

A38 Derby Junctions

TR010022

Volume 6

**6.3 Environmental Statement
Appendices**

**Appendix 8.9b: Bat Roost Surveys –
Buildings and Structures in 2017**

Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

April 2019

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

A38 Derby Junctions Development Consent Order 202[]

6.3 Environmental Statement Appendices

Appendix 8.9b: Bat Roost Surveys – Buildings and Structures in 2017

Regulation Number	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010022
Application Document Reference	6.3
Author	A38 Derby Junctions Project Team, Highways England

Version	Date	Status of Version
1	April 2019	DCO Application

A38 Derby Junctions

Bat Roosts: Buildings and Structures Report

Report Number: HE514503-ACM-EBD-A38_SW_PR_ZZ-RP-EG-0006 P03 S4
January 2019

Contents

1	Introduction.....	1
1.1	Background and Scope.....	1
1.2	Study Site.....	1
1.3	Previous Bat Surveys.....	2
1.4	Proposed Scope of Bat Survey Work for 2017.....	3
1.5	Relevant Legislation and Policy.....	3
1.6	Natural England European Protected Species Licence.....	4
2	Methodology	5
2.1	Desk Study	5
2.2	Preliminary Roost Assessment.....	5
2.3	Bat Roost Presence/ Absence (Dusk/ Dawn) Surveys.....	6
2.4	Thermal Imaging.....	7
2.5	Evaluation of Roosting Bats in Buildings/ Structures.....	8
2.6	Survey Constraints	9
3	Results	10
3.1	Desk Study	10
3.2	Assessment of Bat Roosting Potential of Buildings & Structures.....	11
3.3	Bat Emergence/ Re-Entry Surveys.....	13
4	Discussion	21
4.1	B8 Queensway Group of Buildings.....	21
4.2	Bridges	21
4.3	Evaluation of Roosting Bats	23
5	References	24

List of Tables

Table 1: Guidelines for Assessing the Potential Suitability of Roosting Habitats.....	5
Table 2: Minimum Number of Visits to Determine Presence/ Absence.....	6
Table 3: Confirmed Bat Roosts (in Structures) Surveyed in 2015 and 2016.....	6
Table 4: Biological Data Records for Bat Species from DWT, DBCG and AECOM for the last 10 years within 1km of the Site (*Maternity Roost).....	10
Table 5: Queensway Bat Suitability Summary.....	11
Table 6: B8: Summary of Survey Conditions and Number of Surveys.....	14
Table 7: B8 Dusk Emergence/ Dawn Return Survey Bat Activity	15
Table 8: Bridges - Summary of Survey Conditions	18
Table 9: Bridges - Emergence Survey Bat Activity.....	19
Table 10: Bat Roosts Confirmed, Roost Status and Valuation	23

Appendices

Appendix A	Figures
Appendix B	Desk study – bat records
Appendix C	Full Building Assessments: Including external and internal inspections
Appendix D	DNA Test Result for Sample from B8 QW30
Appendix E	B8 Queensway Group: Emergence Survey Raw Data Sheets
Appendix F	Bridges B2, B3 and B15: Emergence Survey Raw Data Sheets

1 INTRODUCTION

1.1 Background and Scope

- 1.1.1 AECOM Infrastructure & Environment UK Limited (AECOM) has been commissioned by Highways England to provide design services with regards to the A38 Derby Junctions scheme (referred to as the proposed scheme herein).
- 1.1.2 The proposed scheme concerns the grade separation of three junctions on the A38 in Derby, namely:
 - A38/ A61 Little Eaton junction;
 - A38/ A52 Markeaton junction; and
 - A38/ A5111 Kingsway junction.
- 1.1.3 These three junctions are located along an approximate 5.5km length of the A38 national trunk road, to the west and north of Derby.
- 1.1.4 In order to assist with the assessment of the proposed scheme's potential environmental effects, a range of environmental surveys have been undertaken to define prevailing baseline conditions.
- 1.1.5 Previous bat surveys in 2015, 2016 and updated extended Phase 1 Habitat surveys in early 2017 defined the scope of bat work for 2017. Details on the previous bat survey work and the scope of bat work for 2017 is provided in Section 1.3 and Section 1.4 respectively. The results of the 2017 survey work of roosting bats in buildings and structures is reported together with recommendations for further surveys (where appropriate).
- 1.1.6 Further information on the bat work conducted in 2017 in regards to bat activity and bat roosts in trees, can be found in the following separate reports:
 - Bat Activity Report (AECOM 2018(a) HE514503-ACM-EBD-A38_SW_PR_ZZ-RP-EG-0005);
 - Bat Roost: Trees Report (AECOM 2018(b) HE514503-ACM-EBD-A38_SW_PR_ZZ-TN-EG-0002).

1.2 Study Site

- 1.2.1 The proposed scheme under appraisal encompasses the Kingsway and Markeaton junctions, west of the City of Derby (Centroid SK 32801 36103) and Little Eaton junction north of Derby (Centroid SK 36402 39990). A plan showing the proposed scheme boundary (in 2017) is presented in Figure 1, Appendix A. The ecological study area as referred to as the 'Site' extends up to 50m beyond the proposed scheme boundary.
- 1.2.2 The A38 is a busy arterial 'A' road carrying traffic around the west and north of the City of Derby. South of the Kingsway junction, the existing road enters a cutting and is bordered by semi-improved grassland and scrub covered verges. The central reservation south of Kingsway junction and the junction island in this location support a mosaic of habitat types, including semi-improved neutral grassland and native broadleaved woodland. Bramble Brook flows from the west of the proposed scheme in this location through culverts located under the north-bound carriageway and the central reservation before connecting with further culverts located between the

junction islands. North of Kingsway junction there is an area of mixed plantation represented by semi-mature trees on embankment.

- 1.2.3 Markeaton junction is bordered to the east by residential properties and to the west by parkland with veteran trees. The outfall from Markeaton Lake and Markeaton Brook flows through culverts beneath the existing A38 at the northern extent of the Markeaton junction section of the proposed scheme.
- 1.2.4 The western boundary of the proposed scheme at Little Eaton junction borders the road bridge over the River Derwent. The existing A38 is on embankment in this location, with the embankments themselves represented by areas of scrub and immature broadleaved plantation habitats. A variety of grassland habitats exist at the base of the embankments in this location.

1.3 Previous Bat Surveys

- 1.3.1 AECOM undertook an Extended Phase 1 Habitat survey along the route of the proposed scheme in January 2015. This Extended Phase 1 Habitat survey (AECOM(a), 47071319-URS-05-RP-EN-003, 2016) identified structures with potential to support roosting bats across the survey area (proposed scheme boundary plus 50m). Following these initial assessments, each of these built structures was re-assessed by an experienced and licensed bat worker in-line with then current guidance from the Bat Conservation Trust (BCT) (Hundt, 2012).
- 1.3.2 Between May and September 2015 dusk emergence and/ or dawn re-entry surveys and/ or thermal imaging surveys were undertaken at those structures identified by the preceding bat roost potential survey as having potential to support roosting. All dusk emergence and dawn re-entry surveys were undertaken in line with then current guidance published by the Bat Conservation Trust (BCT) (Hundt, 2012). Static detector surveys, walked transect surveys, tree surveys and bat trapping surveys were also undertaken in 2015 (AECOM(b), 47071319-URS-05-RP-EN-020, 2016) and in 2017 (AECOM(c-d) unpublished 2018).
- 1.3.3 During the 2015 bat surveys, 7 structures were identified having bat roost potential; at which bat roosts were confirmed at two structures at Little Eaton junction (as shown on Figure 2b, Appendix A):
 - B2 - a farm access overbridge used as a night roost by brown long eared bats (*Plecotus auritus*);
 - B3 - an overbridge spanning the River Derwent used as a day roost by common pipistrelle (*Pipistrellus pipistrellus*) and as a feeding perch/ resting place by Daubenton's bats (*Myotis daubentonii*) (AECOM(b), 47071319-URS-05-RP-EN-020, 2016).
- 1.3.4 In addition a row of 15 detached residential properties on Queensway and 2 semi-detached properties on the A52 Ashbourne Road at the Markeaton junction (Figure 2a, Appendix A) which would need to be demolished due to the proposed scheme were noted to potentially have suitability to support roosting bats, but due to access restrictions these could not be assessed for bat roost potential in 2015. This group of buildings (Queensway group) were referenced as B8.
- 1.3.5 Further Extended Phase 1 Habitat surveys were undertaken in September 2016 covering additional areas outside of the proposed scheme boundary proposed for

potential flood storage, construction compounds, ecological compensation and new access provisions (AECOM(e), 47071319-URS-05-TN-EN-023, 2016). These surveys identified further structures with potential to support roosting bats which were assessed by an experienced and licensed bat worker in-line with the new guidance from the Bat Conservation Trust (BCT) (Collins 2016). During these surveys a bat roost was confirmed at a railway bridge over the River Derwent (B15) at Little Eaton junction (Figure 2b, Appendix A).

1.4 Proposed Scope of Bat Survey Work for 2017

Potential Roost Feature (PRF) Assessment

- 1.4.1 Buildings and structures (bridges and culverts) likely to be affected by the proposed scheme with potential to support roosting bats, were identified during the 2017 extended Phase 1 Habitat survey. The methodology and results of the PRF assessment are provided within the Phase 1 Habitat survey report (AECOM(f), 2017 Unpublished).
- 1.4.2 The 17 residential properties at the Markeaton junction were subject to external and internal survey assessments in February 2017 (where possible) (Figure 2a, Appendix A). This defined the scope for further dusk emergence and dawn re-entry surveys (where required). The methodology and results are provided within this report.

Bat Roost Presence/ Absence (Dusk Emergence/ Dawn Return) Surveys

- 1.4.3 Confirmed roost sites at buildings and structures identified from the 2015 and 2016 surveys were subject to bat roost presence/ absence surveys in 2017 (Figure 2b, Appendix A). This was to aim to gain up to date and more detailed survey information to further characterise those roosts, to support the ecological impact assessment of the scheme and feed into any potential draft licence applications.
- 1.4.4 New potential roost features identified during the 2017 PRF assessment with potential to be impacted by the proposed scheme, and not previously surveyed in 2015, were also subject to dusk emergence/ dawn return surveys (where applicable).

1.5 Relevant Legislation and Policy

- 1.5.1 All species of bat and their roosts (whether bats are present or not) are protected under the Conservation of Habitats and Species Regulations 2017 and under the Wildlife and Countryside Act 1981 (as amended). Taken together, this legislation makes it an offence to deliberately damage, destroy or obstruct access to a bat roost or to deliberately kill, damage, take or disturb bats.
- 1.5.2 A bat roost is defined as 'any structure or place, which is used for shelter or protection' or a 'breeding site or resting place'. Since bats commonly use the same roosts at particular times of the year after periods of absence, the roost is protected whether or not bats are resident.
- 1.5.3 Given the above legislation the potential presence of bats at a site represents a material consideration in the planning process. Even where planning permission is not required there is still a legal responsibility placed on the developer to ensure that a Natural England licence is obtained to cover any works that have the potential to result in an offence under the above legislation.

- 1.5.4 Seven of the UK bat species are listed as Species of Principal Importance in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, with a species action plan prepared: namely, the barbastelle bat (*Barbastella barbastellus*), Bechstein's bat (*Myotis bechsteinii*), noctule bat (*Nyctalus noctula*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared bat, greater horseshoe bat (*Rhinolophus ferrumequinum*) and lesser horseshoe bat (*Rhinolophus hipposideros*). In addition, Species Action Plans within the local Lowland Derbyshire Biodiversity Action Plan (2012) have been prepared for common pipistrelle, whiskered bat (*Myotis mystacinus*), brandt's bat (*Myotis brandtii*), Natterer's bat (*Myotis nattereri*), Leisler's bat (*Nyctalus leisleri*) and Nathusius' pipistrelle (*Pipistrellus nathusii*).
- 1.5.5 Highways England, through the national Road Investment Strategy (RIS), has set an aspiration that the operation, maintenance, and enhancement of the Strategic Road Network (SRN) should move to a position that reduces no net loss of biodiversity; and, in the long term, Highways England should deliver a net gain in biodiversity across its broader range of works. Highways England published a Biodiversity Plan in 2015 (Highways England, 2015) to show how it will work with service providers to halt overall biodiversity loss, and maintain and enhance habitats and ecological networks. The Government requires Highways England to demonstrate progress against the 2015 Biodiversity Plan, to secure an ongoing annual reduction in the loss of net biodiversity due to its activities. The 2015 Biodiversity Plan provides a general plan to protect and increase biodiversity. The 2015 Biodiversity Plan supersedes the preceding 2002 Highways Agency (now Highways England) Biodiversity Action Plan (BAP), which still however carries some relevance as it lists specific species of conservation concern. Bats are listed in the 2002 Highways Agency BAP as priority species. The objectives of this species action plan for bats is to avoid mortality to bats or loss of bat habitat as a result of construction and operation of the network, and to enhance habitats for bats where this can be achieved safely.

1.6 Natural England European Protected Species Licence

- 1.6.1 Although the law provides strict protection to bats, it also allows this protection to be set aside (derogated) under Regulation 53 of the Habitats Regulations through the issuing of European Protected Species Mitigation Licences (EPSML) for the purpose of preserving public health; public safety; other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment. However, in accordance with the requirements of the Habitats Regulations, a licence can only be issued where the following requirements are satisfied:
- a) there is no satisfactory alternative;
 - b) the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.
- 1.6.2 In England, EPSML applications are currently determined by Natural England and take up to five working days to acknowledge receipt and then at least 30 working days to determine.

2 METHODOLOGY

2.1 Desk Study

- 2.1.1 As part of the Extended Phase 1 Habitat Report Update (AECOM(f), unpublished 2018) an updated desk study was undertaken that included up-to-date bat records obtained from the Derbyshire Bat Conservation Group (DBCG) and Derbyshire Wildlife Trust (DWT).

2.2 Preliminary Roost Assessment

- 2.2.1 A row of 15 detached residential properties on Queensway and 2 semi-detached properties on the A52 Ashbourne Road, at the Markeaton junction section of the proposed scheme (B8: Queensway group, Figure 2a Appendix A) which could not be accessed in 2015, were externally and internally assessed in February 2017 (where accessed could be gained) based upon the Bat Conservation Trust (BCT) survey guidelines (Collins, 2016).
- 2.2.2 Close focusing binoculars were used to conduct an external assessment of all residential buildings within the Queensway Group (B8). All potential bat access/egress points and features with the potential to support roosting bats (e.g. cracks, crevices, roof voids) were identified and recorded along with any evidence which may have indicated the location of roosts, such as:
- Stains around potential access points;
 - Scratch marks around potential access points;
 - Bat droppings;
 - Feeding remains;
 - Odours or noise characteristics of bats.
- 2.2.3 Following the external inspection an internal inspection of all accessible roof spaces within buildings B8 (17 properties on Queensway) with Potential Roost Feature (PRF) suitability was undertaken in February 2017 (where buildings were accessible) by a licenced ecologist from AECOM (Class License WML CL18; Level 2). During the survey, high powered torches were used to make a search for bats and signs of bats such as droppings, urine staining and feeding remains. Where such signs were found, the location and distribution were marked on a plan of the building.
- 2.2.4 On the basis of the external and internal surveys, the overall potential of the building to support roosting bats was then classified using a scale of negligible, low, moderate, high or confirmed. This assessment was based on both the intrinsic suitability of the feature to support roosting bats and other evidence giving an indication of the likelihood of use (e.g. presence of droppings, cobwebs, or exposure to elements). The grading system used to determine the potential of a feature to support roosting bats is shown in Table 1.

Table 1: Guidelines for Assessing the Potential Suitability of Roosting Habitats

Roost Suitability	Description of Roosting Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.

Roost Suitability	Description of Roosting Habitats
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 and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

2.3 Bat Roost Presence/ Absence (Dusk/ Dawn) Surveys

2.3.1 Dusk emergence and/ or dawn re-entry surveys of the buildings at Queensway identified by the preceding Preliminary Roost Assessment as having at least low roost suitability were undertaken between May and September 2017 (Figure 3a Appendix A). The recommended survey timing and minimum survey effort to be confident in a negative result is determined by the roost suitability classification, as shown in Table 2.

2.3.2 Additionally, dusk emergence and dawn re-entry surveys were conducted on those structures with confirmed roosts identified during surveys carried out in 2015 and 2016, as described in Table 3 (Figure 3b, Appendix A). Three separate survey visits were conducted between May to September 2017; and at least two of the three surveys were undertaken between May to August 2017.

Table 2: Minimum Number of Visits to Determine Presence/ Absence

Roost Suitability	Minimum number and type of surveys required
Low	One dusk emergence or dawn re-entry survey: May to August.
Moderate	Two separate survey visits May to September (at least two weeks apart and preferably more). One dusk emergence and a separate dawn re-entry survey. At least one of the two surveys undertaken May to August.
High	Three separate survey visits May to September. At least one dusk emergence and a separate dawn re-entry survey. The third visit could be either dusk or dawn. At least two of the three surveys undertaken May to August.

Table 3: Confirmed Bat Roosts (in Structures) Surveyed in 2015 and 2016

Structure number	Brief Description of Structure	Bat Suitability Criteria
B2 Flood Arch Bridge	Precast concrete box culvert bridge enclosing a small Underpass beneath the existing A38 to provide farm vehicle access to fields.	Confirmed Brown long-eared bat night roost (AECOM(b) 2016)

Structure number	Brief Description of Structure	Bat Suitability Criteria
B3 River Derwent	Reinforced concrete slab bridge carrying the existing A38 over the River Derwent. Concrete piers on either bank support the 3-spans of the bridge.	Confirmed Common pipistrelle day roost (AECOM(b) 2016)
B15 Flood Area 7b	Railway bridge over River Derwent within the potential flood compensation area to the north. Concrete deck bridge with pipes draining the decking (where a single Daubenton's bat was observed).	Confirmed Daubenton's bat day roost (AECOM(c) 2016)

- 2.3.3 The aim of these surveys was to determine whether bats emerged and/ or returned to the building/ structure, indicating that a roost may be present. Where bat roosts were confirmed the aim of surveys was to characterise the roost type and species present. Surveyors were positioned around the building/ structure in such a way that all suitable features to support roosting bats were adequately viewed; the surveys commenced 1.5 - 2 hours before sunrise and finished 15 minutes after sunrise or 15 minutes before sunset and 1.5 - 2 hours after sunset. A licenced bat ecologist from AECOM was present during each survey visit. All surveys were undertaken in suitable weather conditions (see Table 6).
- 2.3.4 During the dusk and dawn survey periods the surveyors observed potential access/ egress points. Surveyors carried bat echolocation detectors (Elekon Batlogger M) to detect bats and assist in species identification.
- 2.3.5 The time, location, number, species (where possible) and direction of flight were recorded for each bat pass (discrete burst of echolocation heard, or bat activity observed) encountered during the survey.
- 2.3.6 Sound analysis was carried out post-survey by an experienced bat ecologist. Recordings made as Wav files were converted to Zero Crossing (ZC) files using Kaleidoscope software version 3.1.6 (Wildlife Acoustics Inc., Maynard, MA, USA) and analysed using Analook software version 4.2 (Titley Scientific, Coppull, Lancashire, UK). Where possible bat calls were identified down to species level following the call parameters outlined in Russ 2013 (see limitations). The analytical process included checks of 10% of each analyst's files by another appropriately experienced analyst for quality assurance purposes.

2.4 Thermal Imaging

- 2.4.1 Thermal imaging bat emergence/ re-entry surveys were led by an experienced bat ecologist and certified thermographer (Infrared Training Centre level 2). Recordings were made using a FLIR T650sc thermal imaging camera (FLIR Systems, Wilsonville, Oregon, United States) alongside a Song Meter SM2BAT+ static acoustic bat detector (Wildlife Acoustics Inc., Maynard, MA, USA) and an Elekon Batlogger M (Elekon Electronics, Luzern, Switzerland).
- 2.4.2 Thermal imaging is a non-invasive method to detect natural thermal radiation from objects in the environment. It can operate in total darkness (and in full sunlight) and it requires no additional lighting to operate; it is a long-range and non-invasive technique.

2.4.3 Thermal imaging was used to support standard emergence and return surveys at the following locations:

- At the back of the Queensway properties at Markeaton (which are proposed for demolition as part of the proposed scheme; note thermal imaging was used on the rear of the properties to accommodate camera angles for maximum coverage as well as covering a greater number of potential roost features/ access points to these properties).
- At the bridges with confirmed bat roosts at Little Eaton junction (i.e. B3, road bridge over the River Derwent and B2 Flood Arch bridge) which require additional data to characterise the roosts for potential licencing purposes).
- At B15, a rail bridge over the River Derwent in a potential flood compensation area where a bat was observed within a structure on the bridge in September 2016.

2.4.4 A thermal imaging camera was used on at least 1 evening emergence or dawn return survey for each property in order to:

- Enhance survey information - using the high powered camera to 'see-in-the-dark' by picking up the thermal heat signatures of bats that would otherwise be difficult to see in very low light conditions.
- Enhance coverage of the properties - to reduce surveyor effort (i.e. the required surveyor numbers to ensure complete coverage of a property could be reduced).

2.4.5 After the surveys, thermal imaging files were analysed by the lead surveyor and or a suitably qualified assistant, using FLIR ResearchIR MAX software (FLIR Systems, Wilsonville, Oregon, United States). The analytical process included checks of at least 5% of each analyst's files by another appropriately experienced analyst for quality assurance purposes.

2.5 Evaluation of Roosting Bats in Buildings/ Structures

2.5.1 The relative ecology and nature conservation value of roosting bats associated with the site has been determined using the principles described in Valuing Bats in Ecological Assessment (Wray *et al.* 2010).

2.5.1 Results from biological records and the bat roost surveys were used where applicable to assist with the evaluation of roosting bats. For this evaluation, the following guidance has also been applied where/ if applicable:

- Lowland Derbyshire Biodiversity Action Plan;
- Derbyshire Mammal Group – Bats in Derbyshire distribution information;
- UK Mammals: Species Status and Population Trends (Battersby, 2005);
- The State of the UK's Bats: National Bat Monitoring Programme Populations Trends 2017 (BCT 2017);
- The state of Britain's Mammals (Macdonald and Burnham 2008);
- Joint Nature Conservation Committee. 2007. Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006. Peterborough: JNCC. Available from: www.jncc.gov.uk/article17

2.6 Survey Constraints

- 2.6.1 There were access restrictions at 6 properties at the Queensway group of buildings (B8), namely:
- Number 16 Queensway - No access was available to number 16 Queensway and no surveys were undertaken here.
 - Number 259 Ashbourne Road - No access to complete surveys was possible at number 259 Ashbourne Road.
 - Number 4 Queensway - Access restrictions to number 4 Queensway prevented an evening survey going ahead in suitable weather conditions..
 - Number 10, 12 and 14 Queensway – External and internal survey assessments were carried out; however, no access was subsequently available to conduct dusk emergence/ dawn return surveys.
- 2.6.2 Although there were access restrictions to some of the properties as outlined above, through extensive surveys at the remaining neighbouring properties it is considered that an accurate representation of bat species and bat activity levels in this area has been determined. As no significant bat activity was identified within the vicinity of these buildings, it would be reasonable to assume no significant bat roosts (i.e. maternity roosts) are present here.
- 2.6.3 Dusk emergence and dawn return surveys of the two bridges over the River Derwent (B3 and B15) presented difficulties in terms of obtaining sufficient line-of-sight and visual sightings of all potential roost features on these structures. This was further exacerbated by low light levels under the bridges. These constraints were mitigated for by the use of a thermal imaging camera to enable both increased coverage of the structures and identification of moving bats in dark conditions. It is considered that this enabled an accurate representation of bat species and bat activity levels in these areas.
- 2.6.4 There are limitations in relation to species identification from sound files/ flight observation e.g. it is not always possible to identify *Myotis* bats to species level from bat detector recordings. Where roosts were suspected or found, the internal inspection and any DNA analysis of droppings (if required) would confirm the species present and was therefore not a major constraint.

3 RESULTS

3.1 Desk Study

- 3.1.1 Up to date bat records were obtained from the DBCG and DWT. Table 4 presents a list of the closest known roosts for each species within 1km of the proposed scheme in the last 10 years; and are also illustrated on Figure 3 and Figure 4 in the Bat Activity Report (AECOM(c), 2018a)

Table 4: Biological Data Records for Bat Species from DWT, DBCG and AECOM for the last 10 years within 1km of the Site (*Maternity Roost)

Common Name	Scientific Name	Description of record	Location of nearest record (km) and bearing	Date of record	Source of data	Status
Kingsway and Markeaton Junctions						
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Roost in M39 tree	Within the site	2015	AECOM	Hab Regs, W&CA
		Roost	0.09	2012	DBCG	
			0.10	2015	DWT	
			0.15	2014	DBCG	
			0.20	2009	DWT	
			0.20	2014	DWT	
			0.20*	2015	DBCG	
			0.65	2011	DBCG	
			0.85*	2007	DWT	
Soprano pipistrelle	<i>Pipistrelle pygmaeus</i>	Roost	0.09	2012	DBCG	HabRegs; W&CA; LBAP
			0.70	2012	DBCG	
Pipistrelle sp	<i>Pipistrelle sp</i>	Roost	Within the site	2016	DBCG	Hab Regs, W&CA
			0.40	2016	DWT	
			0.75*	2012	DWT	
Brown long-eared bat	<i>Plecotus auritus</i>	Roost	0.09	2012	DBCG	Hab Regs, W&CA LBAP
			0.20	2014	DWT	
Unidentified bat	<i>Chiroptera</i>	Roost	On site boundary	2015	DBCG	Hab Regs, W&CA
Little Eaton Junction						
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Roost in B3	Within the site	2015	AECOM	Hab Regs, W&CA.
		Roost	0.60	2013	DWT	
			0.65	2007	DWT	
Soprano pipistrelle	<i>Pipistrelle pygmaeus</i>	Roost	0.40	2015	DWT	HabRegs: W&CA; LBAP

Common Name	Scientific Name	Description of record	Location of nearest record (km) and bearing	Date of record	Source of data	Status
Pipistrelle specie	<i>Pipistrellus sp</i>	Roost	0.55	2016	DWT	Hab Regs, W&CA.
Brown long-eared	<i>Plecotus auritus</i>	Roost in B2	Within the site	2015	AECOM	Hab Regs, W&CA LBAP
		Roost	0.28	2015	DBCG	
			0.35	2016	DBCG	
			0.45	2016	DWT	
			0.75	2013	DWT	
			0.90	2007	DWT	

3.1.2 Around Kingsway and Markeaton junctions proposed scheme boundary there are 3 identified known roosts situated within the site; these include a common pipistrelle, *Pipistrellus* species (common or soprano pipistrelle) and an unidentified species roosts. Up to 1km from the proposed scheme boundary there are 8 common pipistrelle, 2 soprano pipistrelle, 2 *Pipistrellus* species and 2 brown long-eared known roosts.

3.1.3 Around Little Eaton junction proposed scheme boundary 2 bat roosts are recorded within the site; a common pipistrelle and brown long-eared roost. Up to 1km from the proposed scheme boundary there are 2 common pipistrelle, 1 soprano pipistrelle, 2 *Pipistrellus* species and 5 brown long-eared known roosts.

3.2 Assessment of Bat Roosting Potential of Buildings & Structures

B8: Queensway

3.2.1 Initial assessments as part of the Extended Phase 1 Habitat survey in 2015 (AECOM(a), 47071319-URS-05-RP-EN-003, 2016) identified 17 houses (referenced as B8) potentially with features of potential value to roosting bats, including loose/missing tiles, roof vents, hanging tiles and mortar joints. Detailed external and internal surveys were undertaken as part of this study and are summarised in Table 5, with the full building assessment with associated photographs of features of interest in Appendix C. The locations of the buildings are shown in Figure 2a (Appendix A), with results of the assessment shown in Figure 3a (Appendix A).

Table 5: Queensway Bat Suitability Summary

Building number	Summary of Features	Bat Suitability Criteria
QW2	2-storey detached brick building with full brick extension on the north-east side of the building with flat roof. Clay tiled multi-pitched roof with bay front window and front pitched roof extension. Plastic intact fascias and soffits.	Moderate
QW4	2-storey detached brick building with pitched tiled roof and dormer window. Single storey brick and glass extension on the east side of the building with lean to roof. Wooden cladding located on the north side of the building	Moderate

Building number	Summary of Features	Bat Suitability Criteria
QW6	2-storey detached brick building with single pitched roof and new PVC soffits and fascia boarding. Attached flat roof garage with roofing felt, and single flat roof porch to the south of the building.	Low
QW8	2-storey detached brick building with hip and valley pitched roof, with single story brick extension on the north and south-east side of the building with lean to roofs with clay tiles.	Moderate
QW10	2-storey detached brick building with hip and valley pitched roof. New fascia boarding and windows recently installed and roof tile replacement completed. Single story extension to the rear of the property with pitched roof	Low
QW12	2-storey detached brick building with a hip and valley pitched roof and tall chimney stacks with a single storey pitched roof side extension. A conservatory extension is located on the south-east side of the building.	Low
QW14	2-storey detached building with multi pitched roof with a single-storey flat roofed garage with roofing felt, adjoins the north-east side of the building. Wall hanging tiles are present between the two front bay windows.	Moderate
QW16	No access. 2-storey brick detached house with a hipped tiled roof leading to a flat central section of roof. Potential areas where gaps could provide access points include; between roof tile, flashing, soffit boxes & fascia and hanging tiles on rear bay.	Unknown
QW18	2-storey detached brick building with multi-pitched roof. 3 single storey brick extensions located on south-east side of the building, with lean to tiled roofs. Plastic soffits and fascia boarding.	Low
QW20	2-storey detached brick building with half-hipped roof, lead flashing and hanging wall tiles. Single storey brick extension located on the south-east side of the building with a flat roof.	Moderate
QW22	2-storey detached brick building with half-hipped multi pitched roof. Hanging tiles located on the north-west side of the building between the bay windows and on the lean to side extension garage wall.	Low
QW24	2-storey detached brick building with pitched roof. Hanging tiles located on south-east side of building between bay windows. Large two storey flat roof extension present to the rear of the property.	Low
QW26	2-storey detached brick building with a cross hipped roof. Flat roofed garage extension to front of property and building located on north-west and south-east side of building respectively. Plastic box soffits present	Moderate

Building number	Summary of Features	Bat Suitability Criteria
QW28	No property. Single derelict present; concrete panel sides, open front (north) and gently pitched asbestos sheet roof. No suitable roosting locations.	Negligible
QW30	2-storey detached brick building with pitched roof. Flat roof located on the north side of the building. Hanging wall tiles situated on the north-west side of the building.	Confirmed
QW32	Loft space converted to create a 3-storey detached brick building with multiple pitched roof. Single storey brick extension with flat roof present to the rear and side of the property. Conservatory located on the south-east side of the building	High
QW257	257 Ashbourne Road. 2-storey semi-detached brick buildings with pitched roof. Some minor gaps leading to restricted roosting opportunities.	Low
QW259	259 Ashbourne Road. 2-storey semi-detached brick buildings with pitched roof. Some minor gaps leading to restricted roosting opportunities.	Low

- 3.2.2 During the internal inspections of Number 30 Queensway approximately 10 bat droppings were noted within the roof void (see photographs at Appendix C). Subsequent DNA analysis confirmed these droppings to be from whiskered bats (Appendix D). No other evidence of bats was found associated with other buildings within the Queensway group (odd numbers 4 - 32 Queensway and 257/ 259 Ashbourne Road).

3.3 Bat Emergence/ Re-Entry Surveys

Queensway

- 3.3.1 Where buildings had at least low potential to support roosting bats a series of emergence/ re-entry surveys were conducted. Table 6 summarises the dates and number of surveys conducted for each building and weather conditions. The locations of the properties and results of the surveys are shown in Figures 2a and 3a (Appendix A).
- 3.3.2 During the surveys the thermal imaging (TI) camera was used as detailed in Table 6.
- 3.3.3 During the emergence/ re-entry surveys two common pipistrelle bats were recorded emerging from Number 30 (QW30) on 5 September 2017. No other bats were recorded emerging from, or returning to roost, at any other of the Queensway group buildings. The location of the confirmed roost is shown in Figure 3a (Appendix A).
- 3.3.4 At least 6 species or species groups of bats (common pipistrelle, soprano pipistrelle, *Myotis* species, noctule, *Nyctalus/ Eptesicus* species (noctule, Leisler's bat or serotine) and brown long-eared bat were recorded foraging and/ or commuting within the vicinity of the buildings during surveys. A description of the activity at each building is presented in Table 7. Full raw data survey sheets are presented in Appendix E.

Table 6: B8: Summary of Survey Conditions and Number of Surveys

Building Number	PRF	Number of surveys	Dates of surveys	Weather conditions
QW 2	Moderate	2	01/08/2017(TI camera)	19°C scattered cloud and still
			26/09/2017 (TI camera)	14.4°C dry, light breeze, overcast
QW 4	Moderate	0	survey aborted and not repeated due to access restrictions	n/a
QW 6	Low	1	23/08/2017 (TI camera)	20°C humid, warm and clear
QW 8	Moderate	2	22/08/2017 (TI camera)	18°C dry, misty and overcast
			14/09/2017	14°C dry, cool and a slight breeze
QW 18	Low	1	24/08/2017	12°C clear, calm and cool
QW 20	Moderate	2	27/06/2017 (TI camera)	15.8°C dry and overcast
			10/08/2017	10°C cool, clear and damp
QW 22	Low	2	23/08/2017 (TI camera)	17°C rain previous evening, dry, slight breeze and overcast
			30/06/2017 (TI camera)	13°C raining up until survey and humid
QW 24	Low	1	30/06/2017 (TI camera)	13°C raining up until survey and humid
QW 26	Moderate	2	04/07/2017 (TI camera)	20°C warm, dry, slightly overcast, gentle breeze
			06/09/2017 (TI camera)	13.9°C heavy rain overnight until 1 hour before survey. Dry and overcast
QW 28	Negligible	0	N/a	N/a
QW 30	Confirmed	3	21/06/2017 (TI camera)	20°C warm, still and overcast
			03/07/2017 (TI camera)	17°C dry, mild, overcast. Previously cool and dry
			05/09/2017 (TI camera)	19°C rained earlier in day, humid and slight breeze
QW 32	High	4	21/06/2017 (TI camera)	20°C warm, still and overcast
			03/07/2017 (TI camera)	17°C dry, mild, overcast. Previously cool and dry
			05/09/2017 (TI camera)	19°C rained earlier in day, humid and slight breeze
QW257	Low	1	04/09/2017 (TI camera)	20°C dry and overcast with light breeze

Table 7: B8 Dusk Emergence/ Dawn Return Survey Bat Activity

Building Number	Survey Date (Dusk or Dawn)	Description of Bat Activity	Roost presence/ absence and species
QW 2	01/08/2017 (Dusk)	No bats recorded emerging. Common pipistrelle bats observed and recorded foraging around trees to the rear (south) of the property from 21:06 (shortly after sunset), with occasional foraging heard around both the rear and front of the property throughout much of the survey. One common pipistrelle bat was recorded commuting to the north-west (rear of adjoining properties) at 21:13, with 3 further recordings and sighting of common pipistrelle bat commuting to the rear (south) of the property from 21:24 until 21:35. Occasional foraging Soprano pipistrelle bats were recorded from 21:21 until 21:49 to the south of the property. One <i>Myotis</i> species bat was recorded at 21:38. A possible serotine bat was recorded at 21:35 and a Noctule bat at 21:50.	No
	26/09/2017 (Dawn)	No bats recorded entering roosts. Occasional foraging common pipistrelle bats were recorded from 04:30 to 05:45; and two common pipistrelle bats commuting south-east at 06:30. Soprano pipistrelle bats were briefly recorded at 05:03, 05:53 and 06:08. <i>Myotis</i> species bats were recorded commuting past the building twice at 04:48 and 05:58.	No
QW 4	29/06/2017 (Dawn)	One dawn survey aborted due to rain within 30 minutes of survey start – no bats recorded.	Survey aborted
QW 6	23/08/2017 (Dusk)	No bats recorded emerging. Occasional brief passes of both common and soprano pipistrelle bats were recorded and observed during the survey, with more bats observed and recorded in the rear garden of the property (south). Few foraging buzzes were recorded with most of the activity being brief commuting passes. 1 and 2 passes of <i>Myotis</i> and <i>Nyctalus</i> species bat were also recorded.	No
QW 8	22/08/2017 (Dawn)	No bats recorded entering roosts. Few bats recorded during survey with just 3 or 4 common pipistrelle and 1 or 2 of each soprano pipistrelle, Noctule and <i>Myotis</i> species.	No
	14/09/2017 (Dusk)	No bats recorded emerging. Common pipistrelle bats recorded from 19:45, with 1 bat flying to the front of the property (north-west), 1 bat to the rear at 19:51, and occasional passes thereafter. 1 or 2 of each soprano pipistrelle and <i>Myotis</i> species were also recorded.	No

Building Number	Survey Date (Dusk or Dawn)	Description of Bat Activity	Roost presence/absence and species
QW 18	24/08/2017 (Dawn)	No bats recorded entering roosts. (Small bird emerged from nest site under missing hanging tile at the rear (south) of the building.) A couple of soprano pipistrelle and <i>Myotis</i> species bat passes were recorded and 1 common pipistrelle bat was observed commuting south-east along the rear gardens of the Queensway properties at ~30 minutes before sunrise.	No
QW 20	27/06/2017 (Dusk)	No bats recorded emerging. Occasional common pipistrelle bats were recorded commuting and foraging to the rear of the property (south) throughout the survey, with just 4 bat passes recorded to the front of the property (north /north-west). 1 or 2 of each soprano pipistrelle and <i>Myotis</i> species were also recorded.	No
	10/08/2017 (Dawn)	No bats recorded entering roosts. 1 soprano pipistrelle recorded commuting past property, no other bats detected.	No
QW 22	23/08/2017 (Dawn)	No bats recorded entering roosts. Common and soprano pipistrelle bats occasionally recorded commuting past and foraging around both rear (south) and front (north-north-west) of the buildings.1 <i>Nyctalus</i> species bat was recorded. No activity was recorded after 35 minutes before sunset.	No
QW 24	30/06/2017 (Dusk)	No bats recorded emerging. 4 common pipistrelle bats were recorded to the rear of the property (south), with 1 bat passing form the front (north-west) to the rear (south).	No
QW 26	04/07/2017 (Dusk)	One common pipistrelle bat observed commuting across the rear garden (south) of the property ~15 minutes after sunset. Subsequently common pipistrelle bats recorded occasionally from 22:05 until the end of the survey with most activity noted at the southern end of the garden to the rear of the property; this included 1 or 2 bats foraging around the building and garden, as well as commuting bats. 1 or 2 of each <i>Nyctalus</i> and <i>Myotis</i> species were also recorded. No soprano pipistrelle bats recorded during the survey.	No
	06/09/2017 (Dawn)	No bats recorded entering roosts. Common pipistrelle bats recorded at 05:48 and 06:09, the later foraging over the building as recorded by the thermal imaging.	No

Building Number	Survey Date (Dusk or Dawn)	Description of Bat Activity	Roost presence/absence and species
QW 30	21/06/2017 (Dawn)	No bats recorded entering roosts. Common pipistrelle bats heard occasionally all around the building from 02:44 until ~20 minutes before sunset. 2 noctule bats commuting ~3am and 5 recorded Noctule passes around 04:00 until 04:15. A few (<10) soprano pipistrelle bat passes were recorded to the south-easts, mostly commuting along the garden boundary to the rear.	No
	03/07/2017 (Dusk)	No bats recorded emerging. Common pipistrelle bats occasionally recorded throughout the survey, including foraging and commuting with most bats recorded towards the south of the property (rear garden). On bat recorded at sunset and subsequent occasional bats from ~15 minutes after sunset. 1 Soprano pipistrelle, 4 <i>Nyctalus</i> species and 6 <i>Myotis</i> species were also recorded.	No
	05/09/2017 (Dusk)	Two common pipistrelle bats recorded by the thermal imaging camera emerging from (i) a gap between the roof tiles and chimney on the western side of the property at 21:19; and from in-between roof tiles at the rear (south) of the property at 21:21. Soprano pipistrelle, <i>Myotis</i> species and noctule bats recorded during the survey, with 4 noctule bat heard passing overhead.	Yes (Common pipistrelle)
QW 32	21/06/2017 (Dawn)	No bats recorded entering roosts. Common pipistrelle bats heard occasionally all around the building from 02:44 until ~20 minutes before sunset. 2 noctule bats commuting ~3am and 5 recorded Noctule passes around 04:00 until 04:15. A few (<10) soprano pipistrelle bat passes were recorded to the south-easts, mostly commuting along the garden boundary to the rear.	No
	03/07/2017 (Dusk)	No bats recorded emerging. Occasional common pipistrelle bats recorded throughout the survey, including commuting from south to north and foraging around the edges of the garden. The odd soprano pipistrelle and <i>Myotis</i> species bat also recorded.	No
	05/09/2017 (Dusk)	No bats recorded emerging. Occasional common and soprano pipistrelle bats recorded throughout the survey, including commuting and 1 bat foraging over the building. 7 Noctule bat recorded commuting overhead towards the end of the survey. <i>Myotis</i> species bat also recorded.	No
QW257	04/09/2017 (Dusk)	Little bat activity, limited to a handful of bat passes of common pipistrelle, a couple of noctule bat passes and one soprano pipistrelle bat pass.	No

Bridges

- 3.3.5 At 3 bridges where bats had previously been confirmed as roosting, a series of dusk emergence/ dawn return surveys were conducted to further characterise the roost type and confirm species present. Table 8 summarises the number of surveys conducted at each bridge, dates the surveys were conducted and weather conditions. The locations of the bridges (and confirmed roosts) are shown in Figures 2b and 3b (Appendix A).
- 3.3.6 During all surveys a thermal imaging camera was used to enhance visibility in dark conditions, more accurately pick out bat movement and access points used and cover wider areas within the surveys.

Table 8: Bridges - Summary of Survey Conditions

Structure Number	Roost presence/absence	Number of surveys	Dates of surveys	Weather conditions
B 2	Confirmed roost	3	22/06/2017	19°C calm, overcast and warm
			05/07/2017	17°C warm, dry, scattered cloud
			02/08/2017	15.8°C dry and overcast
B 3	Confirmed roost	3	20/06/2017	19.9°C dry and overcast
			06/07/2017	22°C dry, scattered cloud and humid
			03/08/2017	15°C heavy rain dusk before, light breeze, overcast, very humid
B15	Confirmed roost	3	04/07/2017	17°C mild, overcast and calm
			22/08/2017	20°C warm, overcast and humid
			06/09/2017	15.5°C dry and overcast

- 3.3.7 During the dusk emergence/ dawn return surveys bat roosts were confirmed at all 3 bridges. Common and soprano pipistrelle, *Myotis* species bats (probably all Daubenton's bats) and *Nyctalus* species bats, both noctule and Leisler's bats were recorded.
- 3.3.8 At B2, a maximum count of 3 common pipistrelles and 1 soprano pipistrelle were recorded emerging from or entering gaps under the bridge. Other bats, both pipistrelles and *Myotis* species bats, were recorded and/ or observed foraging around the bridge.
- 3.3.9 At B3 a maximum count of 64 bats returned to roost at the bridge in gaps between the longitudinal girders and the northern end of the bridge, as recorded by the thermal imaging camera; however this did not record the species of bat. Species present (i.e. foraging around the bridge) included common and soprano pipistrelle and Daubenton's bats. On other survey occasions at the bridge small numbers (<5) of common pipistrelle were observed emerging from gaps at abutments on the northern bank of the river.
- 3.3.10 At B15 common and soprano pipistrelle and Daubenton's bats were all recorded and observed foraging around the bridge and over the river. The thermal imaging camera

confirmed 2 bats, identified as Daubenton's bats, returning to roost at different drainage pipes in the centre of the bridge.

3.3.11 A description of the activity at each structure is presented in Table 9. Full raw data survey sheets are presented in Appendix F.

Table 9: Bridges - Emergence Survey Bat Activity

Structure Number	Survey Date	Description of Bat Activity	Roost present (species)
B 2	22/06/2017	3 common pipistrelle bats observed returning to roost underneath the bridge at 03:09 and 03:12, with a further 1 common pipistrelle circling around the southern end of the bridge between 03:49 - 03:50. Common and occasionally soprano pipistrelle bat passes heard throughout from 02:24 until 03:59. 5 noctule (or <i>Nyctalus</i> species) passes heard. 3-4 <i>Myotis</i> species bat passes recorded. Bats heard and observed passing through and over the bridge.	Yes Common pipistrelle x3
	05/07/2017	Several bats commuting and foraging over and under bridge. No emerging or re-entering bats. Regular common and soprano pipistrelle passes with an occasional <i>Myotis</i> species pass and 1 noctule bat pass. Bats heard and observed passing through and over the bridge.	No
	02/08/2017	1 common pipistrelle emerged from between the first and second longitudinal girder to the northern end of the bridge (the precise location being recorded by thermal imaging). A single soprano pipistrelle heard and seen flying from the south under the bridge and into roost. Regular common and soprano pipistrelle passes with a couple of <i>Myotis</i> species pass at the start and near the end of the survey. Bats heard and observed passing through and over the bridge.	Yes Common pipistrelle x1 Soprano pipistrelle X1
B 3	20/06/2017	The thermal imaging camera recorded 3 bats (species not confirmed) emerging from the abutment on the eastern bank of the river, shortly followed by a 4 th emergence from in-between the 2 nd and 3 rd longitudinal girder from the south, over the river. At 3.57 a single common pipistrelle bats flew into the bridge and entered roosts near bridge supports. Regular soprano and common pipistrelle bats were recorded foraging from the start of the survey until approximately half an hour before sunrise with constant foraging over the river initially. Occasional <i>Myotis</i> species bats were observed and recorded, including at least one call identified as Daubenton's bat. A couple of noctule bat passes also recorded.	Yes 4 bats (species unconfirmed) Common pipistrelle X1

Structure Number	Survey Date	Description of Bat Activity	Roost present (species)
	06/07/2017	Unknown (estimate of 50) number of bats of mixed common pipistrelle and Daubenton's (some echolocation calls only reported as <i>Myotis</i> species but also backed up as Daubenton's by flight pattern and behaviour) emerged between 22:00 and 22:11. Foraging activity under the bridge was consistent through the survey, but no bats were observed emerging.	No confirmed roosts
	03/08/2017	Multiple bats commuting and foraging under bridge and around bridge entrance including common and soprano pipistrelle and <i>Myotis</i> species (Daubenton's). Thermal imaging cameras recorded 64 bats entering roosts at the bridge between 04:05 and 04:58. The species of these bats is not recorded by thermal cameras; but the locations of the roosts were confirmed as bridge supports to the north-eastern side of the bridge.	Yes 64 bats confirmed (species not recorded by thermal imaging, but from activity recorded and observed suspect common pipistrelle and possibly Daubenton's bats).
B 15	04/07/2017	Multiple individuals of Soprano pipistrelle >10, <i>Myotis</i> species and common pipistrelle foraging and swarming around the pipes draining the bridge decking. Bats observed entering and exiting several pipes so actual numbers of re-entries not clear. 5 <i>Nyctalus</i> species recorded commuting overhead. Thermal imaging confirmed pipes within the centre of the bridge (i.e. over the river) were used as roosts sites, in addition to pipe identified during phase1 survey in February 2017.	Yes. Exact numbers/ species not confirmed; as bats could have emerged from elsewhere and moved into site.
	22/08/2017	From 21:28 until 21:58 multiple soprano pipistrelle bats foraging over water under the bridge; from 21:58 until common pipistrelle bats displaced the soprano pipistrelle foraging over the water and around the underside of the bridge, with only few soprano bat passes recorded afterwards. Occasional <i>Myotis</i> bats were heard from 22:12, around the same time that a single bat was observed exiting one of the drainage pipes under the bridge on the thermal camera; however, the species identification was not confirmed. Regular foraging calls of <i>Myotis</i> (most likely Daubenton's bat) and common pipistrelle with occasional soprano pipistrelle heard until ~22:35; and sporadic calls of all 3 species until the end of the survey.	Yes. 1 bat emergence confirmed (suspect common pipistrelle or <i>Myotis</i> species /Daubenton's).
	06/09/2017	Occasional foraging soprano pipistrelle bats heard foraging beyond the bridge before ~20:00, 1 soprano pipistrelle observed under the bridge followed by several bats (3+) foraging under the bridge until ~20:30. Thereafter occasional soprano pipistrelle and <i>Myotis</i> bats recorded foraging over water both under the bridge and beyond. Throughout the survey occasional noctule bats were recorded passing over site. The thermal imaging camera recorded 2 bats entering the structure and 1 exiting at 21:26.	None confirmed but behaviour (flying in and out of features) suggests some roosting.

4 DISCUSSION

4.1 B8 Queensway Group of Buildings

- 4.1.1 All the Queensway group of houses near the Markeaton junction are proposed to be demolished as part of the proposed scheme. External and internal assessments of houses were undertaken to inform preliminary roost assessments.
- 4.1.2 Following the assessment of bat roost potential a series of evening emergence and dawn return surveys were undertaken at 12 properties; with access restrictions to another property (QW4) resulting in it not being possible to rearrange a survey in suitable weather conditions. The remaining properties, QW4 and 4 other properties where access was not available will be taken forward where possible to the 2018 survey programme for completion. No property with the potential for bat roosts was present at QW28.
- 4.1.3 During the internal inspection as part of the preliminary roost assessments of the properties a bat roost was confirmed at one property QW30; a small number (<10) of bat droppings was found. DNA analysis of these droppings (Appendix D) confirmed the species as whiskered bat. Of the other Queensway group of properties, one was rated as High potential, 6 Medium potential, 8 Low potential and no properties offered no potential.
- 4.1.4 Emergence and dawn return surveys, including using a thermal imaging camera, confirmed two bat roosts within the properties, with individual common pipistrelle bats observed emerging from the roof void at QW30 on one occasion. The single common pipistrelle emerged from a different part of the same building where the small number of whiskered bat droppings were previously found. No other bat roosts were confirmed.
- 4.1.5 It is concluded therefore that of the 12 properties fully surveyed, one property QW30 supports roosting bats. The characterisation of the roost (the roost type) is given as occasional or transitory roosts for small numbers of common pipistrelle and whiskered bats; as evidenced by one single common pipistrelle bat emergence and <10 whiskered bat droppings. Bat roosts are considered to be absent from the other properties. The significance of the confirmed roost is assessed to be low and is of low conservation status and its loss would have a minimal impact to the local population of both species. As this building is proposed to be demolished as part of the proposed scheme, following planning consent, a licence would be required prior to demolition of this building in (see Section 1.5).
- 4.1.6 An active bird nest was recorded at one property and future demolition works should also consider the potential presence of nesting birds.

4.2 Bridges

- 4.2.1 Dusk emergence and dawn return surveys were undertaken at 3 bridges; B2: Flood Arch Bridge, B3: River Derwent and B15: Flood compensation area bridge. Bridges B2 and B3 were previously identified and surveyed in 2015 (AECOM(b), 47071319-URS-05-RP-EN-020, 2016) where small numbers of bats were recorded at both bridges. B15 was identified as a confirmed roost during an extended Phase 1 Habitat Survey of a potential flood compensation area in February 2016, when a single

Daubenton's bat was observed inside the structure (AECOM(c), 47071319-URS-05-TN-EN-023), 2016).

- 4.2.2 At B2, Flood Arch Bridge, a maximum count of 3 common pipistrelles and one soprano pipistrelle were recorded emerging from or entering gaps under the bridge. Other bats, both pipistrelles and *Myotis* species bats, were recorded and/ or observed foraging around the bridge. This roost is characterised as a small day roost used by both soprano and common pipistrelle bats.
- 4.2.3 At B3, River Derwent Bridge, a maximum count of 64 bats returned to roost at the bridge in gaps between longitudinal girders to the northern end of the bridge, as recorded by the thermal imaging camera. Species present (i.e. foraging around the bridge) included common and soprano pipistrelle and Daubenton's bats, but the species returning to roost was not confirmed. On other survey occasions at the bridge small numbers (<5) of common pipistrelle were observed emerging from gaps at abutments on the northern bank of the river.
- 4.2.4 The number of bats returning to roost at this bridge is consistent with a maternity roost. However, whilst a small number of common pipistrelle bats were separately recorded emerging from the bridge on another survey visit the species of the bats returning to roost in larger number was not confirmed; Daubenton's bats and soprano pipistrelle were present in addition to common pipistrelle and the roost site is suitable for all 3 species. It is considered that the roost could represent a mixed species maternity/satellite roost or single species maternity/ satellite roost.
- 4.2.5 At B15, common and soprano pipistrelle and Daubenton's bats were all recorded and observed foraging around the bridge and over the river. The thermal imaging camera confirmed 2 bats, identified as Daubenton's bats, returning to roost at different drainage pipes in the centre of the bridge; the actual numbers using the structure as a roost was not confirmed.
- 4.2.6 The high levels of bat foraging activity associated with the 2 bridges over the River Derwent (B3 and B15) might be expected as the river provides an abundant resource of prey items for bats; over water by vegetation and partly shaded by a structure being prime habitats for many insects that the recorded species of bats feed on. The use of the road bridge over the river, B3, as a possible mixed species roost is not unusual and mirrors the situation at another nearby modern concrete road bridge over the River Trent to the west of Nottingham (A6097 Gunthorpe Bridge- pers. obs.).
- 4.2.7 The results of these surveys showed a change in recorded roost status and use in bridges B3 and B2 compared to the initial surveys undertaken in 2015 (AECOM 2016b). This could partly be a reflection of natural change in use of roosts by local populations of bats; particularly in the case of the low levels of differing species activity recorded at B2 in both 2015 and 2017.
- 4.2.8 Further characterisation of the roosts' status', including number of species and maximum counts of each roost, should be further examined, through additional surveys or obtaining other roost records, to support the environmental assessment and should be considered for the 2018 survey programme and any future licence requirements, where required.

4.3 Evaluation of Roosting Bats

- 4.3.1 Bat roosts have been confirmed at 3 bridges: B2 Flood Arch; B3 road crossing of the River Derwent; B15 rail crossing of the River Derwent; and one property: number 30 Queensway (part of B8). The status of each roost is given in Table 10.

Table 10: Bat Roosts Confirmed, Roost Status and Valuation

Structure Number	Species	Roost status	Conservation Value
B2	Common pipistrelle	Small day roost	Local
	Soprano pipistrelle	Single bat day roost	Local
B3	Common pipistrelle	Confirmed roost, possible maternity roost	Unconfirmed – provisionally County
	Soprano pipistrelle	Possible roost	Unconfirmed – provisionally County
	Daubenton's bat	Possible roost	Unconfirmed – provisionally County
B8: QW30	Common pipistrelle	Two single bat day roost	Local
	Whiskered bat	Single bat day roost	Local
B15	Daubenton's bat	Small day roost	Local

- 4.3.2 Compensation, mitigation and/ or enhancement for affected bat roosts should be considered as part of the environmental assessment in light of the full nature of impacts once full details of the proposed scheme are developed. In addition any licensing of works to bat roosts (whether disturbance to, or destruction/ modification of the roost) will need to show evidence of how the local status of the bats affected is maintained and/ or enhanced.

5 REFERENCES

AECOM(a) (2016) A38 Derby Junctions Phase 1 Habitat Survey Report Ref. No. 47071319-URS-05-RP-EN-003.

AECOM(b) (2016) A38 Derby Junctions Bat Survey Report Ref. No. 47071319-URS-05-RP-EN-020.

AECOM(c) (2018a) Bat Activity Survey Report HE514503-ACM-EBD-A38_SW_PR_ZZ-RP-EG-0005.

AECOM(d) (2018b) Bat Tree Report HE514503-ACM-EBD-A38_SW_PR_ZZ-TN-EG-0002.

AECOM(e) (2016) A38 Derby Junctions Additional Sites Individual Technical notes Ref. Nos. 47071319-URS-05-TN-EN-023.

AECOM(f) (2017) unpublished Extended Phase 1 Report Update.

Battersby, J. (Ed) & Tracking Mammals Partnership. (2005). UK Mammals: Species Status and Population Trends.

Collins, J. (ed.) (2016). Bat Surveys for Professional ecologists: Good Practice Guidelines (3rd ed). The Bat Conservation Trust, London.

Highways England (2015) Our plan to protect and increase biodiversity. Highways England.

HMSO (2017) Conservation of Habitats and Species Regulations 2017. London: HMSO.

Hundt, L (2012) Bat Surveys: Good practice Guidelines, 2nd edition, Bat Conservation Trust.

Lowland Derbyshire Biodiversity Action Plan. (2012). 1st ed. [ebook] Derbyshire: www.derbyshirebiodiversity.org.uk, p.246. Available at: http://www.derbyshirebiodiversity.org.uk/news/files/Lowland_Derbyshire_Biodiversity_Action_Plan_2011-2020.pdf [Accessed December. 2017].

Joint Nature Conservation Committee. 2007. Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006. Peterborough: JNCC. Available from: www.jncc.gov.uk/article17

Macdonald, D. Burnham, D. (2008). The state of Britain's Mammals 2008. People's Trust for Endangered Species.

Russ, J. 2013. British Bat Calls. A Guide to species Identification. Pelagic Publications.

The State of the UK's Bats: National Bat Monitoring Programme Populations Trends 2017 (BCT 2017).

Wray, S. Wells, D, Long, E Mitchell-Jones, T (2010). Valuing Bats in Ecological Impact Assessment. CIEEM In Practice Issue 70 (December 2010).

Appendix A Figures

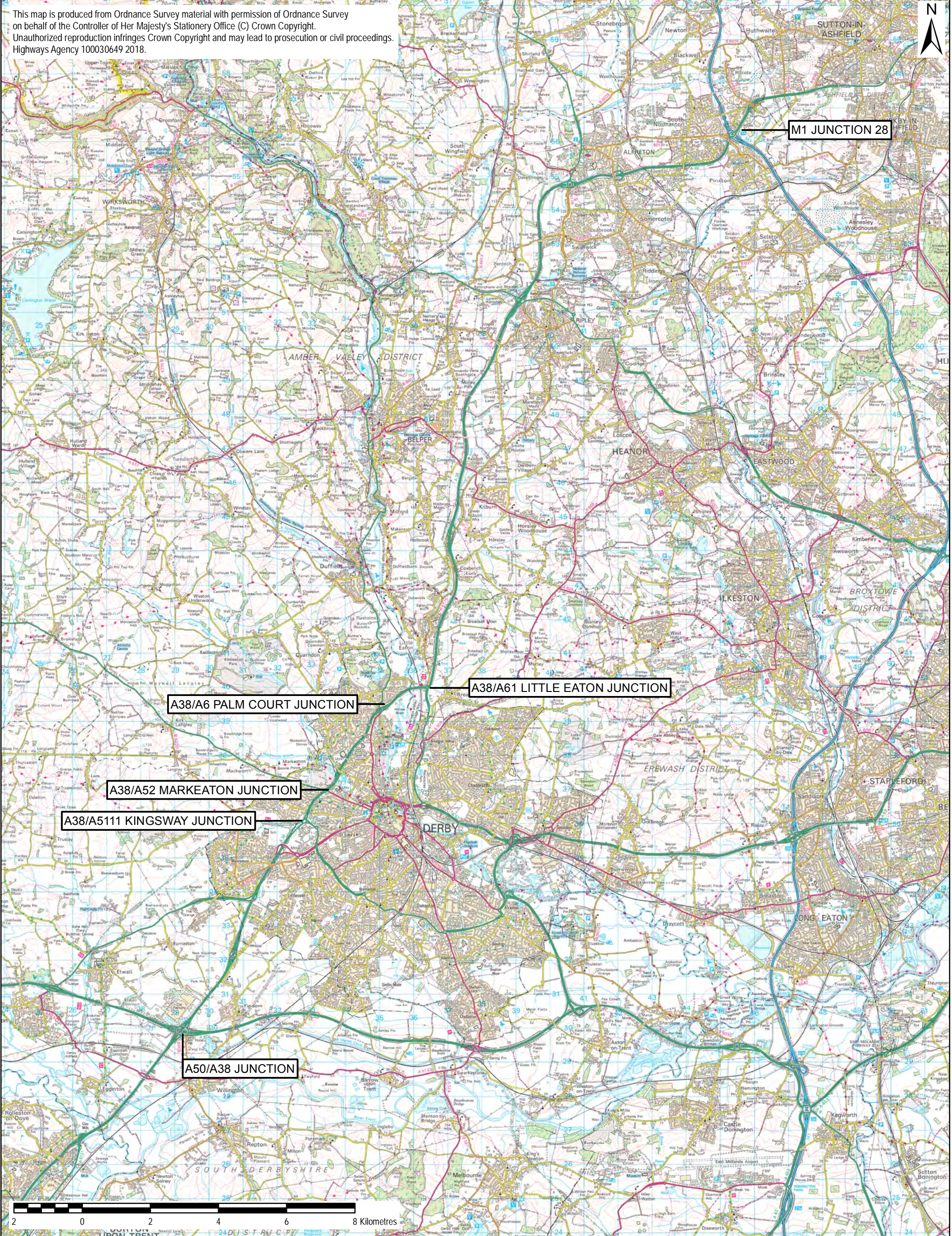
Figure 1: Locations Plan



Figure 2a: Queensway

Figure 2b: Little Eaton

Figure 3a: Queensway Bat Survey Results

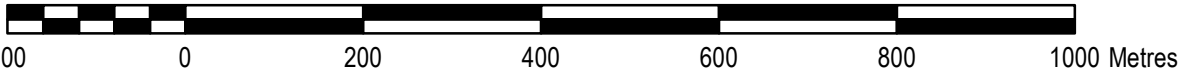
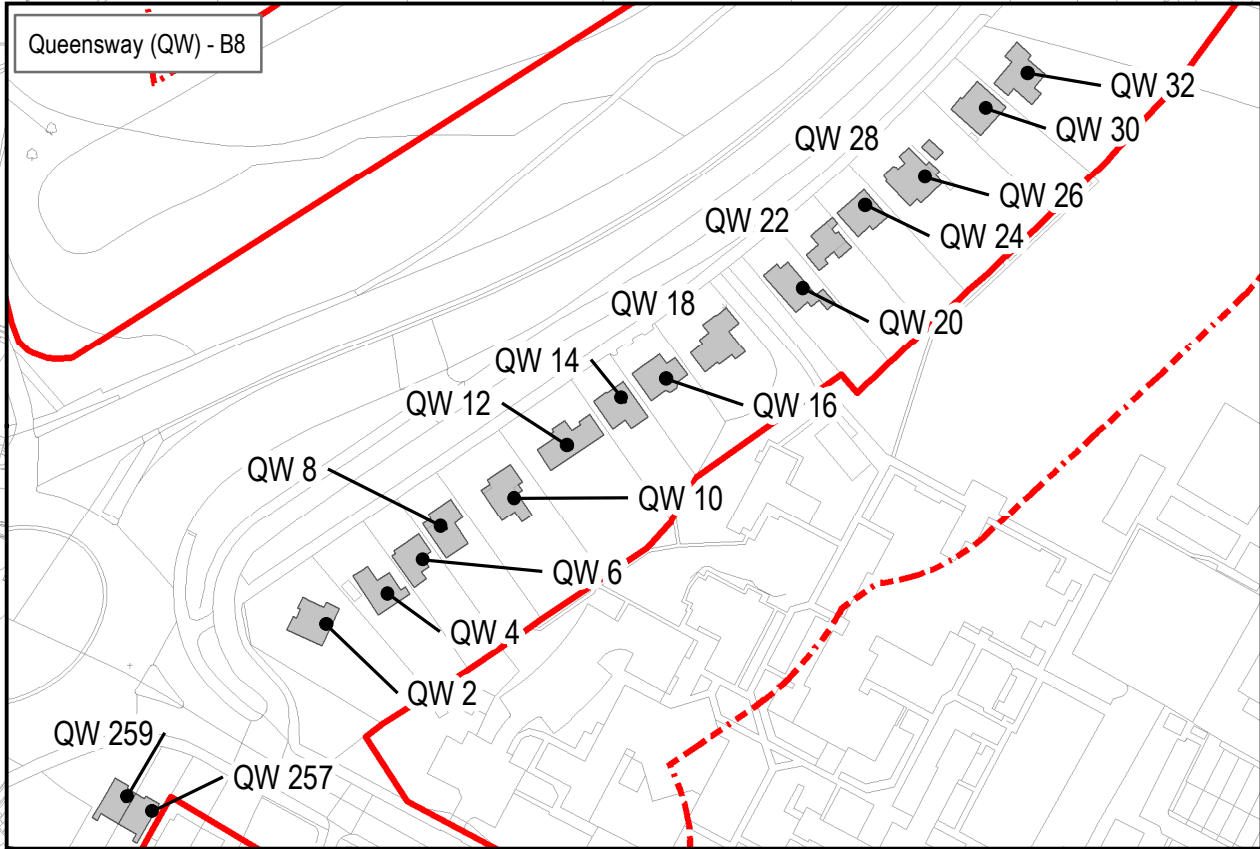
Figure 3b: Little Eaton Bat Survey Results



Project Title/Drawing Title		AECOM Internal Project Number 60533462			<div></div> <div></div>
A38 DERBY JUNCTIONS SCHEME LOCATION PLAN		Drawn GB	Checked SW	Approved SW	
		Date 04/02/2016	Scale @ A3 1:100,000	Purpose of issue FINAL	AECOM Royal Court Basil Close, Chesterfield Derbyshire, S41 7SL +44 (0) 1246 209221 +44 (0) 1246 209229 www.aecom.com
THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM'S APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM'S EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.		Drawing Number Figure 1		Rev 2F	

File Name: \\ch-wip-001\CH_Roads\A38 Derby Jns - POT33912 CAD\12.1 WIP\FIGURE 1.1 - LOCATION PLAN F1.mxd

This map is produced from Ordnance Survey material with permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office (C) Crown Copyright. Unauthorized reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Highways England 100030649 2017.



Legend

- Scheme boundary (indicative)
- 50m buffer

Project Title/Drawing Title
**A38 DERBY JUNCTIONS
KINGSWAY - MARKEATON
LOCATION OF SURVEY AREA
QUEENSWAY**

AECOM Internal Project Number
60533462

Drawn
CAA

Checked
HP

Approved
PB

Date
18/01/2018

Scale @ A3
1:8,500

Purpose of issue
FINAL

Drawing Number
Figure 2A

Rev
.

A38 Derby Junctions Project
Highways England, Floor 5
2 Colmore Square
38 Colmore Circus
Birmingham
B4 6BN



AECOM
Royal Court
Basil Close, Chesterfield
Derbyshire, S41 7SL
+44 (0) 1246 209221
+44 (0) 1246 209229
www.aecom.com



This map is produced from Ordnance Survey material with permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office (C) Crown Copyright. Unauthorized reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Highways England 100030649 2017.





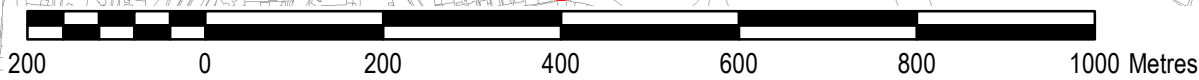
B15



B2

B3

Legend

-  Scheme boundary (indicative)
-  50m buffer

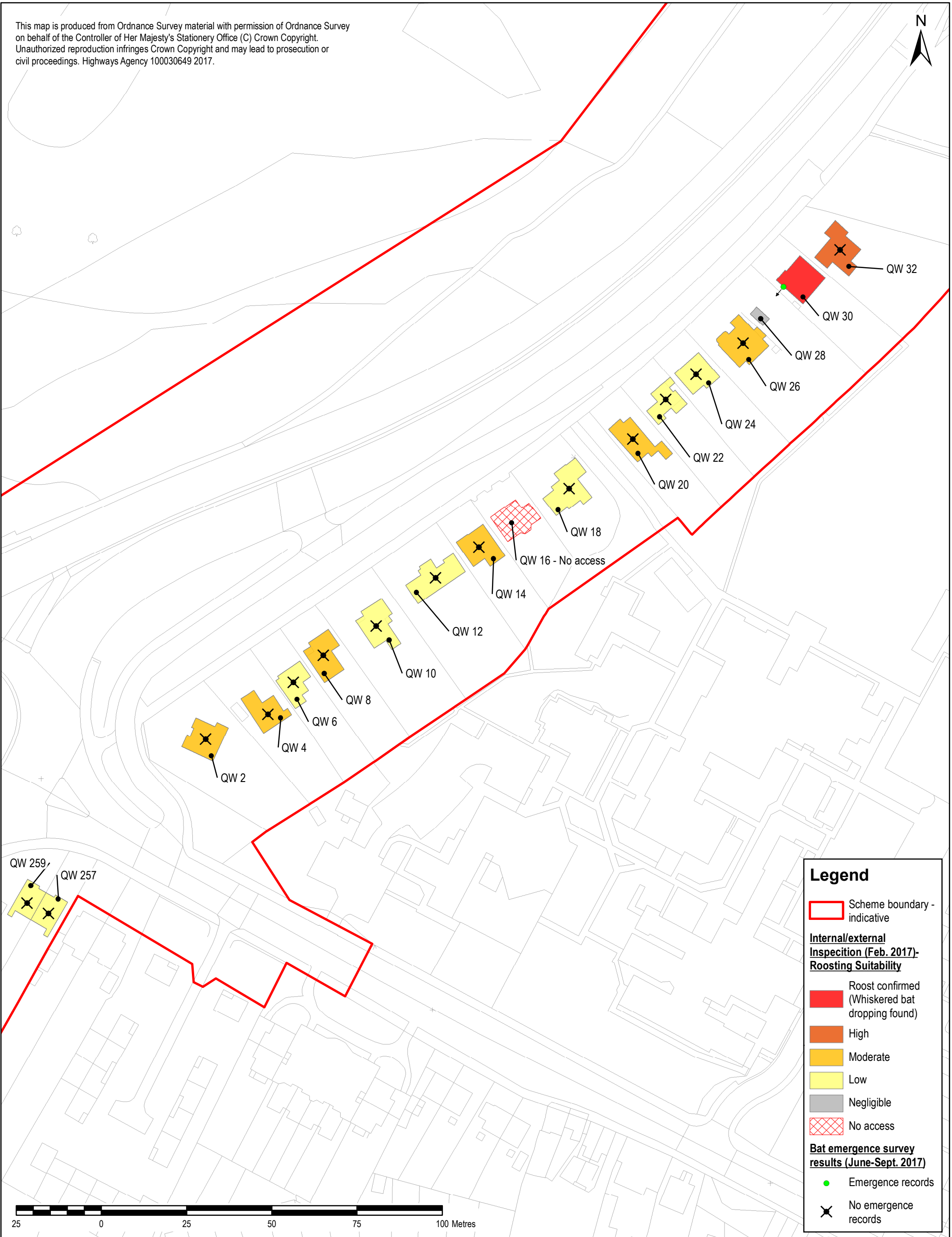


Project Title/Drawing Title A38 DERBY JUNCTIONS LITTLE EATON LOCATION OF SURVEY AREA	AECOM Internal Project Number 60533462			A38 Derby Junctions Project Highways England, Floor 5 2 Colmore Square 38 Colmore Circus Birmingham B4 6BN	
	Drawn CAA	Checked HP	Approved PB		
	Date 04/01/2018	Scale @ A3 1:8,500	Purpose of issue FINAL	AECOM Royal Court Basil Close, Chesterfield Derbyshire, S41 7SL +44 (0) 1246 209221 +44 (0) 1246 209229 www.aecom.com	
	Drawing Number Figure 2B		Rev .		
THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM'S APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM'S EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.					

THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM'S APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM'S EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.

File Name: A:\Highways Agency\47071390 A38 Derby Jns - Environment\Technical\Ecology\GIS_A38_2017\project_files\Bats\Queensway\Figure 2b_A38 Little Eaton_2017.mxd

This map is produced from Ordnance Survey material with permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office (C) Crown Copyright. Unauthorized reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Highways Agency 100030649 2017.



Legend

Scheme boundary - indicative

Internal/external Inspection (Feb. 2017)- Roosting Suitability

Roost confirmed (Whiskered bat dropping found)

High

Moderate

Low

Negligible

No access

Bat emergence survey results (June-Sept. 2017)

Emergence records

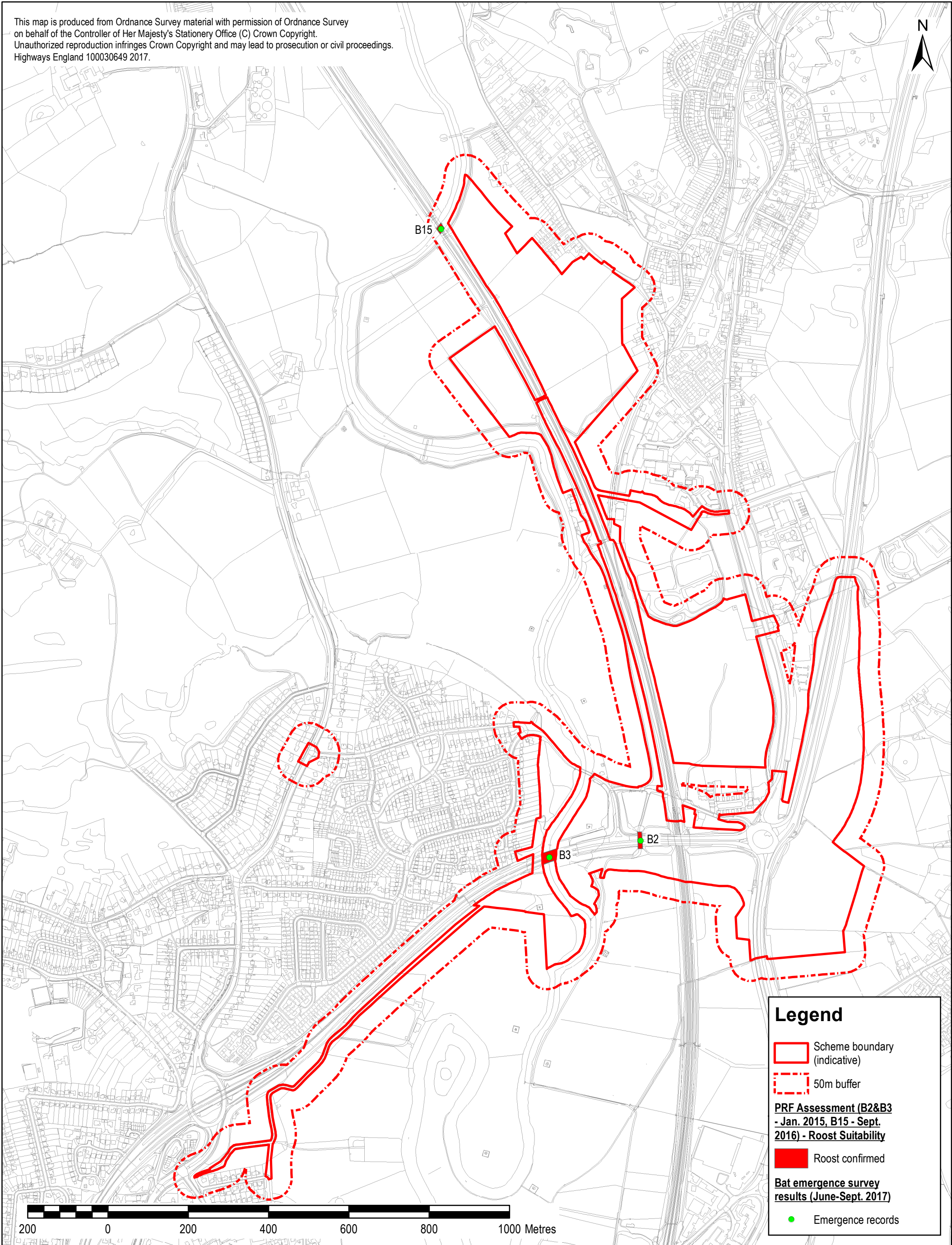
No emergence records

Project Title/Drawing Title			AECOM Internal Project Number			A38 Derby Junctions Project	
A38 DERBY JUNCTIONS QUEENSWAY BUILDINGS ROOSTING SUITABILITY AND BAT EMERGENCE RESULTS			60533462			Highways England, Floor 5	
			Drawn	Checked	Approved	2 Colmore Square	
			CAA	GSB	MP	38 Colmore Circus	
			Date	Scale @ A3	Purpose of issue	AECOM	
			19/03/2018	1:1,000	FINAL	Royal Court	
			Drawing Number	Rev		Basil Close, Chesterfield	
			Figure 3A	0		Derbyshire, S41 7SL	
THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM'S APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM'S EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.						+44 (0) 1246 209221	
						+44 (0) 1246 209229	
						www.aecom.com	



File Name:X:\Highways Agency\47071390 A38 Derby Jns - Environment\Technical\Ecology\GIS_A38_2017\project_files\Bats\Queensway\Figure 3a_A38 Queensway Bat survey results 2017_20180118.mxd

This map is produced from Ordnance Survey material with permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office (C) Crown Copyright. Unauthorized reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Highways England 100030649 2017.



Legend

Scheme boundary
(indicative)

50m buffer

**PRF Assessment (B2&B3
- Jan. 2015, B15 - Sept.
2016) - Roost Suitability**

Roost confirmed

**Bat emergence survey
results (June-Sept. 2017)**

Emergence records

Project Title/Drawing Title A38 DERBY JUNCTIONS LITTLE EATON ROOST SUITABILITY AND BAT EMERGENCE RESULTS	AECOM Internal Project Number 60533462			<div><div><div></div><div>highways england</div></div></div> <div><div><div></div><div>AECOM</div></div></div>
	Drawn CAA	Checked HP	Approved PB	
	Date 18/01/2018	Scale @ A3 1:8,500	Purpose of issue FINAL	AECOM Royal Court Basil Close, Chesterfield Derbyshire, S41 7SL +44 (0) 1246 209221 +44 (0) 1246 209229 www.aecom.com
THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM'S APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM'S EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.	Drawing Number Figure 3B		Rev .	

File Name: A:\Highways Agency\47071390 A38 Derby Jns - Environment\Technical\Ecology\GIS_A38_2017\project_files\Bats\Queensway\Figure 3b_A38 Little Eaton Bat survey results_2017_20180118.mxd

Appendix B Desk study – bat records

Derbyshire Bat Conservation Group records, September 2017

Map Reference	Common name	Record	Date	Number Counted	Comments
SK346428	Common pipistrelle	11685	14-Apr-16	1	Manual ID from the full spectrum recording. Single pass.
SK346428	Common pipistrelle	11687	14-Apr-16	1	Manual ID from the full spectrum recording. Single pass.
SK348429	Common pipistrelle	11686	14-Apr-16	1	Manual ID from the full spectrum recording. Two passes
SK333405	Common pipistrelle	11395	28-May-15	3	Emerging from barn in large residential garden. Proposed conversion to residential accommodation
SK333377	Common pipistrelle	8371	20-Apr-15	7	Foraging bats at 20:30
SK348429	Soprano pipistrelle	11688	14-Apr-16	1	Manual ID from the full spectrum recording. Single pass.
SK333405	Brown long-eared bat	11396	10-Jul-15	2	Roosting in building in large residential garden. Proposed conversion to residential accommodation.
SK350431	Daubenton's bat	11724	05-May-16	1	Manual ID from the full spectrum recording. multiple passes
SK350433	Daubenton's bat	11723	05-May-16	1	Manual ID from the full spectrum recording. multiple passes
SK350433	Noctule	11725	05-May-16	1	Manual ID from the full spectrum recording. Single pass.
SK350431	Noctule	11726	05-May-16	1	Manual ID from the full spectrum recording. multiple passes
SK350431	Common pipistrelle	11727	05-May-16	1	Manual ID from the full spectrum recording. multiple passes
SK350433	Common pipistrelle	11728	05-May-16	1	Manual ID from the full spectrum recording. multiple passes

Map Reference	Common name	Record	Date	Number Counted	Comments
SK350428	Common pipistrelle	11711	14-Apr-16	1	Manual ID from the full spectrum recording. single pass, bat seen while walking
SK350431	Soprano pipistrelle	11729	05-May-16	1	Manual ID from the full spectrum recording. multiple passes
SK350433	Soprano pipistrelle	11730	05-May-16	1	Manual ID from the full spectrum recording. multiple passes
SK356420	Brown long-eared bat	11474	28-Feb-16	1	Dwelling, Belper
SK369401	Brown long-eared bat	11433	21-Dec-15		NE bat roost visit record. Dwelling. Roost present
SK386426	Pipistrelle bats	11478	16-Jan-16		Dwelling, Ilkeston
SK327349	Brandt's bat	8498	23-Apr-15	1	Female. Released on site same evening Grounded bat found on hospital 5th floor
SK338368	Myotis bats	11562	01-Sep-15	1	1 pass
SK333360	Whiskered bat	11571	01-Sep-16	1	Grounded juv ♀ from Kingsway Retail Park handed to vet. Released 7/9/16
SK338352	Natterer's bat	9650	27-Oct-15	1	Grounded bat, into care, released later. Female
SK338368	Noctule	11564	07-Sep-15	1	2 passes
SK338368	Noctule	11560	01-Sep-15	1	2 passes
SK338368	Noctule	11557	21-Aug-15	1	Multiple passes and foraging over allotments
SK338368	Common pipistrelle	11563	07-Sep-15	1	19 passes
SK338368	Common pipistrelle	11558	01-Sep-15	6	Maternity roost. 6 emerged from fascia at eaves. Cavity wall brick office block with flat roof.
SK338368	Common pipistrelle	11559	01-Sep-15	1	Multiple passes and foraging over allotments
SK338368	Common pipistrelle	11554	21-Aug-15	8	Maternity roost. 8 emerged from fascia at eaves. Cavity wall brick office block with flat roof.

Map Reference	Common name	Record	Date	Number Counted	Comments
SK338368	Common pipistrelle	11555	21-Aug-15	1	14 passes and foraging over allotments
SK354342	Common pipistrelle	8417	09-Jun-15	1	Bat foraging over gardens soon after sunset.
SK338368	Soprano pipistrelle	11556	21-Aug-15	1	2 passes and foraging over allotments
SK338368	Brown long-eared bat	11561	01-Sep-15	1	2 passes

Appendix C Full Building Assessments: Including external and internal inspections

Building No.	Building Description	Description of Potential Roosting Features	Roosting Suitability
B8 QW2	Two-storey detached brick building with full brick extension on the north-east side of the building with flat roof. Clay tiled multi-pitched roof with bay front window and front pitched roof extension. Plastic intact fascias and soffits.	Overview of house	Moderate
	External	Open exposed pipe holes with large cavity present situated on the north-west side of the building.	
		Air vent flap missing on north side of the building with adjacent clay wall hanging tiles with shallow cavities.	
		Numerous slipped, loose and missing tiles, clay tiles found on all sides of the building roof sections.	
		Cavity in brickwork approx. 2cm between window and brick, located on the south-east side of the building.	
		Large cavity in brickwork next to down pipes, located on the north side of the building.	
		Multiple gaps between the soffit box and brickwork found on the north and south-east sides of the building, unclear if the boxing is open.	
	Internal Wooden beamed unlined roof structure with battens and exposed clay tiles.	Heavily cobwebbed roof beam apex. No evidence of bats within the roof void.	
		Brick chimney breast with intact mortar but suitable for perching	
		Multiple small defunct wasp nests present.	
B8 QW4	Two-storey detached brick building with pitched tiled roof and dormer window. Single storey brick and glass extension on the east side of the building with lean to roof. Wooden cladding located on the north side of the building	Overview of house	Moderate
	External features	Missing and lifted tiles situated on both the north and south sides of the building, predominantly around the chimney.	

Building No.	Building Description	Description of Potential Roosting Features	Roosting Suitability
		1 cm gap between the soffit boarding and brickwork, located on the south side of the building.	
		Missing soffit panel leading into soffit box between the roof of the extension and brickwork.	
	Internal features Lined roof void with exposed beams on most part of the roof section. Smaller section of roof with traditional unlined beams with exposed tiles and mortar	Large roof space with 3 sections.	
		Roof membrane present with exposed beams, roof area clean with no evidence of bats in the new extension.	
		Possible entry point through the membrane (small hole present).	
		3+ defunct small wasp nests in the old roof section which is unlined with exposed tiles.	
B8 QW6	Two-storey detached brick building with single pitched roof and new PVC soffits and fascia boarding. Attached flat roof garage with roofing felt, and single flat roof porch to the south of the building.	Overview of house Missing mortar in roofing edge tiles present as well as slipped roof tiles.	Low
	External features	Lifted and missing roof tiles located on the south side of the building	
		Mortar missing between brick work at the top of the chimney	
B8 QW6		Loose roofing felt on top of garage roof and hole between lead flashing and brickwork of main building. Located on the south side of the building.	
B8 QW8	Two-storey detached brick building with hip and valley pitched roof, with single story brick extension on the north and south-east side of the building with lean to roofs with clay tiles.	Overview of house Recently built extensions with new window frames and soffits.	Moderate

Building No.	Building Description	Description of Potential Roosting Features	Roosting Suitability
B8 QW8	External features	5 cm cavity between soffit box and top of the roof along the south side of the building.	
		2 cm gap between soffit boarding and brickwork with wooden fascia boarding.	
		Missing hanging tile on front of building above the garage door leading to exposed cavity under the lead flashing.	
B8 QW10	Two-storey detached brick building with hip and valley pitched roof. New fascia boarding and windows recently installed and roof tile replacement completed. Single story extension to the rear of the property with pitched roof	Overview of house	Low
	External Features	Intact pitched roof extension with replaced roof tiles, brick work intact with newly fitted windows.	
		Lifted tiles with gaps between tiles and lead flashing present on single storey rear extension.	
		Tile missing underneath chimney stack.	
		Exposed wooden beams present on flat roof extension, possible cavities present.	
B8 QW12	Two-storey detached brick building with a hip and valley pitched roof and tall chimney stacks with a single storey pitched roof side extension. A conservatory extension is located on the south-east side of the building.	Overview of house	Low
	External features	Possible cavities present between lead flashing along the valley between the two roof pitches where the lead flashing is visible.	
		A small number of loose and missing tiles located on the north-west and south-east sides of the building.	
		Missing mortar in roof edge tile.	
		0.5 cm cavity between fascia boarding and brick wall.	

Building No.	Building Description	Description of Potential Roosting Features	Roosting Suitability
		Single storey extension to rear of property shallow cavities present around mortar.	
B8 QW14	Two-storey detached building with multi pitched roof with a single-storey flat roofed garage with roofing felt, adjoins the north-east side of the building. Wall hanging tiles are present between the two front bay windows.	Overview of house	Moderate
	External features	Missing and lifted edge and roof tiles located on every side of the building.	
		Small cavity and hole in brickwork on the south-east and north-west sides of the building respectively.	
		Roofing felt lifted in multiple places of the flat roofed garage located on the north-east side of the building.	
	Internal features	Unlined roof with exposed beams and visible clay tiles and mortar. Apex heavily cobwebbed, no evidence of roosting bats.	
		Defunct wasp nests and dead wasps present within the roof void	
		Entry points for bats visible where light penetrates into the roof void.	
B8 QW16	No access		
B8 QW18	Two-storey detached brick building with multi-pitched roof. Three single storey brick extensions located on south-east side of the building, with lean to tiled roofs. Plastic soffits and fascia boarding.	Overview of house	Low
	External features	Lifted and missing tiles located on the north-west and south-east sides of the building	
		Hanging tile missing and cavity found between the brick wall and extension.	
		Large hole located on the north-east side of the building creating a cavity with the drain pipe still present.	

Building No.	Building Description	Description of Potential Roosting Features	Roosting Suitability
		Hole in roof edge with missing mortar and gap between fascia boarding and brick wall.	
B8 QW20	Two-storey detached brick building with pitched jerkinhead roof, lead flashing and hanging wall tiles. Single storey brick extension located on the south-east side of the building with a flat roof.	Overview of house	Moderate
	External features	Single storey flat roofed garage.	
		Lifted hanging wall tiles between the two bay windows to the front of the property.	
		Lifted lead flashing on the south-east side of the building above the window.	
B8 QW22	Two-storey detached brick building with jerkinhead multi pitched roof. Hanging tiles located on the north-west side of the building between the bay windows and on the lean to side extension garage wall.	Overview of house	Low
	Single storey glass conservatory present to the rear of the property. Single brick with pitched roof extension to the rear of the property	Wooden batten present on rear pitched roof, unclear if lifted tiles present under or behind the boarding.	
	External features	Gaps in mortar beneath tiles in multiple areas.	
		Cavity between brick and roofing on south-east side of building present.	
		Cavity under bottom of window tile between hanging tiles and fascia boarding.	
B8 QW24	Two-storey detached brick building with pitched roof. Hanging tiles located on south-east side of building between bay windows. Large two storey flat roof extension present to the rear of the property.	Overview of house	Low
	External features	Loose tiles located adjacent to chimney stack. Gaps under ridge tiles where mortar is missing.	
		Many lifted hanging wall tiles located on the north-west side of the building between the two bay windows.	

Building No.	Building Description	Description of Potential Roosting Features	Roosting Suitability
B8 QW26	Two-storey detached brick building with a cross hipped roof. Flat roofed garage extension to front of property and building located on north-west and south-east side of building respectively. Plastic box soffits present	Overview of house	Moderate
	Single story extension to rear of property with flat roof.		
	External features	Lifted tiles present around see through light tiles present on roof pitch. Tile repair and replacement visible	
		Missing tiles in roof allowing potential access to roof void.	
		Large cavity underneath the end ridge tile located between the south-east and south-west sides of the building due to missing mortar.	
		Cavities found on all sides of the building between the soffit boarding and brickwork.	
	Internal Features Main central area of roof void is converted with plastered walls	Large clear tiled windows present in the roof void allowing light to penetrate.	
	Around the side of the converted central roof void the roof side are unlined with exposed tiles, mortar and wood beams.	Large defunct wasps nest present. Side areas heavily cobwebbed with debris present. No obvious entry points into the loft space.	
		Brick columns present in roof void with mortar missing creating cavities.	
B8 QW28	Single derelict garage, no house present. Garage open fronted with concrete panel walls and a gently pitched asbestos sheet roof on metal beams.	No roosting potential.	Negligible
	Internal inspection of garage recorded 2 old bird nests but no suitable roosting locations for bats.		

Building No.	Building Description	Description of Potential Roosting Features	Roosting Suitability
B8 QW30	Two-storey detached brick building with pitched roof. Flat roof located on the north side of the building. Hanging wall tiles situated on the north-west side of the building.	Overview of house	Confirmed
	Two storey lean to side extension present.	Roof tile replacement evident on rear roof pitch.	
	External features	Missing ridge tiles and lifted tiles found on both the south-east and north-west sides of the bundling.	
		Broken hanging wall tile and cavity located on the north-west side of the building.	
		1 cm gap between soffit boarding and brickwork.	
		Small hole in brickwork located on the north-east side of the building.	
	Internal	Unlined roof section with exposed tiles, mortar and wooden beams present, light from exposed cavities present in the loft space showing egress points into the loft space.	
		Large treated defunct wasps nest present, smaller defunct wasps nest present on roof beams.	
		Small cluster of bat dropping present near the loft hatch entrance. Droppings sent off for DNA analysis.	
B8 QW32	Loft space converted to create a three-storey detached brick building with multiple pitched roof.	Overview of house No loft spaces present all have been converted.	High
B8 QW32	Single storey brick extension with flat roof present to the rear and side of the property. Conservatory located on the south-east side of the building		
	External features	Missing edge tiles located in multiple areas of the roof. Split and hole in fascia boarding located on south-west side of building.	

Building No.	Building Description	Description of Potential Roosting Features	Roosting Suitability
		<p>Cavity where the tiles of two roofs meet located on the north-east side of the building.</p> <p>Flat roof section present possible cavity between boarding and lead flashing.</p> <p>Hanging wall tiles present which are lifted in places.</p> <p>Cavity between soffit and brickwork.</p> <p>Large hole found in brickwork on the north-west side of the building.</p> <p>Cavities above the wood door to the side of the building leading to an old coal house. Access into this room was not permitted at the time of the survey.</p>	
B8 257	Two-storey semi-detached brick building with pitched roof		Low
B8 257	External features	Slipped and lifted tiles located on the north-west, south-east and north sides of building	
		QW 257: Soffit panels missing allowing access behind, originally filled with roofing felt which is missing in places and creating sealed cavities along the panel.	
		QW 257: Missing wall tile and gap under lead flashing.	
B8 257	internal features	Approximately 5 defunct wasp nests. Dead wasps present.	
		Clear flight path through to other roof space.	
		Two entry points, one with large wasp nest, the other via exposed tile.	
		Apex heavily cobwebbed. No evidence of roosting bat present within the loft space	
B8 259	No access		

Building No.	Building Description		Description of Potential Roosting Features	Roosting Suitability
B2	Flood Arch Bridge	See previous reports: AECOM(a) (2016) A38 Derby Junctions Phase 1 Habitat Survey Report Ref. No. 47071319-URS-05-RP-EN-003 AECOM(b) (2016) A38 Derby Junctions Bat Survey Report Ref. No. 47071319-URS-05-RP-EN-020		Confirmed
B3	River Derwent Road Bridge			Confirmed
B15	River Derwent Rail Bridge in Flood Compensation area	See previous reports: AECOM(e) (2016) A38 Derby Junctions Additional Sites Individual Technical notes Ref. Nos. 47071319-URS-05-TN-EN-023		Confirmed

Appendix D DNA Test Result for Sample from B8 QW30



31 March 2017

Re: Bat Identification Results for [REDACTED], AECOM

Bat job number 9241, received 20 March 2017

Sample labelled: 60533462.ENV3.4-B/D 30/ A38 Derby Junctions Scheme

PCR amplification successful. DNA sequence:

ATGACCAACATTTCGAAAGTCCCACCCCTTAGTAAAAATTATTAATAGCTCATTATCG
ACCTTCCTGCCCCATCAAATATCTCATCTTGATGAAATTCGGATCTCTTTAGGAAT
CTGC

Phylogenetic analysis identification: *Myotis mystacinus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

Professor Robin Allaby

School of Life Sciences,
Gibbet Hill Campus,
University of Warwick,
Coventry CV4 7AL
Tel: 02476575059
Fax: 02476574500
Email: r.g.allaby@warwick.ac.uk

Appendix E B8 Queensway Group: Emergence Survey Raw Data Sheets

QW 2 – Dusk Survey – 1 August 2017

B8 QW2				
Project Name	A38	Surveyor	SR	
Surveyor Location	K	Rain (0-5)	0	
Date	01/08/2017	Wind (0-7)	0	
Start	20:45	Cloud Cover (0-5)	1	
Sunset	21:00	Temperature	19°C	
Finish	23:00	Weather description	Still	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:13	P.pip	1	N	Seen not heard (SNH) flew from the rear of the property and headed NW
21:29	P.pyg	1	N	Heard not seen (HNS) commuting
21:37	P.pip	1	Y	HNS commuting
21:40	P.pip	1	Y	Heard and seen (H&S) commute/foraging in between QW 4 and QW 2
21:42	P.pip	1	Y	H&S foraging between QW4 and QW 2
21:48	P.pip	2	Y	H&S foraging in front of QW 4
21:50	<i>Nyctalus</i> sp.	1	Y	HNS commuting
21:54	P.pip	1	Y	HNS brief foraging pass
21:57	P.pip	1	Y	HNS commuting
22:00	P.pip	1	Y	HNS foraging possibly over trees
22:01	P.pip	1	Y	HNS foraging possibly over trees
22:02	P.pip	1	Y	HNS foraging nearby
22:04 – 22:13	P.pip	>3	Y	H&S foraging near light to N continuously, multiple passes, high activity
22:17	P.pip	>1	Y	HNS foraging
22:19	P.pip	1	Y	HNS foraging
22:26	P.pip	1	Y	HNS foraging continuously for around 15 minutes
22:21	P.pip	1	Y	HNS commuting
22:36	P.pip	1	Y	HNS commuting
22:38	<i>Myotis</i> sp.	1	Y	HNS commuting
22:38 – 23:00	P.pip	>1	Y	HNS multiple bat foraging continuously
22:39	<i>Myotis</i> sp.	1	Y	HNS foraging continuously

B8 QW2				
Project Name	A38	Surveyor		OC
Surveyor Location	L	Rain (0-5)		0
Date	01/08/2017	Wind (0-7)		0
Start	20:45	Cloud Cover (0-5)		1
Sunset	21:00	Temperature		19°C
Finish	23:00	Weather description		Still
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:06	P.pip	1	Y	Heard and seen (H&S) foraging around back garden of QW 2
21:11	P.pip	1	Y	H&S foraging around back garden
21:16	P.pip	1	Y	H&S foraging around back garden
21:19	P.pip	1	Y	H&S commuting across back garden
21:21	P.pyg	1	Y	HNS foraging
21:23	P.pyg	1	Y	HNS foraging
21:24	P.pip	1	Y	H&S commuting across back garden
21:25	P.pyg	1	Y	H&S commuting across back garden
21:26	P.pyg	1	Y	H&S foraging around back garden
21:29	P.pyg	1	Y	HNS foraging
21:33	P.pyg	1	Y	HNS foraging
21:34	P.pip	1	Y	H&S foraging around back garden
21:35	Nyc/Epi	1	Y	HNS commuting
21:35	P.pip	1	Y	HNS commuting
21:36 – 21:39	P.pip	1	Y	HNS continuous foraging
21:36 – 21:37	P.pyg	1	Y	HNS foraging
21:40	P.pip	1	Y	H&S foraging around back garden
21:42	P.pip	1	Y	H&S foraging constantly in back garden
21:42	P.pyg	1	Y	H&S foraging constantly in back garden
21:55	P.pip	1	Y	Heard not seen (HNS) foraging
22:03	<i>Myotis</i> sp.	1	Y	HNS brief commuting pass
22:04	P.pip	1	Y	HNS
22:08	P.pip	1	Y	H&S commuting across garden
22:09	P.pip	1	Y	H&S commuting across garden
22:11	P.pip	1	Y	HNS foraging
22:22	P.pip	1	Y	HNS commuting
22:24	P.pip	1	Y	HNS foraging
22:25	P.pip	1	Y	HNS foraging
22:28	P.pip	1	Y	HNS foraging
22:30	P.pip	1	Y	H&S foraging constantly around back garden
22:34	P.pip	1	Y	HNS foraging
22:36	<i>Myotis</i> sp.	1	Y	HNS foraging
22:40	P.pip	1	Y	HNS foraging constantly
22:42	P.pip	1	Y	HNS foraging constantly
22:45	P.pip	1	Y	HNS foraging constantly
22:47 – 23:00	P.pip	1	Y	H&S foraging constantly around back garden

B8 QW2				
Project Name	A38	Surveyor	EW	
Surveyor Location	M	Rain (0-5)	0	
Date	01/08/2017	Wind (0-7)	0	
Start	20:45	Cloud Cover (0-5)	1	
Sunset	21:00	Temperature	19°C	
Finish	23:00	Weather description	Still	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:37	P.pyg	1	Y	Heard not seen (HNS)
21:39	P.pip	1	Y	HNS
21:40	P.pip	1	Y	HNS
21:42 – 21:43	P.pip	1	Y	HNS foraging continuously
21:44	P.pip	1	Y	HNS foraging
21:48	P.pip	2	Y	H&S commuting around QW 2
21:52	P.pyg	1	Y	HNS
21:54	P.pip	1	Y	HNS
22:00	P.pip	1	Y	HNS
22:02	P.pip	1	Y	HNS
22:02 – 22:14	P.pip	1	Y	HNS foraging continuously
22:17 – 23:19	P.pip	1	Y	HNS foraging
22:22	P.pip	1	Y	HNS
22:25	P.pip	1	Y	HNS
22:26	P.pip	1	Y	HNS
22:27	P.pip	1	Y	HNS
22:30	P.pip	1	Y	HNS
22:36	P.pip	1	Y	HNS
22:38	P.pip	1	Y	HNS
22:38	<i>Myotis</i> sp.	1	Y	HNS
22:39	P.pip	1	Y	HNS
22:42	P.pyg	1	Y	HNS
22:43	P.pip	2	Y	HNS multiple bats
22:48	P.pip	1	Y	HNS
22:49	P.pyg	1	Y	HNS
22:50	P.pip	1	Y	HNS
22:54	P.pip	1	Y	HNS
22:55	P.pip	1	Y	HNS
22:56	P.pip	1	Y	HNS
22:57	P.pip	1	Y	HNS
22:58	P.pip	1	Y	HNS

B8 QW2				
Project Name	A38	Surveyor	DW	
Surveyor Location	N	Rain (0-5)	0	
Date	01/08/2017	Wind (0-7)	0	
Start	20:45	Cloud Cover (0-5)	1	
Sunset	21:00	Temperature	19°C	
Finish	23:00	Weather description	Still	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:12	P.pip	1	Y	Heard not seen (HNS) foraging
21:16	P.pip	1	Y	HNS foraging
21:26	P.pyg	1	Y	Heard and seen (H&S) foraging, flew between surveyor and flat roof
21:35	P.pip	1	Y	HNS brief pass, faint call
21:37	P.pyg	1	Y	H&S foraging, multiple passes, flew between surveyor and flat roof
21:38	P.pip	1	Y	HNS foraging
21:42	P.pip	1	Y	HNS foraging
21:44 – 21:46	P.pip	1	Y	HNS foraging
21:46	P.pyg	1	Y	HNS foraging
21:46 – 21:48	P.pip	1	Y	HNS foraging
21:52	P.pyg	1	Y	HNS foraging
21:54	P.pip	1	Y	HNS foraging
22:00 – 22:12	P.pip	1	Y	HNS foraging
22:17 – 22:19	P.pip	1	Y	HNS foraging
22:22	P.pip	1	Y	HNS foraging
22:24 – 22:27	P.pip	1	Y	HNS foraging
22:29 – 22:36	P.pip	1	Y	HNS foraging
22:38	<i>Myotis</i> sp.	1	Y	HNS foraging
22:38 – 22:40	P.pip	1	Y	HNS foraging
22:42 – 22:43	P.pip	1	Y	HNS foraging
22:43	P.pip	2	Y	HNS foraging
22:43 – 22:44	P.pip	1	Y	HNS foraging
22:49	P.pyg	1	Y	HNS foraging
22:48 – 22:51	P.pip	1	Y	HNS foraging
22:54 – 23:00	P.pip	1	Y	HNS foraging

QW 2 – Dawn Survey – 26 September 2017

B8 QW2				
Project Name	A38	Surveyor	CA	
Surveyor Location	K	Rain (0-5)	0	
Date	26/09/2017	Wind (0-7)	1	
Start	04:58	Cloud Cover (0-5)	4	
Sunrise	06:58	Temperature	14.4°C	
Finish	07:13	Weather description	Dry, light breeze and overcast	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
05:03	P.pyg	1	Y	Heard not seen (HNS)
05:16	P.pip	1	Y	Heard and seen (H&S) commuting from E to W across front of building
05:23	P.pip	1	Y	H&S commuting from E to W across front of building
05:28	P.pip	1	Y	HNS brief pass
05:37	P.pip	1	Y	H&S commuting from N to S along the side of building
05:40	P.pip	1	Y	HNS brief foraging pass
05:43	P.pip	1	Y	HNS faint pass
05:48	<i>Myotis</i> sp.	1	Y	H&S commuting from N to S along the side of building
05:52	P.pyg	1	Y	HNS
05:54	P.pyg	1	Y	HNS, very brief and faint pass
05:57	P.pyg	1	Y	HNS commuting
06:29	P.pip	1	Y	H&S commuting from N to S along the side of building

B8 QW2				
Project Name	A38	Surveyor	DD	
Surveyor Location	M	Rain (0-5)	0	
Date	26/09/2017	Wind (0-7)	1	
Start	04:58	Cloud Cover (0-5)	4	
Sunrise	06:58	Temperature	14.4°C	
Finish	07:13	Weather description	Dry, light breeze and overcast	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:42	P.pip	1	Y	Heard not seen (HNS) foraging
04:44	P.pip	1	Y	HNS foraging
05:04	P.pyg	1	Y	HNS foraging
05:17	P.pip	1	Y	HNS foraging
05:19	P.pip	1	Y	HNS foraging
05:24	P.pip	1	Y	HNS foraging
05:26	P.pip	1	Y	HNS foraging
05:28	P.pip	1	Y	HNS foraging
05:41	P.pip	1	Y	HNS foraging
05:45	P.pip	1	Y	HNS foraging
05:53	P.pyg	1	Y	HNS faint pass
06:30	P.pip	1	Y	HNS foraging

B8 QW2				
Project Name	A38	Surveyor	EW	
Surveyor Location	N	Rain (0-5)	0	
Date	26/09/2017	Wind (0-7)	1	
Start	04:58	Cloud Cover (0-5)	4	
Sunrise	06:58	Temperature	14.4°C	
Finish	07:13	Weather description	Dry, light breeze and overcast	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
05:03	P.pyg	1	Y	Heard not seen (HNS)
05:15	P.pip	1	Y	Heard and seen (H&S) flew over house from S to N
05:19	P.pip	1	Y	H&S flew over house from N to S
05:22	P.pip	1	Y	H&S flew around back of house from E to W
05:25	P.pip	1	Y	HNS
05:27	P.pip	1	Y	H&S flew around back of house from E to W
05:36	P.pip	1	Y	HNS
05:39	P.pip	1	Y	HNS
05:39	P.pyg	1	Y	HNS
05:41	P.pip	1	Y	H&S flew around back of house from W to E and into trees
05:43	P.pip	1	Y	H&S flew around back of house from W to E and into trees
05:48	<i>Myotis</i> sp.	1	Y	HNS
05:52	P.pyg	1	Y	H&S flew around house from E to W
05:54	P.pyg	1	Y	H&S flew around house from E to W
06:07	P.pyg	1	Y	HNS
06:11	P.pyg	1	Y	HNS
06:28	P.pip	1	Y	HNS

QW 6 – Dusk Survey – 23 August 2017

B8 QW6				
Project Name	A38	Surveyor	JC	
Surveyor Location	O	Rain (0-5)	0	
Date	23/08/2017	Wind (0-7)	0	
Start	19:59	Cloud Cover (0-5)	1	
Sunset	20:14	Temperature	20°C	
Finish	22:14	Weather description	Humid, warm and clear	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
20:30	P.pyg	1	Y	Heard not seen (HNS)
20:40	P.pip	1	Y	HNS brief pass
20:55	<i>Nyctalus</i> sp.	1	Y	HNS brief pass
21:01	P.pip	1	Y	HNS brief pass
21:02	P.pip	1	Y	HNS brief pass
21:10 – 21:12	P.pip	1	Y	HNS continuous passes
21:14	P.pip	1	Y	HNS
21:21 – 21:22	P.pip	1	Y	HNS continuous passes
21:26	P.pip	>1	Y	HNS continuous passes until the end of survey
21:35 – 22:14	<i>Myotis</i> sp.	1	Y	HNS brief commuting pass
21:56	P.pyg	1	Y	HNS
22:13	P.pyg	1	Y	HNS

Project Name	A38	Surveyor	CA	
Surveyor Location	L	Rain (0-5)	0	
Date	26/09/2017	Wind (0-7)	1	
Start	04:58	Cloud Cover (0-5)	4	
Sunrise	06:58	Temperature	14.4°C	
Finish	07:13	Weather description	Dry, light breeze and overcast	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:30 – 04:35	P.pip	1	Y	Heard not seen (HNS) brief foraging pass
04:40	P.pip	1	Y	HNS commuting
04:48	<i>Myotis</i> sp.	1	Y	HNS brief pass
05:24	P.pip	1	Y	Heard not seen (HNS) foraging
05:32	P.pip	1	Y	HNS commuting
05:36	P.pip	1	Y	HNS commuting
05:51	P.pyg	1	Y	HNS brief pass
05:54	P.pip	1	Y	HNS brief pass
05:56	P.pyg	1	Y	HNS brief pass
06:08	P.pyg	1	Y	HNS commuting
06:28	P.pip	1	Y	H&S commuting seen flying over building towards tree line

B8 QW6				
Project Name	A38	Surveyor	LJF	
Surveyor Location	P	Rain (0-5)	0	
Date	23/08/2017	Wind (0-7)	0	
Start	19:59	Cloud Cover (0-5)	1	
Sunset	20:14	Temperature	20°C	
Finish	22:14	Weather description	Humid, warm and clear	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
20:17	Pip sp.	1	N	Heard and seen (H&S) foraging, flew from QW 8, not echo locating
20:29	P.pip	1	Y	Heard not seen (HNS) commuting
20:32	P.pip	1	Y	H&S commuting flew from QW 6 towards QW 4
20:39	P.pip	1	Y	H&S commuting across garden of QW 6
20:41	P.pip	1	Y	HNS commuting
20:46	P.pip	1	Y	HNS commuting
20:51	P.pyg	1	Y	HNS commuting
20:55	<i>Nyctalus</i> sp.	1	Y	HNS commuting
20:55	P.pip	1	Y	HNS commuting
20:56	P.pip	1	Y	HNS commuting
21:02	P.pip	1	Y	HNS commuting
21:05	P.pip	1	Y	HNS commuting
21:11 – 21:12	P.pip	1	Y	HNS foraging, multiple passes
21:14	P.pip	1	Y	HNS commuting
21:17	P.pip	1	Y	HNS commuting
21:22	P.pip	1	Y	HNS commuting
21:24	P.pyg	1	Y	HNS commuting
21:27	P.pip	1	Y	HNS commuting
21:29	P.pip	1	Y	HNS commuting
21:30	P.pip	1	Y	HNS commuting
21:34	P.pip	1	Y	HNS commuting
21:35	<i>Myotis</i> sp.	1	Y	HNS commuting
21:36	P.pip	1	Y	HNS commuting
21:37 – 21:38	P.pip	1	Y	HNS foraging, multiple passes
21:40 – 21:41	P.pip	1	Y	HNS foraging, multiple passes
21:50	P.pip	1	Y	HNS commuting
21:54 – 21:55	<i>Myotis</i> sp.	1	Y	HNS foraging, multiple passes
21:57	P.pip	1	Y	HNS commuting
22:02	P.pip	1	Y	HNS commuting
22:05	P.pip	1	Y	HNS commuting
22:06	P.pip	1	Y	HNS foraging, multiple passes
22:06	P.pyg	1	Y	HNS foraging, multiple passes
22:12	P.pip	1	Y	HNS brief commuting pass
22:14	P.pip	1	Y	HNS brief commuting pass

QW 8 – Dawn Survey – 22 August 2017

B8 QW8				
Project Name	A38	Surveyor	OC	
Surveyor Location	Q	Rain (0-5)	0	
Date	22/08/2017	Wind (0-7)	1	
Start	03:59	Cloud Cover (0-5)	5	
Sunrise	05:59	Temperature	18°C	
Finish	06:14	Weather description	Dry, misty and overcast	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:21	P.pip	1	Y	Heard not seen (HNS)
04:53	P.pyg	1	Y	HNS
05:13	Noctule	1	Y	HNS
05:15	P.pip	1	Y	HNS
05:20	P.pip	1	Y	Heard and seen (H&S) commuting, flying SE along the side of the building
05:45	P.pip	1	Y	H&S commuting, flying SE along the side of the building

B8 QW8				
Project Name	A38	Surveyor	LFJ	
Surveyor Location	R	Rain (0-5)	0	
Date	22/08/2017	Wind (0-7)	1	
Start	03:59	Cloud Cover (0-5)	5	
Sunrise	05:59	Temperature	18°C	
Finish	06:14	Weather description	Dry, misty and overcast	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:22	P.pip	1	Y	Heard not seen (HNS)
04:53	P.pyg	1	Y	HNS
05:13	Noctule	1	Y	HNS
05:15	P.pip	1	Y	HNS
05:20	P.pip	1	Y	HNS
05:31	P.pip	1	Y	HNS
05:41	P.pyg	1	Y	HNS
05:46	P.pip	1	Y	HNS

QW 8 – Dusk Survey – 14 September 2017

B8 QW8				
Project Name	A38	Surveyor	MO	
Surveyor Location	Q	Rain (0-5)	0	
Date	14/09/2017	Wind (0-7)	2	
Start	19:08	Cloud Cover (0-5)	4	
Sunset	19:23	Temperature	14°C	
Finish	21:05	Weather description	Dry, cool and a slight breeze	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
19:44	P.pip	1	Y	Heard not seen (HNS)
19:46	P.pip	1	Y	Heard and seen (H&S) commuting, circled round and went into tree
19:47	P.pip	1	Y	H&S commuting, circled round and went into tree
19:51	P.pip	1	Y	H&S commuting, circled round and went into tree
19:53	P.pip	1	Y	H&S commuting, circled round and went into tree
19:55	P.pip	1	Y	H&S commuting, circled round and went into tree
19:56	P.pip	1	Y	H&S commuting, circling QW 8
19:57	P.pyg	2	Y	H&S commuting, flew towards the rear of QW8
19:57	<i>Myotis</i> sp.	1	Y	HNS
19:59	P.pip	1	Y	HNS
20:00	P.pip	1	Y	HNS
20:00	P.pyg	1	Y	HNS
20:02	P.pip	2	Y	HNS
20:03	P.pip / P.pyg	1	Y	HNS
20:05	P.pip	2	Y	HNS
20:12	P.pip	1	Y	HNS
20:13	P.pip	1	Y	HNS
20:38	P.pip	1	Y	HNS
20:39	P.pip	1	Y	HNS
20:41	P.pip	1	Y	HNS
20:42	P.pyg	1	Y	HNS
20:46	P.pyg	1	Y	HNS
20:47	P.pip	1	Y	HNS
20:49	P.pip	1	Y	HNS

B8 QW8				
Project Name	A38	Surveyor	JT	
Surveyor Location	R	Rain (0-5)	0	
Date	14/09/2017	Wind (0-7)	2	
Start	19:08	Cloud Cover (0-5)	4	
Sunset	19:23	Temperature	14°C	
Finish	21:05	Weather description	Dry, cool and a slight breeze	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
19:44	P.pip	1	Y	Heard not seen (HNS)
19:45	P.pip	1	Y	HNS
19:46	P.pip	1	Y	Heard and seen (H&S) commuting
19:47	P.pip	1	Y	H&S commuting
19:48	P.pip	1	Y	H&S commuting along rear of QW 8 from N to S
19:48	P.pip	1	Y	H&S commuting along rear of QW 8 from S to N
19:49	P.pip	1	Y	H&S commuting along N side of QW 8
19:49 – 19:53	P.pip	1	Y	H&S several regular passes and occasional foraging
19:53	P.pip	1	Y	HNS
19:54	P.pip	1	Y	HNS
19:53	P.pip	1	Y	HNS
19:54	P.pip	1	Y	HNS
19:55	P.pip	1	Y	HNS
19:56	P.pip	1	Y	H&S foraging circling around the roof
19:58 – 20:01	P.pip	1	Y	HNS
20:06	P.pip	1	Y	H&S flew over QW 8 and foraging in garden
20:11	P.pip	1	Y	HNS
20:13	P.pip	1	Y	HNS
20:31	P.pip	1	Y	HNS
20:33	P.pip	1	Y	HNS
20:34	P.pip	1	Y	HNS
20:41	P.pip	1	Y	HNS
20:48	P.pip	1	Y	HNS
20:50	P.pip	1	Y	HNS
20:59	Ppi Ppyg	1	Y	HNS

QW 18 – Dawn Survey – 24 August 2017

B8 QW18				
Project Name	A38	Surveyor	LFJ	
Surveyor Location	S	Rain (0-5)	0	
Date	24/08/2017	Wind (0-7)	0	
Start	04:02	Cloud Cover (0-5)	0	
Sunrise	06:02	Temperature	12°C	
Finish	06:17	Weather description	Clear, calm and cool	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
05:05	Pip	1	Y	Heard not seen (HNS) very faint call

B8 QW18				
Project Name	A38	Surveyor	RM	
Surveyor Location	T	Rain (0-5)	0	
Date	24/08/2017	Wind (0-7)	0	
Start	04:02	Cloud Cover (0-5)	0	
Sunrise	06:02	Temperature	12°C	
Finish	06:17	Weather description	Clear, calm and cool	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:03	<i>Myotis</i> sp.	1	Y	Heard not seen (HNS)
04:11	P.pyg	1	Y	HNS
04:43	P.pyg	1	Y	HNS
05:00	P.pyg	1	Y	HNS
05:01	P.pyg	1	Y	HNS
05:05	P.pyg	1	Y	HNS
05:26	P.pip	1	Y	Heard and seen (H&S) flew across rear of QW 18 from NE to SW

B8 QW18				
Project Name	A38	Surveyor	EW	
Surveyor Location	U	Rain (0-5)	0	
Date	24/08/2017	Wind (0-7)	0	
Start	04:02	Cloud Cover (0-5)	0	
Sunrise	06:02	Temperature	12°C	
Finish	06:17	Weather description	Clear, calm and cool	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:04	<i>Myotis</i> sp.	1	Y	Heard not seen (HNS)
04:12	P.pyg	1	Y	HNS commuting
04:19	<i>Myotis</i> sp.	1	Y	HNS commuting, faint pass
05:02	P.pyg	1	Y	HNS commuting
05:06	P.pyg	1	Y	HNS commuting
05:27	P.pip	1	Y	Heard and seen (H&S) flew across rear of QW 18 from NE to SW

B8 QW18				
Project Name	A38	Surveyor		OC
Surveyor Location	V	Rain (0-5)		0
Date	24/08/2017	Wind (0-7)		0
Start	04:02	Cloud Cover (0-5)		0
Sunrise	06:02	Temperature		12°C
Finish	06:17	Weather description		Clear, calm and cool
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:04	P.pip	1	Y	Heard not seen (HNS) commuting
04:12	P.pyg	1	Y	HNS commuting
04:19	P.pyg	1	Y	HNS commuting
04:44	P.pyg	1	Y	HNS commuting
04:50	P.pip	1	Y	HNS commuting
05:01	P.pyg	1	Y	HNS commuting
05:02	P.pyg	1	Y	HNS commuting
05:06	P.pyg	1	Y	HNS commuting
05:27	P.pip	1	Y	HNS commuting

QW 20 – Dusk Survey – 27 June 2017

B8 QW20				
Project Name	A38	Surveyor		LFJ
Surveyor Location	X	Rain (0-5)		0
Date	27/06/2017	Wind (0-7)		2
Start	21:20	Cloud Cover (0-5)		5
Sunrise	21:35	Temperature		15.8°C
Finish	23:35	Weather description		Dry and overcast
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:38	P.pip	1	Y	HNS commuting
21:40	P.pip	1	Y	HNS commuting
21:50	P.pyg	1	Y	HNS commuting
21:52 – 22:00	P.pip	1	Y	HNS foraging continuously
22:02	P.pip	1	Y	HNS commuting
22:04	P.pip	1	Y	HNS commuting
22:04	Myotis sp.	1	Y	HNS commuting
22:16	P.pyg	1	Y	HNS commuting
22:22	P.pip	1	Y	HNS commuting
22:54	P.pip	1	Y	Heard not seen (HNS) commuting
22:59	P.pip	1	Y	HNS commuting
23:01	P.pip	1	Y	HNS commuting
23:02	P.pip	1	Y	HNS foraging
23:04	P.pip	1	Y	HNS commuting
23:06	P.pip	1	Y	HNS foraging
23:08	P.pip	1	Y	HNS foraging
23:10 – 23:15	P.pip	1	Y	HNS foraging and commuting
23:15	P.pip	1	Y	HNS foraging and
23:18 – 23:20	P.pip	1	Y	HNS commuting
23:21 – 23:24	P.pip	1	Y	HNS foraging and commuting

B8 QW20				
Project Name	A38	Surveyor		LFJ
Surveyor Location	X	Rain (0-5)		0
Date	27/06/2017	Wind (0-7)		2
Start	21:20	Cloud Cover (0-5)		5
Sunrise	21:35	Temperature		15.8°C
Finish	23:35	Weather description		Dry and overcast
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
23:23	P.pip	1	Y	HNS foraging
23:26 – 23:28	P.pip	1	Y	HNS foraging
23:30	P.pip	1	Y	HNS commuting
23:31	P.pip	1	Y	HNS commuting
23:33	P.pip	1	Y	HNS foraging and commuting

B8 QW20				
Project Name	A38	Surveyor		OC
Surveyor Location	W	Rain (0-5)		0
Date	27/06/2017	Wind (0-7)		2
Start	21:20	Cloud Cover (0-5)		5
Sunrise	21:35	Temperature		15.8°C
Finish	23:35	Weather description		Dry and overcast
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
22:02	P.pip	1	Y	Heard not seen (HNS) commuting
22:14	P.pip	1	Y	Heard and seen (H&S) foraging overhead
22:16	Ppi Ppyg	1	Y	HNS brief commuting pass
22:21	P.pip	1	Y	HNS brief commuting pass
22:43	P.pip	1	Y	HNS brief commuting pass

QW 20 – Dawn Survey – 10 August 2017

B8 QW20				
Project Name	A38	Surveyor		LFJ
Surveyor Location	W	Rain (0-5)		0
Date	10/08/2017	Wind (0-7)		0
Start	03:38	Cloud Cover (0-5)		0
Sunrise	05:38	Temperature		10°C
Finish	05:53	Weather description		Cool, clear and damp
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
No bats were detected				

B8 QW20				
Project Name	A38	Surveyor	KF	
Surveyor Location	X	Rain (0-5)	0	
Date	10/08/2017	Wind (0-7)	0	
Start	03:38	Cloud Cover (0-5)	0	
Sunrise	05:38	Temperature	10°C	
Finish	05:53	Weather description	Cool, clear and damp	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:45	P.pyg	1	Y	HNS commuting

QW 22 – Dawn Survey – 23 August 2017

B8 QW22				
Project Name	A38	Surveyor	RM	
Surveyor Location	Y	Rain (0-5)	0	
Date	23/08/2017	Wind (0-7)	1	
Start	04:00	Cloud Cover (0-5)	1	
Sunrise	06:00	Temperature	17°C	
Finish	06:15	Weather description	Rain previous evening but now dry	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:22	Ppi Ppyg	1	Y	Heard not seen (HNS)
04:33	P.pip	1	Y	HNS
04:37	P.pip	1	Y	HNS
04:40	P.pip	1	Y	HNS
04:42	P.pyg	1	Y	HNS
04:52	P.pip	1	Y	HNS
04:53	P.pip	1	Y	HNS
05:11	P.pip	1	Y	HNS
05:14	<i>Nyctalus</i> sp.	1	Y	HNS
05:15	P.pip	1	Y	HNS
05:28	P.pip	1	Y	HNS
05:39	P.pyg	1	Y	HNS
05:40	P.pyg	1	Y	Heard and seen (H&S) commuting from front to rear between QW 22 and QW 20

B8 QW22				
Project Name	A38	Surveyor	LFJ	
Surveyor Location	Z	Rain (0-5)	0	
Date	23/08/2017	Wind (0-7)	1	
Start	04:00	Cloud Cover (0-5)	5	
Sunrise	06:00	Temperature	17°C	
Finish	06:15	Weather description	Rain previous evening but now dry	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
03:53	P.pip	1	Y	Heard not seen (HNS)
03:57	P.pip	1	Y	Heard not seen (HNS)
04:02	P.pip	1	Y	Heard not seen (HNS)

B8 QW22				
Project Name	A38	Surveyor		LFJ
Surveyor Location	Z	Rain (0-5)		0
Date	23/08/2017	Wind (0-7)		1
Start	04:00	Cloud Cover (0-5)		5
Sunrise	06:00	Temperature		17°C
Finish	06:15	Weather description		Rain previous evening but now dry
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:13	Ppi Ppyg	1	Y	HNS
04:22	P.pip	1	Y	HNS
04:36	P.pip	1	Y	Heard and seen (H&S) foraging continuously
04:47	P.pip	1	Y	HNS
04:49	Ppi Ppyg	1	Y	HNS
04:53	P.pip	1	Y	HNS
04:56	P.pyg	1	Y	HNS
05:00	Ppi Ppyg	1	Y	HNS
05:04	P.pip	1	Y	HNS
05:11	P.pip	1	Y	HNS
05:15	P.pip	1	Y	HNS
05:19	P.pip	1	Y	HNS
05:22	P.pip	1	Y	HNS
05:24	P.pip	1	Y	HNS
05:40	P.pyg	1	Y	HNS

QW 24 – Dawn Survey – 30 June 2017

B8 QW24				
Project Name	A38	Surveyor		SR
Surveyor Location	AA	Rain (0-5)		0
Date	30/06/2017	Wind (0-7)		1
Start	02:44	Cloud Cover (0-5)		5
Sunrise	04:44	Temperature		13
Finish	04:59	Weather description		Raining up until survey, humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:09	P.pip	1	Y	Heard not seen (HNS) commuting

B8 QW24				
Project Name	A38	Surveyor		OC
Surveyor Location	AB	Rain (0-5)		0
Date	30/06/2017	Wind (0-7)		1
Start	02:44	Cloud Cover (0-5)		5
Sunrise	04:44	Temperature		13
Finish	04:59	Weather description		Raining up until survey, humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:08	P.pip	1	Y	Heard and seen (H&S) commuting, flew past house

B8 QW24				
Project Name	A38	Surveyor		LFJ
Surveyor Location	AC	Rain (0-5)		0
Date	30/06/2017	Wind (0-7)		1
Start	02:44	Cloud Cover (0-5)		5
Sunrise	04:44	Temperature		13
Finish	04:59	Weather description		Raining up until survey, humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
04:03	P.pip	1	Y	Heard not seen (HNS) commuting to rear (south)
04:08	Pip sp	1	Y	Heard and seen (H&S) flew from the front of QW 24 and then across the garden towards QW 26
04:19	P.pip	1	Y	H&S crossed through rear garden of QW 26
04:32	P.pip	1	Y	H&S crossed through rear garden of QW 26

QW 26 – Dusk Survey – 4 July 2017

B8 QW26				
Project Name	A38	Surveyor		KF
Surveyor Location	AD	Rain (0-5)		0
Date	04/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		3
Sunset	21:30	Temperature		20°C
Finish	23:30	Weather description		Warm, dry, slightly overcast, gentle breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
22:04	P.pip	1	Y	Heard not seen (HNS) commuting
22:09	P.pip	1	Y	HNS
22:16	P.pip	1	Y	HNS
22:24	P.pip	1	Y	HNS
22:25	P.pip	1	Y	HNS
22:27	P.pip	1	Y	HNS
22:28	P.pip	1	Y	HNS
22:34	Myotis sp.	1	Y	HNS
22:38	P.pip	1	Y	HNS
22:40	P.pip	1	Y	HNS
22:42	P.pip	1	Y	HNS
22:44	P.pip	1	Y	HNS
22:45	P.pip	1	Y	HNS
22:49	P.pip	1	Y	HNS
22:51	P.pip	1	Y	HNS
22:55	P.pip	1	Y	HNS
22:56	P.pip	1	Y	HNS
22:58	P.pip	1	Y	HNS
22:59	P.pip	1	Y	HNS
23:00	P.pip	1	Y	HNS
23:01	P.pip	1	Y	HNS

B8 QW26				
Project Name	A38	Surveyor		KF
Surveyor Location	AD	Rain (0-5)		0
Date	04/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		3
Sunset	21:30	Temperature		20°C
Finish	23:30	Weather description		Warm, dry, slightly overcast, gentle breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
23:03	P.pip	1	Y	HNS
23:13	P.pip	1	Y	HNS
23:15	<i>Myotis</i> sp.	1	Y	HNS commuting

B8 QW26				
Project Name	A38	Surveyor		OC
Surveyor Location	AE	Rain (0-5)		0
Date	04/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		3
Sunset	21:30	Temperature		20°C
Finish	23:30	Weather description		Warm, dry, slightly overcast, gentle breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:42	P.pip	1	N	Seen not head (SNH) commuting across garden
22:02	P.pip	1	Y	Heard and seen (H&S) commuting across garden
22:05	P.pip	1	Y	H&S commuting across garden
22:07	P.pip	1	Y	Heard not seen (HNS) commuting
22:09	P.pip	1	Y	HNS commuting
22:11	P.pip	1	Y	HNS commuting
22:12	P.pip	1	Y	H&S flying over garden
22:14	P.pip	1	Y	HNS commuting
22:17	P.pip	1	Y	H&S foraging in garden
22:21	P.pip	1	Y	HNS commuting
22:23	P.pip	1	Y	HNS commuting
22:24	P.pip	1	Y	HNS commuting
22:27 – 22:30	P.pip	1	Y	H&S commuting and foraging across garden
22:33	<i>Myotis</i> sp.	1	Y	HNS commuting
22:37	P.pip	1	Y	H&S commuting across garden
22:38	P.pip	1	Y	HNS commuting
22:42	P.pip	1	Y	H&S commuting across garden
22:43	P.pip	1	Y	HNS foraging
22:47	P.pip	1	Y	HNS commuting
22:50	P.pip	1	Y	HNS commuting
22:53	P.pip	1	Y	HNS commuting
22:54	P.pip	1	Y	HNS commuting
22:56	P.pip	1	Y	H&S commuting across garden
22:58	P.pip	1	Y	HNS commuting

B8 QW26				
Project Name	A38	Surveyor		OC
Surveyor Location	AE	Rain (0-5)		0
Date	04/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		3
Sunset	21:30	Temperature		20°C
Finish	23:30	Weather description		Warm, dry, slightly overcast, gentle breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
22:59	P.pip	1	Y	HNS commuting
23:00	P.pip	1	Y	HNS commuting
23:02	P.pip	1	Y	HNS commuting
23:10	P.pip	1	Y	HNS commuting
23:14	Myotis sp.	1	Y	HNS commuting
23:24	P.pip	1	Y	HNS commuting
23:26	P.pip	1	Y	HNS commuting
23:29	P.pip	1	Y	HNS commuting
23:32	P.pip	1	Y	HNS commuting
23:34	P.pip	1	Y	HNS commuting

B8 QW26				
Project Name	A38	Surveyor		TT
Surveyor Location	AF	Rain (0-5)		0
Date	04/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		3
Sunset	21:30	Temperature		20°C
Finish	23:30	Weather description		Warm, dry, slightly overcast, gentle breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
22:05	P.pip	1	Y	Heard not seen (HNS) brief pass
22:15	P.pip	1	Y	Heard and seen (H&S) commuting across driveway
22:25	P.pip	1	Y	HNS brief pass
22:27	P.pip	1	Y	HNS
22:30	P.pip	1	Y	H&S commuting across driveway
22:41	P.pip	1	Y	H&S foraging on driveway
22:43	P.pip	1	Y	HNS
22:47	Myotis sp.	1	Y	H&S foraging on driveway
22:49	P.pip	1	Y	HNS
22:50	Nyctalus sp.	1	Y	HNS

B8 QW26			
Project Name	A38	Surveyor	LFJ
Surveyor Location	AG	Rain (0-5)	0
Date	04/07/2017	Wind (0-7)	1
Start	21:15	Cloud Cover (0-5)	3
Sunset	21:30	Temperature	20°C

Finish	23:30	Weather description		Warm, dry, slightly overcast, gentle breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:48	P.pip	1	Y	Heard not seen (HNS) brief pass
22:03	P.pip	1	Y	HNS brief pass
22:05	P.pip	1	Y	Heard and seen (H&S) Came from surveyor location AD and flew towards QW 24
22:07	P.pip	1	Y	HNS brief pass
22:08	P.pip	1	Y	H&S flew from QW 24 across the rear of QW 26 towards QW 28
22:11	P.pip	1	Y	HNS brief pass
22:12	P.pip	1	Y	HNS brief pass
22:14	P.pip	1	Y	H&S flew from behind and through garden to QW 24
22:17	P.pip	1	Y	HNS brief pass
22:21	P.pip	1	Y	HNS brief pass
22:23	P.pip	1	Y	H&S foraging flew from behind and through garden to QW 24
22:24	P.pyg	1	Y	HNS brief pass
22:27	P.pip	1	Y	H&S foraging, flew from front of building to QW 24
22:28	P.pip	1	Y	HNS brief pass
22:29	P.pip	1	Y	HNS brief pass
22:30	P.pip	1	Y	H&S foraging around outside of building
22:33	<i>Myotis</i> sp.	1	Y	HNS brief pass
22:37	P.pip	1	Y	HNS brief pass
22:38	P.pip	1	Y	HNS brief pass
22:42	P.pip	1	Y	HNS brief pass
22:43	P.pip	1	Y	HNS brief pass
22:47	P.pip	1	Y	HNS brief pass
22:50	P.pip	1	Y	HNS brief pass
22:53	P.pip	1	Y	HNS brief pass
22:54	P.pip	1	Y	HNS brief pass
22:56	P.pip	1	Y	HNS brief pass
22:58	P.pip	1	Y	HNS brief pass
22:59	P.pip	1	Y	HNS brief pass
23:00	P.pip	1	Y	HNS brief pass
23:02	P.pip	1	Y	HNS brief pass
23:10	P.pip	1	Y	HNS brief pass
23:14	<i>Myotis</i> sp.	1	Y	HNS brief pass
23:24	P.pip	1	Y	HNS brief pass
23:26	P.pip	1	Y	HNS brief pass
23:32	P.pip	1	Y	HNS brief pass
23:34	P.pip	1	Y	HNS brief pass

QW 26 – Dawn Survey – 6 September 2017

B8 QW26				
Project Name	A38	Surveyor	KL	
Surveyor Location	AG	Rain (0-5)	0	
Date	06/09/2017	Wind (0-7)	1	
Start	04:24	Cloud Cover (0-5)	5	
Sunrise	06:24	Temperature	13.9°C	
Finish	06:39	Weather description	Heavy rain overnight until 1 hour before survey, dry and overcast.	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
05:48	P.pip	1	Y	Heard not seen (HNS) brief pass

B8 QW26				
Project Name	A38	Surveyor	HA	
Surveyor Location	AF	Rain (0-5)	0	
Date	06/09/2017	Wind (0-7)	1	
Start	04:24	Cloud Cover (0-5)	5	
Sunrise	06:24	Temperature	13.9°C	
Finish	06:39	Weather description	Heavy rain overnight until 1 hour before survey, dry and overcast.	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
No bats were detected				

B8 QW26				
Project Name	A38	Surveyor	MO	
Surveyor Location	AD	Rain (0-5)	0	
Date	06/09/2017	Wind (0-7)	1	
Start	04:24	Cloud Cover (0-5)	5	
Sunrise	06:24	Temperature	13.9°C	
Finish	06:39	Weather description	Heavy rain overnight until 1 hour before survey, dry and overcast.	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
No bats were detected				

B8 QW26				
Project Name	A38	Surveyor	OC	
Surveyor Location	AE	Rain (0-5)	0	
Date	06/09/2017	Wind (0-7)	1	
Start	04:24	Cloud Cover (0-5)	5	
Sunrise	06:24	Temperature	13.9°C	
Finish	06:39	Weather description	Heavy rain overnight until 1 hour before survey, dry and overcast.	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
05:47	P.pip	1	Y	Heard and seen (H&S) commuting across garden
05:49	P.pip	1	Y	Heard not seen (HNS) commuting
06:09	P.pyg	1	Y	HNS commuting

QW 30 – Dusk Survey – 3 July 2017

B8 QW30				
Project Name	A38	Surveyor		AD
Surveyor Location	AH	Rain (0-5)		0
Date	03/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		5
Sunrise	21:33	Temperature		17°C
Finish	23:33	Weather description		Dry, mild, overcast. Previously cool and dry
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
22:48	P.pip	1	Y	Heard not seen (HNS) brief pass
22:50	P.pip	1	Y	HNS brief pass
22:56	P.pip	1	Y	HNS brief pass
23:03	P.pip	1	Y	HNS brief pass
23:05	P.pip	1	Y	HNS brief pass

B8 QW30				
Project Name	A38	Surveyor		KF
Surveyor Location	AI	Rain (0-5)		0
Date	03/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		5
Sunrise	21:33	Temperature		17°C
Finish	23:33	Weather description		Dry, mild, overcast. Previously cool and dry
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:33	P.pip	1	Y	Heard not seen (HNS) commuting
21:46 – 21:49	P.pip	1	Y	HNS foraging
21:48	P.pyg	1	Y	HNS commuting
21:51	P.pip	1	Y	HNS commuting
21:53 – 21:56	P.pyg	1	Y	HNS foraging continuously
21:58	P.pip	1	Y	HNS commuting
22:03	P.pip	1	Y	HNS commuting
22:06	P.pip	1	Y	HNS commuting
22:12	P.pip	1	Y	HNS commuting
22:13	P.pyg	1	Y	HNS commuting
22:14	P.pip	1	Y	HNS commuting
22:18	P.pyg	1	Y	HNS commuting
22:21 – 22:26	P.pip	1	Y	HNS foraging continuously
22:27	<i>Myotis</i> sp.	1	Y	HNS commuting
22:30	P.pip	1	Y	HNS commuting
22:40	P.pip	1	Y	HNS commuting
22:42	<i>Myotis</i> sp.	1	Y	HNS commuting
22:44	Noctule	1	Y	HNS commuting
22:44	P.pyg	1	Y	HNS commuting
22:45	P.pip	1	Y	HNS commuting
22:45	<i>Myotis</i> sp.	1	Y	HNS commuting
22:47	P.pip	1	Y	HNS commuting
22:56	P.pip	1	Y	HNS commuting

B8 QW30				
Project Name	A38	Surveyor		KF
Surveyor Location	AI	Rain (0-5)		0
Date	03/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		5
Sunrise	21:33	Temperature		17°C
Finish	23:33	Weather description		Dry, mild, overcast. Previously cool and dry
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
22:57	Noctule	1	Y	HNS commuting
22:57	P.pyg	1	Y	HNS commuting
22:58	P.pip	1	Y	HNS commuting
23:01	P.pyg	1	Y	HNS commuting
23:02	P.pip	1	Y	HNS commuting
23:05	Noctule	1	Y	HNS commuting
23:05	P.pyg	1	Y	HNS commuting
23:07	P.pip	1	Y	HNS commuting
23:09	<i>Myotis</i> sp.	1	Y	HNS commuting
23:10	P.pip	1	Y	HNS commuting
23:12	P.pip	1	Y	HNS commuting
23:12	<i>Myotis</i> sp.	1	Y	HNS commuting
23:18	P.pip	1	Y	HNS commuting
23:22	P.pip	1	Y	HNS commuting
23:22	<i>Myotis</i> sp.	1	Y	HNS commuting
23:22	P.pyg	1	Y	HNS commuting
23:25	<i>Myotis</i> sp.	1	Y	HNS commuting
23:34	P.pip	1	Y	HNS commuting
23:36	P.pip	1	Y	HNS commuting

B8 QW30				
Project Name	A38	Surveyor		TT
Surveyor Location	AJ	Rain (0-5)		0
Date	03/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		5
Sunrise	21:33	Temperature		17°C
Finish	23:33	Weather description		Dry, mild, overcast. Previously cool and dry
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:48	P.pip	1	Y	Heard not seen (HNS)
21:50	P.pip	1	Y	HNS
21:57	P.pip	1	Y	HNS
22:04	P.pip	1	Y	HNS
22:05	P.pip	1	Y	HNS
22:07	P.pip	1	Y	HNS
22:12	P.pip	1	Y	Heard and seen (H&S) commuting, flew across drive towards QW 32
22:14	P.pip	1	Y	HNS
22:26	P.pip	1	Y	H&S commuting, flew across drive towards

B8 QW30				
Project Name	A38	Surveyor		TT
Surveyor Location	AJ	Rain (0-5)		0
Date	03/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		5
Sunrise	21:33	Temperature		17°C
Finish	23:33	Weather description		Dry, mild, overcast. Previously cool and dry
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
				QW 32
22:36	Noctule	1	Y	HNS
22:44	Noctule	1	Y	HNS
22:45	P.pip	1	Y	HNS
22:47	P.pip	1	Y	HNS
22:57	Noctule	1	Y	HNS
23:01	Ppi Ppyg	1	Y	HNS
23:06	Noctule	1	Y	HNS
23:10	P.pip	1	Y	HNS
23:11	P.pip	1	Y	HNS
23:12	P.pip	1	Y	HNS
23:21	P.pip	1	Y	HNS
23:22	P.pyg	1	Y	HNS

QW 30 – Dusk Survey – 5 September 2017

B8 QW30				
Project Name	A38	Surveyor		HL
Surveyor Location	AH	Rain (0-5)		0
Date	05/09/2017	Wind (0-7)		1
Start	19:30	Cloud Cover (0-5)		3
Sunrise	19:45	Temperature		19°C
Finish	21:45	Weather description		Rained earlier in day. Humid and slight breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
20:02	Noctule	1	Y	Heard not seen (HNS) brief pass
20:08	P.pip	1	Y	HNS brief pass
20:15	P.pip	1	Y	Heard and seen (H&S) flew over trees
20:19	P.pip	1	Y	HNS brief commuting pass
20:24	P.pip	1	Y	HNS commuting
20:34	P.pip	1	Y	HNS commuting and foraging
20:57	P.pip	1	Y	HNS commuting
21:03	P.pip	1	Y	HNS brief commuting pass
21:07	Noctule	1	Y	HNS brief, faint commuting pass
21:13	P.pip	1	Y	HNS commuting
21:14	Noctule	1	Y	HNS commuting
21:16	Ppi Ppyg	1	Y	HNS commuting
21:18	P.pip	1	Y	HNS commuting
21:19	Noctule	1	Y	HNS commuting and foraging

B8 QW30				
Project Name	A38	Surveyor		HL
Surveyor Location	AH	Rain (0-5)		0
Date	05/09/2017	Wind (0-7)		1
Start	19:30	Cloud Cover (0-5)		3
Sunrise	19:45	Temperature		19°C
Finish	21:45	Weather description		Rained earlier in day. Humid and slight breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:20	P.pip	1	Y	HNS commuting
21:21	P.pip	1	Y	HNS commuting
21:27	P.pip	1	Y	HNS commuting
21:36	P.pip	1	Y	HNS commuting
21:40	P.pip	1	Y	HNS commuting
21:41	Noctule	1	Y	HNS commuting

B8 QW30					
Project Name	A38	Surveyor		OC	
Surveyor Location	AI	Rain (0-5)		0	
Date	05/09/2017	Wind (0-7)		1	
Start	19:30	Cloud Cover (0-5)		3	
Sunrise	19:45	Temperature		19°C	
Finish	21:45	Weather description		Rained earlier in day. Humid and slight breeze	
Time	Species	No. of bats	Recording (Y/N)	Ref. number	Description of behaviour
20:04	P.pyg	1	Y		Heard not seen (HNS)
20:06	P.pyg	1	Y		HNS
20:07 – 20:10	P.pip	1	Y		Heard and seen (H&S) commuting across garden
20:10	P.pyg	1	Y		H&S commuting across garden
20:15	P.pyg	1	Y		HNS commuting
20:16	<i>Myotis</i> sp.	1	Y		H&S commuting across garden
20:18	P.pip	1	Y		HNS foraging
20:19	P.pip	1	Y	6	H&S emergence from tiles near chimney
20:19	P.pyg	1	Y		HNS commuting
20:21	P.pip	1	Y	7	H&S emergence from roof
20:22	P.pip	1	Y		H&S commuting across garden
20:26	P.pyg	1	Y		HNS commuting
20:27	P.pip	1	Y		H&S commuting across garden
20:33	P.pip	1	Y		HNS commuting
20:35	P.pip	1	Y		H&S foraging over houses
21:00	P.pyg	1	Y		HNS commuting
21:05	P.pip	1	Y		HNS commuting
21:07	Noctule	1	Y		HNS commuting
21:08	<i>Myotis</i> sp.	1	Y		HNS commuting

B8 QW30					
Project Name	A38	Surveyor		OC	
Surveyor Location	AI	Rain (0-5)		0	
Date	05/09/2017	Wind (0-7)		1	
Start	19:30	Cloud Cover (0-5)		3	
Sunrise	19:45	Temperature		19°C	
Finish	21:45	Weather description		Rained earlier in day. Humid and slight breeze	
Time	Species	No. of bats	Recording (Y/N)	Ref. number	Description of behaviour
21:14	Noctule	1	Y		HNS commuting
21:19	Noctule	1	Y		HNS commuting
21:20	P.pip	1	Y		HNS commuting
21:21	<i>Myotis</i> sp.	1	Y		HNS commuting
21:21	Noctule	1	Y		HNS commuting
21:21	P.pyg	1	Y		HNS commuting
21:22	Noctule	1	Y		HNS commuting
21:41	Noctule	1	Y		HNS commuting
21:53	P.pyg	1	Y		HNS commuting

B8 QW30				
Project Name	A38	Surveyor		HA
Surveyor Location	AJ	Rain (0-5)		0
Date	05/09/2017	Wind (0-7)		1
Start	19:30	Cloud Cover (0-5)		3
Sunrise	19:45	Temperature		19°C
Finish	21:45	Weather description		Rained earlier in day. Humid and slight breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
20:17	P.pip	1	Y	Heard and seen (H&S) commuting, flew over trees towards A38
20:19	P.pip	1	Y	HNS brief pass
20:34	P.pip	1	Y	HNS brief pass
20:34	P.pyg	1	Y	HNS brief pass
20:35	Ppi Ppyg	1	Y	HNS commuting and foraging
20:50	Ppi Ppyg	1	Y	HNS brief pass
20:57	P.pip	1	Y	HNS brief pass
21:07	Noctule	1	Y	HNS brief pass
21:09	<i>Myotis</i> sp.	1	Y	HNS brief pass
21:13	P.pip	1	Y	HNS commuting
21:16	Ppi Ppyg	1	Y	HNS commuting
21:19	Noctule	2	Y	HNS commuting and foraging
21:22	Noctule	1	Y	HNS brief pass
21:27	P.pip	1	Y	HNS brief pass
21:36	P.pip	1	Y	HNS foraging
21:40	P.pip	1	Y	HNS foraging
21:41	Noctule	1	Y	HNS commuting

QW 32 – Dawn Survey – 21 June 2017

B8 QW32				
Project Name	A38	Surveyor	OC	
Surveyor Location	AL	Rain (0-5)	0	
Date	21/06/2017	Wind (0-7)	0	
Start	02:40	Cloud Cover (0-5)	5	
Sunrise	04:40	Temperature	20°C	
Finish	04:55	Weather description	Warm, still and overcast	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
02:44	P.pip	1	Y	Heard not seen (HNS) commuting
02:46	P.pip	1	Y	HNS commuting
02:49	P.pip	1	Y	HNS commuting
02:53	P.pip	1	Y	HNS commuting
02:54	P.pip	1	Y	HNS commuting
02:54	P.pyg	1	Y	HNS commuting
02:59	P.pip	1	Y	HNS commuting
03:13	Ppi Ppyg	1	Y	HNS commuting
03:35	P.pip	1	Y	HNS foraging
03:37	P.pip	1	Y	HNS foraging
03:39	P.pip	1	Y	HNS commuting
03:43	P.pip	1	Y	HNS foraging
03:44	P.pip	1	Y	HNS commuting
03:46	P.pip	1	Y	HNS commuting
03:53	P.pip	1	Y	HNS commuting
03:56	P.pip	1	Y	HNS commuting
03:59 – 04:01	P.pip	1	Y	HNS foraging
04:05	P.pip	1	Y	HNS commuting
04:06	P.pip	1	Y	HNS commuting
04:08	P.pyg	1	Y	HNS commuting
04:45	P.pip	1	Y	HNS commuting
04:59	P.pip	1	Y	HNS commuting

B8 QW32				
Project Name	A38	Surveyor	KF	
Surveyor Location	AM	Rain (0-5)	0	
Date	21/06/2017	Wind (0-7)	0	
Start	02:40	Cloud Cover (0-5)	5	
Sunrise	04:40	Temperature	20°C	
Finish	04:55	Weather description	Warm, still and overcast	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
02:44	P.pip	1	Y	Heard not seen (HNS) commuting
02:46 – 02:48	P.pip	1	Y	HNS commuting
02:51	P.pip	1	Y	HNS commuting
02:53	P.pip	1	Y	HNS commuting
02:54	P.pyg	1	Y	HNS commuting
02:54	P.pip	1	Y	HNS commuting
02:58	P.pip	1	Y	HNS commuting
02:59	P.pip	1	Y	HNS commuting
03:07	<i>Myotis</i> sp.	1	Y	HNS commuting
03:13	Ppi Ppyg	1	Y	HNS commuting
03:25	P.pip	1	Y	HNS commuting
03:28	P.pip	1	Y	HNS commuting
03:32	P.pip	1	Y	HNS commuting
03:35 – 03:39	P.pip	1	Y	HNS commuting
03:41	P.pip	1	Y	HNS commuting
03:42	P.pip	1	Y	HNS commuting
03:44 – 03:47	P.pip	1	Y	HNS commuting
03:50	P.pip	1	Y	HNS commuting
03:52 - 03:55	P.pip	1	Y	HNS commuting
03:56	<i>Myotis</i> sp.	1	Y	HNS commuting
03:57 – 04:00	P.pip	1	Y	HNS commuting
03:59	Noctule	1	Y	HNS commuting
04:00	Noctule	1	Y	HNS commuting
04:01	Noctule	1	Y	HNS commuting
04:01	P.pyg	1	Y	HNS commuting
04:01	<i>Myotis</i> sp.	1	Y	HNS commuting
04:03	P.pip	1	Y	HNS commuting
04:05 – 04:09	Noctule	1	Y	HNS commuting
04:06 – 04:09	P.pyg	1	Y	HNS commuting
04:09	P.pip	1	Y	HNS commuting
04:13	P.pip	1	Y	HNS commuting
04:13	Noctule	1	Y	HNS commuting
04:14	Noctule	1	Y	HNS commuting
04:14	P.pyg	1	Y	HNS commuting
04:20	Noctule	1	Y	HNS commuting
04:21	Noctule	1	Y	HNS commuting

B8 QW32				
Project Name	A38	Surveyor	GB	
Surveyor Location	AN	Rain (0-5)	0	
Date	21/06/2017	Wind (0-7)	0	
Start	02:40	Cloud Cover (0-5)	5	
Sunrise	04:40	Temperature	20°C	
Finish	04:55	Weather description	Warm, still and overcast	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
02:47 – 02:48	P.pip	1	Y	Heard not seen (HNS) foraging
02:50	P.pip	1	Y	HNS commuting
02:52	P.pip	1	Y	HNS commuting
02:53	Noctule	1	Y	HNS commuting
02:56	P.pip	1	Y	HNS commuting
02:57	Noctule	1	Y	HNS commuting
03:00	P.pip	1	Y	HNS commuting
03:06	P.pip	1	Y	HNS commuting
03:13	P.pip	1	Y	HNS commuting
03:18	P.pip	1	Y	HNS commuting
03:25	P.pip	1	Y	HNS commuting
03:31	P.pip	1	Y	HNS commuting
03:32	P.pip	1	Y	HNS commuting
03:33	P.pip	1	Y	HNS commuting
03:39	P.pip	1	Y	HNS commuting
03:41	P.pip	1	Y	HNS commuting
03:44	P.pip	1	Y	HNS commuting
03:47	P.pip	1	Y	HNS commuting
03:48	P.pip	1	Y	HNS commuting
03:50	P.pip	1	Y	Heard and seen (H&S) commuting from QW 30 towards trees
03:52	P.pip	1	Y	H&S commuting from QW 30 towards trees
03:55	P.pip	1	Y	H&S commuting from QW 30 towards trees
03:59	P.pip	1	Y	H&S commuting from QW 30 towards trees
04:00	P.pip	1	Y	HNS commuting
04:01	P.pip	1	Y	HNS commuting
04:01	Noctule	1	Y	HNS commuting
04:04	P.pip	1	Y	HNS
04:06	P.pip	1	Y	HNS
04:06	P.pip	1	Y	H&S commuting from QW 30 towards trees
04:07	Noctule	1	Y	HNS very faint pass
04:09	Noctule	1	Y	HNS commuting
04:10	P.pip	1	Y	HNS
04:14	Noctule	1	Y	HNS very faint pass
04:14	P.pip	1	Y	HNS commuting
04:15	Noctule	1	Y	HNS commuting
04:17	Noctule	1	Y	HNS commuting
04:19	Noctule	1	Y	HNS commuting
04:31	Noctule	1	Y	HNS commuting

B8 QW32				
Project Name	A38	Surveyor	KL	
Surveyor Location	AO	Rain (0-5)	0	
Date	21/06/2017	Wind (0-7)	0	
Start	02:40	Cloud Cover (0-5)	5	
Sunrise	04:40	Temperature	20°C	
Finish	04:55	Weather description	Warm, still and overcast	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
02:44	P.pip	1	Y	Heard not seen (HNS) commuting
02:47	P.pip	1	Y	HNS commuting
02:49	P.pip	1	Y	HNS commuting
02:54	P.pip	1	Y	HNS commuting
03:00	P.pip	1	Y	HNS commuting
03:13	Ppi Ppyg	1	Y	HNS commuting
03:36	P.pip	1	Y	HNS foraging
03:37	P.pip	1	Y	HNS commuting
03:39	P.pip	1	Y	HNS commuting
03:45	P.pip	1	Y	HNS commuting
03:46	P.pip	1	Y	HNS commuting
03:54	P.pip	1	Y	HNS commuting
03:56	P.pip	1	Y	HNS commuting
03:57	<i>Myotis</i> sp.	1	Y	HNS commuting
04:00	P.pip	1	Y	HNS commuting
04:01	P.pyg	1	Y	HNS commuting
04:01	Noctule	1	Y	HNS commuting
04:06	Noctule	1	Y	HNS commuting
04:06	P.pyg	1	Y	HNS commuting
04:07	P.pip	1	Y	HNS commuting
04:07	Noctule	1	Y	HNS commuting
04:07	P.pyg	1	Y	HNS commuting
04:08	P.pyg	1	Y	HNS commuting
04:09	P.pyg	1	Y	HNS commuting
04:09	Noctule	1	Y	HNS commuting
04:14	Noctule	1	Y	HNS commuting
04:14	P.pyg	1	Y	HNS commuting
04:21	Noctule	1	Y	HNS commuting

QW 32 – Dusk Survey – 3 July 2017

B8 QW32				
Project Name	A38	Surveyor	CA	
Surveyor Location	AL	Rain (0-5)	0	
Date	03/07/2017	Wind (0-7)	1	
Start	21:15	Cloud Cover (0-5)	5	
Sunrise	21:33	Temperature	17°C	
Finish	23:33	Weather description	Dry, mild, overcast. Previously cool and dry	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:35	P.pip	1	Y	Heard not seen (HNS) brief pass
21:40	P.pip	1	Y	HNS brief pass
21:45 – 21:51	P.pip	1	Y	HNS continuous brief passes
21:50	P.pyg	1	Y	HNS brief pass
21:53 – 21:59	P.pip	1	Y	HNS continuous brief passes
21:54	P.pyg	1	Y	HNS brief pass
22:06 – 22:07	P.pip	1	Y	HNS brief pass
22:13	P.pip	1	Y	HNS brief pass
22:14	P.pyg	1	Y	HNS brief pass
22:15	P.pip	1	Y	HNS brief pass
22:19	P.pyg	1	Y	HNS brief pass
22:22	P.pip	1	Y	HNS brief pass
22:23	P.pip	1	Y	HNS brief pass
22:24	P.pip	1	Y	HNS brief pass
22:25	P.pip	1	Y	HNS brief pass
22:26	P.pip	1	Y	HNS brief pass
22:27	P.pip	1	Y	HNS brief pass
22:28	<i>Myotis</i> sp.	1	Y	HNS brief pass
22:32	P.pip	1	Y	HNS brief pass
22:33	P.pip	1	Y	HNS brief pass
22:41	P.pip	1	Y	HNS brief pass
22:44	P.pip	1	Y	HNS brief pass
22:46	P.pip	1	Y	HNS brief pass
22:48	P.pip	1	Y	HNS brief pass
22:59	P.pip	1	Y	HNS brief pass
23:00	P.pip	1	Y	HNS brief pass
23:02	P.pyg	1	Y	HNS brief pass
23:03	P.pip	1	Y	HNS brief pass
23:05	P.pip	1	Y	HNS brief pass
23:08	P.pip	1	Y	HNS brief pass
23:11	P.pip	1	Y	HNS brief pass
23:13	P.pip	1	Y	HNS brief pass
23:13	<i>Myotis</i> sp.	1	Y	HNS brief pass
23:19	P.pip	1	Y	HNS brief pass
23:23	P.pyg	1	Y	HNS brief pass
23:23	P.pip	1	Y	HNS brief pass

B8 QW32				
Project Name	A38	Surveyor		SC
Surveyor Location	AM	Rain (0-5)		0
Date	03/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		5
Sunrise	21:33	Temperature		17°C
Finish	23:33	Weather description		Dry, mild, overcast. Previously cool and dry
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:34	P.pip	1	Y	Heard and seen (H&S) foraging over building from S to N
21:39	P.pyg	1	Y	Heard not seen (HNS) brief pass
21:41	P.pyg	1	Y	HNS brief pass
21:44 – 21:45	P.pip	1	Y	HNS foraging
21:45	P.pyg	1	Y	HNS foraging
21:46	P.pip	1	Y	H&S foraging, came from the W and circled in garden
21:48	P.pip	1	Y	H&S foraging over building from S to N
21:49	P.pip	1	Y	H&S foraging, flew from NW to garden
21:49	P.pyg	1	Y	H&S foraging, flew over house from E to garden
21:52	P.pip	1	Y	H&S foraging over building from S to N
21:53	P.pyg	1	Y	H&S foraging over building from S to N
21:54	P.pip	1	Y	H&S foraging over building from S to N
21:55	P.pip	1	Y	H&S foraging over building from S to N
21:57	P.pip	2	Y	H&S foraging over building from S to N
22:07	P.pip	1	Y	H&S foraging over building from S to N
22:13	P.pip	1	Y	H&S foraging over building from S to N
22:13	P.pyg	1	Y	H&S foraging, flew from NW to garden
22:14	P.pip	1	Y	HNS foraging
22:19	P.pyg	1	Y	H&S foraging over building from S to N
22:22	P.pip	1	Y	H&S foraging over building from S to N
22:23	P.pip	1	Y	H&S foraging across back of building
22:26	P.pip	1	Y	H&S foraging over building from S to N
22:27	<i>Myotis</i> sp.	1	Y	H&S foraging across back of building
22:31	P.pip	1	Y	HNS foraging over building from S to N
22:36	P.pip	1	Y	HNS foraging
22:40	P.pip	1	Y	H&S commuting, flew from NW to garden, very high
22:42	P.pip	1	Y	HNS foraging
22:44	P.pip	1	Y	HNS foraging
22:44	Noctule	1	Y	HNS distant
22:47	P.pip	1	Y	HNS foraging
22:50	P.pip	1	Y	HNS foraging
22:56	P.pip	1	Y	HNS foraging
22:57	P.pip	1	Y	HNS brief foraging pass
22:58	P.pip	1	Y	H&S foraging over building from S to N
23:02	P.pyg	1	Y	HNS foraging
23:03	P.pip	1	Y	H&S commuting straight over top of building
23:07	P.pip	1	Y	HNS foraging

B8 QW32				
Project Name	A38	Surveyor		SC
Surveyor Location	AM	Rain (0-5)		0
Date	03/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		5
Sunrise	21:33	Temperature		17°C
Finish	23:33	Weather description		Dry, mild, overcast. Previously cool and dry
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
23:11	P.pip	1	Y	HNS foraging
23:13	P.pip	1	Y	HNS foraging
23:19	P.pip	1	Y	HNS foraging
23:22	P.pip	1	Y	HNS foraging
23:22	P.pyg	1	Y	HNS foraging
23:22	<i>Myotis</i> sp.	1	Y	HNS foraging
23:23	P.pyg	1	Y	HNS foraging
23:26	P.pyg	1	Y	HNS foraging

QW 32 – Dusk Survey – 5 September 2017

B8 QW32				
Project Name	A38	Surveyor		JT
Surveyor Location	AL	Rain (0-5)		0
Date	05/09/2017	Wind (0-7)		1
Start	19:30	Cloud Cover (0-5)		3
Sunrise	19:45	Temperature		19°C
Finish	21:45	Weather description		Rained earlier in day. Humid and slight breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
20:08	P.pip	1	Y	Heard and seen (H&S) commuting to the NE of QW 32
20:10	P.pyg	1	Y	HNS commuting
20:11	P.pip	1	Y	Heard not seen (HNS) commuting, faint call
20:16	P.pip	1	Y	H&S commuting to the NE of QW 32
20:19	P.pip	1	Y	HNS faint commuting pass
20:20	P.pip	1	Y	HNS faint commuting pass
20:22	P.pip	1	Y	HNS faint commuting pass
20:23	P.pip	1	Y	HNS faint commuting pass
20:27	P.pip	1	Y	HNS faint commuting pass
20:28	P.pip	1	Y	HNS faint commuting pass
20:34	P.pip	1	Y	HNS faint commuting pass
20:38	P.pip	1	Y	HNS faint commuting passes
20:48	P.pip	1	Y	HNS faint commuting pass
20:50	P.pip	1	Y	HNS faint commuting pass
21:00	P.pip	1	Y	HNS faint commuting pass
21:05	P.pip	1	Y	HNS faint commuting pass
21:07	Noctule	1	Y	HNS faint commuting pass
21:08	<i>Myotis</i> sp.	1	Y	HNS faint commuting pass

B8 QW32				
Project Name	A38	Surveyor		JT
Surveyor Location	AL	Rain (0-5)		0
Date	05/09/2017	Wind (0-7)		1
Start	19:30	Cloud Cover (0-5)		3
Sunrise	19:45	Temperature		19°C
Finish	21:45	Weather description		Rained earlier in day. Humid and slight breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:19	Noctule	1	Y	HNS faint commuting pass
21:21	<i>Myotis</i> sp.	1	Y	HNS faint commuting pass
21:22	Noctule	1	Y	HNS faint commuting pass
21:28	P.pip	1	Y	HNS faint commuting pass
21:30	P.pip	1	Y	HNS faint commuting pass
21:36	P.pip	1	Y	HNS faint commuting pass
21:41	Noctule	1	Y	HNS faint commuting pass

B8 QW32				
Project Name	A38	Surveyor		SR
Surveyor Location	AN	Rain (0-5)		0
Date	03/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		5
Sunrise	21:33	Temperature		17°C
Finish	23:33	Weather description		Dry, mild, overcast. Previously cool and dry
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:41	P.pip	1	Y	Heard not seen (HNS) single pass
21:42	P.pip	1	Y	HNS single pass
21:48	P.pip	1	Y	HNS single pass
21:50	P.pip	1	Y	Heard and seen (H&S) single pass heading NE
21:53	P.pip	1	Y	HNS single pass
21:56	P.pip	1	Y	HNS single pass
21:58	P.pip	1	Y	HNS single pass
22:03	P.pip	1	Y	HNS single pass
22:05	P.pip	1	Y	H&S single commuting pass from NE to SW
22:07	P.pip	1	Y	HNS single pass
22:14	P.pip	1	Y	HNS single pass
22:16	P.pip	1	Y	HNS single pass
22:25	P.pip	1	Y	HNS single pass
22:26	P.pip	1	Y	H&S single commuting pass, flying N
22:41	P.pip	1	Y	HNS single pass
22:44	Noctule	1	Y	HNS single pass
22:44	P.pip	1	Y	HNS single pass
22:45	P.pip	1	Y	HNS single pass
22:47	P.pip	1	Y	HNS two passes
22:49	P.pip	1	Y	HNS single pass

B8 QW32				
Project Name	A38	Surveyor		SR
Surveyor Location	AN	Rain (0-5)		0
Date	03/07/2017	Wind (0-7)		1
Start	21:15	Cloud Cover (0-5)		5
Sunrise	21:33	Temperature		17°C
Finish	23:33	Weather description		Dry, mild, overcast. Previously cool and dry
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
22:57	Noctule	1	Y	HNS single pass
23:01	Common or P.pyg	1	Y	HNS single pass
23:05	Noctule	1	Y	HNS faint pass
23:06	P.pip	1	Y	HNS single pass
23:08	P.pip	1	Y	HNS single pass
23:10	P.pip	1	Y	HNS single pass
23:12	P.pip	1	Y	HNS single pass
23:14	P.pip	1	Y	HNS single pass
23:21	P.pip	1	Y	HNS single pass
23:22	P.pyg	1	Y	HNS single pass

B8 QW32				
Project Name	A38	Surveyor		TT
Surveyor Location	AM	Rain (0-5)		0
Date	05/09/2017	Wind (0-7)		1
Start	19:30	Cloud Cover (0-5)		3
Sunrise	19:45	Temperature		19°C
Finish	21:45	Weather description		Rained earlier in day. Humid and slight breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
20:05	P.pyg	1	Y	Heard no seen (HNS) brief pass
20:08	P.pip	1	Y	Heard and seen (H&S) flew from building to rear of garden
20:11	P.pip	1	Y	H&S flew from QW 30
20:13	P.pyg	1	Y	HNS
20:16	P.pyg	1	Y	HNS
20:18	P.pip	1	Y	H&S flew from QW 30
20:20	P.pyg	1	Y	HNS
20:22	P.pip	1	Y	H&S flew from QW 30
20:26	P.pyg	1	Y	HNS
20:27	P.pip	1	Y	H&S flew over house
20:33	P.pip	1	Y	HNS
20:37	P.pip	1	Y	HNS
20:44	P.pip	1	Y	HNS
20:46	P.pip	1	Y	HNS
20:47	P.pip	1	Y	HNS
20:48	P.pip	1	Y	H&S flew from rear of garden towards QW 32
20:50	P.pip	1	Y	HNS

B8 QW32				
Project Name	A38	Surveyor		TT
Surveyor Location	AM	Rain (0-5)		0
Date	05/09/2017	Wind (0-7)		1
Start	19:30	Cloud Cover (0-5)		3
Sunrise	19:45	Temperature		19°C
Finish	21:45	Weather description		Rained earlier in day. Humid and slight breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
20:58	P.pip	1	Y	HNS
21:05	P.pip	1	Y	HNS not a clear call
21:05	P.pyg	1	Y	HNS
21:07	Noctule	1	Y	HNS
21:12	P.pyg	1	Y	HNS
21:14	Noctule	1	Y	HNS
21:18	Noctule	1	Y	HNS
21:21	P.pip	1	Y	HNS
21:21	<i>Myotis</i> sp.	1	Y	HNS
21:22	Noctule	1	Y	HNS
21:35	P.pip	1	Y	HNS
21:40	P.pip	1	Y	HNS
21:41	Noctule	1	Y	HNS

B8 QW32				
Project Name	A38	Surveyor		MO
Surveyor Location	AN	Rain (0-5)		0
Date	05/09/2017	Wind (0-7)		1
Start	19:30	Cloud Cover (0-5)		3
Sunrise	19:45	Temperature		19°C
Finish	21:45	Weather description		Rained earlier in day. Humid and slight breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
19:33	Noctule	1	Y	Heard not seen (HNS) commuting
20:02	Noctule	1	Y	HNS commuting
20:08	P.pip	1	Y	HNS commuting
20:15	P.pip	1	Y	HNS commuting
20:19	P.pip	1	Y	HNS commuting
20:24	P.pip	1	Y	HNS commuting
20:34	P.pip	1	Y	HNS commuting
20:57	P.pip	1	Y	HNS commuting
21:02	P.pip	1	Y	HNS commuting
21:07	Noctule	1	Y	HNS commuting
21:13	P.pip	1	Y	HNS commuting
21:15	Noctule	1	Y	HNS commuting
21:16	Ppi Ppyg	1	Y	HNS commuting
21:18	P.pip	1	Y	HNS commuting
21:19	Noctule	1	Y	HNS commuting
21:20	P.pip	1	Y	HNS commuting

B8 QW32				
Project Name	A38	Surveyor		MO
Surveyor Location	AN	Rain (0-5)		0
Date	05/09/2017	Wind (0-7)		1
Start	19:30	Cloud Cover (0-5)		3
Sunrise	19:45	Temperature		19°C
Finish	21:45	Weather description		Rained earlier in day. Humid and slight breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:21	P.pip	1	Y	HNS commuting
21:21	Noctule	1	Y	HNS commuting
21:27	P.pip	1	Y	HNS commuting
21:29	P.pip	1	Y	HNS commuting
21:36	P.pip	1	Y	HNS commuting
21:39	P.pip	1	Y	HNS commuting
21:41	Noctule	1	Y	HNS commuting

B8 QW32				
Project Name	A38	Surveyor		GB
Surveyor Location	AO	Rain (0-5)		0
Date	05/09/2017	Wind (0-7)		1
Start	19:30	Cloud Cover (0-5)		3
Sunrise	19:45	Temperature		19°C
Finish	21:45	Weather description		Rained earlier in day. Humid and slight breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
20:07	P.pip	1	Y	Heard not seen (HNS) commuting
20:08	P.pip	1	Y	HNS commuting
20:10	P.pip	1	Y	HNS commuting
20:16	P.pyg	1	Y	HNS commuting
20:18	P.pip	1	Y	HNS commuting
20:19	P.pip	1	Y	HNS commuting
20:20	P.pip	1	Y	HNS commuting
20:20	P.pyg	1	Y	HNS commuting
20:21	P.pip	1	Y	HNS commuting
20:22	P.pip	1	Y	HNS commuting
20:26	P.pyg	1	Y	HNS commuting
20:27	P.pip	1	Y	HNS commuting
20:34	P.pip	1	Y	HNS commuting
20:37	P.pip	1	Y	HNS commuting
21:16	Ppi Ppyg	1	Y	HNS commuting
21:19	Noctule	1	Y	HNS commuting
21:21	P.pip	1	Y	HNS commuting
21:21	Noctule	1	Y	HNS commuting
21:41	Noctule	1	Y	HNS commuting

Building 257 Ashbourne Road - Dusk Survey – 4 September 2017

Building 257 Ashbourne Road				
Project Name	A38	Surveyor		OC
Surveyor Location	B	Rain (0-5)		0
Date	04/09/2017	Wind (0-7)		1
Start	19:30	Cloud Cover (0-5)		5
Sunset	19:47	Temperature		20°C
Finish	21:47	Weather description		Dry and overcast with light breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
20:00 – 20:05	P.pip	1	Y	Heard not seen (HNS), commuting and continuous foraging, multiple passes
20:28	P.pip	1	Y	Heard and seen (H&S), commuting, flew over top of house
20:39	Noctule	1	Y	HNS, commuting
20:45	Noctule	1	Y	HNS, commuting
21:01	Noctule	1	Y	HNS, commuting, faint calls
21:26	P.pip	1	Y	HNS, commuting
21:26	P.pyg	1	Y	HNS, commuting

Building 257 Ashbourne Road				
Project Name	A38	Surveyor		HA
Surveyor Location	A	Rain (0-5)		0
Date	04/09/2017	Wind (0-7)		1
Start	19:30	Cloud Cover (0-5)		5
Sunset	19:47	Temperature		20°C
Finish	21:47	Weather description		Dry and overcast with light breeze
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
20:34	P.pip	1	Y	Heard not seen (HNS)
20:24	Noctule	1	Y	Heard and seen (H&S), foraging, flew from 259 to big tree in 255 and then back in the direction of 259
20:28	P.pip	1	Y	HNS
20:37	P.pip	1	Y	HNS
20:39	Noctule	1	Y	HNS
21:00	Noctule	1	Y	HNS
21:03	P.pip	1	Y	HNS
21:25	P.pyg	1	Y	HNS
21:26	P.pip	1	Y	HNS

Thermal Imaging Raw Data

Location#_Date: QW 2_010817	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T204424293				no bats
Rec.T#: T205939149	_12:49:334	n	n	foraging bat appears from out of frame. bats keep foraging but none going in or out of building
Rec.T#: T211449646		n	n	not bats
Rec.T#: T213013690		n	n	bats keep foraging but none going in or out of building
Rec.T#: T214544671		n	n	some foraging bats, none in or out of building
Rec.T#: T220212332		n	n	no bats
Rec.T#: T222115656	_09:32_400	n	n	cat in frame No bats going in or out
Rec.T#: T223643559		n	n	couple of bats foraging late in the vid. but other than that, no bats
Rec.T#: T225156878		n	n	no bats
Location#_Date: QW2_2 60917	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T045813035		n	n	no bats
Rec.T#: T051431499		n	n	no bats
Rec.T#: T053112496		n	n	no bats
Rec.T#: T054716603		n	n	1 bat flies across the garden right to left. No emerging or re-entering bats
Location#_Date: QW6_230817	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T195811055		n	n	no bats
Rec.T#: T201333836		n	n	no bats
Rec.T#: T202902577		n	n	no bats
Rec.T#: T204423298		n	n	no bats
Rec.T#: T210013642		n	n	no bats
Rec.T#: T211544067		n	n	no bats
Rec.T#: T213106432		n	n	no bats
Rec.T#: T214620865		n	n	no bats
Rec.T#: T220124692		n	n	no bats
Location#_Date: QW 8_220817	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T041234342		n	n	no bats
Rec.T#: T042551531		n	n	no bats
Rec.T#: T044120318		n	n	no bats
Rec.T#: T050436110		n	n	no bats
Rec.T#: T052000250		n	n	no bats
Rec.T#: T053528277		n	n	no bats

Rec.T#: T055052774	_10:51:667	n	n	squirrel on roof on building next door
Rec.T#: T060611811		n	n	no bats
Location# Date: QW20_270617	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T202000907		n	n	no bats
Rec.T#: T203508562		n	n	no bats
Rec.T#: T205020442		n	n	no bats
Rec.T#: T210529689		n	n	no bats
Rec.T#: T212043738		n	n	no bats
Rec.T#: T213602247		n	n	no bats
Location# Date: QW 20_100817	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T033803875		n	n	no bats
Rec.T#: T035421391		n	n	no bats
Rec.T#: T040941905		n	n	no bats
Rec.T#: T042503247		n	n	no bats
Rec.T#: T044031162		n	n	no bats
Rec.T#: T045557091		n	n	no bats
Rec.T#: T051220479		n	n	no bats
Rec.T#: T052737812		n	n	no bats
Location# Date: QW22_230817	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T035753652		n	n	no bats
Rec.T#: T041317245		n	n	no bats
Rec.T#: T042900536		n	n	no bats
Rec.T#: T044419590		n	n	no bats
Rec.T#: T045949493		n	n	no bats
Rec.T#: T051509935		n	n	no bats
Rec.T#: T053043193		n	n	no bats
Rec.T#: T054621946		n	n	no bats
Rec.T#: T060216609		n	n	no bats
Location# Date: QW22_24_(24)300617	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T015349279		n	n	no bats
Rec.T#: T020949608		n	n	no bats
Rec.T#: T021110497		n	n	no bats
Rec.T#: T021220957		n	n	no bats
Rec.T#: T022741874		n	n	no bats
Rec.T#: T024252367		n	n	no bats
Rec.T#: T025802406		n	n	no bats
Rec.T#: T031326173		n	n	no bats

Rec.T#: T032906387		n	n	no bats
Location#_Date: QW26_040717	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T210144679		n	n	Couple of bats commuting over building right to let and front to back. No bats emerging or re-entering.
Rec.T#: T211703665		n	n	Bats commuting and foraging over the building. 1 bat flies into and out of frame towards right corner of house and then back out of from in last couple of seconds in the recording. No bats emerging or re-entering.
Rec.T#: T213215364		n	n	Bats commuting and foraging over building
	00:09:45:666	n	N	
		n	n	Bats commuting and foraging over building
Rec.T#: T214721269		n	n	Bats commuting and foraging over building. No bats emerging or re-entering
Rec.T#: T220234702		n	n	Bats commuting and foraging over building. No bats emerging or re-entering
Rec.T#: T221745832		n	n	Bats commuting and foraging over building. No bats emerging or re-entering
Rec.T#: T223323533		n	n	Bats commuting and foraging over building. No bats emerging or re-entering
Rec.T#: T224838284		n	n	Bats commuting and foraging over building. No bats emerging or re-entering
Rec.T#: T230026936		n	n	Bats commuting and foraging over building. No bats emerging or re-entering
Rec.T#: T231704696		n	n	Bats commuting and foraging over building. No bats emerging or re-entering
Location#_Date:QW26_060917	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T042428879		n	n	no bats
Rec.T#: T044039571		n	n	no bats
Rec.T#: T045716839		n	n	no bats
Rec.T#: T051259091		n	n	no bats
Rec.T#: T052947536		n	n	no bats
Rec.T#: T054612191		n	n	no bats
Rec.T#: T060231257		n	n	no bats
Red.t#: T062049824		n	n	Bats flying over building, no emergences or re-entries

Rec.T#: T063628352		n	n	no bats
Location#_Date: QW30+32 (32)_210617	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T015150162	_02:24:467	n	n	upper left 1/3 of screen: 1 bat, from out of frame.
Rec.T#: T020659760		n	n	4 shots with bats in frame, but no good shots or emergence or re-entry.
Rec.T#: T022209885	_09:17:633	n	n	2 bats foraging
	_13:55:533	n	n	1 bat enters frame from upper 1/3 left & forages above chimney. Good footage
Rec.T#: T023721759	_00:13:866	n	n	Good footage. Bat foraging in left side of frame
	_02:45:533	n	n	Cat in the garden
	_07:40:000	n	n	Weird "blob" on the footage?
Rec.T#: T025238961	_07:38:333	n	n	1 bat comes from front of building and flies toward camera. Good footage
Rec.T#: T030753083		n	n	All bats in footage flies towards QW 30. Birds start flying.
Rec.T#: T032304091		n	n	All bats in footage flies towards QW 30. on the final 1/3 of the rec. A beetle(?) or bee starts flying in front of camera
Rec.T#: T033822967		n	n	No bats
Location#_Date: 30+32(30)_030717	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T211416681				swallows flying.
Rec.T#: T212931800				no bats - birds
Rec.T#: T214502472	_06:27:467	n	Y	bat emerges from where edge of roof connects to chimney furthest away from surveyors. Screenshot taken.
	_07:20:233	n	N	
Rec.T#: T221524666		n	n	foraging bats in garden
Rec.T#: T223043837		n	n	foraging bats in garden
Rec.T#: T224559363		n	n	foraging bats in garden
Rec.T#: T230116694		n	n	foraging bats in garden
Rec.T#: T231254802		n	n	foraging bats in garden
Rec.T#: T232802754		n	n	foraging bats in garden
Rec.T#: T232820491		n	n	foraging bats in garden
Location#_Date:QW30+ 32(30)_050917	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T193643921		n	n	no bats
Rec.T#: T195248352		n	n	no bats
Rec.T#: T200856682	00:11:47:100	n	N	

Red.T#: T202514430		n	n	Several bats flying over and around house, no emergences or re-entries.
Rec.T#: T204312577		n	n	Several bats flying over and around house, no emergences or re-entries.
Red.T#: T205946858		n	n	no bats
Rec.T#: T211944402		n	n	no bats
Rec.T#: T213511684		n	n	no bats
Location#_Date: QW257_040917	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T193423842		n	n	no bats
Rec.T#: T195041825		n	n	no bats
Rec.T#: T200709279		n	n	no bats
Rec.T#: T201313307		n	n	Couple of bat flying over house, nothing emerging or re-entering
Rec.T#: T204019535		n	n	no bats
Rec.T#: T205636298		n	n	no bats
Rec.T#: T211814357		n	n	Couple of bat flying over house, nothing emerging or re-entering
Rec.T#: T213434049		n	n	Couple of bat flying over house, nothing emerging or re-entering

Appendix F Bridges B2, B3 and B15: Emergence Survey Raw Data Sheets

B2 – Dawn Survey – 22 June 2017

Bridge 2				
Project Name	A38	Surveyor		KF
Surveyor Location	North of bridge	Rain (0-5)		0
Date	22/06/2017	Wind (0-7)		0
Start	02:40	Cloud Cover (0-5)		5
Sunrise	04:40	Temperature		19°C
Finish	04:55	Weather description		Calm, cloudy and warm
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
02:24	P.pip	1	Y	Heard not seen (HNS), commuting
02:26	P.pip	1	Y	HNS, commuting
02:28	P.pip	1	Y	HNS, commuting
02:31	P.pip	1	Y	HNS, commuting
02:35	<i>Nyctalus</i> sp.	1	Y	HNS, commuting
02:37 – 02:39	P.pip	1	Y	HNS, commuting and continuous foraging
02:37	<i>Nyctalus</i> sp.	1	Y	HNS, commuting
02:39 – 02:41	<i>Nyctalus</i> sp.	1	Y	HNS, commuting and continuous foraging,
02:41 – 02:43	P.pip	1	Y	HNS, commuting and continuous foraging
02:45	P.pip	1	Y	HNS, commuting
02:46 – 02:47	P.pip	2	Y	HNS, commuting and foraging, multiple passes
02:52	P.pip	1	Y	HNS, commuting
02:53 – 02:56	P.pip	2	Y	HNS, commuting and continuous foraging
02:58	P.pip	1	Y	Heard and seen (H&S) commuting and foraging under bridge
03:00	P.pip	1	Y	H&S, commuting and foraging under bridge
03:03	P.pip	1	Y	H&S, commuting and foraging under bridge
03:07	P.pip	1	Y	H&S, commuting and foraging under bridge
03:08	<i>Myotis</i> sp.	1	Y	HNS, commuting
03:14	P.pip	1	Y	HNS, commuting and foraging
03:25	<i>Myotis</i> sp.	1	Y	HNS, commuting
03:27	P.pip	1	Y	HNS, commuting
03:30	P.pip	1	Y	HNS, commuting
03:31	<i>Nyctalus</i> sp.	1	Y	HNS, commuting
03:32 – 03:38	P.pip	1	Y	HNS, commuting
03:36	P.pyg	1	Y	HNS, commuting
03:37	P.pip	1	Y	HNS, commuting

Bridge 2				
Project Name	A38	Surveyor		KF
Surveyor Location	North of bridge	Rain (0-5)		0
Date	22/06/2017	Wind (0-7)		0
Start	02:40	Cloud Cover (0-5)		5
Sunrise	04:40	Temperature		19°C
Finish	04:55	Weather description		Calm, cloudy and warm
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
03:38	P.pip	1	Y	HNS, commuting
03:40	P.pip	1	Y	HNS, commuting
03:42	<i>Myotis</i> sp.	1	Y	HNS, commuting
03:42	P.pip	1	Y	HNS, commuting
03:46	P.pyg	1	Y	HNS, commuting
03:53	P.pyg	1	Y	HNS, commuting
03:53	P.pip	1	Y	HNS, commuting
03:54	<i>Nyctalus</i> sp.	1	Y	HNS, commuting
03:59	P.pip	1	Y	HNS, commuting
04:05	<i>Nyctalus</i> sp.	1	Y	HNS, commuting

Bridge 2					
Project Name	A38	Surveyor		KL	
Surveyor Location	Centre, under the bridge	Rain (0-5)		0	
Date	22/06/2017	Wind (0-7)		0	
Start	02:40	Cloud Cover (0-5)		5	
Sunrise	04:40	Temperature		19°C	
Finish	04:55	Weather description		Calm, cloudy and warm	
Time	Species	No. of bats	Recording (Y/N)	Ref. Number	Description of behaviour
02:38 – 02:50	P.pip	1	Y		Heard not seen (HNS), commuting and continuous foraging
02:52 – 02:57	P.pip	1	Y		HNS, commuting and continuous foraging and multiple passes
02:58 – 03:05	P.pip	1	Y		Heard and seen (H&S), commuting and foraging under bridge, multiple passes
03:09	<i>Myotis</i> sp.	1	Y		HNS, commuting
03:09	P.pip	1	Y	1	H&S Re-entered under bridge
03:10 – 03:12	P.pip	1	Y		H&S, commuting and foraging under bridge, multiple passes
03:12	P.pip	2	Y	2	H&S both bats re-entered under bridge
03:11 – 03:16	P.pip	1	Y		H&S, commuting and foraging under bridge, multiple passes
03:27	P.pip	1	Y		HNS, commuting

Bridge 2					
Project Name	A38	Surveyor		KL	
Surveyor Location	Centre, under the bridge	Rain (0-5)		0	
Date	22/06/2017	Wind (0-7)		0	
Start	02:40	Cloud Cover (0-5)		5	
Sunrise	04:40	Temperature		19°C	
Finish	04:55	Weather description		Calm, cloudy and warm	
Time	Species	No. of bats	Recording (Y/N)	Ref. Number	Description of behaviour
03:30	<i>Myotis</i> sp.	1	Y		HNS, commuting
03:30 – 03:32	P.pip	1	Y		HNS, commuting
03:36	<i>Myotis</i> sp.	1	Y		HNS, commuting
03:36	P.pyg	1	Y		HNS, commuting
03:37	P.pip	1	Y		HNS, commuting
03:42	<i>Myotis</i> sp.	1	Y		HNS, commuting
03:42	P.pip	1	Y		HNS, commuting
03:49	P.pip	1	Y		H&S, commuting, seen circling in front of bridge
03:51	P.pip	1	Y		H&S, commuting, seen circling in front of bridge
03:53	P.pyg	1	Y		HNS, commuting
03:53	P.pip	1	Y		HNS, commuting
03:58	P.pip	1	Y		HNS, commuting

Bridge 2					
Project Name	A38	Surveyor		OC	
Surveyor Location	Southern end of bridge	Rain (0-5)		0	
Date	22/06/2017	Wind (0-7)		0	
Start	02:40	Cloud Cover (0-5)		5	
Sunrise	04:40	Temperature		19°C	
Finish	04:55	Weather description		Calm, cloudy and warm	
Time	Species	No. of bats	Recording (Y/N)	Ref. Number	Description of behaviour
02:30	P.pyg	1	Y		Heard not seen (HNS), commuting
02:32	P.pip	1	Y		HNS, commuting
02:37 – 02:46	P.pip	1	Y		HNS, commuting and continuous foraging, multiple passes
02:45	P.pyg	1	Y		HNS, commuting
02:48	P.pip	1	Y		HNS, commuting
02:51 – 02:56	P.pip	1	Y		HNS, commuting and continuous foraging, multiple passes
02:56	P.pyg	1	Y		HNS, commuting
02:58 – 03:09	P.pip	1	Y		Heard and seen (H&S) commuting and foraging under bridge, multiple passes

Bridge 2					
Project Name	A38	Surveyor		OC	
Surveyor Location	Southern end of bridge	Rain (0-5)		0	
Date	22/06/2017	Wind (0-7)		0	
Start	02:40	Cloud Cover (0-5)		5	
Sunrise	04:40	Temperature		19°C	
Finish	04:55	Weather description		Calm, cloudy and warm	
Time	Species	No. of bats	Recording (Y/N)	Ref. Number	Description of behaviour
03:09	P.pip	1	Y	1	H&S Re-entered under bridge
03:10	P.pip	1	Y		H&S commuting and foraging under bridge, multiple passes
03:12	P.pip	2	Y	2	H&S both bats re-entered under bridge
03:20	P.pip	1	Y		H&S, commuting, flew over bridge
03:27	P.pip	1	Y		HNS, commuting
03:30	<i>Myotis</i> sp.	1	Y		HNS, commuting
03:32	P.pip	1	Y		HNS, commuting
03:34	P.pip	1	Y		HNS, commuting
03:35	P.pyg	1	Y		HNS, commuting
03:36	<i>Myotis</i> sp.	1	Y		HNS, commuting
03:38	P.pip	1	Y		HNS, commuting
03:42	<i>Myotis</i> sp.	1	Y		HNS, commuting
03:43	P.pyg	1	Y		HNS, commuting
03:46	P.pip	1	Y		HNS, commuting
03:49	P.pip	1	Y		H&S, commuting, seen circling in front of bridge
03:52	P.pip	1	Y		HNS, commuting
03:53	P.pyg	1	Y		HNS, commuting
03:54	<i>Nyctalus</i> sp.	1	Y		HNS, commuting
03:55	P.pyg	1	Y		HNS, commuting
03:59	P.pip	1	Y		HNS, commuting

B2 – Dusk Survey – 5 July 2017

Bridge 2					
Project Name	A38	Surveyor		LJF	
Surveyor Location	C	Rain (0-5)		0	
Date	05/07/2017	Wind (0-7)		1	
Start	21:17	Cloud Cover (0-5)		2	
Sunset	21:32	Temperature		17°C	
Finish	23:32	Weather description		Warm, dry	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour	
21:45	P.pip	1	Y	Heard and seen (H&S) came from the North and flew towards the bridge	
21:47	P.pip	1	Y	Heard not seen (HNS) foraging	
21:52	P.pip	1	Y	HNS foraging	
21:55 – 22:00	P.pip			H&S, continuous foraging in front of bridge	

Bridge 2				
Project Name	A38	Surveyor		LJF
Surveyor Location	C	Rain (0-5)		0
Date	05/07/2017	Wind (0-7)		1
Start	21:17	Cloud Cover (0-5)		2
Sunset	21:32	Temperature		17°C
Finish	23:32	Weather description		Warm, dry
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
				and in field
21:56 – 22:10	P.pyg	1	Y	HNS, continuous foraging
22:00	Ppi Ppyg	1	Y	HNS, foraging
22:03 – 22:05	Ppi Ppyg	1	Y	HNS, foraging
22:05	P.pip	1	Y	HNS, commuting
22:07 – 22:14	P.pip	1	Y	HNS, commuting
22:07	Ppi Ppyg	1	Y	HNS, foraging
22:08	Myotis sp.	1	Y	HNS, commuting, brief pass
22:08 – 22:10	Common or P.pyg	1	Y	HNS, continuous foraging, multiple passes
22:14 – 22:16	P.pyg	1	Y	HNS, continuous foraging, multiple passes
22:18	P.pyg	1	Y	HNS, commuting, brief pass
22:21	P.pyg	1	Y	HNS, commuting, brief pass
22:24	Myotis sp.	1	Y	HNS, commuting, brief pass
22:26	P.pyg	1	Y	HNS, commuting, brief pass
22:28	P.pip	1	Y	HNS, commuting, brief pass
22:28 – 22:30	P.pyg	1	Y	HNS, continuous foraging
22:29 – 22:30	Ppi Ppyg	1	Y	HNS, continuous foraging
22:32	P.pip	1	Y	HNS, commuting, brief pass
22:36	Myotis sp.	1	Y	HNS, commuting, brief pass
22:42	P.pip	1	Y	HNS, commuting, brief pass
22:46	Myotis sp.	1	Y	HNS, commuting, brief pass
22:47	P.pip	1	Y	HNS, commuting, brief pass
22:48	P.pyg	1	Y	HNS, commuting, brief pass
22:57 – 23:04	P.pip	1	Y	HNS, continuous foraging, multiple passes
23:07	Nyctalus sp.	1	Y	HNS, commuting
23:09	P.pip	1	Y	HNS, commuting, brief pass
23:13	P.pip	1	Y	HNS, commuting, brief pass
23:17	P.pyg	1	Y	HNS, commuting, brief pass
23:21	Myotis sp.	1	Y	HNS, commuting, brief pass
23:23	P.pip	1	Y	HNS, commuting, brief pass
23:24	P.pip	1	Y	HNS, commuting
23:27	P.pip	1	Y	HNS, commuting, brief pass
23:28	Myotis sp.	1	Y	HNS, commuting, brief pass
23:28	P.pip	1	Y	HNS, commuting, brief pass
23:29	Myotis sp.	1	Y	HNS, commuting, brief pass
23:34	P.pip	1	Y	HNS, commuting, brief pass
23:34	Ppi Ppyg	1	Y	HNS, commuting, brief pass
23:35	Myotis sp.	1	Y	HNS, commuting, brief pass

Bridge 2				
Project Name	A38	Surveyor		RM
Surveyor Location	E	Rain (0-5)		0
Date	05/07/2017	Wind (0-7)		1
Start	21:17	Cloud Cover (0-5)		2
Sunset	21:32	Temperature		17°C
Finish	23:32	Weather description		Warm, dry
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:47	P.pip	1	Y	Heard and seen (H&S), foraging under bridge
21:50	P.pip	1	Y	Heard not seen (HNS), commuting
21:52	P.pip	1	Y	HNS, commuting, brief pass
21:56	P.pip	1	Y	HNS, commuting, brief pass
21:58	P.pip	1	Y	H&S, foraging continuously at the other side of the bridge
21:59	P.pyg	1	Y	H&S, foraging overhead
22:00	P.pip	1	Y	HNS, commuting, brief pass
22:00	P.pyg	1	Y	HNS, commuting, brief pass
22:00	Ppi Ppyg	1	Y	HNS, commuting, brief pass
22:01	P.pip	1	Y	HNS, commuting, brief pass
22:05	P.pip	1	Y	HNS, brief foraging pass
22:05	P.pyg	1	Y	HNS, brief foraging pass
22:05	Ppi Ppyg	1	Y	HNS, brief foraging pass
22:08	P.pip	1	Y	HNS, commuting, brief pass
22:09 – 22:11	P.pip	1	Y	H&S, foraging overhead, multiple passes
22:10	P.pyg	1	Y	HNS, commuting, brief pass
22:11	<i>Myotis</i> sp.	1	Y	HNS, commuting, brief pass
22:12	P.pip	1	Y	HNS, commuting, brief pass
22:13	P.pip	1	Y	HNS, commuting, brief pass
22:15	P.pip	1	Y	HNS, commuting, brief pass
22:17	P.pyg	1	Y	HNS, commuting, brief pass
22:17 – 22:24	P.pip	1	Y	H&S, foraging, circling overhead
22:19	P.pyg	1	Y	HNS, commuting, brief pass
22:25	<i>Myotis</i> sp.	1	Y	HNS, commuting, brief pass
22:25	Ppi Ppyg	1	Y	HNS, commuting, brief pass
22:27	P.pyg	1	Y	HNS, multiple passes
22:28	P.pip	1	Y	HNS, commuting, brief pass
22:29 – 22:31	P.pyg	1	Y	HNS, commuting, brief pass
22:30	P.pip	1	Y	HNS, commuting, brief pass
22:31	Ppi Ppyg	1	Y	HNS, commuting, brief pass
22:32	P.pip	1	Y	HNS, commuting, brief pass
22:34 – 22:40	P.pip	1	Y	H&S, foraging under bridge
22:35	Ppi Ppyg	1	Y	HNS, commuting, brief pass
22:42	P.pip	1	Y	HNS, commuting, brief pass
22:47	<i>Myotis</i> sp.	1	Y	HNS, foraging
22:48	P.pyg	1	Y	HNS, foraging
22:58 – 23:04	P.pip	1	Y	HNS, continuous foraging
22:59	P.pyg	2	Y	HNS, continuous foraging
23:01	<i>Myotis</i> sp.	1	Y	HNS, commuting, brief pass

23:04	<i>Myotis</i> sp.	1	Y	HNS, commuting, brief pass
23:14	P.pyg	1	Y	HNS, commuting, brief pass
23:15	P.pip	1	Y	HNS, commuting, brief pass
23:15	Ppi Ppyg	1	Y	HNS, commuting, brief pass
23:16	P.pip	1	Y	HNS, brief foraging pass
23:17	<i>Myotis</i> sp.	1	Y	HNS, commuting, brief pass
23:18 – 23:19	P.pip	1	Y	HNS, foraging, multiple passes
23:21	<i>Myotis</i> sp.	1	Y	HNS, commuting, brief pass
23:21 – 23:32	P.pip	1	Y	HNS, continuous foraging, multiple passes

B2 – Dawn Survey – 2 August 2017

Bridge 2				
Project Name	A38	Surveyor		OC
Surveyor Location	C	Rain (0-5)		0
Date	02/08/2017	Wind (0-7)		1
Start	03:25	Cloud Cover (0-5)		5
Sunrise	05:25	Temperature		15.8°C
Finish	05:40	Weather description		Dry and overcast
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
03:25	<i>Myotis</i> sp.	1	Y	HNS commuting, brief pass
03:25	P.pip	1	Y	HNS commuting, brief pass
03:25 - 03:49	P.pip	2	Y	Heard not seen (HNS) commuting and foraging continuously
03:27	<i>Myotis</i> sp.	1	Y	HNS commuting, brief pass
03:49	<i>Myotis</i> sp.	1	Y	HNS commuting, brief pass
03:49	P.pyg	1	Y	HNS commuting, brief pass
03:49 – 04:11	P.pip	1	Y	HNS foraging continuously
03:54	P.pyg	1	Y	HNS commuting, brief pass
04:02	Ppi Ppyg	1	Y	HNS commuting, brief pass
04:03	Ppi Ppyg	1	Y	HNS commuting, brief pass
04:05	Ppi Ppyg	1	Y	HNS commuting, brief pass
04:13	P.pyg	1	Y	HNS commuting, brief pass
04:18	P.pip	1	Y	HNS foraging continuously
04:19	P.pyg	1	Y	HNS commuting, brief pass
04:20	P.pip	1	Y	HNS commuting, brief pass
04:21 – 04:22	P.pip	1	Y	HNS foraging continuously
04:25 – 04:27	P.pip	1	Y	HNS foraging continuously
04:27	P.pyg	1	Y	HNS commuting, brief pass
04:29	P.pip	1	Y	HNS commuting, brief pass
04:30	P.pip	1	Y	HNS commuting, brief pass
04:32	P.pip	1	Y	HNS commuting, brief pass
04:35	P.pyg	1	Y	HNS commuting, brief pass
04:36	P.pip	1	Y	HNS commuting, brief pass
04:36	P.pyg	1	Y	HNS commuting, brief pass
04:37 – 04:45	P.pip	1	Y	HNS commuting and foraging continuously
04:38 – 04:43	P.pyg	1	Y	HNS commuting and foraging continuously
04:42	<i>Myotis</i> sp.	1	Y	HNS commuting, brief pass
04:47	P.pip	1	Y	HNS commuting, brief pass
04:49	P.pyg	1	Y	HNS commuting, brief pass

Bridge 2					
Project Name	A38	Surveyor		MS	
Surveyor Location	E	Rain (0-5)		0	
Date	02/08/2017	Wind (0-7)		1	
Start	03:25	Cloud Cover (0-5)		5	
Sunrise	05:25	Temperature		15.8°C	
Finish	05:40	Weather description		Dry and overcast	
Time	Species	No. of bats	Recording (Y/N)	Ref. Number	Description of behaviour
03:25	<i>Myotis</i> sp.	1	Y		Heard not seen (HNS) brief pass
03:25 - 04:11	P.pip	1	Y		HNS Foraging continuously
03:27	<i>Myotis</i> sp.	1	Y		HNS commuting, brief pass
03:44	P.pyg	1	Y		HNS brief foraging pass
03:49	<i>Myotis</i> sp.	1	Y		HNS commuting, brief pass
03:49	P.pyg	2	Y		HNS commuting, brief pass
03:54	P.pyg	1	Y		HNS very short, faint call
04:02	Ppi Ppyg	1	Y		HNS very short, faint call
04:03	Ppi Ppyg	1	Y		HNS commuting, brief pass
04:13	P.pyg	1	Y		HNS foraging
04:18	P.pip	1	Y		HNS foraging
04:19	P.pyg	1	Y		HNS commuting, brief pass
04:20 – 04:22	P.pip	1	Y		HNS foraging, multiple passes
04:25 – 04:27	P.pip	1	Y		HNS foraging, multiple passes
04:27	P.pyg	1	Y		HNS commuting, brief pass
04:29	P.pip	1	Y		HNS brief foraging call
04:30	P.pip	1	Y		HNS, brief pass
04:32	P.pip	2	Y		HNS brief pass
04:35	P.pyg	1	Y		HNS foraging
04:36	P.pip	1	Y		HNS brief pass
04:36	P.pyg	1	Y		HNS brief pass
04:37	P.pip	1	Y		HNS brief pass
04:38 – 04:39	Ppi Ppyg	1	Y		HNS foraging and commuting
04:38 – 04:45	P.pip	2	Y		HNS foraging and commuting
04:40 – 04:43	P.pyg	1	Y		HNS foraging and commuting
04:42	<i>Myotis</i> sp.	1	Y		HNS commuting, brief pass
04:49	P.pyg	1	Y	3	Heard and seen (H&S) flew under bridge and re-entered

B3 – Dawn Survey – 20 June 2017

Bridge 3				
Project Name	A38	Surveyor		OC
Surveyor Location	H	Rain (0-5)		0
Date	20/06/2017	Wind (0-7)		2
Start	02:40	Cloud Cover (0-5)		5
Sunrise	04:40	Temperature		19.9°C
Finish	04:40	Weather description		Warm, dry and overcast
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
02:40 – 03:10	P.pip	1	Y	Heard and seen (H&S) constant foraging
02:47	P.pyg	1	Y	H&S foraging under bridge
02:55	Ppi Ppyg	1	Y	H&S foraging under bridge
02:56 – 02:57	P.pyg	1	Y	H&S foraging under bridge
03:04	Ppi Ppyg	1	Y	H&S foraging under bridge
03:05	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
03:11 – 03:15	P.pip	1	Y	H&S foraging over river under bridge
03:12	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
03:12	P.pyg	1	Y	H&S foraging under bridge
03:20	P.pip	1	Y	Heard not seen (HNS) foraging
03:23 – 03:28	P.pip	1	Y	H&S foraging over river and then flew away from bridge
03:24	<i>Myotis</i> sp.	1	Y	HNS foraging
03:25	P.pyg	1	Y	HNS foraging
03:26	<i>Nyctalus</i> sp.	1	Y	HNS foraging
03:27	P.pyg	1	Y	HNS commuting, brief pass
03:28 – 03:32	P.pip	1	Y	H&S foraging, circling under bridge
03:32	<i>Nyctalus</i> sp.	1	Y	HNS foraging
03:32	P.pyg	1	Y	HNS foraging
03:36	<i>Myotis</i> sp.	1	Y	HNS foraging
03:36 – 03:37	P.pip	1	Y	HNS foraging
03:41	P.pyg	1	Y	H&S foraging under bridge
03:43	P.pip	1	Y	HNS commuting
03:45 – 03:46	P.pip	1	Y	HNS foraging
03:48	P.pip	1	Y	HNS foraging
03:48	P.pyg	1	Y	HNS foraging
03:50	P.pip	1	Y	H&S foraging and circling under bridge
03:54	P.pip	1	Y	HNS brief foraging pass
03:56	P.pip	1	Y	HNS brief foraging pass
03:57	P.pyg	1	Y	HNS brief foraging pass
03:57	P.pip	1	Y	H&S commuting, flew into bridge and entered near supports
03:58	<i>Nyctalus</i> sp.	1	Y	HNS foraging
03:58 – 04:00	P.pip	1	Y	H&S foraging under bridge
04:02	<i>Myotis</i> sp.	1	Y	HNS foraging

Bridge 3				
Project Name	A38	Surveyor	KL	
Surveyor Location	F	Rain (0-5)	0	
Date	20/06/2017	Wind (0-7)	2	
Start	02:40	Cloud Cover (0-5)	5	
Sunrise	04:40	Temperature	19.9°C	
Finish	04:40	Weather description	Warm, dry and overcast	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
02:45 – 04:08	P.pip	2+	Y	Heard and seen (H&S) constant commuting and foraging throughout survey, seen flying along bridge to NE and back again, multiple bats but only 2 seen at the same time
02:57	<i>Myotis</i> sp.	1	Y	Heard not seen (HNS) foraging
02:58	P.pyg	1	Y	HNS commuting, brief pass
02:59	<i>Myotis</i> sp.	1	Y	HNS commuting, brief pass
03:03	<i>Myotis</i> sp.	1	Y	HNS commuting, brief pass
03:04 – 03:20	<i>Myotis</i> sp.	1	Y	HNS foraging continuously
03:12	Daub	1	Y	HNS commuting, brief pass
03:13	P.pyg	1	Y	HNS commuting, brief pass
03:15	P.pyg	1	Y	HNS commuting, brief pass
03:23 – 03:26	<i>Myotis</i> sp.	1	Y	HNS foraging continuously
03:23	P.pyg	1	Y	HNS brief foraging pass
03:24 – 03:25	Ppi Ppyg	1	Y	HNS Foraging continuously
03:25 – 03:26	P.pyg	1	Y	HNS Foraging continuously
03:29	P.pyg	2	Y	HNS brief foraging passes
03:29 – 03:53	<i>Myotis</i> sp.	1	Y	H&S multiple foraging passes, flew along bridge to NE and back again
03:32 – 03:33	P.pyg	2	Y	HNS foraging continuously
03:37 – 03:38	P.pyg	2	Y	Heard and seen (H&S) flew along bridge going NE and back again
03:40	Daub	1	Y	HNS commuting, brief pass
03:42 – 03:43	P.pyg	1	Y	HNS brief foraging passes
03:45	P.pyg	2	Y	H&S flew along bridge from NE
03:47	Ppi Ppyg	2	Y	HNS commuting, brief pass
03:48	P.pyg	1	Y	H&S flew along bridge from NE
03:54	Ppi Ppyg	2	Y	H&S flew NE to SW
03:55 – 03:57	<i>Myotis</i> sp.	1	Y	H&S flew SW to NE
04:00 – 04:01	<i>Myotis</i> sp.	1	Y	H&S bat near crevice on outside bridge did not enter
04:03	<i>Myotis</i> sp.	1	Y	H&S flew NE to SW under bridge
04:05	<i>Myotis</i> sp.	1	Y	HNS commuting, brief pass
04:06	<i>Myotis</i> sp.	1	Y	HNS commuting, brief pass

B3 – Dusk Survey – 6 July 2017

Bridge 3				
Project Name	A38	Surveyor		LFJ
Surveyor Location	F	Rain (0-5)		0
Date	06/07/2017	Wind (0-7)		3
Start	21:17	Cloud Cover (0-5)		3
Sunset	21:32	Temperature		22°C
Finish	23:32	Weather description		humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:42	P.pip	1	Y	Heard not seen (HNS)
21:46	P.pip	1	Y	Heard and seen (H&S) commuting
21:52	P.pip	1	Y	HNS commuting
21:56 – 21:58	P.pip	1	Y	H&S foraging under bridge
21:56	Daub	1	Y	H&S foraging under bridge
21:57 – 21:59	<i>Myotis</i> sp.			H&S foraging under bridge
22:00 – 22:11	<i>Myotis</i> sp.	>1	Y	H&S continuous emergence from N side of bridge, 2 nd row of gaps. Big roost, multiple species
22:00 – 22:11	Daub	>1	Y	H&S continuous emergence from N side of bridge, Big roost, multiple species
22:00 – 22:11	P.pip	>1	Y	H&S continuous emergence from N side of bridge, Big roost, multiple species
22:13	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
22:15	Daub	1	Y	H&S foraging under bridge
22:15	Noctule	1	Y	H&S foraging under bridge
22:15	P.pip	1	Y	H&S foraging under bridge
22:15	P.pyg	1	Y	H&S foraging under bridge
22:16 – 22:17	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
22:17	P.pip	1	Y	H&S foraging under bridge
22:19	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
22:19 – 22:20	P.pip	1	Y	H&S foraging under bridge
22:20	P.pyg	1	Y	H&S foraging under bridge
22:21	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
22:22	<i>Nyctalus</i> sp.	1	Y	H&S foraging under bridge
22:22	P.pip	1	Y	H&S foraging under bridge
22:23	P.pip	1	Y	H&S continuous foraging under bridge
22:24 – 22:25	P.pip	1	Y	H&S foraging under bridge
22:25	Daub	1	Y	H&S foraging under bridge
22:25	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
22:25	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
22:26	P.pyg	1	Y	H&S foraging under bridge
22:27	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
22:28	P.pip	1	Y	H&S foraging under bridge
22:30 – 22:31	<i>Nyctalus</i> sp.	1	Y	H&S foraging under bridge
22:30 – 22:36	P.pyg	1	Y	H&S foraging under bridge
22:31	P.pip	1	Y	H&S foraging under bridge
22:32 – 22:47	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
22:34	Daub	1	Y	H&S foraging under bridge
22:34	P.pip	1	Y	H&S foraging under bridge

Bridge 3				
Project Name	A38	Surveyor		LFJ
Surveyor Location	F	Rain (0-5)		0
Date	06/07/2017	Wind (0-7)		3
Start	21:17	Cloud Cover (0-5)		3
Sunset	21:32	Temperature		22°C
Finish	23:32	Weather description		humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
22:36	Daub	1	Y	H&S foraging under bridge
22:38 – 22:40	Daub	1	Y	H&S foraging under bridge
22:41 – 22:7	P.pip	1	Y	H&S foraging under bridge
22:43 – 22:46	P.pyg	1	Y	H&S foraging under bridge
22:46	Serotine	1	Y	H&S foraging under bridge
22:47	P.pyg	1	Y	H&S foraging under bridge
22:49 – 22:59	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
22:50 – 22:54	P.pip	2	Y	H&S foraging under bridge
22:50	P.pyg	2	Y	H&S foraging under bridge
22:54 – 22:58	P.pyg	2	Y	H&S foraging under bridge
22:56 – 22:25	P.pip	1	Y	H&S foraging under bridge
23:01 – 23:07	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
23:01 – 23:04	P.pyg	2	Y	H&S foraging under bridge
23:06 – 23:25	P.pyg	2	Y	H&S foraging under bridge
23:10	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
23:12 – 23:24	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
23:31	<i>Myotis</i> sp.	1	Y	H&S foraging under bridge
23:31	Noctule	1	Y	H&S foraging under bridge
23:31 – 22:32	P.pip	1	Y	H&S foraging under bridge
23:31 – 22:32	P.pyg	1	Y	H&S foraging under bridge

Bridge 3				
Project Name	A38	Surveyor		TT
Surveyor Location	H	Rain (0-5)		0
Date	06/07/2017	Wind (0-7)		3
Start	21:17	Cloud Cover (0-5)		3
Sunset	21:32	Temperature		22°C
Finish	23:32	Weather description		humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:42	P.pip	1	Y	Heard not seen (HNS)
21:49	P.pip	1	Y	HNS
21:51 – 21:53	P.pip	1	Y	HNS foraging
21:56 – 21:58	P.pip	1	Y	Heard and seen (H&S) foraging and circling under bridge
21:58	<i>Myotis</i> sp.	1	Y	HNS foraging
21:59	P.pyg	1	Y	HNS foraging
22:03 – 22:04	P.pip	1	Y	HNS foraging
22:06	P.pip	1	Y	HNS foraging
22:07	P.pyg	1	Y	HNS foraging

Bridge 3				
Project Name	A38	Surveyor		TT
Surveyor Location	H	Rain (0-5)		0
Date	06/07/2017	Wind (0-7)		3
Start	21:17	Cloud Cover (0-5)		3
Sunset	21:32	Temperature		22°C
Finish	23:32	Weather description		humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
22:09	<i>Myotis</i> sp.	1	Y	HNS foraging
22:09	P.pip	1	Y	HNS foraging
22:10	<i>Myotis</i> sp.	1	Y	HNS foraging
22:11 – 22:13	P.pip	1	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:11 – 22:13	P.pyg	1	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:12 – 22:14	<i>Myotis</i> sp.	1	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:16 – 22:25	P.pip	2	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:16	P.pyg	1	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:17	Noctule	1	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:19	<i>Myotis</i> sp.	1	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:22	<i>Myotis</i> sp.	1	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:22 – 22:37	P.pyg	2	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:24	<i>Myotis</i> sp.	1	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:27 – 22:28	<i>Myotis</i> sp.	1	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:27	P.pip	1	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:29	P.pip	1	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:30	<i>Myotis</i> sp.	1	Y	H&S foraging and circling under bridge, constant calls, multiple species
22:30 – 22:38	P.pip	2	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge
22:32	Leisler	1	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge
22:32	<i>Myotis</i> sp.	1	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge
22:35 – 23:12	<i>Myotis</i> sp.	2	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge
22:41 – 23:41	P.pip	2	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge

Bridge 3				
Project Name	A38	Surveyor		TT
Surveyor Location	H	Rain (0-5)		0
Date	06/07/2017	Wind (0-7)		3
Start	21:17	Cloud Cover (0-5)		3
Sunset	21:32	Temperature		22°C
Finish	23:32	Weather description		humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
22:46 – 22:50	P.pyg	2	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge
22:54 – 23:02	P.pyg	2	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge
23:05	Daub	1	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge
23:06 – 23:20	P.pyg	2	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge
23:15 – 23:26	<i>Myotis</i> sp.	1	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge
23:22 – 23:30	P.pyg	1	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge
23:28	<i>Myotis</i> sp.	1	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge
23:30 – 23:40	<i>Myotis</i> sp.	2	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge
23:33 – 23:39	P.pyg	2	Y	H&S foraging and circling under bridge, constant calls, multiple species, also foraging in field to south of bridge

B3 – Dawn Survey – 3 August 2017

Bridge 3				
Project Name	A38	Surveyor		MS
Surveyor Location	F	Rain (0-5)		0
Date	03/08/2017	Wind (0-7)		2
Start	03:27	Cloud Cover (0-5)		4
Sunrise	05:27	Temperature		15°C
Finish	05:42	Weather description		Heavy rain in dusk before survey, very humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
03:27 – 03:29	P.pip	1	Y	Heard not seen (HNS) faint pass
03:31	P.pip	1	Y	HNS faint pass
03:38	P.pip	1	Y	HNS faint pass
03:43 – 03:45	P.pip	1	Y	HNS two faint and brief passes
03:47 – 03:48	P.pip	1	Y	HNS two brief passes

Bridge 3				
Project Name	A38	Surveyor		MS
Surveyor Location	F	Rain (0-5)		0
Date	03/08/2017	Wind (0-7)		2
Start	03:27	Cloud Cover (0-5)		4
Sunrise	05:27	Temperature		15°C
Finish	05:42	Weather description		Heavy rain in dusk before survey, very humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
03:51	P.pyg	1	Y	HNS faint and brief pass
03:53	P.pip	1	Y	HNS faint but constant passes
03:55 – 03:57	P.pip	1	Y	HNS foraging intermittently
04:00 – 04:02	P.pip	1	Y	HNS foraging intermittently
04:04	P.pip	1	Y	HNS foraging intermittently
04:09	P.pip	1	Y	HNS foraging intermittently
04:11 – 04:14	P.pip	2	Y	HNS foraging intermittently
04:17 – 04:23	P.pip	1	Y	HNS foraging intermittently
04:22 – 04:23	P.pyg	1	Y	HNS foraging nearby for several minutes
04:31	P.pip	1	Y	HNS foraging nearby
04:35	P.pip	1	Y	HNS brief call
04:37	P.pip	1	Y	HNS brief call, loud
04:38	Leisler	1	Y	HNS foraging
04:38	P.pyg	1	Y	HNS foraging
04:40	P.pip	1	Y	HNS foraging
04:47	P.pyg	1	Y	HNS foraging

B15 – Dawn Survey – 4 July 2017

B15				
Project Name	A38	Surveyor		SR
Surveyor Location	I	Rain (0-5)		0
Date	04/07/2017	Wind (0-7)		0
Start	02:47	Cloud Cover (0-5)		5
Sunrise	04:47	Temperature		17°C
Finish	05:02	Weather description		Overcast, mild and calm
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
02:51 – 04:26	P.pyg	2	Y	Heard and seen (H&S) Constant foraging by all three species, with a high number of passes throughout the length of survey.
	Whis/ Bran	1		
	Myotis sp.	1		
03:35	Daubenton's	1	Y	H&S, Single foraging pass,
03:53	Nyctalus sp.	1	Y	Heard not seen (HNS) brief pass
04:03	Nyctalus sp.	1	Y	HNS brief pass
04:09 – 04:10	P.pip	1	Y	H&S Foraging with multiple passes
04:15	Nyctalus sp.	1	Y	HNS brief pass
04:20 – 04:21	P.pip	1	Y	H&S foraging, multiple passes
05:02	Nyctalus sp.	1	Y	HNS brief pass

B15 – Dusk Survey – 22 August 2017

B15				
Project Name	A38	Surveyor		LFJ
Surveyor Location	I	Rain (0-5)		0
Date	22/08/2017	Wind (0-7)		1
Start	20:02	Cloud Cover (0-5)		5
Sunrise	20:17	Temperature		20°C
Finish	22:17	Weather description		Warm and humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
20:38 – 20:39	P.pyg	1	Y	Heard and seen (H&S) foraging over the water
21:07 – 21:08	P.pip	1	Y	H&S foraging over the water
21:07	P.pyg	1	Y	H&S, foraging over the water
21:14	<i>Myotis</i> sp	1	Y	Heard not seen (HNS) foraging
21:16	<i>Myotis</i> sp	1	Y	HNS foraging
21:18	<i>Myotis</i> sp	1	Y	HNS foraging
21:24	<i>Myotis</i> sp	1	Y	HNS foraging
21:54	<i>Myotis</i> sp	1	Y	HNS foraging
21:57 – 21:58	<i>Myotis</i> sp	1	Y	HNS foraging
22:10	<i>Myotis</i> sp	1	Y	HNS foraging

B15				
Project Name	A38	Surveyor		OC
Surveyor Location	J	Rain (0-5)		0
Date	22/08/2017	Wind (0-7)		1
Start	20:02	Cloud Cover (0-5)		5
Sunrise	20:17	Temperature		20°C
Finish	22:17	Weather description		Warm and humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
20:28 – 20:51	P.pyg	1	Y	Heard and seen (H&S) foraging over the water, multiple passes
20:51 – 20:52	P.pip	1	Y	H&S foraging over the water, multiple passes
20:53 – 20:54	P.pyg	1	Y	H&S foraging over the water, multiple passes
21:03 – 21:06	P.pip	1	Y	H&S foraging over the water, multiple passes
21:06	P.pip	2	Y	H&S foraging over the water, multiple passes
21:06 – 21:13	P.pip	1	Y	H&S foraging over the water, multiple passes
21:12	<i>Myotis</i> sp.	1	Y	H&S foraging over the water, multiple passes
21:12	P.pip	1	Y	H&S foraging over the water, multiple passes
21:13	<i>Myotis</i> sp.	1	Y	H&S foraging over the water, multiple passes
21:13 – 21:14	Ppi Ppyg	1	Y	H&S foraging over the water, multiple passes
21:14	P.pyg	1	Y	H&S foraging over the water, multiple passes
21:14 – 21:15	Ppi Ppyg	1	Y	H&S foraging over the water, multiple passes
21:15 – 21:17	P.pip	1	Y	H&S foraging over the water, multiple passes
21:17	P.pyg	1	Y	H&S foraging over the water, multiple passes
21:18	<i>Myotis</i> sp.	1	Y	H&S foraging over the water, multiple passes
21:18 – 21:35	P.pip	1	Y	H&S foraging over the water, multiple passes
21:20 – 21:21	<i>Myotis</i> sp.	1	Y	H&S foraging over the water, multiple passes

B15				
Project Name	A38	Surveyor		OC
Surveyor Location	J	Rain (0-5)		0
Date	22/08/2017	Wind (0-7)		1
Start	20:02	Cloud Cover (0-5)		5
Sunrise	20:17	Temperature		20°C
Finish	22:17	Weather description		Warm and humid
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
21:24	Whis/Bran	1	Y	H&S foraging over the water, multiple passes
21:24	<i>Myotis</i> sp.	1	Y	H&S foraging over the water, multiple passes
21:30 – 21:32	<i>Myotis</i> sp.	1	Y	H&S foraging over the water, multiple passes
21:34 – 21:35	<i>Myotis</i> sp.	1	Y	H&S foraging over the water, multiple passes
21:35	P.pyg	1	Y	H&S foraging over the water, multiple passes
21:39 – 21:40	<i>Myotis</i> sp.	1	Y	H&S foraging over the water, multiple passes
21:45	P.pip	1	Y	H&S foraging over the water, multiple passes
21:45 – 21:46	P.pyg	1	Y	H&S foraging over the water, multiple passes
21:47	<i>Myotis</i> sp.	1	Y	H&S foraging over the water, multiple passes
21:54 – 21:56	<i>Myotis</i> sp.	1	Y	H&S foraging over the water, multiple passes
22:01	<i>Myotis</i> sp.	1	Y	H&S foraging over the water, multiple passes
22:07	<i>Myotis</i> sp.	1	Y	H&S foraging over the water, multiple passes
22:09 – 22:16	P.pip	1	Y	H&S foraging over the water, multiple passes
22:13 – 22:16	Ppi Ppyg	1	Y	H&S foraging over the water, multiple passes
22:16	P.pyg	1	Y	H&S foraging over the water, multiple passes
20:28 – 20:51	P.pyg	1	Y	H&S foraging over the water, multiple passes

B15 – Dusk Survey – 6 September 2017

B15				
Project Name	A38	Surveyor		OC
Surveyor Location	I	Rain (0-5)		0
Date	06/09/2017	Wind (0-7)		1
Start	19:25	Cloud Cover (0-5)		5
Sunset	19:40	Temperature		15.5°C
Finish	21:40	Weather description		Dry and overcast
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
19:47 – 19:55	P.pyg	1	Y	Heard not seen (HNS), faint calls (i.e. not under the bridge).
19:59	P.pyg	1	Y	Heard & seen (H&S) flying under bridge
20:03 – 20:29	P.pyg	1	y/n	Occasional foraging under the bridge (> 1 bat)
20:30	P.pip	1	Y	HNS commuting
20:36 – 20:44	P.pyg	1	Y	HNS commuting nearby (i.e. not under the bridge)
21:12	P.pyg	1	Y	HNS commuting
21:30 – 21:39	P.pyg	1	Y	Occasional bat passes HNS commuting
21:40	<i>Myotis</i> sp	1	Y	HNS commuting

B15.				
Project Name	A38	Surveyor	RM	
Surveyor Location	J	Rain (0-5)	0	
Date	06/09/2017	Wind (0-7)	1	
Start	19:25	Cloud Cover (0-5)	5	
Sunset	19:40	Temperature	15.5°C	
Finish	21:40	Weather description	Dry and overcast	
Time	Species	No. of bats	Recording (Y/N)	Description of behaviour
19:47	P.pyg	1	Y	Heard & seen (H&S), foraging
19:51	P.pyg	1	Y	H&S foraging
19:54 – 20:03	P.pyg	1	Y	H&S foraging
20:03	P.pyg	2	Y	H&S foraging
20:04 – 20:29	P.pyg	1	Y	H&S foraging
20:08 – 20:22	P.pip	1	Y	H&S foraging
20:12	<i>Myotis</i> sp.	1	Y	H&S foraging
20:21	<i>Myotis</i> sp.	1	Y	H&S foraging
20:25 – 20:46	P.pip	1	Y	H&S foraging
20:32	P.pyg	1	Y	H&S foraging
20:32	P.pyg	1	Y	H&S foraging
20:35 – 20:39	P.pyg	1	Y	H&S foraging
20:41	P.pyg	1	Y	H&S foraging
20:41 – 20:42	P.pyg	1	Y	H&S foraging
20:46 – 20:47	P.pyg	1	Y	H&S foraging
20:50	P.pyg	1	Y	H&S foraging
20:54	<i>Myotis</i> sp.	1	Y	H&S foraging
20:54	P.pyg	1	Y	H&S foraging
20:57 – 20:58	P.pyg	1	Y	H&S foraging
21:00 – 21:01	P.pyg	1	Y	H&S foraging
21:08	P.pip	1	Y	H&S foraging
21:12	P.pyg	1	Y	H&S foraging
21:14	P.pyg	1	Y	H&S foraging
21:16 – 21:17	P.pyg	1	Y	H&S foraging
21:20 – 21:23	P.pyg	1	Y	H&S foraging
21:26	P.pyg	1	Y	H&S foraging
21:37	P.pyg	1	Y	H&S foraging
21:39 – 21:41	P.pyg	1	Y	H&S foraging

Thermal Imaging Raw Data

Location#_Date: B15_040717	Recording Time:	Re- entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T025632213	_08:37:233	Y	n	bat flies around pipe on left row, furthers away from camera. Possibly briefly perches on pipe, Screenshot taken
				multiple bats forage throughout entire video, bats circle the pipes and possibly goes in and out of pipes very often, but it is not possible to determine those instances for sure.
Rec.T#: T031152965	_11:10:033	Y	n	Bat enters pipe on right row. screen shot taken
Rec.T#: T032753745				multiple bats forage throughout entire video, bats circle the pipes.
Rec.T#: T034051332				multiple bats forage throughout entire video, bats circle the pipes.
Rec.T#: T035601136				multiple bats forage throughout entire video, bats circle the pipes.
Rec.T#: T041115934				bats forage throughout video. Mouse (rat?) in the footage.
Rec.T#: T042629241				no bats
Rec.T#: T044156515				no bats
Rec.T#: T045712957				no bats
Location#_Date: B15_220817	Recording Time:	Re- entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T195711960		n	n	no bats
Rec.T#: T201213612		n	n	no bats
Rec.T#: T202739930	_01:47:567	n	n	bats foraging near the water. Throughout video bats are foraging along pipes and bridge, but not entering or emerging from pipes.
Rec.T#: T204303004		n	n	bats foraging near the water. Throughout video bats are foraging along pipes and bridge, but not entering or emerging from pipes.
Rec.T#: T205819856		n	n	bats foraging near the water. Throughout video bats are foraging along pipes and bridge, but not entering or emerging from pipes.
Rec.T#: T211341466	_01:30:967	n	n	bat flies up close to the thermal camera. Cool footage.
		n	n	bats foraging near the water. Throughout video bats are foraging along pipes and bridge, but not entering or emerging from pipes.
Rec.T#: T212856288		n	n	bats foraging near the water. Throughout video bats are foraging along pipes and bridge, but not entering or emerging from pipes.

Rec.T#: T214411926	_14:22:767	Y	Y	bat perch on a pipe on the right row of pipes, sit and calls, takes off again.
Rec.T#: T215944489	_00:07:899	Y	Y	bat perch on a pipe on the left row of pipes, sit and calls.
Rec.T#: T220722870	_03:14:467	N	Y	Bat emerges from pipe closest to camera on the left row of pipes.
Location#_Date:B15_06 0917	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T192731384		n	n	no bats
Rec.T#: T194325941		n	n	Several bats commuting and foraging under bridge. No emerging or re-entering bats
Rec.T#: T195917541		n	n	Several bats commuting and foraging under bridge. No emerging or re-entering bats
Rec.T#: T201731064		n	n	Several bats commuting and foraging under bridge. No emerging or re-entering bats
Rec.T#: T203303323		n	n	Several bats commuting and foraging under bridge. No emerging or re-entering bats
Rec.T#: T204856807		n	n	Several bats commuting and foraging under bridge. No emerging or re-entering bats
Rec.T#: T210558623		n	n	Several bats commuting and foraging under bridge. No emerging or re-entering bats
Rec.T#: T212615549	00:15:16:176	n	Y	Possible emergence of 1 bat from far side of bridge between longitudinal girder and abutment.
	00:15:36:867	Y	n	Possible re-entry of 1 bat from far side of bridge between longitudinal girder and abutment.
	00:16:28:700	Y	n	Possible re-entry of 1 bat from far side of bridge between longitudinal girder and abutment.
Location#_Date: B2_220617	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T01417178	_02:44:200	N	N	Continuous foraging by bats above bridge. Most bats pretty far away.
	_02:53:633	n	N	
Rec.T#: T015528738				Continuous foraging by bats above bridge. Most bats pretty far away.
Rec.T#: T021041475				Some foraging above bridge, but bats are very far away
Rec.T#: T022551812		n	n	Some foraging around and inside of bridge.
Rec.T#: T024105062		n	n	some foraging above bridge, but bats are very far away

Rec.T#: T025622814		n	n	some foraging above bridge, but bats are very far away
Rec.T#: T030629850		n	n	NO BATS
Location#_Date: B2_050717	Recording Time:	Re- entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T213143617		n	n	2 bats fly over bridge. No bats emerging or re-entering
Rec.T#: T214713676		n	n	Several bats commuting and foraging over and under bridge. No emerging or re-entering bats.
Rc.T#: T220251126		n	n	Several bats commuting and foraging over and under bridge. No emerging or re-entering bats.
Rec.T#: T221800204	00:12:24:033	n	N	
Rec.T#: T223413423		n	n	A couple of bats commuting and foraging over and around the bridge. No bats emerging or re-entering.
Rec.T#: T224918449		n	n	Several bats commuting and foraging over and under bridge. No emerging or re-entering bats.
Rec.T#: T230429254		n	n	Several bats commuting and foraging over and under bridge. No emerging or re-entering bats.
Rec.T#: T231944738		n	n	A couple of bats commuting and foraging over and around the bridge. No bats emerging or re-entering.
Location#_Date: B2_020817	Recording Time:	Re- entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T032603793	00:02:32:800	n	Y	1 bat emerges from between the first and second longitudinal girder.
	00:04:02:033	n	N	
Rec.T#: T034208426		n	n	Several bats commuting and foraging over and under bridge. No emerging or re-entering bats.
Rec.T#: T035739788		n	n	Several bats commuting and foraging over and under bridge. No emerging or re-entering bats.
Rec.T#: T041306201		n	n	A couple of bats commuting and foraging over and around the bridge. No bats emerging or re-entering.
Rec.T#: T042834667		n	n	Several bats commuting and foraging over and under bridge. No emerging or re-entering bats.
Rec.T#: T044347178		n	n	Several bats commuting and foraging over and under bridge. No emerging or re-entering bats.
Rec.T#: T045915838		n	n	no bats
Rec.T#: T051728930		n	n	no bats
Rec.T#: T053312442		n	n	no bats

Location#_Date: B3_200617	Recording Time:	Re- entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T015003699	_00:00:28:30 0	N	Y	Possible emergence 1 bat from opposite side of bridge where bridge meets abutment
	00:01:00:066	n	Y	Possible emergence 1 bat from opposite side of bridge where bridge meets abutment
	_00:01:29:80 0	N	Y	Possible emergence 1 bat from opposite side of bridge where bridge meets abutment
	_00_01:33:3 66	N	Y	Emergence 1 bat from between 2nd and 3rd longitudinal girder from the right.
	_00:05:25:03 3	N	n	
	_00:08:25:66 6	N	n	
	_00:13:27:10 0	N	n	
Rec.T#: T020513358	_00:01:25:13 3	N	N	
	00:06:43:800	n	N	
Rec.T#: T022025097	_03:33:267	n	n	Good footage. Several foraging bats under bridge
	_05:15:700	n	n	Good footage. Bat flying close to camera
				Lots of really good footage throughout entire recording, several bats foraging and socialising under the bridge.
Rec.T#: T023629777	_07:33:066	n	N	
				Good footage. Several foraging bats under bridge
Rec.T#: T025145617				Good footage. Several foraging bats under bridge. KF walks into frame at one point
Rec.T#: T030655583				barely any bats in video.
Rec.T#: T032208179				KF packing up in front of cam. No bats.
Location#_Date: B3_060717	Recording Time:	Re- entry: Y/N	Emergence: Y/N	Description:
Rec.T#: T211831680		n	n	no bats
Rec.T#: T213338698		n	n	Several bats commuting under bridge. No emerging or re-entering bats.
Rec.T#: T214852778	00:09:35:533	Y	n	1 bat re-enters in between 7th and 8th longitudinal girder from the left.
	00:09:40:133	n	Y	1 bat emergence from between 7th and 8th longitudinal girder from the left.
	00:10:47:833	Y	n	1 bat re-enters in between the 6th and 7th longitudinal girder from the left.

	00:10:53:633	n	Y	1 bat emergence from between 9th and 10th longitudinal girder from the left.
Rec.T#: T220407908	00:07:21:500	n	n	
	00:08:05:200 - 00:08:06:600	Y	n	2 bats re-entering, 1 between the 7th and 8th longitudinal girder from the left. 1 between the 8th and 9th longitudinal girder from the left.
	00:08:17:166	n	Y	1 bat emergence from between 7th and 8th longitudinal girder from the left.
	00:08:32:033	Y	n	1 bat re-enters in between the 6th and 7th longitudinal girder from the left.
		Y	Y	Several bats flying into and out of longitudinal girders, possible occasional use of longitudinal girders as a feeding perch.
Rec.T#: T221917480		Y	Y	Several bats flying into and out of longitudinal girders, possible occasional use of longitudinal girders as a feeding perch. Bats also constantly foraging and commuting under bridge.
Rec.T#: T223428089	00:15:02:834	Y	n	2 bats seen perching in-between 7th and 8th longitudinal girder on the second cross girder from the front.
Rec.T#: T224937929	00:00:25:900	n	Y	1 bat flies off from perch (other bat has left perch during footage transition)
		Y	Y	Several bats flying into and out of longitudinal girders, possible occasional use of longitudinal girders as a feeding perch. Bats also constantly foraging and commuting under bridge.
Rec.T#: T231520705	00:14:47:167	Y	n	1 bat seen perching between 6th and 7th longitudinal girder from the left perched on 6th cross girder from the front.
	00:15:49:447	Y		Perching bat flies climbs further up perch out of view between 6th and 7th longitudinal girder from the left perched on 6th cross girder from the front.
Location#_Date: B3_030817	Recording Time:	Re-entry: Y/N	Emergence: Y/N	Description:
REC.T#: T032835032		n	n	Multiple bats commuting and foraging under bridge and around bridge entrance. No bats seen emerging or re-entering.
Rec.T#: T034407237		n	n	Multiple bats commuting and foraging under bridge and around bridge entrance. No bats seen emerging or re-entering.
Rec.T#: T035923526	00:06:52:667	Y	n	3 bats re-enter into right-hand side of longitudinal girder
	00:07:35:467	Y	n	4 bats re-enter into right hand side of longitudinal girder

Recc.T#: T041440726	00:00:43:100	Y	n	1 bat re-enter into right hand side of longitudinal girder
	00:01:33:067	Y	n	1 bat re-enter into right hand side of longitudinal girder
	00:01:37:467	Y	n	1 bat re-enter into right hand side of longitudinal girder
	00:10:49:234	Y	n	1 bat re-enter into right hand side of longitudinal girder
	00:11:09:934	Y	n	1 bat re-enter into right hand side of longitudinal girder
	00:11:15:434	Y	n	1 bat re-enter into right hand side of longitudinal girder
	00:11:20:867	Y	n	1 bat re-enter into right hand side of longitudinal girder
	00:11:23:567	Y	n	1 bat re-enter into right hand side of longitudinal girder
	00:11:35:400	Y	n	1 bat re-enter into right hand side of longitudinal girder
	00:11:40:067	Y	n	1 bat re-enter into right hand side of longitudinal girder
Rec.T#: T042955880	00:00:05:466	Y	n	3 bats re-enter into right hand side of longitudinal girder
	00:00:12:633	Y	n	2 bats re-enter into right hand side of longitudinal girder
	00:00:28:100	Y	n	4 bats re-enter into right hand side of longitudinal girder
	00:00:52:899	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:01:04:466	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:01:13:66	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:03:16:733	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:03:26:233	Y	n	2 bats re-enter into right hand side of longitudinal girder
	00:03:31:966	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:08:36:800	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:08:40:266	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:08:42:166	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:09:00:233	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:09:13:333	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:09:54	Y	n	1 bat re-enters into right hand side of longitudinal girder

	00:09:56:666	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:10:08:533	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:11:05	n	Y	1 bat emerges from right hand side of longitudinal girder
	00:11:18:966	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:14:21:100	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:14:23:266	Y	n	1 bat re-enters into right hand side of longitudinal girder
Rec.T: T044508450	00:00:26	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:00:36:333	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:00:42:733	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:00:44:766	Y	n	2 bats re-enter into right hand side of longitudinal girder
	00:01:12:366	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:01:16:700	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:01:53:666	Y	n	2 bats re-enter into right hand side of longitudinal girder
	00:05:31:533	Y	n	3 bats re-enter into right hand side of longitudinal girder
	00:05:39:833	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:05:41:766	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:09:02:266	Y	n	2 bats re-enter into right hand side of longitudinal girder
	00:09:47:566	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:11:51:666	Y	n	1 bat re-enters into right hand side of longitudinal girder
	00:13:23:166	Y	n	1 bat re-enters into right hand side of longitudinal girder
Rec.T#: T050027220		n	n	several bats flying into and around bridge, no emergences or re-entries.
Rec.T#: T051540381		n	n	no bats