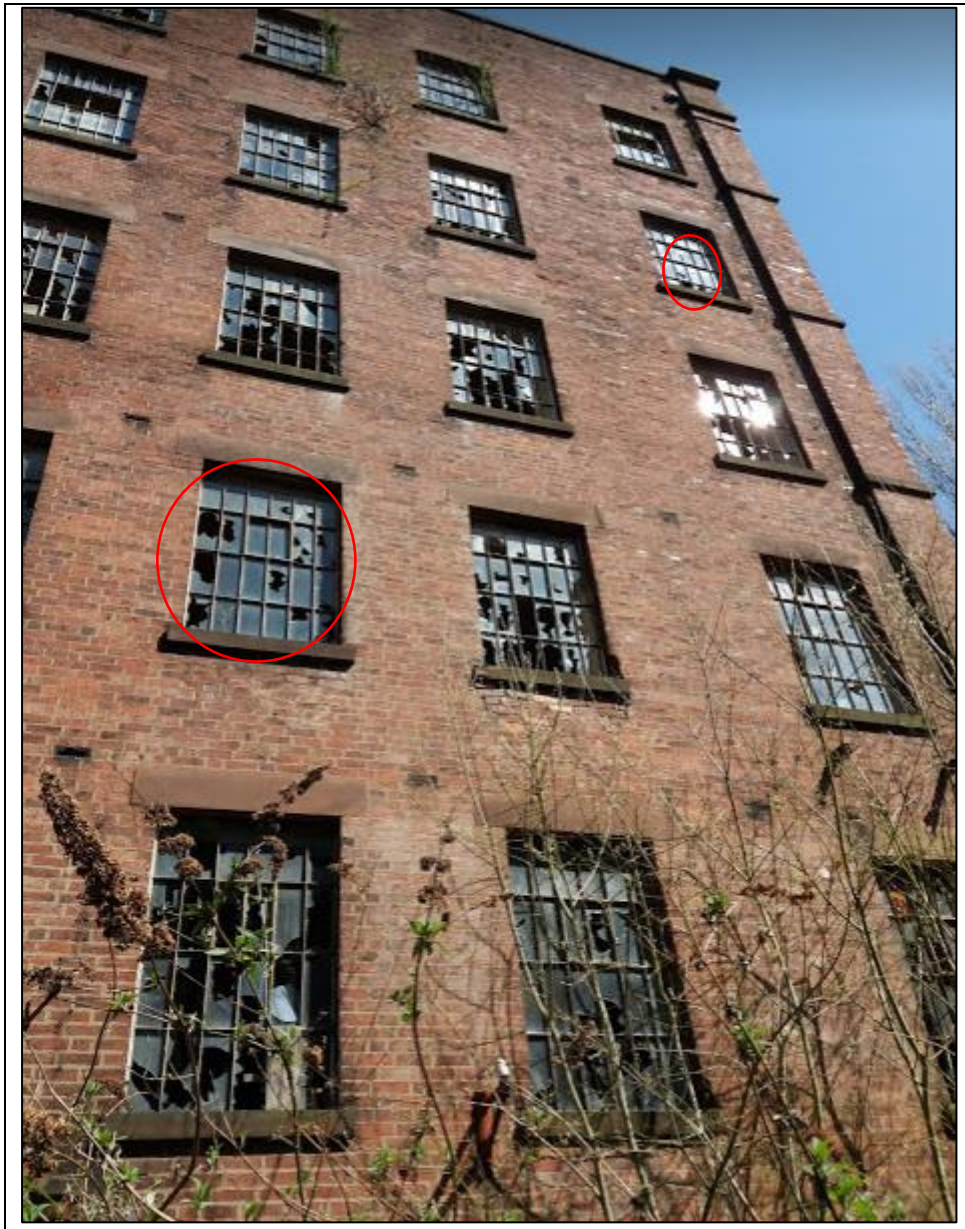


Photo 3 – Common pipistrelle re-entry points on the northern elevation of the building.

4.0 Conclusions, Impacts and Recommendations

4.1 Informative guidelines

The surveys undertaken to date in and around B1 and B2 provide sufficient information to inform a European Protected Species Mitigation Licence (EPSML). An EPSML **will be** required to enable the proposed works to be lawfully undertaken, whilst ensuring the favourable conservation status of the species concerned in their natural range; detailed mitigation will be described in the EPSML Method Statement.

Natural England's European Protected Species Guidance: How to get a licence states:

"In order to obtain a licence to allow for the capture of EPS, damage or destruction of breeding sites, etc., in advance of any otherwise legitimate activity which may impact on the favourable conservation status of the EPS concerned, you … must demonstrate that the damage will be adequately compensated for to satisfy Regulation 53(9)(b)"..... "Current Natural England advice is that there should be no net loss in the local population status of the species concerned, taking into account factors such as population size, viability and connectivity. Hence, when it is unavoidable that an activity will affect an EPS population, the mitigation should aim to maintain a population of equivalent status on or near the original site."

Appropriate justification for this assessment is provided in Section 3 and Tables 1 and 2 of this report.

4.2 Evaluation

Taking the desk-based assessment and site survey results into account, the following recommendations are reached for each site survey feature.

Table 5: Evaluation of buildings on site

Ref	Survey assessment conclusions (Type of bat roost present)	Foreseen impacts	Recommendations / Mitigation	Enhancements The Local Planning Authority has a duty to ask for enhancements under the NPPF and circular 06/2005: Biodiversity and Geological Conservation. Para.99
B1	Day roost of common pipistrelles and occasional day roost of noctule. A total of 12 bats, 11 common pipistrelles and one noctule were seen using the building over the surveys.	As the proposed development involves the conversion of B1 the bat roosts in the building will be destroyed. Any bats present during the works could be injured or killed.	**A European Protected Species Mitigation Licence (EPSML) will be required from Natural England prior to the commencement of works, once planning has been granted.** Detail mitigation required under EPSML: • Bat boxes erected on site prior to commencement of works. These will include one of the following: 2F Schwegler Bat Box (trees only) 1FF Schwegler Bat Box (buildings & trees) 2FN Schwegler Bat Box (trees only) Bat boxes should be positioned 3-5m above ground level facing in a south/south-westerly direction with a clear flight path to and from the entrance. • Pre-works inspection of the internal spaces unless this is not possible due to health and safety reasons, immediately prior to the commencement of works. • Destructive search via soft stripping by hand under ecological supervision of the roof structure prior to any roof works.	The mitigation/compensation detailed for the EPSML provides sufficient enhancements of the developed site for bats.

			• Any bats located during the pre-works inspection and destructive search will be carefully captured by hand and transported to an appropriate bat box by the License Named Ecologist or their Accredited Agent. • Permanent replacement roosting provision will be incorporated into the developed site this will include bat tubes. • Post-development monitoring in the form of a site visit upon completion of the development to confirm the compensation measures detailed within the EPSML have been installed (in accordance with the latest guidance from Natural England). • Lighting will be controlled across the developed site. Research into the effects of artificial lighting on bats has shown that it can impact upon bat emergence times and lead to a reduced foraging time. As bats are faithful to their roost sites, often returning to the same site for many years, the impact of lighting on emergence times and in turn reduced foraging times can ultimately result in the roosts being abandoned. • Key areas of the site which are sensitive to artificial lighting are the site boundaries which consist of vegetation providing foraging and commuting routes for bats. The area to the rear of B1 on the south western side of the site is also important for foraging and commuting bats, although vegetation has been removed from here. • The lighting on the developed site will be limited to the converted building only. No lighting will be installed within the other external areas, thereby maintaining the existing dark areas within the developed site for bats. • Low impact lighting strategies will be adopted from the guidance outlined in the Bat Conservation Trust "Bats and Lighting" publications: http://www.bats.org.uk/pages/bats_and_lighting.html • The lighting on the site will:	

			- Use narrow spectrum light sources to lower the range of species affected by lighting - Use light sources that emit minimal ultra-violet light - Avoid white and blue wavelengths of the light spectrum to reduce insect attraction and where white light sources are required in order to manage the blue short wave-length content they should be of a warm / neutral colour temperature <4,200 kelvin. - Not use bare bulbs and any light pointing upwards. The spread of light will be kept in line with or below the horizontal. • Light spill will be reduced via the use of low level lighting used in conjunction with hoods, cowls, louvers and shields. Lights will also be directional to ensure that light is directed to the intended areas only. • External lighting will be positioned below the eaves, be on PIR sensors that are sensitive to large objects only (so that they are not triggered by passing bats) and will be set to the shortest time duration to reduce the amount of time the lights are on. • Wall lights and security lights will be 'dimmable' and set to the lowest light intensity settings. There are several products on the market that allow the control of the light intensity and the duration that the lights are on. All lighting on the developed site will make use of the most up to date technology available. All of the above will ensure that the replacement bat roosts within the developed site will not be affected by any external lighting ensuring their long-term use.	
B2	No roost confirmed.	No bat roost confirmed in B2. Bats are very unlikely to be roosting within B2 and as such, there are not	If bats are found during any stage of the development, work should stop immediately, and a suitably qualified ecologist should be contacted to seek further advice.	The mitigation/ compensation measures for the EPSML will provide sufficient replacement roosting provision within the developed site.

		anticipated to be any impacts on bats as a result of the proposed works.		

5.0 Bibliography

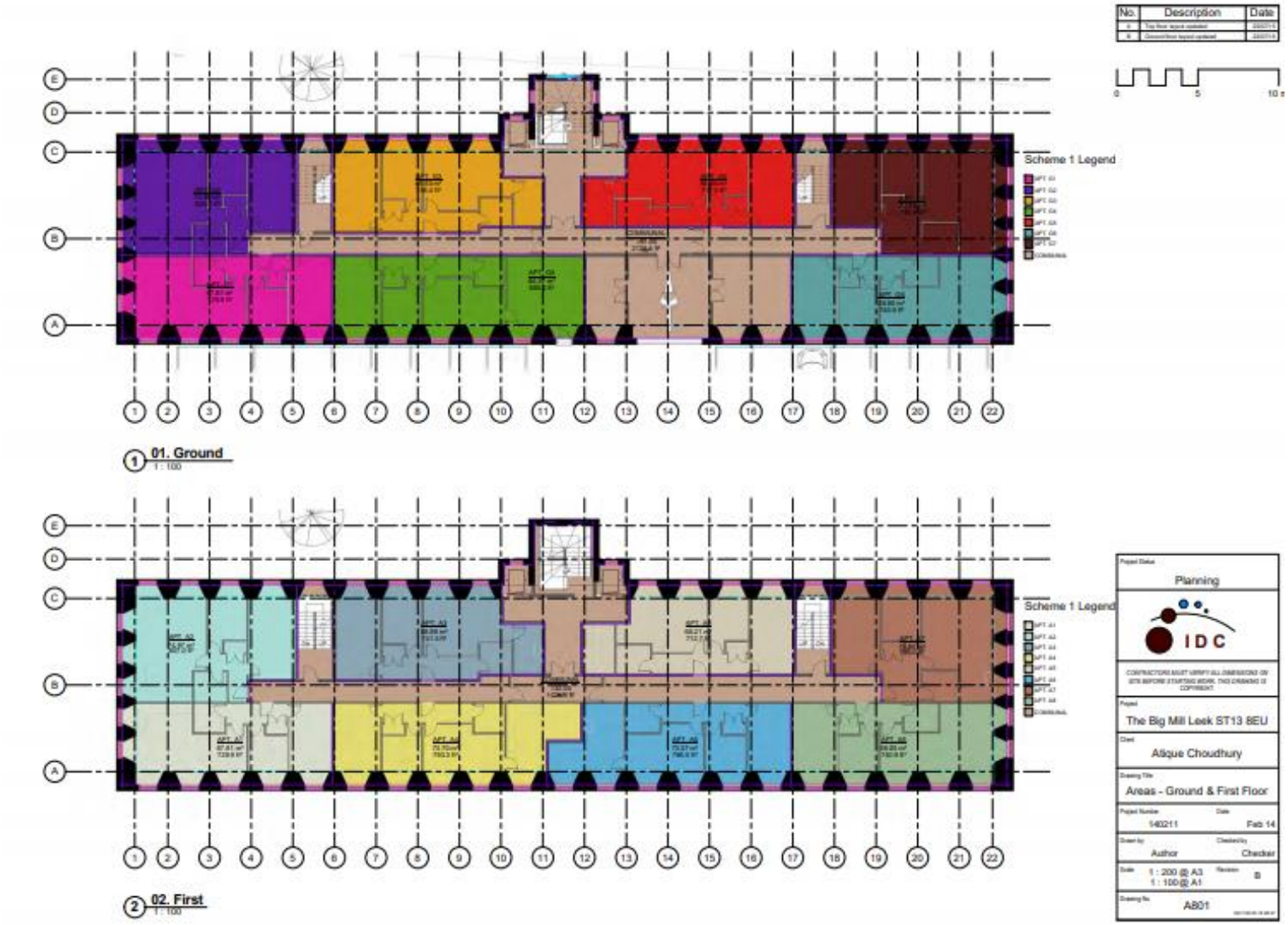
- Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists —Good Practice Guidelines, 3rd edition, Bat Conservation Trust, London.
- Garland & Markham (2008) Is important bat foraging and commuting habitat legally protected?
- Google Earth (2018) accessed on May 2018.
- Magic database (2018) http://www.magic.gov.uk/MagicMap.aspx accessed on May 2018.
- Mitchell-Jones, A.J. (2004). Bat Mitigation Guidelines. English Nature, Peterborough.

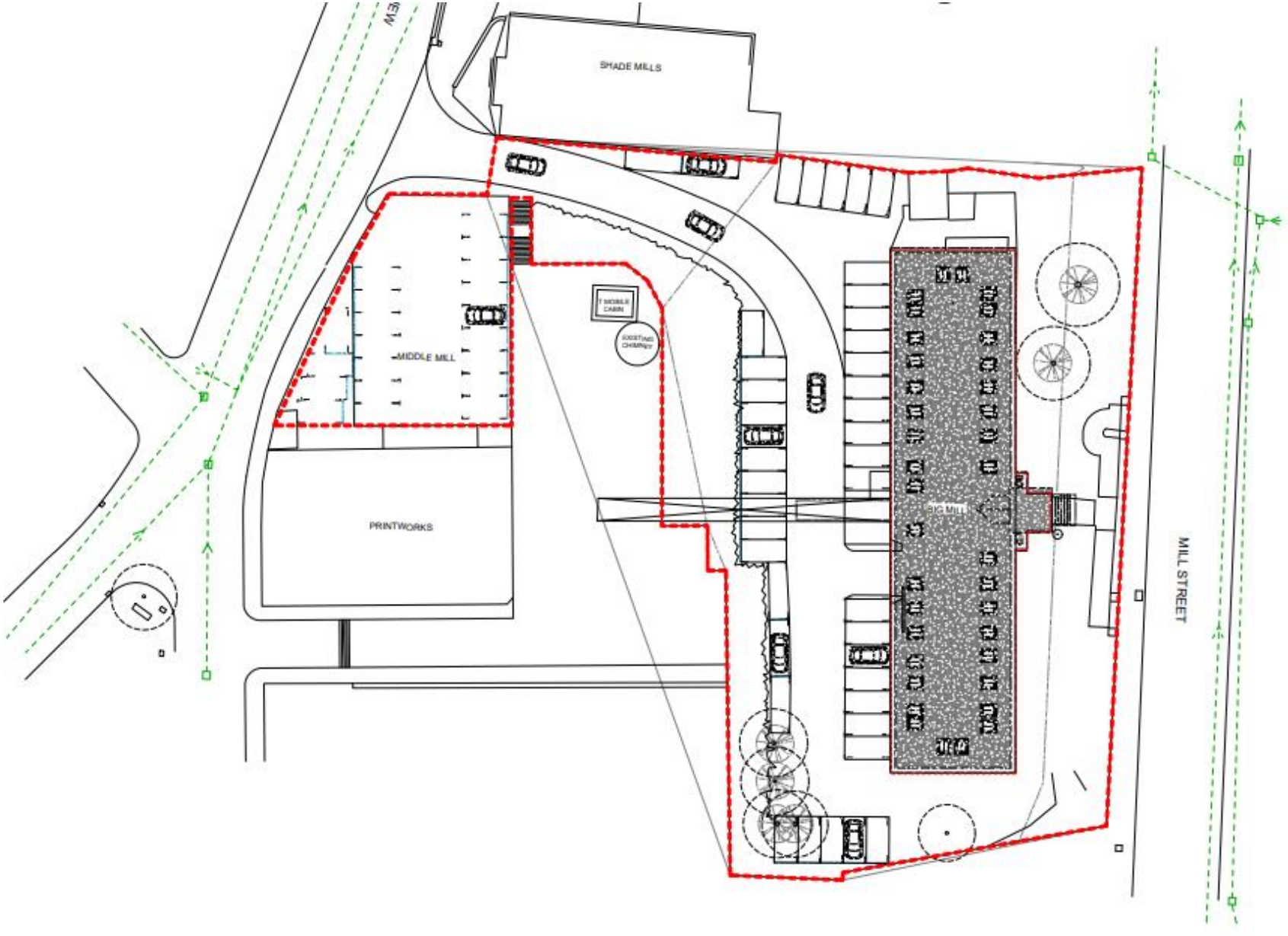
Appendix 1: Survey Plan



Appendix 2: Proposed Site Plan

Indicative layout shown for ground and first floor only, but all other floors are the same





KEY TO LINES:

Site Boundary - 4005 sqm

Flat No: 55

Car Park No: 64

Bicycle Park No: 55

Project Status: Planning

IDC

CONTRACTORS MUST VERIFY ALL DIMENSIONS ON SITE BEFORE STARTING WORK. THIS DRAWING IS COPYRIGHT.

Project: The Big Mill Leek ST13 8EU

Client: Atique Choudhury

Drawing Title: Site Block Plan

Project Number	Date
140211	Feb 14
Drawn by: Author	Checked by: Checker
Scale: 1 : 400 @ A3 1 : 200 @ A1	Revision:
Drawing No.: A100	

Appendix 3: Legislation and Planning Policy related to bats

LEGAL PROTECTION

All species of bat are fully protected under The Conservation of Habitats and Species Regulations 2010 (as amended) through their inclusion on Schedule 2.

Regulation 41 prohibits:

- Deliberate killing, injuring or capturing of Schedule 2 species (e.g. all bats)
- Deliberate disturbance of bat species as:

  a) to impair their ability:

  (i) to survive, breed, or reproduce, or to rear or nurture young

  (ii) to hibernate or migrate

  b) to affect significantly the local distribution or abundance of the species
- Damage or destruction of a breeding site or resting place

Bats are also protected under the Wildlife and Countryside Act 1981 (as amended) through their inclusion on Schedule 5. Under this Act, they are additionally protected from:

- Intentional or reckless disturbance (at any level)
- Intentional or reckless obstruction of access to any place of shelter or protection
- Selling, offering or exposing for sale, possession or transporting for purpose of sale

Effect on development works:

A European Protected Species Mitigation (EPSM) Licence issued by the relevant statutory authority (e.g. Natural England) will be required for works likely to affect a bat roost or for operations likely to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young and hibernate). The licence is to allow derogation from the relevant legislation but also to enable appropriate mitigation measures to be put in place and their efficiency/success to be monitored.

The legislation may also be interpreted such that, in certain circumstances, important foraging areas and/or commuting routes can be regarded as being afforded *de facto* protection, for example, where it can be proven that the continued usage of such areas is crucial to maintaining the integrity and long-term viability of a bat roost (Garland & Markham, 2008)

NATIONAL PLANNING POLICY (ENGLAND)

National Planning Policy Framework

The National Planning Policy Framework promotes sustainable development. The Framework specifies the need for protection of designated sites and priority habitats and species. An emphasis is also made on the need for ecological infrastructure through protection, restoration and re-creation. The protection and recovery of priority species (considered likely to be those listed as UK Biodiversity Action Plan priority species) is also listed as a requirement of planning policy.

In determining a planning application, planning authorities should aim to conserve and enhance biodiversity by ensuring that: designated sites are protected from harm; there is appropriate mitigation or compensation where significant harm cannot be avoided; opportunities to incorporate biodiversity in and around developments are encouraged; and planning permission is refused for development resulting in the loss or deterioration of irreplaceable habitats including aged or veteran trees and also ancient woodland.

The Natural Environment and Rural Communities Act 2006 and the Biodiversity Duty

Section 40 of the Natural Environment and Rural Communities (NERC) Act, 2006, requires all public bodies to have regard to biodiversity conservation when carrying out their functions. This is commonly referred to as the 'biodiversity duty'.

Section 41 of the Act (Section 42 in Wales) requires the Secretary of State to publish a list of habitats and species which are of 'principal importance for the conservation of biodiversity.' This list is intended to assist decision makers such as public bodies in implementing their duty under Section 40 of the Act. Under the Act these habitats and species are regarded as a material consideration in determining planning applications. A developer must show that their protection has been adequately addressed within a development proposal.