M42 Junction 6 Development Consent Order

Scheme Number TR010027

8.38 Bat Survey Report 2018

Planning Act 2008

Rule 8 (1)(e)

The Infrastructure Planning (Examination Procedure) Rules 2010

Volume 8

July 2019

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Examination Procedure) Rules 2010

M42 Junction 6 Development Consent Order

Development Consent Order 202[ ]

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Regulation Number	Rule 8(1)(e)
Planning Inspectorate Scheme Reference	TR010027
Document Reference	8.38
Author	M42 Junction 6 Project Team & Highways England

Version	Date	Status of Version
1	July 2019	Final

Table of contents

I. Automated static monitoring results
J. Associated bat reports

Figures:

List of Tables:

1. Introduction

1.1 Purpose of this document

1.1.1 This supplementary report provides further information on the baseline survey results recorded during the 2017-2018 bat surveys and supersedes the previous Appendix 9.5, Bat Report [**APP-133/Volume 6.3**].

1.1.2 The report presents the complete findings of the following two aspects of the 2017-2018 bat surveys that had not been completed and/or findings interpreted with sufficient time for consideration within Chapter 9: Biodiversity [**APP-053/Volume 6.1**].

Potential Roost Feature (PRF) surveys:

1.1.3 These were conducted with the following objectives:

i. to assess the potential of trees and built structures within the study area to support bat roosts; and

ii. to identify the species and categorise any roosts found in trees and built structures within the study area.

Bat activity surveys:

1.1.4 These were conducted with the following objectives:

i. to record bat activity levels and make observations on bat behaviour along four walked transects passing through a range of habitats within the study area;

ii. to record and identify levels of bat activity using static bat detectors at eight locations spaced within the study area; and

iii. to identify the species present and their relative abundance in terms of activity levels at these locations.

1.1.5 The baseline data presented in the Environmental Statement and supporting technical reports for bats includes all information relating to confirmed bat roosts and bat activity data from the periods of highest activity. As such, this baseline was considered sufficiently robust to identify and evaluate the potential impacts of the Scheme on these features, and to define the scope of mitigation, a point that Natural England have not disputed following submission of the Development Consent Order (DCO) application in January 2019.

1.2 Legislation

1.2.1 All species of bat and their roosts (whether bats are present or not) are protected under the Conservation of Habitats and Species Regulations 2017 [REF1] and under the Wildlife and Countryside Act 1981 (as amended) [REF2]. 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.

1.2.2 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.

1.2.3 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.

1.2.4 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). However, in accordance with the requirements of the Habitats Regulations a licence can only be issued where the following three tests are satisfied:

i. 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;

ii. there is no satisfactory alternative; and

iii. 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.

1.2.5 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.

1.2.6 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 (*Barbastella barbastellus*), Bechstein's bat (*Myotis bechsteinii*), noctule (*Nyctalus noctula*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared bat, greater horseshoe bat (*Rhinolophus ferrumequinum*) and lesser horseshoe bat (*Rhinolophus hipposideros*).

1.3 Biodiversity Action Plans

Highways England Biodiversity Plan in 2015

1.3.1 Highways England, through the national Road Investment Strategy (RIS) [REF3], 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.

1.3.2 Highways England published a Biodiversity Plan in 2015 [REF4] 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.

The Warwickshire, Coventry & Solihull Local Biodiversity Action Plan (DATE)

1.3.3 The Warwickshire, Coventry & Solihull Local Biodiversity Action Plan [REF5] for Bats lists all species of bats recorded in Warwickshire, Coventry and Solihull (Vice-county of Warwickshire along the lines of the historic county of Warwickshire) in addition to their current status, see **Table 1-1**.

Table 1-1 - Status of bats within the Vice-county of Warwickshire (Warwickshire, Coventry & Solihull)

Species	Status
Common pipistrelle *(Pipistrellus pipistrellus)*	Common, widespread, not threatened
Soprano pipistrelle	Common, widespread, not threatened
Nathusius' pipistrelle (*Pipistrellus nathusii*)	Rare, restricted, endangered
Brown long-eared bat	Common, widespread, not threatened
Noctule	Common, widespread, not threatened
Daubenton's bat *(Myotis daubentonii)*	Frequent, widespread, vulnerable
Whiskered bat (*Myotis mystacinus*)	Frequent, widespread, vulnerable
Brandt's bat (*Myotis brandtii*)	Frequent, widespread, vulnerable
Natterer's bat (*Myotis nattereri*)	Scarce, widespread, vulnerable
Leisler's bat (*Nyctalus leisleri*)	Scarce, widespread, vulnerable
Serotine *(Eptesicus serotinus)*	Scarce, widespread, vulnerable
Barbastelle	Rare, restricted, endangered
Lesser horseshoe bat	Scarce, restricted, endangered
Bechstein's bat	may be present/ unknown
Alcathoe bat *(Myotis alcathoe)*	may be present/ unknown

2. Methodology

2.1 Preliminary appraisal

2.1.1 A preliminary appraisal of trees, buildings and other man-made structures, together with an assessment of the value of habitats to commuting and foraging bats was undertaken between August 2017 and October 2018 as access to land parcels for the Scheme was obtained (see Chapter 3 The project of the Environmental Statement [**APP-048/Volume 6.1**]).

2.1.2 For the purpose of defining the survey area in accordance with IAN 116/0813 [REF6], both mature trees and structures within 100m would normally be considered as potential bat roosts. As such these would be assessed for indirect impacts as a result of disturbance and/ or change to environmental conditions, which could potentially make commuting, roosting or foraging unsuitable.

2.1.3 The spatial extent of the bat surveys needs to be proportionate to the likely ecological importance and impacts. Therefore, in order to provide a proportionate approach in the early design stages given the number of buildings, structures and mature trees located in proximity to the proposed junction improvements, only those buildings, structures and trees within the current Order Limits (where access was available) were assessed (see **Figure 9.5A (a), 9.5B (a)**).

2.1.4 The preliminary appraisal included initial daytime assessments of PRFs, commuting and foraging habitat, to aid the design of the various types of bat surveys necessary to inform specific bat-related impacts and mitigation measures. This information was assessed against **Table 2-1**.

2.1.5 This preliminary appraisal was also aided by:

i. a review of the previous bat survey work [REF7; REF8]; and

ii. a review of published bat surveys in support of a planning application for the proposed M42 Junction 6 Improvement scheme: Motorway Service Area (MSA) and New Junction between Junctions 5 & 6 [REF9; REF10].

Table 2-1 - Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement (Collins 2016).

Suitability	Description Roosting habitats	Description Commuting and foraging habitats
Confirmed Roost	Known roost where bats or evidence of bats has been recorded.	-
High	A tree or structure with one or more PRFs 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.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape

Suitability	Description Roosting habitats	Description Commuting and foraging habitats
		that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.
Moderate	A structure or tree with one or more PRFs 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).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
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). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Negligible	Negligible features likely to be used by bats for roosting.	Negligible habitat features on site likely to be used by commuting or foraging bats.

2.2 Daytime inspection of built structures

2.2.1 Daytime roost inspections of all accessible built structures (bridges and buildings) within the order limits were undertaken between December 2017 and October 2018. The details of structures surveyed (buildings and bridges), including those with access limitations, are presented in **Table 3-1**. This table also details those structures that were initially included within the survey area but have been scoped out of further assessment due to the location outside the order limits, building and bridge (structure) numbers have not been changed. These assessments were undertaken by experienced and licensed bat ecologists (Class License WML CL18; Level 2).

2.2.2 The inspections took into account standard guidance provided by the Collins (2016) [REF11], Mitchell Jones (2004) [REF12] and Mitchell-Jones & McLeish (2004) [REF13].

2.2.3 The surveys entailed a direct search for evidence of bats on both internal and external features of the structures. The inspections were carried out from the ground and from a ladder; other supporting equipment included close focusing binoculars, a powerful torch, endoscope and mirrors. The structures were examined externally for features that could support roosting bats and features that could lead to internal potential roost spaces. The structures were subject to detailed internal examination, including the roof void (when safe to do so), assessing the roof timbers, beneath roofing felt and thatch where possible, the ridge line, and behind timber cladding.

2.2.4 The suitability of the wider landscape for bats was also assessed, including the connectivity of habitats immediately adjoining the Order Limits.

2.2.5 The presence of roosting bats can be spotted through signs such as accumulations of moth or butterfly wings or bat droppings and staining and/ or scratch marks around potential entrance and exit points. However, the absence of droppings/ evidence cannot be treated as conclusive evidence that bats are not present, and therefore an assessment was made of the potential of the building to support bats based on the scale provided in **Table 2-1**.

2.3 Ground level tree assessment

2.3.1 Ninety-two trees or tree groups were assessed in April 2017 during surveys for the Stage 2 route options (WSP 2017a). A number of these trees were re-visited in July – September 2017 and April – October 2018 to separate out groups of trees and undertake Ground Level Tree Assessment (GLTA) where access was not previously available (see Limitations at section 2.14). A GLTA of a further two hundred and twenty trees and one tree group was undertaken between April and October 2018.These assessments were undertaken by a licensed bat ecologist (Class License WML CL18; Level 2), aided by a torch and binoculars.

2.3.2 During the GLTA, features considered to provide suitable roost sites for bats such as the following were sought (also see **Table 2-1** for details on roost categorisation):

i. Trunk cavity - Large hole in trunk caused by rot or injury;

ii. Branch cavity - Large hole in branch caused by rot or injury;

iii. Trunk split - Large split/fissure in trunk caused by rot or injury;

iv. Branch spilt - Large split/fissure in branch caused by rot or injury;

v. Branch socket cavity - Where a branch has fallen from the tree and resulted in formation of an access point in to a cavity;

vi. Woodpecker hole - Hole created by nesting birds suitable for use by roosting bats;

vii. Lifted bark - Areas of bark which has rotted/lifted to form suitable access point/ roost site for bats;

viii. Hollow trunk - Decay in heartwood leading to internal cavity in trunk;

ix. Hazard beam failure - Where a section of the tree stem/branch has failed causing collapse and leading to longitudinal fractures/splits/cracks along; and

x. Ivy cover - Dense/mature ivy cover where the woody stems could create small cavities/crevices.

2.3.3 In some instances where it was not possible to fully assess a tree from every angle, a precautionary approach was adopted with the trees being categorised as moderate or high suitability to ensure further detailed inspections were undertaken.

2.4 Roost Presence/Absence and Characterisation Surveys - Structures

2.4.1 Three built structures were recorded as providing suitability for roost bats, namely:

- B1 Heath End House;
- S1 a bridge under the A45; and
- S2 a culvert under the M42.

2.4.2 Where the preliminary PRF assessment concluded that a structure within the Order Limits had low, moderate or high suitability, further surveys were undertaken.

2.4.3 These further surveys comprised emergence and re-entry surveys to assess current usage by bats, including species, number and where possible roost characterisation. These surveys entail observers noting whether bats emerged from, or entered roosting sites, their foraging/ commuting activity and other behaviour using direct observation and bat detectors. These surveys were undertaken, following best practice outlined in Collins (2016) [REF11], as well as the Bat Workers Manual [REF13].

2.4.4 Roost emergence and re-entry surveys were undertaken at one building, a confirmed roost site at B1 Heath End House. In line with published guidance, this building was subject to three survey visits; one evening emergence survey and two dawn re-entry surveys undertaken between May and September 2018.

2.4.5 Two other built structures, S1 a bridge under the A45 and S2 a culvert under the M42, were assessed as providing Low suitability for roosting bats and in line with published guidance subject to one emergence survey.

2.4.6 Emergence surveys commenced approximately 15 minutes before sunset, finishing 1.5-2 hours after sunset. Dawn/ re-entry surveys commenced 1.5-2 hours before sunrise, finishing approximately 15 minutes after sunrise. Surveys were undertaken in good weather conditions, within the range of conditions required by published guidance. A licenced ecologist (Class License WML CL18; Level 2) was present during each survey visit.

2.4.7 During the dusk and dawn survey periods the surveyors observed potential access/egress points. Surveyors carried full spectrum bat echolocation detectors[1] to assist in detecting bats and species identification.

2.4.8 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. All sound files were analysed using AnalookW software, where possible down to species level following the call parameters outlined in Russ (2012) [REF14].

[1] Elekon Batlogger M, Wildlife Acoustics Echometer Touch Pro, Wildlife Acoustics SM2, Batbox Duet

2.5 Aerial survey, presence/absence and roost characterisation surveys - Trees

2.5.1 A large number of trees containing PRFs are present within the Order Limits. The spatial extent of the roost surveys needs to be proportionate to the roost suitability and therefore the likely ecological importance and impacts. In order to provide a proportionate approach given the large number of mature trees located in proximity to the Scheme, it was necessary to differentiate between roost suitability types in line with standard guidance (Collins 2016) [REF11].

2.5.2 Furthermore, roost switching behaviour is acknowledged as common amongst tree dwelling bat species, which causes tree roosting data to generally have a shorter validity period than building roosting data. As a result of this, individual trees may only form part of the roosting requirements of individual roosting bats in any one season (Forestry Commission England (2005)) [REF15].

2.5.3 Further surveys were not undertaken for trees with negligible or low suitability PRFs (identified from the ground level tree assessments) in line with standard guidance.

2.5.4 Due to the extensive survey area, it was considered sufficient to include on plans and in the results tables only those trees assessed to provide low, moderate or high suitability for roosting bats, in addition to confirmed roosts, see **Figure 9.5B (a)**.

2.6 Aerial tree inspections

2.6.1 Where safe to do so, and access was available, an aerial PRF inspection (tree climbing survey) was undertaken of all trees with moderate and high roosting suitability within the Order Limits.

2.6.2 The aim of this survey was to identify and locate signs of bats or bat roosts within trees. In addition the survey enabled a more accurate assessment of bat roosting potential through close examination of PRFs to re-classify (downgrade or upgrade) PRFs where appropriate. Any trees downgraded to low suitability were not subject to further survey effort.

2.6.3 These surveys were undertaken by staff certified to both climb trees and perform aerial rescue and who held a Natural England bat survey licence (Class License WML CL18; Level 2). The climbing methodology used follows that detailed within the Arboriculture and Forestry Advisory Group (AFAG) Tree Climbing Operations Leaflet (AFAG40115) [REF16].

2.6.4 Features identified as providing potential to support roosting bats during the climbing inspection were examined using endoscopes, mirrors and torches. Evidence of bat occupation sought included: the physical presence of bats, droppings, urine staining, and mammalian oil staining. Identification and assessment of PRFs was based on methods, examples and the combined experience of ecologists as described in the Bat Tree Habitat Key [REF17; REF18].

2.7 Presence/absence and roost classification survey or trees

2.7.1 The following details the approach taken for further surveys (based on the results of the GLTAs and where applicable a subsequent aerial PRF survey).

2.7.2 Trees with moderate and high suitability for roosting bats within Order Limits were subject to two (moderate) or three (high) survey visits (emergence and re-entry surveys). Due to changing boundaries and land access limitations some trees with suitability for bats were not surveyed, further details are provided in Section 2.14.

2.7.3 Where it was considered that sufficient, recent data collected by third parties (e.g. as part of Planning or European Protected Species (EPS) Mitigation Licence applications undertaken to inform unrelated developments) was available for a tree assessed as offering Moderate or High potential or a confirmed roost once survey was undertaken. This information was considered when determining the need for further survey work. This was particularly relevant to trees within a section of the Scheme boundary subject to recent surveys in 2018 [REF10] (Annex J).

2.7.4 Emergence surveys commenced approximately 15 minutes before sunset, finishing 1.5-2 hours after sunset. Dawn/re-entry surveys commenced 1.5-2 hours before sunrise, finishing approximately 15 minutes after sunrise.

2.7.5 Surveys were undertaken in good weather conditions, within the range of conditions required by published guidance. A licenced ecologist (Class License WML CL18; Level 2) was present during each survey visit.

2.7.6 During the dusk and dawn survey periods the surveyors observed potential access/egress points. Surveyors carried echolocation detectors (Elekon Batlogger M, Batbox Duet) to detect bats and assist in species identification.

2.7.7 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. All sound files have been analysed using Analook W software, with some recordings made using Batbox Duet detectors analysed using Batsound 3.31. Where possible species identification was made to species level following the call parameters outlined in Russ (2012) [REF14].

2.7.8 A FLIR T1010 thermal imaging camera was used on tree roost surveys of confirmed roosts to supplement identification and counts of bats roosting at the trees.

2.8 Bat hibernation scoping surveys

2.8.1 No underground sites or features suitable to support hibernating bats have been identified within the Order Limits to date. No specific hibernation surveys were undertaken on building B1 during the winter of 2017/2018 as features for possible hibernation such as under ridge tiles, inside cavity walls were inaccessible for survey. Building B1 was assessed to have potential to support no more than one or two individual overwintering bats.

2.9 Swarming surveys

2.9.1 No underground sites or features suitable to support large numbers of hibernating bats were identified within the Order Limits. No specific swarming surveys were undertaken as no suitable locations have been identified.

2.10 Bat activity surveys

2.10.1 The number of bat activity surveys required to achieve a reasonable survey effort was assessed in relation to habitat suitability following the Bat Conservation Trust Bat Surveys for professional Ecologists (Collins, 2016) [REF11].

2.10.2 The habitat suitability for foraging and commuting bats was assessed by WSP in April 2017 [REF7] to be of Moderate value given the connective habitats present. This was reconfirmed in Spring 2018 in advance of activity surveys based on the refinement of the Scheme.

2.10.3 One survey visit per month (April to October) was proposed, in appropriate weather conditions with one dusk/dawn survey conducted within the same 24 hour period, in line with survey guidelines shown in **Table 2-2**.

Table 2-2 - Guidelines on the number of bat activity surveys recommended to achieve a reasonable survey effort in relation to habitat suitability (Collins, 2016).

Survey type	Low suitability habitat for bats	Moderate suitability habitat for bats	High suitability habitat for bats
Transect/spot count/timed search surveys	One survey visit per season (spring – April/May, summer – June/July/August, autumn – September/October)[1] in appropriate weather conditions for bats Further surveys may be required if these survey visits reveal higher levels of bat activity than predicted by habitat alone	One survey visit per month (April to October)[1] in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period.	Up to two survey visits per month (April to October)[1] in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period.
AND			
Automated/static bat detector surveys	One location per transect, data to be collected on five consecutive nights per season (spring – April/May, summer – June/July/August, autumn – September/October)[1] in appropriate weather conditions for bats	Two locations per transect, data to be collected on five consecutive nights per month (April to October)[1] in appropriate weather conditions for bats	Three locations per transect, data to be collected on five consecutive nights per month (April to October)[1] in appropriate weather conditions for bats

[1]. April, September and October surveys are both weather- and location-dependent. Conditions may become more unsuitable in these months, particularly in Scotland, which may reduce the length of the survey season.

2.11 Walked transects

2.11.1 In line with habitats of Moderate value one survey visit per month (April to October) was undertaken (see **Table 2-3**).

2.11.2 Previously six transect routes had been followed for the period July to October 2017 [REF8] when the Scheme was at route selection stage. With the Scheme refined to a preferred route in August 2017, as agreed with Natural England in April 2018, two of the previous transect routes were discontinued and one modified to take in a small area covered by one of the two removed transects.

2.11.3 Each transect survey involved two surveyors walking a pre-determined route which included a series of 'spot counts' selected to represent the different habitats in the survey area. At each 'spot count', the surveyors remained stationary for short, set period of time (3-5 minutes) and, using bat echolocation detectors, bat activity was noted as well as bat flight direction. Any additional activity encountered whilst walking between spot counts was also recorded.

2.11.4 The survey route was designed to include potential flight paths or foraging areas within the Order Limits and mature trees, which offer potential roost sites. The starting point and direction of the transect was varied during each survey visit in order to ensure different areas of the transect were walked close to dusk. The transect routes are shown on **Figure 9.5C (a)**. Transect surveys were undertaken in appropriate weather conditions with, during the series of surveys, one dusk/dawn survey conducted within the same 24 hour period.

2.11.5 Surveyors carried echolocation detectors (Elekon Batlogger M) to help determine the species present. In accordance with the survey guidelines (Collins 2016) [REF11], dusk surveys were carried out from sunset to at least two hours after dusk, and dawn surveys commenced two hours before sunrise, until sunrise. All surveys were undertaken during favourable weather. 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. All sound files were analysed using Analook W software, where possible down to species level following the call parameters outlined in Russ (2012) [REF14].

2.12 Automated detector surveys

2.12.1 Static monitoring with automated bat detectors were not undertaken as part of the 2017 surveys. In 2018 eight static monitoring locations (two per transect) were established (in accordance with the guidelines presented in **Table 2-3)**. At each monitoring point static detectors were deployed for a minimum of five consecutive nights in appropriate weather conditions for bats each month from April to October 2018.

2.12.2 SM2BAT+/SM4BAT Full Spectrum automated bat detectors were placed at the eight monitoring locations as shown in **Figure 9.5C (a)**. The locations of the automated detectors were determined in order to cover a variety of habitat types and locations across the Order Limits, based upon suitable bat foraging and commuting features. The detectors were placed in the same location during each survey period to allow for quantitative analysis to be undertaken.

2.12.3 The static detector data collected were analysed to determine the total number of bat passes for each species or species group (depending on the level of identification possible from the recordings made) and then used to derive a metric; the Bat Activity Index (BAI) for the relative bat activity per hour at each survey location. This analysis provides an indication of:

i. seasonal variation in species activity and composition at each survey location;

ii. relative levels of bat activity across the Site; and

iii. potential roosting sites, important foraging areas and commuting routes.

2.12.4 BAI values for the site are calculated by averaging the number of bat passes per hour. Full automated detector results for each month were used to calculate the BAI for each location and gives an indication of bat abundance and activity at a particular location per month.

2.12.5 The term 'pass' is defined as a single file made up of bat pulses of a single species i.e. this may be one bat or many bats in a single file. No guidance is available on what constitutes low, moderate or high bat activity based on number of passes. As such a relative scale called a 'bat activity value' is used in this report where:

i. Very Low Activity is less than 2 passes per hour (mean/hr over the five nights at each survey location)

ii. Low Activity is 2 to 25 passes per hour;

iii. Moderate Activity is 26 to 99 passes per hour; and

iv. High Activity is over 100 passes per hour.

2.13 Evaluation of commuting and foraging habitats for bats

2.13.1 The relative ecology and nature conservation value of any bat populations associated with the Scheme is assessed in line with the principles described in Valuing Bats in Ecological Assessment (Wray et al. 2010) [REF19].

2.14 Limitations and assumptions

General

2.14.1 Ecological surveys are limited by factors which affect the presence of animals such as the time of year, migration patterns and behaviour.

2.14.2 Bat roosts are transient, and bats may make use of landscape features outside of the survey dates and in the future.

2.14.3 The absence of bat activity from any particular location during the surveys cannot be taken as conclusive proof that the species is not present or that it will not be present in the future.

2.14.4 Whilst the roost categories attempt a standard terminology, there would be instances where an experienced ecologist may categorise a structure as having lower potential to support roosting bats than based purely on the features of the structure. For example, sources of disturbance may reduce the potential of a feature to support roosting bats, such as exterior light spillage reducing the potential for light sensitive species, or proximity to fast moving road or rail traffic. The potential of a structure which appears to have features suitable for roosting bats but which is isolated from suitable foraging and commuting habitat may also

be reduced. Conversely, good foraging and commuting habitat directly adjacent to a structure can enhance the potential for roosting bats.

2.14.5 The identification of individual *Myotis* species are difficult to separate based on echolocation calls alone (Russ 2012) [REF14]. Where it was not possible to differentiate calls to species level, the genus or likely bat species (based on other relevant observations) are documented instead.

2.14.6 Calls from brown long-eared bats are directional and usually very quiet, which makes them difficult to pick up using the detector. In order to reduce the significance of this limitation, visual observation was used to complement recordings, which enabled the location of such species to be identified during the surveys.

2.14.7 Long-eared bats encountered are assumed to be brown long-eared as the grey long-eared bat's range is restricted to southern England (Barlow and Briggs 2012) [REF20].

Buildings and Structures surveys

2.14.8 Constraints to the survey area were presented by difficulties in obtaining access, with **Figure 9.5D (a)** showing the extent of the accessible site. Some areas of the survey area remained inaccessible throughout the survey period and some other areas had periodic reduced access. A reasonable effort was made at all times to gain access to the survey areas within the Order Limits.

2.14.9 Within the Order Limits structures (bridges and culverts) S2, S3, S4, S5, S6, S6, S8, S9 S10 and S11) were inaccessible or only partly accessible due to access restrictions to rail lines and the M42 carriageway for health and safety reasons. At these locations a provisional assessment based on a combination of what was determined from a reduced access survey and inspection of aerial maps, details are provided in **Table 3-1**, with full survey results/assessment and an explanation of any further limitation or justification for accepting a reduced survey effort (through lack of access) detailed in Annex A.

2.14.10 Within the Order Limits one building, B4 the Warwickshire Gaelic Athletic Association Clubhouse, was not accessible during the survey period. Efforts will be made to gain access to these small group of buildings within the scope for 2019 bat surveys.

Trees

2.14.11 Constraints to the survey area were presented by difficulties in obtaining access agreements, with **Figure 9.5D (a)** showing the extent of the accessible site. Some areas of the survey area remained inaccessible throughout the survey period and some other areas had periodic reduced access, including revoked access. As the Order Limits were refined during the course of surveys, this changed the scope of required surveys; in some instances (as detailed below), this occurred at a time when it was not possible to complete surveys within the recommended survey periods. Reasonable efforts were made at all times to gain access to the survey areas within the Order Limits.

2.14.12 Tree T90 rated as providing High suitability for bats was subject to one roost survey rather than three due to access to this location being revoked during the course of surveys. Where access permits additional surveys will be added to the scope for 2019 bat surveys.

2.14.13 A roost survey was not undertaken at Tree T88 (moderate suitability) for health and safety reasons as this tree was located on Catherine-de-Barnes road, with the adjoining field not accessible. Additional surveys will be added to the scope for 2019 bat surveys if safe access can be obtained.

2.14.14 At tree T17.2, which supports a confirmed roost of one common pipistrelle bat, two of the three dusk/dawn surveys completed were undertaken in September (guidance states no more than one of the surveys should be undertaken in September). The tree was initially appraised as having Moderate potential following tree climbing surveys, with bats confirmed only during the second survey visit in early-September; no bats were recorded during the final visit. Although one of the surveys was sub-optimal, given the evidence from both tree climbing and nocturnal surveys it is considered that no significant roosts are present and that the data collected is sufficient to evaluate the status of the roost that is present.

2.14.15 Tree group T25 was not subject to roost surveys as following the initial GLTA in April 2017 and updated GLTA assessment were completed in October 2018. Roost surveys at these trees will be added to the scope for 2019 bat surveys. It noted, however, that roost surveys were undertaken at neighbouring trees on six occasions in 2018 with no bat activity associated with roosting bats recorded at these adjacent trees (i.e. no large number of bats indicating a significant roost was present within the vicinity) and is therefore not considered a limitation to the agreed bat licencing decision as per Natural England's letter of no impediment.

2.14.16 Refinements of the Scheme boundary resulted in some trees being scoped out of tree climbing and roost surveys. In selected cases some of these trees were then brought back within the Order Limits after the period for further roost surveys had been passed. These trees: T43, T46, T49, T50, T54, T119, T121 and T144 rated as High; T116, T117, T118, T120, T122, T221, & T222 rated as Moderate and T235 rated as High. None of these trees would be lost due to the Scheme and any potential impacts would be limited to indirect impacts resulting from proximity disturbance from nearby construction and or habitat enhancement works (such as noise and light pollution). Thus it is not considered to affect the assessment. Recommended further surveys will be added to the scope for 2019 bat surveys.

2.14.17 Late land access agreements and refinements of the Scheme boundary resulted in updates to GLTA in October; which identified further trees where further climbed surveys and /or roost emergence /re-entry surveys are recommended: T261, T272, T274, T277, T281, T284 and T298 rated as High; T262, T263, T267, T268, T269, T270, T276, T278, T280, T282, T289, T295, T303 and T311 rated as Moderate. None of these trees would be lost and any potential impacts would be limited to indirect impacts resulting from proximity disturbance from nearby construction and or habitat enhancement works (such as noise and light pollution). Thus it is not considered to affect the assessment. Recommended further surveys will be added to the scope for 2019 bat surveys.

2.14.18 Trees within the Order Limits and located within the boundaries of Bickenhill Meadows Site of Special Scientific Interest (SSSI) were scoped out of further surveys after the initial GLTA as these will not be impacted by the Scheme.

Activity surveys

2.14.19 Walked transects and static monitoring was not undertaken in April 2018, due to access arrangements. As transects in April are considered sub-optimal (see **Table 2-2**) this is not considered a significant constraint.

2.14.20 As a result of land access restrictions:

- the June Transect 1 survey was cancelled;
- both the July dusk and dawn Transect 4 surveys were slightly reduced in length; and
- access to Transect route 2 was unavailable for the September and October.

2.14.21 Notwithstanding the above, the description and overall results of bat activity across the Order Limits is considered sufficient to inform the assessment.

Equipment

2.14.22 Different bat detector equipment and analysis software was used for the 2017 and 2018 transects, reducing the scope to compare data across years.

Hibernation surveys

2.14.23 Hibernation sites within buildings suitable to support individual/low numbers of overwintering bats have not been surveyed, as the aim of the hibernation survey was defined as to identify any important hibernation sites that are used by larger number of bats. The potential of buildings, structures and trees to provide suitable hibernation roosts have been assessed as part of the inspection of these features for roosting suitability. This is not considered to limit the results.

3. Results

3.1 Buildings/structures

Preliminary Appraisals

3.1.1 Within the Order Limits four buildings and twelve other built structures were identified for survey and assessment. Results of this are summarised in **Table 3-1**, with locations of buildings and other structures shown in **Figure 9.5A (a)**. The table includes buildings that we originally identified within earlier iterations of the survey area, but have been subsequently scoped out due to falling outside the defined Order Limits. Full results of the survey assessments are shown in Annex A.

3.1.2 At B1 Heath End House small roosts of brown long-eared bats and *Pipistrelle* species were confirmed through small numbers of bat droppings found inside roof voids in March and August 2018. The building could provide some limited hibernation potential within cavity walls or the roof void itself.

3.1.3 Two structures, S1, East Way bridge under the A45, and S2, culvert for Hollywell Brook under M42 were both assessed as providing low suitability for roosting bats, see full results at Annex A for details.

Table 3-1 - Summary of buildings and structures assessed for bat potential

Reference Building /Structure	Brief description	Likely Impacts	Status
B1	Heath End House. Detached bungalow.	Direct Loss	Small brown long-eared day roost. Small common pipistrelle day roost. Local significance only
B2	Birmingham Dogs Home. Recently constructed dog kennels and associated buildings.	None anticipated. Outside Order Limits	Scoped out
B3	Detached House on Catherine-de-Barnes Lane.	None anticipated. Outside Order Limits	Scoped out
B4	Páirc na hÉireann (Gaelic Athletic Association). Clubhouse and associated buildings.	Presumed direct loss	Unknown (no access) Further surveys scheduled for June 2019
B5	A series of three small wooden sheds off Catherine-de-Barnes Lane.	Direct Loss	Negligible potential
B6	Sewage Pumping Station off Clock Lane.	None	Negligible potential

Reference Building /Structure	Brief description	Likely Impacts	Status
B7	Detached House and outbuildings.	None anticipated. Outside Order Limits	Scoped out
B8	National Motorcycle Museum/National Conference Centre.	None anticipated. Outside Order Limits	Scoped out
B9	DHL, Middle Bickenhill Lane.	None anticipated. Outside Order Limits	Scoped out
B10	Two houses and outbuildings at Middle Bickenhill Lane.	None anticipated. Outside Order Limits	Scoped out
B11	Two detached houses and associated outbuildings off Solihull Road B4102, east of M42.	None anticipated. Outside Order Limits.	Scoped out
B12	Boswell Caravan Park. Includes static homes and several small permanent buildings	None anticipated Outside Order Limits	Scoped out
S1	Bridge under A45 at East Way.	None anticipated.	Low. Single roost survey completed: no bats present
S2	Culvert for Hollywell Brook under M42.	Direct Impacts, culvert extension anticipated	Low Single roost survey completed: no bats present
S3	Bridge East Way over M42.	None anticipated	Negligible potential*. Part accessed
S4	A45 over Railway.	None anticipated	Negligible potential*. No access.
S5	M42 over Railway.	None anticipated	Negligible potential*. No access
S6	Field access bridge over M42.	None anticipated	Negligible potential*. Part accessed
S7	Bridge: Shadowbrook Lane over M42.	None anticipated	Negligible potential*. Part accessed
S8	Bridge: Solihull Road over M42.	Direct Loss	Negligible potential*. Part accessed
S9	Bridge: Friday Lane over M42.	None anticipated	Negligible potential*. Part accessed
S10	Existing M42 Junction 6 bridges.	None anticipated	Negligible potential*. No access

Reference Building /Structure	Brief description	Likely Impacts	Status
S11	Bridge: M42 over River Blythe.	None anticipated	Negligible potential*. No access.
S12	Bridge. Catherine-de-Barnes Lane under A45 Clock roundabout	None anticipated	Negligible potential.

*: reduced access, see full results at Annex A for details.

Roost surveys – Buildings and other structures

3.1.4 At B1 Heath End House roost surveys undertaken in May and June recorded no bats confirmed as exiting or entering the building however on 30 May 2018 a single brown long-eared bat was recorded flying outside the building at a time that would correspond with emergence. During a dawn survey on 4 September 2018 four common pipistrelle bats were observed to re-enter the building at verge gaps on the south-western corner. Full results of the roost surveys of buildings and structures are shown in Annex B and Figure F. Raw data for the confirmed roost is provided in Annex G.

3.1.5 B1 is confirmed as a small day roost for brown long-eared (maximum count one) and common pipistrelle (maximum count four) bats. These small day roosts are assessed to be of low conservation significance.

3.1.6 Single visit roost surveys were undertaken at two structures assessed as providing Low potential for bats; S1, East Way bridge under the A45, and S2, culvert for Hollywell Brook under M42. No bats were recorded roosting at either feature and bats are considered absent from these structures.

3.2 Trees

Ground Level Tree Assessment (Preliminary Appraisal)

3.2.1 Following the GLTA forty-five trees were assessed as high suitability, one hundred and forty-one trees rated as moderate suitability and one hundred and twenty-six trees rated as low suitability for bat roosts. Full results of the GLTA are presented in Annex C. Constraints to the survey area with respect to access agreements, refer to **Figure 9.5D (a)** and section 2.14, resulted in small areas being brought forward to the scope for 2019 bat surveys.

Aerial Tree Inspections

3.2.2 Trees rated as providing moderate or high suitability for bats by the initial GLTA within the Order Limits were subject to further direct inspection through a tree climbing survey. Nineteen trees were rated as high, thirty-five trees as moderate, thirty-one low and three downgraded to negligible suitability for bats. Full results of the tree climbing assessment of trees are given in Annex D. A further thirty-four trees, twelve rated as high suitability and twenty-two as Moderate, were brought forward to the scope for 2019 bat surveys (see Limitations at section 2.14).

3.2.3 No evidence of confirmed bat roosts, from droppings or actual bats present, was found during any GLTA or climbed inspection of trees.

3.2.4 A summary of all trees rated as providing high or moderate suitability within the boundary of the Order Limits, including initial GLTA assessment and any change following climbed surveys, is shown in Annex E. The location of trees and with bat roosting potential is shown in **Figure 9.5B (a)**.

Roost surveys – Trees

3.2.5 Fifty-three trees were taken forward for roost surveys from the initial assessments and subsequent tree climbing, as detailed above and in Annex E. Where access was not available during the survey season or changing site boundaries affected the number of trees within the Order Limits further roost surveys are scheduled for 2019, see Limitations at Section 2.14.

3.2.6 Confirmed roosts of one or two individual common species were recorded at trees T17, T21, T80, T83, T85.2 and T242. A summary of roosting status at these trees is provided in **Table 3-2** and **Figure 9.5F (a)**. Results of tree roost surveys for these six confirmed tree roosts, together with all tree roost surveys is provided in Annex F. Raw data for the confirmed roosts is provided in Annex G.

Table 3-2 - Summary of roosting status of confirmed tree roosts

Tree number	Tree species and initial bat roosting suitability assessment score	Species and maximum count	Roost status
T17	*Quercus robur* Moderate	One common pipistrelle	Small day roost. Max count 1 Local significance only.
T21	*Quercus robur* Moderate	One common pipistrelle (suspected roost)	Small day roost. Max count 1 Local significance only.
T80	*Fraxinus excelsior* Moderate	Two soprano pipistrelle	Small day roost. Max count 2 Local significance only.
T83	*Quercus robur* High	Two common pipistrelle	Small day roost. Max count 2 Local significance only.
T85.2	*Fraxinus excelsior* High	Four soprano pipistrelle	Small day roost. Max count 4 Local significance only.
T242	*Populus alba* High	One soprano pipistrelle	Small day roost. Max count 1 Local significance only.

3.2.7 During roost surveys of trees, common pipistrelle, soprano pipistrelle and noctule bats were frequently observed and recorded across the site, foraging near trees and commuting along hedge lines. Occasional *Myotis* species bats and a couple of brown long-eared bat calls were also recorded foraging or commuting near to surveyed trees.

3.2.8 Assessments of trees undertaken by a third party [REF10] in conjunction with a nearby proposed development included trees within the Order Limits. The results of these 2014 surveys confirmed roosts at two trees within the Order Limits; (this documents reference numbers) T9 and T76.

3.2.9 Surveys undertaken 2018 for the DCO application, confirmed a roost within a further tree within the Order Limits, T239, but no evidence of roosting bats was recorded at the two previously recorded tree roosts (T9 and T76) and the roost feature at T9 was reported as no longer present [REF10] (Annex J).

3.2.10 A minimum one emergence or dawn survey was undertaken at these three trees during this study between May and September 2018, irrespective of roost potential status; no roosting bats were recorded. A summary of the roost status of these trees is provided in **Table 3-3**.

Table 3-3 - Roost status of other tree roosts within the Order Limits

Tree number	Tree species	Previous roost record (Wardell Armstrong, 2018b)	Results of this study, roosting suitability status and emergence/ re-entry survey results	Status
T9	*Quercus robur*	Single brown long-eared dropping recorded in 2014	Suitability rating: Moderate Roost survey: No bats recorded	Small day roost Local significance only
T76	*Quercus robur*	Multiple brown long-eared droppings recorded in 2014. Feature no longer present in 2018.	Suitability rating: Low Roost survey: No bats recorded	Roost feature no longer present
T239	*Fraxinus excelsior*	Single *Myotis* species observed in a frost crack in 2018.	Suitability rating: Moderate Roost survey: No bats recorded	Small day roost Local significance only

Hibernation surveys

3.2.11 An assessment of the potential for trees to support hibernation bat roosts was made during the course of GLTA and climbed inspections based on the potential or confirmed presence of deep cavities. The results of these assessments are presented in Annex E.

3.3 Bat activity surveys – walked transects

3.3.1 The following species or species groups were recorded during the survey work undertaken: Common pipistrelle; soprano pipistrelle; *Pipistrellus* species (either common or soprano pipistrelle); noctule; *Nyctalus* species (either Leisler's bat or noctule); *Myotis* species and brown long-eared bat.

3.3.2 A summary of the results of transect survey undertaken from May to October 2018; together with results from the relevant transects previously undertaken in 2017 (WSP 2017a) (see Annex J) is provided in **Table 3-4**. Full transect survey results from 2018 are given in Annex H and shown on **Figure 9.5E (a)**. Full results of Transects July, August, September and October 2017 are detailed in WSP Bat Activity Survey Report November 2017 [REF8] (Annex J).

3.3.3 Common pipistrelle was the most common bat recorded during walked transect surveys, followed by noctule on Transect routes 1 and 2; and by soprano pipistrelle on Transect routes 4 and 5. It is important to note that a comparison of the relative occurrence of each species should be treated with caution due to the different way different species of bats echolocate and the range at which different species calls can be received on bat detectors (Russ 2012) [REF14], for instance long-eared bats are likely to be under recorded due to their quiet calls.

3.3.4 Comparisons of the same species between different transect routes and different times of year are, however, valid. These comparisons show the most active areas of the site are along Transect route 2, located to the west of the proposed route on or near semi-improved grassland west of Páirc na hÉireann (Warwickshire Gaelic Athletic Association). Noctule bats were particularly active at this location in June 2018.

3.3.5 The bat activity surveys completed between July and October 2017 and between May and October 2018 recorded bat foraging and commuting activity on all transects across the Order Limits. The vast majority of activity was by common pipistrelle, with soprano pipistrelle, noctule, *Nyctalus* species and *Myotis* species occasionally recorded. The levels of activity are considered to be low and typical of the habitats present and are not considered to be high; no significant differences in seasonal activity levels were noted. The highest levels of bat activity recorded were along hedgerows in fields to the west of Catherine-de-Barnes Lane (including on or near semi-improved grassland west of Páirc na hÉireann: WGAA) and in the vicinity of Aspbury's Copse. Activity was also recorded along hedgerows, tree lines and plantation woodland immediately east of the M42, and along hedgerows between Catherine-de-Barnes Land and the M42. The lowest levels of activity were recorded in the north of the study area east of Catherine-de-Barnes.

Table 3-4 - Walked transect results summary

Transect 1

Species	July 2017	Aug 2017 dawn	Sept 2017 dusk	Sept 2017 dawn	Oct 2017	May 2018	June 2018[2]	July 2018 dusk	July 2018 dawn	Aug 2018	Sept 2018	Oct 2018
Common pipistrelle	13	1	5	12	8	16	n/a	10	17	11	11	12
Soprano pipistrelle	0	0	0	0	0	1	n/a	0	0	3	1	2
Pipistrellus species	-	-	-	-	-	0	n/a	0	0	1	0	0
Noctule	3	2	0	0	0	4	n/a	0	0	0	0	1
Nyctalus species	0	0	0	0	0	0	n/a	0	0	0	0	0
Myotis species	0	1	1	1	0	0	n/a	0	0	0	0	0
Brown long-eared bat	-	-	-	-	-	1	n/a	0	0	0	0	0

Transect 2

Species	July 2017	Aug 2017 dawn	Sept 2017 dusk	Sept 2017 dawn	Oct 2017	May 2018	June 2018[2]	July 2018 dusk	July 2018 dawn	Aug 2018	Sept 2018[2]	Oct 2018[2]
Common pipistrelle	40	8	48	20	63	26	21	28	13	9	n/a	n/a
Soprano pipistrelle	0	0	8	5	5	0	1	1	2	1	n/a	n/a
Pipistrellus species	-	-	-	-	-	0	0	0	2	0	n/a	n/a
Noctule	3	0	1	0	0	6	19	1	1	1	n/a	n/a
Nyctalus species	0	0	1	0	0	0	3	1	0	1	n/a	n/a
Myotis species	0	0	1	0	2	0	0	1	0	1	n/a	n/a
Brown long-eared bat	-	-	-	-	-	1	0	0	0	0	n/a	n/a

Transect 4

Species	July 2017	Aug 2017 dawn	Sept 2017 dusk	Sept 2017 dawn	Oct 2017	May 2018	June 2018[1]	July 2018 dusk	July 2018 dawn	Aug 2018	Sept 2018	Oct 2018
Common pipistrelle	22	43	11	2	6	15	19	3	15	8	1	1
Soprano pipistrelle	0	3	5	1	3	7	8	2	2	2	0	2
Pipistrellus species	-	-	-	-	-	1	1	0	1	0	0	0
Noctule	0	1	0	0	0	1	1	0	1	0	0	0
Nyctalus species	0	0	0	0	0	0	1	0	0	0	0	4
Myotis species	0	0	0	0	1	1	0	0	1	0	0	0
Brown long-eared bat	-	-	-	-	-	0	0	0	1	0	0	0

Transect 5

Species	July 2017	Aug 2017 dawn	Sept 2017 dusk	Sept 2017 dawn	Oct 2017	May 2018	June 2018[1]	July 2018 dusk	July 2018 dawn	Aug 2018	Sept 2018	Oct 2018
Common pipistrelle	28	26	12	12	34	11	18	6	8	8	2	3
Soprano pipistrelle	1	1	0	1	2	1	3	4	1	3	0	1
Pipistrellus species	-	-	-	-	-	0	0	0	0	0	0	0
Noctule	0	0	0	0	0	1	3	0	0	5	0	0
Nyctalus species	0	0	0	0	0	0	0	0	0	0	0	0
Myotis species	0	1	0	0	1	1	1	0	0	1	0	0
Brown long-eared bat	-	-	-	-	-	0	0	0	1	0	0	0

(notes: 1: April 2018 transect not undertaken due to access limitations – see section 2.14)

3.4 Bat activity surveys – static monitoring 2018

3.4.1 Static monitoring was undertaken at eight locations, as shown in **Figure 9.5C (a)** and **Table 3-5**.

3.4.2 The following species or species groups were recorded during the survey work undertaken: common pipistrelle; soprano pipistrelle; *Pipistrellus* species (common or soprano pipistrelle); Nathusius' pipistrelle; noctule; Leisler's, *Nyctalus* species (either Leisler's bat or noctule); serotine; *Myotis* species and brown long-eared. A summary of the results of static monitoring to date is presented in **Table 3-6**, with full raw data at Annex I.

3.4.3 The bat activity index was classed as low or very low at all months and monitoring locations except:

i. **Location 4 - July, October**: large number of common pipistrelle calls and additionally a high number of unassigned pipistrelle species calls in July (either common or soprano);

ii. **Location 5 - May and June:** large number of common pipistrelle calls; and

iii. **Location 8 - July:** large number of common pipistrelle calls and high number of noctule calls.

3.4.4 Very occasional serotine bat passes were recorded; with four passes at monitoring location 8, on 11 July – 12 July; and one pass each on 12, 15 and 17 September at monitoring locations across the Scheme (Locations 1, 5 and 6 respectively, monitoring locations are shown on **Figure 9.5C (a)**.

3.4.5 In September and October a small number of Nathusius' pipistrelle passes were recorded; four passes at monitoring Location 7 over three nights in September; one pass each on two nights in September at monitoring Location 8; one pass at monitoring Location 4 in October and three passes over two nights in October at monitoring Location 5. This species was not recorded in any other surveys.

3.4.6 74% of all *Myotis* species bats recorded by the static monitoring occurred during the September monitoring at Location 8 and the October monitoring at Location 3. Within these two monitoring periods *Myotis* bat activity was further concentrated such that four individual nights accounted for 70% of all recorded *Myotis* bat activity, with one night 15 September at monitoring Location 8 accounting for over 25% of all *Myotis* bat activity recorded (raw data for static monitoring is presented in Annex I).

Table 3-5 - Static Monitoring Locations

Static monitoring point (Location)	Location: grid reference	Location: habitat
1	SP1849082323	Edge of a small planted woodland within the existing M42 junction 6 between slip roads.
2	SP1849082323	To the west of Catherine-de-Barnes Lane in between a belt of scrub and an improved grassland field.

Static monitoring point (Location)	Location: grid reference	Location: habitat
3	SP1858582344	To the east of Catherine-de-Barnes Lane (opposite location 2 above) in a small belt of planted trees at the southern end of an improved grassland field.
4	SP1858681600	To the east of Catherine-de-Barnes Lane on Shadowbrook Lane at the edge of the garden of B1 Heath End House.
5	SP1826381217	In a hedgerow in-between fields to the west of Catherine-de-Barnes Lane (opposite Location 6 below).
6	SP1852481221	In a hedgerow between arable fields immediately to the west of an un-named woodland situated between Catherine de-Barnes Road and the existing M42 south of Shadowbrook Road
7	SP1882881137	In a hedgerow between arable fields east of an un-named woodland situated between Catherine de-Barnes Road and the existing M42 south of Shadowbrook Road.
8	SP1904380677	On Solihull Road north of Aspbury's Copse and west of the existing M42.

Table 3-6 - Automatic bat detector survey results

Month	Detector Location	Number of passes per bat species (over five consecutive nights)										Total Number of Bat Passes	Bat Activity Index (bat passes per hour)	Bat Activity Index Value
		Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	Pipistrelle sp.	Noctule	Leisler	*Nyctalus* sp.	Serotine	*Myotis* sp.	Brown long-eared			
May	1	13	4	-	-	-	-	-	-	-	-	17	0.45	Very Low
	2	101	-	-	-	104	1	28	-	-	-	235	6.27	Low
	3	120	6	-	6	-	-	-	-	-	-	132	3.52	Low
	4	93	1	-	-	149	-	7	-	3	-	253	6.75	Low
	5	1189	12	-	3	-	-	-	-	6	-	1210	32.27	Moderate
	6	16	-	-	-	19	1	3	-	5	-	44	1.17	Very Low
	7	-	-	-	-	-	-	-	-	-	-	0	0	-
	8	362	29	-	3	13	4	8	-	22	-	441	11.76	Low

Month	Detector Location	Number of passes per bat species (over five consecutive nights)										Total Number of Bat Passes	Bat Activity Index (bat passes per hour)	Bat Activity Index Value
		Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	Pipistrelle sp.	Noctule	Leisler	*Nyctalus* sp.	Serotine	*Myotis* sp.	Brown long-eared			
June	1	27	33	-	11	-	-	-	-	1	-	72	2.06	Low
	2	34	1	-	1	7	-	-	-	-	-	43	1.2	Very Low
	3	1	-	-	-	5	-	1	-	-	-	7	0.2	Very low
	4	153	5	-	24	-	-	-	-	-	-	182	5.2	Low
	5	1872	2	-	26	29	1	40	-	-	-	1970	56.11	Moderate
	6	8	-	-	2	4	2	-	-	-	-	16	0.46	Very Low
	7	530	4	-	9	-	2	-	-	6	-	551	15.74	Low
	8	109	-	-	-	-	-	-	-	-	-	109	3.11	Low
July	1	296	22	-	-	1	-	-	-	-	-	319	8.51	Low
	2	149	12	-	44	-	-	-	-	-	-	205	5.47	Low
	3	90	-	-	10	-	-	-	-	-	-	100	2.67	Low
	4	1176	19	-	147	-	-	-	-	-	-	1343	35.79	Moderate
	5	170	6	-	2	2	-	-	-	-	-	180	4.8	Low
	6	99	2	-	2	14	-	4	-	16	-	135	3.6	Low
	7	329	19	-	37	-	-	-	-	-	-	385	10.27	Low
	8	2223	2	-	6	11	33	126	4	-	-	2405	64.13	Moderate
August	1	4	8	-	2	-	-	1	-	-		15	0.33	Very Low
	2	76	4	-	1	3	1	1	-	1	2	89	1.98	Very Low
	3	156	13	-	40	-	-	-	-	-	-	209	4.64	Low
	4	519	16	-	29	12	-	2	-	9	1	587	13.04	Low
	5	463	12	-	45	1	-	4	-	2	1	538	11.96	Low
	6	145	18	-	-	20	-	7	-	12	1	203	4.51	Low
	7	374	44	-	8	11	3	11	-	2	7	461	10.24	Low
	8	515	62	-	5	7	3	115	-	-	-	707	15.71	Low

Month	Detector Location	Number of passes per bat species (over five consecutive nights)										Total Number of Bat Passes	Bat Activity Index (bat passes per hour)	Bat Activity Index Value
		Common pipistrelle	Soprano pipistrelle	Nathusius pipistrelle	Pipistrelle sp.	Noctule	Leisler	*Nyctalus* sp.	Serotine	*Myotis* sp.	Brown long-eared			
September	1	21	1	-	1	-	-	-	1	2	-	26	0.47	Very Low
	2	25	3	-	6	5	-	2	-	1	-	42	0.76	Very Low
	3	306	13	-	19	-	-	1	-	3	-	342	6.22	Low
	4	12	-	-	-	-	-	-	-	-	-	12	0.22	Very Low
	5	399	9	-	74	4	-	6	1	6	4	503	9.15	Low
	6	1155	15	-	-	1	-	6	1	3	5	1188	21.6	Low
	7	292	86	4	5	5	-	11	-	3	2	413	7.51	Low
	8	810	55	2	5	3	4	182	-	253	1	1318	23.96	Low
October	1	30	12	-	-	5	1	8	-	-	-	56	0.90	Very Low
	2	86	2	-	14	4	-	2	-	1	-	109	1.74	Very Low
	3	82	4	-	2	1	-	2	-	148	7	246	3.94	Low
	4	2262	19	1	1	4	-	6	-	18	1	2312	36.99	Moderate
	5	507	13	3	97	7	11	5	-	7	-	650	10.40	Low
	6	300	31	-	-	2	2	-	-	2	-	337	5.39	Low
	7	90	16	-	2	1	1	-	-	2	15	127	2.03	Low
	8	810	55	-	5	3	3	182	-	7	1	1068	23.96	Low

3.5 Bat activity surveys – assessment of value

3.5.1 Following the scoring values given in Wray et al (2010) [REF19] for valuing bat foraging areas and commuting routes scores of 19 and 20 respectively are calculated as presented within **Table 3-7**, which correspond to foraging areas and commuting routes of district, local or parish value.

Table 3-7 - Scoring values for assessing bat foraging and commuting values (from Wray et al 2010) [REF19]

i. Commuting value by species

Species	National Rarity	Number of bats	Site/Nearby Roost Potential	Type & Complexity of Linear Features	Total score	Value
Common pipistrelle	2	5	4	3	14	District/local
Soprano pipistrelle	2	5	4	3	14	District/local
Nathusius' pipistrelle	5	5	1	3	14	District/local
Noctule	5	5	4	3	17	District/local
Leisler's bat	5	5	4	3	17	District/local
all *Nyctalus* sp.	5	5	4	3	17	District/local
Serotine	5	5	3	3	17	District/local
Myotis sp	5	5	4	3	17	District/local
Brown long-eared bat	2	5	4	3	14	District/local

ii. Foraging value by species

Species	National Rarity	Number of bats	Site/Nearby Roost Potential	Foraging habitat characteristics	Total score	Value
Common pipistrelle	2	10	4	3	19	District/local
Soprano pipistrelle	2	5	4	3	14	District/local
Nathusius' pipistrelle	5	5	1	3	14	District/local
Noctule	5	5	4	3	17	District/local
Leisler's bat	5	5	4	3	17	District/local
all *Nyctalus* sp.	5	5	4	3	17	District/local
Serotine	5	5	3	3	17	District/local
Myotis sp	5	5	4	3	17	District/local
Brown long-eared bat	2	5	4	3	14	District/local

3.5.2 The assemblage of bat species present is not considered to meet any of the Warwickshire Local Wildlife Site species selection criteria [REF21]. Overall the assemblage of bats is considered to be consistent with the local records and are unexceptional. The less common occurrences of seven serotine bat passes during one night in July and three in September is consistent with this species sparse records in the county [REF22]. Occasional records of Nathusius' pipistrelle in September and October across the site is consistent with an increase in records of this species during its autumn migration [REF23]. On this basis the foraging and commuting habitats present are considered to be of no more than Local importance.

4. Discussion

4.1 Buildings and Structures

4.1.1 Access was available to the single building (B1 Heath End House) and all other structures that are likely to be directly impacted by the Scheme. Building B1 Heath End House was recorded as supporting a small roost of a single brown long-eared bat and a small roost of four common pipistrelle bats. These roosts were assessed as small day roosts of low conservation significance and of District or Local level.

4.1.2 Access was not available to one groups of buildings, B4 Páirc na hÉireann. Efforts will be made to include these buildings within the 2019 bat survey schedule.

4.1.3 Other buildings or structures were either scoped out of surveys (see Table 4 and Appendix A) or recorded no evidence of bats (S1, East Way bridge under the A45, and S2, culvert for Hollywell Brook under M42.

4.2 Trees

4.2.1 Based on the survey work undertaken to date and scoping out of all trees beyond the Order Limits a final list of trees assessed to provide high or moderate suitability for bat roost comprised thirty-one trees rated as high and fifty-eight as moderate.

4.2.2 Roost surveys were undertaken on nineteen trees rated as high suitability, twenty-eight as moderate suitability, and eight as low suitability for roosting bats.

4.2.3 Further roost surveys are scheduled for 2019, see Limitations at section 2.14. With the exception of one tree group (T25) none of these trees would be lost and any potential impacts would be limited to indirect impacts resulting from proximity disturbance from nearby construction and or habitat enhancement works (such as noise, light pollution), which is not considered to significantly affect the existing assessment. In respect of tree group T25 it noted that roost surveys were undertaken at neighbouring trees on six occasions in 2018 with no bat activity associated with roosting bats recorded at these adjacent trees (i.e. no large number of bats indicating a significant roost was present within the vicinity) and is therefore not considered a limitation to the agreed bat licencing decision as per Natural England's letter of no impediment.

4.2.4 Access was not available to undertake initial assessments of trees (GLTAs) at two sections around and to the west of Páirc na hÉireann and immediately to the southwest of the existing M42 Junction 6 (see **Figure 9.5D (a)**). No trees would be lost within these areas and any potential impacts would be limited to indirect impacts resulting from proximity disturbance from nearby construction and or habitat enhancement works (such as noise, light pollution) and is not considered to affect the assessment. Reasonable effort was made to gain access to the survey areas within the Order Limits. A GLTA of these two areas will be undertaken, pending access, as part of the 2019 bat survey schedule.

4.2.5 Nocturnal roost surveys have confirmed bat roosts at six trees:

i. One common pipistrelle bat was recorded roosting at tree T17;

ii. One common pipistrelle bat at tree T21;

iii. Two soprano pipistrelle bats at tree T80;

iv. Two common pipistrelle bats at tree T83;

v. Four soprano pipistrelle bats at tree T85.2; and

vi. One soprano pipistrelle bat at tree T242.

4.2.6 These roosts were all assessed as small day roosts of low conservation significance and of Local importance.

4.2.7 Small common pipistrelle bat roosts have also been confirmed by others in the boundary of the Scheme in trees T54, T124 and T215 (Aspbury's Copse pLWS), although no bats were recorded entering or emerging from these trees during separate surveys in 2018, see **Table 3-3**.

4.3 Bat activity surveys

4.3.1 Bat activity surveys completed between July and October 2017 and between May and October 2018 recorded bat foraging and commuting activity on all transects and static monitoring locations across the site. The following species or species groups were recorded during the survey work undertaken: common pipistrelle; Soprano pipistrelle; *Pipistrellus* species (common or soprano pipistrelle); Nathusius' pipistrelle; Noctule; Leisler's; *Nyctalus* species (either Leisler's bat or Noctule); Serotine; *Myotis* species and brown long-eared bat.

4.3.2 The levels of activity are considered to be low and typical of the habitats present. The highest levels of bat activity recorded were along hedgerows in fields to the west of Catherine-de-Barnes Lane and in the vicinity of Aspbury's Copse. Activity was also recorded along hedgerows, tree lines and plantation woodland immediately east of the M42, and along hedgerows between Catherine-de-Barnes Land and the M42. The lowest levels of activity were recorded in the north of the study area east of Catherine-de-Barnes.

4.3.3 Bat activity survey results suggest that while there would be some severance impacts and disturbance to commuting and foraging routes, this would be limited to Local significance and no key flight paths and or foraging routes of significant maternity roosts have been recorded. Peak counts on any one night have been sporadic and unevenly distributed during the static monitoring surveys, with no single site regularly recording significant numbers of bats. Peak counts on isolated individual nights or couple of nights suggest highly variable levels of bat activity.

4.3.4 The assemblage of bat species present is not considered to meet any of the Warwickshire Local Wildlife Site species selection criteria [REF21]. Overall the assemblage of bats is considered to be consistent with the local records and unexceptional. Following the scoring system devised by Wray et al (2010) [REF19] the foraging areas and commuting routes within the proposed scheme boundary for all bat species in all locations have provisionally been assessed as District or Local value. On this basis the foraging and commuting habitats present are considered to be of no more than Local importance.

4.4 Potential Impacts

4.4.1 The Scheme would result in the loss of roosts associated with building B1 and trees T17, T21 and T242. None of the remaining roosts would be directly affected by the Scheme.

4.4.2 It is considered that a protected species will be required for the loss of roosts in B1, T17, T21 and T242. A draft European Protected Species (EPS) Mitigation Licence application has been submitted to Natural England in respect of the four recorded roosts. A letter of no impediment to a licence being issued has been received from Natural England [**APP-145/Volume 6.3**].

4.4.3 Potential impacts to any areas outstanding within the 2019 bat survey schedule will be limited to indirect impacts resulting from proximity disturbance from nearby construction and or habitat enhancement works (such as noise, light pollution) and is not considered to affect the assessment.

4.4.4 Only one group of trees, T25, would be directly impacted. Where bat surveys have been completed in 2018 on neighbouring trees no bat activity associated with roosting bats was recorded (i.e. no large number of bats indicating a significant roost was present within the vicinity). It is therefore considered reasonable to presume that no significant roost (maternity or rare species) is present within this vicinity; however, the potential for small roosts of common species (as recorded across the wider site and in a nearby tree: T21) to be present within a tree at T25 is accepted. Should such a roost be recorded this will be included within a EPS Mitigation Licence in line with the methods and mitigation outlined in the submitted draft Licence application and the corresponding letter of no impediment to a licence being issued has been received from Natural England [**APP-145/Volume 6.3**]. Additional small roost(s) of common species are not considered a deviation from the current mitigation proposals and is therefore not considered a limitation to the agreed bat licencing decision as per Natural England's letter of no impediment.

4.4.5 Demolition of building B1 and felling of trees T17, T21 and T242 should follow the methods and procedures specified in the licence documents. This will specify pre-work checks for bats prior to demolition/felling, followed by soft stripping of suitable roosting features or soft felling of trees under the supervision of an appropriately licenced bat worker.

4.4.6 Mitigation in the form of alternative roosting locations will provided and detailed in the licence documents. This mitigation will take the form of at least, and preferably more than, like-for-like replacement. Given the status of the roosts concerned this mitigation will be in the form of a series of bat boxes to be installed at appropriate locations within the Order Limits. These mitigation bat boxes will be installed prior to any licensed works to the buildings and trees on site. Such mitigation is considered to be appropriate and suitable to maintain the Favourable conservation status of bats.

4.4.7 Highways England, or subsequent landowner(s) if applicable, will be responsible for the maintenance and upkeep of these bat boxes for a minimum period of five years post installation.

4.4.8 Felling of any trees directly impacted by the Scheme, without roosts confirmed, will follow a Method Statement to limit the potential for bat roosts to be impacted. This is due to the transitional nature of many bat roosts within trees and to ensure that any tree being felled that has potential features suitable for bat roosts is not occupied by bats in-between the surveys being undertaken and works carried out.

4.4.9 The Method Statement for the felling of any trees with rated bat potential (High, Moderate and Low), but no confirmed roost, within the Scheme would comprise of following key points:

i. Trees will be subject to an updated survey to comprise: (i) an updated ground based assessment (GLTA) to note any potential change in roosting potential status (i.e. upgrade or downgrade); and (ii) a climbed inspection for trees rated as providing Moderate or High suitability for bats (including any additions from possible upgrades resulting from the updated GLTA).

ii. Where any bat roosts are confirmed from these pre-works surveys protected species derogation licences will be sought before trees are felled (i.e. the existing site licence sought for T17 and T21 to be amended).

iii. Where possible trees will be felled outside of the main summer activity season of May-August.

iv. Trees with rated or unknown hibernation potential (see Annex E) will be felled where possible outside of the core winter period November – February inclusive.

v. Felling of trees will be undertaken under the supervision of a licensed bat worker and competent ecological clerk of works. Where possible trees will be either section felled or lowered to the ground by other means (such as by a mechanical digger).

vi. Provision of additional bat boxes (in addition to agreed licensed mitigation) will be available in the unlikely event that a bat is encountered during felling.

vii. Provision will be made for the potential transfer of any injured bat to a recognised bat carer.

viii. Upon felling of the tree a check will be undertaken by the licensed bat worker and competent ecological clerk of work and the tree left *in-situ* for one day prior to removal to allow any potential bats time to leave.

ix. Contractors should also consider the presence of nesting birds and the legal protection given to these.

4.5 Outstanding bat surveys - 2019

4.5.1 The following additional surveys are scheduled (access permitting) for 2019:

i. External and internal inspection (PRF survey) of previously inaccessible building: B4.

ii. Initial PRF inspection of tress not previously accessed: previously inaccessible land parcels at and around Páirc na hÉireann and immediately to the southwest of the existing M42 Junction.

iii. Tree climbing surveys: T43, T44, T116, T117, T118, T119, T120, T121, T122, T144, T261, T262, T263, T267, T268, T269, T270, T271, T272, T274, T277, T276, T278, T280, T281, T282, T284 T289, T295, T298, T303 and T311.

iv. Roost surveys of buildings: B4.

v. Roost surveys of Trees: T24.3, T25.2-T25.8, T88 & where applicable following climbed surveys: T43, T44, T116, T117, T118, T119, T120, T121, T122, T144, T261, T262, T263, T267, T268, T269, T270, T271, T272, T274, T277, T276, T278, T280, T281, T282, T284 T289, T295, T298, T303 and T311.

5. References

Reference Number	Source
REF1	The Conservation of Habitats and Species Regulations 2017
REF2	The Wildlife and Countryside Act 1981 (as amended)
REF3	Department for Transport (2015) Road Investment Strategy for the 2015/16 to 2019/20 Road Period
REF4	Highways England (2015) Highways England Biodiversity Action Plan
REF5	Warwickshire Wildlife Trust (2015 to 2017) Warwickshire Coventry and Solihull Local Biodiversity Action Plan
REF6	Highways Agency (2008) Interim Advice Note 116/08: Nature conservation advice in relation to bats: IAN 116/08 Page 15 of 57 October 2008 http://www.standardsforhighways.co.uk/ha/standards/ians/pdfs/ian116.pdf
REF7	WSP (2017) M42 Junction 6 Improvement Preliminary Bat Assessment May 2017 WSP (UK) LTD.
REF8	WSP (2017) M42 Junction 6 Improvement Preliminary Bat Activity Survey Report November 2017 WSP (UK) LTD
REF9	Wardell Armstrong (2018) Motorway Service Area (MSA) and New Junction between Junctions 5 & 6 of the M42, Solihull. Bat Activity Survey – 2018 Update. July 2018.
REF10	Wardell Armstrong (2018b) Motorway Service Area (MSA) and New Junction between Junctions 5 & 6 of the M42, Solihull. Bat Roost Survey Report – 2018 Update. July 2018.
REF11	Collins (2016), English Nature (2004) and Joint Nature Conservation Committee (2004).
REF12	Mitchell-Jones, A.J. (2004) Bat Mitigation Guidelines. English Nature, Peterborough
REF13	Mitchell-Jones, A.J. and McLeish, A.P. (eds) (2004) Bat Workers' Manual (3rd edn). JNCC, Peterborough
REF14	Russ, J.M. (2012) British Bat Calls: A Guide to Species Identification. Pelagic Publishing, Exeter.
REF15	Forestry Commission England (2005) Woodland Management for Bats. Forestry Commission Publications, Wetherby
REF16	Arboriculture and Forestry Advisory Group (AFAG) Tree Climbing Operations Leaflet (AFAG40115).
REF17	Andrews H et al. (2016) Bat Tree Habitat Key (3rd Edition). AEcol, Bridgwater
REF18	Bat Tree Habitat Key (2018). http://battreehabitatkey.co.uk/ [accessed 14/08/2018]
REF19	Wray, S. Wells, D, Long, E Mitchell-Jones, T (2010). Valuing Bats in Ecological Impact Assessment. CIEEM In Practice Issue 70 (December 2010)
REF20	Barlow, K.E. and Briggs, P.A. (2012) Grey long-eared bat surveillance 2012. JNCC Report No 478
REF21	Habitat Biodiversity Audit (HBA) for Warwickshire: The Green Book revised ver. 12/13 Guidance for the Selection of Local Wildlife Sites in Warwickshire, Coventry and Solihull https://apps.warwickshire.gov.uk/api/documents/WCCC-863-559 [accessed 01.10.18]

REF22	Warwickshire Bat Group (2018) Warwickshire's bats: Serotine. www.warksbats.co.uk/aboutbats/species/serotine.aspx [accessed 13/12/18]
REF23	Russ. J (2017) Nathusius' pipistrelle in Great Britain & Ireland current distribution (26 June 2017) www.nathusius.org.uk/Distribution.htm [accessed 13/12/18]

Annex A: Buildings and structures assessment

Reference Building /Structure	Description	External Survey	Internal Survey	Bat Roosting Suitability
B1	Heath End House. Detached bungalow with pitched tiled roof and wooden boarding on gable end walls	06/12/2017. Noted numerous gaps which could provide potential access points for bats: under roof tiles on the southern elevation; around a dormer window on the northern roof elevation; around lead flashing at the two (east and west) gable-end and at the window on the northern roof elevation; chimneys; gaps to western gable end soffit box; missing mortar at the ridge at the eastern gable end and under wooden boarding at the northeast corner of the building.	21/03/2018 Lead flashing had been removed from most of the roof (stolen) in recent days and was being repaired whilst the internal survey was undertaken. Internal roof voids inspected. Main roof void F1 bitumen felt present, height ~2m from floor to apex. No sign of actual bats present. 2 x brown long-eared bat droppings on the floor of the roof void directly in the centre below the ridge beam at the eastern gable end. Small void at north-west corner of building adjacent to northern dormer window. One bat dropping noted on floor (likely *Pipistrellus* species). No signs of evidence in other small voids in areas of restricted height; many cobwebs present in these areas and areas where older F1 felt replaced with modern BRMs.	Confirmed. Direct Impact. Further (roost) surveys undertaken small day roosts of brown ling-eared and common pipistrelle bats confirmed. Local significance only.

Reference Building /Structure	Description	External Survey	Internal Survey	Bat Roosting Suitability
B2	Birmingham Dogs Home. Recently constructed dog kennels and associated buildings.	No access Aerial plans show the building to be of recent construction with no obvious defects. The nature of the construction leaves potential gaps into the interior of the kennels which could be accessed by bats. However, the use of the building as an active dog kennel would not be compatible with an active bat roost.	n/a	Scoped out of further surveys as outside the Order Limits.
B3	Detached House on Catherine-de-Barnes Lane.	No access	n/a	Scoped out of further surveys as outside the Order Limits.
B4	Páirc na hÉireann (Gaelic Athletic Association). Various clubhouse and associated buildings.	No access to date Survey scheduled for June 2019	No access to date Survey scheduled for June 2019	Unknown (no access) Further surveys required.

Reference Building /Structure	Description	External Survey	Internal Survey	Bat Roosting Suitability
B5	A series of three small wooden sheds off Catherine-de-Barnes Lane.	25.09.18 Three small separate wooden structures; 1. To the north a small wooden-board shed with gently pitched corrugated metal roof; 2. In the middle and back from the road a part collapsed wooden shed with missing doors and/or windows, with a wooden roof; and 3. To the south a small wooden board shed with flat felt roof.	no access necessary as the interior was visible from the exterior	Negligible No further surveys required.
B6	Sewage Pumping Station off Clock Lane.	Surveyed from field boundary. Series of small pump constructs, no actual buildings present.	n/a	Negligible No further surveys required.
B7	Detached House and outbuildings.	No access	n/a	Scoped out of further surveys as outside the Order Limits.
B8	National Motorcycle Museum/National Conference Centre.	No access Aerial plans and a site visit to trees in a neighbouring field show the building to be of recent construction and lacking obvious potential bat access points.	n/a	Scoped out of further surveys as outside the Order Limits.

Reference Building /Structure	Description	External Survey	Internal Survey	Bat Roosting Suitability
B9	DHL, Middle Bickenhill Lane.	External survey only undertaken with reduced access. Recent construction within last five years. Detached brick building with hipped concrete tiled roof. Assessed from east aspect only – roadside. No obvious gaps or potential on this side of the building.	n/a	Scoped out of further surveys as outside the Order Limits.
B10	Two houses and outbuildings at Middle Bickenhill Lane.	No access	n/a	Scoped out of further surveys as outside the Order Limits.
B11	Two detached houses and associated outbuildings off Solihull Road B4102, east of M42.	No access	n/a	Scoped out of further surveys as outside the Order Limits.
B12	Boswell Mobile Home Park	Various static homes and caravans none of which appeared to have suitable features for bats, except:		Scoped out of further surveys as outside the Order Limits.
		B12a: Small brick shed in the centre of the site with a pitched clay tile roof with broken tiles, lifted tiles and missing gable verge mortar.		
		B12b: Static Home No. 1. Brick base and concrete panelling with hipped pan tiled roof. Small gaps around the lead flashing of the chimney		
		B12c: Adjoining shed. Brick with pitched roof. Potential access gaps at open northern porch area which provides access to the under the roof against the eaves. Some ivy and other vegetation growing over the southern half of this small building.		

Reference Building /Structure	Description	External Survey	Internal Survey	Bat Roosting Suitability
S1	Bridge under A45 at East Way	Concrete deck bridge over concrete abutment walls. Possible expansion gaps which could provide roosting opportunities for bats where decking meets outer wall, especially on the northern side of the bridge. Possible gaps at expansion joints in-between decking and internal abutment walls. Lighting columns present under the bridge. Immediately adjacent habitat poor to medium value and presence of lighting columns under the bridge decrease any potential suitability for bats.		Low Further (roost) survey undertaken – bats confirmed absent. No impacts anticipated.
S2	Culvert for Hollywell Brook under M42	Ridged concrete culvert (laid concrete not sections). No signs of potential PRFs, west exit overshadowed by NEC car park lighting. Assessed as Low as a precaution.		Low Further (roost) survey undertaken – bats confirmed absent. Potential direct impacts (extension of culvert)
S3	Bridge East Way over M42.	Large concrete bridge spanning M42 with two concrete pillars and concrete abutments on earth embankments. Potential gaps on both west and east abutment walls noted from aerial view; the western abutment giving covered access into suitable bat foraging habitat, the eastern abutment being more exposed. No access to motorway carriageway for surveys or inspection. Potential for use as a bat roost limited due to bridge's position over a busy motorway.		Low No impacts anticipated and no access available, therefore scoped out of any further surveys.
S4	A45 over Railway	No access to Network Rail land. Twin bridge. Southern bridge: concrete decking over concrete abutments. Potential roosting opportunities unlikely due to construction materials and design. Northern Bridge: Unknown decking, brick pillars either side of railway with possible space/gaps where decking meets embankments. Roosting opportunities unknown. Potential for use as a bat roost limited due to bridge's position over a busy railway.		Unknown. No access. No known impacts and no access, therefore scoped out of further surveys.

Reference Building /Structure	Description	External Survey	Internal Survey	Bat Roosting Suitability
S5	M42 over Railway	No access to Network Rail land. Potential for use as a bat roost limited due to bridge's position over a busy railway		Unknown. No access. No known impacts. Scoped out of further surveys.
S6	Field access bridge over M42	Concrete abutments with concrete decking, side abutments walls checked with no gaps or suitable PRF features. No access to M42 carriageway (i.e. under the bridge) but assessments with the aid of binoculars from the upper sides of the bridge considered sufficient to assess the suitability of all areas expect directly under the bridge. Potential for use as a bat roost limited due to bridge's position over a busy motorway.		Negligible. Scoped out of further surveys.
S7	Shadowbrook Lane over M42	Concrete abutments with concrete decking, side abutments walls checked with no gaps or suitable PRF features. No access to M42 carriageway (i.e. under the bridge) but assessments with the aid of binoculars from the upper sides of the bridge considered sufficient to assess the suitability of all areas expect directly under the bridge. Potential for use as a bat roost limited due to bridge's position over a busy motorway.		Negligible. Scoped out of further surveys.
S8	Solihull Road over M42	Concrete abutments with concrete decking, side abutments walls checked with no gaps or suitable PRF features. No access to M42 carriageway (i.e. under the bridge) but assessments with the aid of binoculars from the upper sides of the bridge considered sufficient to assess the suitability of all areas expect directly under the bridge. Potential for use as a bat roost limited due to bridge's position over a busy motorway.		Negligible. Scoped out of further surveys (Direct Impacts anticipated).
S9	Friday Lane over M42	Concrete abutments with concrete decking, side abutments walls checked with no gaps or suitable PRF features. No access to M42 carriageway (i.e. under the bridge) but assessments with the aid of binoculars from the upper sides of the bridge considered sufficient to assess the suitability of all areas expect directly under the bridge. Potential for use as a bat roost limited due to bridge's position over a busy motorway.		Negligible. Scoped out of further surveys.

Reference Building /Structure	Description	External Survey	Internal Survey	Bat Roosting Suitability
S10	Existing M42 Junction 6 bridges	No access. Concrete decking over M42 with concrete abutments. No obvious roosting opportunities. Potential for use as a bat roost limited due to bridge's position over a busy motorway.		Negligible. Scoped out of further surveys.
S11	Bridge: M42 over River Blythe.	No access. Concrete decking with concrete abutments. No access for surveys or inspection.		No known impacts. Scoped out of further surveys.
S12	Bridge. Catherine-de-Barnes Lane under A45 Clock roundabout	Concrete deck and abutment wall bridge. No obvious gaps and no features of potential use to bats.		Negligible

Annex B: Buildings and structures roost survey results

Building /Structure number	PRF suitability	Date of survey	Results	Roost present (Y/N)
B1	Confirmed	30/05/2018 (Dusk)	One brown long-eared bat suspected emergence at eastern gable end, gap present at apex. One Noctule bat pass and several common pipistrelle bats also recorded foraging and commuting nearby during the survey.	Y
		05/07/2018 (Dawn)	No bats recorded emerging. Noctule and common pipistrelle bats recorded during the survey	
		04/09/2018 (Dawn)	Four common pipistrelle bats re-entered under verge mortar at western gable end, in the middle of the southern section. Noctule and common pipistrelle bats recorded during the survey	
S1	Low	20/08/2018 (Dusk)	No bats recorded emerging. Noctule and common pipistrelle bats recorded during the survey.	N
S2	Low	31/08/2018 (Dusk)	No bats recorded emerging.	N

Annex C: Ground Level Tree Assessments (GLTA)

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
1	419143	280692	High	WSP April 2017	*Quercus robur*	Stem (multiple locations), major branch (multiple locations)	Multiple	Multiple	Knot holes, missing bark, cracks, broken branches
2	419260	280932	Moderate	WSP April 2017	*Quercus robur*	Stem, major branch	Multiple	Multiple	PRF on stem where branch broken off, missing bark, knot holes in dead branches
3	419320	280887	Low	WSP April 2017	*Quercus robur*	2 x Major branches	Multiple	Multiple	Knot hole in dead branch, knot hole in living branch
4	419369	280882	Low	WSP April 2017	*Quercus robur*	Limb	NW	20	Knot hole
5	419334	280827	Moderate	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	Multiple	Missing bark, small knot holes, cracks
6	418855	280417	Moderate	WSP April 2017	*Crataegus monogyna*	Stem	Multiple	20	Missing branch
7	418939	280480	High	WSP April 2017	*Fraxinus excelsior*	Multiple locations	Multiple	Multiple	Knot holes, missing limb
8	418961	280467	Moderate	WSP April 2017	*Fraxinus excelsior*	Multiple locations	Multiple	Multiple	Knot hole, missing limbs
9	418901	280209	Moderate	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	Multiple	Missing bark
10	418901	280209	Moderate	WSP April 2017	*Quercus robur*	Stem	N	10	Split in stem, missing bark

Tree no.	Location		GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
	X	Y							
11	418882	280863	Moderate	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	Multiple	Knot holes, missing bark, lifted bark, split stem
12	418787	280763	Low	WSP April 2017	*Quercus robur*	Major branches	N	8	Rotten branch
13	419762	280889	Moderate	WSP April 2017	*Quercus robur*	Stem	NE	6	Knot hole
14	418775	280892	Moderate	WSP April 2017	*Quercus robur*	Stem	NW	5	Split in stem
15	418779	280942	Low	WSP April 2017	*Quercus robur*	Limb	NW	8	Split in bark
16	418790	280966	Moderate	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	Multiple	Missing limbs
17.1	418812	281024	Moderate	18/10/2018	*Quercus robur*	90	NE	6	Missing branch, and knot holes
17.2	418810	281018	Moderate	18/10/2018	*Quercus robur*	100			Small hazard beam, knot holes
18	418814	281067	Low	WSP April 2017	*Quercus robur*	Multiple locations	NW	6	Missing branches
19	418817	281080	Low	WSP April 2017	*Quercus robur*	Stem	SW	7	Missing branches
20	418779	281153	Low	WSP April 2017	*Quercus robur*	Stem	S	4	Knot hole
21	418747	281102	Moderate	WSP April 2017	*Quercus robur*	Stem	N	6	Knot hole
22	418746	281095	Moderate	WSP April 2017	*Fraxinus excelsior*	Multiple locations	Multiple	Multiple	Knot hole, dead branch with holes

Tree no.	Location		GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
	X	Y							
23	418745	281074	Low	WSP April 2017	*Quercus robur*	Minor branch	W	7	Rotten limb
24.1	418749	281042	High	24/07/2017	*Populus alba*	Multiple			Loose bark, cavities
24.3	418749	281042	Moderate	24/07/2017	*Fraxinus excelsior*	Limb			Snapped limb
25.2	418731	281065	Moderate	18/10/2018	*Quercus robur*	branch		8	Possible hazard beam or gap around wound
25.3	418731	281063	Moderate	18/10/2018	*Quercus robur*	trunk			Loose bark, possible tear, dead wood
25.4	418731	281051	Moderate	18/10/2018	*Quercus robur*	trunk			Dead wood, missing bark
25.5	418738	281054	High	18/10/2018	*Fraxinus excelsior*	trunk			Fungus (don't climb), dying trunk with some green shoots, loose bark, woodpecker hole to north
25.6	418740	281059	Moderate	18/10/2018	*Quercus robur*				Leaning tree, precautionary rating
25.7	418743	281072	High	18/10/2018	*Fraxinus excelsior*	trunk	N	6	Tear wound and woodpecker hole
25.8	-	-	Low	18/10/2018	*Quercus robur*				Minor rot holes
26	418690	280947	Moderate	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	Multiple	Three knot holes, missing branch
27	418672	280932	Low	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	Multiple	Small holes and crack
28	418689	280900	Low	WSP April 2017	*Quercus robur*	Branch	E	6	Hole and dead branch

Tree no.	Location		GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
	X	Y							
29	419015	282567	High	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	Multiple	Cavities, splits, dead wood
30	419069	282540	Moderate	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	Multiple	Splits, cavities, missing limbs
31	419001	282537	Moderate	WSP April 2017	*Fraxinus excelsior*	Multiple locations	Multiple	Multiple	Knot hole, split
32	419028	282513	Low	WSP April 2017	*Quercus robur*	Branch	N	8	Knot hole
33	419914	282502	High	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	Multiple	Knot holes
34	419099	282546	High	WSP April 2017	*Aesculus hippocastanum*	Stem	NE	8	Cavity
35	419106	282567	High	WSP April 2017	*Fraxinus excelsior*	Multiple locations	Multiple	Multiple	Woodpecker holes
36	419117	282559	High	WSP April 2017	*Fraxinus excelsior*	Multiple locations	Multiple	Multiple	Knot holes, large cavities
37	419252	282634	Low	WSP April 2017	*Quercus robur*	Branch	W	10	Split in branch
38	419192	282579	Moderate	WSP April 2017	*Fraxinus excelsior*	Branch	NW	20	Woodpecker holes
39	419146	282575	Moderate	WSP April 2017	*Quercus robur*	Stem	Multiple	Multiple	Splits
40	419131	282556	High	WSP April 2017	*Quercus robur*	Stem	N	6	Cavity
41	419122	282561	High	WSP April 2017	*Fraxinus excelsior*	Multiple locations	Multiple	Multiple	Knot holes and cavities
42	418156	282287	Low	WSP April 2017	*Quercus robur*	Stem	SE	1	Split

Tree no.	Location		GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
	X	Y							
43	418156	282300	High	WSP April 2017	*Quercus robur*	Stem	All	Multiple	Five tear outs, dead wood
44	418172	282332	Low	WSP April 2017	*Quercus robur*	Major branch	N	9	Woodpecker hole
45	419226	281200	Low	WSP April 2017	*Fraxinus excelsior*	Multiple locations	S & W	6.5	Knot hole
46	419207	281198	Moderate	WSP April 2017	*Quercus robur*	Multiple locations, upper limbs	Multiple	8	Missing bark, missing limbs, splits in limbs
47	419190	281203	High	WSP April 2017	*Fraxinus excelsior*	Stem	N & S	7	Stem split and missing limb
48	419107	281216	Moderate	WSP April 2017	*Quercus robur*	Limbs - two main features	N	7	Splits in limb
49	419053	281249	Moderate	WSP April 2017	*Fraxinus excelsior*	Stem	S	2.5	Cavity in stem
50	418915	281296	Moderate	WSP April 2017	*Quercus robur*	Multiple - cavity on stem and limbs	Multiple	4 to 10	Knot holes, lifted bark,
51	418844	281411	Moderate	WSP April 2017	*Fraxinus excelsior, Quercus robur*	Stem, limbs	SW	4 and up	Knot holes, missing limbs, lifted bark
52	418817	281441	Low	WSP April 2017	*Quercus robur*	Limbs	W & E	4	Broken limbs
53	418801	281426	Moderate	WSP April 2017	*Quercus robur*	Multiple limbs	Multiple	6	Limbs, split limb, knot hole
54	418756	281396	High	WSP April 2017	*Quercus robur*	Stem and limbs	S & SW	2 and up	Knot holes, split limbs

Tree no.	Location		GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
	X	Y							
55	418736	281376	Moderate	WSP April 2017	*Quercus robur*	Stem and limbs	Multiple	8 and up	Knot hole, split branches, lifting bark, missing limb
56.1	418733	281367	Low	WSP April 2017	*Quercus robur*	Limb	W	8	Dead branch off limb
56.2	418733	281367	Low	WSP April 2017	*Quercus robur*	-	-	-	-
57	418738	281344	Low	WSP April 2017	*Quercus robur*	Stem	Multiple	5	Knot holes, lifted bark
58	418709	281254	Moderate	WSP April 2017	*Quercus robur*	Limb	N	8	Split in limb
59	418805	281218	Low	WSP April 2017	*Quercus robur*	Stem	S	3	Knot hole
60	418202	280837	Low	WSP April 2017	*Fraxinus excelsior*	Stem	S	4	Knot hole
61	419036	281167	High	WSP April 2017	*Quercus robur*	Upper limbs	Multiple	8	Knot holes, cavities
62	419024	281150	Low	WSP April 2017	*Quercus robur*	Stem	NW	7	Tear out
63	409013	281150	Moderate	WSP April 2017	*Quercus robur*	Stem	NW	6	Split bark, knot hole
64	418947	281150	Moderate	WSP April 2017	*Quercus robur*	Stem	W & E	10	Woodpecker hole on western tree - eastern tree dead branches with overlap
65	418846	281131	Low	WSP April 2017	*Quercus robur*	Limbs	N & E	10	Branches grown into each other

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
66	418744	281162	Low	WSP April 2017	*Quercus robur*	Stem	SE	7	Knot hoke
67	418728	281270	Moderate	25/04/2018	*Quercus robur*	Stem	Multiple	7	Dead wood and gaps
68	418699	281273	Moderate	25/04/2018	*Fraxinus excelsior*	Stem	S	4	Cavity present. Precautionary upgraded as tree will be lost and adjoining trees are to be surveyed
69	418685	281172	Moderate	25/04/2018	*Quercus robur*	Multiple locations	Multiple	5	Dead wood
70	418519	281118	Moderate	WSP April 2017	*Quercus robur*	Stem	N	Multiple	Four woodpecker holes
71	418571	281092	Moderate	WSP April 2017	*Fraxinus excelsior*	Stem	Multiple	7	Knot holes and cavities
72	418565	281082	Moderate	WSP April 2017	*Quercus robur*	Stem	Multiple	5	Knot holes and cavities
73	418655	281059	Moderate	WSP April 2017	*Fraxinus excelsior*	Stem	N	5	Missing limb
74	418661	281061	Moderate	WSP April 2017	*Populus alba*	Stem	Multiple	6	Missing limbs and branches
75	418683	281048	Low	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	7	Dead wood and missing branches
76	419175	280944	Low	WSP April 2017	*Quercus robur*	Minor limb	SW	12	Deadwood
77	419149	280940	Low	WSP April 2017	*Quercus robur*	Branches	N	6	Deadwood
78.1	419124	280961	Low	WSP April 2017	*Quercus robur*	Minor branches	Multiple	7	Deadwood

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
78.2	419124	280961	Low	WSP April 2017	*Fraxinus excelsior*	Minor branches	Multiple	7	Deadwood
79	419079	281133	Moderate	WSP April 2017	*Fraxinus excelsior*	Multiple locations	Multiple	Multiple	Cavities knot holes
80	419094	280978	Moderate	WSP April 2017	*Fraxinus excelsior*	Major branches	Multiple	Multiple	Knot holes and broken branches
81.1	418894	281053	Low	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	5	Knot holes deadwood missing branches
81.2	418894	281053	Low	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	5	Knot holes deadwood missing branches
81.3	418894	281053	Low	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	5	Knot holes deadwood missing branches
82	418290	482180	Moderate	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	8m	Woodpecker hole, dead branch and lifted bark
83	418330	482040	Moderate	WSP April 2017	*Quercus robur*	Multiple locations	Multiple	Multiple	Woodpecker holes, splits in bark and cavity
84.1	418404	281589	Low	30/08/2017	*Quercus robur*	Multiple locations	E, SE, SW	7m, 3m, 2m	Tear out - no recess. Knot hole behind limb (limb still present). Crevice above and below. Knot hole on limb - small cavity
84.2	418404	281589	Low	30/08/2017	*Quercus robur*	-	-	-	-
85.1	418980	281063	Moderate	15/08/2017	*Quercus robur*	limb			Hole /cavity
85.2	418980	281063	High	15/08/2017	*Fraxinus excelsior*	multiple			Woodpecker holes and other cavities

Tree no.	Location		GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
	X	Y							
86.1	418519	281474	Moderate	07/09/2017	*Fraxinus excelsior*	multiple			Several cavities
86.2	418605	281483	Moderate	07/09/2017	*Quercus robur*	multiple			Split and possible cavities
86.3	418587	281493	Moderate	14/06/2018	*Quercus robur*	Outer lower limb	NW		Woodpecker hole plus other possible features
86.4	418528	281494	Moderate	14/06/2018	*Quercus robur*	Branch, stem	SE,S		Lifted bark; knot hole
86.5	418526	218518	Moderate	14/06/2018	*Quercus robur*	multiple			Branch wounds, possible cavities
87	418450	281310	Low	WSP April 2017	*Quercus robur*	Trunk and limb	S & SW	3, 7	Knothole and deadwood
88	418450	281340	High	WSP April 2017	*Quercus robur*	Trunk	E	Base upwards	Split trunk
89	418270	281600	Moderate	WSP April 2017	*Fraxinus excelsior*	Limb	S	10	Woodpecker hole
90	418240	281590	Moderate	WSP April 2017	*Fraxinus excelsior*	Limb	S	10	Woodpecker hole
91	418160	281620	Low	WSP April 2017	*Quercus robur*	All	All	All	Ivy, possibly obscuring features
92	418260	281410	Low	WSP April 2017	*Quercus robur, Alnus glutinosa*	Multiple locations	All	Multiple	Multiple
101	-	-	Low	25/04/2018	*Fraxinus excelsior*	multiple			Thick ivy, dead wood in outer branch
102	-	-	Low	25/04/2018	*Quercus robur*	limbs			Deadwood, stropped bark on minor branches

Tree no.	Location		GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
	X	Y							
104	418485	281224	Moderate	25/04/2018	*Quercus robur*	centre of trunk + outer branched		4-7m	Snapped branches
105	418552	281263	Moderate	25/04/2018	*Quercus robur*	throughout			Dead wood and snapped branches throughout, precautionary rating for climbing
106	-	-	Moderate	25/04/2018	*Quercus robur*	throughout			Dead wood and snapped branches throughout, precautionary
107	418548	281288	Moderate	25/04/2018	*Quercus robur*	throughout			Dead wood and snapped branches throughout, precautionary rating for climbing
108	-	-	Moderate	25/04/2018	*Quercus robur*	throughout			Dead wood and snapped branches throughout, precautionary rating for climbing
109	-	-	Low	25/04/2018	*Quercus robur*	Limb /branch		10	Snapped branches but no obvious gaps
110	-	-	Moderate	25/04/2018	*Quercus robur*	Stem		2m, 5m	Two cavities
111	-	-	High	25/04/2018	*Quercus robur*	Stem			Wood pecker holes, one large cavity

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
112	418547	281604	Moderate	25/04/2018	*Quercus robur*	multiple	multiple	multiple (high)	Dead braches and callus wounds, possible hazard beam or tear; other features possible. Precautionary
113	418549	281601	Low	25/04/2018	*Quercus robur*	throughout			Dead wood throughout, precautionary rating for climbing
114	-	-	Low	25/04/2018	*Populus alba*	multiple	n/a	n/a	Thick ivy and some dead wood
115	-	-	Low	25/04/2018	*Populus alba*	multiple	n/a	n/a	Thick ivy and some dead wood
116	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Dead wood and branch snaps precautionary climb
117	-	-	Moderate	30/04/2018	*Quercus robur*	Limb	SW	6m	Deadwood in canopy, possible hazard beam at 6m at 40cm long split
118	-	-	Moderate	30/04/2018	*Quercus robur*	multiple		5m	Thick ivy, dead minor limb, possible hole at 5m, climb to check
119	-	-	High	30/04/2018	*Quercus robur*	Limbs	N	6m	Woodpecker holes outer branch
120	-	-	Moderate	30/04/2018	*Fraxinus excelsior*	multiple	-	-	Rot holes could have cavities, outer limbs snapped, deadwood, bird nest

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
121	-	-	High	30/04/2018	*Quercus robur*	multiple	-	-	Four rot holes, possible bird nest, dead limb with possible small cavities, further rot hole on opposite side
122	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Minor dead wood & snapped branch.4m split, minor ivy. Rot holes with cavity at 1.5m facing field
124	-	-	Low	30/04/2018	*Fraxinus excelsior*	throughout	-	-	Ivy
125	-	-	Low	30/04/2018	*Salix fragilis*	throughout	-	-	Ivy
126	-	-	Low	30/04/2018	*Fraxinus excelsior*	throughout	-	-	Ivy
127	-	-	Moderate	30/04/2018	*Quercus robur*	throughout	-	-	Large mature tree with restricted access Climb to check Precautionary. Fox path, prints and scat
128	-	-	High	30/04/2018	*Quercus robur*	limb and stem	SW, NE	8m, 7m	Snapped main branch at 8m with large split to heartwood 3m long. Additional split at 7m on other side with possible gaps along occluded wound. Woodpecker hole.
129	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Deadwood and rot holes, climb to check
130	-	-	Moderate	30/04/2018	*Quercus robur*	throughout	-	-	Canopy restricts view,

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
									climb to check
131	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Dead wood, missing bark, precautionary climb
132	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Mature oak possible features climb to check, precautionary
133	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Mature oak possible features climb to check, precautionary
134	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Mature oak possible features climb to check, precautionary
135	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Mature oak possible features climb to check, precautionary
136	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Mature oak possible features climb to check, precautionary
137	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Mature oak possible features climb to check, precautionary. Possible Buzzard nest or perch site
138	-	-	High	30/04/2018	*Quercus robur*	Limb	N	5m	3m long split in large branch, downward-facing opening with stripped/loose bark

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
144	-	-	Moderate	30/04/2018	*Quercus robur*	throughout	-	-	Deadwood and minor ivy, large mature tree precautionary - climb to check
145	-	-	Low	30/04/2018	*Fraxinus excelsior*	multiple	-	-	Thick ivy
146	-	-	Low	30/04/2018	*Fraxinus excelsior*	multiple	-	-	Ivy, lots of decay /deadwood
147	-	-	High	30/04/2018	*Fraxinus excelsior*	multiple	-	-	Branch split off, missing bark, 5m(SE) woodpecker holes
148	-	-	Low	30/04/2018	*Quercus robur*	trunk	-	-	Leading limb snapped at 4m, loose bark, occluded wound
149	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Deadwood, loose bark, woodpecker feeding holes. Precautionary climb.
150	-	-	Moderate	30/04/2018	*Quercus robur*	trunk	-	-	Loose bark 4m (W). Possible gap 5m (S)
151	-	-	Moderate	30/04/2018	*Fraxinus excelsior*	trunk	NW	5m	Woodpecker hole
152	-	-	Low	30/04/2018	*Alnus glutinosa*	trunk	-	-	Rot holes
153	-	-	Moderate	30/04/2018	*Alnus glutinosa*	trunk	-	-	Small woodpecker hole
154	-	-	Moderate	30/04/2018	*Alnus glutinosa*	trunk	-	-	Small woodpecker hole
155	-	-	Low	30/04/2018	*Alnus glutinosa*	trunk	-	5m	Rot holes
156	-	-	Moderate	30/04/2018	*Alnus glutinosa*	trunk	E	2m	Woodpecker hole, rot hole

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
157	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Split in dead branched 4, 5, 7m, loose bark at dead limb on outer beam at 7m
158	-	-	Low	30/04/2018	*Quercus robur*	multiple	-	-	Main trunk fallen into field, loose bark. Gaps. Deadwood. Gaps under splits
159	-	-	Low	30/04/2018	*Quercus robur*	trunk	-	-	Thick ivy
160	-	-	High	30/04/2018	*Quercus robur*	multiple	-	-	Loose/ stripped bark at 5m. Possible WP holes 8m (NW), very large rot hole. Crown to base splits
161	-	-	Moderate	30/04/2018	*Quercus robur*	trunk	-	-	Deadwood, stripped bark on dead limbs. Possible splits (SE)
162	-	-	High	30/04/2018	*Fraxinus excelsior*	multiple	-	-	Woodpecker holes. 3 Gaps at 7m (W), broken limbs at 4m
163	-	-	High	30/04/2018	*Fraxinus excelsior*	trunk	-	-	Woodpecker holes (E) at 4m & rot holes
164	-	-	Moderate	30/04/2018	*Fraxinus excelsior*	multiple	-	-	Branch splits. Gaps under loose bark at crown (fallen branch), deadwood, snapped branches
165	-	-	Low	30/04/2018	*Crataegus monogyna*	multiple	-	-	Very thick ivy

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
166	-	-	Low	30/04/2018	*Crataegus monogyna*	multiple	-	-	Very thick ivy
167	-	-	Low	30/04/2018	*Alnus glutinosa*	trunk	-	-	Main trunk snapped 4m. Loose bark
168	-	-	High	30/04/2018	*Alnus glutinosa*	multiple	-	-	2-4m cavity /split, woodpecker holes 2m (E), leading limb snapped, likely to be hollow
169	-	-	High	30/04/2018	*Alnus glutinosa*	multiple	-	-	Woodpecker holes 3m (N) splits loose bark2 snapped branches 9m. Snapped main branch
170	-	-	High	30/04/2018	*Alnus glutinosa*	trunk	-	3-5m	More than ten woodpecker holes between 3-5m
171	-	-	Moderate	30/04/2018	*Alnus glutinosa*	trunk	-	-	Split (exposed cavity), 3-4.5m not that deep
172	-	-	Moderate	30/04/2018	*Alnus glutinosa*	throughout	-	-	Split 2-3m long
173	-	-	Moderate	30/04/2018	*Alnus glutinosa*	throughout	-	-	Large mature tree with dead wood precautionary climb
174	-	-	Low	30/04/2018	*Alnus glutinosa*	throughout	-	-	Standing deadwood
175	-	-	Low	30/04/2018	*Quercus robur*	throughout	-	-	Lightning strike split main trunk, loose bark,
176	-	-	Moderate	30/04/2018	*Fraxinus excelsior*	multiple	-	-	Thick ivy cover. Loose bark possible split, ivy

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
177	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Some deadwood, no obvious feature, precautionary climb
178	-	-	Low	30/04/2018	*Quercus robur*	-	-	-	No obvious features but poor access, precautionary Low
179	-	-	Moderate	30/04/2018	*Quercus robur*	throughout	-	-	Restricted access mature trees with noted branch splits and possible other features. Precautionary - climb to check
180	-	-	Moderate	30/04/2018	*Quercus robur*	throughout	-	-	Restricted access mature trees with noted branch splits and possible other features. Precautionary - climb to check
181	-	-	Moderate	30/04/2018	*Quercus robur*	throughout	-	-	Restricted access mature trees with noted branch splits and possible other features. Precautionary - climb to check
183	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Standing dead wood, loose bark,
184	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Rot holes. Loose bark. Possible cavities
185	-	-	Moderate	30/04/2018	*Fraxinus excelsior*	stem	-	-	Possible rot holes

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
186	-	-	Low	30/04/2018	*Quercus robur*	throughout	-	-	Ivy
187	-	-	Low	30/04/2018		throughout	-	-	Ivy
188	-	-	Low	30/04/2018	*Quercus robur*	throughout	-	-	Ivy and minor split
189	-	-	Low	30/04/2018	*Fraxinus excelsior*	throughout	-	-	Ivy
190	-	-	Low	30/04/2018	*Quercus robur*	throughout	-	-	Ivy
191	-	-	High	30/04/2018	*Alnus glutinosa*	stem		5m	Four woodpecker holes
192	-	-	Moderate	30/04/2018	*Alnus glutinosa*	stem	-	-	Two rot holes leading to possible cavities
193	-	-	Low	30/04/2018		trunk	-	-	Exposed standing deadwood, trunk snapped at 4m.
194	-	-	Low	30/04/2018	*Alnus glutinosa*	trunk		4m	Rot hole with possible cavity
195	-	-	Moderate	30/04/2018	*Alnus glutinosa*	trunk		4m	Two woodpecker holes, standing deadwood with top of tree snapped off,
196	-	-	Moderate	30/04/2018	*Alnus glutinosa*	-	-	-	Three bat boxes
197	-	-	Low	30/04/2018	*Quercus robur*	multiple	-	-	Ivy, rot holes
198	-	-	Low	30/04/2018	*Quercus robur*	multiple	-	-	branch split, occluded wound
199	-	-	High	30/04/2018	*Quercus robur*	multiple	-	-	Large hole at 4m with possible cavity, rot holes, two woodpecker holes

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
200	-	-	Low	30/04/2018	*Quercus robur*	trunk	-	-	Minor rot holes
201	-	-	Low	30/04/2018	*Quercus robur*	multiple	-	-	Thick ivy
202	-	-	Moderate	30/04/2018	*Quercus robur*	trunk	-	4m	Rot hole with possible cavity
203	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Thick ivy, possible minor cavities
204	-	-	Moderate	30/04/2018	*Quercus robur*	multiple	-	-	Thick ivy, possible minor cavities, deadwood
205	-	-	Low	30/04/2018	*Quercus robur*	multiple	-	-	Ivy
206	-	-	Low	30/04/2018	*Quercus robur*	multiple	-	-	Ivy
207	-	-	Low	30/04/2018	*Quercus robur*	multiple	-	-	Ivy
208	-	-	Low	30/04/2018	*Quercus robur*	multiple	-	-	Ivy
209	-	-	Low	30/04/2018	*Quercus robur*	multiple	-	-	Ivy
210	-	-	Low	30/04/2018	*Quercus robur*	multiple	-	-	Ivy
211	-	-	Low	30/04/2018	*Quercus robur*	Trunk	-	-	Small rot hole, deadwood
212	-	-	High	30/04/2018	*Fraxinus excelsior*	multiple	-	-	Three woodpecker holes high in crown, minor rot holes, loose bark, branch split
213	-	-	Low	30/04/2018	*Fraxinus excelsior*	multiple	-	-	Thick ivy, possible dead wood
214	-	-	Low	30/04/2018	*Fraxinus excelsior*	Limb	-	-	Major snapped limb but appears to be exposed

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
246	-	-	Low	30/04/2015	*Quercus robur*	multiple	-	-	Split at 3-5m on main leaning truck. No likely cavity and exposed
216	-	-	Low	12/06/2018	*Quercus robur*	limbs	S	4m	Minor dead branch, snag with small cracks/gap, callus roll in outer branch
217	420102	283521	Moderate	12/06/2018	*Quercus robur*	trunk	S	2m	rot hole, lifted bark, branch wounds, minor cavities
218	-	-	Low	12/06/2018	*Quercus robur*	throughout	-	-	Minor dead wood & potential for small cavities, rated L as precaution
219	-	-	Low	12/06/2018	*Fraxinus excelsior*	main trunk	-	-	Ivy
220	420216	283242	Moderate	12/06/2018	*Crataegus monogyna*	not accessible	-	-	Ivy, precautionary
221	420193	283246	Moderate	12/06/2018	*Quercus robur*	not accessible	trunk	-	Trunk cavities and ivy
222	420178	283245	Moderate	12/06/2018	*Fraxinus excelsior*	not accessible	-	-	Thick ivy & precautionary
223	-	-	Low	12/06/2018	*Alnus glutinosa*	main trunk	-	-	Thick ivy
224	-	-	Low	12/06/2018	*Quercus robur*	throughout	-	-	Minor dead wood, precautionary

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
225	420023	283695	Moderate	12/06/2018	*Fraxinus excelsior*	throughout	-	-	Thick ivy, exposed dead wood, small crevices, missing & lifted bark
229	420159	283019	Moderate	12/06/2018	*Quercus robur*	trunk	N	5m	Possible callus roll. Also dead wood, black fungal staining, bird nest
230	420183	282969	Moderate	12/06/2018	*Quercus robur*	throughout	-	-	Most bark exposed or missing, much dead wood, with small crevices & others possible
231	420192	282967	Moderate	12/06/2018	*Quercus robur*	trunk	SE	6m	Possible splits
232	420220	283001	Moderate	12/06/2018	*Quercus robur*	-	-	-	Minor dead wood, precautionary- difficult to see
233	420219	282983	Moderate	12/06/2018	*Quercus robur*	branch wound on outer branch	S		minor dead wood, precautionary- difficult to see, possible cavity at callus roll
234	420221	282962	Moderate	12/06/2018	*Quercus robur*	-	-	-	Minor dead wood, precautionary- difficult to see
235	420258	283060	High	12/06/2018	*Quercus robur*	throughout	N	8m	Dead wood, lifted bark, possible hazard beam or gaps around large callus role

Tree no.	Location		GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
	X	Y							
236	420259	283005	Moderate	12/06/2018	*Quercus robur*	trunk	N	3m	Possible cavity at rot hole
237	420250	282951	High	12/06/2018	*Quercus robur*	leading branch	NW	5-7m	Long split with decay and wound/ cavity around an old callus wound, minor splits elsewhere
238	420261	282950	Moderate	12/06/2018	*Quercus robur*	outer branch	S, NW	-	Minor branch snap & wound, possible callus roll
239	418983	280595	High		*Quercus robur*	trunk		0.3-2m	Thin frost crack from 30cm to ~2m. Myotis bat observed in crack by WA surveys for motorway service station in 2018
240	418931	280629	Moderate		*Quercus robur*				Dead Oak with multiple features on the woodland/arable field edge (small amount of hazard tape on the tree, next to a hawthorn) NW of woodland edge.
241	418962	280530	Moderate		*Quercus robur*				knot holes, minor dead wood
242	418976	280632	High		*Populus alba*		SW		Broken limb with potential features, woodpecker holes, knotholes

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
243	418984	280633	Moderate		*Populus alba*		S/SW		Tear out, broken branches,
244	419054	280615	Moderate		*Populus alba*				Dead wood, possible cavities, precautionary rating
245	420334	283081	Moderate	20/07/2018	*Fraxinus excelsior*	trunk	multiple	-	Small cavities or rot holes
246	420272	282932	Moderate	20/07/2018	*Quercus robur*	Branch	-	-	Two large splits
247	420276	282925	Moderate	20/07/2018	*Fraxinus excelsior*	Trunk	multiple	-	Woodpecker holes
248	420350	282924	Moderate	20/07/2018	*Quercus robur*	Trunk	multiple	-	Loose bark, callus on branch wound, small splits, woodpecker holes
249	420375	282916	Moderate	20/07/2018	*Quercus robur*	Trunk	SE	5	Possible cavity
250	420382	282916	Moderate	20/07/2018	*Fraxinus excelsior*	branch	multiple	-	Branch wounds, possible cavities
251	420360	282936	Moderate	20/07/2018	*Fraxinus excelsior*	branch	multiple	-	Branch wounds, possible cavities, woodpecker holes
252	-	-	Low	30/04/2018	*Quercus robur*	Trunk	-	3-5	Split but no cavity and exposed
253	418960	280537	Low		*Acer campestre*	-	-	-	Dead wood, knot holes, loose bark, but suboptimal features providing very little shelter
254	418936	280636	Low		*Populus alba*	-	-	-	Peeling bark

Tree no.	Location		GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
	X	Y							
255	418933	280635	Low		*Crataegus monogyna*	Trunk	-	-	Ivy
256	418951	280621	Low		*Quercus robur*	-			Large possibly veteran tree precautionary rating as no obvious features
257	418978	280627	Low		*Populus alba*	-	W		One small hole
258	418949	280609	Low		*Populus alba*	Trunk	All		Ivy
259	419044	280614	Low		*Populus alba*	Trunk	All		Ivy
260	419015	280619	Low		*Populus alba*	-			Small hole
261	418490	282786	High	18/10/2018	*Quercus robur*	trunk	N	8	Knot holes developing, desiccation of lower dead branches
262	418494	282775	Moderate	18/10/2018	*Quercus robur*	all			Desiccation features in dead branches, occluded wounds /tears. Can't see fully- recommend climb
263	418539	282643	Moderate	18/10/2018	*Quercus robur*	all			Deadwood, possible decay, loose stripped bark
264	418535	282647	Low	18/10/2018	*Quercus robur*	all			Ivy
265	418548	282601	Low	18/10/2018	*Quercus robur*	trunk	all		Ivy

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
266	418997	280270	Low	18/10/2018	*Acer campestre*	trunk	S	4	Tear with possible cavity, other tears and broken branches. Poor location next to A45
267	419003	280230	Moderate	18/10/2018	*Quercus robur*	trunk			Dead standing trunk with loose bark & desiccation features /splits
268	419010	280158	Moderate	18/10/2018	*Quercus robur*	trunk	S	3	Low loose bark at butt rot, knot holes, including several with cavities
269	419035	280291	Moderate	18/10/2018	*Quercus robur*	trunk	S	8	Dead standing oak with well-developed knot holes with cavities and loose bark
270	419115	280273	Moderate	18/10/2018	*Quercus robur*	trunk	E	4	fallen dead standing oak with desiccation features /splits , loose bark - partly fallen
271	419116	280260	High	18/10/2018	*Quercus robur*	all			Knot holes, loose bark, splits, hole in dead branch
272	419121	280262	High	18/10/2018	*Salix fragilis*	all			Twisted main stem, bends at ~90 degrees at ~3m. Lots of potential under near horizontal section, dead wood, cracks, splits, twists.
273	419166	280500	Low	18/10/2018	*Populus alba*		S	15	Large split/tear looks exposed

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
G1	419225 - 419109	280494 - 280519	Low	18/10/2018	*Populus alba*				Group of white poplars (8-12 individual trees) athe southern edge of Ashbury Coppice. Most appear to have only superficial features like ivy
274	419258	280496	High	18/10/2018			S, SW		Missing bark, lifted bark, desiccation splits, knotholes with cavity [4m S], woodpecker holes [7m SW]
276	419266	280500	Moderate	18/10/2018					Minor rot holes and deadwood
277	419279	280505	High	18/10/2018	*Crataegus monogyna*		S	2.5	Small hawthorn in outgrown hedge at end of wood; 2 holes.
278	419316	280522	Moderate	18/10/2018	*Quercus robur*				10m into woodland, can't access – precautionary rating.
279	419313	280553	Low	18/10/2018	*Prunus spinosa*				Dead blackthorn on edge of wood; 2 holes into heartwood.
280	419312	280558	Moderate	18/10/2018	*Prunus spinosa*		SE	0.5 & 2.2	Dead blackthorn on edge of woodland; 2 holes at 50cm and 2.2m.
281	419306	280561	High	18/10/2018	*Fraxinus excelsior*		E	5 & 8	2 large cavities. No direct access.

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
282	419300	280600	Moderate	18/10/2018	*Fraxinus excelsior*		S	7	Knothole, 3-stemmed tree, in a line of similar ashes.
284	419359	280652	High	18/10/2018	*Quercus robur*				Dense thick ivy, missing bark. Wound, missing bark, desiccation splits, other potential features obscured.
285	419425	280666	Low	18/10/2018	*Quercus robur*				Ivy
286			Low	18/10/2018	*Leylandii*		N	1.6	Main trunk snapped at 1.6m 60 degrees
288			Low	18/10/2018	*Quercus robur*				Restricted view. Nothing obvious precautionary Low
289	418508	282877	Moderate	18/10/2018	*Quercus robur*		all		Tear at 3m East, joined main trunks at 3m, fused branches at 4m, S, knot hole and callus 12m south
290	418667	282347	Low	18/10/2018	*Fraxinus excelsior*				Twin-stem ash with thick ivy
291	418660	282342	Low	18/10/2018	*Fraxinus excelsior*				Twin-stem ash with thick ivy
292	418626	282331	Low	18/10/2018	*Fraxinus excelsior*				Minor rot hole at cut branch
293	418599	282326	Low	18/10/2018	*Fraxinus excelsior*		N	8	Little rot hole
294	418626	282341	Low	18/10/2018	*Acer pseudoplatanus*				Thick ivy

Tree no.	Location X	Location Y	GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
295	418610	282333	Moderate	18/10/2018	*Fraxinus excelsior*		N	6	Ivy and tear wound
296	418608	282330	Low	18/10/2018	*Fraxinus excelsior*				Road-side tree with thick ivy
297	418640	282348	Low	18/10/2018	*Fraxinus excelsior*				Road-side tree with thick ivy
298	418647	282352	High	18/10/2018	*Fagus sylvatica*				Main trunk cut, old with cavities.
299	418669	282373	Low	18/10/2018	*Fraxinus excelsior*				
300	418671	282373	Low	18/10/2018	*Fraxinus excelsior*				
301	418635	282442	Low	18/10/2018	*Acer pseudoplatanus*				Ivy
302	418625	282447	Low	18/10/2018	*Ulmus minor*				Ivy
303	418708	282349	Moderate	18/10/2018	*Fraxinus excelsior*				Old ash with very gnarled trunk possible gaps between bark, lifted bark, and small holes, in a copse of hazel and rhodidendron so sheltered location.
304	418590	282139	Low	18/10/2018	*Crataegus monogyna*				Outgrown hawthorn in hedgerow, ivy.
305	418591	282141	Low	18/10/2018	*Crataegus monogyna*				Outgrown hawthorn in hedgerow, ivy.
306	418594	282145	Low	18/10/2018	*Crataegus monogyna*				Outgrown hawthorn in hedgerow, ivy.

Tree no.	Location		GLTA rating	GLTA date	Tree species	PRF Location	PRF Orientation	Approx. height	PRF Form & general information
	X	Y							
307	418604	282161	Low	18/10/2018	*Crataegus monogyna*				Outgrown hawthorn in hedgerow, ivy.
308	418605	282162	Low	18/10/2018	*Crataegus monogyna*				Outgrown hawthorn in hedgerow, ivy.
309	418606	282164	Low	18/10/2018	*Crataegus monogyna*				Outgrown hawthorn in hedgerow, ivy.
310	418591	282279	Low	18/10/2018	*Quercus robur*				Ivy
311	418647	282217	Moderate	18/10/2018	*Quercus robur*				Loose, missing bark, desiccation splits, top branches lopped
312	418563	281966	Low	18/10/2018	*Populus alba*				Ivy
313	418581	281982	Low	18/10/2018	*Malus domestica*				Ivy
314	418510	282872	Low	18/10/2018	*Quercus robur*				Stunted by being in the shade of 289, small branch splits and minor wounds. Low as a precaution
315	418509	282865	Low	18/10/2018	*Crataegus monogyna*				One of several outgrown hawthorn along the hedgerow with some ivy; thicker ivy present here.

Annex D: Tree climbing results

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
1	*Quercus robur*	1a	31/08/2017	Deadwood with desiccation fissure	S	13m	No	High	High
		1b		Deadwood with desiccation fissure	E	9m	No		
		1c		Deadwood with desiccation fissure and cavity	W	8m	No		
		1d		Deadwood with desiccation fissure and cavity	S	10m	No		
		1e		Knot hole	NE	7m	No		
		1f		Knot hole forming cavity	S	5m	No		
		1g		Knot hole forming cavity	S	4m	No		
		1h		Deadwood with cavity	SE	7m	No		
2	*Quercus robur*	2a	31/08/2017	Minor desiccation fissure on limb	W	7m	No	Moderate	Negligible
		2b		Knot hole forming - no PRF.	E	2m	No		
		2c		Some ivy 2-8m - checked as much as possible and no PRF	All	2-8m	No		
3	*Quercus robur*	3a	31/08/2017	Knot hole end of limb - small cavity	N	12m	No	Low	Low
		3b		Wound - topside of dead limb - small cavity only	N	10m	No		
		3c		Raised bark	S	9m	No		
		3d		Cavity on topside of limb - small cavity with potential water egress	E	6m	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
		3e		Dead limb - multiple knot holes/cavities - small cavities only	S	5m	No		
4	*Quercus robur*		27/07/2018	Number of deadwood limbs offering no shelter	W	4m	No	Low	Negligible
5	*Quercus robur*	5a	31/08/2017	Knot hole forming - cavity behind	E	7m	No	Moderate	Moderate
		5b		Multiple areas of deadwood but no true PRF	n/a	n/a	No		
6	*Crataegus monogyna*			Branch cavity - Knot hole opening 3 x 1cm on underside of lower limb, extending laterally 7cm deep, woodlice in the apex.	NE	2.5m	No		
7	*Fraxinus excelsior*	7a	06/09/2017	2 x Knot hole on limb - no recess	S	14m	No	Moderate	Moderate
		7b		Squirrel hole on stem	S	11m	No		
		7c		Split in stem - no recess/prf	N	8m	No		
		7d		Snapped limb - no recess/prf	NW	7m	No		
8	*Fraxinus excelsior*	8a	06/09/2017	Woodpecker hole on stem - entrance enlarged by squirrel	W	10m	No	High	Moderate
		8b		Knot hole on limb - small cavity	NW	10m	No		
		8c		Transverse snap on limb - small cavity	E	5m	No		
		8d		Knot hole forming - small cavity only	N	4m	No		
		8e		Large knot hole - exposed feature - no real potential	S	4m	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
9	*Quercus robur*	9a	06/09/2017	Lightning strike with rams horns, raised bark and desiccation fissures	E	0-11m	No	Moderate	Moderate
		9b		Various small sections of raised bark and desiccation fissures	W	5-11m	No		
10	*Quercus robur*	10a	06/09/2017	Knot hole on limb - small cavity	S	12m	No	Moderate	Low
		10b		Deadwood on limb - rams horns and desiccation fissures	NE	8-11m	No		
		10c		Transverse split on limb - no prf.	E	3m	No		
11	*Quercus robur*	11a	07.09.17	Knot hole on topside of limb - no recess/prf	S	5m	No	Moderate	Negligible
		11b		Knot hole - no recess/prf	W	4m	No		
13	*Quercus robur*	13a	07.09.17	Knot hole	N	6m	No	Moderate	Low
		13b		Crevice under deadwood on limb	N	6m	No		
14	*Quercus robur*	14a	01/09/2017	Dead limbs x 2 - desiccation fissures	W	7m	No	Moderate	Low
16	*Quercus robur*	14b	01/09/2017	Lifted bark	S	3-6m	No	Moderate	Moderate
		14c		Lifted bark	E	1-3m	No		
		16a		Snapped limb/split in limb - desiccation fissures	SE	10-12.5m	No		
		16b		Transverse snap - no recess/PRF	S	9m	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
		16c		Split in dead limb	N	8m	No		
		16d		Snapped limb with large cavity	W	6m	No		
		16e		Split in stem ear base - very deep feature	SW	0.5 - 1m	No		
21	*Quercus robur*	21a	23/08/2017	Cavity in rotten limb	W	5m	No	Moderate	Moderate
		21b		Knot hole - joins 21a	W	5m	No		
22	*Fraxinus excelsior*	22a	23/08/2017	2 x limb with rot hole. Could not inspect with endoscope as on end of rotten limb - low potential only	N & W	6m	No	Moderate	Low
		22b		No recess in all knot holes present	n/a	n/a	No		
24.1	*Populus alba*	24.1a	24.07.2017	Poplar to west. Raised bark on stem	N	15m-16m	No	Unknown	High
		24.1b		Multiple cavity on stem in deadwood	N	15m	No		
		24.1c		Large wound on stem. Including multiple cavities. Also raised bark and rams horns.	N	9m-13m	No		
		24.1d		Large wound on stem with multiple cavities.	N	6-7m	No		
24.2	*Fraxinus excelsior*	24.2	24/07/2017	Ash to west. No recessed features	n/a	n/a	No	Unknown	Negligible

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
24.3	*Fraxinus excelsior*	24.3a	24/07/2017	Ash to east. Large tear-out (missing limb). Cavity 0.5m on stem	S	5-6m	No	Unknown	Moderate
		24.3b		Knot hole on stem - no recess/PRF	S	6m	No		
24.4	*Populus alba*	24.4a	24/07/2017	Poplar to east. Woodpecker holes on deadwood on limb - no recess/PRF	N	18m-20m	No	Unknown	Negligible
		24.4b		Snapped limbs - no recess	N	Multiple	No		
25	-	-	-	No tree present	-	-	-	-	-
26	*Quercus robur*	26a	01/09/2017	Knot hole forming - limb	S	7.5m	No	Moderate	Low
		26b		Knot hole on limb	S	7m	No		
		26c		Knot hole on stem	S	4.5m	No		
		26d		Knot hole forming	W	4	No		
46	*Quercus robur*	46a	10/08/2017	Raised bark and small cavity in deadwood on limb	N	6m	No	Moderate	Moderate
		46b		Raised bark on limb	W	5m	No		
		46c		Desiccation-fissures on limb and crevice on lifted bark on collar	E	4m	No		
47	*Fraxinus excelsior*	47a	10/08/2017	Tear out on stem	N	11m (top of tree)	No	High	High
		47b		Tear out on stem	S	7m	No		
		47c		Tear out on stem (leads to 47b)	S	6m	No		
		47d		Tear out on stem - cavity leading to 47b	N	5m	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
48	*Quercus robur*	48a	14/08/2017	Rams horns on east side of limb north of tree - also behind heartwood	E	7m	No	Moderate	Low
49	*Fraxinus excelsior*	49a	14/08/2017	Cavity in deadwoods	E	3.5m	No	Moderate	Moderate
		49b		Knot hole	W	3m	No		
		49c		Cavity in deadwoods	E	2.5m	No		
50	*Quercus robur*	50a		Knot hole	NW	3.5m	No	Moderate	Moderate
		50b		Lifted bark on stem	All	all above 3m	No		
		50c	14/08/2017	Desiccation-fissures present	All	all above 3m	No		
51.1	*Fraxinus excelsior*	51.1a	07/09/2017	Knot hole on stem with small cavity	W	10m	No	Moderate	Low
		51.1b		Knot hole on stem with small cavity	E	4m	No		
		51.1c		Ash - North. Knot hole on stem - honeycomb present swarm gone	W	4m	No		
51.2	*Quercus robur*	51.2a	07/09/2017	Oak. Small desiccation fissures and small cavity	W	4m	No	Moderate	Low
51.3	*Fraxinus excelsior*	51.3	07/09/2017	Ash - South. Dense ivy on stem - not possible to climb. Visual from ground and from climb on 51.2. No PRF observed.	n/a	n/a	No	Moderate	Low

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
53.1	*Quercus robur*	53.1a	07/09/2017	Oak - East. Subsidence crack on limb - small crevice only.	S	6m	No	Moderate	Low
53.2	*Quercus robur*	53.2a	07/09/2017	Oak - West. Rams horns on deadwood on topside of limbs	W	7m	No	Moderate	Low
		53.2b		Deadwood on limb - lifted bark and small cavity	S	5-6m	No		
54	*Quercus robur*	54a	10/08/2017	Tear out on stem with desiccation-fissures and rams horns	S	12 - 14m	No	High	Moderate
		54b		Weld on stem.	S	6m	No		
		54c		Weld on stem.	S	3-5m	No		
55	*Quercus robur*	55a	10/08/2017	Small area of raised bark. No further PRF	Multiple	Multiple	No	Moderate	Low
58	*Quercus robur*	58a	23/08/2017	Canker	N	6m	No	Moderate	Low
		58b		Knot hole on topside of limb not visible from ground. Goes up into dry cavity	N	6m	No		
61	*Quercus robur*	61a	10/08/2017	Tear out on limb (6a,b,a all link)	S	8m	No	High	High
		61b		Tear out on limb (6a,b,a all link)	N	7m	No		
		61c		Tear out on limb (6a,b,a all link)	W	7m	No		
		61d		Tear out - but no cavity present i.e. no prf	E	7m	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
63	*Quercus robur*	63a	10/08/2017	Minor lifted bark exposed at top and bottom. No true know hole present. Also, desiccation-fissures on limbs but no suitable PRF	Multiple	Multiple	No	Moderate	Low
64-1	*Quercus robur*	64.1a	15/08/2017	Squirrel hole on stem	W	10m	No	Moderate	High
		64.1b		Wound on stem	NW	10m	No		
		64.1c		Wound on limb. Large cavity on topside of limb, but goes into dry cavity. Not visible from ground level	W	9m	No		
		64.1d		Wound topside of limb	S	9m	No		
		64.1e		Wound on underside of limb	S	8.5m	No		
64-2	*Quercus robur*	64.2a	15/08/2017	False knot hole - no recess	E	7m	No	Moderate	Negligible
67	*Quercus robur*	67a	15/08/2017	Rams horns	N	4-6m	No	Moderate	Moderate
		67b		Rams horns	S	4-6m	No		
		67c		Raised bark	Multiple	Multiple	No		
68	*Fraxinus excelsior*	68a	15/08/2017	Multiple rot cavities on stem - subject to water egress	Multiple	7m	No	Moderate	Low
		68b		Multiple rot cavities on stem	Multiple	2-3m	No		
69	*Quercus robur*	69a	27/07/2018	Shelter 10cm deep behind callus roll. Sub optimal.	NE	10	No	Moderate	High
		69b		Cavity behind callus roll 8cm deep. Very enclosed.	NE	9	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
		69c		clean smooth dry cavity behind old flush cut leading into main trunk. Very tight, twisted cavity, upward developed. Estimate 30cm deep. Access hole 4 x 2cm.	SE	3	No		
70	*Quercus robur*	70a	27/07/2018	Woodpecker hole on stem	N	12m	No	Moderate	High
		70b		Subsidence crack on limb - small cavities	S	8m	No		
		70c		Subsidence crack on limb - multiple cavities	SE	8m	No		
		70d		Woodpecker hole on stem	S	5m	No		
		70e		Woodpecker hole on stem	S	5m	No		
		70f		Woodpecker hole started but no recess/PRF	S	4m	No		
71	*Fraxinus excelsior*	71a	27/07/2018	Knot hole - no recess	NW	11m	No	Moderate	High
		71b		Knot hole with large cavity - approx. 0.5m	W	7m	No		
		71c		Snapped limb - small crevice only	NW	6m	No		
		71d		Knot hole with large cavity	SW	5m	No		
		71e		Fluting on stem - no recess/PRF	SE	3-5m	No		
72	*Quercus robur*	72a	27/07/2018	Knot hole forming - PRF into cavity behind dead limb	SE	7m	No	Moderate	Moderate
		72b		Raised bark	S	7m	No		
		72c		Knot hole on stem - cavity deep behind rotten limb	W	5m	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
		72d		Multiple knot holes with no cavity yet formed - no PRF	Multiple	Multiple	No		
73	*Fraxinus excelsior*	73a	20/07/2017	Knot hole on stem - large cavity goes down to 73b	N	7m	No	Moderate	High
		73b		Knot hole on stem - large cavity goes down and up to 73b	SW	6m	No		
		73c		Large tear out with multiple cavities in deadwood	N	4m	No		
		73d		Knot hole - no current recess/PRF	S	4m	No		
74	*Populus alba*	74a	23/08/2017	Missing Limb	N	15m	No	Moderate	Low
		74b		Missing Limb	SE	13m	No		
		74c		Missing Limb	S	6m	No		
79	*Fraxinus excelsior*	79a	14/08/2017	Multiple know holes on north of stem and limbs	N	5-7m	No	Moderate	High
		79b		raised bark on stem	N	5-7m	No		
		79c		Butt rot	N	0-1m	No		
80	*Fraxinus excelsior*	80a	14/08/2017	Knot hole on limb	N	12.5m	No	Moderate	Moderate
		80b		Knot hole on stem	SW	12m	No		
		80c		Rot wood cavity on snapped limb	S	7m	No		
		80d		Knot hole cavity covered by ivy	NE	4m	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
82	*Quercus robur*	82a	30/08/2017	Woodpecker hole - no cavity above or below	E	20m	No	Moderate	Low
		82b		Dead limb - lifted bark	S	8m	No		
		82c		Transverse snap -crevice	NE	7m	No		
83	*Quercus robur*	83a	30.08.17	5x squirrel holes on limb - with 2 x connected	N	8-10m	No	Moderate	High
		83b		Knot hole - large cavity connected to squirrel holes	N	11m	No		
		83c		Subsidence crack with 2 x squirrel holes, rams horns and cavities	S	10-14m	No		
		83d		Knot hole - no PRF	W	8m	No		
		83e		Knot hole	W	3m	No		
84.1	*Quercus robur*	84.1a	30/08/2017	Tear out - no recess	E	7m	No	Moderate	Low
		84.1b		Knot hole behind limb (limb still present). Crevice above and below.	SE	3m	No		
		84.1c		Knot hole on limb - small cavity	SW	2m	No		
84.2	*Quercus robur*	84.2	30/08/2017	Desiccation fissure at top of stem/tree	N	15m	No	Moderate	Low
85-1	*Quercus robur*	85-1a	15/08/2017	Oak - knot hole on limb	SW	4m	No	Moderate	Low
85-2	*Fraxinus excelsior*	85-1a	15/08/2017	Ash - squirrel hole	E	15m	No	High	High
		85-1b		Woodpecker hole	N	14m	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
		85-1c		Knot hole	S	10m	No		
		85-1d		Knot hole	NW	10m	No		
		85-1e		Weld	N	1m	No		
86.1	*Fraxinus excelsior*	86.1a	07/09/2017	Knot hole in hollow stem (not vis from ground).	W	8m	No	Moderate	Moderate
		86.1b		Knot hole	S	7m	No		
		86.1c		2 x knot holes on stem. Enlarged by squirrel and connected.	S	6m	No		
86.2	*Quercus robur*	86.2a	07/09/2017	Small split on topside of stem - not visible from the ground	W	8m	No	Moderate	Moderate
		86.2b		Hazard beam with cavity	S	6m	No		
		86.2c		2 x knot holes enlarged by squirrel	S	5m	No		
86.3	*Quercus robur*	86.3a	14/06/2018	Woodpecker hole Located on outer lower limb, opening 7cm diameter, leading into downward 20cm diameter cavity with nesting material in the base, also extends upwards in two parts approximately 30cm, unable to fully inspect due to the gnarly deadwood structure. Bumpy	NW	6.5	No	Moderate	High
		86.3b		Small branch stud with receding 5cm deep cavity behind callus roll	SE	6	No		
		86.3c		Attached small dead limb with upward facing split cavity offering limited shelter	N	6	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
86.4	*Quercus robur*	86.4a	14/06/2018	Branch cavity. Cracks in deadwood flush cut. 5cm deep 2cm width, clean and dry, Smooth	N	4	No	Moderate	Moderate
		86.4b		Knot hole. Small area of shelter under callus roll 5cm deep 3cm width	NE	4	No		
		86.4c		Shelter offered behind callus roll at base of deadwood stump, 3cm deep, rough	NW	6	No		
		86.4d		Numerous areas of lifted bark on trunk and deadwood around the canopy.	SE	10	No		
		86.4e		50cm length of lifted bark on underside of dead branch 12cm depth shelter	SE	12	No		
		86.4f		Small branch cavity underside of lateral limb over building 3cm by 6cm depth	E	8	No		
		86.4g		Small hole upward developing cavity, dry, smooth inside 3cm x 8cm depth, woodlice in apex, rough.	SE	4	No		
86.5	*Quercus robur*	86.5a	14/06/2018	Offering no suitable shelter	E	6	No	Moderate	Low
		86.5b		Completely healed over	SE	5.5	No		
		86.5c		Upward facing with a small 4cm deep cavity at the top with woodlice in the apex, rough	N	5	No		
		86.5d		Small inward developed cavity at the base of dead limb, 7cm deep and limited opportunities to shelter, rough.	SE	4.5	No		
		86.5e		At the end of lower limb, no cavity	SW	4	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
88	*Quercus robur*	88a	10.08.17	>1m lifted bark	E	6-7m	No	High	Moderate
		88b		Weld at top of stem.	E	5m	No		
		88c		Wound round 0-5m in height. Cavity at top of wounds and rams horns near top	E	0-5m	No		
89	*Fraxinus excelsior*	89a	30/08/2017	Woodpecker hole - no cavity above or below	S	12m	No	Moderate	Low
90	*Fraxinus excelsior*	90a	30/08/2017	3 x squirrel holes on stem and limbs, including deadwood	N & E	8m - 16m	No	Moderate	High
		90b		7 x woodpecker holes on stem and limbs	N, E & S	10m - 15m	No		
		90c		Tear out of stem - small crevice only and rams horns present	E	16m	No		
		90d		Wound - large cavity	E	12m	No		
		90e		Wound - large exposed cavity	E	11m	No		
104	*Quercus robur*	104a	14/06/2018	Branch cavity, opening 9 x 9cm 12cm depth	W	10	No	Moderate	Moderate
		104b		Large section of dead tree. Multiple cracks in deadwood up to 10cm deep from 5m to 10m.	N	10	No		
		104c		Small branch cavity 1x5cm opening developing upwards 15cm to a tight apex, dry and clean	NW	12	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
		104d		Loose bark around dead lateral branch over field, mostly upward facing shelter, but a 10cm cavity under the bark where dead branch meets main limb	NW	7	No		
105	*Quercus robur*	105a	14/06/2018	30cm deep loose bark cavity on underside of dead stump	E	5	No	Moderate	High
		105b		Cavity at base of dead limb 10cm deep into main trunk. Cobwebs present	W	9	No		
		105c		Small branch cavity within deadwood 2 x 5cm opening developing down 10cm, enclosed, dry, clean	W	1	No		
		105d		Knot hole 4 x 3cm and 4cm depth, clean	W	211	No		
		105e		Branch cavity & knot hole on underside of limb, dry, clean, 4 x 4cm opening leading upwards into 40cm of clean branch cavity then reaching nesting material from above cavity with separate entrance 5 x 5cm on top of branch	W	11	No		
		105f		Branch cavity 30 x3 cm developed upwards further 12cm at top, dry, clean	S	12	No		
		105g		Branch cavity 3 x 12cm in the end of a dead stump, dry and enclosed	W	9	No		
		105h		Branch cavity in side of same dead stump as above. 6 x 12cm entrance developing inwards 40cm into multiple apex, dry, some cobwebs	W	9	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
106	*Quercus robur*	106a	14/06/2018	Lower dead limb with lifted bark extending 2m long and 30cm wide in some areas, majority of the substrate is smooth - not all of the lifted could be inspected due to camera access	NE	5	No	Moderate	Moderate
		b		On the branch union, damp and cluttered substrate with a 5cm deep cavity behind callus roll	NW	5	No		
		c		Deadwood, no splits or cavities	E	4.5	No		
		d		Callus roll on underside of lower limb, no cavities	W	5	No		
		e		Knot hole opening 7cm, 10cm deep, rough substrate and cobwebby	N	2.5	No		
107	*Quercus robur*	107a	14/06/2018	Lifted/loose bark Offering some optimal shelter but exposed from the top	E	7	No	Moderate	Low
		107b		Lower dead limb with lifted bark near the end	NE	6	No		
		107c		Lifted bark but not fully enclosed and possibly exposed to the elements	E	6	No		
		107d		Old snapped out limb with a split near the trunk, no cavities	E	6	No		
		107e		Callous roll on end of broken limb	SW	6	No		
		107f		knot hole opening 6cm diameter, 25cm deep, very cobwebby at the entrance and cluttered inside but dry and clean near the apex	SW	6	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
		107g		Dead stub with fissures leading into the branch offering limited roosting potential	W	7	No		
108	*Quercus robur*	108a	14/06/2018	Lateral dead limb with many areas of loose bark 4m in length. Shelter offered 4-6cm in depth. Also a pocket cavity at base near trunk 9 x 9cm	E	5	No	Moderate	Low
		108b		Deadwood limb with loose bark creating cavity 15cm depth upwards	SW	7	No		
		108c		Loose bark at base of deadwood, upward facing pocket 5 x 8cm depth	S	5	No		
		108d		Branch cavity and damage from old tear out offering no shelter	W	6	No		
		108e		Small cavity from tare out wound 8cm deep upward facing	S	5	No		
109	*Quercus robur*	109a	14/06/2018	Knot hole on side of lower limb, 4 x 8cm opening, developing inwards 6cm behind callus roll	SE	7	No	Low	Low
		109b		Branch cavity, opening 5 x 5cm, 12cm deep and upward facing	W	9	No		
		109c		Branch cavity, opening 7 x 12cm, 7cm deep	S	11	No		
110	*Quercus robur*	110a	14/06/2018	Attached deadwood with small inward shallow pocket behind callus roll, 10cm deep	W	6	No	Moderate	Moderate
		110b		Laterally developed cavity underneath the dead stub, opening 3cm diameter, 15cm deep to single apex, rough substrate but enclosed and dry	S	2	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
		110c		Old tear out wound opening 5 x 30cm leading into a downward developed cavity 60cm deep, bird nesting material in the base	S	2	No		
111	*Quercus robur*	111a	14/06/2018	Woodpecker hole. Large branch cavity with nesting material in the base, entrances consists of two woodpecker holes and a large open knot hole in the middle - all connected to the same cavity, approximately 1.2m long, clean and smooth substrate	SW	5	No	High	High
		111b		Woodpecker hole, opening 5cm diameter leading into a downward developed cavity 30cm deep with cob webs and nesting material in the base	N	6.5	No		
		111c		Branch cavity with Two connecting knotholes located on branch elbow, extending laterally to a dry, clean single apex with smooth substrate 60cm long, and downward developed 50cm long with nesting material in the base	W	4.5	No		
		111d		Knot hole on lower limb, opening 20cm diameter, 15cm deep with a small upward 10cm deep cavity at the back of the feature	NE	4	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
112	*Quercus robur*	112a	27/07/2018	Callus roll Upward facing scar, laterally developed 2m long with areas of 12cm shelter beneath the callus roll, cob webs. Smooth substrate.	N	9	No	Moderate	Moderate
		112b		Callus roll Upward facing scar, upward developed 1m long with areas of 12cm shelter beneath the callus roll, cob webs Smooth substrate.	NW	11	No		
		112c		Callus roll Upward facing scar, upward developed 2m long with areas of 10cm shelter beneath the callus roll, cob webs - this branch scar twists round to the underneath of feature 4 (as follows). Smooth substrate.	SW	8	No		
		112d		Branch Cavity following on from feature 3 - 2m long branch scar underneath the limb, callus roll extends the full length with a cavity at the end of the deadwood scar, developed laterally inwards 25cm, 4cm opening, enclosed and dry with a small amount of cob webs Smooth substrate.	SW	9	No		
		112e		Branch Cavity lower down on the underside of the same limb, opening 40 x 3cm, 10cm deep with additional loose bark offering more shelter Smooth substrate.	SW	8.5	No		
113	*Quercus robur*	113a	14/06/2018	60cm long upward facing offering sub optimal shelter	N	7	No	Moderate	Low

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
		113b		Upward facing branch stub on lower limb overhanging the road, offering no shelter	N	6	No		
		113c		Small cavity behind callus roll on dead stub, 5cm deep	SW	8.5	No		
217	*Quercus robur*	217a	26/07/2018	Shelter beneath deadwood and callus roll, opening 5 x 8cm, 20cm deep offering enclosed, dry shelter for one bat	NW	4	No	Moderate	Moderate
		217b		Knot Hole. Opening 4cm diameter, developing inwards 10cm to a point	W	5	No		
		217c		Knot Hole. 6cm diameter opening, 8cm deep	S	5	No		
		217d		Branch cavity. Upward facing 12 x 7cm opening, developing downwards 50cm behind deadwood, cob webs	S	5	No		
		217e		Knot Hole. Opening 10 x 5cm, Developing inwards and upwards 15cm, cob webs	SE	7	No		
		217f		Small enclosed cavity 15cm deep shelter behind callus roll	E	5.5	No		
		217g		Knot Hole. 4cm diameter opening, 20cm deep laterally developed into trunk enclosed and suitable for one bat	E	3	No		
		217h		Knot Hole. Opening 10 x 5cm, 12cm deep laterally developed offering sub optimal shelter, dry rot powder fills the cavity	S	2.5	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
220	*Crataegus monogyna*	220a	26/07/2018	dense ivy cover across the tree with no other obvious PRFs, although the feature is classes as moderate, the overall classification is low due to the DBH and the amount of sub optimal shelter the tree offers	N/A	3.5	No	Moderate	Moderate
221	*Quercus robur*	221a	26/07/2018	Cavity at base 7cm diameter opening leading up hollow trunk 1m with two entrances at top 1cm diameter and 6cm diameter leading into same cavity.	S	0.5	No	Moderate	Low
		221b		Medium density ivy around upper part of multiple stems	N/A	5	No		
222	*Fraxinus excelsior*	222a	26/07/2018	Knot hole at the end of the limb, opening 7cm diameter leading downwards 20cm	E	4	No	Moderate	Moderate
		222b		Dense ivy across the majority of the main stem with thick established ivy stems covering most the eastern aspect - recommended a further nocturnal survey because of this feature	N/A	1.5	No		
		222c		Opening 10cm diameter developing downwards 30cm	SE	0.5	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
225	*Fraxinus excelsior*	225a	26/07/2018	Opening 10 x 20cm developing down into spacious cavity 40cm deep. Two eggs (possibly pigeon) in bottom	5	S	No	Moderate	Moderate
		225b		Wound on smaller stem with upward developed cavity at top 8cm and shelter on side behind lifted bark 5cm	3	N	No		
		225c		Numerous areas of lifted bark on stem near a canker offering small crevices max depth 10cm	2.5	S	No		
		225d		Opening 2 x 15cm wide, leading into a downward developed cavity 20cm deep, enclosed with clean smooth walls	2	N	No		
		225e		Knot hole leading into a wide spacious cavity, upward developed 1.3m leading into other possible fissures or cavities	0.5	N/A	No		
229	*Quercus robur*	229a	19/07/2018	Small cavity in flush cut.	N	5	No	Moderate	Low
		229b		Lateral limb with callus roll on top 2m length offering shelter in places 10cm deep.	N	11	No		
		229c		Callus roll 2m length in vertical dying limb offering shelter 5cm deep in places.	NE	12	No		
		229d		7 x 7cm diameter 6cm depth shelter.	W	11	No		
		229e		Small cavity in flush cut wound 4 x 4 x 6cm deep.	S	4	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
230	*Quercus robur*	230a	19/07/2018	Patches of loose bark across the tree potentially offering optimal shelter	N/A	6	No	Moderate	Moderate
		230b		Tree is completely dead with no live growth, thus standing deadwood which could potentially have a number of fissures and holes and associated cavities.	N/A	5	No		
231	*Quercus robur*	231a	19/07/2018	Split. Old tear out limb with a large 40cm long split leading to pockets of sub optimal shelter, cobwebby inside	SE	6	No	Moderate	Low
		231b		Small attached dead limb on the outer canopy with patches of loose bark offering 5 - 10cm deep pockets of shelter but too small for any roost potential,	S	5	No		
232	*Quercus robur*	232a	19/07/2018	Flush cut with inward developed cavity, opening 3cm diameter, 12 deep splitting into two cavities, dry and enclosed	S	6	No		Low
233	*Quercus robur*	233a	19/07/2018	Small cavity within flush cut 3 x 3cm 6cm depth.	10	N	No	High	High
		233b		Entrance 8 x 7cm at the end of a dead limb, developed inwards 45cm to a conical apex, woodlice present with some cobwebs.	15	E	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
		233c		Large opening 30 x 7 on underside of branch with down developed pocket 15cm deep. Second small enclosed cavity upwards 3 x 6cm opening and 10cm deep. Dry. Two other small cavities upwards into deadwood 7cm deep.	15	S	No		
		233d		Cavity in large flush cut. Small cavity opening 8 x 8cm 12cm deep.	5	S	No		
		233e		Small cavity at base of large flush cut. 6 x 4cm opening developed in and behind dead wood 12cm.	3	W	No		
		233f		Knot hole, opening 8 x 8cm with multiple small cavities developing laterally up to 15cm in depth. Dry, enclosed	9	E	No		
		233g		Knot hole in end of dead limb. Unable to inspect due to canopy die back. Unsafe	15	N	No		
234	*Quercus robur*	234a	19/07/2018	Loose bark attached to one of the stags horns in the upper canopy offering 10 - 15cm deep shelter but mostly narrow and exposed to the elements	N	7	No	Moderate	Low
		234b		Flush cut with small cavity in the bottom corner, opening 6 x 3cm, developing laterally inwards 15cm, cobwebby	N	3.5	No		
		234c		Flush cut with split, opening 6 x 2cm, developing inwards 10cm to a narrow point	W	2.5	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
235	*Quercus robur*	235a	19/07/2018	Opening 10 x 7cm and 13cm laterally developed, dry but shallow	N	5	No	High	High
		235b		50cm deep downward developed cavity with old bird nesting material in the base, clean and smooth substrate but possibly exposed to the elements - also a long dead limb attached to the same feature is hollowed out, branch cavity extends 1m with some exposure from the top	N	9	No		
		235c		Knot hole opening 12cm diameter, developed laterally 12cm dry but shallow	W	9	No		
		235d		branch cavity, opening 10cm diameter, leading into a 40 deep laterally developed cavity located on the outer upper canopy, substrate is clean, dry and smooth with an enclosed single apex, woodlice present	W	10	No		
		235e		Knot hole, opening 10cm diameter, 7cm deep	S	8	No		
		235f		not hole opening 12cm diameter, 25cm deep spacious cavity, clean smooth substrate leading laterally to an enclosed point	S	9.5	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
236	*Quercus robur*	236a	19/07/2018	Trunk cavity, 8 x 8cm opening 30cm depth into smaller cavity 4 x 3cm. Also developing down 10cm into open pocket	N	6	No	High	Moderate
		236b		Small area of loose bark offering some but limited shelter. 15cm depth	W	8	No		
		236c		30cm of loose bark covering a part of the underside of branch creating fairly exposed shelter	E	7	No		
237	*Quercus robur*	237a	19/07/2018	Large deadwood limb with multiple fissures descending into the main stem offering optimal shelter under lifted bark and within the fissured dead wood	N	6	No	High	High
		237b		Large upward facing 5m long branch scar offering pockets of shelter beneath the callus roll and dead wood	E	6	No		
		237c		4m long upward facing scar on upper limb offering shelter within the fissures dead wood and pockets of 10cm deep shelter behind the callus roll.	S	10	No		
		237d		Small 8cm deep cavity extending into the healthy limb, opening 12 x 6cm upward facing.	W	16	No		
		237e		Large 4m long upward facing fissured branch scar offering areas of shelter up to 6cm depth and pockets of shelter behind the callus roll up to 10cm deep	N	15	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
		237f		Large 4m branch scar upward facing offering 8cm deep shelter behind the callus roll	S	12	No		
		237g		2m long branch scar offering pockets of shelter	W	10	No		
		237h		Upward facing lateral 2m scar, offering optimal pockets of shelter beneath the callus roll, also at the top and additional 40cm long branch cavity, dry and enclosed with a small opening	S	6	No		
		237i		5m long scar with pockets of shelter behind the callus roll	E	5	No		
238	*Quercus robur*	238a	19/07/2018	Loose bark around dead limb offering sub optimal shelter	W	10	No	Moderate	Low
		238b		Loose bark underneath dead limb 30cm long but not enclosed	W	9	No		
		238c		Upward facing knot hole on the main stem, no cavity and exposed to the elements	N	4.5	No		
245	*Fraxinus excelsior*	245a	20/07/2018	Knot Hole opening 8 x 3cm, 3cm deep	E	7	No	Moderate	Low
		245b	20/07/2018	Knot Hole opening 6 x 9cm, 8cm deep	S	6	No		
		245c	20/07/2018	Knot Hole opening 6 x 7cm, 8cm deep	S	5	No		
		245d	20/07/2018	Cavity opening 5cm diameter, developed laterally 25cm deep dry and enclosed	W	4.5	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
246	*Quercus robur*	246a	20/07/2018	Branch cavity 10 x 15cm, developing laterally inwards 20cm	S	5	No	Moderate	Moderate
		246b		Large split hazard beam on lower dead limb, extend upwards 12cm into an enclosed sheltered cavity.	NE	3	No		
247	*Fraxinus excelsior*	247a	20/07/2018	Woodpecker hole opening 3cm, developing downwards 20cm with nesting material in the base, cavity is 15cm diameter, bumpy	E	10	No	Moderate	Moderate
		247b		Woodpecker hole opening 7cm, developing downwards 15cm, cavity 20cm diameter, nest material in base, bumpy	E	9	No		
		247c		Woodpecker hole opening 10 x 3cm developing downwards 15cm, squirrel droppings in the base. Smooth	W	8.5	No		
		247d		3 Woodpecker feeding holes, developing laterally only up to 12cm, rough	NE	7	No		
248	*Quercus robur*	248a	20/07/2018	Multiple dead limbs stag horns in the upper canopy with multiple fissures and lifted bark	N/A	10	No	Moderate	Moderate
		248b		Dead stub with inward developed cavity 15cm deep.	NE	8	No		
		248c		Cavity opening 3cm diameter, 20cm deep, cobwebby and dry rot powder covering the entrance	SW	6.5	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
		248d		Callus roll opening 4 x 2cm leading into a downward developed cavity, 15cm deep, dry, clean and enclosed	SW	6	No		
		248e		Knot hole opening 2cm diameter, leading laterally inwards 15cm deep	N	5	No		
		248f		Lightning strike scar with associated loose bark 30cm long 15cm wide offering limited shelter. Smooth	NE	6	No		
		248g		Knot hole opening 3cm diameter, 25cm deep, cobwebby and dry inside	E	6.5	No		
		248h		Woodpecker hole opening 5cm diameter, developing laterally 20cm, cobwebby	NE	6	No		
249	*Quercus robur*	249a	20/07/2018	knot hole opening 6cm diameter, developed laterally 25cm, dry and cobwebby with woodlice in the apex	SE	5	No	Moderate	Moderate
250	*Fraxinus excelsior*	250a	20/07/2018	Branch Cavity upward facing 1.5m long cavity in a dead broken limb with 3 entry points, clean inside offering optimal shelter	N	11	No	Moderate	High
		250b		Large open wound with 2 enclosed cavities, 3 x 3cm opening leading inwards 5cm and 4 x 4cm opening, developing upwards 50cm, clean and enclosed	S	10	No		

Tree no.	Species	PRF no.	Date	PRF Form	PRF Orientation	Approx. PRF Height	Evidence of bat presence	Roosting potential before climbing	Roosting Potential after climbing
251	*Fraxinus excelsior*	251a	20/07/2018	Knot hole opening 5cm diameter, developing inwards 15cm deep and upwards 4cm and downwards 15cm with nesting material in the base.	SW	10	No	Moderate	Moderate
		251b		Woodpecker hole connects to a branch cavity developing downwards 40cm to the branch elbow with another opening leading down to nesting material 40cm further down the limb. Smooth	N	10	No		

Annex E: Bat roost potential of trees after GLTA and tree climbing

Tree no.	Species	GLTA rating	Bat Roosting Potential[1]		
			Rating after climbing	Scope in/out[2] of roost surveys	Hibernation potential[3]
1	*Quercus robur*	High	Low	OUT	N
2	*Quercus robur*	Moderate	Negligible	OUT	N
3	*Quercus robur*	Low	Low	OUT	N
4	*Quercus robur*	Low	Negligible	OUT	N
5	*Quercus robur*	Moderate	Moderate	IN	N
6	*Crataegus monogyna*	Moderate	Low	OUT	N
7	*Fraxinus excelsior*	High	Moderate	IN	N
8	*Fraxinus excelsior*	Moderate	Moderate	IN	Y
9	*Quercus robur*	Moderate	Moderate	IN	N
10	*Quercus robur*	Moderate	Low	OUT	N
11	*Quercus robur*	Moderate	Negligible	OUT	N
12	*Quercus robur*	Low	-	OUT	N
13	*Quercus robur*	Moderate	Low	OUT	N
14	*Quercus robur*	Moderate	Low	OUT	N
15	*Quercus robur*	Low	-	OUT	N
16	*Quercus robur*	Moderate	Moderate	IN	Y
17.1	*Quercus robur*	Low	Moderate	IN	N
17.2	*Quercus robur*	Low	Moderate	IN	N
18	*Quercus robur*	Low	-	OUT	N
19	*Quercus robur*	Low	-	OUT	N
20	*Quercus robur*	Low	-	OUT	N
21	*Quercus robur*	Moderate	Moderate	IN	N
22	*Fraxinus excelsior*	Moderate	Low	IN	N
23	*Quercus robur*	Low	-	OUT	N
24.1	*Populus alba*	High	High	IN	Y
24.3	*Fraxinus excelsior*	Moderate	Moderate	IN	Y
25.2	*Quercus robur*	Moderate	-	IN	Y
25.3	*Quercus robur*	Moderate	-	IN	Y
25.4	*Quercus robur*	Moderate	-	IN	Y
25.5	*Fraxinus excelsior*	High	-	IN	Y

Tree no.	Species	GLTA rating	Bat Roosting Potential[1]		
			Rating after climbing	Scope in/out[2] of roost surveys	Hibernation potential[3]
25.6	*Quercus robur*	Moderate	-	IN	Y
25.7	*Fraxinus excelsior*	High	-	IN	Y
25.8	*Quercus robur*	Low	-	IN	Y
26	*Quercus robur*	Moderate	Low	OUT	N
27	*Quercus robur*	Low	-	OUT	N
28	*Quercus robur*	Low	-	OUT	N
29	*Quercus robur*	High	-	OUT	-
30	*Quercus robur*	Moderate	-	OUT	-
31	*Fraxinus excelsior*	Moderate	-	OUT	-
32	*Quercus robur*	Low	-	OUT	N
33	*Quercus robur*	High	-	OUT	-
34	*Aesculus hippocastanum*	High	-	OUT	-
35	*Fraxinus excelsior*	High	-	OUT	-
36	*Fraxinus excelsior*	High	-	OUT	-
37	*Quercus robur*	Low	-	OUT	N
38	*Fraxinus excelsior*	Moderate	-	OUT	-
39	*Quercus robur*	Moderate	-	OUT	-
40	*Quercus robur*	High	-	OUT	-
41	*Fraxinus excelsior*	High	-	OUT	-
42	*Quercus robur*	Low	-	OUT	N
43	*Quercus robur*	High	-	OUT	-
44	*Quercus robur*	Low	-	OUT	N
45	*Fraxinus excelsior*	Low	-	OUT	N
46	*Quercus robur*	Moderate	Moderate	IN	N
47	*Fraxinus excelsior*	High	High	IN	Y
48	*Quercus robur*	Moderate	Low	OUT	N
49	*Fraxinus excelsior*	Moderate	Moderate	IN	Y
50	*Quercus robur*	Moderate	Moderate	IN	N
51	*Fraxinus excelsior & Quercus robur*	Moderate	Low	OUT	N
52	*Quercus robur*	Low	-	OUT	N
53	*Quercus robur*	Moderate	Low	OUT	N
54	*Quercus robur*	High	Moderate	IN	Y

Tree no.	Species	GLTA rating	Bat Roosting Potential[1]		
			Rating after climbing	Scope in/out[2] of roost surveys	Hibernation potential[3]
55	*Quercus robur*	Moderate	Low	OUT	N
56.1	*Quercus robur*	Low	-	OUT	N
56.2	*Quercus robur*	Low	-	OUT	N
57	*Quercus robur*	Low	-	OUT	N
58	*Quercus robur*	Moderate	Low	OUT	N
59	*Quercus robur*	Low	-	OUT	N
60	*Fraxinus excelsior*	Low	-	OUT	N
61	*Quercus robur*	High	High	IN	Y
62	*Quercus robur*	Low	-	OUT	N
63	*Quercus robur*	Moderate	Low	OUT	N
64	*Quercus robur*	Moderate	High	IN	Y
65	*Quercus robur*	Low	-	OUT	N
66	*Quercus robur*	Low	-	OUT	N
67	*Quercus robur*	Moderate	Moderate	IN	N
68	*Fraxinus excelsior*	Moderate	Low	IN	N
69	*Quercus robur*	Moderate	Moderate	IN	Y
70	*Quercus robur*	Moderate	High	IN	Y
71	*Fraxinus excelsior*	Moderate	High	IN	Y
72	*Quercus robur*	Moderate	Moderate	IN	N
73	*Fraxinus excelsior*	Moderate	High	IN	Y
74	*Populus alba*	Moderate	Low	IN[5]	N
75	*Quercus robur*	Low	-	IN[5]	N
76	*Quercus robur*	Low	-	IN[6]	N
77	*Quercus robur*	Low	-	IN[6]	N
78.1	*Quercus robur*	Low	-	OUT	N
78.2	*Fraxinus excelsior*	Low	-	OUT	N
79	*Fraxinus excelsior*	Moderate	High	IN	Y
80	*Fraxinus excelsior*	Moderate	Moderate	IN	N
81.1	*Quercus robur*	Low	-	OUT	N
81.2	*Quercus robur*	Low	-	OUT	N
81.3	*Quercus robur*	Low	-	OUT	N
82	*Quercus robur*	Moderate	Low	OUT	N
83	*Quercus robur*	Moderate	High	IN	Y

Tree no.	Species	GLTA rating	Bat Roosting Potential[1]		
			Rating after climbing	Scope in/out[2] of roost surveys	Hibernation potential[3]
84.1	*Quercus robur*	Low	-	OUT	N
84.2	*Quercus robur*	Low	-	OUT	N
85.1	*Quercus robur*	Moderate	Low	OUT	Y
85.2	*Fraxinus excelsior*	High	High	IN	Y
86.1	*Fraxinus excelsior*	Moderate	Moderate	IN	N
86.2	*Quercus robur*	Moderate	Moderate	IN	N
86.3	*Quercus robur*	Moderate	High	IN	Y
86.4	*Quercus robur*	Moderate	Moderate	IN	N
86.5	*Quercus robur*	Moderate	Low	OUT	N
87	*Quercus robur*	Low	-	OUT	N
88	*Quercus robur*	High	Moderate	OUT	unknown
89	*Fraxinus excelsior*	Moderate	Low	OUT	N
90	*Fraxinus excelsior*	Moderate	High	IN	Y
91	*Quercus robur*	Low	-	OUT	N
92	*Quercus robur & Alnus glutinosa*	Low	-	OUT	N
101	*Fraxinus excelsior*	Low	-	OUT	N
102	*Quercus robur*	Low	-	OUT	N
104	*Quercus robur*	Moderate	Moderate	IN	N
105	*Quercus robur*	Moderate	High	IN	Y
106	*Quercus robur*	Moderate	Moderate	IN	N
107	*Quercus robur*	Moderate	Low	OUT	N
108	*Quercus robur*	Moderate	Low	IN[7]	N
109	*Quercus robur*	Low	Low	OUT	N
110	*Quercus robur*	Moderate	Moderate	IN	N
111	*Quercus robur*	High	High	IN	Y
112	*Quercus robur*	Moderate	Moderate	IN	N
113	*Quercus robur*	Low	Low	OUT	N
114	*Populus alba*	Low	-	OUT	N
115	*Populus alba*	Low	-	OUT	N
116	*Quercus robur*	Moderate	-	OUT	-
117	*Quercus robur*	Moderate	-	OUT	-
118	*Quercus robur*	Moderate	-	OUT	-

Tree no.	Species	GLTA rating	Bat Roosting Potential[1]		
			Rating after climbing	Scope in/out[2] of roost surveys	Hibernation potential[3]
119	*Quercus robur*	High	-	OUT	-
120	*Fraxinus excelsior*	Moderate	-	OUT	-
121	*Quercus robur*	High	-	OUT	-
122	*Quercus robur*	Moderate	-	OUT	-
124	*Fraxinus excelsior*	Low	-	OUT	N
125	*Salix fragilis*	Low	-	OUT	N
126	*Fraxinus excelsior*	Low	-	OUT	N
127	*Quercus robur*	Moderate	-	OUT	-
128	*Quercus robur*	High	-	OUT	-
129	*Quercus robur*	Moderate	-	OUT	-
130	*Quercus robur*	Moderate	-	OUT	-
131	*Quercus robur*	Moderate	-	OUT	-
132	*Quercus robur*	Moderate	-	OUT	-
133	*Quercus robur*	Moderate	-	OUT	-
134	*Quercus robur*	Moderate	-	OUT	-
135	*Quercus robur*	Moderate	-	OUT	-
136	*Quercus robur*	Moderate	-	OUT	-
137	*Quercus robur*	Moderate	-	OUT	-
138	*Quercus robur*	High	-	OUT	-
144	*Quercus robur*	Moderate	-	OUT	unknown
145	*Fraxinus excelsior*	Low	-	OUT	N
146	*Fraxinus excelsior*	Low	-	OUT	N
147	*Fraxinus excelsior*	High	-	OUT	-
148	*Quercus robur*	Low	-	OUT	N
149	*Quercus robur*	Moderate	-	OUT	-
150	*Quercus robur*	Moderate	-	OUT	-
151	*Fraxinus excelsior*	Moderate	-	OUT	-
152	*Alnus glutinosa*	Low	-	OUT	N
153	*Alnus glutinosa*	Moderate	-	OUT	-
154	*Alnus glutinosa*	Moderate	-	OUT	-
155	*Alnus glutinosa*	Low	-	OUT	N
156	*Alnus glutinosa*	Moderate	-	OUT	-
157	*Quercus robur*	Moderate	-	OUT	-

Tree no.	Species	GLTA rating	Bat Roosting Potential[1]		
			Rating after climbing	Scope in/out[2] of roost surveys	Hibernation potential[3]
158	*Quercus robur*	Low	-	OUT	N
159	*Quercus robur*	Low	-	OUT	N
160	*Quercus robur*	High	-	OUT	-
161	*Quercus robur*	Moderate	-	OUT	-
162	*Fraxinus excelsior*	High	-	OUT	-
163	*Fraxinus excelsior*	High	-	OUT	-
164	*Fraxinus excelsior*	Moderate	-	OUT	-
165	*Crataegus monogyna*	Low	-	OUT	N
166	*Crataegus monogyna*	Low	-	OUT	N
167	*Alnus glutinosa*	Low	-	OUT	N
168	*Alnus glutinosa*	High	-	OUT	-
169	*Alnus glutinosa*	High	-	OUT	-
170	*Alnus glutinosa*	High	-	OUT	-
171	*Alnus glutinosa*	Moderate	-	OUT	-
172	*Alnus glutinosa*	Moderate	-	OUT	-
173	*Alnus glutinosa*	Moderate	-	OUT	-
174	*Alnus glutinosa*	Low	-	OUT	N
175	*Quercus robur*	Low	-	OUT	N
176	*Fraxinus excelsior*	Moderate	-	OUT	-
177	*Quercus robur*	Moderate	-	OUT	-
178	*Quercus robur*	Low	-	OUT	N
179	*Quercus robur*	Moderate	-	OUT	-
180	*Quercus robur*	Moderate	-	OUT	-
181	*Quercus robur*	Moderate	-	OUT	-
183	*Quercus robur*	Moderate	-	OUT	-
184	*Quercus robur*	Moderate	-	OUT	-
185	*Fraxinus excelsior*	Moderate	-	OUT	-
186	*Quercus robur*	Low	-	OUT	N
187	*Quercus robur*	Low	-	OUT	N
188	*Quercus robur*	Low	-	OUT	N
189	*Fraxinus excelsior*	Low	-	OUT	N
190	*Quercus robur*	Low	-	OUT	N
191	*Alnus glutinosa*	High	-	OUT	-

Tree no.	Species	GLTA rating	Bat Roosting Potential[1]		
			Rating after climbing	Scope in/out[2] of roost surveys	Hibernation potential[3]
192	*Alnus glutinosa*	Moderate	-	OUT	-
193	-	Low	-	OUT	N
194	*Alnus glutinosa*	Low	-	OUT	N
195	*Alnus glutinosa*	Moderate	-	OUT	-
196	*Alnus glutinosa*	Moderate	-	OUT	-
197	*Quercus robur*	Low	-	OUT	N
198	*Quercus robur*	Low	-	OUT	N
199	*Quercus robur*	High	-	OUT	-
200	*Quercus robur*	Low	-	OUT	N
201	*Quercus robur*	Low	-	OUT	N
202	*Quercus robur*	Moderate	-	OUT	-
203	*Quercus robur*	Moderate	-	OUT	-
204	*Quercus robur*	Moderate	-	OUT	-
205	*Quercus robur*	Low	-	OUT	N
206	*Quercus robur*	Low	-	OUT	N
207	*Quercus robur*	Low	-	OUT	N
208	*Quercus robur*	Low	-	OUT	N
209	*Quercus robur*	Low	-	OUT	N
210	*Quercus robur*	Low	-	OUT	N
211	*Quercus robur*	Low	-	OUT	N
212	*Fraxinus excelsior*	High	-	OUT	-
213	*Fraxinus excelsior*	Low	-	OUT	N
214	*Fraxinus excelsior*	Low	-	OUT	N
246	*Quercus robur*	Low	-	OUT	N
216	*Quercus robur*	Low	-	OUT	N
217	*Quercus robur*	Moderate	Moderate	OUT	N
218	*Quercus robur*	Low	-	OUT	N
219	*Fraxinus excelsior*	Low	-	OUT	N
220	*Crataegus monogyna*	Moderate	Low	OUT	N
221	*Quercus robur*	Moderate	Moderate	IN	N
222	*Fraxinus excelsior*	Moderate	Moderate	IN	N
223	*Alnus glutinosa*	Low	-	OUT	N
224	*Quercus robur*	Low	-	OUT	N

Tree no.	Species	GLTA rating	Bat Roosting Potential[1]		
			Rating after climbing	Scope in/out[2] of roost surveys	Hibernation potential[3]
225	*Fraxinus excelsior*	Moderate	Moderate	IN	Y
229	*Quercus robur*	Moderate	Low	OUT	N
230	*Quercus robur*	Moderate	Moderate	OUT	Y
231	*Quercus robur*	Moderate	Low	OUT	N
232	*Quercus robur*	Moderate	Low	OUT	N
233	*Quercus robur*	Moderate	High	OUT	Y
234	*Quercus robur*	Moderate	Low	OUT	N
235	*Quercus robur*	High	High	IN	Y
236	*Quercus robur*	Moderate	Low	OUT	Y
237	*Quercus robur*	High	High	OUT	Y
238	*Quercus robur*	Moderate	Low	OUT	N
239	*Quercus robur*	High (Confirmed)	n/a[4]	IN	Y
240	*Quercus robur*	Moderate	n/a[4]	IN	Y
241	*Quercus robur*	Moderate	n/a[4]	IN	N
242	*Populus alba*	High	n/a[4]	IN	N
243	*Populus alba*	Moderate	n/a[4]	IN	N
244	*Populus alba*	Moderate	n/a[4]	IN	N
245	*Fraxinus excelsior*	Moderate	Low	OUT	N
246	*Quercus robur*	Moderate	Moderate	OUT	N
247	*Fraxinus excelsior*	Moderate	Moderate	OUT	N
248	*Quercus robur*	Moderate	Moderate	OUT	N
249	*Quercus robur*	Moderate	Moderate	OUT	N
250	*Fraxinus excelsior*	Moderate	High	OUT	Y
251	*Fraxinus excelsior*	Moderate	Moderate	OUT	Unknown
252	*Quercus robur*	Low	-	OUT	N
253	*Acer campestre*	Low	-	OUT	N
254	*Populus alba*	Low	-	OUT	N
255	*Crataegus monogyna*	Low	-	OUT	N
256	*Quercus robur*	Low	-	OUT	N
257	*Populus alba*	Low	-	OUT	N
258	*Populus alba*	Low	-	OUT	N
259	*Populus alba*	Low	-	OUT	N
260	*Populus alba*	Low	-	OUT	N

Tree no.	Species	GLTA rating	Bat Roosting Potential[1]		
			Rating after climbing	Scope in/out[2] of roost surveys	Hibernation potential[3]
261	*Quercus robur*	High	-	-[8]	N
262	*Quercus robur*	Moderate	-	-[8]	Unknown
263	*Quercus robur*	Moderate	-	-[8]	N
264	*Quercus robur*	Low	-	-	N
265	*Quercus robur*	Low	-	-	N
266	*Acer campestre*	Low	-	-	N
267	*Quercus robur*	Moderate	-	-[8]	Y
268	*Quercus robur*	Moderate	-	-[8]	N
269	*Quercus robur*	Moderate	-	-[8]	N
270	*Quercus robur*	Moderate	-	-[8]	Y
271	*Quercus robur*	High	-	-[8]	Y
272	*Salix fragilis*	High	-	-[8]	Y
273	*Populus alba*	Low	-	-	N
G1	*Populus alba*	Low	-	-	N
274		High	-	-[8]	Y
276		Moderate	-	-[8]	N
277	*Crataegus monogyna*	High	-	-[8]	N
278	*Quercus robur*	Moderate	-	-[8]	Unknown
279	*Prunus spinosa*	Low	-	-	Y
280	*Prunus spinosa*	Moderate	-	-[8]	Y
281	*Fraxinus excelsior*	High	-	-[8]	Y
282	*Fraxinus excelsior*	Moderate	-	-[8]	N
284	*Quercus robur*	High	-	-[8]	Y
285	*Quercus robur*	Low	-	-	N
286	*Leylandii*	Low	-	-	N
288	*Quercus robur*	Low	-	-	N
289	*Quercus robur*	Moderate	-	-[8]	Y
290	*Fraxinus excelsior*	Low	-	-	N
291	*Fraxinus excelsior*	Low	-	-	N
292	*Fraxinus excelsior*	Low	-	-	N
293	*Fraxinus excelsior*	Low	-	-	N
294	*Acer pseudoplatanus*	Low	-	-	N
295	*Fraxinus excelsior*	Moderate	-	-[8]	N

Tree no.	Species	GLTA rating	Bat Roosting Potential[1]		
			Rating after climbing	Scope in/out[2] of roost surveys	Hibernation potential[3]
296	*Fraxinus excelsior*	Low	-	-	N
297	*Fraxinus excelsior*	Low	-	-	N
298	*Fagus sylvatica*	High	-	-[8]	Y
299	*Fraxinus excelsior*	Low	-	-	N
300	*Fraxinus excelsior*	Low	-	-	N
301	*Acer pseudoplatanus*	Low	-	-	N
302	*Ulmus minor*	Low	-	-	N
303	*Fraxinus excelsior*	Moderate	-	-[8]	Y
304	*Crataegus monogyna*	Low	-	-	N
305	*Crataegus monogyna*	Low	-	-	N
306	*Crataegus monogyna*	Low	-	-	N
307	*Crataegus monogyna*	Low	-	-	N
308	*Crataegus monogyna*	Low	-	-	N
309	*Crataegus monogyna*	Low	-	-	N
310	*Quercus robur*	Low	-	-	N
311	*Quercus robur*	Moderate	-	-[8]	N
312	*Populus alba*	Low	-	-	N
313	*Malus domestica*	Low	-	-	N
314	*Quercus robur*	Low	-	-	N
315	*Crataegus monogyna*	Low	-	-	N

1. Refer to Table to for definitions of High, Moderate and Low bat potential.
2. Scoping In or Out of further (Roost) surveys based on trees having negligible or low potential or falling outside Order Limits.
3. Occasional hibernation potential for trees outside the Scheme boundary (and those trees within Bickenhill Meadows SSSI and therefore included within the proposed scheme boundary but outside any areas of proposed works) are not included.
4. No tree climbing of these trees as this step was skipped and activity surveys undertaken.
5. Trees T74, T75 included for roost surveys due to proposed direct impacts
6. Trees T76, T77 included for roost surveys due to one of these trees (determined to be T76) previously being reported as a roost by Wardell Armstrong (2018b) [REF10] (Annex J).
7. Tree 108 included for roost surveys as part of the edge of a woodland block.
8. Access to undertake or update GLTA was too late to schedule roost surveys.

Annex F: Tree roost survey results: summary

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T1	T1 originally assessed as providing High suitability for bats. This tree is located adjacent to the M42 carriageway boundary and subject to extensive light and noise pollution from the motorway making a survey using bat detectors and thermal imaging or infra-red cameras ineffectual as the specialist survey equipment was not able to record activity over the background noise and light. In light of the surrounding environment reducing the suitability of this tree to support bat roosts the suitability of this tree has been downgraded to Low and requires no additional survey effort							Scoped out of survey
T5	Moderate	31/07/2018 (Dusk)	No emergence from tree. One species, Common pipistrelle, foraging.	17/08/2018 (Dawn)	No re-entry to tree. *Nyctalus* species. Commuting 2 passes	n/a	n/a	N
T7	Moderate	31/07/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle, Noctule and Myotis species bats recorded. Mostly common pipistrelle foraging and commuting activity but also two Myotis recorded commuting along the hedgerow late on.	14/08/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle, *Nyctalus* species and Leisler. Mostly common pipistrelle foraging along hedgerow near tree	14/09/2018 (Dawn)	No re-entry to tree. Common pipistrelle & soprano pipistrelle commuting.	N

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T8	Moderate	31/07/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle and Noctule bats recorded foraging near the tree.	14/08/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle, *Nyctalus* species and Leisler. Mostly common pipistrelle seen foraging along hedgerow throughout survey	14/09/2018 (Dawn)	No re-entry to tree. Common pipistrelle & soprano pipistrelle. Common pipistrelle seen foraging along hedgerow	N
T9	Moderate	09/08/2018 (Dawn)	Common pipistrelle foraging, 5 passes during survey	22/08/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle, Leisler and noctule. Mostly Common pipistrelle, 2 bats seen foraging continuously in field throughout survey	n/a	n/a	N
T16	Moderate	31/07/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle and Noctule bats detected during the survey.	14/08/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle, Leisler, *Nyctalus* species, *Myotis* species and brown long-eared recorded. Mostly common pipistrelle commuting/foraging	14/09/2018 (Dawn)	No re-entry to tree. Common pipistrelle, soprano pipistrelle, noctule, *Myotis* species. Not a lot of activity approx. 4/5 passes throughout survey	N

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T17	Moderate	9/08/18 dawn	2 species (common pipistrelle and soprano pipistrelle) were detected during the survey. Soprano pipistrelle re-entered the tree at 05.22	03/09/2018 (Dusk)	No emergence from tree. 2 species (common pipistrelle and soprano pipistrelle) were detected during the survey. Foraging and commuting	18/09/2018 (Dawn)	5 species (common pipistrelle and soprano pipistrelle, noctule, Leisler, brown long-eared) were detected during the survey. Soprano pipistrelle emerged from the tree at 19:34	Y
T21	Moderate	27/06/18 (Dusk)	One common pipistrelle emerged from tree.. Common pipistrelle detected foraging near the tree during the survey.	12/07/2018 (Dawn)	No re-entry to tree. Common pipistrelle recorded during the survey, including foraging along western side of hedgerow close to dawn but did not enter tree.	13/09/2018 (Dusk)	3 species common pipistrelle and soprano pipistrelle, brown long-eared). Foraging and commuting throughout survey.	Y

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T22	Low	27/06/18 (Dusk)	No emergence from tree. Common pipistrelle and Noctule bats recorded during the survey.	12/07/2018 (Dawn)	No re-entry to tree. Common pipistrelle recorded during the survey, including foraging along western side of hedgerow close to dawn but did not enter tree.	n/a	n/a	N
T24.1	Moderate	27/06/18 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle and Noctule bats recorded foraging.	12/07/2018 (Dawn)	No re-entry to tree. Common pipistrelle, soprano pipistrelle recorded. Regular foraging activity by these species throughout the survey.	01/08/2018 (Dawn)	No re-entry to tree. 4 species (common pipistrelle and soprano pipistrelle, noctule, Leisler) were detected during the survey. Mostly C pip foraging and commuting.	N
T24.3	Moderate	22/08/2018 (Dusk)	No emergence from tree. 3 species (common pipistrelle, noctule, brown long-eared) were detected during the survey. Only 6 bat passes throughout survey	n/a	n/a	n/a	n/a	N

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T25.3	Moderate	09/08/2018 (Dawn)	1 species (soprano pipistrelle) two passes detected commuting during the survey.	n/a	n/a	n/a	n/a	
T47	High	07/08/2018 (Dusk)	No emergence from tree. 2 species present (common pipistrelle, soprano pipistrelle) during the survey. Continuous foraging and commuting activity	21/08/2018 (Dawn)	No bats were detected during the survey	05/09/2018 (Dusk)	No emergence from tree. 4 species (common pipistrelle, soprano pipistrelle, *Nyctalus*, species, brown long-eared) were detected during the survey. Mostly common pipistrelle & soprano pipistrelle foraging throughout survey	N

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T61	High	07/08/2018 (Dusk)	2 species (common pipistrelle, soprano pipistrelle) were detected during the survey. Continuous foraging and commuting activity during the survey	21/08/2018 (Dawn)	No re-entry to tree. 4 species (common pipistrelle, *Nyctalus* species, Leisler and brown long-eared) were detected during the survey. Foraging and commuting activity	04/09/2018 (Dawn)	No re-entry to tree. 3 species (common pipistrelle, soprano pipistrelle and Leisler) were detected during the survey. Foraging and commuting.	N
T64	High	07/08/2018 (Dusk)	2 species (common pipistrelle, soprano pipistrelle) were detected during the survey. Foraging and commuting activity	21/08/2018 (Dawn)	2 species (common pipistrelle and Leisler) were detected during the survey. Mainly foraging activity	04/09/2018 (Dawn)	2 species detected (Leisler and soprano pipistrelle) on 4 bat passes detected throughout the survey	N
T67	MOD	27/06/18 (Dusk)	No emergence from tree. Noctule bats detected during the survey.	13/07/2018 (Dawn)	No re-entry to tree. Common pipistrelle recorded during the survey.	n/a	n/a	N

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T68	Low	27/06/18 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle, Noctule and Myotis species bats recorded foraging during the survey.	12/07/2018 (Dawn)	No re-entry to tree. Common pipistrelle and *Nyctalus* species bats recorded foraging during the survey. Swarming activity (common pipistrelle) around the southern side of the tree, but did not enter tree and flew west along the hedgerow towards T69 and the woodland block beyond.	09/08/2018 (Dawn)	No re-entry to tree. 3 species (common pipistrelle, soprano pipistrelle and *Nyctalus* species) were detected during the survey Foraging and commuting	N
T69	Moderate	09/08/2018 (Dawn)	No re-entry to tree. 3 species (common pipistrelle, soprano pipistrelle and *Nyctalus* species) were detected during the survey. Foraging and commuting along hedgerow	22/08/2018 (Dusk)	No emergence from tree. 4 species (common pipistrelle, noctule, brown long-eared and *Nyctalus* species) were detected during the survey. Foraging and Commuting.	n/a	n/a	N

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T70	High	28/06/18 (Dusk)	No emergence from tree. Common pipistrelle & Noctule bats detected during the survey.	13/07/2018 (Dawn)	No re-entry to tree. Common pipistrelle & Noctule bats detected during the survey.	01/08/2018 (Dawn)	No re-entry to tree. 2 species detected (*Myotis* species and noctule) during the survey. 1 *Myotis* species pass and 1 noctule pass.	N
T71	High	28/06/18 (Dusk)	No emergence from tree. Common pipistrelle & Noctule bats detected during the survey.	13/07/2018 (Dawn)	No re-entry to tree. Common and soprano pipistrelle recorded during the survey.	01/08/2018 (Dawn)	No re-entry to tree. 2 species (common pipistrelle & noctule) detected during the survey. One pass from each species commuting.	N
T72	Moderate	28/06/18 (Dusk)	No emergence from tree. Common pipistrelle & Noctule bats detected during the survey.	13/07/2018 (Dawn)	No re-entry to tree. Common pipistrelle recorded during the survey.	n/a	n/a	N

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T73	High	28/06/18 (Dusk)	No emergence from tree. Common and soprano pipistrelle recorded.	13/07/2018 (Dawn)	No re-entry to tree. Common and soprano pipistrelle recorded during the survey.	01/08/2018 (Dawn)	No re-entry to tree. 2 species (common pipistrelle and noctule) detected during the survey. One pass from each species commuting.	N
T74	Low	28/06/18 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle and noctule bats detected during the survey.	n/a	n/a	n/a	n/a	N
T75	Low	132072018 (Dawn)	No re-entry to tree. Common pipistrelle and noctule bats detected during the survey.	n/a	n/a	n/a	n/a	N
T76		18/09/2018 (Dusk)	No emergence from tree. 4 species (common pipistrelle, soprano pipistrelle, Leisler and *Nyctalus* species) were detected during the survey. Foraging and commuting.	n/a	n/a	n/a	n/a	N

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T77		18/09/2018 (Dusk)	No emergence from tree. 4 species (common pipistrelle, soprano pipistrelle, Leisler and noctule) were detected during the survey. Foraging and commuting.	n/a	n/a	n/a	n/a	N Reported brown long-eared roost
T79	High	07/08/2018 (Dusk)	Only recorded common pipistrelle during the survey foraging and commuting	21/08/2018 (Dawn)	No re-entry to tree. Only recorded 1 *Nyctalus* species. Throughout the survey - brief pass	18/09/2018 (Dusk)	No emergence from tree. Only recorded 1 *Pipistrellus* species. Throughout the survey - brief pass	N
T80	Moderate	08/08/2018 (Dawn)	No emergence from tree. Only recorded 1 common pipistrelle pass throughout the survey	20/08/2018 (Dusk)	Two s pip seen emerging from tree. Recorded common pipistrelle, soprano pipistrelle, *Myotis* species and noctule.	13/09/2018 (Dusk)	No emergence from tree. 4 species recorded (common pipistrelle soprano pipistrelle, Leisler and noctule) during the survey. Foraging.	Y

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T83	High	08/08/2018 (Dusk)	2 common pipistrelle emerged from tree. Species detected (common pipistrelle, soprano, *Myotis* species and noctule)	21/08/2018 (Dawn)	3 species detected (common pipistrelle, brown long-eared and noctule). Two common pipistrelle re-entered tree	05/09/2018 (Dusk)	3 species detected (common pipistrelle, soprano pipistrelle and *Nyctalus* species) 1 common pipistrelle seen emerging from tree	Y
T85.2	High	08/08/2018 (Dawn)	2 species detected (common pipistrelle and soprano pipistrelle)	20/08/2018 (Dusk)	2 soprano pipistrelle emerged. 2 species (common pipistrelle and soprano pipistrelle) were detected during the survey	20/08/2018 (Dusk)	No emergence from tree. 4 species (noctule, *Myotis* species, common pipistrelle and brown long-eared were detected during the survey. Commuting and foraging	Y

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T86.1	Moderate	04/07/2018 (Dusk)	No emergence from tree. Common pipistrelle & noctule bats detected during the survey.	04/09/2018 (Dawn)	No re-entry to tree. 2 species (common pipistrelle and soprano pipistrelle) were detected during the survey. Foraging and commuting	n/a	n/a	N
T86.2	Moderate	04/07/2018 (Dusk)	**AUGUST-Transect 2 DUSK**	04/09/2018 (Dawn)	No re-entry to tree. 1 species (soprano pipistrelle) was detected during the survey. Foraging and commuting	n/a	n/a	N
T86.3	High	04/07/2018 (Dusk)	No emergence from tree. Common pipistrelle & noctule bats detected during the survey.	04/09/2018 (Dawn)	No re-entry to tree. 2 species (noctule and soprano pipistrelle) were detected during the survey. Foraging and commuting	12/09/2018 (Dusk)	No emergence from tree. 3 species commuting or occasionally foraging (common pipistrelle and one pass each of soprano pipistrelle and *Myotis* species)	N

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T86.4	Moderate	04/07/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle and noctule bats recorded foraging during the survey.	04/09/2018 (Dawn)	2 species (common pipistrelle and soprano pipistrelle) were recorded during the survey. Only 3 bat passes were detected during the survey. No bats re-entered the tree.	n/a	n/a	N
T90	High	09/08/2018 (Dawn)	No re-entry to the tree. 2 species (common pipistrelle and soprano pipistrelle) were detected during the survey. Only 2 bat passes were detected during the survey.	No access	n/a	No access	n/a	N
T104	Moderate	12/07/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle, noctule and brown long-eared bats recorded during the survey.	25/07/2018 (Dawn)	No re-entry to tree. Regular common pipistrelle foraging and commuting throughout the survey. Bats crossing the proposed scheme route at this point.	n/a	n/a	N
T105	High	12/07/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle and noctule bats recorded foraging during the survey.	25/07/2018 (Dawn)	No re-entry to tree. Common and soprano pipistrelle recorded during the survey.	13/09/2018 (Dusk)		N

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T106	Moderate	12/07/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle, noctule, *Nyctalus* & *Myotis*) were detected during survey foraging and commuting.	25/07/2018 (Dawn)	No re-entry to tree. Common and soprano pipistrelle recorded during the survey.	n/a	n/a	N
T108	Low	25/07/2018 (Dawn)	No emergence from tree. Common and soprano pipistrelle recorded.	n/a	n/a	n/a	n/a	N
T110	Moderate	12/07/2018 (Dusk)	No emergence from tree. Common pipistrelle and noctule bats recorded.	25/07/2018 (Dawn)	No re-entry to tree. Common and soprano pipistrelle recorded during the survey.	n/a	n/a	N
T111	High	12/07/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle, noctule and long-eared bats foraging and commuting during the survey.	25/07/2018 (Dawn)	No re-entry to tree. Common and soprano pipistrelle both foraging along the southern edge of the wood. Possible long-eared bat also recorded.	13/09/2018 (Dusk)	No emergence from tree. 1 species common pipistrelle, only 3 passes recorded throughout survey.	N
T112	Moderate	08/08/2018 (Dawn)	No re-entry to tree. 3 species (common pipistrelle, soprano pipistrelle and *Nyctalus* species) were detected during the survey.	03/09/2018 (Dusk)	No emergence from tree. 2 species (common pipistrelle and soprano pipistrelle) foraging and commuting.	n/a	n/a	N

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T225	Moderate	16/08/2018 (Dusk)	No bats detected during the survey.	31/08/2018 (Dawn)	No re-entry to tree. One species (common pipistrelle) was detected during the survey. Only two bat commuting passes were detected.	n/a	n/a	N
T230	Moderate	24/07/2018 (Dusk)	No emergence from tree. Common pipistrelle recorded during the survey.	Scoped out of further surveys.	n/a	n/a	n/a	N
T233	Moderate	24/07/2018 (Dusk)	No emergence from tree. Common and soprano pipistrelle recorded.	Scoped out of further surveys.	n/a	n/a	n/a	N
T235	High	24/07/2018 (Dusk)	No emergence from tree. Common and soprano pipistrelle recorded.	Scoped out of further surveys.	n/a	n/a	n/a	N
T237	High	24/07/2018 (Dusk)	No emergence from tree. Common pipistrelle, soprano pipistrelle and *Myotis* species bats recorded foraging during the survey.	Scoped out of further surveys.	n/a	n/a	n/a	N
T239	High	17/08/2018 (Dawn)	No bats were detected during the survey.	30/08/2018 (Dusk)	No emergence from tree. 2 species were detected during the survey (common pipistrelle and *Myotis* species).	13/09/2018 (Dusk)	No bats were detected during the survey.	N Reported *Myotis* roost

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T240	Moderate	16/08/2018 (Dusk)	No emergence from tree. 4 species detected commuting and foraging in the area (common pipistrelle, soprano pipistrelle, brown long-eared bat, *Myotis* species) no bats seen re-entering/emerging.	31/08/2018 (Dawn)	No re-entry to tree. 1 species (common pipistrelle) was detected for a single foraging pass during the survey.	n/a	n/a	N
T241	Moderate	16/08/2018 (Dusk)	No emergence from tree. 1 species (common pipistrelle) detected commuting and foraging in the area. No bats seen re-entering/emerging	31/08/2018 (Dawn)	No bats were detected during the survey.	n/a	n/a	N
T242	Moderate	17/08/2018 (Dawn)	No bats were detected during the survey	30/08/2018 (Dusk)	No emergence from tree. 2 species (common and soprano pipistrelle) were detected during the survey.	13/09/2018 (Dusk)	2 species (common and soprano pipistrelle) were detected during the survey. A single soprano pipistrelle emerged from the tree	Y
T243	Moderate	17/08/2018 (Dawn)	No re-entry to tree. A single bat pass from a Soprano pipistrelle was recorded during the survey.	30/08/2018 (Dusk)	No emergence from tree. 1 species (common pipistrelle) detected during the survey.	n/a	n/a	N

Tree number	PRF suitability	Date of survey	Results	Date of survey	Results	Date of survey	Results	Roost present (Y/N)
T244	High	17/08/2018 (Dawn)	No bats were detected during the survey	30/08/2018 (Dusk)	No emergence from tree. 2 species (common and soprano pipistrelle) were detected during the survey.	n/a	n/a	N

Annex G: Roost survey results: raw data for confirmed roosts.

KEY: Pip45 (Common pipistrelle); Pip55 (Soprano pipistrelle); PipSp (call between common pipistrelle and soprano pipistrelle); NathPip (Nathusius pipistrelle); Noctule (Noctule bat); Leisler (Leisler bat); Serotine (Serotine bat); Nyctalus sp. (either Leisler or Noctule bat); Nyc/Epi (either Leisler, Noctule or Serotine bat); Myotis sp. (Myotis species); Long-eared bat (either grey long-eared or brown long-eared bat)

Heath End House – Dusk – 30 May 2018

MAY				
Project Name	M42 Junction 6	Surveyor		JT
Survey Location	B	Rain (0-5)		1
Date	30/05/2018	Wind (0-7)		0
Start	21:10	Cloud Cover (0-5)		5
Sunset	21:17	Temperature		18°C
Finish	23:00	Weather description		Rain earlier in evening but stopped during survey, light fog but not enough to impact visibility, 82% humidity, still and cloudy.
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
22:17	Noctule	1	Y	Heard not seen (HNS) commuting
22:20	Pip 45	1	Y	HNS commuting
22:24 – 22:30	Pip 45	16	Y	HNS foraging and commuting
22:32 – 22:47	Pip 45	24	Y	HNS foraging and commuting
22:38	Long-Eared Bat	2	Y	Seen flying outside eastern gable end, suspected emergence.
22:44 – 22:45	Pip 45	2	Y	HNS foraging and commuting
22:49 – 22:53	Pip 45	10	Y	HNS foraging and commuting
22:56	Pip 45	2	Y	HNS foraging and commuting
22:59 - 23:01	Pip 45	4	Y	HNS foraging and commuting

Project Name	M42 Junction 6	Surveyor		GG
Survey Location	C	Rain (0-5)		1
Date	30/05/2018	Wind (0-7)		0
Start	21:10	Cloud Cover (0-5)		5
Sunrise	21:17	Temperature		18°C
Finish	23:00	Weather description		Rain earlier in evening but stopped during survey, light fog but not enough to impact visibility, 82% humidity, still and cloudy.
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
22:06	Pip 45	1	Y	Heard not seen (HNS) commuting
22:17	Noctule	2	Y	HNS commuting
22:20	Pip 45	1	Y	HNS commuting
22:21	Pip 45	1	Y	HNS commuting
22:40 - 22:43	Pip 45	10	Y	HNS foraging and commuting
22:45 – 22:50	Pip 45	15	Y	HNS foraging and commuting
22:52 – 22:53	Pip 45	2	Y	HNS foraging and commuting
22:56	Pip 45	1	Y	HNS foraging and commuting
22:57	Myotis sp.	1	Y	HNS foraging and commuting
23:00	Pip 45	1	Y	HNS foraging and commuting

Heath End House – Dawn – 5 July 2018

JULY				
Project Name	M42 Junction 6	Surveyors		DR
Survey Location	A	Rain (0-5)		0
Date	05/07/2018	Wind (0-7)		0
Start	03:00	Cloud Cover (0-5)		3
Sunrise	04:52	Temperature		16°C
Finish	05:00	Weather description		Dry, warm, no wind
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
03:05	Pip sp.	2	Y	Heard not seen (HNS) foraging
03:07	Pip 45	1	Y	HNS foraging
03:11	Pip 45	3	Y	HNS foraging
03:13	Pip 45	2	Y	HNS foraging
03:21	Pip 45	2	Y	HNS foraging
03:29	Pip 45	1	Y	HNS foraging
03:41	Pip 45	1	Y	HNS foraging
03:50 – 03:53	Noctule	6	Y	HNS foraging
04:08	Pip 45	2	Y	HNS foraging
04:18 – 04:19	Noctule	4	Y	Heard and seen (H&S) commuting from south east to north west
Project Name	M42 Junction 6	Surveyors		TC
Survey Location	B	Rain (0-5)		0
Date	05/07/2018	Wind (0-7)		0
Start	03:00	Cloud Cover (0-5)		3
Sunrise	04:52	Temperature		16°C
Finish	05:00	Weather description		Dry, warm, no wind
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
03:06	Pip sp.	2	Y	Heard not seen (HNS) foraging
03:07	Pip 45	1	Y	HNS foraging
03:09	Pip sp.	1	Y	HNS foraging
03:10	Pip 45	5	Y	HNS foraging
03:15	Pip sp.	1	Y	HNS foraging
03:22 – 03:23	Pip 45	3	Y	HNS foraging
03:30	Pip 45	1	Y	HNS foraging

03:30	Pip sp.	1	Y	HNS foraging
03:37	Pip 45	1	Y	HNS foraging
03:43	Pip 45	1	Y	HNS foraging
03:51 – 03:52	Noctule	1	Y	HNS foraging
04:09	Pip 45	1	Y	Heard and seen (H&S) commuting, flew north west towards trees
04:20	Noctule	1	Y	HNS commuting
Project Name	M42 Junction 6	Surveyors		JW
Survey Location	C	Rain (0-5)		0
Date	05/07/2018	Wind (0-7)		0
Start	03:00	Cloud Cover (0-5)		3
Sunrise	04:52	Temperature		16°C
Finish	05:00	Weather description		Dry, warm, no wind
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
03:06	Pip sp.	1	Y	Heard not seen (HNS) foraging
03:10	Pip 45	1	Y	HNS foraging
03:12	Pip 45	1	Y	HNS foraging
03:12	Pip sp.	2	Y	HNS foraging
03:14	Pip 45	1	Y	HNS foraging
03:15	Pip 55	1	Y	Heard and seen (H&S) foraging adjacent to house
03:22 – 03:24	Pip 45	4	Y	HNS foraging
03:39	Pip 45	1	Y	H&S commuting between building and surveyor
03:51	Noctule	2	Y	HNS commuting

Heath End House – Dawn – 4 September 2018

SEPTEMBER				
Project Name	M42 Junction 6	Surveyors		AR
Survey Location	A	Rain (0-5)		0
Date	04/09/2018	Wind (0-7)		3
Start	04:52	Cloud Cover (0-5)		5
Sunrise	06:22	Temperature		15°C
Finish	06:22	Weather description		Wet night, cool, breezy and cloudy
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
05:02	Pip 45	1	Y	Heard not seen (HNS) foraging
05:05 – 05:06	Pip 45	2	Y	HNS commuting
05:25	Pip 45	3	Y	HNS commuting
05:38	Pip 45	3	Y	HNS foraging
05:43	Pip 45	1	Y	HNS foraging
05:44	Pip 45	1	Y	HNS foraging
06:05	Pip 45	1	Y	HNS foraging
06:08 – 06:09	Pip 45	2	Y	HNS foraging
06:10	Pip 45	2	Y	Heard and seen (H&S) re-entered building, see notes from location C for full details
06:10	Pip sp.	1	Y	HNS foraging
06:17	Pip 45	2	Y	Heard and seen (H&S) re-entered building, see notes from location C for full details
Project Name	M42 Junction 6	Surveyors		DR
Survey Location	B	Rain (0-5)		0
Date	04/09/2018	Wind (0-7)		3
Start	04:52	Cloud Cover (0-5)		5
Sunrise	06:22	Temperature		15°C
Finish	06:22	Weather description		Wet night, cool, breezy and cloudy
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
04:47	Pip 45	1	Y	Heard not seen (HNS) commuting
04:56	Pip 45	3	Y	HNS brief foraging pass
05:06 – 05:07	Pip 45	3	Y	HNS foraging
05:26 – 05:27	Pip 45	15	Y	H&S foraging between surveyor and building

05:39	Pip 45	3	Y	HNS foraging
05:44	Pip 45	3	Y	H&S foraging overhead
05:48 – 05:51	Pip 45	6	Y	HNS foraging
06:05	Pip 45	1	Y	HNS brief pass
06:18	Pip 45	3	Y	H&S commuting
Project Name	M42 Junction 6	Surveyors		LS
Survey Location	C	Rain (0-5)		0
Date	04/09/2018	Wind (0-7)		3
Start	04:52	Cloud Cover (0-5)		5
Sunrise	06:22	Temperature		15°C
Finish	06:22	Weather description		Wet night, cool, breezy and cloudy
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
04:45	Pip 45	2	Y	Heard not seen (HNS) foraging
04:54	Pip 45	2	Y	HNS foraging
05:00	Pip 45	1	Y	HNS foraging
05:04	Pip 45	2	Y	HNS foraging
05:24	Pip 45	13	Y	Heard and seen (H&S) foraging around south west of house
05:37	Pip 45	1	Y	HNS foraging
05:41 – 05:42	Pip 45	2	Y	HNS foraging
06:03	Pip 45	2	Y	HNS foraging
06:06 – 06:08	Pip 45	24	Y	HNS foraging
06:08	Pip 55	3	Y	HNS foraging
06:09 – 06:11	Pip 45	2	Y	H&S two bats re-entered building, one re-entered on south west corner of chimney (1) and the second bat re-entered on the very edge of the house/chimney in cavity between wood paneling (2)
06:09	Pip sp.	1	Y	HNS foraging
06:15 – 06:16	Pip 45	7	Y	H&S two more bats re-entered on the very edge of the house/chimney in cavity between wood paneling

Tree 17 – Dawn – 9 August 2018

AUGUST				
Project Name	M42 Junction 6	Surveyors		KC
Survey Location	D	Rain (0-5)		0
Date	09/08/2018	Wind (0-7)		1
Start	04:07	Cloud Cover (0-5)		5
Sunrise	05:37	Temperature		16°C
Finish	05:37	Weather description		Rain evening previous but before dusk. During survey dry and cool
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
04:46	Pip 45	1	Y	Heard not seen (HNS0 very brief and faint pass
05:22	Pip 55	1	Y	HNS brief commuting pass
Project Name	M42 Junction 6	Surveyors		GG
Survey Location	E	Rain (0-5)		0
Date	09/08/2018	Wind (0-7)		1
Start	04:07	Cloud Cover (0-5)		5
Sunrise	05:37	Temperature		16°C
Finish	05:37	Weather description		Rain evening previous but before dusk. During survey dry and cool
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
04:45	Pip sp.	1	Y	Heard not seen (HNS) foraging
04:46	Pip 55	1	Y	HNS foraging
05:21	Pip 55	1	Y	Heard and seen (H&S) bat approached the tree canopy from North West and was not seen exiting the canopy from either side of the tree so assumed re-entry.

Tree 17 – Dusk – 3 September 2018

SEPTEMBER				
Project Name	M42 Junction 6	Surveyors		DH
Survey Location	D	Rain (0-5)		0
Date	03/09/2018	Wind (0-7)		2-3
Start	19:39	Cloud Cover (0-5)		4
Sunrise	19:54	Temperature		20°C
Finish	21:24	Weather description		Gentle breeze, overcast and dry
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
20:23	Pip 55	1	Y	Heard not seen (HNS) brief pass
20:28 – 20:31	Pip 45	4	Y	Heard and seen (H&S) multiple bats foraging along hedgerow
20:36 – 20:37	Pip 45	2	Y	H&S commuting along hedgerow
20:39 – 20:47	Pip 45	23	Y	H&S multiple bats foraging along hedgerow
20:52 – 21:03	Pip 45	40	Y	H&S multiple bats foraging along hedgerow
20:55	Pip 55	1	Y	H&S foraging along hedgerow
20:58	Pip sp.	1	Y	H&S foraging along hedgerow
21:06 – 21:09	Pip 45	15	Y	H&S multiple bats foraging along hedgerow
21:11	Pip 45	2	Y	H&S foraging along hedgerow
21:11	Pip 55	1	Y	H&S foraging along hedgerow
21:15 – 21:19	Pip 45	19	Y	H&S multiple bats foraging along hedgerow
21:21 – 21:24	Pip 45	12	Y	H&S multiple bats foraging along hedgerow
Project Name	M42 Junction 6	Surveyors		DM
Survey Location	E	Rain (0-5)		0
Date	03/09/2018	Wind (0-7)		2-3
Start	19:39	Cloud Cover (0-5)		4
Sunrise	19:54	Temperature		20°C
Finish	21:24	Weather description		Gentle breeze, overcast and dry
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
20:29 – 20:31	Pip 45	6	Y	Heard and seen (H&S) foraging along hedgerow
20:33	Pip 45	1	Y	H&S foraging along hedgerow

20:36 – 20:37	Pip 45	2	Y	H&S multiple bats foraging along hedgerow
20:39 – 20:47	Pip 45	40	Y	H&S multiple bats foraging along hedgerow
20:51	Pip 45	1	Y	H&S foraging along hedgerow
20:53 – 21:11	Pip 45	86	Y	H&S multiple bats foraging along hedgerow
20:55	Pip 55	2	Y	H&S foraging along hedgerow
21:11	Pip 55	1	Y	H&S foraging along hedgerow
21:15 – 21:26	Pip 45	73	Y	H&S multiple bats foraging along hedgerow

Tree 17 – Dusk – 18 September 2018

SEPTEMBER				
Project Name	M42 Junction 6	Surveyors		TC
Survey Location	D	Rain (0-5)		0
Date	18/09/2018	Wind (0-7)		3
Start	18:59	Cloud Cover (0-5)		1
Sunrise	19:14	Temperature		20°C
Finish	20:44	Weather description		Gentle breeze, warm and dry
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
19:33	Pip 55	1	Y	Heard and seen (H&S) commuting south along hedgerow
19:36 – 19:39	Pip 55	11	Y	H&S continuous foraging over field to east
19:40	Noctule	1	Y	Heard not seen (HNS) commuting
19:42	Pip 55	3	Y	H&S foraging, flew overhead into field
19:47 – 19:48	Pip 45	4	Y	HNS foraging
19:58	Pip 45	1	Y	HNS commuting
19:58	Noctule	2	Y	HNS commuting
20:00 – 20:03	Pip 45	17	Y	HNS foraging
20:05	Pip 55	1	Y	HNS foraging
20:11	Pip 45	1	Y	HNS foraging
20:14	Nyctalus sp.	1	Y	HNS foraging
20:14	Leisler	1	Y	HNS foraging
20:26	Pip 45	1	Y	HNS foraging
20:33	Nyctalus sp.	2	Y	HNS foraging
20:36	Pip 45	2	Y	HNS foraging
20:41	Long-eared bat	1	Y	HNS foraging
20:41	Nyctalus sp.	1	Y	HNS foraging
20:45	Pip 55	4	Y	HNS foraging

Project Name	M42 Junction 6	Surveyors		GG
Survey Location	D	Rain (0-5)		0
Date	18/09/2018	Wind (0-7)		3
Start	18:59	Cloud Cover (0-5)		1
Sunrise	19:14	Temperature		20°C
Finish	20:44	Weather description		Gentle breeze, warm and dry
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
19:33	Pip 55	2	Y	Heard and seen (H&S) foraging along hedgerow
19:36	Pip 55	2	Y	Heard not seen (HNS) foraging
19:38	Pip 55	3	Y	HNS foraging
19:40	Pip 55	3	Y	HNS foraging
19:40	Noctule	1	Y	HNS foraging
19:42	Pip 55	1	Y	HNS foraging
19:48 – 19:49	Pip 45	1	Y	H&S foraging in field
19:51	Pip 55	1	Y	HNS foraging
19:58	Noctule	1	Y	HNS foraging
19:59	Pip 45	1	Y	HNS foraging
20:01 – 20:03	Pip 45	11	Y	HNS foraging
20:06	Pip 55	22	Y	HNS foraging
20:12	Pip 45	1	Y	HNS foraging
20:15	Noctule	1	Y	HNS foraging
20:20	Pip 45	2	Y	HNS foraging
20:27 – 20:28	Pip 45	6	Y	HNS foraging
20:34	Noctule	1	Y	HNS foraging
20:36	Pip 45	1	Y	HNS foraging
20:38	Noctule	2	Y	HNS foraging
20:41 – 20:46	Pip 45	17	Y	HNS foraging
20:45	Pip 55	1	Y	HNS foraging

Tree 22 – Dusk – 27 June 2018

JUNE					
Project Name	M42 Junction 6	Surveyors		TC	
Survey Location	F	Rain (0-5)		0	
Date	27/06/2018	Wind (0-7)		1	
Start	21:17	Cloud Cover (0-5)		0	
Sunrise	21:33	Temperature		22°C	
Finish	23:09	Weather description		Humid, warm, still, dry and clear skies	
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**	
22:22	Pip 45	1	Y	Heard not seen (HNS) foraging	
22:26	Pip 45	1	Y	HNS foraging	
22:26	Pip sp.	1	Y	Heard and seen (H&S) foraging along hedgerow	
22:28	Pip 45	1	Y	H&S foraging along hedgerow	
22:33	Noctule	1	Y	HNS foraging	
22:33	Nyctalus sp.	1	Y	HNS foraging	
22:37	Pip 45	1	Y	HNS foraging	
22:43 – 22:44	Pip 45	3	Y	HNS foraging	
22:56 – 22:57	Pip 45	2	Y	HNS foraging	
23:00 – 23:01	Pip 45	4	Y	HNS foraging	
23:05	Pip 45	1	Y	HNS foraging	
23:05	Pip sp.	1	Y	HNS brief and distant pass	
23:09	Pip sp.	1	Y	HNS foraging	
23:10	Pip 45	1	Y	HNS foraging	
23:12	Pip 45	4	Y	HNS foraging	
Project Name	M42 Junction 6	Surveyors		GG	
Survey Location	G	Rain (0-5)		0	
Date	27/06/2018	Wind (0-7)		1	
Start	21:17	Cloud Cover (0-5)		0	
Sunrise	21:33	Temperature		22°C	
Finish	23:09	Weather description		Humid, warm, still, dry and clear skies	
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Ref. Number**	**Description of behaviour**
22:20	Pip 45	1	Y		Heard not seen (HNS) commuting

22:28	Pip 45	1	Y		Heard and seen (H&S) foraging north to south along hedgerow
22:44	Pip 45	1	Y		HNS foraging
22:44	Pip sp.	2	Y		H&S foraging along west side of hedgerow
22:48	Pip sp.	1	Y	4	H&S bat flew into tree canopy and wasn't seen emerging from either side assumed re-entry
22:56	Pip 45	1	Y		HNS foraging
22:57	Pip 45	1	Y		H&S foraging south to north along hedgerow
23:08	Pip sp.	1	Y		HNS foraging

Tree 22 – Dawn – 12 July 2018

JULY				
Project Name	M42 Junction 6	Surveyors		CA
Survey Location	F	Rain (0-5)		0
Date	12/07/2018	Wind (0-7)		1
Start	02:59	Cloud Cover (0-5)		4
Sunrise	04:59	Temperature		15-16°C
Finish	04:59	Weather description		Warm, light breeze and dry
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
02:45	Pip 45	1	Y	Heard not seen (HNS) foraging
02:47	Pip 45	1	Y	HNS foraging
02:50	Pip 45	1	Y	HNS foraging
02:54	Pip 45	3	Y	HNS foraging
02:56	Pip 45	1	Y	HNS foraging
02:58	Pip 45	3	Y	HNS foraging
03:03 – 03:05	Pip 45	5	Y	HNS foraging
03:09 – 03:10	Pip 45	8	Y	HNS foraging
03:13	Pip 45	2	Y	HNS foraging
03:24 – 03:26	Pip 45	8	Y	HNS foraging
03:28 – 03:29	Pip 45	5	Y	HNS foraging
03:41	Pip 45	7	Y	HNS foraging
03:45 – 03:46	Pip 45	6	Y	HNS foraging
03:48	Pip 45	1	Y	HNS foraging
03:50 – 03:51	Pip 45	9	Y	HNS foraging
03:54	Pip 45	1	Y	HNS foraging
03:58	Pip 45	3	Y	HNS foraging
04:01	Pip 45	3	Y	HNS foraging
04:05 – 04:06	Pip 45	9	Y	HNS foraging
04:08	Pip 45	3	Y	HNS foraging
04:10 – 04:13	Pip 45	7	Y	HNS foraging

Tree 22 – Dusk – 13 September 2018

SEPTEMBER				
Project Name	M42 Junction 6	Surveyors		GG
Survey Location	F	Rain (0-5)		0
Date	13/09/2018	Wind (0-7)		2
Start	19:10	Cloud Cover (0-5)		5
Sunrise	19:25	Temperature		15°C
Finish	20:55	Weather description		Cloudy with slight wind
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
19:50	Pip 55	1	Y	Heard not seen (HNS) foraging
19:52	Pip sp.	1	Y	HNS foraging
19:53 – 19:54	Pip 55	2	Y	HNS multiple bats foraging
19:58	Pip sp.	1	Y	HNS foraging
20:04	Pip 55	1	Y	HNS foraging
20:07	Pip sp.	1	Y	HNS foraging
20:12	Pip 45	2	Y	HNS foraging
20:14 – 20:16	Pip 45	10	Y	HNS multiple bats foraging
20:20 – 20:25	Pip 45	18	Y	HNS multiple bats foraging
20:36	Pip 45	1	Y	HNS foraging
20:40	Pip 45	1	Y	HNS foraging
20:46	Pip 45	3	Y	HNS foraging
Project Name	M42 Junction 6	Surveyors		AS
Survey Location	G	Rain (0-5)		0
Date	13/09/2018	Wind (0-7)		2
Start	19:10	Cloud Cover (0-5)		5
Sunrise	19:25	Temperature		15°C
Finish	20:55	Weather description		Cloudy with slight wind
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
19:52 – 19:53	Pip sp.	2	Y	Heraed not seen (HNS) brief faint passes
19:49	Pip sp.	3	Y	Heard not seen (HNS) foraging
19:51 – 19:52	Pip sp.	4	Y	Heard and seen (H&S) foraging east to west across hedgerow
19:54	Pip sp.	2	Y	HNS foraging

19:56	Pip sp.	2	Y	HNS foraging
20:04	Pip sp.	1	Y	HNS foraging
20:07	Pip sp.	1	Y	HNS foraging
20:12 – 20:16	Pip 45	12	Y	H&S foraging north to south along hedgerow
20:16	Long-eared Bat	1	Y	HNS foraging
20:20 – 20:24	Pip 45	13	Y	H&S foraging north to south along hedgerow
20:26	Pip 45	2	Y	HNS foraging
20:35 – 20:36	Pip 45	2	Y	HNS foraging
20:39 – 20:40	Pip 45	3	Y	HNS foraging
20:45 – 20:46	Pip 45	2	Y	HNS foraging
20:49	Pip 45	1	Y	HNS foraging

Tree 80 – Dawn – 8 August 2018

AUGUST				
Project Name	M42 Junction 6	Surveyors		MD
Survey Location	H	Rain (0-5)		0
Date	08/08/2018	Wind (0-7)		3
Start	04:05	Cloud Cover (0-5)		2
Sunrise	05:36	Temperature		13-11°C
Finish	05:36	Weather description		Cool, dry, gentle breeze
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
04:20	Pip 45	1	Y	Heard not seen (HNS) commuting
Project Name	M42 Junction 6	Surveyors		CA
Survey Location	I	Rain (0-5)		0
Date	08/08/2018	Wind (0-7)		3
Start	04:05	Cloud Cover (0-5)		2
Sunrise	05:36	Temperature		13-11°C
Finish	05:36	Weather description		Cool, dry, gentle breeze
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
04:21	Pip 45	1	Y	Heard not seen (HNS) foraging

Tree 80 – Dusk – 20 August 2018

AUGUST				
Project Name	M42 Junction 6	Surveyors		KC
Survey Location	H	Rain (0-5)		0
Date	20/08/2018	Wind (0-7)		0
Start	20:07	Cloud Cover (0-5)		5
Sunrise	20:23	Temperature		23°C
Finish	21:53	Weather description		Light rain 30 minutes before dusk and off throughout survey, overcast and still
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
20:25	Pip 55	1	Y	Heard not seen (HNS) foraging
20:35	Pip 55	1	Y	HNS foraging
20:44	Nyctalus sp.	1	Y	HNS foraging
20:44	Noctule	1	Y	HNS foraging
20:54 – 20:55	Pip 45	4	Y	HNS multiple bats foraging
21:03	Pip 45	1	Y	HNS foraging
21:08	Pip 45	3	Y	HNS foraging
21:10	Pip 45	1	Y	HNS foraging
21:12	Myotis sp.	1	Y	HNS foraging
21:12	Pip 45	1	Y	HNS foraging
21:14 – 21:15	Pip 45	1	Y	HNS multiple bats foraging
21:17	Pip 45	1	Y	HNS foraging
21:17	Noctule	2	Y	HNS foraging
21:26 – 21:27	Pip 45	2	Y	HNS multiple bats foraging
21:31	Pip 45	2	Y	HNS foraging
21:35	Pip 45	1	Y	HNS foraging
21:39	Nyctalus sp.	1	Y	HNS foraging
21:49	Myotis sp.	1	Y	HNS foraging
21:49	Pip 45	1	Y	HNS foraging

AUGUST					
Project Name	M42 Junction 6	Surveyors		JH	
Survey Location	I	Rain (0-5)		0	
Date	20/08/2018	Wind (0-7)		0	
Start	20:07	Cloud Cover (0-5)		5	
Sunrise	20:23	Temperature		23°C	
Finish	21:53	Weather description		Light rain 30 minutes before dusk and off throughout survey, overcast and still	
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Ref. number**	**Description of behaviour**
20:15	Noctule	1	Y		Heard and seen (H&S) high flying from south to north across hedgerow
20:25	Pip 55	1	Y	5	H&S 1 bat emerged from south west corner of tree, did a 180° turn and flew north
20:34	Pip 55	1	Y	6	H&S 1 bat emerged from the south and flew south across field
20:44	Noctule	1	Y		HNS foraging
20:51	Pip 45	1	Y		HNS foraging
20:52	Noctule	1	Y		HNS foraging
21:06	Pip 55	1	Y		HNS foraging
21:10	Noctule	2	Y		HNS foraging
21:12	Myotis sp.	1	Y		HNS foraging
21:14	Pip 45	1	Y		HNS foraging
21:17	Noctule	1	Y		HNS foraging
21:19	Pip 45	1	Y		HNS foraging
21:26	Pip 45	1	Y		HNS foraging
21:31	Pip 45	2	Y		HNS foraging
21:37	Pip 55	2	Y		HNS foraging
21:38	Noctule	3	Y		HNS foraging
21:49	Myotis sp.	1	Y		HNS foraging
21:49	Pip 45	1	Y		HNS foraging

Tree 80 – Dusk – 13 September 2018

SEPTEMBER				
Project Name	M42 Junction 6	Surveyors		LS
Survey Location	H	Rain (0-5)		0
Date	13/09/2018	Wind (0-7)		9
Start	19:13	Cloud Cover (0-5)		4
Sunrise	19:28	Temperature		16°C
Finish	20:58	Weather description		Cool breezy evening after a sunny day
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
19:52	Pip 55	1	Y	Heard not seen (HNS) commuting
20:00	Pip 55	1	Y	HNS foraging
20:03	Noctule	1	Y	HNS foraging
20:19 – 20:22	Pip 45	8	Y	HNS foraging
Project Name	M42 Junction 6	Surveyors		LS
Survey Location	H	Rain (0-5)		0
Date	13/09/2018	Wind (0-7)		9
Start	19:13	Cloud Cover (0-5)		4
Sunrise	19:28	Temperature		16°C
Finish	20:58	Weather description		Cool breezy evening after a sunny day
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
19:52	Pip 55	1	Y	Heard not seen (HNS) commuting
20:03	Noctule	2	Y	HNS foraging
20:19	Pip 45	3	Y	HNS foraging
20:21	Pip 45	3	Y	HNS foraging

Tree 83 – Dusk – 8 August 2018

AUGUST				
Project Name	M42 Junction 6	Surveyors		KC
Survey Location	J	Rain (0-5)		0
Date	08/08/2018	Wind (0-7)		0
Start	21:05*	Cloud Cover (0-5)		5
Sunrise	20:45	Temperature		16°C
Finish	22:15	Weather description		Rain during day but stopped before dusk *survey started late as tree was difficult to access
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
21:15	Pip 45	1	Y	Heard and seen (H&S) emerged from the tree headed east then flew back west
21:16	Noctule	2	Y	Heard not seen (HNS) commuting
21:18 – 21:19	Pip 45	6	Y	H&S commuting along hedgerow
21:18	Pip 55	1	Y	H&S commuting along hedgerow
21:22	Myotis sp.	1	Y	H&S commuting along hedgerow
21:23	Pip 45	2	Y	H&S commuting along hedgerow
21:23	Pip 55	1	Y	H&S commuting along hedgerow
21:27	Pip 45	1	Y	H&S circled tree and then flew along hedgerow
21:30	Pip 45	1	Y	H&S appears to have emerged from tree but too dark to tell rom which feature – would recommend Thermal Imaging for future surveys
21:32 – 21:33	Pip 45	3	Y	HNS foraging
21:37	Pip 45	1	Y	HNS foraging
21:40 – 21:42	Pip 45	3	Y	HNS foraging
21:45	Pip 45	1	Y	HNS foraging
21:49	Pip 45	3	Y	HNS foraging
21:53 – 21:54	Pip 45	2	Y	HNS foraging
21:56	Pip 45	2	Y	HNS foraging
22:00	Pip 45	2	Y	HNS foraging
22:04	Pip 45	1	Y	HNS foraging
22:06	Pip 45	1	Y	HNS foraging
Project Name	M42 Junction 6	Surveyors		JW
Survey Location	K	Rain (0-5)		0

Date	08/08/2018	Wind (0-7)		0
Start	21:05*	Cloud Cover (0-5)		5
Sunrise	20:45	Temperature		16°C
Finish	22:15	Weather description		Rain during day but stopped before dusk *survey started late as tree was difficult to access
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
21:15	Pip 45	1	Y	Heard and seen (H&S) emerged from the tree headed east then flew back west
21:16	Noctule	3	Y	Heard not seen (HNS) foraging
21:18	Pip 55	1	Y	HNS foraging
21:18 – 21:19	Pip 45	6	Y	HNS foraging
21:23	Myotis sp.	1	Y	HNS foraging
21:23	Pip 55	1	Y	HNS foraging
21:23	Pip 45	2	Y	HNS foraging
21:27	Pip 45	1	Y	HNS foraging
21:30	Pip 45	1	Y	H&S appears to have emerged from tree but too dark to tell rom which feature – would recommend Thermal Imaging for future surveys
21:33	Pip 45	2	Y	HNS foraging
21:41	Pip 45	2	Y	HNS foraging
21:45	Pip 45	1	Y	HNS foraging
21:49	Pip 45	2	Y	HNS foraging
21:54	Pip 45	1	Y	HNS foraging
21:56	Pip 45	2	Y	HNS foraging
22:01	Pip 45	1	Y	HNS foraging
22:04	Pip 45	1	Y	HNS foraging
22:06	Pip 45	1	Y	HNS foraging
22:14	Pip 45	1	Y	HNS foraging

Tree 83 – Dawn – 21 August 2018

AUGUST					
Project Name	M42 Junction 6	Surveyors		RMB & FMC	
Survey Location	J&I (Thermal Imaging)	Rain (0-5)		0	
Date	21/08/2018	Wind (0-7)		0	
Start	04:29	Cloud Cover (0-5)		3	
Sunrise	05:59	Temperature		18°C	
Finish	06:14	Weather description		Light breeze, dry and mild	
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Ref. number**	**Description of behaviour**
04:28	Pip 45	4	Y		Heard not seen (HNS) foraging
04:31 – 04:36	Pip 45	20	Y		HNS foraging
04:47	Long-eared bat	2	Y	9	Heard and seen (H&S) flew back into left side branch of tree
04:54	Pip 45	3	Y	10	H&S continuous foraging and then flew back into left side branch of tree
04:55 – 04:56	Pip 45	9	Y		HNS foraging
04:57	Long-eared bat	1	Y		HNS foraging
05:11	Pip 45	1	Y		HNS foraging
05:11	Noctule	1	Y		HNS foraging
05:28	Pip 45	1	Y		HNS foraging
05:29 – 05:41	Noctule	47	Y		HNS multiple bats continuous foraging
05:45 – 05:49	Noctule	15	Y		HNS multiple bats continuous foraging

Tree 83 – Dusk – 5 September 2018

SEPTEMBER					
Project Name	M42 Junction 6	Surveyors		GG	
Survey Location	J	Rain (0-5)		0	
Date	05/09/2018	Wind (0-7)		2	
Start	19:31	Cloud Cover (0-5)		2	
Sunrise	19:47	Temperature		16°C	
Finish	21:17	Weather description		Warm, mild sunny with scattered cloud	
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Ref. number**	**Description of behaviour**
20:20	Pip 45	1	Y	11	Heard and seen (H&S) Bat emerged, not clear from which feature
20:24 – 20:25	Pip 45	3	Y		HNS foraging
20:27	Pip 45	1	Y		HNS foraging
20:33	Pip 45	1	Y		HNS foraging
20:37	Pip 45	2	Y		HNS foraging
20:40	Nyctalus sp.	1	Y		HNS foraging
21:15	Nyc/Epi	2	Y		HNS foraging
Project Name	M42 Junction 6	Surveyors		GG	
Survey Location	J	Rain (0-5)		0	
Date	05/09/2018	Wind (0-7)		2	
Start	19:31	Cloud Cover (0-5)		2	
Sunrise	19:47	Temperature		16°C	
Finish	21:17	Weather description		Warm, mild sunny with scattered cloud	
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**	
20:20	Pip 45	1	Y	Heard and seen (H&S) commuting from south to north	
20:23 – 20:25	Pip 45	3	Y	H&S foraging along hedgerow	
20:27	Pip 45	1	Y	Heard not seen (HNS) foraging	
20:33	Pip 45	1	Y	HNS foraging	
20:35	Pip 45	1	Y	HNS foraging	
20:37	Pip 45	1	Y	HNS foraging	
20:39	Nyctalus sp.	1	Y	HNS foraging	
21:15	Nyctalus sp.	1	Y	HNS foraging	

Tree 85.2 – Dawn – 8 August 2018

AUGUST				
Project Name	M42 Junction 6	Surveyors		TC
Survey Location	L	Rain (0-5)		0
Date	08/08/2018	Wind (0-7)		2
Start	04:05	Cloud Cover (0-5)		3
Sunrise	05:36	Temperature		15°C
Finish	05:36	Weather description		Cool, dry, gentle breeze
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
04:21	Pip 45	1	Y	Heard not seen (HNS) foraging
04:53	Pip 55	1	Y	HNS foraging
Project Name	M42 Junction 6	Surveyors		DR
Survey Location	M	Rain (0-5)		0
Date	08/08/2018	Wind (0-7)		2
Start	04:05	Cloud Cover (0-5)		3
Sunrise	05:36	Temperature		15°C
Finish	05:36	Weather description		Cool, dry, gentle breeze
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
04:21	Pip 45	1	Y	Heard not seen (HNS) commuting
04:57	Pip 55	2	Y	HNS commuting
Project Name	M42 Junction 6	Surveyors		LS
Survey Location	N	Rain (0-5)		0
Date	08/08/2018	Wind (0-7)		2
Start	04:05	Cloud Cover (0-5)		3
Sunrise	05:36	Temperature		15°C
Finish	05:36	Weather description		Cool, dry, gentle breeze
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
04:21	Pip 45	1	Y	Heard not seen (HNS) commuting
04:54	Pip 55	1	Y	HNS commuting
04:57	Pip 55	1	Y	HNS commuting

Tree 85.2 – Dusk – 20 August 2018

AUGUST				
Project Name	M42 Junction 6	Surveyors		RR
Survey Location	L	Rain (0-5)		0
Date	20/08/2018	Wind (0-7)		0
Start	20:07	Cloud Cover (0-5)		5
Sunrise	20:23	Temperature		23°C
Finish	21:53	Weather description		Light rain 30 minutes before dusk and off throughout survey, overcast and still
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
20:16	Noctule	1	Y	HNS commuting
20:26	Pip 55	4	N	HNS commuting
20:28	Pip 55	1	Y	Single bat emerged from knot hole on branch
20:29	Pip 55	1	Y	Second bat emerged from knot hole on branch
20:31	Pip 55	2	Y	HNS commuting
20:34	Pip 55	Multiple	Y	Foraging through trees
20:35	Pip 55	1	Y	HNS commuting
20:44	Pip 55	1	Y	Commute
20:45	Pip 55	1	Y	Commute
20:45	Myotis	1	Y	Commute
20:53	Pip 45	Multiple	Y	Foraging
20:55	Pip 55	1	Y	Commute
20:57	Pip 55	1	Y	Commute
21:03	Pip 45	1	Y	Commute
21:05	Pip 45	2	Y	HNS forage
21:06	Pip 45	2	Y	HNS Commute
21:06	Ble	1	Y	HNS faint pass
21:07	Pip 45	2	Y	HNS Commute
21:08-21:21	Ble	Multiple	Y	HNS forage
21:23-21:28	Ble	Multiple	Y	HNS forage
21:31-21:37	Ble	Multiple	Y	HNS forage
21:39	Ble	1	Y	HNS faint pass
21:44-21:47	Ble	Multiple	Y	HNS forage
21:52-21:55	Myotis	Multiple	Y	HNS forage

Project Name	M42 Junction 6	Surveyors		LW
Survey Location	M	Rain (0-5)		0
Date	20/08/2018	Wind (0-7)		0
Start	20:07	Cloud Cover (0-5)		5
Sunrise	20:23	Temperature		23°C
Finish	21:53	Weather description		Light rain 30 minutes before dusk and off throughout survey, overcast and still
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
20:33	Pip 55	1	Y	Heard not seen (HNS) foraging
20:47	Pip 55	1	Y	HNS foraging
20:48	Pip 45	1	Y	HNS foraging
20:50	Pip 45	1	Y	HNS foraging
20:55	Pip 55	1	Y	HNS foraging
20:57	Pip 55	1	Y	HNS foraging
21:02 – 21:03	Pip 45	2	Y	HNS foraging
21:06	Pip 45	2	Y	HNS foraging
21:13	Pip 45	1	Y	HNS foraging
21:15 – 21:16	Pip 45	1	Y	HNS foraging
21:19	Pip 45	1	Y	HNS foraging
21:22	Pip 45	1	Y	HNS foraging
21:24 – 21:26	Pip 45	3	Y	HNS foraging
21:32 – 21:36	Pip 45	4	Y	HNS foraging
21:39 – 21:40	Pip 45	1	Y	HNS foraging
21:45 – 21:46	Pip 45	1	Y	HNS foraging
21:52 - 21:53	Pip 45	2	Y	HNS foraging
Project Name	M42 Junction 6	Surveyors		LW
Survey Location	M	Rain (0-5)		0
Date	20/08/2018	Wind (0-7)		0
Start	20:07	Cloud Cover (0-5)		5
Sunrise	20:23	Temperature		23°C
Finish	21:53	Weather description		Light rain 30 minutes before dusk and off throughout survey, overcast and still

Time	Species	No. of passes	Recording (Y/N)	Description of behaviour
20:25 – 20:47	Pip 55	59	Y	Heard not seen (HNS) foraging
20:48 – 20:50	Pip 45	4	Y	HNS foraging
20:54	Pip 45	3	Y	HNS foraging
20:55	Pip 55	2	Y	HNS foraging
20:57	Pip 55	1	Y	HNS foraging
21:01 – 21:03	Pip 45	6	Y	HNS foraging
21:06 – 21:56	Pip 45	198	Y	HNS multiple bats foraging

Tree 85.2 – Dusk – 25 September 2018

SEPTEMBER				
Project Name	M42 Junction 6	Surveyors		JT
Survey Location	L	Rain (0-5)		0
Date	25/09/2018	Wind (0-7)		1
Start	19:00	Cloud Cover (0-5)		1
Sunrise	18:58	Temperature		12°C
Finish	20:31	Weather description		Fine, clear and dry
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
19:54	Noctule	1	Y	Heard not seen (HNS) commuting
19:58 – 19:59	Pip 45	9	Y	HNS commuting
Project Name	M42 Junction 6	Surveyors		TC
Survey Location	M	Rain (0-5)		0
Date	25/09/2018	Wind (0-7)		1
Start	19:00	Cloud Cover (0-5)		1
Sunrise	18:58	Temperature		12°C
Finish	20:31	Weather description		Fine, clear and dry
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
19:49	Long-eared bat	1	Y	Heard not seen (HNS) brief pass
19:51	Long-eared bat	2	Y	HNS brief pass
19:57 – 19:58	Pip 45	7	Y	HNS multiple commuting passes
Project Name	M42 Junction 6	Surveyors		GG
Survey Location	N	Rain (0-5)		0
Date	25/09/2018	Wind (0-7)		1
Start	19:00	Cloud Cover (0-5)		1
Sunrise	18:58	Temperature		12°C
Finish	20:31	Weather description		Fine, clear and dry
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
20:19	Myotis sp.	1	Y	Heard not seen (HNS) commuting
20:28	Pip 45	1	Y	HNS brief faint pass

Tree 242 – Dawn – 17 August 2018

AUGUST				
Project Name	M42 Junction 6	Surveyors		RR
Survey Location	O	Rain (0-5)		0
Date	17/08/2018	Wind (0-7)		1
Start	04:21	Cloud Cover (0-5)		1
Sunrise	05:51	Temperature		12°C
Finish	06:06	Weather description		Light breeze and dry
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
No bats were detected during the survey				
Project Name	M42 Junction 6	Surveyors		RR
Survey Location	P	Rain (0-5)		0
Date	17/08/2018	Wind (0-7)		1
Start	04:21	Cloud Cover (0-5)		1
Sunrise	05:51	Temperature		12°C
Finish	06:06	Weather description		Light breeze and dry
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
No bats were detected during the survey				

Tree 242 – Dusk – 30 August 2018

AUGUST				
Project Name	M42 Junction 6	Surveyors		AR
Survey Location	O	Rain (0-5)		0
Date	30/08/2018	Wind (0-7)		1
Start	19:46	Cloud Cover (0-5)		4
Sunrise	20:01	Temperature		19°C
Finish	21:31	Weather description		Dry with a slight breeze
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
20:14 – 20:16	Pip 45	10	Y	Heard not seen (HNS) foraging
20:20	Pip 45	1	Y	HNS foraging
20:29	Pip 45	1	Y	HNS foraging
20:34	Pip 55	1	Y	HNS foraging
20:34	Pip 45	1	Y	HNS foraging
21:22	Pip 45	1	Y	HNS foraging
Project Name	M42 Junction 6	Surveyors		DR
Survey Location	P	Rain (0-5)		0
Date	30/08/2018	Wind (0-7)		1
Start	19:46	Cloud Cover (0-5)		4
Sunrise	20:01	Temperature		19°C
Finish	21:31	Weather description		Dry with a slight breeze
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**
20:14	Pip 45	7	Y	Heard not seen (HNS) foraging
20:19	Pip 45	1	Y	HNS foraging
20:28	Pip 45	1	Y	HNS foraging
21:29	Pip 45	1	Y	HNS foraging

Tree 242 – Dusk – 13 September 2018

SEPTEMBER					
Project Name	M42 Junction 6	Surveyors		JW	
Survey Location	O	Rain (0-5)		0	
Date	13/09/2018	Wind (0-7)		2-3	
Start	19:12	Cloud Cover (0-5)		4	
Sunrise	19:27	Temperature		19°C	
Finish	20:57	Weather description		Dry	
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Description of behaviour**	
19:53	Pip 55	1	N	Commute	
Project Name	M42 Junction 6	Surveyors		TC	
Survey Location	P	Rain (0-5)		0	
Date	13/09/2018	Wind (0-7)		2-3	
Start	19:12	Cloud Cover (0-5)		4	
Sunrise	19:27	Temperature		19°C	
Finish	20:57	Weather description		Dry	
Time	**Species**	**No. of passes**	**Recording (Y/N)**	**Ref. number**	**Description of behaviour**
19:23	Pip 55	1	Y	12	Heard and seen (H&S) emerged from tree and went south
19:23 – 19:25	Pip 55	19	Y		H&S foraging around tree
19:44	Pip 45	1	Y		Heard not seen (HNS) very brief pass
19:55	Pip 55	1	Y		Heard not seen (HNS) brief pass

Annex H: Transect results

Month	Survey date	Weather conditions
May	30/05/2018 DUSK	Dry, misty and overcast with a light air, 15°C
June	15/06/2018 DAWN	Dry, warm with a gentle breeze and overcast. 18°C
July	10/07/2018 DUSK	Warm, dry with a gentle air with wispy clouds 19°C.
	11/07/2018 DAWN	Warm, dry, light air with wispy clouds, 15°C

MAY-Transect 1 DUSK					
Project Name		M42 J6	Surveyors		
Survey Location		Transect 1	Rain (0-5)		
Date		30/05/2018	Wind (0-7)		
Start		20:51	Cloud Cover (0-5)		
Sunrise			Temperature		
Finish		23:05	Weather description		
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
3	21:32 – 21:37	Noctule	1	Heard not seen (HNS)	Foraging single pass
3 – 4	21:36	Common pipistrelle	1	HNS	Brief pass
4	21:38	Noctule	1	HNS	Foraging single pass
4	21:38	Common pipistrelle	1	HNS	Foraging single pass
4	21:39	Common pipistrelle	1	HNS	Foraging single pass
4 – 5	21:43	Common pipistrelle	1	HNS	Brief faint pass
4 – 5	21:45	Noctule	1	HNS	Brief faint pass
6 – 7	21:55 – 22:00	Common pipistrelle	2	Heard and seen (H&S)	Continuous foraging
6 – 7	22:01 – 22:08	Noctule	1	HNS	Foraging single pass
8	22:12	Common pipistrelle	1	HNS	Brief faint pass
8 – 9	22:23	Common pipistrelle	1	HNS	Brief pass
9	22:27	Common pipistrelle	1	H&S	Single pass
9	22:32 –	Common	1	HNS	Foraging activity sporadic

	22:35	pipistrelle			for 3 minutes
9 – 10	22:35	Common pipistrelle	1	H&S	Single pass
9 – 10	22:36	Long-eared bat	1	HNS	Brief single pass
9 – 10	22:37	Common pipistrelle	1	HNS	Brief single pass
10 – 11	22:44	Common pipistrelle	1	HNS	Brief single pass
10 – 11	22:44	Soprano pipistrelle	1	HNS	Brief single pass
11 – 12	22:49 – 22:57	Common pipistrelle	1	HNS	Continuous foraging activity
12	22:57 – 23:05	Common pipistrelle	2	HNS	Continuous foraging activity

JUNE-Transect 1 DUSK

No access available for June Transect

JULY-Transect 1 DUSK

Project Name	M42 J6	Surveyors	
Survey Location	Transect 1	Rain (0-5)	0
Date	10/07/18	Wind (0-7)	1
Start	21:21	Cloud Cover (0-5)	1
Sunrise		Temperature	19°C - 18°C
Finish	22:59	Weather description	Warm, dry with a gentle air with wispy clouds

Spot Count	Time	Species	No. of bats	Observation	Description of behaviour
	22:03 – 22:05	Common pipistrelle	1	HNS	Continuous foraging
	22:07	Common pipistrelle	1	HNS	Brief single pass
	22:09	Common pipistrelle	1	HNS	Brief single pass
	22:11	Common pipistrelle	1	HNS	Brief single pass
	22:13 – 22:15	Common pipistrelle	1	HNS	Sporadic foraging activity
	22:32 – 22:35	Common pipistrelle	1	H&S	Sporadic foraging activity
	22:35 – 22:39	Common pipistrelle	2	H&S	Continuous foraging activity
	22:42	Common pipistrelle	1	HNS	Brief single pass
	22:50	Common	1	H&S	Brief single pass

		pipistrelle			
JULY-Transect 1 DAWN					
Project Name		M42 J6	Surveyors		
Survey Location		Transect 1	Rain (0-5)		0
Date		11/07/18	Wind (0-7)		1
Start		02:50	Cloud Cover (0-5)		1
Sunrise			Temperature		15°C
Finish		04:34	Weather description		Warm, dry, light air with wispy clouds
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
12 – 11	02:52	Common pipistrelle	1	HNS	Brief single pass
9	03:17	Common pipistrelle	1	HNS	Brief single pass
8	03:29	Common pipistrelle	1	HNS	Brief single pass
8 – 7	03:32	Common pipistrelle	1	HNS	Brief single pass
8 – 7	03:34 – 03:35	Common pipistrelle	1	HNS	Foraging activity multiple passes
7	03:37 – 03:38	Common pipistrelle	1	HNS	Foraging activity multiple passes
7 – 6	03:42 – 03:44	Common pipistrelle	1	HNS	Foraging activity multiple passes
6	03:46	Common pipistrelle	1	H&S	Brief single pass
6	03:47	Common pipistrelle	1	HNS	Faint brief pass
6 – 5	03:49	Common pipistrelle	1	HNS	Foraging activity multiple passes
9	03:56	Common pipistrelle	1	HNS	Brief pass
4	04:02	Common pipistrelle	1	H&S	Foraging activity observed
4	04:03	Common pipistrelle	1	HNS	Foraging pass
4 – 3	04:09 – 04:11	Common pipistrelle	2	HNS	Foraging activity multiple passes
4 – 3	04:13	Common pipistrelle	1	HNS	Foraging pass
3	04:14	Common pipistrelle	1	HNS	Brief pass

AUGUST – Transect 1 DUSK					
Project Name		M42 J6	Surveyors		JC and DR
Survey Location		Transect 1	Rain (0-5)		0
Date		08/08/18	Wind (0-7)		1
Start		20:34	Cloud Cover (0-5)		3
Sunrise		20:34	Temperature		16°C
Finish		22:16	Weather description		Cool evening, several rain showers just prior to survey, but dry throughout survey
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
4-5	21:13	Soprano pipistrelle	1	HNS	Brief single pass
4-5	21:14	Common pipistrelle	1	HNS	Multiple foraging passes
4-5	21:16 – 21:21	Common pipistrelle	1	H&S	Continuous foraging activity
6-7	21:30	Common pipistrelle	1	HNS	Brief pass
6-7	21:34	Common pipistrelle	1	HNS	Foraging
7	21:37	Common pipistrelle	1	HNS	Foraging
7	21:39	Soprano pipistrelle	1	HNS	Foraging
7-8	21:44	Common pipistrelle	1	H&S	2 bats seen foraging
7-8	21:48	Common pipistrelle	1	HNS	Foraging
7-8	21:48	Soprano pipistrelle	1	HNS	Foraging
8-9	21:53	Common pipistrelle	1	HNS	Foraging
9	21:57	Common pipistrelle	1	HNS	Foraging
9-10	22:06	Pipistrelle Species	1	HNS	Foraging
9-10	22:11	Common pipistrelle	1	HNS	Foraging
10	22:15	Common pipistrelle	4	HNS	Foraging
SEPTEMBER – Transect 1 DUSK					
Project Name		M42 J6	Surveyors		JC and TC
Survey Location		Transect 1	Rain (0-5)		0

Date		12/09/18	Wind (0-7)		1
Start		19:14	Cloud Cover (0-5)		1
Sunrise		19:29	Temperature		15°C
Finish		20:41	Weather description		Cool, clear, dry and still
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
6-5	19:51	Common pipistrelle	1	HNS	Brief pass
5	19:54	Common pipistrelle	2	HNS	Foraging
5	19:55	Soprano pipistrelle	1	HNS	Foraging
3a-3	20:12	Common pipistrelle	1	HNS	Foraging
3a-3	20:15	Common pipistrelle	1	HNS	Foraging
3	20:18	Common pipistrelle	1	H&S	Several passes, one bat foraging along hedgerow
3-2	20:21	Common pipistrelle	3	H&S	Three bats foraging alone hedgerow
1	20:38	Common pipistrelle	1	HNS	Two brief passes
1	20:40-20:42	Common pipistrelle	1	HNS	Continuous foraging activity from one bat
OCTOBER – Transect 1 DUSK					
Project Name		M42 J6	Surveyors		JT and TC
Survey Location		Transect 1	Rain (0-5)		0
Date		02/10/18	Wind (0-7)		1
Start		18:28	Cloud Cover (0-5)		5
Sunrise		18:43	Temperature		15°C
Finish		20:00	Weather description		Light rain showers during survey, overcast, still and cool
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
4	19:04	Common pipistrelle	1	HNS	Foraging
4-5	19:07	Common pipistrelle	1	HNS	Brief pass
5-6	19:15	Common pipistrelle	1	HNS	Foraging
5-6	19:16	Common pipistrelle	1	HNS	Foraging

6	19:17	Common pipistrelle	1	HNS	Foraging
6	19:18	Common pipistrelle	1	HNS	Foraging
6	19:19	Common pipistrelle	1	H&S	Foraging south along hedgerow
6-7	19:22	Common pipistrelle	1	HNS	Foraging
6-7	19:23	Noctule	1	HNS	Commuting
7	19:28	Common pipistrelle	1	H&S	Foraging along hedgerow
7	19:30	Soprano pipistrelle	1	H&S	Foraging
7-8	19:31	Soprano pipistrelle	1	HNS	Foraging
7-8	19:33	Common pipistrelle	1	H&S	Foraging along hedgerow
7-8	19:34	Common pipistrelle	1	H&S	Foraging along hedgerow
8	19:35-19:39	Common pipistrelle	4	H&S	Constant foraging between PC7 and PC8

MAY-Transect 2 DUSK					
Project Name		M42 J6	Surveyors		
Survey Location		Transect 2	Rain (0-5)		
Date		30/05/18	Wind (0-7)		
Start		21:16	Cloud Cover (0-5)		
Sunset		21:16	Temperature		
Finish		23:05	Weather description		
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
2	21:31	Noctule	1	Heard not seen (HNS)	Commuting single pass
2	21:35	Noctule	1	HNS	Foraging single pass
2	21:36 - 21:37	Noctule	1	HNS	Foraging activity
2	21:36 - 21:37	Common pipistrelle	1	HNS	Foraging activity
2	21:39	Common pipistrelle	1	HNS	Foraging pass
2 – 3	21:42	Common pipistrelle	1	HNS	Foraging pass
3	21:44	Common pipistrelle	2	HNS	Foraging activity noted in corner of field multiple passes detected by two bats
3	21:45	Noctule	1	HNS	Foraging pass
3	21:51	Common pipistrelle	3	HNS	Multiple foraging passes by three bats
2 – 3	21:53	Common pipistrelle	2	Heard and seen (H&S)	Foraging activity observed around club house of sports facility
2 – 3	21:55 - 22:00	Common pipistrelle	1	H&S	Foraging along hedge line
3 – 4	22:01 - 22:02	Noctule	1	H&S	Foraging activity
6	22:07 - 22:08	Noctule	1	HNS	Foraging activity in corner of field
5 – 6	22:11	Common pipistrelle	1	HNS	Continuous foraging activity along hedge line
3 – 4	22:22	Common pipistrelle	1	HNS	Brief single pass
4	22:23	Common pipistrelle	2	HNS	Continuous foraging activity at spot count
4	22:27	Common pipistrelle	1	HNS	Commuting single pass
4 – 5	22:28	Common pipistrelle	1	HNS	Single brief pass

4 – 5	22:30	Common pipistrelle	2	HNS	Multiple foraging passes
5	22:33	Common pipistrelle	2	H&S	Multiple foraging passes
5 – 6	22:37	Long-eared	1	HNS	Foraging single pass
5 – 6	22:37	Common pipistrelle	1	HNS	Foraging multiple passes
6	22:40	Common pipistrelle	2	HNS	Foraging multiple passes by two bats
6	22:42	Common pipistrelle	1	HNS	Continuous forging activity during spot count
7	22:49	Common pipistrelle	2	HNS	Continuous forging activity during spot count
7 – 8	22:51	Common pipistrelle	1	HNS	Foraging pass
7 – 8	22:52	Common pipistrelle	1	HNS	Multiple foraging passes
8	22:54 - 22:56	Common pipistrelle	2	HNS	Continuous foraging activity during spot count
8	22:58	Common pipistrelle	1	H&S	Foraging single pass
8	22:59	Common pipistrelle	2	HNS	Foraging multiple passes along leylandii hedgerow
8 – 9	23:01	Common pipistrelle	1	HNS	Multiple foraging passes
9	23:03 - 23:05	Common pipistrelle	1	H&S	Continuous foraging activity
JUNE-Transect 2					
Project Name		M42 J6	Surveyors		JC and GG
Survey Location		Transect 2	Rain (0-5)		0
Date		11/06/18	Wind (0-7)		3
Start		21:28	Cloud Cover (0-5)		5
Sunset		21:28	Temperature		18°C
Finish		23:05	Weather description		Dry, warm with a gentle breeze and overcast.
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
10 – 9	21:38	Noctule	1	HNS	Faint foraging call
9	21:42	Noctule	1	HNS	Very faint foraging pass
3	21:50	Noctule	1	HNS	Foraging pass
3	21:51	Noctule	1	HNS	Foraging pass
3 – 4	21:53	Noctule	1	HNS	Foraging pass
3 – 4	21:55	Noctule	2	H&S	Two bats flew south and then circled round hedge foraging

4	21:58 - 22:01	Noctule	3	H&S	Foraging along the hedgerow
4 – 5	22:02	Common pipistrelle	1	H&S	Brief commuting pass
4 – 5	22:03	Noctule	1	H&S	Brief commuting pass
4 – 5	22:07	Common pipistrelle	1	H&S	Brief pass
4 – 5	22:09	Nyctalus species	1	H&S	Observed foraging circling overhead, multiple passes
4 – 5	22:10	Noctule	1	HNS	Foraging
5	22:12 - 22:14	Noctule	1	H&S	Observed foraging circling around hedgerow
5 – 6	22:16	Soprano pipistrelle	1	HNS	Brief pass
6	22:16	Nyctalus species	1	HNS	Brief pass
6	22:17	Noctule	1	HNS	Foraging pass
6	22:18	Common pipistrelle	2	H&S	Observed foraging by two bats
6	22:19	Nyctalus	1	HNS	Foraging pass
6	22:20	Common pipistrelle	1	HNS	Foraging pass
6 – 7	22:22	Noctule	2	H&S	Foraging pass
6 – 7	22:23 - 22:24	Common pipistrelle	2	H&S	Observed foraging along hedgerow
6 – 7	22:25	Common pipistrelle	2	H&S	Foraging pass
6 – 7	22:25	Noctule	1	HNS	Foraging pass
6 – 7	22:26	Common pipistrelle	1	HNS	Foraging pass
6 – 7	22:27	Noctule	1	HNS	Foraging pass
7	22:28 - 22:30	Common pipistrelle	4	H&S	Constant foraging activity along hedgerow
7 – 8	22:31 - 22:33	Common pipistrelle	1	H&S	Constant foraging activity along hedgerow
8	22:34 - 22:35	Noctule	1	H&S	Constant foraging activity along hedgerow
7 – 8	22:37 - 22:38	Common pipistrelle	3	H&S	Constant foraging activity observed
8 – 9	22:40 - 22:41	Common pipistrelle	1	HNS	Constant foraging activity
9	22:43	Common pipistrelle	1	HNS	Foraging pass
9 – 10	22:46 - 22:47	Common pipistrelle	1	HNS	Constant foraging activity

JULY-Transect 2 DUSK					
Project Name		M42 J6	Surveyors		SR and TC
Survey Location		Transect 2	Rain (0-5)		0
Date		10/07/18	Wind (0-7)		1
Start		21:21	Cloud Cover (0-5)		1
Sunset		21:26	Temperature		19°C - 18°C
Finish		22:59	Weather description		Warm, dry with a gentle air with wispy clouds
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
	22:17	Nyctalus	1	HNS	Very faint brief pass
	22:18 – 22:19	Common pipistrelle	1	HNS	Brief pass
	22:23 – 22:24	Common pipistrelle	1	HNS	Foraging activity
	22:25 – 22:28	Common pipistrelle	2	H&S	Foraging activity observed around hedgerow
	22:27 – 22:31	Common pipistrelle	2	H&S	Foraging activity multiple passes
	22:31	Common pipistrelle	3	H&S	Constant foraging activity
	22:36 – 22:37	Common pipistrelle	3	H&S	Foraging activity
	22:39	Noctule	1	HNS	Foraging pass
	22:41 – 22:42	Common pipistrelle	1	HNS	Foraging activity
	22:42 – 22:43	Common pipistrelle	1	HNS	Foraging activity in corner or site
	22:43 – 22:47	Common pipistrelle	1	H&S	Foraging activity
	22:49	Soprano pipistrelle	1	H&S	Foraging activity
	22:51	Common pipistrelle	1	H&S	Two foraging passes
	22:53	Common pipistrelle	1	H&S	Foraging pass
	22:57	Common pipistrelle	1	HNS	Foraging pass
	22:58 – 22:59	Common pipistrelle	1	HNS	Foraging activity
	23:01 – 23:03	Common pipistrelle	1	H&S	Two foraging passes
	22:10	Common pipistrelle	1	H&S	Foraging pass
	23:10	Myotis species	1	HNS	Single foraging pass

	23:11	Common pipistrelle	1	HNS	Foraging pass
	23:12 – 23:17	Common pipistrelle	1	HNS	Occasional foraging passes
	23:23	Common pipistrelle	1	HNS	Two foraging passes adjacent to road
	23:26	Common pipistrelle	1	HNS	Foraging pass
	23:31	Common pipistrelle	1	HNS	Brief pass
	23:37	Common pipistrelle	1	HNS	Foraging pass
	23:38 – 23:39	Common pipistrelle	1	HNS	Occasional foraging passes
JULY-Transect 2 DAWN					
Project Name		M42 J6	Surveyors		SR and TC
Survey Location		Transect 2	Rain (0-5)		0
Date		11/07/18	Wind (0-7)		1
Start		02:48	Cloud Cover (0-5)		1
Sunrise		04:49	Temperature		15°C
Finish		04:49	Weather description		Warm, dry, light air with wispy clouds
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
10	02:57:00	Pipistrellus species	1	HNS	Brief pass
10	02:59:19	Pipistrellus species	1	HNS	Brief pass
9 – 8	03:11 – 03:14	Common pipistrelle	1	HNS	Foraging activity noted in corner of site, multiple passes.
8	03:18	Common pipistrelle	1	H&S	Foraging activity around hedgerow
8	03:21	Common pipistrelle	2	H&S	Foraging activity noted by two bats
7	03:30	Common pipistrelle	1	HNS	Foraging activity
7	03:33-03:34	Common pipistrelle	1	H&S	Brief pass
7 – 6	03:38	Common pipistrelle	2	H&S	Foraging activity
7 – 6	03:40	Common pipistrelle	1	HNS	Foraging activity
6	03:44	Common pipistrelle	1	HNS	Forging activity two passes observed

5	03:51	Common pipistrelle	1	HNS	Faint foraging activity detected
5	03:53 – 03:56	Common pipistrelle	1	HNS	Constant foraging activity
5 – 4	03:59	Common pipistrelle	1	HNS	Foraging pass
5 – 4	04:00	Soprano pipistrelle	1	HNS	Faint call single pass
5 – 4	04:02	Noctule	1	HNS	Commuting pass
4	04:06 – 04:08	Soprano pipistrelle	1	HNS	Foraging activity

AUGUST-Transect 2 DUSK			
Project Name	M42 J6	Surveyors	KC and TC
Survey Location	Transect 2	Rain (0-5)	1
Date	08/08/18	Wind (0-7)	1
Start	20:34	Cloud Cover (0-5)	3
Sunset	20:34	Temperature	16°C
Finish	22:22	Weather description	Cool evening, several rain showers just prior to survey, but dry throughout survey

Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
	21:15-21:17	Soprano pipistrelle	1	HNS	Foraging
	21:29	Noctule	1	HNS	Foraging
	21:31	Common pipistrelle	1	HNS	Foraging
	21:34	Common pipistrelle	1	H&S	Foraging along hedgerow
	21:38	Common pipistrelle	1	H&S	Foraging along hedgerow
	21:42	Common pipistrelle	1	H&S	Foraging
	21:42	Myotis sp	1	HNS	Foraging
	21:47	Common pipistrelle	1	HNS	Foraging
	21:57	Common pipistrelle	1	HNS	Foraging
	22:01	Common pipistrelle	1	HNS	Brief pass
	22:13	Common pipistrelle	1	HNS	Commuting
	22:13	Nyctalus sp	1	HNS	Commuting

	22:16	Common pipistrelle	1	HNS	Commuting
SEPTEMBER -Transect 2					
access withdrawn					
OCTOBER-Transect 2					
access withdrawn					

MAY-Transect 4 DUSK					
Project Name		M42 J6	Surveyors		
Survey Location		Transect 4	Rain (0-5)		
Date		30/05/18	Wind (0-7)		
Start		21:16	Cloud Cover (0-5)		
Sunset		21:16	Temperature		
Finish		23:27	Weather description		
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
2	21:21	Soprano pipistrelle	1	HNS	Brief pass
2	21:23	Soprano pipistrelle	1	HNS	Brief pass
2	21:24	Common pipistrelle	1	HNS	Brief pass
2	21:27	Soprano pipistrelle	1	HNS	Brief pass
2	21:27	Common pipistrelle	1	HNS	Brief pass
2 – 3	21:30 – 21:32	Common pipistrelle	1	HNS	Foraging activity
2 – 3	21:32 – 21:33	Common pipistrelle	1	(H&S	Foraging pass
4	21:40	Soprano pipistrelle	1	HNS	Brief pass
4	21:43 – 21:44	Common pipistrelle	1	HNS	Foraging activity
4	21:44	Soprano pipistrelle	1	HNS	Brief pass
4	21:45	Noctule	1	HNS	Brief pass
4	21:45 – 21:49	Common pipistrelle	2	H&S	Foraging activity
4 – 5	21:50 – 21:52	Common pipistrelle	3	H&S	Foraging activity
4 – 5	21:50	Soprano pipistrelle	1	HNS	Brief pass
4 – 5	21:51	Soprano pipistrelle	1	HNS	Brief pass
8	22:23	Myotis species	1	HNS	Brief pass
9	22:28	Common pipistrelle	1	HNS	Foraging pass
9 – 10	22:32	Common pipistrelle	1	HNS	Brief pass
9 – 10	22:34	Common pipistrelle	1	HNS	Brief pass

12 – 1	22:52	Common pipistrelle	1	HNS	Brief pass
12 – 1	22:57 – 22:58	Pipistrellus species	1	HNS	Brief pass
12	23:26	Common pipistrelle	1	HNS	Brief pass

JUNE-Transect 4			
Project Name	M42 J6	Surveyors	CC and TC
Survey Location	Transect 4	Rain (0-5)	0
Date	11/06/18	Wind (0-7)	3
Start	21:05	Cloud Cover (0-5)	5
Sunset	21:28	Temperature	18°C
Finish	23:01	Weather description	Dry, warm with a gentle breeze and overcast.

Spot Count	Time	Species	No. of bats	Observation	Description of behaviour
1 – 2	21:17	Soprano pipistrelle	1	H&S	Commuting brief pass
2	21:19	Soprano pipistrelle	1	HNS	Faint pass
2	21:22	Soprano pipistrelle	1	HNS	Multiple foraging passes
2	21:24	Common pipistrelle	1	HNS	Multiple foraging passes
2	21:25 - 21:27	Common pipistrelle	1	HNS	Multiple foraging passes
2	21:25 - 21:26	Soprano pipistrelle	1	H&S	Circling foraging overhead, multiple passes
2 – 3	21:28	Soprano pipistrelle	1	HNS	Foraging pass
2 – 3	21:28 - 21:34	Common pipistrelle	1	H&S	Constant foraging activity
2 – 3	21:30- 21:31	Common pipistrelle	1	H&S	Foraging activity observed
2 – 3	21:32	Soprano pipistrelle	1	HNS	Foraging pass
2 – 3	21:34	Soprano pipistrelle	1	HNS	Foraging pass
4	21:35	Common pipistrelle	1	HNS	Brief pass
4 – 5	21:41	Soprano pipistrelle	1	HNS	Brief pass
5	21:42	Common pipistrelle	1	HNS	Brief pass
5	21:44	Common pipistrelle	1	HNS	Brief pass

5 – 6	21:46	Common pipistrelle	1	HNS	Foraging multiple passes
5	21:48	Pipistrellus species	1	H&S	Foraging pass
6	21:49 - 21:51	Common pipistrelle	1	HNS	Foraging passes
8	22:05	Common pipistrelle	1	HNS	Two foraging passes
8	22:06	Common pipistrelle	1	HNS	Multiple foraging passes
9 – 10	22:16	Noctule	1	HNS	Brief pass
10	22:17	Common pipistrelle	1	HNS	Multiple forging passes
10	22:20 - 22:21	Common pipistrelle	1	HNS	Foraging activity
10	22:23	Common pipistrelle	1	HNS	Brief pass
10 – 11	22:25	Common pipistrelle	1	HNS	Multiple passes
11	22:27	Common pipistrelle	1	HNS	Foraging pass
12 – 1	22:30	Common pipistrelle	1	HNS	Foraging pass
12 – 1	22:36	Nyctalus species	1	HNS	Brief pass
12 – 1	22:47	Common pipistrelle	1	HNS	Brief pass
12 – 1	22:50	Common pipistrelle	1	HNS	Brief pass
JULY-Transect 4 DUSK					
Project Name		M42 J6	Surveyors		
Survey Location		Transect 4	Rain (0-5)		0
Date		10/07/18	Wind (0-7)		1
Start		21:26	Cloud Cover (0-5)		1
Sunset		21:26	Temperature		19°C - 18°C
Finish		22:53	Weather description		Warm, dry with a gentle air with wispy clouds
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
	22:03	Common pipistrelle	1	HNS	Foraging brief passes
	22:12	Soprano pipistrelle	1	HNS	Brief pass
	22:24	Common pipistrelle	1	H&S	Brief pass

	22:29	Soprano pipistrelle	1	HNS	Brief pass
	22:38	Common pipistrelle	1	HNS	Brief pass

JULY-Transect 4 DAWN			
Project Name	M42 J6	Surveyors	
Survey Location	Transect 4	Rain (0-5)	0
Date	11/07/18	Wind (0-7)	1
Start	02:55	Cloud Cover (0-5)	1
Sunrise	04:49	Temperature	15°C
Finish	04:58	Weather description	Warm, dry, light air with wispy clouds

Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
12 – 1	02:53	Soprano pipistrelle	1	HNS	Foraging pass
1	02:59	Noctule	1	HNS	Brief pass
1 – 2	03:03	Pipistrellus species	1	HNS	Brief pass
1 – 2	03:06 – 03:10	Common pipistrelle	1	HNS	Foraging activity multiple passes
1 – 2	03:29 – 03:32	Common pipistrelle	2	HNS	Foraging activity by two bats, multiple passes
4	03:37	Common pipistrelle	1	HNS	Foraging activity
4	03:42	Common pipistrelle	2	HNS	Foraging activity
4	03:44	Common pipistrelle	1	HNS	Brief pass
4 – 3	03:45 – 03:46	Common pipistrelle	1	HNS	Brief pass
4 – 3	03:45	Myotis species	1	HNS	Brief pass
3	03:48	Common pipistrelle	1	HNS	Brief pass
4 – 3	03:58 – 04:04	Common pipistrelle	1	HNS	Foraging pass
4 – 5	04:05	Common pipistrelle	1	HNS	Foraging pass
4 – 5	04:05 – 04:06	Soprano pipistrelle	1	HNS	Foraging pass
4 – 5	04:08	Common pipistrelle	1	HNS	Foraging pass
4 – 5	04:09	Long-eared	1	HNS	Brief pass
4 – 5	04:09	Common	1	HNS	Brief pass

		pipistrelle			
5	04:12	Common pipistrelle	1	HNS	Foraging pass
6 – 7	04:25	Common pipistrelle	1	HNS	Brief Pass
AUGUST – Transect 4 DUSK					
Project Name		M42 J6	Surveyors		CC and GG
Survey Location		Transect 4	Rain (0-5)		0
Date		08/08/18	Wind (0-7)		1
Start		20:34	Cloud Cover (0-5)		3
Sunrise		20:34	Temperature		16°C
Finish		22:05	Weather description		Cool evening, several rain showers prior to survey, but dry throughout survey
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
2	20:36	Soprano pipistrelle	1	HNS	Brief pass
	20:51	Common pipistrelle	1	HNS	Commuting
	20:58	Common pipistrelle	1	HNS	Commuting
9	21:12-21:13	Common pipistrelle	1	HNS	Foraging
10	21:22	Common pipistrelle	1	HNS	Commuting
10	21:23	Soprano pipistrelle	1	H&S	Continuous foraging in adjacent woodland
10	21:23	Common pipistrelle	1	HNS	Commuting
10	21:38-21:39	Common pipistrelle	1	HNS	Foraging
10	21:42	Common pipistrelle	1	HNS	Brief pass
12	22:00	Common pipistrelle	1	HNS	Brief pass
SEPTEMBER – Transect 4 DUSK					
Project Name		M42 J6	Surveyors		CC and DR
Survey Location		Transect 4	Rain (0-5)		0
Date		12/09/18	Wind (0-7)		1
Start		19:14	Cloud Cover (0-5)		1
Sunrise		19:29	Temperature		15°C
Finish		20:34	Weather description		Cool, clear, dry and still

Spot Count	Time	Species	No. of bats	Observation	Description of behaviour
6-7	20:07	Common pipistrelle	1	H&S	Multiple foraging passes over arable field
October – Transect 4 DUSK					
Project Name		M42 J6	Surveyors		GG and CA
Survey Location		Transect 4	Rain (0-5)		0
Date		02/10/18	Wind (0-7)		1
Start		18:28	Cloud Cover (0-5)		5
Sunrise		18:43	Temperature		15°C
Finish		20:10	Weather description		Light rain showers during survey, overcast, still and cool
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
9	19:15-19:19	Common pipistrelle	1	H&S	Continuous foraging along hedgerow
9	19:15-19:23	Soprano pipistrelle	1	H&S	Continuous foraging along hedgerow
9-10	19:25	Soprano pipistrelle	1	HNS	Brief pass
12	19:57	Nyctalus sp	1	HNS	Brief pass
12-end	20:01	Leisler	1	HNS	Brief pass
12-end	20:03	Leisler	1	HNS	Brief pass
12-end	20:06	Leisler	1	HNS	Brief pass

MAY-Transect 5 DUSK					
Project Name		M42 J6	Surveyors		
Survey Location		Transect 5	Rain (0-5)		
Date		30/05/18	Wind (0-7)		
Start		21:16	Cloud Cover (0-5)		
Sunset		21:16	Temperature		
Finish		23:06	Weather description		
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
4 – 5	21:39 – 21:40	Soprano pipistrelle	1	HNS	Forging pass
4 – 5	21:45 – 21:47	Common pipistrelle	1	HNS	Multiple foraging passes
4 – 5	21:47	Common pipistrelle	1	H&S	Foraging pass
5	21:48	Noctule	1	HNS	Brief single pass
5	21:52 – 21:56	Common pipistrelle	1	HNS	Forging activity multiple passes
6	21:57 – 21:59	Common pipistrelle	1	H&S	Foraging activity observed multiple passes
8	22:14	Common pipistrelle	1	H&S	Commuting pass
10	22:22	Common pipistrelle	1	HNS	Brief pass
10	22:23	Myotis species	1	HNS	Brief pass
12 – 13	22:43	Common pipistrelle	1	HNS	Brief pass along hedgerow
13	22:46	Common pipistrelle	1	HNS	Brief pass
14	22:50	Common pipistrelle	1	HNS	Brief pass
15	22:58 – 22:59	Common pipistrelle	1	HNS	Multiple foraging passes
15	23:04 – 23:05	Common pipistrelle	1	HNS	Multiple foraging passes

JUNE-Transect 5			
Project Name	M42 J6	Surveyors	
Survey Location	Transect 5	Rain (0-5)	0
Date	11/06/18	Wind (0-7)	3
Start	21:05	Cloud Cover (0-5)	5
Sunset	21:28	Temperature	18°C
Finish	23:01	Weather description	Dry, warm with a gentle breeze and overcast.

Spot Count	Time	Species	No. of bats	Observation	Description of behaviour
4	21:50	Noctule	1	HNS	Brief pass
5	21:58	Noctule	1	H&S	Commuting along hedgerows towards woodlands
8	22:18 – 22:20	Noctule	1	HNS	Brief faint pass
8 – 9	22:24 - 22:33	Common pipistrelle	4	H&S	Continuous woodland edge foraging
8 – 9	22:25	Myotis species	1	H&S	Foraging along woodland edge
8 – 9	22:27	Soprano pipistrelle	2	H&S	Foraging along woodland edge
9	22:35 - 22:36	Common pipistrelle	2	H&S	Foraging along woodland edge
9 – 10	22:39 - 22:42	Common pipistrelle	1	HNS	Foraging
11 – 12	22:57 - 22:04	Common pipistrelle	2	H&S	Forging along hedgerows
12	23:05 - 23:06	Common pipistrelle	2	HNS	Continuous foraging
12 – 13	23:08 - 23:11	Common pipistrelle	1	HNS	Forging along hedgerow in arable field
12 – 13	23:11	Soprano pipistrelle	1	HNS	Single pass
13	23:12 - 23:14	Common pipistrelle	2	HNS	Foraging along hedgerow
14	23:15	Common pipistrelle	1	H&S	Foraging observed
14 – 15	23:16 - 23:23	Common pipistrelle	1	H&S	Foraging along hedgerow
14 – 15	23:20	Soprano pipistrelle	1	HNS	Foraging along hedgerow
15 – 1	23:27	Common pipistrelle	1	HNS	Faint pass

JULY-Transect 5 DUSK			
Project Name	M42 J6	Surveyors	DH and LS
Survey Location	Transect 5	Rain (0-5)	0
Date	10/07/18	Wind (0-7)	1
Start	21:22	Cloud Cover (0-5)	1
Sunset	21:26	Temperature	19°C - 18°C
Finish	23:12	Weather description	Warm, dry with a gentle air with wispy clouds

Spot Count	Time	Species	No. of bats	Observation	Description of behaviour
	22.04	Soprano pipistrelle	1	HNS	Single foraging pass
	22:20 – 22:22	Common pipistrelle	1	H&S	Constant foraging activity
	22:26	Common pipistrelle	1	H&S	Forging pass
	22.51	Soprano pipistrelle	1	HNS	Communising along hedgerow
	22:55 – 22:57	Common pipistrelle	1	HNS	Constant foraging activity
	23:02 – 23:05	Common pipistrelle	1	HNS	Constant foraging activity
	23.04	Soprano pipistrelle	1	HNS	Foraging activity
	23:08 – 23:09	Common pipistrelle	1	HNS	Foraging activity
	23:11	Common pipistrelle	1	HNS	Foraging activity
	23:11	Soprano pipistrelle	1	HNS	Foraging activity

JULY-Transect 5 DAWN			
Project Name	M42 J6	Surveyors	DH and LS
Survey Location	Transect 5	Rain (0-5)	0
Date	11/07/18	Wind (0-7)	1
Start	02:49	Cloud Cover (0-5)	1
Sunrise	04:49	Temperature	15°C
Finish	04:58	Weather description	Warm, dry, light air with wispy clouds

Spot Count	Time	Species	No. of bats	Observation	Description of behaviour
1	02:49-02:51	Common pipistrelle	1	HNS	Foraging along hedgerow
1	02:58 – 03:00	Common pipistrelle	1	HNS	Foraging along hedgerow
1 – 2	03:05	Common pipistrelle	1	HNS	Brief pass along hedgerow
4	03:21	Long-eared	1	HNS	Brief pass
4	03:21	Common pipistrelle	1	HNS	Brief pass
8	03:52 – 03:55	Common pipistrelle	1	HNS	Foraging along woodland edge
8 – 9	03:55	Soprano pipistrelle	1	HNS	Brief pass

8 – 9	03:55 – 03:58	Common pipistrelle	1	HNS	Foraging along woodland edge
9	03:58	Common pipistrelle	2	HNS	Foraging along woodland edge
AUGUST – Transect 5 DUSK					
Project Name	M42 J6	Surveyors	DH and RP		
Survey Location	Transect 5	Rain (0-5)	0		
Date	08/08/18	Wind (0-7)	1		
Start	20:34	Cloud Cover (0-5)	3		
Sunrise	20:34	Temperature	16°C		
Finish	22:05	Weather description	Cool evening, several rain showers prior to survey, but dry throughout survey		
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
9	21:11	Noctule	1	HNS	Brief pass
9	21:17	Common pipistrelle	1	HNS	Brief pass
8	21:24	Common pipistrelle	1	H&S	Commuting across field from woodland south
8	21:25	Noctule	1	HNS	Brief pass
8	21:28	Common pipistrelle	1	HNS	Foraging
8	21:30	Noctule	1	HNS	Commuting
8	21:31	Noctule	2	H&S	Foraging
7	21:33	Soprano pipistrelle	1	HNS	Foraging
7	21:36	Soprano pipistrelle	1	HNS	Commuting
7	21:38	Common pipistrelle	2	HNS	Foraging
7	21:40	Soprano pipistrelle	1	H&S	Commuting along hedgerow
5	21:50	Common pipistrelle	1	HNS	Commuting
4	21:55	Myotis sp	1	H&S	Commuting west
4	21:56	Common pipistrelle	1	HNS	Commuting
4	22:13	Common pipistrelle	1	HNS	Commuting

SEPTEMBER – Transect 5 DUSK					
Project Name	M42 J6		Surveyors		DH and GG
Survey Location	Transect 4		Rain (0-5)		0
Date	12/09/18		Wind (0-7)		1
Start	19:14		Cloud Cover (0-5)		1
Sunrise	19:29		Temperature		15°C
Finish	20:34		Weather description		Cool, clear, dry and still
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
8	20:01	Common pipistrelle	1	HNS	Brief pass
13	20:26	Common pipistrelle	1	HNS	Foraging
OCTOBER – Transect 5 DUSK					
Project Name	M42 J6		Surveyors		JC and LS
Survey Location	Transect 5		Rain (0-5)		0
Date	02/10/18		Wind (0-7)		1
Start	18:36		Cloud Cover (0-5)		5
Sunrise	18:43		Temperature		15°C
Finish	20:05		Weather description		Light rain showers during survey, overcast, till and cool
Spot Count	**Time**	**Species**	**No. of bats**	**Observation**	**Description of behaviour**
9-10	19:24	Common pipistrelle	1	H&S	Foraging along hedgerow
12	19:44	Soprano pipistrelle	1	HNS	Brief pass
13	19:50	Common pipistrelle	1	HNS	Foraging
15-end	20:04	Common pipistrelle	1	HNS	Foraging

Annex I: Automated static monitoring results

Static location 1

May

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
30/05/2018	21:17	14.5 - 15.1	Pip45	23:21			8	2					00:00	04:51	10	11	
			PipSp				1								1		
31/05/2018	21:18	16.3 - 18.9			No bats were detected									04:51	0	0	
01/06/2018	21:20	17.4 - 20.1	Pip45						2				01:47	04:50	2	4	0.45
			Pip55	22:36		1									1		
			PipSp			1									1		
02/06/2018	21:20	13.8 - 19.6	Pip45						1				01:45	04:50	1	2	
			PipSp	00:24				1							1		
03/06/2018	21:21	15.6 - 20.8			No bats were detected									04:48	0	0	

June

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
19/06/2018	21:32	17.3 - 20.3	Pip45				4	3	15		2			04:44	24	45	2.06
			Pip55			9									9		
			PipSp				5	1	2		3		03:43		11		
			Myotis sp.	22:09		1									1		
20/06/2018	21:33	11.5 - 15.0			No bats were detected									04:44	0	0	
21/06/2018	21:33	10.8 - 14.5	Pip55	22:52		4	9						23:24	04:44	13	13	
22/06/2018	21:33	11.8 - 18.1	Pip45						1					04:45	1	5	
			Pip55	23:14			3				1		03:17		4		
23/06/2018	21:33	11.2 - 17.6	Pip45					2						04:45	2	9	
			Pip55	23:17			6				1		03:15		7		

July

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
10/07/2018	21:27	12.5 - 21.6	Pip45				13	24						04:58	37	43	8.51
			Pip55	23:39			1			2	2				5		
			Noctule									1	04:43		1		
11/07/2018	21:26	14.8 - 20.4	Pip45	23:57			1		19	23	9			04:59	52	61	
			Pip55							8	1		03:37		9		
12/07/2018	21:25	16.0 - 20.6	Pip45	00:05				8	25	30	6			05:00	69	75	
			Pip55					1	2	1	2		03:53		6		
13/07/2018	21:24	15.0 - 20.3	Pip45	23:14			4	1	9	33	18		03:24	05:01	65	66	
			Pip55							1					1		
14/07/2018	21:23	14.0 - 24.1	Pip45	22:57		1		1	17	44	10		03:50	05:02	73	74	
			Pip55							1					1		

August

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
08/08/2018	20:46	12.8-15.3	Pip45	21:52	1			1				1	04:05	05:40	3	9	0.33
			Pip55							3		1			4		
			PipSp					2							2		
09/08/2018	20:44	11.3-17.0	Pip55	03:02							3			05:41	3	4	
			Nyctalus sp								1		03:37		1		
10/08/2018	20:43	7.0-14.3	Pip55											05:43	1	1	
11/08/2018	20:41	13.8-14.6	-	No bats were detected										05:45	0	0	
12/08/2018	20:39	14.6-16.0	Pip45	02:10						1			02:10	05:46	1	1	

September

Day	Sunset	Min - max temp. °C	Species	First bat pass	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
03/10/2018	18:40	13.0-18.0	Pip45	19:04		1	1	2	2	1	1			1			1	06:25	07:13	10	17	0.90
			Pip55			1	1							1						3		
			Noctule			2	1													3		
			Nyctalus sp												1					1		
04/10/2018	18:38	13.75-18.5	Pip45			4	1	3	2	2	2				1				07:15	15	26	
			Pip55			1		3									2	06:32		6		
			Noctule			1														2		
			Nyctalus sp	18:55		1														3		
05/10/2018	18:35	8.25-17.5	Pip45	18:53	1	1	2	1											07:17	5	13	
			Pip55		1			1			1							00:19		3		
			Leisler					1												1		
			Nyctalus sp		1	1	2													4		
06/10/2018	18:33	2.5-9.0																	07:18	0	0	
07/10/2018	18:31	9.25-11.25																	07:20	0	0	

October

Day	Sunset	Min - max temp. °C	Species	First bat pass	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
12/09/2018	19:30	7.2-14.8	Pip45	19:51	1													06:38	1	2	0.47
			Serotine						1								23:57		1		
13/09/2018	19:27	11.5-14.6	Pip45	22:30				1										06:39	1	2	
			Myotis sp						1								23:16		1		
14/09/2018	19:25	11.0-15.6	Pip45	22:16				1										06:41	1	1	
15/09/2018	19:22	12.8-16.1	Pip45	20:30		1	5	2	4							3	06:11	06:43	15	17	
			Pip55					1											1		
			Pip sp						1										1		
16/09/2018	19:20	16.3-17.6	Pip45	22:05				2		1							00:37	06:44	3	4	
			Myotis sp					1											1		

Static Location 2

May

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
30/05/2018	21:17	14.5 - 15.1	Pip45		3	6		1	8		2	4		04:51	24		
			Noctule	21:34	3	2					7	16	04:30		28	53	
			Nyctalus sp.									1			1		
31/05/2018	21:18	16.3 - 18.9	Pip45						2		5	62		04:51	69		
			Noctule	21:39	2	1	1		1		5	4	04:25		14	87	
			Nyctalus sp.								3	1			4		
01/06/2018	21:20	17.4 - 20.1	Pip45								1	1		04:50	2		
			Noctule	21:52	1	1					8	15	04:21		25	45	6.27
			Nyctalus sp.			1	1				3	13			18		
02/06/2018	21:20	13.8 - 19.6	Pip45								6			04:50	6		
			Noctule	22:01		3					9	10	04:11		22	50	
			Nyctalus sp.			2					18	2			22		
03/06/2018	21:21	15.6 - 20.8			No bat were detected									04:48	0	0	

June

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
19/06/2018	21:32	17.3 - 20.3	Pip45					1	2		1		03:16	04:44	4	12	1.2
			PipSp					1							1		
			Noctule	21:49	4	3									7		
20/06/2018	21:33	11.5 - 15.0	Pip45	23:45			1						23:45	04:44	1	1	
21/06/2018	21:33	10.8 - 14.5	Pip45	22:45		1							22:45	04:44	1	1	
22/06/2018	21:33	11.8 - 18.1	Pip45	03:11							1		03:11	04:45	1	1	
23/06/2018	21:33	11.2 - 17.6	Pip45						1		25		03:57	04:45	26	27	
			Pip55	22:17		1									1		

July

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
10/07/2018	21:27	12.5 - 21.6	Pip45	22:34		3	5		7	1	2	2	04:09	04:58	20	23	5.47
			Pip55			1									1		
			PipSp				1				1				2		
11/07/2018	21:26	14.8 - 20.4	Pip45	23:55		3	3	5	5		5		03:17	04:59	21	23	
			PipSp					1	1						2		
12/07/2018	21:25	16.0 - 20.6	Pip45	23:19		1	1		2		5	5	04:23	05:00	14	25	
			Pip55							4	2				6		
			PipSp				1	1	2	1					5		
13/07/2018	21:24	15.0 - 20.3	Pip45			13	24	3	5	8	5			05:01	58	93	
			Pip55			2				1					3		
			PipSp	21:59	1		16	5	1	3	6		03:55		32		
14/07/2018	21:23	14.0 - 24.1	Pip45	22:00		12	10	4	1	3	3	3		05:02	36	41	
			Pip55			1	1								2		
			PipSp			2						1	04:09		3		

August

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
08/08/2018	20:46	12.8-15.3	Pip45		16		3			1		4			05:40	24	29	
			Pip55										3	05:06		3		
			Noctule	21:05	1											1		
			Myotis sp				1									1		
09/08/2018	20:44	11.3-17.0	Pip45	21:15	1	2							2	05:02	05:41	5	9	
			Pip55		1											1		
			Noctule				1									1		
			Leisler			1										1		
			Long-eared bat							1						1		
10/08/2018	20:43	7.0-14.3	Pip45	21:01	3									21:01	05:43	3	3	
11/08/2018	20:41	13.8-14.6	Pip45	21:34	1		1							23:55	05:45	2	2	
12/08/2018	20:39	14.6-16.0	Pip45		9	2	1	2	4	4	7	8	5	05:07	05:46	42	46	
			PipSp	21:04	1											1		
			Noctule								1					1		
			Nyctalus sp		1											1		
			Long-eared bat			1										1		

September

Day	Sunset	Min - max temp. °C	Species	First bat pass	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
12/09/2018	19:30	7.2 - 14.8	Pip45			6	2									21:49	06:38	8	10	0.76
			Nyctalus sp.	19:59	1													1		
			Myotis sp.			1												1		
13/09/2018	19:27	11.5 - 14.6	Pip45	20:18		3		2								22:30	06:39	5	5	
14/09/2018	19:25	11.0 - 15.6	Noctule	23:58					1							23:58	06:41	1	1	
15/09/2018	19:22	12.8 - 16.1	Pip45		7	2			1						1	05:38	06:43	11	20	
			Pip55		2				1									3		
			PipSp	19:50	4	1												5		
			Nyctalus sp.					1										1		
16/09/2018	19:20	16.3 - 17.6	Pip45										1			03:13	06:44	1	6	
			PipSp		1													1		
			Noctule	19:43	1	1	1				1							4		

October

Day	Sunset	Min - max temp. °C	Species	First bat pass	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
03/10/2018	18:40	13.0 - 18.0	Pip45	19:10		17	3		1					1			1	06:31	07:13	23	35	1.74
			PipSp			8														8		
			Noctule			3														3		
			Myotis sp.							1										1		
04/10/2018	18:38	13.75 - 18.5	Pip45			21								1	2	1	3	06:48	07:15	28	34	
			PipSp	19:07		5														5		
			Noctule			1														1		
05/10/2018	18:35	8.25 - 17.5	Pip45	18:58	2	19	3	2	1	3	1	2	1						07:17	34	38	
			Pip55						1								1	06:22		2		
			PipSp			1														1		
			Nyctalus sp.				1													1		
06/10/2018	18:33	2.5 - 9.0	*Nyctalus* sp.	19:29		1												19:22	07:18	1	1	
07/10/2018	18:31	9.25 - 11.25	Pip45	19:46		1												19:46	07:20	1	1	

Static Location 3

May

Day	Sunset	Min - max temp. °C	Species	First bat pass	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
30/05/2018	21:17	14.5 - 15.1	Pip45			36	2		1		1		12	04:22	04:51	52	56	3.52
			Pip55	21:39		4										4		
31/05/2018	21:18	16.3 - 18.9	Pip45			4							1	04:13	04:51	5	6	
			Pip55	21:49		1										1		
01/06/2018	21:20	17.4 - 20.1	Pip45			2	28	2			1	1	4	04:20	04:50	38	40	
			PipSp	20:52	1	1										2		
02/06/2018	21:20	13.8 - 19.6	Pip45	22:06			5				1	3	8		04:50	17	20	
			Pip55										1	04:10		1		
			PipSp										2			2		
03/06/2018	21:21	15.6 - 20.8	Pip45				2					5	1	04:01	04:48	8	10	
			PipSp	20:23	1							1				2		

June

Day	Sunset	Min - max temp. °C	Species	First bat pass	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
19/06/2018	21:32	17.3 - 20.3	Pip45										1	04:00	04:44	1	5	0.2
			Noctule	20:52	1	2	1									4		
20/06/2018	21:33	115. - 15.0			No bats were detected										04:44	0	0	
21/06/2018	21:33	10.8 - 14.5			No bats were detected										04:44	0	0	
22/06/2018	21:33	11.8 - 18.1	Noctule	22:17			1								04:45	1	2	
			Nyctalus sp.					1						23:17		1		
23/06/2018	21:33	11.2 - 17.6			No bats were detected										04:45	0	0	

July

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
10/07/2018	21:27	12.5 - 21.6	Pip45						3	1	1	2	04:10	04:58	7	12	
			PipSp	22:36		1					1	3			5		
11/07/2018	21:26	14.8 - 20.4	Pip45	00:17				1		3		1	04:12	04:59	5	7	
			PipSp							2					2		
12/07/2018	21:25	16.0 - 20.6	Pip45	22:39		1						4	04:29	0	5	5	2.67
13/07/2018	21:24	15.0 - 20.3	Pip45	00:29				1	5	22	4	21	04:24	05:01	53	55	
			PipSp						1			1			2		
14/07/2018	21:23	14.0 - 24.1	Pip45	22:01		4			1	6	7	2		05:02	20	21	
			PipSp									1	04:18		1		

August

Day	Sunset	Min - max temp. °C	Species	First bat pass	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
08/08/2018	20:46	12.8 - 15.3	Pip45	21:05		33	4							2		05:40	39	53	4.64
			Pip55			5								1	05:09		6		
			PipSp			6	2										8		
09/08/2018	20:44	11.3 - 17.0	Pip45	21:11		24	7	3	1				4	2	05:06	05:41	41	61	
			Pip55										4				4		
			PipSp			5	2						9				16		
10/08/2018	20:43	7.0 - 14.3	Pip45			12									21:47	05:43	12	16	
			Pip55	20:26	1	1											2		
			PipSp			2											2		
11/08/2018	20:41	13.8 - 14.6	Pip45	20:56	4	10	2	1								05:45	17	21	
			PipSp		1		2	1							23:22		4		
12/08/2018	20:39	14.6 - 16.0	Pip45	21:02		12	5	1	1					28	05:21	05:46	47	58	
			Pip55											1			1		
			PipSp			2	1		1					6			10		

September

Day	Sunset	Min - max temp. °C	Species	First bat pass	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
12/09/2018	19:30	7.2 - 14.8	Pip45	19:48	8	4	6	1										06:38	19	25	6.22
			PipSp		1	2													3		
			Nyctalus sp.							1									1		
			Myotis sp.		1						1						01:33		2		
13/09/2018	19:27	11.5 - 14.6	Pip45		4	3	3	1		3					2	3	06:09	06:39	19	28	
			Pip55	19:28	3	1									1				5		
			PipSp		1					3									4		
14/09/2018	19:25	11.0 - 15.6	Pip45		1	9	3	1								4	06:07	06:41	18	21	
			Pip55	19:25	1	1													2		
			Myotis sp.							1									1		
15/09/2018	19:22	12.8 - 16.1	Pip45	19:41	28	5	14	2	3	2			11	16	1	82	06:20	06:43	164	179	
			Pip55			1		1							1				3		
			PipSp		1											11			12		
16/09/2018	19:20	16.3 - 17.6	Pip45	19:45	19	1	3	7	31	1	4	1	1	1	13	4	06:21	06:44	86	89	
			Pip55						1	2									3		

October

Day	Sunset	Min - max temp. °C	Species	First bat pass	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	07:00 - 08:00	Last bat pass	Sunrise	Species Total (per night)
03/10/2018	18:40	13.0 - 18.0	Pip45			8	1		1		1		1	2		1	1		06:31	07:13	16
			Pip55	18:42	1																1
			PipSp											1							1
			Nyctalus sp.			1							1								2
			Myotis sp.									1		1	1						3
			Long-eared bat			1															1
04/10/2018	18:38	13.75 - 18.5	Pip45			7	5	4	2	9	21		1		1	8	1		06:45	07:15	59
			Pip55	18:17	1																1
			Noctule										1								1
			Myotis sp.			1					6	9	11	4	19	20	8				78
			Long-eared bat								1	3	1								5
05/10/2018	18:35	8.25 - 17.5	Pip45	19:02		6														07:17	6
			PipSp			1															1
			Myotis sp.									4	5	1					03:26		10
06/10/2018	18:33	2.5 - 9.0			No bats were detected															07:18	0

Static Location 4

May

Day	Sunset	Min - max temp. °C	Species	First bat pass	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
30/05/2018	21:17	14.5 - 15.1	Pip45		5		1	1	2	16	24				04:51	49	65	6.75
			Noctule	20:34	4					1	1	9		03:28		15		
			Nyctalus sp.									1				1		
31/05/2018	21:18	16.3 - 18.9	Pip45		13	6		1	1	4	4	1			04:51	30	66	
			Noctule	20:37	5	4		1			9	16		03:26		35		
			Nyctalus sp.		1											1		
01/06/2018	21:20	17.4 - 20.1	Pip45	20:58	5	4									04:50	9	35	
			Noctule		1	5	1				3	14		03:31		24		
			Nyctalus sp.									1				1		
			Myotis sp.				1									1		
02/06/2018	21:20	13.8 - 19.6	Pip45			2					1				04:50	3	37	
			Noctule	20:40	11	4					8	10		03:13		33		
			Nyctalus sp.								1					1		
03/06/2018	21:21	15.6 - 20.8	Pip45			2									04:48	2	50	
			Pip55				1									1		
			Noctule	20:48	7	9					12	14		03:15		42		
			Nyctalus sp.			2					1					3		
			Myotis sp.			2										2		

June

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
19/06/2018	21:32	17.3 - 20.3	Pip45	22:11		30	4	5	4	4	25		03:55	04:44	72	81	5.2
			PipSp			5	1	2	1						9		
20/06/2018	21:33	11.5 - 15.0	Pip45	22:06		63	5	6			6	1	04:00	04:44	81	101	
			Pip55			5									5		
			PipSp			10		2	3						15		
21/06/2018	21:33	10.8 - 14.5			No bats were detected									04:44	0	0	
22/06/2018	21:33	11.8 - 18.1			No bats were detected									04:45	0	0	
23/06/2018	21:33	11.2 - 17.6			No bats were detected									04:45	0	0	

July

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
10/07/2018	21:27	12.5 - 21.6	Pip45	22:08		21	60	40	42	15	31	11	04:10	04:58	220	252	35.79
			Pip55					1	4						5		
			PipSp			1	1	5	14		1	5			27		
11/07/2018	21:26	14.8 - 20.4	Pip45	22:12		13	6	26	129	229	83	38		04:59	524	571	
			Pip55						2	1		1			4		
			PipSp			1		3	1	1	2	35	04:16		43		
12/07/2018	21:25	16.0 - 20.6	Pip45	22:06		24	15	11	27	24	57	29		05:00	187	221	
			Pip55								2	3			5		
			PipSp				1	2	7		9	10	04:24		29		
13/07/2018	21:24	15.0 - 20.3	Pip45	22:02		22	3	20	29	1	32	8	04:05	05:01	115	153	
			Pip55			1			1		1				3		
			PipSp			12			1		22				35		
14/07/2018	21:23	14.0 - 24.1	Pip45	22:07		60	3	4	28	10	21	4	04:09	05:02	130	145	
			Pip55			2									2		
			PipSp			2	4	3	3	1					13		

August

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
08/08/2018	20:46	12.8 - 15.3	Pip45		117	12	2	1			1	1	4	05:01	05:40	138	158	13.04
			Pip55		1											1		
			PipSp		1	1										2		
			Noctule	21:05	2		6									8		
			Nyctalus sp.				1	1								2		
			Myotis sp.			3	2	1								6		
			Long-eared bat			1										1		
09/08/2018	20:44	11.3 - 17.0	Pip45		75	38		1						00:45	05:41	114	136	
			Pip55			1										1		
			PipSp		4	9	3	3								19		
			Noctule	21:14	1											1		
			Myotis sp.				1									1		
10/08/2018	20:43	7.0 - 14.3	Pip45	21:17	38									21:57	05:43	38	41	
			Pip55		1											1		
			PipSp		2											2		
11/08/2018	20:41	13.8 - 14.6	Pip45	21:22	9	3	1							23:41	05:45	13	14	
			Myotis sp.				1									1		
12/08/2018	20:39	14.6 - 16.0	Pip45		54	7	69	68	1	12	4	1			05:46	216	239	
			Pip55		5							3	5	05:08		13		
			PipSp	21:08	5			1								6		
			Noctule			1		1			1					3		
			Myotis sp.				1									1		

September

Day	Sunset	Min - max temp. °C	Species	First bat pass	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
12/09/2018	19:30	7.2 - 14.8			No bats were detected											06:38	0	0	
13/09/2018	19:27	11.5 - 14.6			No bats were detected											06:39	0	0	
14/09/2018	19:25	11.0 - 15.6			No bats were detected											06:41	0	0	0.22
15/09/2018	19:22	12.8 - 15.6	Pip45	20:13	1	2	1	1						4	05:52	06:43	9	9	
16/09/2018	19:20	16.3 - 17.6	Pip45	20:14	1		2								22:49	06:44	3	3	

October

Day	Sunset	Min - max temp. °C	Species	First bat pass	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
03/10/2018	18:40	13.0 - 18.0	Pip45			103	14	2	2			3	27	11	11	106	9	06:02	07:13	288	297	36.99
			Pip55			3										1				4		
			Noctule	19:07		2														2		
			Nyctalus sp.			1										1				2		
			Myotis sp.							1										1		
04/10/2018	18:38	13.75 - 18.5	Pip45	19:13		102	4	1					3	25	159	107	2	06:17	07:15	403	413	
			Pip55				1													1		
			Nyctalus sp.			1		1												2		
			Myotis sp.			1	1	2				2			1					7		
05/10/2018	18:35	8.25 - 17.5	Pip45		4	162	155	173	88	191	96	119	92	63	150			04:42	07:17	1293	1321	
			Pip55				4	4	3	3										14		
			NathPip			1														1		
			PipSp			1														1		
			Noctule	18:26	1	1														2		
			Nyctalus sp.			1														1		
			Myotis sp.			1	5		1	2										9		
06/10/2018	18:33	2.5 - 9.0	Pip45			8												19:40	07:18	8	9	
			Nyctalus sp.	19:25		1														1		
07/10/2018	18:31	9.25 - 11.25	Pip45	19:03		6					2		12	23	140	87			07:20	270	272	
			Myotis sp.													1		05:57		1		
			Long-eared bat													1				1		

Static Location 5

May

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
30/05/2018	21:17	14.5 - 15.1	Pip45	21:35	10	2	33	88	129	95	76	3	04:16	04:51	436	443	32.27
			Pip55						1	1					2		
			Myotis sp.			3					2				5		
31/05/2018	21:18	16.3 - 18.9	Pip45	21:44	8	27	37	12	53	30	51		03:48	04:51	218	221	
			Pip55			1			1	1					3		
01/06/2018	21:20	17.4 - 20.1	Pip45	21:43	3	25	60	22	2	33	37		03:50	04:50	182	184	
			Pip55			1				1					2		
02/06/2018	21:20	13.8 - 19.6	Pip45	21:46	8	3	2	27	35	39	26	1	04:09	04:50	141	144	
			Pip55			1	1								2		
			Pip sp.						1						1		
03/06/2018	21:21	15.6 - 20.8	Pip45			8	55	46	50	33	20		03:54	04:48	212	218	
			Pip55	21:51	1	1					1				3		
			Pip sp.							2					2		
			Myotis sp.						1						1		

June

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
19/06/2018	21:32	17.3 - 20.3	Pip45		14	47	77	89	128	77	71	23	04:10	04:44	526	595	56.11
			Pip sp.			1	1			2		1			5		
			Noctule	21:39	3	13						11			27		
			Nyctalus sp.			40									40		
			Leisler			1									1		
20/06/2018	21:33	11.5 - 15.0	Pip45	21:55	18	163	230	240	198	207	187	1	04:02	04:44	1244	1261	
			Pip55							1					1		
			Pip sp.			12	2			1	1				16		
21/06/2018	21:33	10.8 - 14.5	Pip45	22:01		12	5	3	6	9	11		03:40	04:44	46	46	
22/06/2018	21:33	11.8 - 18.1	Pip45	22:22		3	1	6	10	6	8			04:45	34	35	
			Pip55									1	04:00		1		
23/06/2018	21:33	11.2 - 17.6	Pip45	21:51	3	7	4	3	2	2	1			04:45	22	27	
			Pip sp.					1			4		03:40		5		

July

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
10/07/2018	21:27	12.5 - 21.6	Pip45			7		1			1		03:58	04:58	9	11	
			Pip55	21:55	1	1									2		
11/07/2018	21:26	14.8 - 20.4	Pip45	21:05	5	30		1	1	2			02:33	04:59	39	41	
			Noctule				2								2		
12/07/2018	21:25	16.0 - 20.6	Pip45	21:52	9	2	2		1		2		03:39	05:00	16	16	4.8
13/07/2018	21:24	15.0 - 20.3	Pip45	21:45	4	5	2			1	3	1	04:02	05:01	16	16	
14/07/2018	21:23	14.0 - 24.1	Pip45	21:46	25	60	1		2	1	1			05:02	90	96	
			Pip55		1	1						2	04:28		4		
			Pip sp.			1		1							2		

August

Day	Sunset	Min - max temp. °C	Species	First bat pass	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
08/08/2018	20:46	12.8 - 15.3	Pip45	20:53	8	63	6	7		1	2	1		18	05:25	05:40	106	131	11.96
			Pip55			3	1										4		
			PipSp		2	8	1	3	3			1					18		
			Noctule						1								1		
			Nyctalus sp.					1	1								2		
09/08/2018	20:44	11.3 - 17.0	Pip45	20:55	1	32	9	7	1							05:41	50	53	
			Pip55						1						00:55		1		
			PipSp			1											1		
			Myotis sp.				1										1		
10/08/2018	20:43	7.0 - 14.3	Pip45	20:59	1	24	1									05:43	26	29	
			Pip55			1											1		
			PipSp			1											1		
			Myotis sp.							1					01:17		1		
11/08/2018	20:41	13.8 - 14.6	Pip45	20:39	8	1	7	4	10	1		2		1	05:15	05:45	34	39	
			PipSp		1		2		1					1			5		
12/08/2018	20:39	14.6 - 16.0	Pip45	20:47	31	54	26	60	35	19	7	7	4	4	05:32	05:46	247	278	
			Pip55			2	1		1	2			2				8		
			PipSp			1	6		6	5	1			1			20		
			Noctule								1						1		
			Nyctalus sp.				1		1								2		

September

Day	Sunset	Min - max temp. °C	Species	First bat pass	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	07:00 - 08:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
12/09/2018	19:30	7.2 - 14.8	Pip45	19:38	12	14	14	1	3						1			05:27	06:38	45	68	9.15
			Pip55				2													2		
			PipSp			4	4		9											17		
			Nyctalus sp.								1				1					2		
			Myotis sp.						1	1										2		
13/09/2018	19:27	11.5 - 14.6	Pip45	19:40	9	9	5	2					2	6	8				06:39	41	54	
			Pip55			1							1							2		
			PipSp			5	4										1	07:54		10		
			Myotis sp.				1													1		
14/09/2018	19:25	11.0 - 15.6	Pip45	19:46	5	6	7	3	3	4	2	1	1		9			05:58	06:41	41	57	
			Pip55					1												1		
			PipSp			3	2	1	2	1	1									10		
			Noctule					1												1		
			Myotis sp.								1									1		
			Long-eared bat				1		2											3		
15/09/2018	19:22	12.8 - 16.1	Pip45	19:25	47	14	25	8	5	16	12	4	2	3	8	7		06:13	06:43	151	180	
			Pip55		1															1		
			PipSp				14	4	3	1			1		1					24		
			Noctule		1															1		
			Nyctalus sp.			1														1		
			Serotine					1												1		
			Myotis sp.							1										1		
16/09/2018	19:20	16.36 - 17.6	Pip45	19:29	32	14	10	16	6	18	20	3			2				06:44	121	144	
			Pip55		1			1			1									3		
			PipSp		2				1		4	3		1	2			05:43		13		
			Noctule			2														2		
			Nyctalus sp.						2		1									3		
			Myotis sp.			1														1		
			Long-eared bat								1									1		

October

Day	Sunset	Min - max temp. °C	Species	First bat pass	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
03/10/2018	18:40	13.0 - 18.0	Pip45	18:19	3	27	16	6		5	14	14	6			2	3	06:31	07:13	96	126	10.4
			Pip55				2				1		1							4		
			PipSp				10	3			2									15		
			Leisler			9														9		
			Nyctalus sp.						1											1		
			Myotis sp.												1					1		
04/10/2018	18:38	13.75 - 18.5	Pip45	18:54	6	77	9	3	14	2	17	16	22	12	7	21	23	06:56	07:15	229	256	
			Pip55			1														1		
			PipSp			5	8	2		1	4	1								21		
			Noctule										1							1		
			Leisler											1						1		
			Nyctalus sp.														1			1		
			Myotis sp.						1					1						2		
05/10/2018	18:35	8.25 - 17.5	Pip45		21	46	27	30	14	6	6	3							07:17	153	215	
			Pip55					2					2			1				5		
			PipSp				3	12	15	10	3	3	3			2		05:45		51		
			Noctule	18:25	1			1	2											4		
			Nyctalus sp.					1					1							2		
06/10/2018	18:33	2.5 - 9.0	Pip45	19:01		2	3	1											07:18	6	19	
			Pip55								1									1		
			NathPip										1							1		
			PipSp				7													7		
			Noctule														1	06:56		1		
			Myotis sp.			1	1		1											3		
07/10/2018	18:31	9.25 - 11.25	Pip45		1	11			2		1		2	2	1	3			07:20	23	34	
			Pip55			2														2		
			NathPip				2													2		
			PipSp			1								2						3		
			Noctule						1											1		
			Leisler	18:47	1															1		
			Nyctalus sp.													1		05:58		1		
			Myotis sp.											1						1		

Static Location 6

May

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
30/05/2018	21:17	14.5 - 15.1	Pip45					1			1		03:07	04:51	2	15	
			Noctule	21:32	10	3									13		
31/05/2018	21:18	16.3 - 18.9	Pip45					1	1		1			04:51	3	9	
			Noctule	21:46	1					1					2		
			Nyctalus sp.		1							1	04:30		2		
			Myotis sp.					1			1				2		
01/06/2018	21:20	17.4 - 20.1	Noctule	22:08		1						1	04:10	04:50	2		1.17
			Nyctalus sp.						1						1		
			Myotis sp.							1					1		
02/06/2018	21:20	13.8 - 19.6	Pip45	21:57	1		1		1	4				04:50	7	9	
			Noctule			1						1	04:10		2		
03/06/2018	21:21	15.6 - 20.8	Pip45	22:29		1	1	1		1				04:48	4	7	
			Leisler				1								1		
			Myotis sp.					1		1			02:58		2		

June

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
19/06/2018	21:32	17.3 - 20.3	Pip45				1	1						04:44	2	8	0.46
			Noctule	22:07		2			1			1	04:00		4		
			Leisler					2							2		
20/06/2018	21:33	11.5 - 15.0	Pip45	23:46			1						23:46	04:44	1	1	
21/06/2018	21:33	10.8 - 14.5			No bats were detected									04:44	0	0	
22/06/2018	21:33	11.8 - 18.1	Pip45			1	1						23:49	04:45	2	4	
			PipSp	22:09		2									2		
23/06/2018	21:33	11.2 - 17.6	Pip45	23:22			2			1			02:47	04:45	3	3	

July

Day	Sunset	Min - max temp. °C	Species	First bat pass	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
10/07/2018	21:27	12.5 - 21.6	Pip45				4	8	3	6	45			02:50	04:58	66	71	3.6
			Myotis sp.	21:20		1		1	1	1	1					5		
11/07/2018	21:26	14.8 - 20.4	Pip45					4	4	10	2			02:48	04:59	20	30	
			Pip55							1						1		
			Pip sp.							1						1		
			Noctule								2					1		
			Nyctalus sp.					1								2		
			Myotis sp.	21:10		1		1	2	1						5		
12/07/2018	21:25	16.0 - 20.6	Pip45	20:50	1										05:00	1	7	
			Pip55						1							1		
			Noctule			1	1						1	04:39		2		
			Nyctalus sp.								1					2		
			Myotis sp.				1									1		
13/07/2018	21:24	15.0 - 20.3	Pip45						1		3			02:52	05:01	4	14	
			Noctule			4			2							6		
			Nyctalus sp.	21:17		1										1		
			Myotis sp.						2		1					3		
14/07/2018	21:23	14.0 - 24.1	Pip45						3	1	4			02:51	05:02	8	13	
			Pip sp.	20:54	1											1		
			Noctule			1										1		
			Nyctalus sp.				1									1		
			Myotis sp.					1		1						2		

August

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
08/08/2018	20:46	12.8 - 15.3	Pip45		17	8	3	4							05:40	32	55	4.51
			Pip55		1				1		2	2				6		
			Noctule	21:15	2			1					1	05:54		4		
			Nyctalus sp.		2											2		
			Myotis sp.			1		1	1		1	7				11		
09/08/2018	20:44	11.3 - 17.0	Pip45		9	2	1								05:41	12	19	
			Pip55		2				1			2	1	05:03		6		
			Noctule	21:14	1											1		
10/08/2018	20:43	7.0 - 14.3	Pip45	21:23	2										05:43	2	3	
			Pip55							1				02:23		1		
11/08/2018	20:41	13.8 - 14.6	Pip45	21:33	8	5	7							23:44	05:45	20	21	
			Noctule			1										1		
12/08/2018	20:39	14.6 - 16.0	Pip45	21:11	17	33	1	4	8	6	7	3			05:46	79	105	
			Pip55		1		1					3				5		
			Noctule		2	6		1			1		4	05:36		14		
			Nyctalus sp.			4		1								5		
			Myotis sp.							1						1		
			Long-eared bat				1									1		

September

Day	Sunset	Min - max temp. °C	Species	First bat pass	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
12/09/2018	19:30	7.2 - 14.8	Pip45	19:58	3	9	2	1										06:38	15	23	21.6
			Pip55			1		1											2		
			PipSp		1			1											2		
			Noctule			1													1		
			Myotis sp.					1					2				03:49		3		
13/09/2018	19:27	11.5 - 14.6	Pip45	23:37					1								23:37	06:39	1	1	
14/09/2018	19:25	11.0 - 15.6	Pip45	20:00		5	1			1							00:38	06:41	7	7	
15/09/2018	19:22	12.8 - 16.1	Pip45	19:35	8	14	3								1		05:50	06:43	26	41	
			Pip55		1		1	1					4		1				8		
			Nyctalus sp.			2													2		
			Long-eared bat				2	1	2										5		
16/09/2018	19:20	16.3 - 17.6	Pip45	19:45	17	213	226	157	158	169	151	9	1		1	4	06:13	06:44	1106	1116	
			Pip55						1		4								5		
			Nyctalus sp.			1		1	2										4		
			Serotine										1						1		

October

Day	Sunset	Min - max temp. °C	Species	First bat pass	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
03/10/2018	18:40	13.0 - 18.0	Pip45	19:11		5	2			1	2	12				1			07:13	23	35	5.39
			Pip55							2						1	5	06:34		8		
			Noctule			1														1		
			Leisler			1			1											2		
			Myotis sp.													1				1		
04/10/2018	18:38	13.75 - 18.5	Pip45			4						1	10	4	14				07:15	33	38	
			Pip55			1											2	06:38		3		
			Noctule			1														1		
			Myotis sp.	19:08		1														1		
05/10/2018	18:35	8.25 - 17.5	Pip45	18:59	1	29	120	76	9	4	1	1							07:17	241	261	
			Pip55			1	11	3	2	1					1	1		05:47		20		
06/10/2018	18:33	2.5 - 9.0			No bats were detected														07:18	0	0	
07/10/2018	18:31	9.25 - 11.25	Pip45	19:22		2	1											20:19	07:20	3	3	

Static Location 7

May

No bats recorded

June

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
19/06/2018	21:32	17.3 - 20.3	Pip45			96	57	24	34	11	61	3	04:02	04:44	286	296	15.74
			Pip55	22:12		1	1	1							3		
			Pip sp.				2	1			1				4		
			Myotis sp.				1	2							3		
20/06/2018	21:33	11.5 - 15.0	Pip45	22:10		28	21	7	1					04:44	57	59	
			Pip sp.						1				01:16		1		
			Leisler			1									1		
21/06/2018	21:33	10.8 - 14.5	Pip45			1	3			1			02:52	04:44	5	8	
			Pip sp.			1									1		
			Leisler	22:12		1									1		
			Myotis sp.			1									1		
22/06/2018	21:33	11.8 - 18.1	Pip45	22:24		14	20	22	8	5	2		03:16	04:45	71	74	
			Pip sp.			1	1	1							3		
23/06/2018	21:33	11.2 - 17.6	Pip45	22:14		34	51	13	2	7	4		03:43	04:45	111	114	
			Pip55					1							1		
			Myotis sp.				1	1							2		

July

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
10/07/2018	21:27	12.5 - 21.6	Pip45	22:30		7	14	6	9	12	18	1	04:02	04:58	67	72	10.27
			Pip55			1		1							2		
			Pip sp.							1	2				3		
11/07/2018	21:26	14.8 - 20.4	Pip45	22:30		12	6	6	11	14	6	3	04:05	04:59	58	62	
			Pip55				1								1		
			Pip sp.						1	2					3		
12/07/2018	21:25	16.0 - 20.6	Pip45	22:11		16	10	7	11	4	8	15	04:15	05:00	71	97	
			Pip55			4				2					6		
			Pip sp.			13	1				4	2			20		
13/07/2018	21:24	15.0 - 20.3	Pip45			11	21	7	12	11	6	4	04:10	05:01	72	81	
			Pip55	22:04		2					4	1			7		
			Pip sp.								1	1			2		
14/07/2018	21:23	14.0 - 24.1	Pip45			26	17	9	4	2	3			05:02	61	73	
			Pip55			3									3		
			Pip sp.	22:22		1		1		4	3		03:58		9		

August

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
08/08/2018	20:46	12.8 - 15.3	Pip45		31	5				1	1	2		04:46	05:40	40	64	10.24
			Pip55		9	2										11		
			PipSp		2											2		
			Noctule		2											2		
			Leisler		1											1		
			Nyctalus sp.	21:26	3	1	1	1	1							7		
			Myotis sp.		1											1		
09/08/2018	20:44	11.3 - 17.0	Pip45		7	18						1		04:10	05:41	26	32	
			Pip55		2	1										3		
			PipSp		2											2		
			Noctule	21:12	1											1		
10/08/2018	20:43	7.0 - 14.3	Pip45		1										05:43	1	19	
			Pip55	21:15	2		9	3								14		
			PipSp							1				02:10		1		
			Leisler					1								1		
			Long-eared bat			1	1									2		
11/08/2018	20:41	13.8 - 14.6	Pip45	21:23	31	95	5	1						00:40	05:45	132	139	
			Pip55		2	1	1									4		
			PipSp		2											2		
			Nyctalus sp.			1										1		
12/08/2018	20:39	14.6 - 16.0	Pip45		77	58	2	3	1	18	10	6			05:46	175	207	
			Pip55		7		1	1	1	2						12		
			PipSp					1								1		
			Noctule	21:06	3	2			1		1		1	05:24		8		
			Leisler			1										1		
			Nyctalus sp.		1			1		1		1				4		
			Myotis sp.		1											1		
			Long-eared bat					1	1		2	1				5		

September

Day	Sunset	Min - max temp. °C	Species	First bat pass	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
12/09/2018	19:30	7.2 - 14.8	Pip45			6	2	2										06:38	10	39	7.51
			Pip55	19:52	7	13	4												24		
			NathPip						2										2		
			Noctule			1	1												2		
			Nyctalus sp.								1						01:57		1		
13/09/2018	19:27	11.5 - 14.6	Pip45			7	3	2	2					1				06:39	15	48	
			Pip55	22:00		29		2							1		05:38		32		
			Nyctalus sp.					1											1		
14/09/2018	19:25	11.0 - 15.6	Pip45			19	7	1										06:41	27	42	
			Pip55	19:59	2	4	2	1		1									10		
			NathPip								1						01:18		1		
			PipSp			1													1		
			Nyctalus sp.					1											1		
			Myotis sp.				1												1		
			Long-eared bat				1												1		
15/09/2018	19:22	12.8 - 16.1	Pip45	19:50	11	47	8	2		2				1				06:43	71	86	
			Pip55			4		3	2				1			1	06:08		11		
			Nyctalus sp.			2		1											3		
			Myotis sp.						1										1		
16/09/2018	19:20	16.3 - 17.6	Pip45		3	66	36	2	20	29	12	1						06:44	169	194	
			Pip55			3				5	1								9		
			NathPip						1										1		
			PipSp					1		2		1							4		
			Noctule			2		1											3		
			Nyctalus sp.	19:48	2	1		1					1				03:20		5		
			Myotis sp.					1											1		
			Long-eared bat			1				1									2		

October

Day	Sunset	Min - max temp. °C	Species	First bat pass	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
03/10/2018	18:40	13.0 - 18.0	Pip45	19:14		18	7	3	1			2		1		1			07:13	33	50	2.03
			Pip55			2		1	1		1		1	1			2	06:38		9		
			Myotis sp.										1							1		
			Long-eared bat			1	1	1				1			1		2			7		
04/10/2018	18:38	13.75 - 18.5	Pip45			8	3			1	1			3	1	1		05:01	07:15	18	30	
			Pip55			2	1		1		1									5		
			Pip Sp				1													1		
			Noctule	18:48	1															1		
			Leisler						1											1		
			Myotis sp.				1													1		
			Long-eared bat			2							1							3		
05/10/2018	18:35	8.25 - 17.5	Pip45	19:01		11	15	5	4	1	1								07:17	37	41	
			Pip55				1													1		
			Pip Sp			1														1		
			Long-eared bat			1						1						01:06		2		
06/10/2018	18:33	2.5 - 9.0			No bats were detected														07:18	0	0	
07/10/2018	18:31	9.25 - 11.25	Pip45			1							1						07:20	2	6	
			Pip55	18:47	1			1												1		
			Long-eared bat			1					1					1		05:14		3		

Static Location 8

May

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
30/05/2018	21:17	14.5 - 15.1	Pip45		1	28	22	15	2		6	1	04:11	04:51	75	97	
			Pip55							8					8		
			Noctule	21:34	5			1	2		1				9		
			Leisler					2							2		
			Myotis Sp.					3							3		
31/05/2018	21:18	16.3 - 18.9	Pip45	22:36		19	16	12	19	2	2			04:51	70	85	
			Pip55						3						3		
			Leisler					1				1	04:03		2		
			Myotis Sp.			6	4								10		
01/06/2018	21:20	17.4 - 20.1	Pip45	21:48	1	66	21	9	5	2	1			04:50	105	128	11.76
			Pip55			1	1	2	3	2	2				11		
			PipSp						1	1					2		
			Noctule									1	04:07		1		
			Nyctalus sp.			3				3					6		
			Myotis sp.						1		2				3		
02/06/2018	21:20	13.8 - 19.6	Pip45	22:02		19	5	2		2				04:50	28	39	
			Pip55			3	1								4		
			Noctule				1				1				2		
			Nyctalus sp.					1			1		03:41		2		
			Myotis sp.					1	2						3		
03/06/2018	21:21	15.6 - 20.8	Pip45			14	38	19	10	2	1		03:11	04:48	84	92	
			Pip55			3									3		
			PipSp				1								1		
			Noctule	21:52	1										1		
			Myotis sp.				3								3		

June

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
19/06/2018	21:32	17.3 - 20.3	Pip45	22:18		24	21	33	3	6	11		03:34	04:44	98	98	3.11
20/06/2018	21:33	11.5 - 15.0			No bats were detected									04:44	0	0	
21/06/2018	21:33	10.8 - 14.5			No bats were detected									04:44	0	0	
22/06/2018	21:33	11.8 - 18.1	Pip45	22:54		2							22:57	04:45	2	2	
23/06/2018	21:33	11.2 - 17.6	Pip45	23:55			1	1			7		03:47	04:45	9	9	

July

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
10/07/2018	21:27	12.5 - 21.6	Pip45	22:22		11	35	140	116	39	20	2		04:58	363	418	64.13
			Pip55							1					1		
			Pip sp.						4						4		
			Noctule						1			2	04:06		3		
			Nyctalus sp.				1	15	13	9					37		
			Leisler					2	1	5	1				9		
11/07/2018	21:26	14.8 - 20.4	Pip45	22:35		17	99	170	68	51	1			04:58	406	498	
			Noctule			1			1			3	04:10		3		
			Leisler					5	3	1	9				18		
			Serotine				1		2	1					4		
			Nyctalus sp.			1	1	3	33	11	17				66		
12/07/2018	21:25	16.0 - 20.6	Pip45	22:27		1	35	160	216	90	22	8		05:00	532	557	
			Pip sp.						2						2		
			Noctule							1		1	04:59		2		
			Leisler			1		1			6				8		
			Nyctalus sp.			3		1			9				13		
13/07/2018	21:24	15.0 - 20.3	Pip45	22:08		39	17	112	46	31	41	20	04:07	05:01	306	315	
			Pip55			1									1		
			Noctule				1								1		
			Nyctalus sp.			1	1	2	1						5		
			Leisler			2									2		
14/07/2018	21:23	14.0 - 24.1	Pip45	22:23		76	133	80	110	143	56	18		05:02	616	617	
			Noctule									1	04:07		1		

August

Day	Sunset	Min - max temp. °C	Species	First bat pass	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
08/08/2018	20:46	12.8 - 15.3	Pip45	21:20	64	10	2				1			05:40	77	88	15.71
			Pip55						1		2		03:48		3		
			PipSp			1									1		
			Noctule							1					1		
			Leisler		1		1								2		
			Nyctalus sp.		1		1		2						4		
09/08/2018	20:44	11.3 - 17.0	Pip45			2	3			1				05:41	6	20	
			Pip55	21:27	1		3	2							6		
			Nyctalus sp.					1	1	5		1	04:36		8		
10/08/2018	20:43	7.0 - 14.3	Pip45											05:43	0	4	
			PipSp			1									1		
			Noctule	21:38	1										1		
			Nyctalus sp.				1				1		03:53		2		
11/08/2018	20:41	13.8 - 14.6	Pip45	21:25	19			3			2		03:59	05:45	24	72	
			Pip55		3	6	28								37		
			PipSp			1	2								3		
			Leisler				1								1		
			Nyctalus sp.			4	3								7		
12/08/2018	20:39	14.6 - 16.0	Pip45		42	129	88	121	12	3	13			05:46	408	523	
			Pip55		3		3	2	5	2	1				16		
			Noctule	21:02	3					1		1			5		
			Nyctalus sp.		1	18	28	35	9	1	1	1	04:12		94		

September

Day	Sunset	Min - max temp. °C	Species	First bat pass	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
12/09/2018	19:30	7.2 - 14.8	Pip45			3	2	3										06:38	8	19	23.96
			Pip55	19:55	1	4													5		
			NathPip				1												1		
			PipSp						1								23:38		1		
			Nyctalus sp.				1												1		
			Myotis sp.				2		1										3		
13/09/2018	19:27	11.5 - 14.6	Pip45				1	1					1	1				06:39	4	21	
			Pip55			1				1	1				2	1	06:52		6		
			Nyctalus sp.	19:59	1	1	2		1		1			1					7		
			Myotis sp.			1		1			2								4		
14/09/2018	19:25	11.0 - 15.6	Pip45	19:51	4	6	3	1	2		2	1	1					06:41	20	30	
			Pip55		1			1	1			1							4		
			PipSp					1											1		
			Nyctalus sp.			1	1							1			04:13		3		
			Myotis sp.							2									2		
15/09/2018	19:22	12.8 - 16.1	Pip45	19:00	3	28	31	41	65	39	14		11	44	16		05:42	06:43	292	584	
			Pip55		1	1	5	3		1	2		2	1	3				19		
			NathPip							1									1		
			PipSp				1												1		
			Noctule					1	1										2		
			Leisler			1													1		
			Nyctalus sp.			13	11	2			45	39	18						128		
			Myotis sp.				12	37	38	13	8	11	16	4					139		
			Long-eared bat								1								1		
16/09/2018	19:20	16.3 - 17.6	Pip45	19:34	7	70	112	91	98	53	41	4	10					06:44	486	661	
			Pip55		2	3		1		5	6	2				2	06:10		21		
			PipSp					1	1										2		
			Noctule							1									1		
			Leisler			2					1								3		
			Nyctalus sp.			4	1	11	2		2	12	11						43		
			Myotis sp.			9	24	48	17	7									105		

October

Day	Sunset	Min - max temp. °C	Species	First bat pass	18:00 - 19:00	19:00 - 20:00	20:00 - 21:00	21:00 - 22:00	22:00 - 23:00	23:00 - 00:00	00:00 - 01:00	01:00 - 02:00	02:00 - 03:00	03:00 - 04:00	04:00 - 05:00	05:00 - 06:00	06:00 - 07:00	07:00 - 08:00	Last bat pass	Sunrise	Species Total (per night)	Bat Total (per night)	BAI per hour
03/10/2018	18:40	13.0 - 18.0	Pip45	19:11		51	18				2	3			9	3				07:13	86	150	
			Pip55			3		2			4	4	6	8	5	12	8		06:34		52		
			PipSp			2	1	2								2	1				8		
			Myotis sp.					3								1					4		
04/10/2018	18:38	13.75 - 18.5	Pip45	19:15		11	11	16	3	4		16	13	25	9	11	4			07:15	123	203	6.85
			Pip55				3		2	5	2	1	1	10	21	14	4		06:32		63		
			PipSp			2						3	3	5		1	2				16		
			Myotis sp.			1															1		
05/10/2018	18:35	8.25 - 17.5	Pip45	18:57	1	7	2	2		1	10									07:17	22	27	
			Pip55					1					1								2		
			PipSp				1											1	07:32		2		
			Myotis sp.			1															1		
06/10/2018	18:33	2.5 - 9.0			No bats were detected															07:18	0	0	
07/10/2018	18:31	9.25 - 11.25	Pip45			1	2			1			3		1	1				07:20	9	48	
			Pip55	18:51	1	2				1		11	7	7	2	5	1		06:24		36		
			PipSp					1						1							2		
			Myotis sp.			1															1		

Pip45 (Common pipistrelle); Pip55 (Soprano pipistrelle); PipSp (call between common pipistrelle and soprano pipistrelle); NathPip (Nathusius pipistrelle); Noctule (Noctule bat); Leisler (Leisler bat); Serotine (Serotine bat); Nyctalus sp. (either Leisler or Noctule bat); Nyc/Epi (either Leisler, Noctule or Serotine bat); Myotis sp. (Myotis species); Long-eared bat (either grey long-eared or brown long-eared bat)

Annex J. Associated Bat Reports

HIGHWAYS ENGLAND

M42 JUNCTION 6 IMPROVEMENT

PRELIMINARY BAT ASSESSMENT

MAY 08, 2017

CONFIDENTIAL

M42 JUNCTION 6 IMPROVEMENT

PRELIMINARY BAT ASSESSMENT

FINAL
CONFIDENTIAL

PROJECT NO.: 62241010
DATE: MAY 2017

WSP
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QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks				
Date	08.05.17			
Prepared by	Sarah Rochelle			
Signature				
Checked by	Lucy Elliott			
Signature				
Authorised by	Andy Bascombe			
Signature				
Project number	62241010			
Report number				
File reference				

SIGNATURES

PREPARED BY

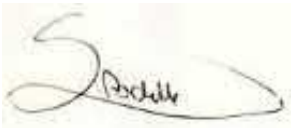

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TABLE OF CONTENTS

TABLES

1 INTRODUCTION

1.1 BACKGROUND

WSP (formally Mouchel) was commissioned by Highways England to undertake a preliminary assessment of land within and adjacent to the proposed M42 Junction 6 Improvement Scheme to determine if the habitats present are likely to be used by bats.

This report presents the results of the preliminary assessment undertaken in April 2017 and makes recommendations for further survey work as appropriate.

1.2 SCHEME LOCATION

At the time of writing, three possible route options (Options 1, 2 and 3) are being considered. All three options are predominantly located to the south west of Junction 6 close to the village of Bickenhill, although all route options also include improvements to the junction itself. The land within the proposed scheme is predominantly used for agriculture and pasture grazing, although the scheme is also close to the National Exhibition Centre (NEC), Birmingham International Railway Station and Birmingham Airport as well as proposed developments including High Speed 2 (HS2) route and terminal, a Motorway Service Area (MSA) and UK Central development.

1.3 STUDY AREA

A study area extending up to 1km from the proposed route was defined, with field surveys focussing on the proposed routes and immediately adjacent habitats. Given the large number of trees within the study area, only those which are likely to be directly affected as a result of the proposed scheme were surveyed for their suitability for roosting bats at this stage.

1.4 STUDY AIMS AND OBJECTIVES

The study sought to determine whether features suitable for roosting and/or foraging and commuting bats are present within or adjacent to the proposed scheme. To achieve this, field surveys were undertaken across the study area to identify possible roosting, foraging and commuting features.

The results of the surveys will be used to inform the need for any future surveys which may be required in order to fully assess the impact of the scheme on bats.

2 METHODOLOGY

2.1 PRELIMINARY ASSESSMENT

2.1.1 ROOSTS

An assessment of the suitability of structures and trees within the study area to support roosting bats was carried out in April 2017. Given the large number of trees within the study area, only those likely to be directly affected as a result of either of the three route options were assessed at this stage.

The methodology for the assessment of structures and trees for their suitability to support bat roosts follows the Bat Conservation Trust's (BCT) Good Practice Guidelines. Surveyors assessed each structure and tree from the ground, using binoculars as required. The location of the structure or tree, along with any potential roosting features (PRFs) were recorded and the structure or tree was described as being of either negligible, low, moderate or high suitability for roosting bats. A summary of each of these categories is provided in Table 1.

Table 2.1 Categories of suitability of structures and trees for bat roosts, summarised from Table 4.1 of the BCT's Good Practice Guidelines.

SUITABILITY	DESCRIPTION
Negligible	Negligible features likely to be used by roosting bats.
Low	A structure or tree with limited roosting potential that could be used by individual bats opportunistically; or a tree of a size and age where PRFs may be present, but have not been observed from the ground. Unlikely to be used regularly or by large numbers of bats
Moderate	A structure or tree with one or more PRFs which may be used regularly by bats, but are unlikely to support roosts of high conservation status.
High	A structure or tree with multiple PRFs suitable for large numbers of bats on a regular basis for longer periods of time.

2.1.2 COMMUTING AND FORAGING HABITATS

An assessment of the suitability of habitats located within the study area for foraging and commuting bats was also carried out in April 2017. Again, the methodology for the assessment of habitats followed BCT's Good Practice Guidelines. Any likely foraging and/or commuting habitats were recorded and described as being of either negligible, low, moderate or high suitability for foraging and commuting bats. A summary of each of these categories is provided in Table 2.

Table 2.2 Categories of suitability of habitats for foraging and commuting bats, summarised from Table 4.1 of the BCT's Good Practice Guidelines.

SUITABILITY	DESCRIPTION
Negligible	Negligible features likely to be used by commuting or foraging bats.

Low	Habitats which may be used by small numbers of foraging and commuting bats, but poorly connected within the wider landscape.
Moderate	Continuous habitat connected to the wider landscape that could be used by foraging and commuting bats.
High	Continuous, high quality habitat that is well connected and likely to be used regularly by foraging and commuting bats. Close to and connected to known roosts.

2.2 LIMITATIONS

At the time of survey, access was not available to all land within the study area. An assessment of the habitats present was undertaken from adjacent land where possible to determine the likelihood of suitable habitat for bats being present, although a detailed assessment could not be undertaken at this stage. Surveys of areas unable to be accessed will be undertaken at a later date once access becomes available to ensure that an assessment of the whole study area has been undertaken.

3 RESULTS

3.1 ROOSTS

3.1.1 TREES

Trees in proximity to each of the proposed route options were assessed for their suitability to support roosting bats. Only trees likely to be directly affected as a result of each route option were surveyed at this stage. 92 trees/small groups of trees and 3 areas of woodland were found to have features suitable for roosting bats. These are described in Appendix A and shown in Figure 1. 16 of these are of high suitability, 41 of these are of moderate suitability and 32 are of low suitability for roosting bats. 3 trees could not be directly assessed due to access restrictions.

3.1.2 STRUCTURES

In addition to the trees listed above, both residential and commercial buildings are present within the study area, some of which are located adjacent to the proposed routes. In addition, two variants of Option 1 will likely result in the loss of two residential properties on Catherine De Barnes Lane. Both properties are of a construction type which appear to offer opportunities for roosting bats.

3.2 COMMUTING AND FORAGING HABITATS

A summary of the habitats present within the study area and an assessment of their suitability for foraging and commuting bats is provided below:

3.2.1 LAND SOUTH OF M42 JUNCTION 6

The land to the west of Catherine De Barnes Lane comprises arable and grassland fields which are connected to the wider area by a network of treelines and hedgerows. These features provide a continuous corridor of vegetation which may be used by commuting bats, with grassland and woodland habitats offering opportunities for foraging. Accordingly, this area is of moderate suitability for foraging and commuting bats.

The land to the east of Catherine De Barnes Lane and to the west of the M42 also comprises arable and grassland habitats. An area of ancient woodland is present at the junction of Catherine De Barnes Lane and Solihull Road and this is connected to smaller parcels of woodland by hedgerows and treelines. Two watercourses are also present. The mosaic of habitats within Bickenhill Meadows Site of Special Scientific Interest (SSSI) including neutral and marshy grassland, woodland and a pond is also likely to be used by foraging bats. This area is of moderate suitability for foraging and commuting bats.

The land to the east of the M42 is similar to the wider area, comprising improved grassland and arable habitats with hedgerows, treelines and waterbodies. Accordingly, these habitats are of moderate suitability for foraging and commuting bats.

3.2.2 LAND NORTH OF M42 JUNCTION 6

Habitats located to the north-east of Junction 6 include improved grassland, arable fields and waterbodies which provide opportunities for foraging bats. These habitats are connected by hedgerows and treelines providing suitable commuting routes for bats. These habitats are of moderate suitability for foraging and commuting bats.

Habitats to the north-west of Junction 6 are dominated by buildings and hard-standing associated with the NEC and Birmingham International railway station. These habitats are of negligible suitability for foraging and commuting bats.

4 RECOMMENDATIONS

4.1 BAT ROOSTING OPPORTUNITIES

Trees, woodlands and structures with features suitable for roosting bats have been recorded within the study area. In order to determine if these features are being used by bats, it is recommended that further survey work is undertaken. Table 3 shows the recommended timings and minimum number of survey visits for presence/absence surveys to give confidence in a negative result when surveying structures. The same is also recommended when surveying trees, however this survey effort is unlikely to give confidence in a negative result. This is due to a number of limitations when undertaking emergence/re-entry surveys of trees, including quiet echolocation calls of some tree-dwelling species and difficulty in observing features which may be high off the ground or obscured by foliage. It is therefore also recommended that where possible, climbed inspection surveys are undertaken in conjunction with emergence/re-entry surveys.

Table 4.1 Recommended minimum number of survey visits for emergence/re-entry surveys to give confidence in a negative result – taken from Tables 7.1 and 7.3 of the BCT's Good Practice Guidelines.

SUITABILITY	SURVEY TIMINGS	SURVEY EFFORT
Low	Structures: May to August Trees: No further surveys required*	Structures: One dusk emergence or one dawn re-entry survey Trees: No further surveys required*
Moderate	May to September with at least one of the surveys between May and August.	Two separate survey visits. One dusk emergence and a separate dawn re-entry survey.
High	May to September with at least two of the surveys between May and August.	Three separate survey visits. At least one dusk emergence and a separate dawn re-entry survey. The third visit could be dusk or dawn.

(as confidence in a negative result is not possible for trees due to limitations outlined above)*

This assessment has focussed on roosting features which are likely to be directly lost as a result of the proposed route options. It is recommended that consideration is also given to the possible presence of roosts within adjacent habitats. It is recommended that walked transect surveys are undertaken (see below) to determine how bats are using the landscape. If suitable, these surveys can be combined with back-tracking surveys, the aim of which is to locate likely roost locations by observing the time and direction of flight of commuting bats at sunset and sunrise. Should these surveys record roosting bats within the close vicinity of either proposed route option, an assessment of the likely impacts of the scheme on these bats and their roosts can be made.

4.2 BAT FORAGING AND WIDER CONTEXT

Suitable foraging and commuting habitat is present across the study area. It is recommended that further survey work, including walked transects and/or static detector surveys are undertaken to record levels of bat activity and determine how bats are using the habitats within the study area so that the effects of the proposals on foraging and commuting bats can be assessed. Table 4 shows the recommended timings and number of surveys to achieve a reasonable survey effort.

Table 4.2 Recommended number of activity surveys to achieve a reasonable survey effort in relation to habitat suitability – taken from Table 8.3 of the BCT's Good Practice Guidelines.

SUITABILITY	SURVEY EFFORT	
	TRANSECT SURVEYS	STATIC DETECTOR SURVEYS
Low	One survey visit per season** in appropriate weather conditions. Further surveys may be required if these survey visits reveal higher levels of bat activity than predicted by habitat alone.	One location per transect, data to be collected on five consecutive nights per season** in appropriate weather conditions for bats.
Moderate	One survey visit per month (April to October) in appropriate weather conditions for bats. At least one of the surveys should comprise dusk and pre-dawn (or dusk-dawn) within one 24-hour period.	Two locations per transect, data to be collected on five consecutive nights per month (April to October) in appropriate weather conditions for bats.
High	Up to two survey visits per month (April to October) in appropriate weather conditions for bats. At least one of the surveys should comprise dusk ad pre-dawn (or dusk-dawn) within one 24-hour period.	Three locations per transect, data to be collected on five consecutive nights per month (April to October) in appropriate weather conditions for bats.

(** *spring* – April/May, summer – June/July/August, autumn – September/October)

BIBLIOGRAPHY

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

5 FIGURES

5.1 FIGURE 1: PRELIMINARY BAT ASSESSMENT RESULTS

APPENDIX

A TREES WITH POTENTIAL ROOSTING FEATURES

TREE NUMBER	SPECIES	LOCATION		POTENTIAL ROOST FEATURES (PRFS)	BAT ROOST POTENTIAL
		N	E		
1	Oak	419143	280692	Knot holes, missing bark, cracks, broken branches	High
2	Oak	419260	280932	Broken branches, missing bark, knot holes in dead branches	Moderate
3	Oak	419320	280887	Knot holes in both living and dead branches	Moderate
4	Ash	419369	280882	Knot hole	Low
5	Oak	419334	280827	Missing bark, small knot holes, cracks	Moderate
6	Oak	419039	280827	Missing branch	Moderate
7	Ash	418939	280480	Knot holes and missing limb	Moderate
8	Ash	418961	280467	Knot hole and missing limbs	High
9	Oak	418901	280209	Missing bark	Moderate
10	Oak	418901	280209	Split in stem, missing bark	Moderate
11	Oak	418882	280863	Knot holes, peeling and lifted bark, split in stem	Moderate
12	Oak	418787	280763	Rotten branch	Low
13	Oak	419762	280889	Knot hole	Moderate

APPENDIX

TREE NUMBER	SPECIES	LOCATION		POTENTIAL ROOST FEATURES (PRFS)	BAT ROOST POTENTIAL
		N	E		
14	Oak	418775	280892	Split in stem	Moderate
15	Oak	418779	280942	Split in bark	Low
16	Oak	418790	280966	Missing limbs	Moderate
17	Oak	418811	281023	Missing branch	Low
18	Oak	418814	281067	Missing branches	Low
19	Oak	418817	281080	Missing branches	Low
20	Oak	418779	281153	Knot hole	Low
21	Ash	418743	281097	Dead branch with hole	Moderate
22	Oak	418743	281097	Hole	Moderate
23	Oak	418745	281074	Knots in limbs	Low
24	2 Poplar and 2 Ash	418749	281042	Stem splits	Moderate, High
25	7 Oak	418749	282044	Multiple	Moderate
26	Oak	418690	280947	Three knot holes and missing branch	Moderate
27	Oak	418672	280932	Small holes and crack	Low
28	Oak	418689	280900	Hole and dead branch	Low
29	Oak	419015	282567	Cavities, splits and dead wood	High
30	Oak	419069	282540	Splits, cavities, missing limbs	Moderate
31	2 Ash	419001	282537	Knot hole, split	Moderate

TREE NUMBER	SPECIES	LOCATION		POTENTIAL ROOST FEATURES (PRFS)	BAT ROOST POTENTIAL
		N	E		
32	Oak	419028	282513	Knot hole	Low
33	Oak	419914	282502	Knot holes	High
34	Horse Chestnut	419099	282546	Cavity	High
35	Ash	419106	282567	Woodpecker holes, cavities	High
36	Ash	419117	282559	Knot holes and large cavities	High
37	Oak	419252	282634	Split in branch	Low
38	Ash	419192	282579	Woodpecker holes	Moderate
39	Oak	419146	282575	Splits	Moderate
40	Oak	419131	282556	Cavity	High
41	2 Ash	419122	282561	Knot holes and cavities	Moderate, High
42	Oak	418156	282287	Split	Low
43	Oak	418156	282300	Five tear outs, dead wood	High
44	Oak	418172	282332	Woodpecker hole	Low
45	Ash	419226	281200	Knot hole	Low
46	Oak	419207	281198	Missing bark, missing limbs, splits in limbs	Moderate
47	Ash	419190	281203	Stem split and missing limb	High
48	Oak	419107	281216	Splits in limb	Moderate
49	Ash	419053	281249	Cavity in stem	Moderate
50	Oak	418915	281296	Knot holes, lifted bark,	Moderate, High

APPENDIX

TREE NUMBER	SPECIES	LOCATION		POTENTIAL ROOST FEATURES (PRFS)	BAT ROOST POTENTIAL
		N	E		
51	2 Ash, 1 Oak	418844	281411	Knot holes, missing limbs, lifted bark	Low, Moderate
52	Oak	418817	281441	Broken limbs	Low
53	2 Oak	418801	281426	Limbs, split limb, knot hole	Moderate
54	Oak	418756	281396	Knot holes, split limbs	High
55	Oak	418736	281376	Knot hole, split branch, lifting bark, missing limb	Moderate
56	2 Oak	418733	281367	Dead branch	Low
57	Oak	418738	281344	Knot holes, lifted bark	Low
58	Oak	418709	281254	Split in limb	Moderate
59	Oak	418805	281218	Knot hole	Low
60	Ash	418202	280837	Knot hole	Low
61	Oak	419036	281167	Knot holes, cavities	High
62	Oak	419024	281150	Tear out	Low
63	Oak	409013	281150	Split bark, knot hole	Moderate
64	Oak	418947	281150	Woodpecker hole on western tree - eastern tree dead branches with overlap	Low, Moderate

TREE NUMBER	SPECIES	LOCATION		POTENTIAL ROOST FEATURES (PRFS)	BAT ROOST POTENTIAL
		N	E		
65	Oak	418846	281131	Branches grown into each other	Low
66	Oak	418744	281162	Knot hole	Low
67	Oak	418728	281270	Dead wood and gaps	Moderate
69	Ash	418699	281273	Cavity	Moderate
69	Oak	418685	281172	Dead wood	Low
70	Oak	418519	281118	Four woodpecker holes	Moderate
71	Ash	418571	281092	Knot holes and cavities	Moderate
72	Oak	418565	281082	Knot holes and cavities	Moderate
73	Ash	418655	281059	Missing limb	Moderate
74	Poplar	418661	281061	Missing limbs and branches	Moderate
75	Oak	418683	281048	Dead wood and missing branches	Low
76	Oak	419175	280944	Dead wood	Low
77	Oak	419149	280940	Dead wood	Low
78	Oak and Ash	419124	280961	Dead wood	Low
79	Ash	419079	281133	Cavities knot holes	Moderate
80	Ash	419094	280978	Knot holes and broken branches	Moderate
81	3 Oak	418894	281053	Knot holes deadwood missing branches	Low
82	Oak	418290	482180	Woodpecker hole, dead branch and lifted bark	Moderate

APPENDIX

TREE NUMBER	SPECIES	LOCATION		POTENTIAL ROOST FEATURES (PRFS)	BAT ROOST POTENTIAL
		N	E		
83	Oak	418330	482040	Woodpecker holes, splits in bark and cavity	Moderate
84	Oak	418404	281589	Unknown	Unknown
85	Unknown	418980	281063	Unknown	Unknown
86	Unknown	418587	281495	Unknown	Unknown
87	Oak	418450	281310	Knothole and deadwood	Low
88	Oak	418450	281340	Split trunk	High
89	Ash	418270	281600	Woodpecker hole	Moderate
90	Ash	418240	281590	Woodpecker hole	Moderate
91	Oak	418160	281620	Ivy, possibly obscuring features	Low
92	Oak and Alder	418260	281410	Multiple	Low

N

Woodland 3

Key

Trees with Bat Roosting Potential (BCT catergories)

- High
- Low
- Low, Moderate
- Moderate
- Moderate, High
- Unknown
- Woodlands with potential bat roosting features

Habitat Type

- (A)rable/(I)mproved
- Amenity
- Bare Ground
- Broad-leaved Plantation Woodland
- Broad-leaved Semi-natural Woodland
- Site of Special Scientific Interest
- Coniferous Plantation Woodland
- Dense Scrub
- Marshy Grassland
- Mixed Semi-natural Woodland
- Semi-improved Neutral Grassland
- Standing Water
- Unimproved Neutral Grassland
- Fence
- Species Poor Defunct Hedge
- Species Poor Hedge and Trees
- Speices Poor Intact Hedge
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Version	Amendment	Drawing Date	Review Date	Approved Date
A	First Issue	12/04/17 SR	10/05/17 LE	12/05/17 AB

Client: Highways England

Project: M42 J6 Ecology Surveys

Drawing Title: Bat Scoping Map

Scale (at A3 size): 1:15,000

Purpose of Issue: Information

Office: Blackfriars

Tel: 020 7822 2497

Drawing Number: Page 1 of 8

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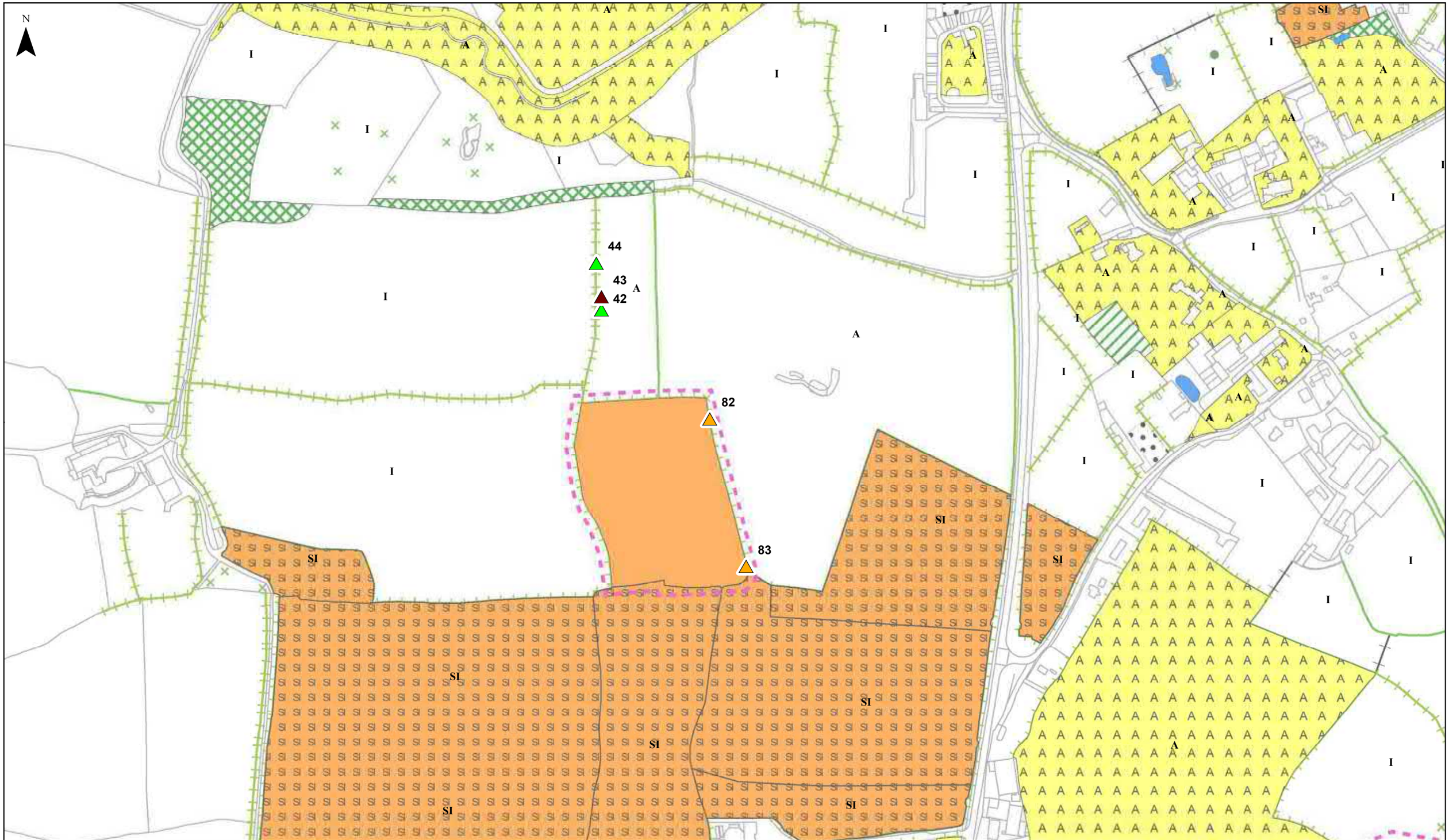

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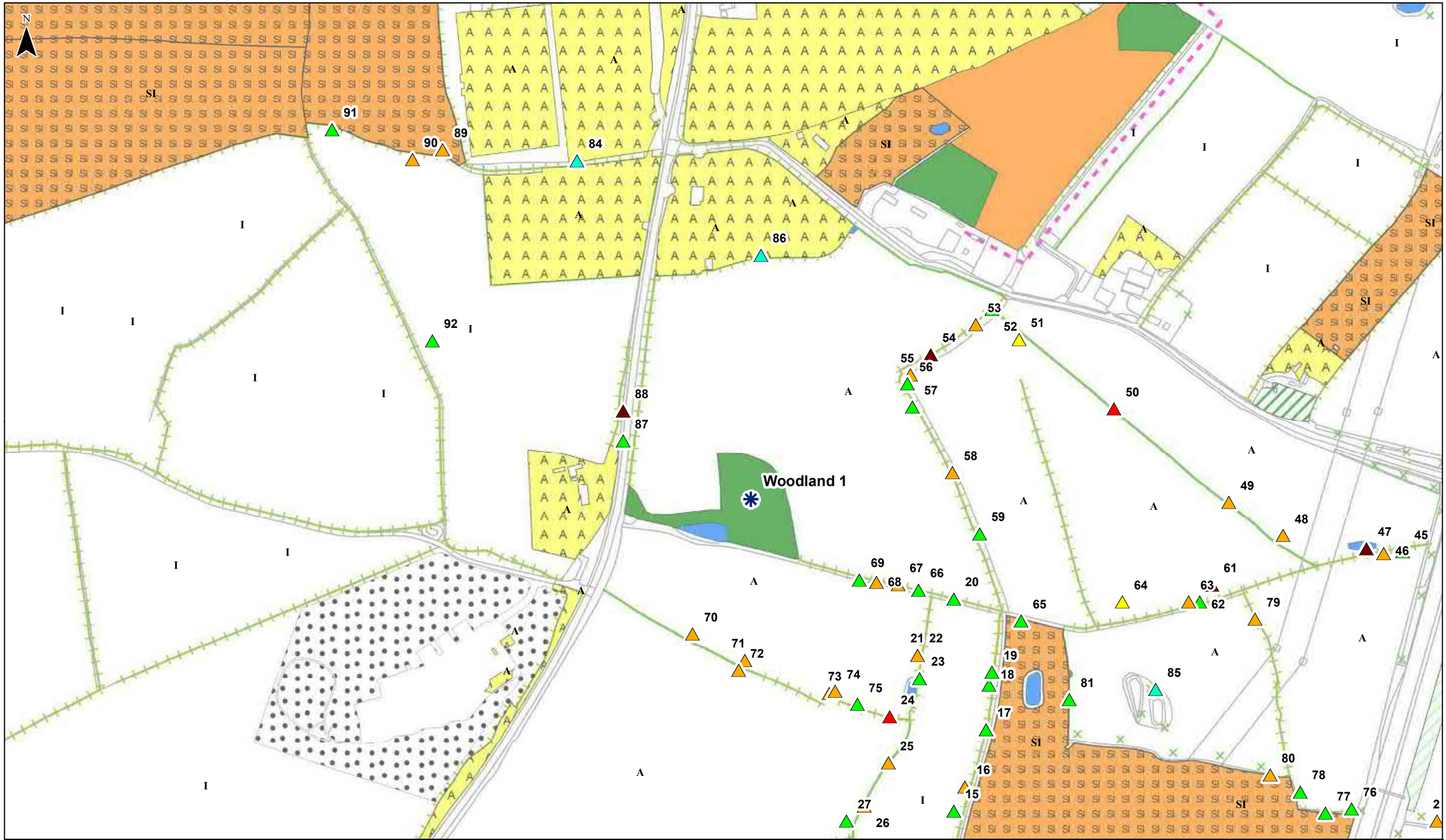

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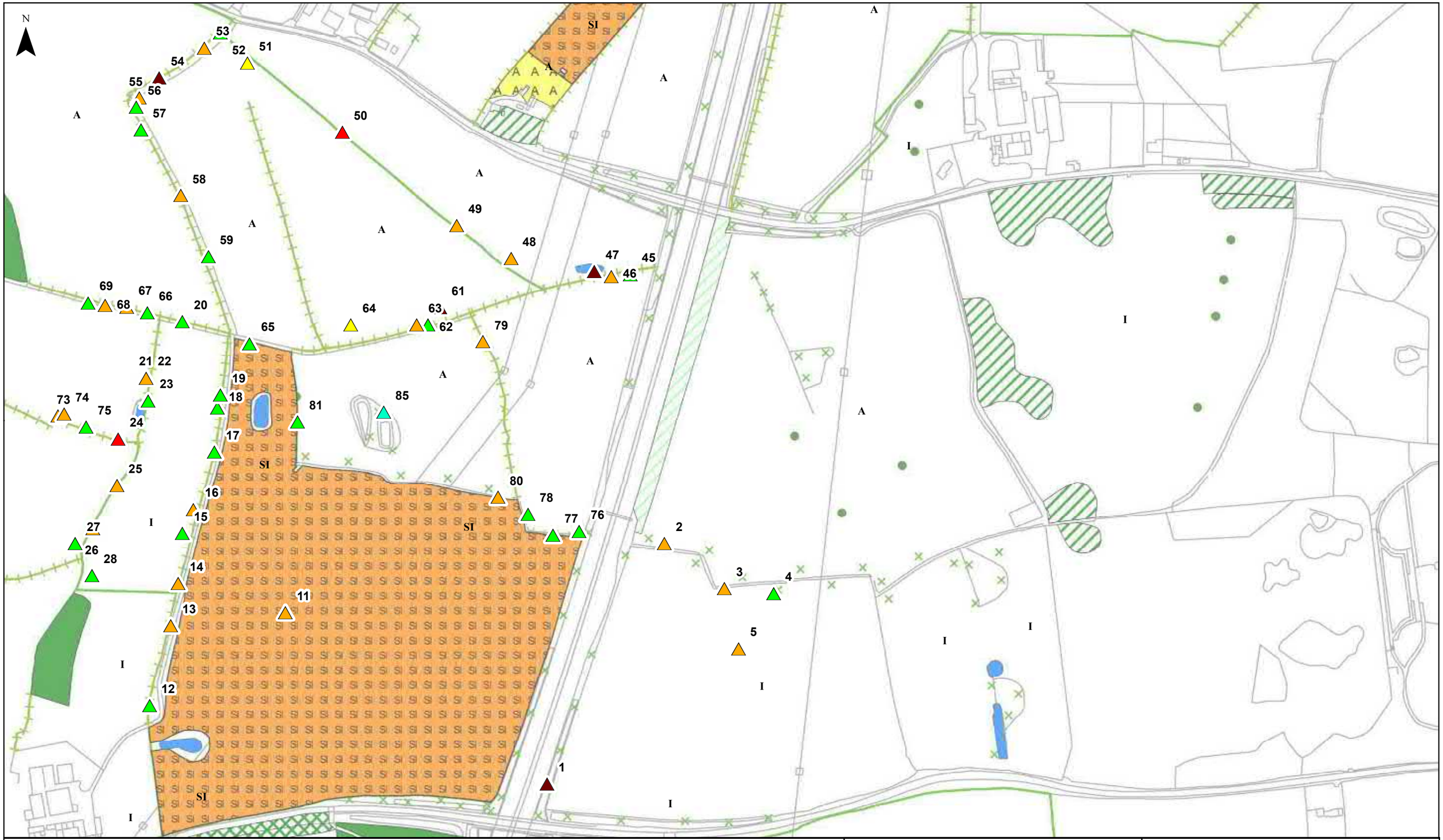

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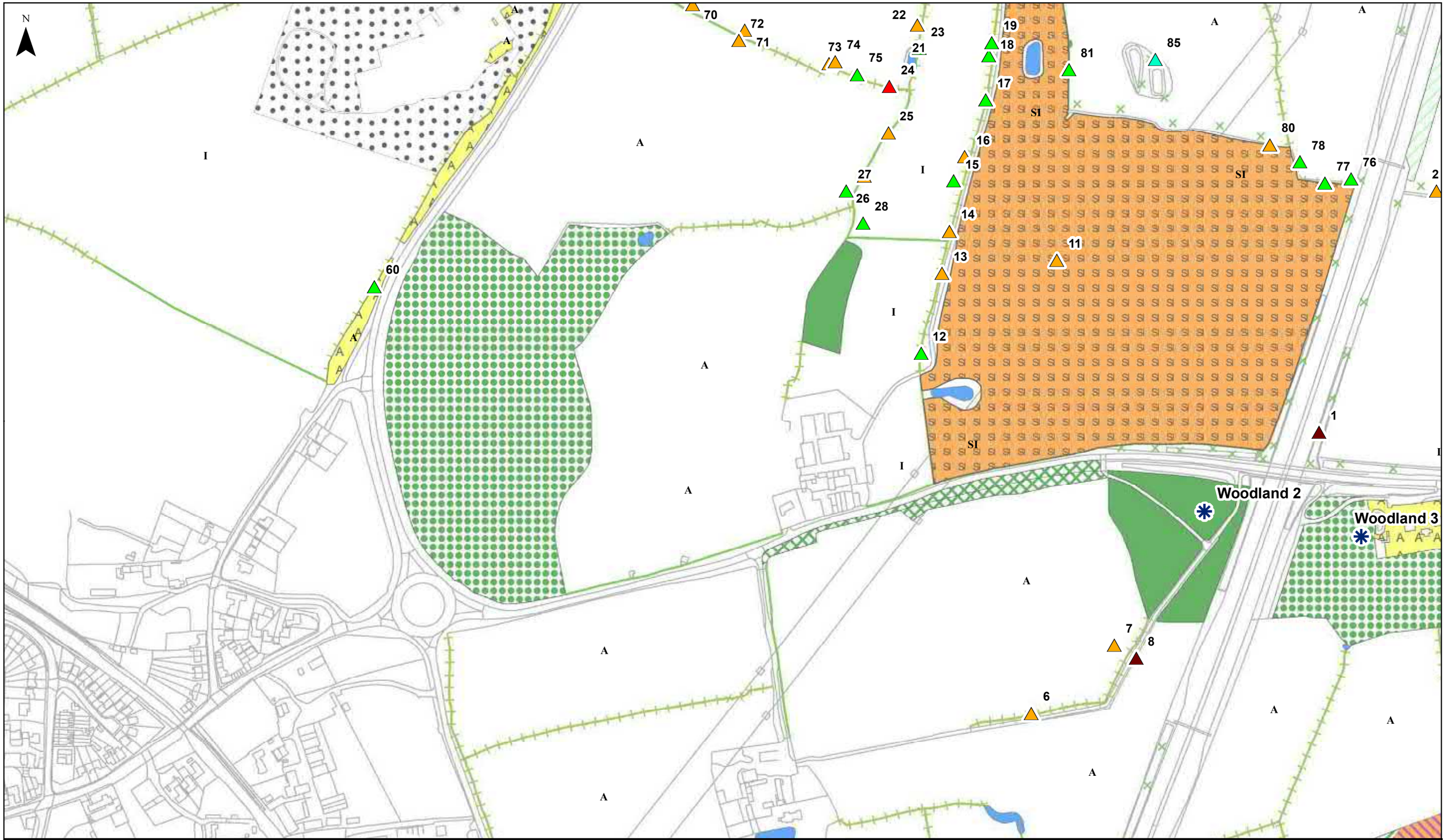

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Drawing Number: Page 7 of 8

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Drawing Number: Page 8 of 8

Highways England

M42 J6 IMPROVEMENT

Bat Activity Survey Report

001
NOVEMBER 2017

CONFIDENTIAL

Highways **England**

M42 J6 IMPROVEMENT

Bat Activity Survey Report

FINAL (VERSION) CONFIDENTIAL

PROJECT NO. 62241010
OUR REF. NO. 001

DATE: NOVEMBER 2017

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QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Final			
Date	20/11/17			
Prepared by	Lucy Elliott			
Signature				
Checked by	Becky Bailey			
Signature				
Authorised by	Andy Bascombe			
Signature				
Project number	62241010			
Report number				
File reference				

CONTENTS

TABLES

FIGURES

1 INTRODUCTION

1.1 BACKGROUND

1.1.1. WSP UK Ltd (formerly Mouchel) was commissioned by Highways England to undertake ecological surveys to inform the proposed M42 Junction 6 Improvement Scheme.

1.1.2. At the time of commission, three possible route options (Options 1, 2 and 3) were being considered. All three options are predominantly located to the south west of Junction 6 close to the village of Bickenhill, although all route options also include improvements to the junction itself.

1.1.3. During the course of the surveys, Option 1 was selected as the preferred route. However, survey work continued across all thee route options following this decision. This ensured that a comprehensive survey of the wider route options corridor was undertaken, allowing for a robust assessment of the impact of the preferred route on bats.

1.1.4. An assessment of the suitability of habitats present along each of the route options was undertaken in April 2017 (WSP, 2017). This concluded that suitable habitat for foraging and commuting bats was present across the three options and further survey work was recommended.

1.2 STUDY AREA

1.2.1. The land within the proposed scheme is predominantly used for agriculture and pasture grazing, although the scheme is also close to the National Exhibition Centre (NEC), Birmingham International Railway Station and Birmingham Airport as well as proposed developments including High Speed 2 (HS2) route and terminal, a Motorway Service Area (MSA) and UK Central Development

1.2.2. Walked transect surveys were undertaken across habitats within and adjacent to the proposed route options, hereafter referred to as the Study Area.

1.3 BRIEF AND OBJECTIVES

1.3.1. Highways England commissioned WSP UK Ltd to complete bat surveys across all three route options in June 2017. The brief was to:

- Complete bat activity surveys, comprising repeated walked transect surveys to identify the species of bat active across the Study Area, and provide an indication of relative activity levels;
- Evaluate the value of the Study Area for bats.

1.3.2. This report presents the results of the walked transect surveys undertaken between July and October 2017.

2 METHODS

2.1 BAT ACTIVITY SURVEY

WALKED TRANSECT SURVEY

2.1.1. A series of walked transect surveys, comprising six transect routes, were undertaken across the Study Area between July to October 2017. The activity transect surveys were carried out taking into account current good practice guidance (Hundt, 2012). Each month a pre-defined transect was walked by two surveyors to record levels of bat activity.

2.1.2. Each dusk walked transect began at sunset and continued for approximately 120 minutes afterwards. The pre-dawn survey commenced approximately 120 minutes before sunrise and terminated at sunrise

2.1.3. During each transect the surveyors noted the bat species heard and seen, including the time, location, and, where possible behaviour type and direction of flight. Surveyors were equipped with Batbox Duet and Anabat SD1 bat detectors to listen to and record bat activity. Calls registered by the bat detectors were recorded for later analysis using specialist computer software (Analook), details of which are provided below.

2.1.4. A plan showing the transect routes walked during the survey is provided in Figure 1. Dates, times and weather conditions of each of the transect survey visits are provided in Table 1 below.

2.2 DATA ANALYSIS

2.2.1. The recordings of bat echolocation calls collected during the surveys were analysed using specialist computer software (Analook). The analysis enables confirmation of species or species group based on call parameters, and the relative activity of different species of bats by counting the minimum number of bats recorded within discrete sound files. Once triggered by ultrasound, the Anabat SD1 detectors record sound files which may contain a number of individual bat calls (or passes), or discrete groups of ultrasound 'pulses'. The assessment of relative bat activity between species is based on the relative abundance of recorded calls of each species within each survey period (i.e. each walked transect survey) and across the combined study period.

2.2.2. It should be recognised that a series of separate sound files may represent a series of different bats commuting within the range of an automated detector, or a smaller number of bats repeatedly triggering the detector (e.g. bats making repeated foraging passes within the range of a detector).

2.2.3. Where possible, bat calls are identified to species level. However, species of the genus ***Myotis*** are grouped together in most cases as their calls are similar in structure and have overlapping call parameters, making species identification problematic (Russ, 2013). For ***Pipistrellus*** species the following criteria based on measurements of peak frequency are used to classify calls:

- Common pipistrelle ***Pipistrellus pipistrellus*** ≥ 42 and <49KHz;
- Soprano pipistrelle ***Pipistrellus pygmaeus*** ≥ 51KHz;
- Nathusius pipistrelle ***Pipistrellus nathusii*** <39KHz;
- Common/soprano pipistrelle ≥49 and <51KHz; and
- Common/Nathusius pipistrelle ≥39 and <42KHz.

2.2.4. In addition, the following categories are used for calls which cannot be identified with confidence due to the overlap in call characteristics between species or species groups:

- ***Myotis*** sp./***Plecotus*** sp.;
- ***Nyctalus*** sp. (either Leisler's bat ***Nyclatus leisleri*** or noctule ***Nyctalus noctula***);
- Serotine ***Epstesicus serotinus***/Leisler's bat; and
- Serotine/***Plecotus*** sp.

2.3 DATES OF SURVEY

2.3.1. The dates of and conditions during survey visits are listed in Table 1 below.

Table 1 - Dates for Bat Activity Survey Visits

Month	Transect Number	Date of Transect Survey	Survey Type	Weather Conditions*
July	1	18/07/17	Dusk	21℃, cloud cover 0, BF2-3, dry
	2	17/07/17	Dusk	21℃, cloud cover 0, BF0, dry
	3	25/07/17	Dusk	20℃, cloud cover 8, BF1, dry
	4	19/07/17	Dusk	19℃, cloud cover 1, BF3, dry
	5	20/07/17	Dusk	14℃, cloud cover 4, BF1, dry
	6	24/07/17	Dusk	19℃, cloud cover 7, BF2, light drizzle
August	1	15/08/17	Dawn	14℃, cloud cover 1, BF2-3, dry
	2	16/08/17	Dawn	14℃, cloud cover 0, BF1, dry
	3	18/08/17	Dawn	15℃, cloud cover 5, BF2, dry
	4	17/08/17	Dusk	16℃, cloud cover 3, BF2, dry
	5	17/08/17	Dusk	16℃, cloud cover 3, BF2, dry
	6	18/08/17	Dawn	15℃, cloud cover 5, BF2, dry
September	1	18/09/17	Dusk	11℃, cloud cover 8, BF1, dry
		19/09/17	Dawn	6℃, cloud cover 0, BF1, dry
	2	19/09/17	Dusk	14℃, cloud cover 1, BF1, dry
		20/09/17	Dawn	11℃, cloud cover 8, BF1, dry
	3	21/09/17	Dusk	13℃, cloud cover 2, BF1, dry
		22/09/17	Dawn	5℃, cloud cover 1, BF1, dry
	4	20/09/17	Dusk	16℃, cloud cover 8, BF1, dry
		21/09/17	Dawn	14℃, cloud cover 8, BF0, rain at start of survey. Stopped after approximately 1 hour.
	5	27/09/17	Dusk	16℃, cloud cover 8, BF3, light rain
		28/09/17	Dawn	15℃, cloud cover 1, BF1, light drizzle
	6	28/09/17	Dusk	16℃, cloud cover 8, BF1, dry
October	1	02/10/17	Dusk	11℃, cloud cover 5, BF3, dry
	2	03/10/17	Dusk	12℃, cloud cover 7, BF1, dry
	3	25/10/17	Dusk	12℃, cloud cover 2, BF0, dry
	4	04/10/17	Dusk	11℃, cloud cover 1, BF1, dry
	5	10/10/17	Dusk	13℃, cloud cover 2, BF4, dry

Month	Transect Number	Date of Transect Survey	Survey Type	Weather Conditions*
	6	26/10/17	Dusk	13℃, cloud cover 5, BF0, dry
		26/10/17	Dawn	8℃, cloud cover 3, BF0, dry

* Cloud cover recorded on oktas scale, wind speed recorded on Beaufort (BF) scale.

2.4 NOTES AND LIMITATIONS

2.4.1. The dawn surveys, scheduled for Transect 4 and 5 during August, were rescheduled to dusk surveys on 17/08/17 as the weather conditions were more favourable for undertaking the survey. Further dawn surveys were undertaken of both Transect 4 and 5 during September and as such, the findings of the surveys are not limited in this regard.

2.4.2. On two of the dawn surveys undertaken during September (Transect 1 on 19/09/17 and Transect 3 on 22/09/17), the overnight temperature dropped to 5℃ and 6℃ respectively, which may have resulted in a reduction in bat activity compared to warmer temperatures. However by undertaking repeat surveys over several months and with a dawn survey undertaken in August, an assessment of the typical levels of bat activity can be determined and as such, the lower temperatures do not pose a constraint to assessment of bat activity.

2.4.3. On three of the surveys undertaken during September (Transect 4 at dawn, Transect 5 at dusk, and Transect 5 at dawn) rain was recorded during part of the survey. However bat activity was recorded throughout each survey, and as above, by undertaking repeat surveys over several months, an assessment of typical levels of bat activity can be determined and the weather conditions do not pose a constraint to assessment of bat activity.

2.4.4. Static detector surveys were not undertaken as part of this study. It is considered that the data obtained during the walked transect surveys provides sufficient information to determine the species of bat present within the Study Area and provide an indication of relative activity levels, as set out within the aims and objectives of the study.

3 RESULTS

3.1 BAT ACTIVITY SURVEY

WALKED TRANSECT SURVEY

3.1.1. The following species or species groups were recorded during the survey work undertaken:

- Common pipistrelle;
- Soprano pipistrelle;
- Noctule;
- ***Nyctalus*** spp. (either Leisler's bat or noctule); and
- ***Myotis*** spp.;

3.1.2. The calls recorded during the transect surveys each month are summarised in Tables 2 - 7 below. Locations of bats encountered during the transect surveys are shown on Figure 2.

Table 2 - Number of Anabat registrations recorded during Transect 1 per month

Month	Survey Type	Common Pipistrelle	Soprano Pipistrelle	Noctule	Noctule/ Leisler's bat	*Myotis* sp.	Grand Total
July	Dusk	13	0	3	0	0	16
August	Dawn	1	0	2	0	1	4
September	Dusk	5	0	0	0	1	6
	Dawn	12	0	0	0	1	13
October	Dusk	8	0	0	0	0	8
TOTALS		39	0	5	0	3	47

Table 3 - Number of Anabat registrations recorded during Transect 2 per month

Month	Survey Type	Common Pipistrelle	Soprano Pipistrelle	Noctule	Noctule/ Leisler's bat	*Myotis* sp.	Grand Total
July	Dusk	40	0	3	0	0	43
August	Dawn	8	0	0	0	0	8
September	Dusk	48	8	1	1	1	59
	Dawn	20	5	0	0	0	25
October	Dusk	63	5	0	0	2	70
TOTALS		179	18	4	1	1	205

Table 4 - Number of Anabat registrations recorded during Transect 3 per month

Month	Survey Type	Common Pipistrelle	Soprano Pipistrelle	Noctule	Noctule/ Leisler's bat	*Myotis* sp.	Grand Total
July	Dusk	14	4	6	3	0	27
August	Dawn	48	0	0	0	0	48
September	Dusk	23	2	3	0	0	28
	Dawn	0	0	0	0	0	0
October	Dusk	34	1	0	1	0	36
TOTALS		119	7	9	4	0	139

Table 5 - Number of Anabat registrations recorded during Transect 4 per month

Month	Survey Type	Common Pipistrelle	Soprano Pipistrelle	Noctule	Noctule/ Leisler's bat	*Myotis* sp.	Grand Total
July	Dusk	22	0	0	0	0	22
August	Dusk	43	3	1	0	0	47
September	Dusk	11	5	0	2	0	18
	Dawn	2	1	0	0	0	3
October	Dusk	6	3	0	0	1	10
TOTALS		84	12	1	2	1	100

Table 6 - Number of Anabat registrations recorded during Transect 5 per month

Month	Survey Type	Common Pipistrelle	Soprano Pipistrelle	Noctule	Noctule/ Leisler's bat	*Myotis* sp.	Grand Total
July	Dusk	28	1	0	0	0	29
August	Dusk	26	1	0	0	1	28
September	Dusk	12	0	0	0	0	12
	Dawn	12	1	0	1	0	14
October	Dusk	34	2	0	0	1	37
TOTALS		112	5	0	1	2	120

Table 7 - Number of Anabat registrations recorded during Transect 6 per month

Month	Survey Type	Common Pipistrelle	Soprano Pipistrelle	Noctule	Noctule/ Leisler's bat	*Myotis* sp.	Grand Total
July	Dusk	90	12	0	0	1	103
August	Dawn	14	1	0	0	0	15
September	Dusk	59	15	0	2	0	76
October	Dusk	4	1	0	0	0	5
	Dawn	0	0	0	0	0	0
TOTALS		167	29	0	2	1	199

3.1.3. The greatest levels of bat activity were recorded on Transect 2, located to the west of Catherine de Barnes Lane, with 205 registrations recorded on the Anabat over the course of the surveys. Foraging activity was recorded along the majority of linear features, particularly on the western edge of the transect (listening points 4 – 8, as shown on Figure 2) where a number of commuting passes were also recorded. As with all the transects undertaken, the majority of calls recorded were common pipistrelle.

3.1.4. Similar levels of activity were recorded on Transect 6, located immediately to the east of the M42, north and south of Shadowbrook Lane. 199 registrations were recorded on the Anabat and again, foraging activity was recorded along the majority of linear features surveyed and also within cattle grazed pasture to the north of Shadowbrook Lane.

3.1.5. Moderate levels of activity were recorded on Transects 3, 4 and 5: 139, 100 and 120 Anabat registrations respectively. Transects 3 and 4 are located immediately adjacent to the existing M42, and focus of activity recorded on these transects was located away from the motorway. Both commuting and foraging activity was recorded along the majority of linear features along Transect 5.

3.1.6. Low levels of activity were recorded on Transect 1: 47 Anabat registrations recorded over the course of the surveys. The majority of activity was located to the east of Catherine de Barnes Lane, with little activity recorded to the west. This is likely to be a result of the frequency of aircraft flying in low to land at Birmingham Airport.

4 CONCLUSIONS

4.1.1. In conclusion, the surveys undertaken have shown that habitats across each of three route options are used by both foraging and commuting bats. Activity levels vary across the areas surveyed, with the greatest activity recorded along Transects 2 and 6, and the least activity recorded along Transect 1. The majority of activity recorded was by common pipistrelle, with soprano pipistrelle, ***Nyctalus*** sp. and ***Myotis*** sp. also recorded.

4.1.2. It is understood that further survey work will be carried out in 2018 to provide additional information on the use Study Area by bats throughout the season.

REFERENCES

PROJECT REFERENCES

- WSP (2017) M42 Junction 6 Improvement – Preliminary Bat Assessment.

TECHNICAL REFERENCES

- Hundt, L. (2012) Bat Surveys: Good Practice Guidelines, 2nd edition, Bat Conservation Trust, London.
- Mitchell- Jones, A.J (2004) Bat Mitigation Guidelines. English Nature.
- Russ, J (2013) British Bat Calls a Guide to Species Identification. Pelagic Publishing.

Figure 1 - Activity Survey: Transect Locations

Figure 2 - Activity Survey: Results

Three White Rose Office Park
Millshaw Park Lane
Leeds
LS11 0DL

wsp.com

LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Listening Points

STATUS:

FOR INFORMATION ONLY

WSP, 6 Devonshire Square
London, EC2M 4YE
Tel: +44 (0) 20 7337 1700
www.wsp.com

CLIENT: Highways England

PROJECT: M42 Junction 6 Improvements

TITLE: Bat Activity Survey Transects Overview

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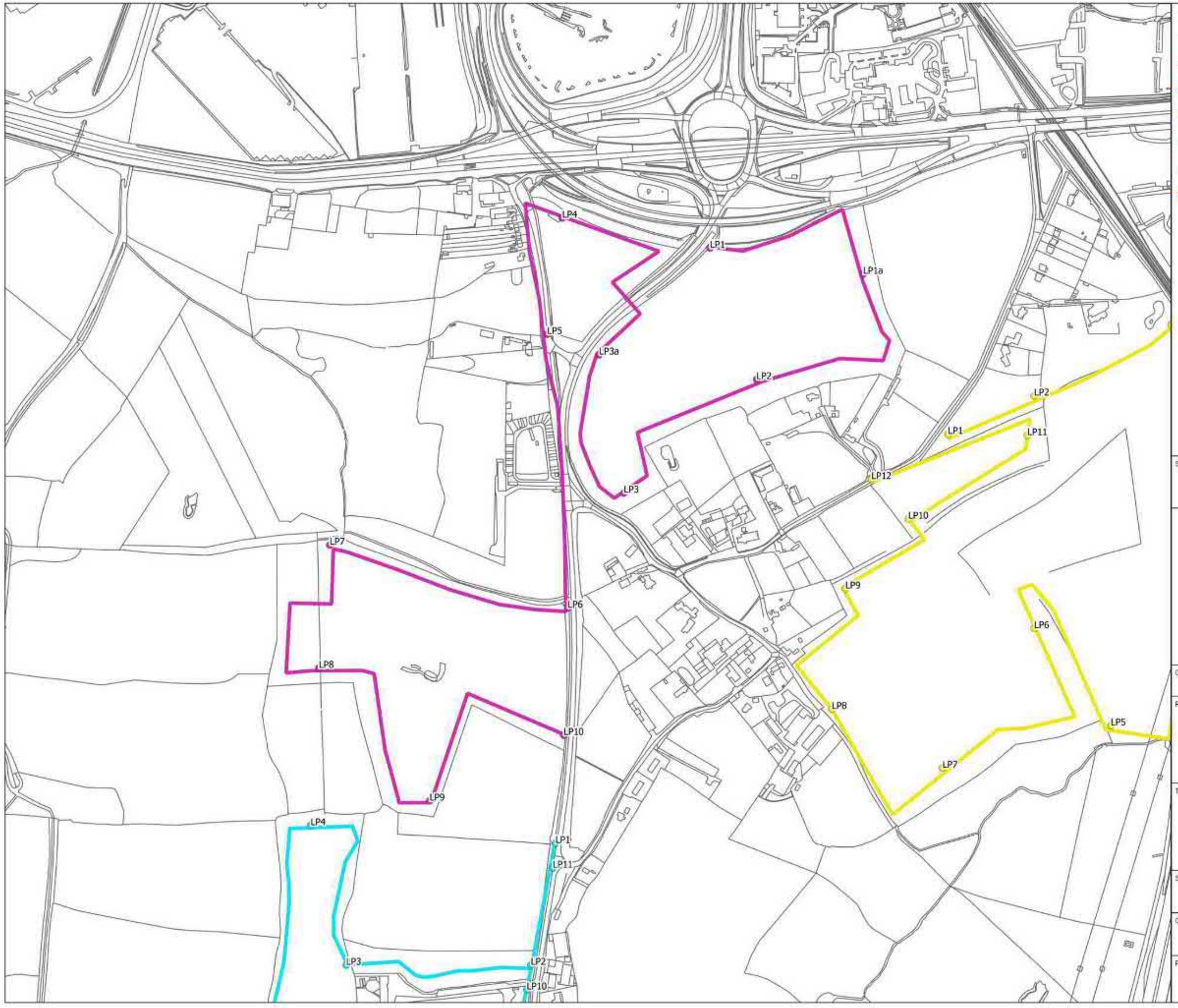

LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6

Listening Points

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PROJECT No: 62241010	Page number: 2 of 7	REV: 0.1

LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Listening Points

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TITLE: Bat Activity Survey Transects
Transect 2

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PROJECT No: 62241010	Page number: 3 of 7	REV: 0.1

LP2
LP2
LP3
LP1
LP11
LP4
LP12
LP10
LP9
LP6
LP8
LP5
LP7

LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Listening Points

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PROJECT: M42 Junction 6 Improvements

TITLE: Bat Activity Survey Transects Transect 3

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PROJECT No: 62241010	Page number: 4 of 7	REV: 0.1

LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Listening Points

STATUS:

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PROJECT: M42 Junction 6 Improvements

TITLE: Bat Activity Survey Transects
Transect 4

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PROJECT No: 62241010	Page number: 5 of 7	REV: 0.1

LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6

Listening Points

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TITLE: Bat Activity Survey Transects
Transect 5

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PROJECT No:	Page number:	REV:
62241010	6 of 7	0.1

LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Listening Points

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TITLE: Bat Activity Survey Transects Transect 6

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PROJECT No: 62241010	Page number: 7 of 7	REV: 0.1

LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Listening Points

Foraging Activity 2017

- Pipistrelle
- Pipistrelle + Noctule/Leisler
- Noc/Leis

Commuting Activity 2017

- Noctule
- Pipistrelle

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TITLE: Bat Activity Survey Overview

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QGIS FILE:	DRAWN: 06/10/17	DATE: 16/11/17
PROJECT No: 62241010	Page number: 1 of 7	REV: 0.1

Transect 1		
Month	**Survey Type**	**Number of Anabat registrations**
July	Dusk	13 x C.Pip, 3 x Noc.
August	Dawn	1 x C.Pip, 2 x Noc., 1 Myo.
September	Dusk	5 x C.Pip, 1 x Myo.
	Dawn	12 x C.Pip, 1 x Myo.
October	Dusk	8 x C.Pip

LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Listening Points

Foraging Activity 2017

- Pipistrelle
- Pipistrelle + Noctule/Leisler
- Noc/Leis

Commuting Activity 2017

- Noctule
- Pipistrelle

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TITLE: Bat Activity Survey Transect 1

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PROJECT No: 62241010	Page number: 2 of 7	REV: 0.1

Transect 2		
Month	**Survey Type**	**Number of Anabat registrations**
July	Dusk	40 x C.Pip, 3 x Noc.
August	Dawn	8 x C.Pip
September	Dusk	48 x C.Pip, 8 x S.Pip, 1 x Noc., 1 x Noc./Leis., 1 x Myo.
	Dawn	20 x C.Pip, 5 x S.Pip
October	Dusk	63 x C.Pip, 5 x S.Pip, 2 x Myo.

LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Listening Points

Foraging Activity 2017

- Pipistrelle
- Pipistrelle + Noctule/Leisler
- Noc/Leis

Commuting Activity 2017

- Noctule
- Pipistrelle

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TITLE: Bat Activity Survey
Transect 2

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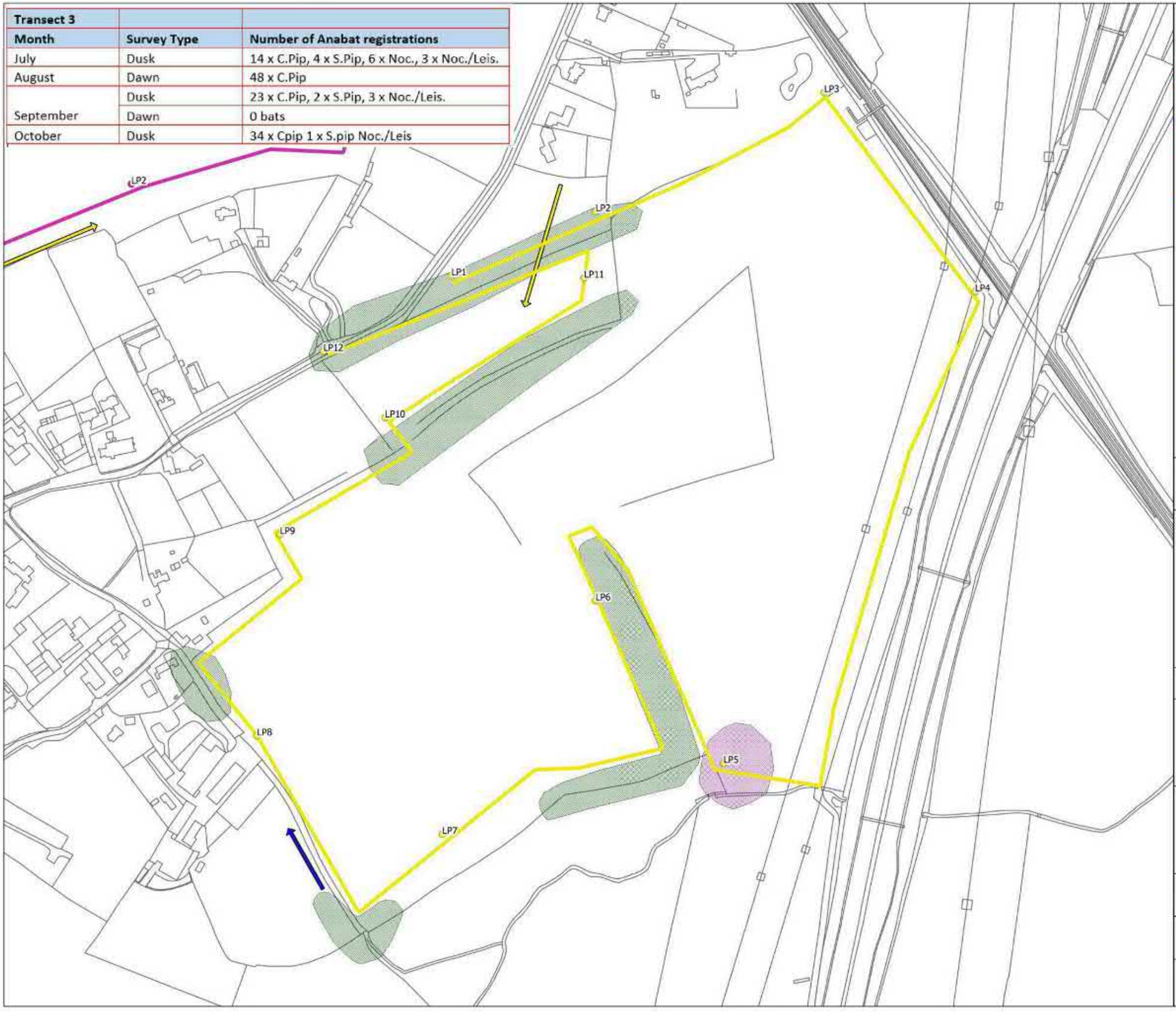
PROJECT No: 62241010	Page number: 3 of 7	REV: 0.1

Transect 3		
Month	**Survey Type**	**Number of Anabat registrations**
July	Dusk	14 x C.Pip, 4 x S.Pip, 6 x Noc., 3 x Noc./Leis.
August	Dawn	48 x C.Pip
	Dusk	23 x C.Pip, 2 x S.Pip, 3 x Noc./Leis.
September	Dawn	0 bats
October	Dusk	34 x Cpip 1 x S.pip Noc./Leis



LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Listening Points

Foraging Activity 2017

- Pipistrelle
- Pipistrelle + Noctule/Leisler
- Noc/Leis

Commuting Activity 2017

- Noctule
- Pipistrelle

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TITLE: Bat Activity Survey Transect 3

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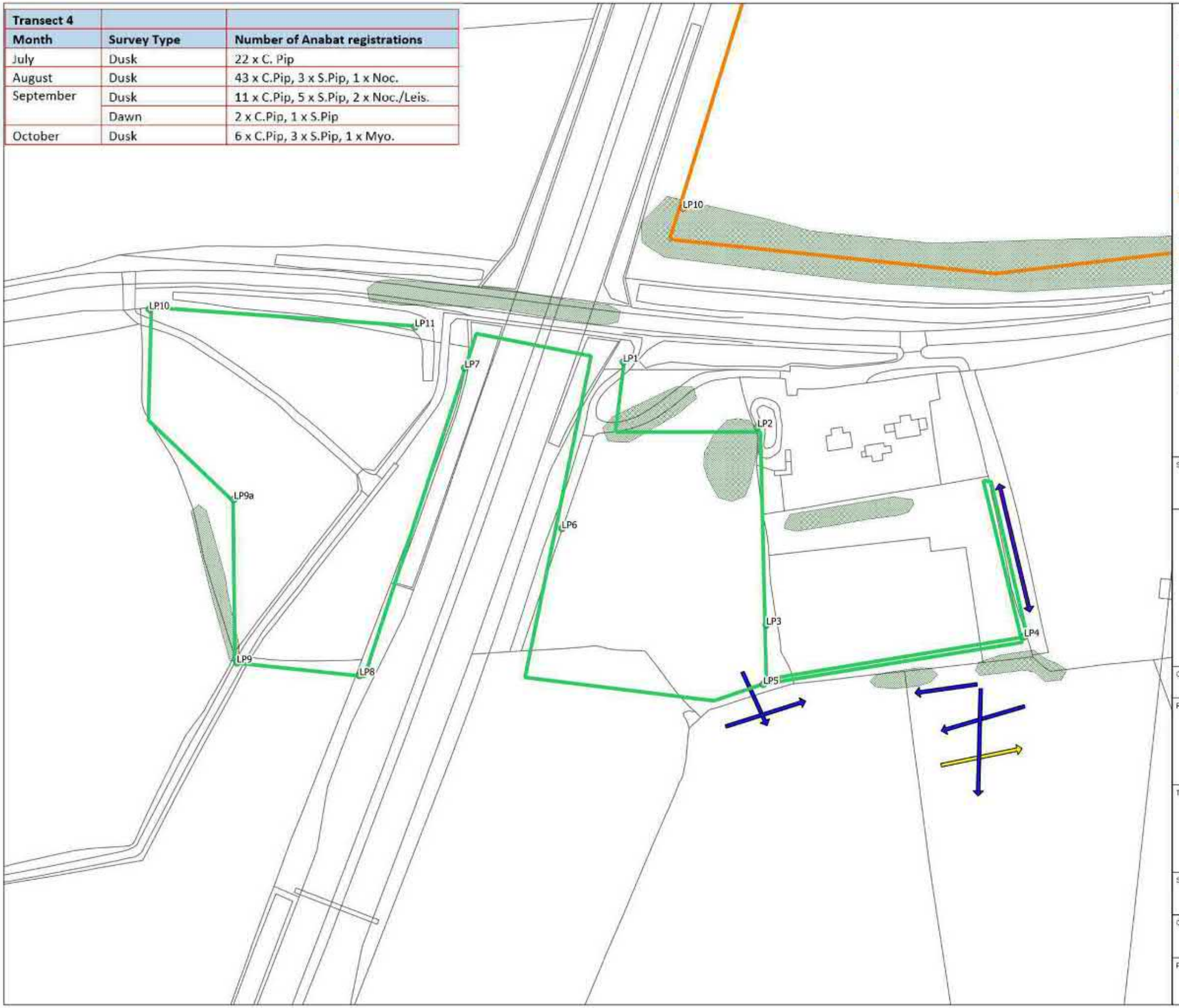
QGIS FILE:	DRAWN: 06/10/17	DATE: 16/11/17
PROJECT No: 62241010	Page number: 4 of 7	REV: 0.1

Transect 4		
Month	**Survey Type**	**Number of Anabat registrations**
July	Dusk	22 x C. Pip
August	Dusk	43 x C.Pip, 3 x S.Pip, 1 x Noc.
September	Dusk	11 x C.Pip, 5 x S.Pip, 2 x Noc./Leis.
	Dawn	2 x C.Pip, 1 x S.Pip
October	Dusk	6 x C.Pip, 3 x S.Pip, 1 x Myo.



LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Listening Points

Foraging Activity 2017

- Pipistrelle
- Pipistrelle + Noctule/Leisler
- Noc/Leis

Commuting Activity 2017

- Noctule
- Pipistrelle

STATUS:
FOR INFORMATION ONLY

WSP, 6 Devonshire Square
London, EC2M 4YE
Tel: +44 (0) 20 7337 1700
www.wsp.com

CLIENT: Highways England

PROJECT: M42 Junction 6 Improvements

TITLE: Bat Activity Survey
Transect 4

SCALE @A3:	CHECKED:	APPROVED:
1:1,500	LE	BB
QGIS FILE:	DRAWN: 06/10/17	DATE: 16/11/17
PROJECT No: 62241010	Page number: 5 of 7	REV: 0.1

Transect 5		
Month	**Survey Type**	**Number of Anabat registrations**
July	Dusk	18 x C.Pip, 1 x S.Pip
August	Dawn	26 x C.Pip, 1 x S.Pip, 1 x Myo.
September	Dusk	12 x C.Pip
	Dawn	12 x C.Pip, 1 x S.Pip, 1 x Noc./Leis.
October	Dusk	34 x C.Pip, 2 x S.Pip, 1 x Myo.

LP1 LP2 LP3 LP4 LP5 LP6 LP7 LP8 LP9 LP10 LP11 LP12 LP13 LP14 LP15

LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Listening Points

Foraging Activity 2017

- Pipistrelle
- Pipistrelle + Noctule/Leisler
- Noc/Leis

Commuting Activity 2017

- Noctule
- Pipistrelle

STATUS:

FOR INFORMATION ONLY

WSP, 6 Devonshire Square
London, EC2M 4YE
Tel: +44 (0) 20 7337 1700
www.wsp.com

CLIENT: Highways England

PROJECT: M42 Junction 6 Improvements

TITLE: Bat Activity Survey Transect 5

SCALE @A3:	CHECKED:	APPROVED:
1:3,000	LE	BB
QGIS FILE:	DRAWN: 06/10/17	DATE: 16/11/17
PROJECT No: 62241010	Page number: 6 of 7	REV: 0.1

Transect 6		
Month	**Survey Type**	**Number of Anabat registrations**
July	Dusk	90 x C.Pip, 12 x S.Pip, 1 x Myo.
August	Dawn	14 x C.Pip, 1 x S.Pip
September	Dusk	59 x C.Pip, 15 x S.Pip, 2 x Noc./Leis.
October	Dusk	4 x C Pip, 1x S Pip
	Dawn	None

LEGEND:

Transects

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Listening Points

Foraging Activity 2017

- Pipistrelle
- Pipistrelle + Noctule/Leisler
- Noc/Leis

Commuting Activity 2017

- Noctule
- Pipistrelle

STATUS:

FOR INFORMATION ONLY

WSP, 6 Devonshire Square
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Tel: +44 (0) 20 7337 1700
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CLIENT: Highways England

PROJECT: M42 Junction 6 Improvements

TITLE: Bat Activity Survey
Transect 6

SCALE @A3:	CHECKED:	APPROVED:
1:4,500	LE	BB
QGIS FILE:	DRAWN: 06/10/17	DATE: 16/11/17
PROJECT No: 62241010	Page number: 7 of 7	REV: 0.1

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ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING, QUARRYING AND MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

EXTRA MSA GROUP

Motorway Service Area (MSA) and New Junction between Junctions 5 & 6 of the M42, Solihull

Bat Roost Survey Report – 2018 Update

July 2018

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DATE ISSUED:	**July 2018**
JOB NUMBER:	**SH11315A**
REPORT NUMBER:	**003**

EXTRA MSA GROUP

Motorway Service Area (MSA) and New Junction between Junctions 5 & 6 of the M42, Solihull

Bat Roost Survey Report – 2018 Update

July 2018

PREPARED BY:

Lorraine Palmer Principal Ecologist

CHECKED AND APPROVED BY:

Tim Palmer Technical Director

CONTENTS

APPENDICES

DRAWINGS	**SCALE**
SH11315A.003 Building Locations Plan	1:2,500@A3
SH11315A.013 Climbed Inspection Survey Area - 2018 Update	1:10,000@A3
SH11315A.014 Bat Roost Location Plan 2018.	1:10,000@A3

1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Wardell Armstrong LLP was commissioned by Extra MSA Group to undertake an update to the previously established baseline of preliminary bat (roost) surveys of a proposed Motorway Service Area (MSA) and new Junction, between Junctions 5 & 6 of the M42, Solihull, (Central Ordnance Survey grid reference SP 19108 80657).

1.1.2 This report aims to validate and update the baseline surveys provided in the earlier Bat Roost report (Wardell Armstrong, 2015) supplied with planning application PL/2015/S1409/PPOL and notes any changes that may have occurred since the previous surveys.

1.1.3 Previous assessments which were undertaken in 2014 include:

- Preliminary tree assessments;
- Climb and inspect surveys of trees;
- Preliminary building assessments; and
- Emergence and/or dawn surveys of buildings.

1.1.4 Consultation with the Solihull Metropolitan Borough Council (SMBC)[1] regarding the level of bat roost survey was undertaken in March 2018. The scope of work required by the LPA in order to update the survey work for bats includes:

- *A single emergence and dawn bat roost survey, covering all buildings to be impacted by works. Survey to be timed for late May or early June when bat activity will be at its peak.*
- *Bat climbed inspection of all trees with significant roost potential (moderate or High roost suitability). Trees identified as roosts to be subject to a single emergence survey to identify species and roost size (number of bats).*

1.1.5 No buildings will be directly impacted by the MSA development, however, any bat roosts which are present within buildings within the vicinity of the MSA site could be exposed to adverse indirect impacts, for example via reduced foraging habitat availability or connectivity; therefore it was deemed necessary to include the results

[1] Jenni Blakeman Solihull Metropolitan Borough Council, Development Officer-Ecologist

of surveys to these buildings within the 2018 update. This report provides a comparison between the surveys carried out in 2014 and 2018 and identifies any significant changes that have occurred.

1.1.6 Evaluations and any new impacts to roosting bats are discussed within the fourth Environmental Statement (ES) Addendum ecology chapter (Wardell Armstrong, 2018).

1.2 Site Context

1.2.1 The survey area comprises land within the application boundary and 50m beyond and is dominated by agricultural land with the M42 running through the centre from north to south. Solihull Road runs centrally from east to west. The habitats within the survey area consist of arable and pastoral land, hedgerows, scattered trees, woodland blocks, waterbodies, and buildings.

2 METHODOLOGY

2.1 Desk Study

2.1.1 An update to the desk top study has been undertaken. The desktop study was informed by review of existing available information provided by Warwickshire Biological Records Centre (WBRC) for a 2km search radius from the application boundary for all bat records. Ordnance Survey (OS) and satellite mapping was also used to gain contextual habitat information.

2.2 Preliminary Building and Tree Assessments

2.2.1 Building and tree inspections were undertaken on 3rd and 4th April 2018 and 8th May by two Natural England Bat Licensed (Natural England Class Licence CL18 (Bat Survey Level 2): Ecologists, from Wardell Armstrong LLP. The purpose of the preliminary survey was to identify any significant changes to the buildings and trees from the original surveys. The building and tree assessments were based on the updated criteria given in best practice guidelines (Collins, 2016).

2.2.2 The external examination of the buildings and trees were undertaken using binoculars and high-powered torches to check for entry points such as cracks or holes, evidence of bat activity such as staining, droppings and feeding remains. Buildings were also inspected internally for signs of bats (where safe to do so) as described above, as well as for the presence of live or dead bats.

2.2.3 Based on the location, age and type of the building, the potential features present and the indicating signs recorded, each building was placed into one of the following categories (Collins, 2016):

- Confirmed roost: Bat or signs of bats discovered during the survey;
- High: Buildings located within or connected to suitable habitat (foraging and/or commuting) with a large number of suitable features for supporting a bat roost. No supporting evidence found;
- Moderate: Buildings located within or connected to suitable habitat (foraging and/or commuting) with a number of suitable features for supporting a bat roost. No supporting evidence found;

- Low: Buildings located within or connected to suitable habitat (foraging and/or commuting); however largely unsuitable for supporting a bat roost with a few suitable features for supporting a bat roost. No supporting evidence found; and
- Negligible: no or very few suitable features. Often well-sealed buildings, with high levels of disturbance and high internal light levels.

2.2.4 Trees were re-assessed in terms of whether they had features capable of supporting roosting bats or not, information obtained from this survey was used to inform the climbed inspection survey.

2.3 Climbed Inspection Survey of Trees

2.3.1 All trees located within the survey area for which features of high or moderate suitability for bats had been established during the preliminary survey, were subject to climbed inspections. Trees which had previously been identified as a confirmed roost were also subject to climbed inspections. The location of surveyed trees is given in Drawing SH11315A/013.

2.3.2 Climbed inspection surveys were undertaken during May and June 2018 by Natural England licenced Ecologists. Climbed inspection surveys involves a surveyor holding an aerial ascent and rescue tree certification; undertaking a detailed inspection of the suitable bat roosting feature(s). This includes searching for any additional suitable features that could not be viewed/accessed from the ground. The features were searched using a high-powered torch and/or an endoscope inspection camera.

2.4 Roost Surveys of Buildings

2.4.1 A single dusk emergence survey and dawn re-entry survey was undertaken on all buildings with Low- High bat roost potential and on those confirmed as supporting a bat roost during the 2014 surveys. Buildings with negligible potential were excluded from the surveys. Emergence and Dawn surveys were undertaken during the optimum survey period in compliance with best practice guidelines (Collins, 2016). The locations of surveyed buildings are given as Drawing SH11315A/003. Table 1 summarises the survey dates. The weather conditions and survey timings are provided within Appendix 5.

2.4.2 During each survey, experienced bat surveyors were located around the buildings, in order to monitor potential bat egress/entry points. The surveys were led by a Natural England Bat Licensed (Natural England Class Licence CL18 (Bat Survey Level 2) Ecologist, Wardell Armstrong LLP.

2.4.3 The emergence surveys were undertaken in the evening approximately fifteen minutes before local sunset, for up to two hours after. The dawn surveys commenced an hour and a half before local sunrise, concluding 15 minutes after sunrise.

2.4.4 Echo Meter Touch (Wildlife Acoustics, Inc., Massachusetts) bat detectors and iPads (Apple Inc., California) were used to detect bats and the built-in Kaleidoscope classifiers were used to assist species identification. If required, the results were later analysed using BatSound sonogram analysis software (Version 3.31, Petterson Elektrik).

Table 1: Building Numbers and Survey Dates

Building Location	Building Number	Date Surveyed	Survey Type
Walford Hall Farm South Western Quadrant	B15	09.05.2018	Dusk
	B16	08.05.2018	Dusk
	B17	09.05.2018	Dawn
	B18	08.05.2018	Dusk
	B19	22.05.2018	Dawn
	B20	17.05.2018	Dawn
	B21	15.05.2018	Dusk
	B22	02.05.2018	Dusk
Hampton Lane farm North Western Quadrant	B3	09.05.2018	Dusk
	B4	09.05.2018	Dawn
	B5	29.05.2018	Dusk
	B6	29.05.2018	Dusk
	B7	29.05.2018	Dusk
	B8	16.05.2018	Dawn
	B9	16.05.2018	Dusk
	B10	30.05.2018	Dawn

2.5 Dusk Emergence and Dawn Re-entry Surveys of Trees

2.5.1 Trees which are confirmed to support a roost (in either 2014 or 2018) or are considered to have roost features of moderate to high value which could not be fully searched by the climbed inspection were subject to a single dusk emergence or dawn

re-entry survey. Survey dates are provided in Table 2 below. The methodology followed that proposed in Collins (2016) and involved survey by two experienced ecologists broadly situated on each side of the tree, checking for bats emerging or returning for roosts at dawn.

Table 2: Tree Emergence/Dawn Re-entry Survey Dates

Tree Number	Date of survey	Time of Sunset/Sunrise	Start of survey
54	26.06.2018 27.06.2018	21.34 04.45	21.19 03.00
98	30.06.2018	21.33	21.18
100	26.06.2018 27.06.2018	21.34 04.45	21.19 03.00
111	27.06.2018	03.00	04.45

2.6 Nomenclature

2.6.1 All flora and fauna names follow the National Biodiversity Network (NBN) Gateway (NBN, 2013). The common and scientific name of species/taxa is provided (if available) when first mentioned in the text, with only the vernacular name referred to thereafter.

2.7 Assessment Limitations

2.7.1 The absence of desk study records has not been relied upon to infer absence of a species/habitat. Often, the absence of records is a result of under-recording within the given search area.

2.8 Quality Assurance & Environmental Management

2.8.1 All Ecologists employed by Wardell Armstrong are members of CIEEM and are bound by its code of professional conduct. All surveys and assessments have been undertaken with reference to the recommendations given in BS 42020.

3 SURVEY RESULTS

3.1 Desk Study

3.1.1 Only two new roost records were supplied within the desk study information, namely, two solitary brown long-eared roosts near Birmingham Airport. This species was previously identified by the desk study undertaken in 2014. Previously records of five bat species have been supplied within desk study search area; namely brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* noctule *Nyctalus noctula*, and Daubenton's Bat *Myotis daubentonii*.

3.2 Preliminary Building Assessments

3.2.1 Appendix 2 provides a description and photograph of the buildings surveyed and an assessment of likely suitability/potential for roosting bats.

3.2.2 The potential of the majority of buildings to support bats has remained unchanged, with the exception of B21. Since the previous surveys this buildings suitability has increased from Low to Moderate value for roosting bats. Features have been created and access to the building interior have occurred due to the natural deterioration of the building. Continued deterioration of roof timbers appears to have caused roof tiles to slip opening up new gaps, which could be utilised by bats as access features to the building interior/roof.

3.2.3 Of the 19 buildings within the survey area: five are assessed as being of 'Negligible' potential, six of 'Low' potential, a further four of 'Moderate' potential and four of 'High' potential. Additionally, 7 of the buildings are confirmed roosts. Buildings B3, B4, B7, B8, B10, B15 and B22 are now all confirmed as supporting one or more species of common pipistrelle, soprano pipistrelle and/or Brown long-eared bat. All identified roosts are of individual, non-breeding bats.

3.2.4 During internal inspections a single fresh brown long-eared bat dropping was recorded within building B4, along with scattered moth wings. A single bat dropping of a size and shape consistent with *Pipistrellus* species was recorded in the southern section of B7 on a bag underneath a roof beam. Degraded droppings of a similar size were recorded immediately outside on a street lamp, likely to have been voided in flight.

3.2.5 Surveys undertaken in 2014 recorded a dropping considered to be the size and shape of a *Pipistrellus* sp within the eastern gable end of the loft void in building B8. Two extremely degraded droppings were also recorded within building B22 this building has since been categorised as confirmed roost for both common and soprano pipistrelle.

3.2.6 Many of the buildings have some limited potential for low numbers of hibernating bats, within ridge tiles and wall crevices.

3.3 Preliminary Tree Assessments

3.3.1 Eighty-one individual trees and five tree groups were identified within the survey area with suitable roosting features for bats. Trees were re-assessed for their suitability to support roosting bats giving a value of low – high potential in accordance with best practice guidelines (Collins 2016). The preliminary assessments have largely been superseded by the reassessment results of the climbed inspections (section 3.4 below).

3.4 Climbed Inspection Surveys

3.4.1 Ninety-three standard trees located on site and within Tree groups G14, G15, G16 and G17 identified as being of Moderate or High Suitability for roosting bats were subject to climbed inspection; eighty-nine of which were fully inspected, and all cavities were exhaustively searched. Eight trees within the survey area could not be searched due to health and safety restrictions or dense ivy these were T62, T63, T64, T98, T99, T103, T111, T112. Only two of these trees namely T98 and T111 may be directly impacted by the proposed development and were therefore subject to further activity survey to determine presence or infer absence of a roost. Climbed inspection results are provided within Appendix 3.

3.4.2 Of the four known tree roosts (T54, T98, T100 and T124) identified during the 2014 surveys, two trees namely T54 and T98 (recorded as a brown long-eared bat roost) together with T124 (recorded as *Pipistrellus* spp) still supported the roost features but were unoccupied at the time of the 2018 inspections and no evidence of occupation (droppings) was recorded. On inspection, the feature located within tree T124 was considered to have deteriorated and is of low suitability, however, other features within the tree were still considered to be of high interest. The roost feature in T100

was no longer viable. Previously, the roost feature was located beneath loose and flaking bark, which has since been lost due to natural processes. Other features were still present and of high value.

3.4.3 One additional tree roost was recorded in T215 (located in Group 16 on drawing number SH11315A/013) during 2018 survey. A single *Myotis spp* was recorded by endoscope survey within a frost crack cavity. This tree is located centrally within Aspbury's copse and will not be directly impacted by the development works.

3.4.4 Table 3 below summarises the identified roosts. Appendix 3 summarises the climbed inspection survey results.

Table 3: Summary of Bat Roosts Located within the Survey Area

Tree Reference Number	Recorded in 2014	Recorded in 2018	DNA Analysis Results	Species Recorded	Number of droppings	Features Present	Impact
54	✓	*x*	Brown Long-eared bat	Brown Long-eared bat	Single	Lifted bark leading to cavity. Multiple deep, well protected cavities present within.	Direct – loss of tree to road layout
98	✓	*x*	n/a	Brown Long-eared bat	n/a	Longitudinal cracks in major limbs.	Direct – loss of tree to accommodate required visibility splay to vehicles exiting Walford Hall Farm.
100	✓	Roost feature no longer present	Brown Long-eared bat	Brown Long-eared bat	Multiple droppings In 2014	Roost feature beneath lifted bark is no longer viable. The lifted bark has now been shed resulting in the loss of the roosting feature.	Indirect - lighting
124	✓	*x*	Inconclusive	Droppings of size and shape consistent with *Pipistrellus* spp.	Multiple droppings	Roost at 9 m in cavity within dead limb	None

215 (G16)	*x*	✓	n/a	*Myotis* spp	None	Frost crack cavity	None

3.5 Dusk Emergence and Dawn Re-entry Surveys

3.5.1 Bat roosts were recorded within 7 buildings. Four species were recorded roosting, namely; common pipistrelle soprano pipistrelle, *Myotis* spp and brown long-eared bat. Table 4 below summarises the roosts identified. Appendix 4 includes the dates and weather conditions of the dusk emergence and dawn re-entry surveys.

Table 4: Summary Dusk and Dawn Survey Results

Building Reference	Species Recorded in 2018	Number of bats	Species previously recorded in 2014	Roost Type	Access Points
B3 Barn at Hampton Lane Farm	Soprano Pipistrelle and *Myotis* spp	Single bat	Common Pipistrelle	Low status non-breeding summer roost	Internal roost. Exit point via south western corner of southern gable and gap in roof.
B4 Barn at Hampton Lane Farm	Brown long-eared	Single bat	Common Pipistrelle	Low status non-breeding summer roost	BLE recorded emerging from the south-eastern gable. Pipistrelle emerged from eaves at the far eastern and western elevations
B7 Barn at Hampton Lane farm	Brown long-eared	Two bats	none	Low status non-breeding summer roost	BLE recorded Light sampling within the southern end of building.
	Pipistrelle spp.	Single bat			Northern elevation
B8 Hampton Lane Farm Cottage	Common pipistrelle	Single bat	Common Pipistrelle (plus degraded dropping in roof void)	Low status non-breeding summer roost	Eastern gable end.
B10 Barn at Hampton Lane Farm	Common Pipistrelle	Single bat	Brown Long-eared Bat	Feeding Perch	Feeding perch on concrete rafters. Pipistrelle re-entered building at northern gable end
			Common Pipistrelle	Low status non-breeding summer roost	
B15 Barn at Walford Hall Farm	None	None	Common Pipistrelle	Low status non-breeding summer roost	Internal Roost, within rafters

B22 Walford Hall Farmhouse	Common Pipistrelle Soprano Pipistrelle	Single bat	Common Pipistrelle	Low status non-breeding summer roost	Raised roof tile Northern Gable end

3.5.2 In summary, the only 'new' roost recorded on site is within building B7 (a low status non-breeding brown long-eared bat and *Pipistrellus* sp roost). In addition, new species have been recorded in two previously known roosts within B3 and B4.

3.6 Emergence and Dawn Re-entry Surveys of Trees

3.6.1 Four trees were subject to an emergence/ dawn re-entry survey, namely, T54, T98 T100 and T111. Three of the trees (T54, T98 and T100) supported non-breeding low status brown long-eared roosts during 2014. No bats were recorded emerging /re-entering the trees during the 2018 update surveys, although their roost status remains.

4 EVALUATION

4.1 Buildings

4.1.1 No buildings will be demolished as part of the development proposals for the MSA or shall be directly impacted by the proposed development, as they all lie outside the planning application area. However, bat roosts may be adversely affected by the proposed MSA lighting scheme or other indirect impacts. This is assessed within the Environmental Statement Ecology Chapter (Wardell Armstrong, 2015).

4.2 Trees

4.2.1 Tree T54 is located within the development area and will be felled. This will result in the loss of a single brown long-eared bat roost which was identified during the 2014 surveys but was not present during the 2018 updates. Given the low number of droppings recorded within the roost and the degraded state of the droppings, together with the total lack of roost evidence from 2018, it is considered that the roost is rarely used and of low status. In terms of T98 the retention/loss of this tree, together with its supporting low status brown long-eared bat roost remains unconfirmed.

4.2.2 The remaining identified tree roosts will not be directly impacted by the development; however, roosts may be affected by indirect adverse effects. Such impacts are assessed within the Environmental Statement Ecology Chapter (Wardell Armstrong, 2015).

4.2.3 Given the anticipated loss of a roost a European Protected Species Licence (EPSL) will be required from Natural England in order to ensure compliance with the relevant protective legislation. The method statement document within the licence application will detail specific mitigation and compensation required in order for the works not to detrimentally impact the local bat population.

4.2.4 Mitigation and compensation would include:

- The installation of 18 tree mounted ‘woodcrete’ bat boxes, to provide roosting opportunities. It is envisaged that three bat boxes would be installed on six separate trees.

- A lighting scheme to retain unlit bat corridors; to provide suitable commuting opportunities for bats. This would seek to limit isolation and fragmentation impacts and link habitats and potential roosting opportunities between the site and adjacent habitats. The scheme should be designed to ensure that the compensation roost provision (bat boxes) described above are not exposed to any light spill;
- Detailed site induction and tool box talks to be given by the Named Ecologist to the contractor personnel on the presence of bats, the legal status and the conditions of the licence; as well as provision of a summary of safe working practices in relation to bats prior to felling;
- Installation of exclusion devices may be used, if appropriate. If required the devices will remain in-situ for a minimum of five nights of suitable weather conditions. If required a final emergence and/or dawn survey will be undertaken before tree felling, to ensure bats are no longer utilising these features;
- Named Ecologist (or Accredited Agent) to supervise the 'soft' felling of the trees. If possible this should include the removal of lifted bark (only if possible without killing or injury of any potential bats); and
- If bats are found during tree felling, bats to be placed in a draw string cloth bag by the Named Ecologist (or Accredited Agent) and placed immediately into one of the previously installed bat boxes.

5 REFERENCES

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Wardell Armstrong (2015) Motorway Service Area (MSA) and New Junction between Junctions 5 & 6 of the M42, Solihull: Environmental Statement Ecology Chapter

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APPENDIX 1 – LEGISLATION AND POLICY SUMMARY

All bat species are listed within Schedule 5 of the Wildlife and Countryside Act 1981 as amended) and receive protection under section 9 of this act. They are also protected under section 39 of the Conservation (Natural Habitats, &c.) Regulations 1997 (and amendments) (known as the Habitats Regulations). Taken together the following offences apply under the combined acts:

Regulation 41 of the Habitats Regulations 2012, states that a person commits an offence if they:

- Deliberately or intentionally capture, injure or kill a bat;
- Intentionally or recklessly damage, destroy or obstruct access to; any structure or place used for shelter or protection by a bat;
- deliberately, intentionally or recklessly disturb a bat;
- damage or destroy a breeding site or resting place of a bat; or
- keep, transport, sell, exchange or offer for sale any bat(s) or anything derived from this species.

Disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong.

The Natural Environment and Rural Communities (NERC) Act 2006 places a duty on public bodies to have regard for the conservation of biodiversity and maintains lists of species and habitats which are of principal importance for the purposes of conserving biodiversity in England and Wales. These lists supersede Section 74 of the CRoW Act 2000.

The United Kingdom Biodiversity Action Plan (UK BAP) first published in 1994 and updated in 2007, is a Government initiative designed to implement the requirements of the Convention of Biological Diversity to conserve and enhance species and habitats. The UK BAP contains a list of priority habitats and species of conservation concern in the UK, and outlines biodiversity initiatives designed to enhance their conservation status. The priority habitats and species in England accord with those listed on Section 41 of the NERC Act.

The 'UK Post-2010 Biodiversity Framework' (Revised July 2012) succeeds the UK BAP and 'Conserving Biodiversity – the UK Approach', and is the result of a change in strategic Thinking following the publication of the CBD's 'Strategic Plan for Biodiversity 2011–2020' and its 20 'Aichi targets', at Nagoya, Japan in October 2010, and the launch of the new EU Biodiversity

Strategy (EUBS) in May 2011. The framework demonstrates how the work of the four countries and the UK contributes to achieving the 'Aichi targets', and identifies the activities required to complement the country biodiversity strategies in achieving the targets.

The NPPF underpins the Government's planning policies for England and how these are to be applied. The central theme of the NPPF is a presumption in favour of sustainable development. This presumption does not apply where development requiring Appropriate Assessment under the Birds or Habitats Directives is being considered, planned or determined.

The NPPF states:
'When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- proposed development on land within or outside a Site of Special Scientific Interest (SSSI) likely to have an adverse effect on a SSSI (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of SSSIs;
- development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;
- opportunities to incorporate biodiversity in and around developments should be encouraged;
- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss

of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and

- the following wildlife sites should be given the same protection as European sites:
- potential Special Protection Areas (SPA) and possible Special Areas of Conservation (SAC);
- listed or proposed Ramsar sites; and
- sites identified, or required, as compensatory measures for adverse effects on European sites, potential SPAs, possible SACs, and listed or proposed Ramsar sites.'

The NPPF requires the Planning Authority to have a responsibility to promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan. In addition, the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

APPENDIX 2 - BUILDING DESCRIPTIONS

Building Number[2]	Brief description	Photographs	Features	Potential in 2014	Potential in 2018	Bat Evidence in 2014	Bat evidence in 2018
B1	Open 'shelter' hay/ straw store		None	Negligible	Negligible	None	None
B2	Dutch Barn. Sheet steel and timber slates		None	Negligible	Negligible	None	None

[2] Building locations are shown on Drawing SH11315/005

Building Number[2]	Brief description	Photographs	Features	Potential in 2014	Potential in 2018	Bat Evidence in 2014	Bat evidence in 2018
B3	Modern sheet steel barn over timber framework and steel joists/supports. Currently used as a grain store.		None	Confirmed Roost	Confirmed Roost -	Single common pipistrelle emerged No evidence recorded during preliminary surveys.	Single soprano pipistrelle and brown long-eared bat emerged from the building
B4	Victorian red brick barn, cattle stalls, hay lofts and sheds. The building has both single and 2 story sections. Asbestos sheeting covers the pitched roof. Small sections of rosemary tiles remain on the roof. Mortar not in a good state of repair.		Gaps in brick work, missing roof tiles and multiple internal access features	High	Confirmed Roost	none	One BLE recorded emerged at dusk and re-entered at dawn

Building Number[2]	Brief description	Photographs	Features	Potential in 2014	Potential in 2018	Bat Evidence in 2014	Bat evidence in 2018
B5	Open barn, of sheet steel and cladded walls		None	Negligible	Negligible	None	None
B6	Open barn, of sheet steel and cladded walls		None	Negligible	Negligible	None	None

Building Number[2]	Brief description	Photographs	Features	Potential in 2014	Potential in 2018	Bat Evidence in 2014	Bat evidence in 2018
B7	Brick built traditional bran, pitched rosemary tiled roof with weatherboarding on gable end. The southern section of the barn has been reroofed, new battens and a roof liner has been used.		Ridge tiles missing, gaps in weather boarding	High	Confirmed Roost		1 Pipistrelle sp recorded flying inside building 2 BLE bats light sampling before emergence
B8	Occupied farm house - c. 1970's-80's. Detached brick built, pitched roof with concrete interlocking tiles. Wooden soffits and barge boards. Lead flashing present and timber cladding.		Gaps in lead flashing, soffits, barge boards and timber cladding.	High	High	Single bat dropping - pip spp in 2014.	No evidence recorded in 2018

Building Number[2]	Brief description	Photographs	Features	Potential in 2014	Potential in 2018	Bat Evidence in 2014	Bat evidence in 2018
B9	L-shaped brick built traditional barn, pitched rosemary tiled roof. The building is partially open fronted. Open fronted sections have been re-roofed using a liner and new battens and modern timbers. A concrete garage is attached to the eastern elevation		Ridge tiles missing,	High	Moderate	None	None
B10	Dutch Barn. Sheet steel and timber slates		Minor gaps between timber and frame.	Confirmed Roost	Confirmed Roost	Single common pipistrelle emerged. No evidence recorded during preliminary inspection	None
B11	Three open fronted breeze block and corrugated asbestos sheet barns with pitched roof. Concrete asbestos ridge and fascia boards. Open to apex with	Outside of ownership boundary – no photograph taken	Gaps between fascias and wall and under central ridge	Low	Negligible	None	None

Building Number[2]	Brief description	Photographs	Features	Potential in 2014	Potential in 2018	Bat Evidence in 2014	Bat evidence in 2018
	skylights present. Barns are in a state of disrepair, with steel sheeting fallen away and loose.						
B15	Open cattle barn of breeze block, steel, wood slats and corrugated asbestos construction. Building open to apex.		Minor gaps between timber and steel frame	Confirmed Roost		Single common pipistrelle emerged	None
B16	Single storey out-building of red brick construction, pitched roof covered with asbestos sheeting. Timber topped, double skin walls. Brickwork mainly in good condition with some gaps, though dense scrub down one side of building – not possible to inspect beneath.		Gaps between roof and wall tops providing access internally, mortar missing where asbestos meets wall providing gaps to niche features.	Low	Low	None	None

Building Number[2]	Brief description	Photographs	Features	Potential in 2014	Potential in 2018	Bat Evidence in 2014	Bat evidence in 2018
B17	Open single storey red brick out-building with single pitched corrugated asbestos roof, with timber frame. Internal walls, half height present. Building open to apex. Brick work mainly in good condition with some gaps, though structurally unsound with wall bulging in places. Timber and timber/brickwork connections well sealed.		Wall top gaps	Low	Low	None	None
B18	Single storey red brick out-building, pitched corrugated asbestos roof. Previously lime rendered internal walls and original timbers present. Internal wall present, separating building into two internal sections. Very bright internally. Brickwork and window/door frames well-sealed. Some gaps in brickwork providing access internally.		Wall tops form internal access and external access to gable end.	Low - Moderate	Moderate	None	None

Building Number[2]	Brief description	Photographs	Features	Potential in 2014	Potential in 2018	Bat Evidence in 2014	Bat evidence in 2018
B19	Modern single storey barn of red brick and corrugated asbestos and steel beam construction with asbestos fascia. Building open to apex and in good condition overall.		None	Negligible	Negligible	None	None
B20	Two storey red brick stables and hay loft. Access to hay loft via open hatch and stables via gaps around doors and windows. Pitched roof with rosemary tiles and lined but ripped in sections. High internal light levels. Internally and externally mortar and brickwork is well sealed. The timber stalls within the stable are tightly sealed and well-sealed at connection to brickwork.		Gaps beneath raised, slipped and broken tiles and ridge tiles. Gaps present on wall tops. Single plank on rear of building with gap, however, the gap is large and exposed	Low - Moderate	Moderate	None	None

Building Number[2]	Brief description	Photographs	Features	Potential in 2014	Potential in 2018	Bat Evidence in 2014	Bat evidence in 2018
B21	Two storey red brick barn, with pitched rosemary tile roof. Internally partially open to the apex with a small second storey section. Mainly bright, however, a dark section is present beneath the second storey section. Mortar and brickwork in good state of repair, both internally and externally. Mortar and brick work in good state of repair, both internally and externally.		Missing, raised, and broken roof tiles. Gaps present on wall tops. Gaps around door frame. Edge of the roof has deteriorated since previous visit. Windows are broken allowing access to building interior.	Low	**Moderate**	None	None
B22	Main farm house. Two storey timber and red brick construction with pitched and hipped rosemary tiled roof. Two chimney stacks present. Windows boarded up. Small cluttered roof space present. Lining and sarking board present in places. Access to only a small percentage of the		Raised, slipped, missing and broken roof and ridge tiles Each room varies in temperature due to size, has cupboards and chimney entrances to roost in and the timber work, liner and	Confirmed roost	Confirmed Roost	Two very old droppings present. Too decomposed to positively identify species, however the droppings were large.	None (no access).

Building Number[2]	Brief description	Photographs	Features	Potential in 2014	Potential in 2018	Bat Evidence in 2014	Bat evidence in 2018
	roof space and it therefore could not be fully searched. Once access is gained to the roof the entire of the building could be utilised by roosting bats as the property is full of niche features.		sarking provide niche features also.			Single common pipistrelle recorded roosting during the emergence surveys	

APPENDIX 3 – CLIMBED INSPECTION RESULTS

Tree Number	Species	Bat suitability 2014	Bat suitability 2018	Notes	Fully Inspected
24	Pedunculate oak	1	Moderate	Multiple moderate features, mostly in deadwood	✓
25	Pedunculate oak	1*	High	3 well protected trunk cavities	✓
26	Pedunculate oak	1	Moderate	Lifted bark leading to small cavity - well protected + multiple moderate features	✓
30	Pedunculate oak	1*	High	Two large, well-protected cavities, one in trunk, one in limb	✓
33	Pedunculate oak	1	Moderate	Enclosed, deep cavity + multiple moderate features	✓
35	Pedunculate oak	2	Moderate	11 features, all low potential! Superficial	✓
36	Pedunculate oak	1	Moderate	Large cavity with two entrances. Well protected	✓
40	Pedunculate oak		Moderate	Cavity beneath callus rolls with horizontal chambers, rot hole and loose bark	✓
48	Pedunculate oak	1	High	Lifted bark/branch cavity, well protected.	✓
48A	Ash	n/a	High	Deadwood branch with upward cavity and large open tear out with enclosed cavities. Loose bark.	✓
49	Ash	1*	High	Multiple large, well-sheltered cavities	✓
50	Pedunculate oak	1	High	Large multi-chambered cavity, plus excellent loose bark feature	✓
51	Pedunculate oak	2	Moderate	Some loose bark providing shelter, to moderate potential	✓
54	Pedunculate oak	Confirmed-BLE	High	Dropping found beneath lifted bark leading to cavity - though single and incomplete. Multiple deep, well protected cavities. No evidence recorded during 2018.	✓
55	Pedunculate oak	1	Moderate	Multiple moderate features - loose bark + callus roll	✓
57	Pedunculate oak	3	Moderate	Two low potential features only	✓
58	Pedunculate oak	1	High	Well protected trunk cavity + multiple moderate features	✓
59	Pedunculate oak	1	High	Well protected cavity but evidence of occasional bird use as roost.	✓

Tree Number	Species	Bat suitability 2014	Bat suitability 2018	Notes	Fully Inspected
60	Pedunculate oak	1	High	Cavity in dead branch and at base in trunk. Dry, enclosed, well protected	✓
61	Pedunculate oak	1	High	Multiple moderate features, plus one high -large, well-protected cavity	✓
62	Pedunculate oak	1	High	Several moderate features + large cavity in dead limb	No – dead and unstable
63	Pedunculate oak	1*	Moderate	Precautionary - not safe to climb. Dead. Multiple features of loose bark/knot holes + dense ivy cover.	No – dead and unstable/ivy
64	Pedunculate oak	1*	moderate	Deadwood/thick ivy	No- unstable – dense ivy
66	Ash	1	High	Upward cavity developing on tear out from main stem and upward cavity in main stem with narrow entrance	✓
66A	Ash	n/a	Moderate	Woodpecker hole with downward cavity	✓
67	Ash	1	High	Rot hole, knots and tear outs on limbs. Butt rot cavity extending up main stem.	✓
91	Ash	1	High	Internal and upward developing cavities, north facing knot hole.	✓
92	Pedunculate oak	1	High	Tree hollow, with butt rot, various cavities extending horizontally and downward.	✓
93	Pedunculate oak	2	Moderate	Callus roll at the base of a limb by main stem and rot hole developing into cavity in attached deadwood.	✓
94	Pedunculate oak	2	Moderate	Large trunk split exposed with small cracks, a branch cavity in deadwood.	✓
95	Ash	2	Moderate	Many cavities/splits but mostly exposed	✓
96	Pedunculate oak	1	Moderate	2 branch cavities to 60cm deep	✓
97	Pedunculate oak	1*	High	Multiple large, multi-chambered cavities in main stem, plus hazard beam in limb, loose bark.	✓

Tree Number	Species	Bat suitability 2014	Bat suitability 2018	Notes	Fully Inspected
98	Pedunculate oak	1	High	Hazard beam accessed and partially endoscope but ivy/dead limbs high in canopy overhanging road - not safe to access	No - Dead and unstable
99	Pedunculate oak	1*	High	Multiple large cavities + 12 additional moderate features. Too complex to fully inspect.	No - Dead and unstable
100	Pedunculate oak	Confirmed-BLE	High	Roost feature no longer present. Much less bark on tree compared to 2015 survey. Other high suitability features present on the tree	✓
101	Pedunculate oak	1	High	Lightning damage - cavity leading to further inaccessible cavities	✓
103	Pedunculate oak	1*	Moderate	Accessible features endoscoped, Crow's nest - superficial deadwood features. Cracks in deadwood provide good, dry shelter.	No – dead and unstable
104	Pedunculate oak	1	High	Callus roll leading to nicely sheltered cavity	✓
105	Ash	1	High	Rot hole within open stem cavity. Minor shelter within hazard beam, callus roll on branch.	✓
107	Pedunculate oak	1	High	Extensive branch cavity with tear out and lateral split providing access pint. Cavity in deadwood, callus roll and loose bark.	✓
110	Pedunculate oak	2	High	Multiple low/moderate features + dense mature ivy offering some potential	✓
111	Pedunculate oak	n/a	Moderate	Very thick Ivy -	No – due to very dense ivy
112	Pedunculate oak	1	High	Multi-chambered cavity with three entrances	No - dead and unstable
122	Pedunculate oak	1	High	Large multi-chambered cavity, dry loose bark	✓
123	Ash	1	High	1m+ deep cavity, fully enclosed.	✓
124	Pedunculate oak	Confirmed-Pot Pip	High	Feature in tree has split open as the dead branch is desiccated. Other features of high interest present.	✓

Tree Number	Species	Bat suitability 2014	Bat suitability 2018	Notes	Fully Inspected
125	Oak sp. (Dead)	1	Moderate	Deep, narrow cavity in end of broken limb - excellent protection + moderately sheltered loose bark/callus roll	✓
126	Pedunculate oak	1*	High	Large tear-out on limb with multiple splits + narrow opening into larger cavity - not possible to fully inspect. Also, well protected hazard beam feature and multiple moderately sheltered cavities.	✓
127	Ash	1*	High	Two fully enclosed, large cavities	✓
129	Pedunculate oak	n/a	Moderate	Deadwood with lifted bark and cavities. Knot holes also present.	✓
130	Ash	n/a	Moderate	Horizontal developed cavity, good shelter on underside	✓
131	Pedunculate oak	n/a	Moderate	Large broken limb and branch cavities upward facing.	✓
132	Crack willow	n/a	High	Wedge shaped cavity within main stem, cavity in split wood and rot holes in deadwood.	✓
133	Pedunculate oak	n/a	Moderate	Knothole with horizontal cavity developing proximally.	✓
134	Pedunculate oak	n/a	Moderate	Hard beam in major limb failure- shelter at proximal end. Dense cobwebs present. Knot hole leading to partial hazard beam.	✓
135	Pedunculate oak	n/a	Moderate	Vertical cavity beneath callus.	✓
136	Pedunculate oak	n/a	High	Horizontally developed cavity in rot hole of pruning cut.	✓
138	Pedunculate oak	n/a	Moderate	Hollow dead limb with internal cavity progressing toward distal end. Cracks allowing some exposure. Decaying pruning cut also present.	✓
139		n/a	Moderate	Knot hole leading to horizontal cavity in main stem. Three pruning wounds.	✓
141	Oak	n/a	Moderate	Pruning wound, a knot hole and deadwood features.	✓
143	Ash	n/a	High	Hollow limb with several woodpecker holes access points into cavity and knot holes.	✓

Tree Groups

Group Number	Tree number	species	Bat Potential 2014	Bat Potential 2018	Notes	Fully Inspected
G15	300	Pedunculate oak	2	Moderate	Broken limb with cavity at break. Enclosed and well protected. Tear-out with callus roll plus cavity in proximal end. Well protected though shallow area.	✓
	301	Pedunculate oak	1	High	Small cavity beneath dead limb offering good shelter.	✓
	302	Oak	2	moderate	Branch weld with cavity. widest entrance from underside. well protected	✓
	303	Ash	1	High	Woodpecker hole leading to bowl shaped downward developed cavity in main stem, with bird nesting material in base. Knot hole leading to cavity and loose bark	✓
	304	Oak	2	Moderate	Lateral cavity proximally developed at base of deadwood. Rot hole and loose bark	✓
	305	Pedunculate oak	1	high	Large upward facing tear-out with 1m split in deadwood along limb - exposed cavity within deadwood. Deep cavity extending upwards into tear out feature, beneath deadwood. Distal section exposed but lower portion well sheltered	✓
	307	Unknown (dead)	1	High	Precautionary	Not safe to climb
	308	Oak	2	Moderate	Large rot hole opening to cavity in stem. progresses downward 50cm (High exposure) and upward 12cm (sheltered). Cobwebs and slugs in abundance	✓
	309	Pedunculate oak	1	High	Knot hole/small tear-out leading to large, upward developed cavity in main stem	✓
	310	Pedunculate oak	1	High	Tear-out in main stem leading to large, upward developed cavity offering good shelter	✓

	311	Pedunculate oak	1	High	woodpecker hole with cavity developing downward 20cm and upward 15cm	✓
	312	Pedunculate oak	1	High	Three consecutive tear outs along hollow limb creating a single cavity with multiple entrance holes. All upper side of limb. Some exposure but well sheltered in parts	✓
	313	Pedunculate oak	1	High	Complex cavity in main stem with woodpecker hole plus knot hole entrances. Multiple crevices within offering excellent shelter	✓
	316	Pedunculate oak	1	High	Knot hole leading to cavity in stem developing upwards. Offers good shelter. Rot hole also present	✓
	316A	Pedunculate oak	1	High	Cavities formed from a combination of three subsidence cracks and butt rot in main stem. Each up to 30cm deep, 2-3cm wide. Offering very good protection	✓
	317A	Field Maple	2	Moderate	Knot hole leading to upward developing cavity in main stem. Offers good shelter. Some debris	✓
	318	Turkey oak	2	Moderate	Knot hole with upward developed cavity, dry and clean	✓
	321	Oak	2	Moderate	Butt rot with upward developing cavity. Unable to fully inspect. Grading provisional	✓
	322	Turkey oak	1	High	Branch weld with developed cavity offering good shelter, rot hole also present leading to cavity.	✓
G16	200	Pedunculate oak	1	High	Small upward cavity and rot hole	Not fully accessible
	205	Pedunculate oak	2	Moderate	Dense ivy, loose splintered bark and broken limb	✓
	205A	Pedunculate oak	2	Moderate	Horizontal cavity on upper side of limb	✓
	206	Ash	1	High	Large branch tear out from main stem, woodpecker hole, small cavity under callus roll and open butt rot cavity.	✓

	207	Ash	2	Moderate	Woodpecker hole leading to small, downward developed, smooth sided cavity in major limb	✓
	208	Field maple	2	Moderate	Loose bark providing shelter against dead trunk, shallow knot hole.	✓
	210	Field maple	2	Moderate	Twin stem, with blind know hole and double knot hole within inaccessible feature.	Not fully inspected
	211	Pedunculate oak	2	Moderate	Large tear out in large limb. 1.2m long. upper section open. cavity dev upwards behind callus roll in lower section - good shelter	✓
	212	Pedunculate oak	2	Moderate	1.4m long cavity in limb from tear-out in upper side of limb, somewhat exposed at base, loose bark and knot holes.	✓
	213	Black popular	1*	High	Woodpecker hole with downward developed nest cavity. two entrances. one west facing, one south. Knot hole feature in main stem.	✓
	215	Pedunculate oak	n/a	Confirmed Roost	Frost crack running from near ground level - cavity extending 60cm from top of opening providing excellent protection. *Myotis* sp recorded	✓
G17	219	Pedunculate oak	1*	High	Lateral split in base of dead limb with tapering wedge-shaped cavity developing distally affording excellent shelter. Knot hole in deadwood leading to a cavity.	✓
G18	18a	Pedunculate oak	n/a	High	Rot hole leading to trunk cavity spreading into major limbs. Damp at the base with detritus. Cavity within deadwood, dry loose bark.	✓

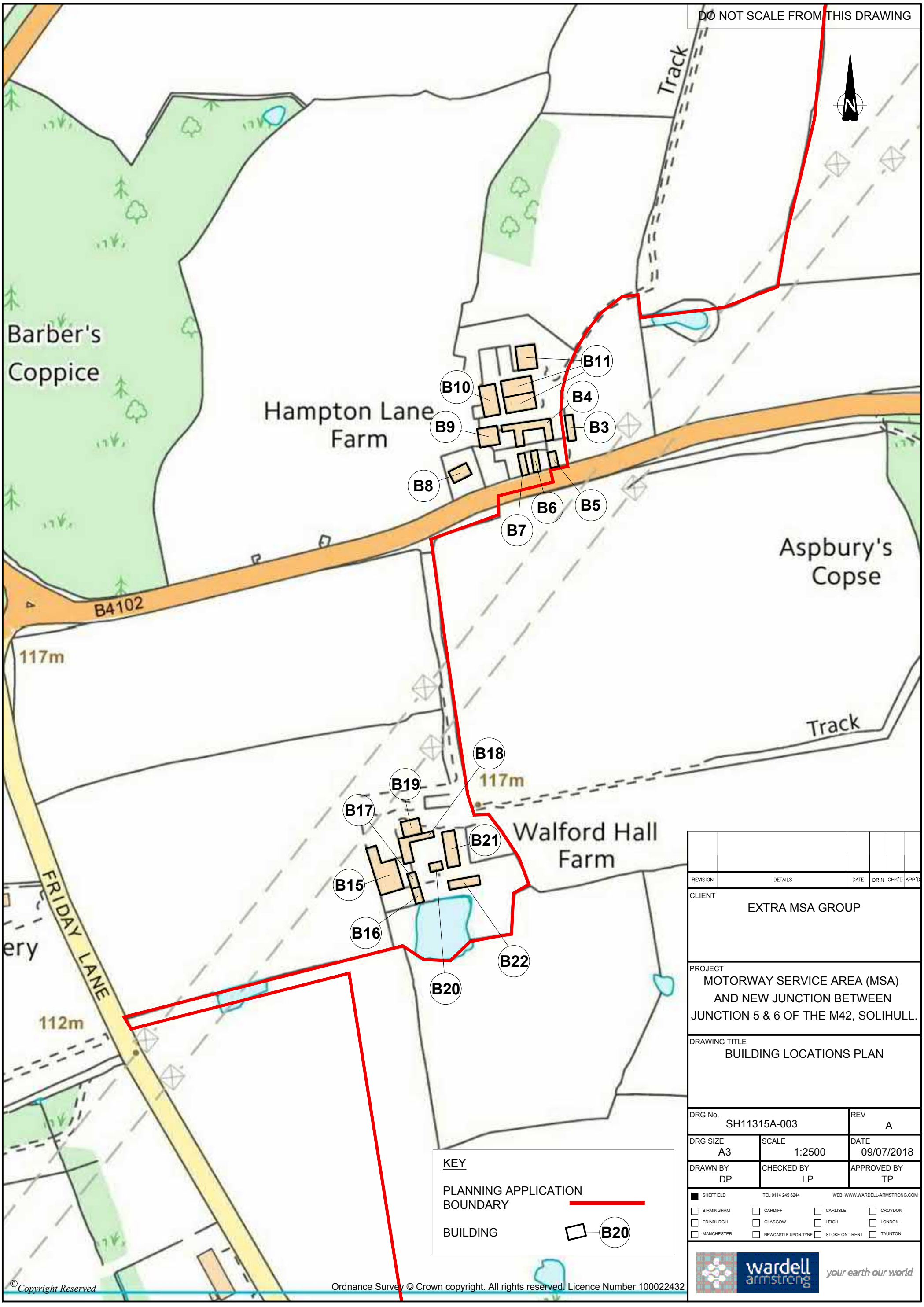
APPENDIX 4: ROOST SURVEY WEATHER CONDITIONS

Appendix 4: Survey Conditions					
Date	**Weather Conditions**	**Sunrise / Sunset**	**Start Time**	**Finish Time**	**Ecologists**
02/05/2018	10°C, 2/8 cloud cover, F4 wind speed, no precipitation	20:34	20:19	22:14	LP, FD, JI & JH
08/05/2018	13°C, 0/8 cloud cover, F2 wind speed, no precipitation	20:46	20:30	22:23	TP, FD, JH, JI & DG
09/05/2018	8°C, 1/8 cloud cover, F1 wind speed, dry	05:25	03:40	05:35	TP, FD, JH, JI & DG
09/05/2018	12°C, 95% cloud cover, F2-3 wind speed, very fine drizzle recorded at start of survey	20:46	20:35	22:30	FD, JH, JI & DG
15/05/2018	18°C, 4/8 cloud cover, F4-F5 wind speed, no precipitation	20:56	20:41	22:56	KS & JH
16/05/2018	13°C, 6/8 cloud cover, F3 wind speed, no precipitation	05:10	03:40	05:25	KS & JH
16/05/2018	13°C, 2/8 cloud cover, F3-F4 wind speed, no precipitation	20:57	20:42	22:57	KS & JH
17/05/2018	4°C, 0/8 cloud cover, F2 wind speed, no precipitation	05:08	03:38	05:23	KS & JH
21/05/2018	20°C, 6/8 cloud cover, F2 wind speed, no precipitation	21:05	20:50	22:35	JI, KS, JH & SG
22/05/2018	12°C, 7/8 cloud cover, F3 wind speed, no precipitation	05:01	03:31	05:16	JI, KS, JH & SG
22/05/2018	17°C, 0/8 cloud cover, F2 wind speed, no precipitation	21:06	20:51	22:38	JI, KS, JH & SG
23/05/2018	9°C, 8/8 cloud cover, F3-F4 wind speed, no precipitation	05:01	03:31	05:16	JI, KS, JH & SG
29/05/2018	17C, 8/8 cloud cover, F5-6, no precipitation	21:16	21:01	21:46	KS, JI, JH & GC
30/05/2018	14C, 8/8 cloud cover - low cloud, F3 wind speed, no precipitation	04:52	03:22	05:07	KS, JI, JH & GC
30/05/2018	14C, 8/8 cloud cover, F3 wind speed, no precipitation	04:52	03:22	05:07	KS, JI, JH & GC
31/05/2018	15C, 8/8 cloud cover (low cloud), F1 wind speed, no precipitation	04:52	03:29	05:07	KS, JI, JH & GC
04/06/2018	14°C, 8/8 cloud cover, F2-3 wind speed, very fine drizzle throughout survey	21:22	21:07	22:52	KS, JH & JI

05/06/2018	12C, 8/8 cloud cover, F3 wind speed, very fine drizzle for parts of survey	04:48	03:18	05:03	KS & JH
05/06/2018	15C, 3/8 cloud cover, F1 wind speed, no precipitation	21:23	21:08	22:53	KS & JH
06/06/2018	9C, 1/8 cloud cover, F1-2 wind speed, no precipitation	04:47	03:17	05:02	KS & JH

DRAWINGS

DO NOT SCALE FROM THIS DRAWING



REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D

CLIENT
EXTRA MSA GROUP

PROJECT
MOTORWAY SERVICE AREA (MSA) AND NEW JUNCTION BETWEEN JUNCTION 5 & 6 OF THE M42, SOLIHULL.

DRAWING TITLE
BUILDING LOCATIONS PLAN

DRG No.	REV
SH11315A-003	A

DRG SIZE	SCALE	DATE
A3	1:2500	09/07/2018

DRAWN BY	CHECKED BY	APPROVED BY
DP	LP	TP

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Key

- Planning Application Boundary
- 50m Distance Buffer
- Trees with Bat Roost Potential
- Tree Groups with Bat Roosting Potential
- Buildings with Bat Roosting Potential
- Woodland Areas

See Inset

INSET 1:2 000 @ A3

B1-10

B15-22

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REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

Extra MSA Group

PROJECT

Motorway Service Area (MSA) and New Junction between Junction 5 & 6 of the M42, Solihull

DRAWING TITLE

Climb and Inspect Survey Area 2018 Update

DRG No	REV
SH11315A/013	A

DRG SIZE	SCALE	DATE
A3	1:7,500	July 2018

DRAWN BY	CHECKED BY	APPROVED BY
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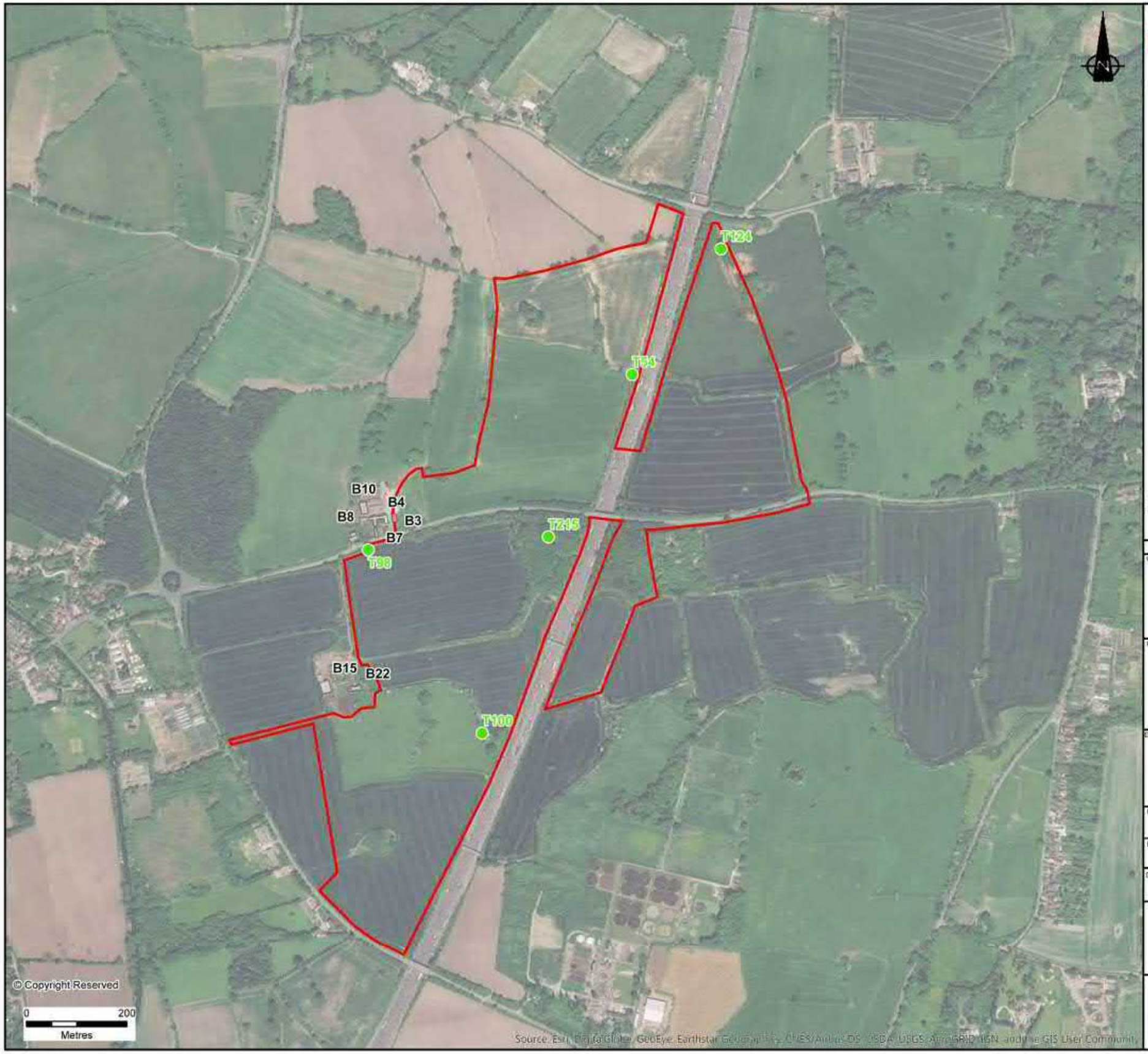

Key

- Planning Application Boundary
- 'Identified Roost' - For Trees
- 'Identified Roost' - For Buildings

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD

CLIENT

Extra MSA Group

PROJECT

Motorway Service Area (MSA) and New Junction between Junction 5 & 6 of the M42, Solihull

DRAWING TITLE

Bat Roost Plan
Trees and Buildings
2018 update

DRG No	REV
SH11315A/014	A

DRG SIZE	SCALE	DATE
A3	1:7,500	July 2018

DRAWN BY	CHECKED BY	APPROVED BY
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Cumbria
CA4 0BQ
Tel: +44 (0)1228 564820

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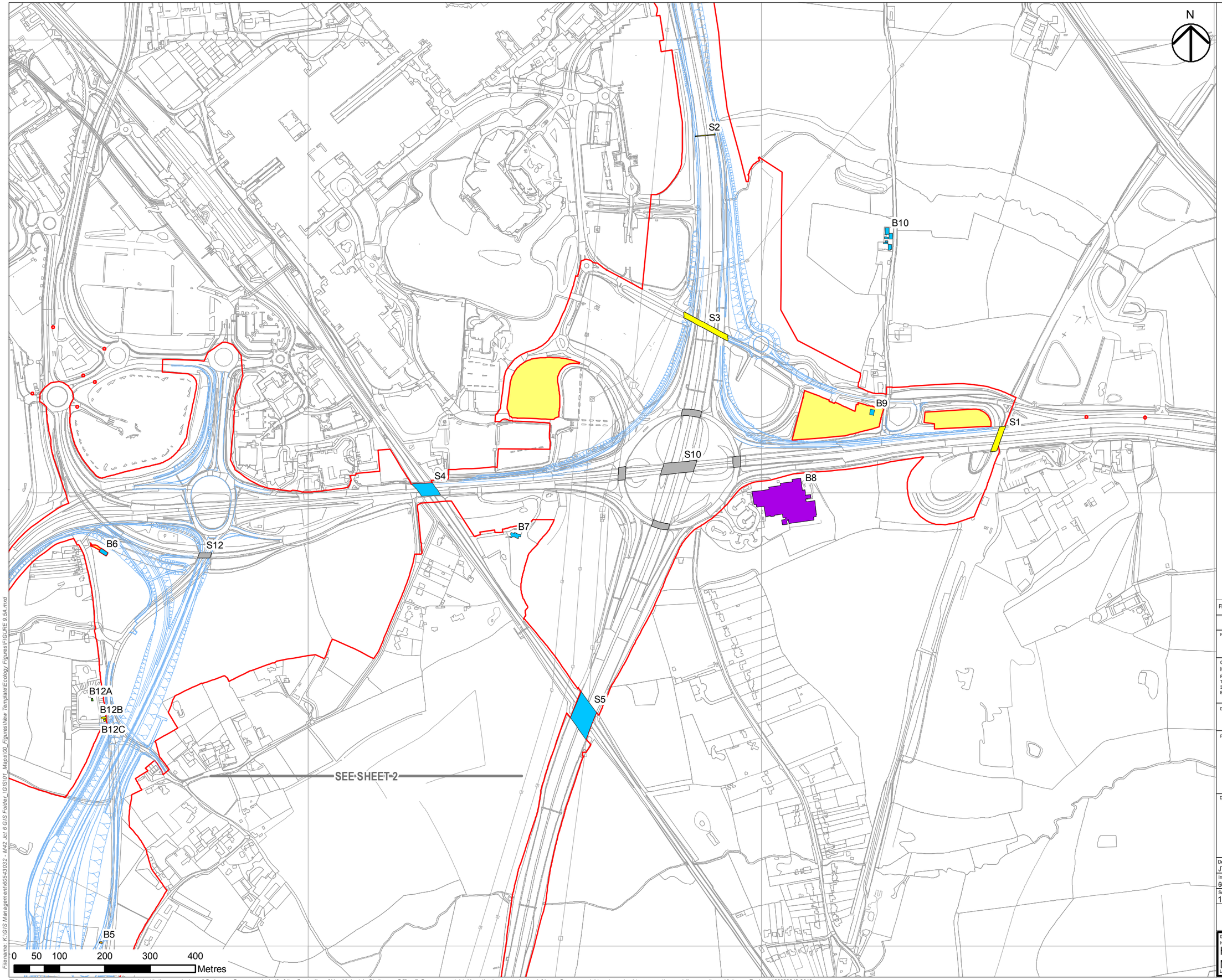
Figure 9.5A (a) Structures and Buildings with Potential for Roosting Bats



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- LIMITS OF LAND TO BE TEMPORARILY ACQUIRED FOR SIGNAGE INSTALLATION
- AREA NOT INCLUDED WITHIN THE DCO BOUNDARY
- STRUCTURE REFERENCE
- BUILDING REFERENCE

BUILDING OR STRUCTURE WITH POTENTIAL FOR ROOSTING BATS

- CONFIRMED ROOST
- MODERATE
- LOW POTENTIAL
- NEGLIGIBLE
- NEGLIGIBLE (PARTIAL
- UNKNOWN\ NO
- NO ACCESS

FIRST ISSUE	GB / JG	02/12/18	P01
Revision Details	By / Check	Date	Suffix

Purpose of Issue

FOR STAGE APPROVAL

Client

Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
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Development Consebt Order Number

TR010027

Project Title

M42 JUNCTION 6 IMPROVEMENT

Drawing Title

FIGURE 9.5A
STRUCTURES AND BUILDINGS WITH POTENTIAL FOR ROOSTING BATS
SHEET 1 OF 3

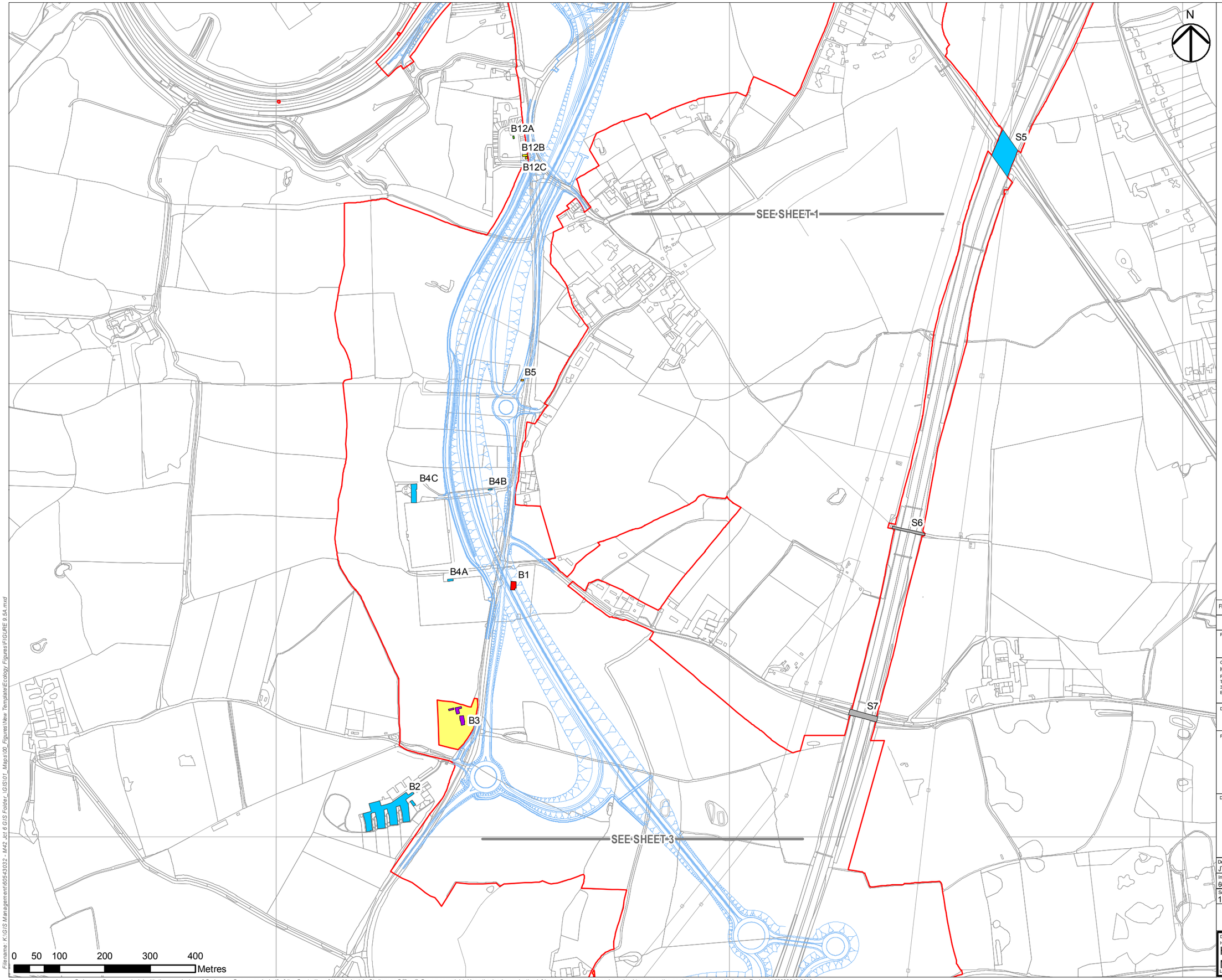
Designed	Drawn	Checked	Approved	Date
JT	GB	MWH	JG	02/12/18

Internal Project No: 60543032	Suitability: S4
Scale @ A3: 1:7,500	Zone: M42

Drawing Number

Highways England Pin	Originator	Volume	Location	Type	Role	Number	Rev
HE551485	-ACM	-EGN-	M42_SW_ZZ_ZZ	-DR-	DC-	0040	P01

Filename: K:\GIS Management\60543032 - M42 Jct 6 GIS Folder_\GIS\01_Maps\00_Figures\New Template\Ecology Figures\FIGURE 9.5A.mxd



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- LIMITS OF LAND TO BE TEMPORARILY ACQUIRED FOR SIGNAGE INSTALLATION
- AREA NOT INCLUDED WITHIN THE DCO BOUNDARY
- STRUCTURE REFERENCE
- BUILDING REFERENCE

BUILDING OR STRUCTURE WITH POTENTIAL FOR ROOSTING BATS

- CONFIRMED ROOST
- MODERATE
- LOW POTENTIAL
- NEGLIGIBLE
- NEGLIGIBLE (PARTIAL
- UNKNOWN\ NO
- NO ACCESS

Revision Details	By / Check	Date	Suffix
FIRST ISSUE	GB / JG	02/12/18	P01

Purpose of Issue

FOR STAGE APPROVAL

Client

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Development Consebt Order Number

TR010027

Project Title

M42 JUNCTION 6 IMPROVEMENT

Drawing Title

FIGURE 9.5A
STRUCTURES AND BUILDINGS WITH POTENTIAL FOR ROOSTING BATS
SHEET 2 OF 3

Designed	Drawn	Checked	Approved	Date
JT	GB	MWH	JG	02/12/18

Internal Project No	Suitability
60543032	S4
Scale @ A3	Zone
1:7,500	M42

Drawing Number

Highways England Pin	Originator	Volume	Rev
HE551485	-ACM	-EGN-	P01
Location	Type	Role	Number
M42_SW_ZZ_ZZ	-DR	-DC	-0041

Filename: K:\GIS Management\60543032 - M42 Jct 6 GIS Folder_\GIS\01_Maps\00_Figures\New Template\Ecology Figures\FIGURE 9.5A.mxd

B3

B2

SEE SHEET 2

S7

S8

S9

S11

N

0 50 100 200 300 400 Metres

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- AREA NOT INCLUDED WITHIN THE DCO BOUNDARY
- STRUCTURE REFERENCE
- BUILDING REFERENCE

BUILDING OR STRUCTURE WITH POTENTIAL FOR ROOSTING BATS

- CONFIRMED ROOST
- MODERATE
- LOW POTENTIAL
- NEGLIGIBLE
- NEGLIGIBLE (PARTIAL
- UNKNOWN\ NO
- NO ACCESS

FIRST ISSUE	GB / JG	02/12/18	P01
Revision Details	By / Check	Date	Suffix

Purpose of Issue

FOR STAGE APPROVAL

Client

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Development Consebt Order Number

TR010027

Project Title

M42 JUNCTION 6 IMPROVEMENT

Drawing Title

FIGURE 9.5A
STRUCTURES AND BUILDINGS WITH POTENTIAL FOR ROOSTING BATS
SHEET 3 OF 3

Designed	Drawn	Checked	Approved	Date
JT	GB	MWH	JG	02/12/18

Internal Project No: 60543032	Suitability: S4
Scale @ A3: 1:7,500	Zone: M42

Drawing Number

Highways England Pin | Originator | Volume
HE551485 -ACM -EGN-
Location | Type | Role | Number
M42_SW_ZZ_ZZ -DR-DC-0042

Rev: P01

Filename: K:\GIS Management\60543032 - M42 Jct 6 GIS Folder_\GIS\01_Maps\00_Figures\New Template\Ecology Figures\FIGURE 9.5A.mxd

Figure 9.5B (a) PRF Assessment of Trees

N

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- LIMITS OF LAND TO BE TEMPORARILY ACQUIRED FOR SIGNAGE INSTALLATION
- LAND NOT INCLUDED WITHIN THE ORDER LIMITS
- GENERAL ARRANGEMENT BOUNDARY
- GENERAL ARRANGEMENT BOUNDARY 50M BUFFER
- AREAS OF LAND NOT ACCESSED

TREES SURVEYED FOR BAT ROOST POTENTIAL 'RATING FOLLOWING GROUND INSPECTION (GLTA) AND SUBSEQUENT CLIMBED INSPECTION (WHERE APPLICABLE). AND ADDED UNDER THREE CATEGORIES FOR HIGH, MODERATE AND LOW: 'TREES WITH NEGLIGIBLE POTENTIAL NOT SHOWN

- HIGH
- MODERATE
- LOW

SEE SHEET 2

KEY PLAN

FIRST ISSUE	GB / JG	21/06/19	C01
Revision Details	By / Check	Date	Suffix

Purpose of Issue

DCO SUBMISSION

Client
Highways England
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Development Consent Order Number

TR010027

Project Title

M42 JUNCTION 6 IMPROVEMENT

Drawing Title

FIGURE 9.B
PRF ASSESMENT OF TREES
SHEET 1 OF 3

Designed	Drawn	Checked	Approved	Date
JT	GB	MWH	JG	21/06/19

Internal Project No: 60543032	Suitability: D7
Scale @ A3: 1:7,500	Zone: M42

Drawing Number

Highways England Pin	Originator	Volume			Rev
HE551485	-ACM	-EGN-			C01
Location: M42_SW_ZZ_ZZ		-DR-DC-0250	Type	Role / Number	

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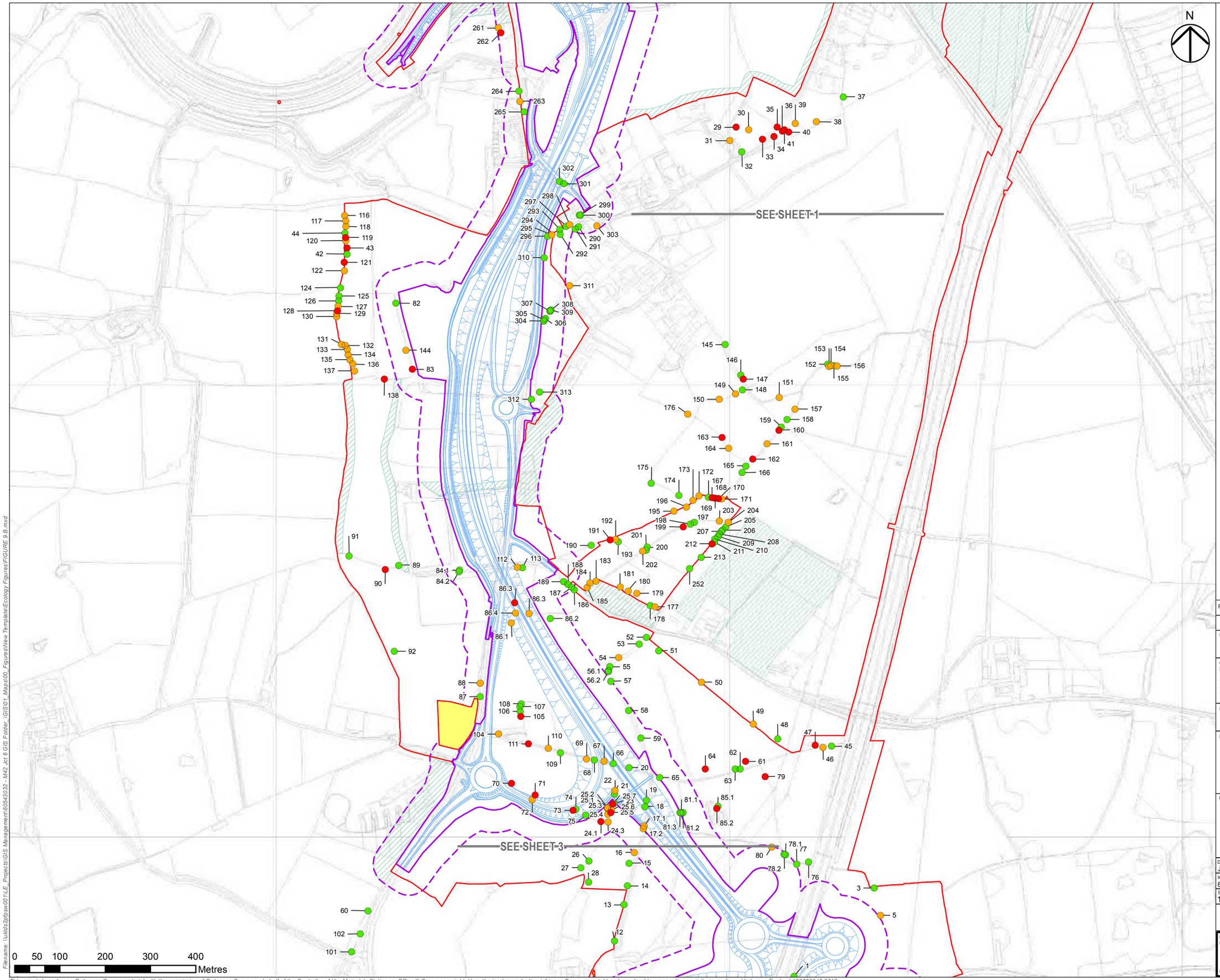
Filename: \\uk\ds2pfsw001\LE_Projects\GIS Management\60543032 - M42 Jct 6 GIS Folder_\GIS\01_Maps\00_Figures\New Template\Ecology Figures\FIGURE 9.B.mxd



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- LIMITS OF LAND TO BE TEMPORARILY ACQUIRED FOR SIGNAGE INSTALLATION
- LAND NOT INCLUDED WITHIN THE ORDER LIMITS
- GENERAL ARRANGEMENT BOUNDARY
- GENERAL ARRANGEMENT BOUNDARY 50M BUFFER
- AREAS OF LAND NOT ACCESSED

TREES SURVEYED FOR BAT ROOST POTENTIAL 'RATING FOLLOWING GROUND INSPECTION (GLTA) AND SUBSEQUENT CLIMBED INSPECTION (WHERE APPLICABLE). AND ADDED UNDER THREE CATEGORIES FOR HIGH, MODERATE AND LOW: 'TREES WITH NEGLIGIBLE POTENTIAL NOT SHOWN

- HIGH
- MODERATE
- LOW

KEY PLAN

FIRST ISSUE	GB / JG	21/06/19	C01
Revision Details	By / Check	Date	Suffix

Purpose of Issue

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Development Consent Order Number

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Project Title

M42 JUNCTION 6 IMPROVEMENT

Drawing Title

FIGURE 9.B
PRF ASSESMENT OF TREES
SHEET 2 OF 3

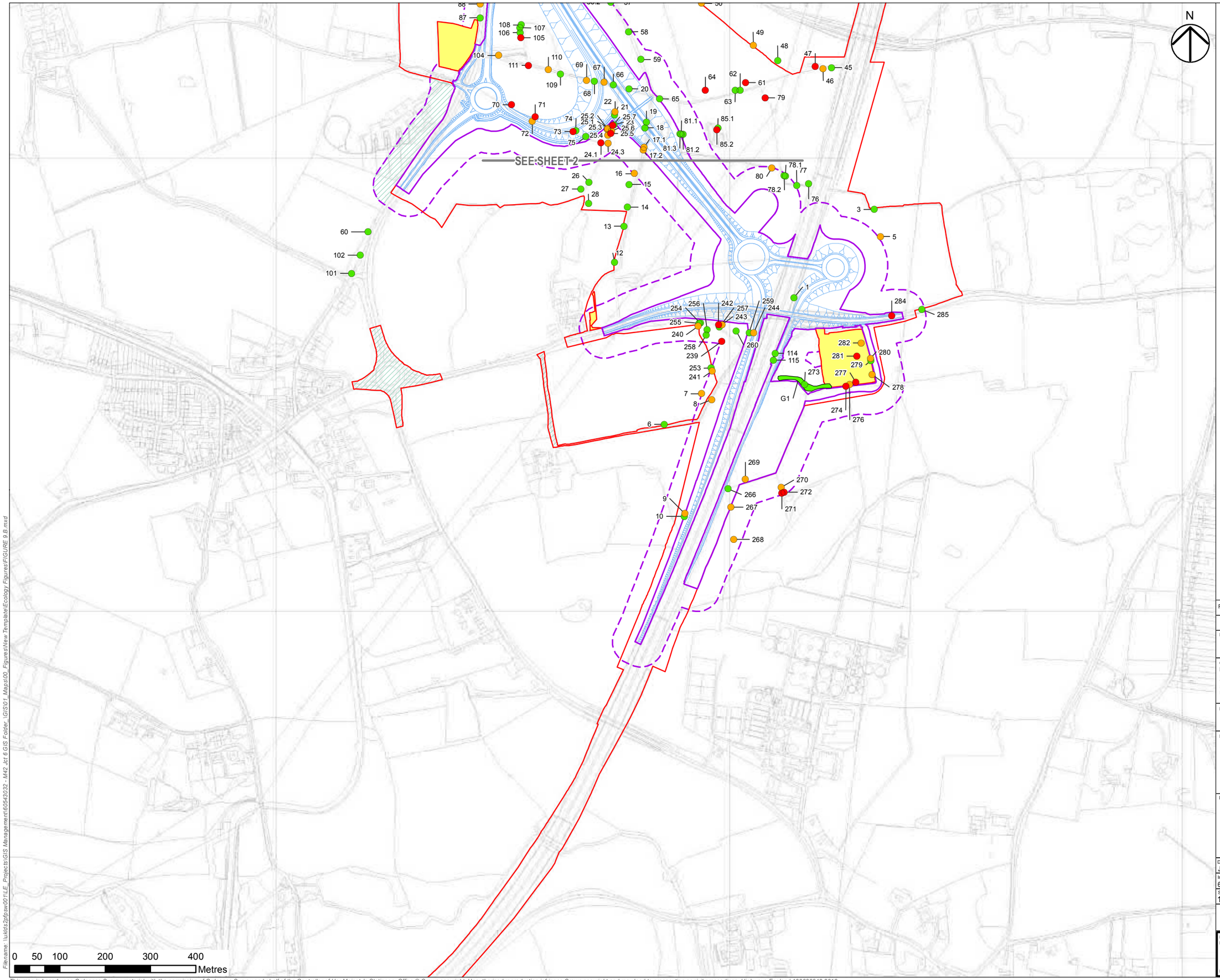
Designed	Drawn	Checked	Approved	Date
JT	GB	MWH	JG	21/06/19

Internal Project No	Suitability
60543032	D7
Scale @ A3	Zone
1:7,500	M42

Drawing Number

Highways England Pin	Originator	Volume			Rev
HE551485	-ACM	-EGN-			C01
Location		Type	Role	Number	
M42_SW_ZZ_ZZ		-DR-	DC-	0251	

Filename: \\uk\ds2pfpsw001\LE_Projects\GIS Management\60543032 - M42 Jct 6 GIS Folder_GIS\01_Maps\00_Figures\New Template\Ecology Figures\FIGURE 9.B.mxd



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- LIMITS OF LAND TO BE TEMPORARILY ACQUIRED FOR SIGNAGE INSTALLATION
- LAND NOT INCLUDED WITHIN THE ORDER LIMITS
- GENERAL ARRANGEMENT BOUNDARY
- GENERAL ARRANGEMENT BOUNDARY 50M BUFFER
- AREAS OF LAND NOT ACCESSED

TREES SURVEYED FOR BAT ROOST POTENTIAL 'RATING FOLLOWING GROUND INSPECTION (GLTA) AND SUBSEQUENT CLIMBED INSPECTION (WHERE APPLICABLE). AND ADDED UNDER THREE CATEGORIES FOR HIGH, MODERATE AND LOW: 'TREES WITH NEGLIGIBLE POTENTIAL NOT SHOWN

- HIGH
- MODERATE
- LOW

KEY PLAN

FIRST ISSUE	GB / JG	21/06/19	C01
Revision Details	By / Check	Date	Suffix

Purpose of Issue

DCO SUBMISSION

Client
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Development Consent Order Number

TR010027

Project Title

M42 JUNCTION 6 IMPROVEMENT

Drawing Title

FIGURE 9.B
PRF ASSESMENT OF TREES
SHEET 3 OF 3

Designed	Drawn	Checked	Approved	Date
JT	GB	MWH	JG	21/06/19

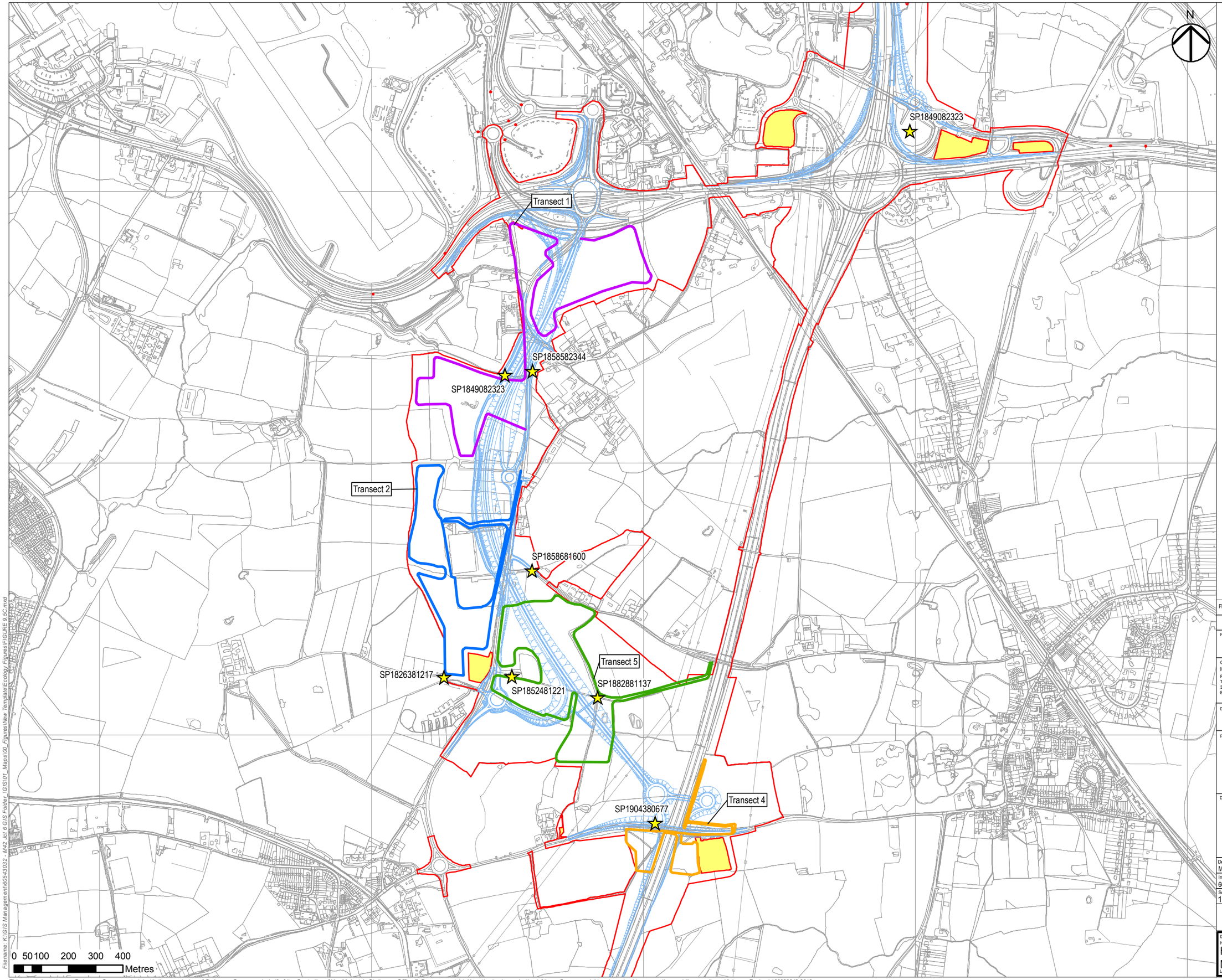
Internal Project No: 60543032	Suitability: D7
Scale @ A3: 1:7,500	Zone: M42

Drawing Number
Highways England Pin | Originator | Volume
HE551485 -ACM -EGN-
Location | Type | Role | Number
M42_SW_ZZ_ZZ -DR-DC-0252

Rev: C01

Filename: \\uk\ds2\fpsw001\LE_Projects\GIS Management\60543032 - M42 Jct 6 GIS Folder_\GIS\01_Maps\00_Figures\New Template\Ecology Figures\FIGURE 9.B.mxd

Figure 9.5C (a) Bat Transect and Static Locations



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- LIMITS OF LAND TO BE TEMPORARILY ACQUIRED FOR SIGNAGE INSTALLATION
- LAND NOT INCLUDED WITHIN THE ORDER LIMITS
- TRANSECT 1
- TRANSECT 2
- TRANSECT 4
- TRANSECT 5
- STATIC LOCATION

Revison Details	By / Check	Date	Suffix
FIRST ISSUE	AAC / JG	12/12/18	P01

Purpose of Issue: DCO SUBMISSION

Client: Highways England
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Development Consent Order Number: TR010027

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: FIGURE 9.5C BAT TRANSECTS AND STATIC LOCATIONS

Designed	Drawn	Checked	Approved	Date
MWH	AAC	MWH	JG	12/12/18

Internal Project No: 60543032	Suitability: D7
Scale @ A3: 1:12,500	Zone: M42

Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type -DR- | Role DC- | Number 0242 | Rev P01

Filename: K:\GIS Management\60543032 - M42 Jct 6 GIS Folder_\GIS\01_Maps\00_Figures\New Template\Ecology Figures\FIGURE 9.5C.mxd

Figure 9.5D (a) Areas of Land not Accessible

N

NOTES

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- LIMITS OF LAND TO BE TEMPORARILY ACQUIRED FOR SIGNAGE INSTALLATION
- LAND NOT INCLUDED WITHIN THE ORDER LIMITS
- AREAS OF LAND NOT ACCESSED

0 250 500 1,000 1,500 2,000 Metres

FIRST ISSUE	GB / JG	10/12/18	P01
Revision Details	By / Check	Date	Suffix

Purpose of Issue: DCO SUBMISSION

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Development Consent Order Number: TR010027

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: FIGURE 9.5D AREAS OF LAND NOT ACCESSIBLE

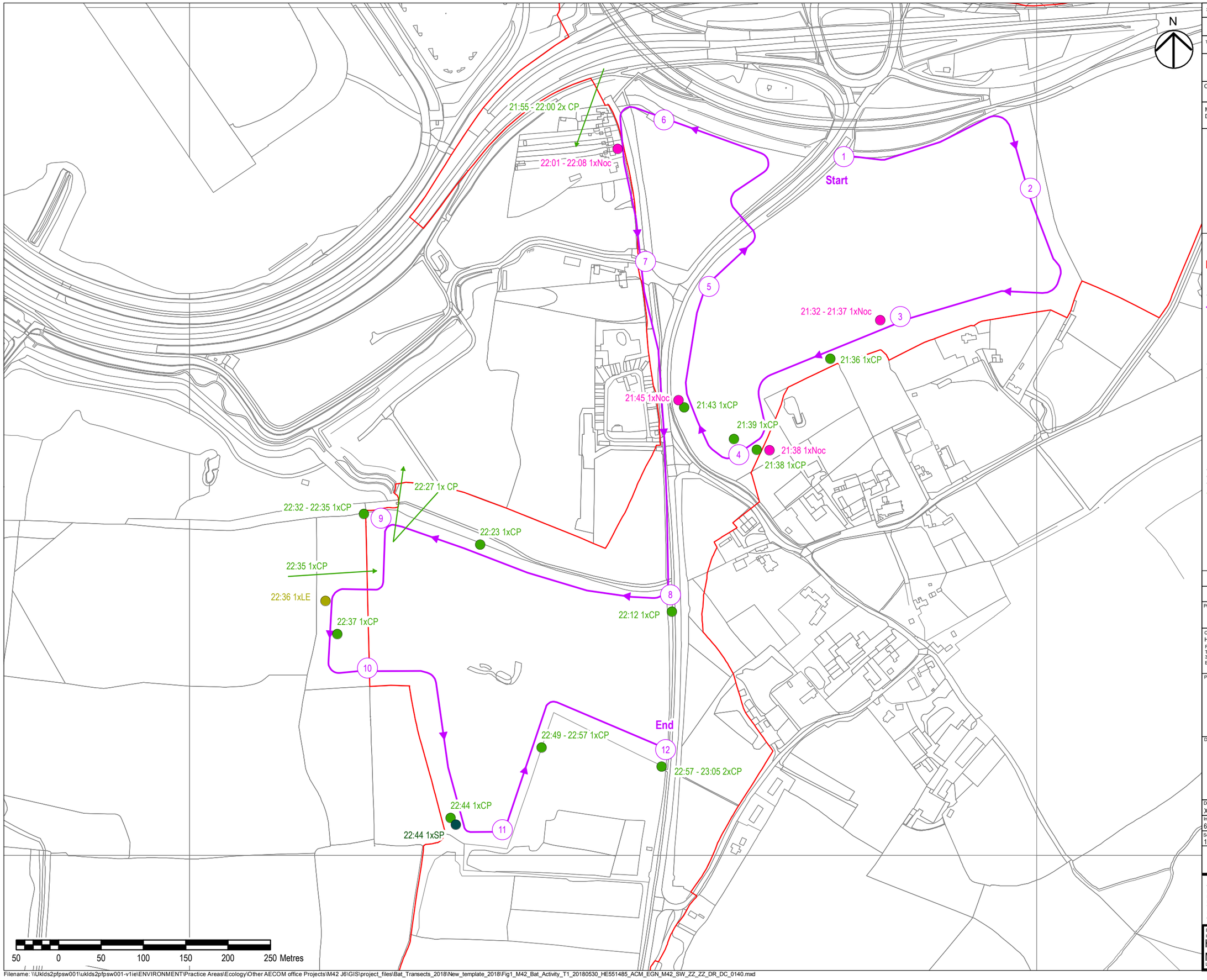
Designed	Drawn	Checked	Approved	Date
JT	GB	MWH	JG	10/12/18

Internal Project No: 60543032	Suitability: D7
Scale @ A3: 1:25,000	Zone: M42

Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type | Role | Number -DR-DC-0167 | Rev P01

Filename: K:\GIS Management\60543032 - M42 Jct 6 GIS Folder_\GIS\01_Maps\00_Figures\New Template\Ecology Figures\FIGURE 9.5D.mxd

Figure 9.5E (a) Bat Surveys Transects



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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Noctule Noc

Long-eared LE

Bat flight (with species, record time and number of bats)

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of: highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (1) Bat Survey Transect 1 Dusk 30/05/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	X	12/10/2018

Internal Project No	Suitability
60543032	X
Scale @ A3	Zone
1:4,000	X

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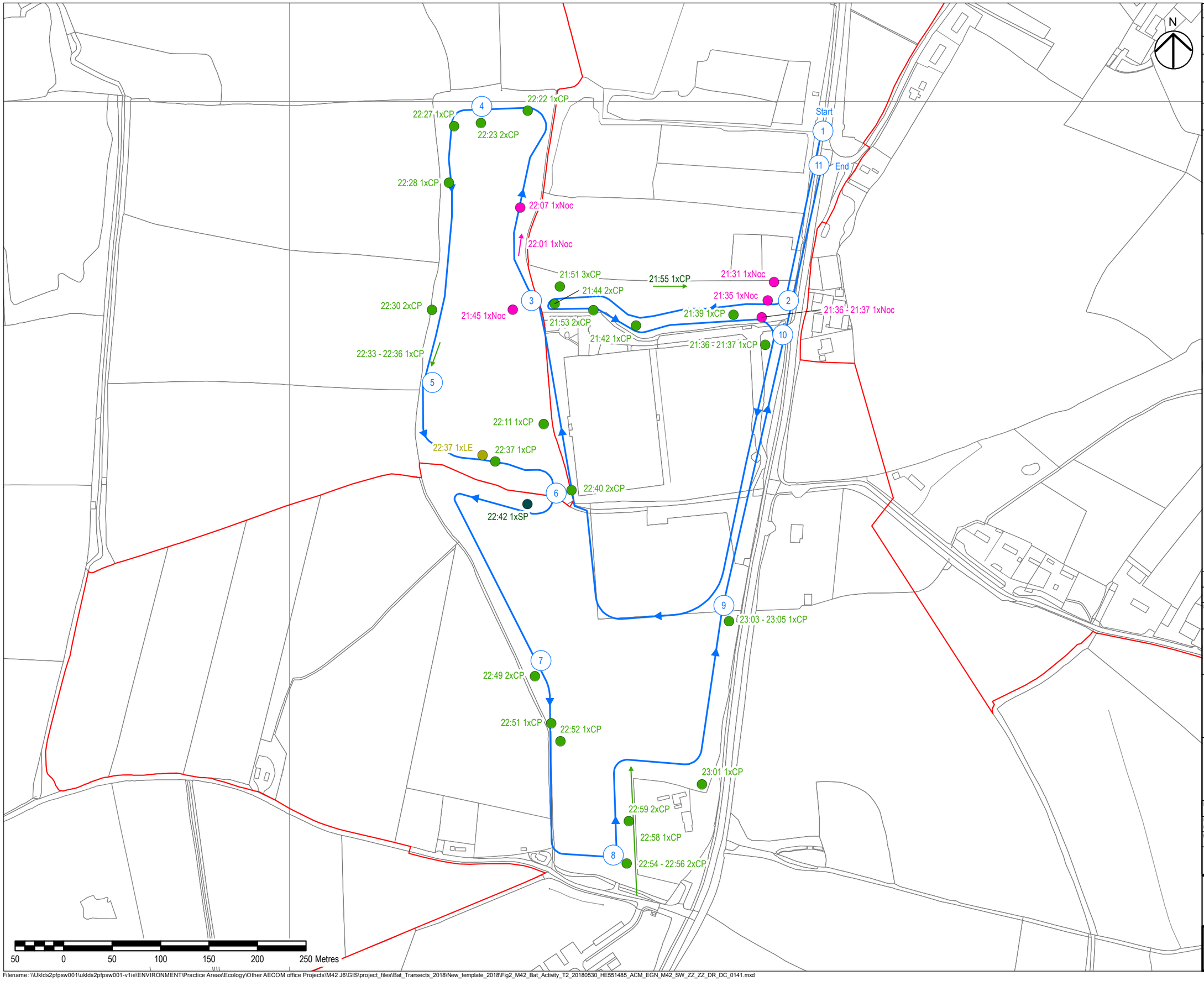
Drawing Number				Rev
Highways England Pin	Originator	Volume		
HE551485	-ACM	-EGN-		P01
M42_SW_ZZ_ZZ	- DR-DC-0140			
Location	Type	Role	Number	

Filename: \\Ukds2pfpsw001\ukds2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig1_M42_Bat_Activity_T1_20180530_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0140.mxd



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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP
Common pipistrelle CP
Noctule Noc
Long-eared LE

Bat flight (with species, record time and number of bats)

Common pipistrelle CP
Noctule Noc

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (2) Bat Survey Transect 2 Dusk 30/05/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	12/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3: 1:3,500	Zone: M42

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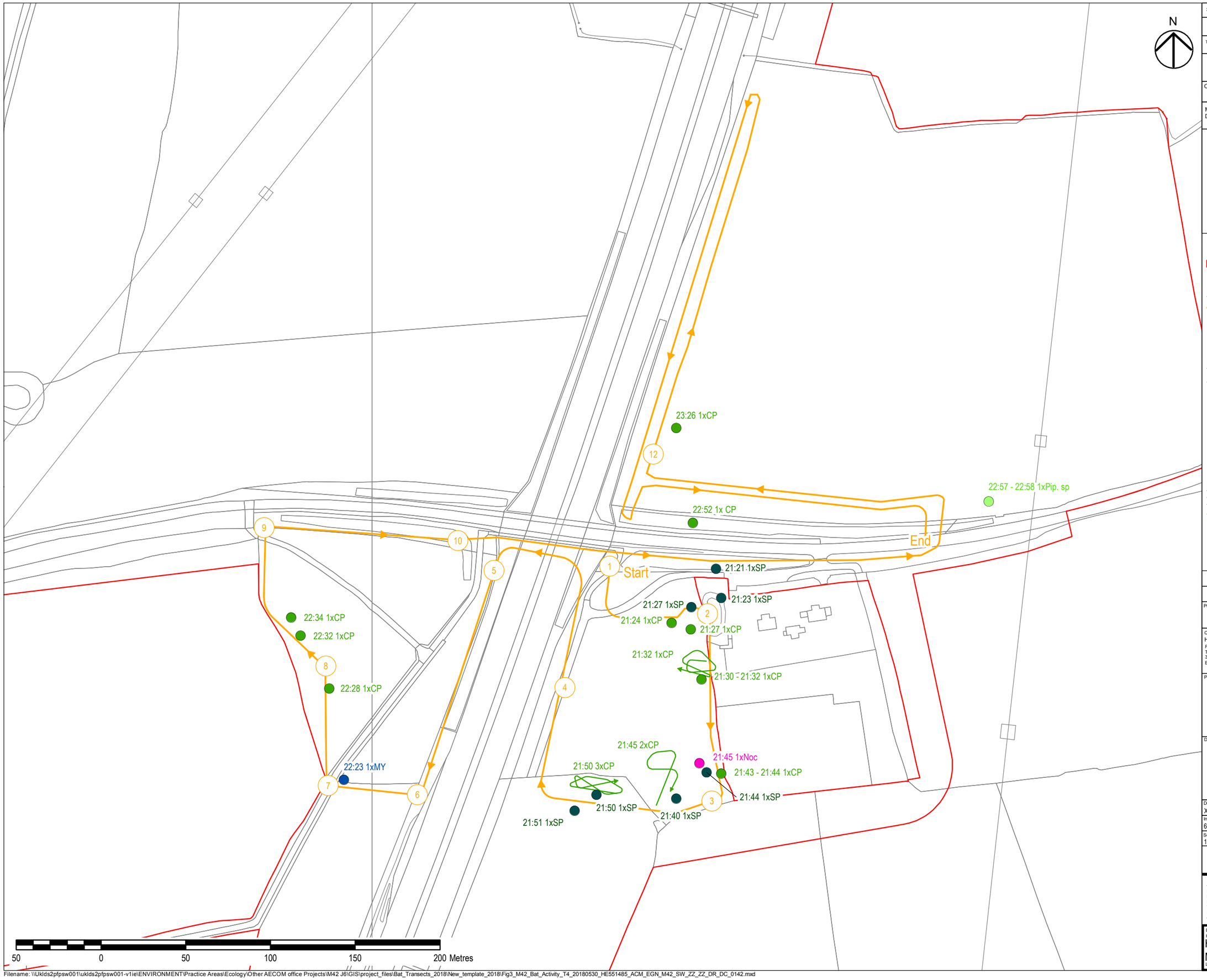
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type - | Role DR | Number DC-0141

Rev: P01

Filename: \\Ukds2pfpsw001\ukds2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig2_M42_Bat_Activity_T2_20180530_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0141.mxd



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4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.

LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

- Soprano pipistrelle SP
- Common pipistrelle CP
- Pipistrelle species Pip. sp
- Noctule Noc
- *Myotis* MY

Bat flight (with species, record time and number of bats)

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of: highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (3) Bat Survey Transect 4 Dusk 30/05/18

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3: 1:3,500	Zone: M42

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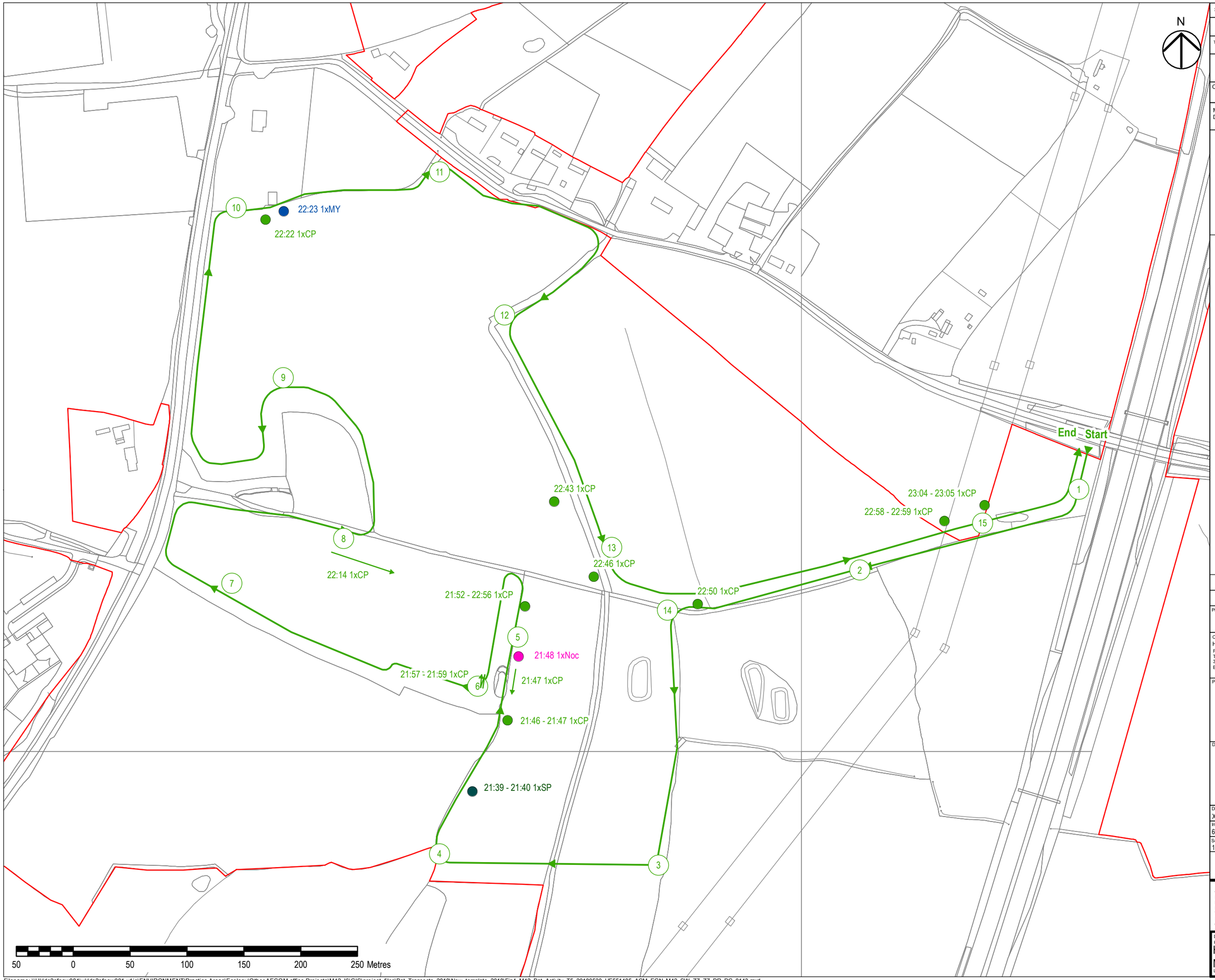
Basingstoke, Hampshire RG21 7PP

Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type - | Role DR | Number DC-0142 | Rev P01

Filename: \\Ukids2pfpsw001\ukids2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig3_M42_Bat_Activity_T4_20180530_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0142.mxd



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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

NOTES
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3. ALL DIMENSIONS IN MILLIMETRES, ALL CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.

4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.

LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Noctule Noc

Myotis MY

Bat flight (with species, record time and number of bats)

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of: highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (4) Bat Survey Transect 5 Dusk 30/05/18

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3: 1:3,000	Zone: M42

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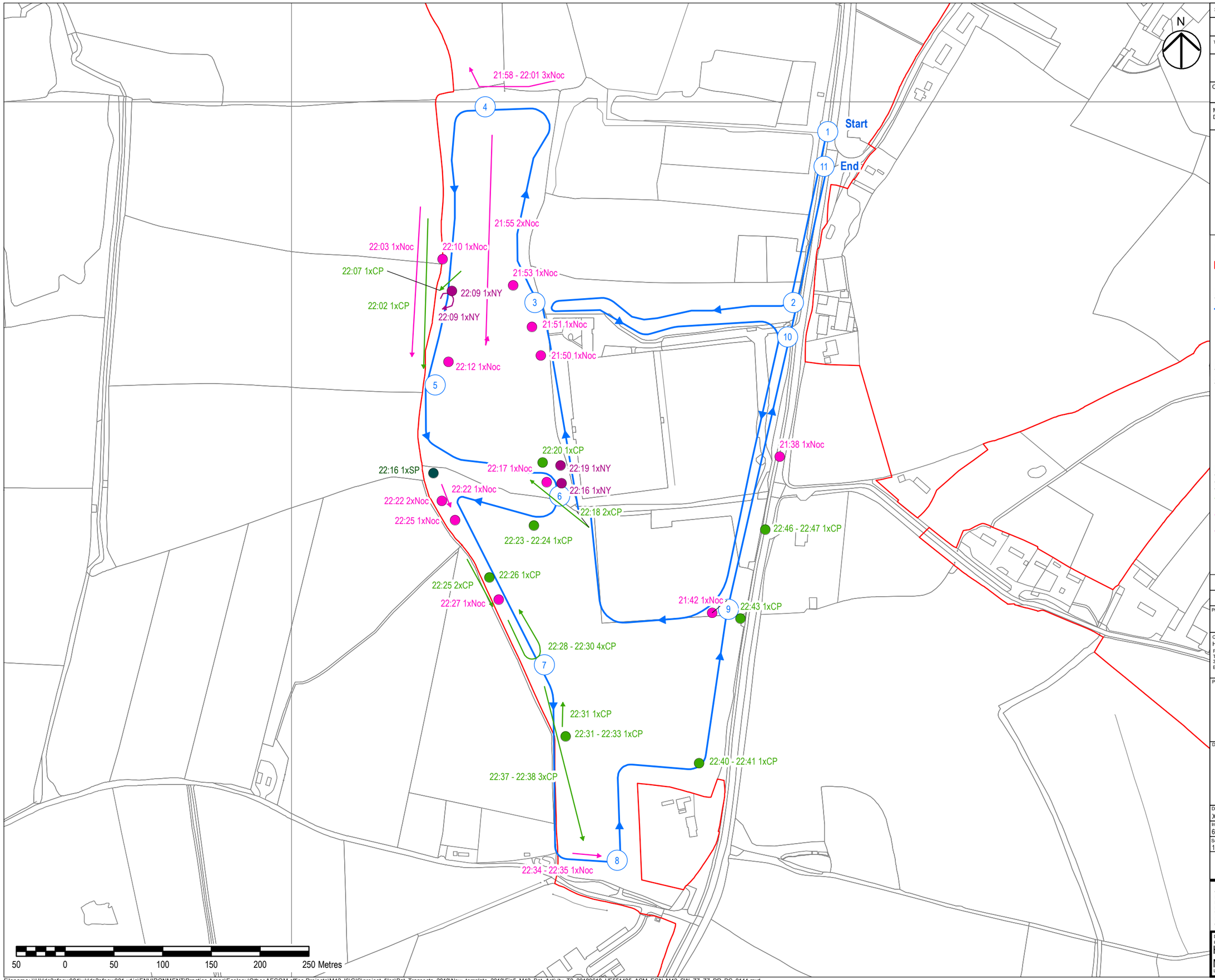
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type - | Role DR | Number DC-0143 | Rev P01

Filename: \\Ukld s2pfpsw001\ukld s2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig4_M42_Bat_Activity_T5_20180530_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0143.mxd



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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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LEGEND

Scheme boundary

Bat transect

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Noctule Noc

Nyctalus NY

Bat flight (with species, record time and number of bats)

Common pipistrelle CP

Noctule Noc

Nyctalus NY

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (5) Bat Survey Transect 2 Dusk 18/06/18

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3	Zone
1:3,500	M42

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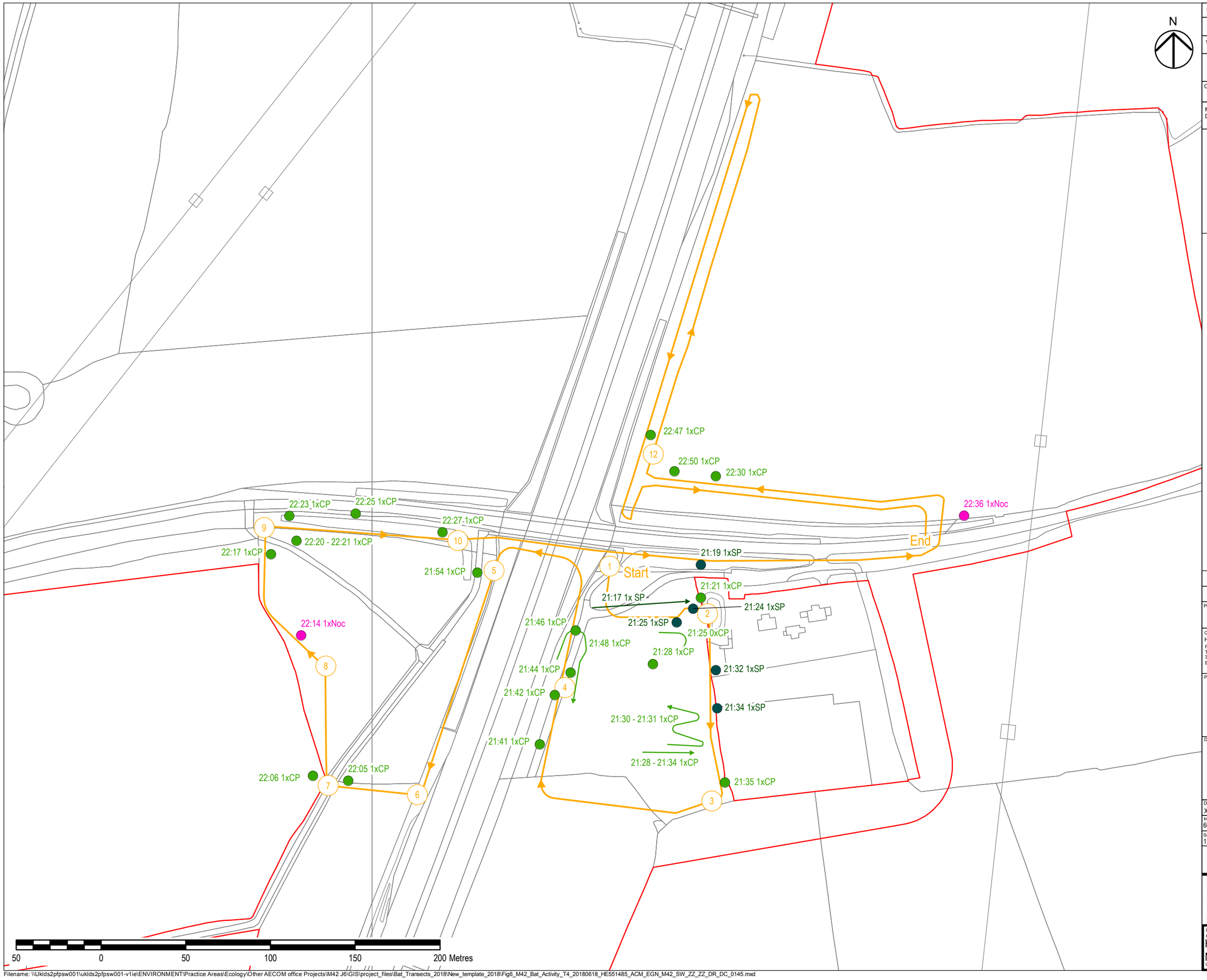
Drawing Number: Highways England Pin | Originator | Volume
HE551485 -ACM -EGN-
M42_SW_ZZ_ZZ - DR-DC-0144
Location | Type | Role | Number

Rev: P01

Filename: \\Ukds2pfpsw001\ukds2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig5_M42_Bat_Activity_T2_20180618_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0144.mxd



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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

- Soprano pipistrelle SP
- Common pipistrelle CP
- Noctule Noc
- *Nyctalus* NY

Bat flight (with species, record time and number of bats)

- Soprano pipistrelle SP
- Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (6) Bat Survey Transect 4 Dusk 18/06/18

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3: 1:2,000	Zone: M42

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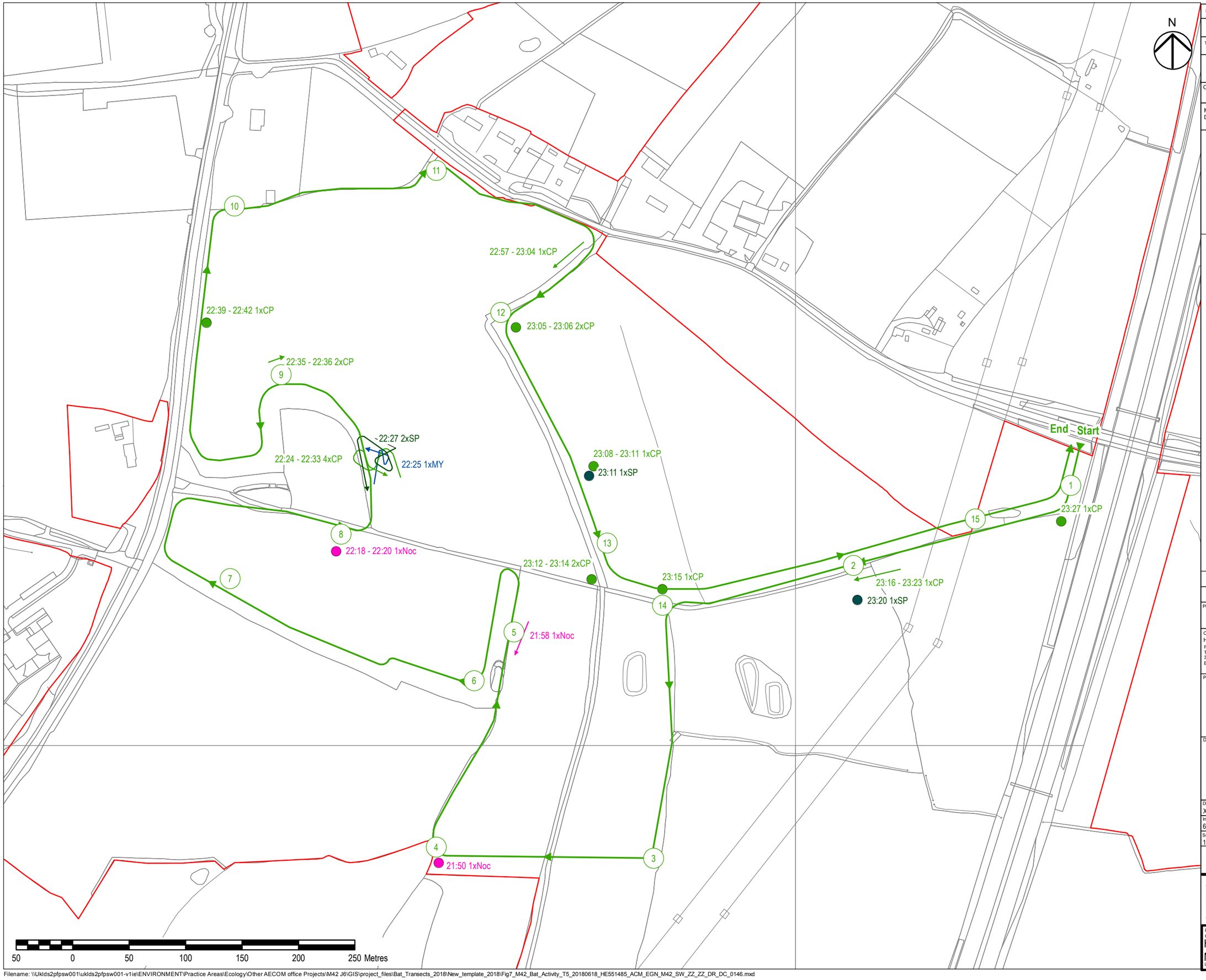
Drawing Number: Highways England Pin	Originator	Volume	Rev
HE551485	-ACM	-EGN-	P01
Location: M42_SW_ZZ_ZZ	Type: -	Role: DR	Number: DC-0145



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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Noctule Noc

Bat flight (with species, record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Noctule Noc

Myotis MY

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (7) Bat Survey Transect 5 Dusk18/06/18

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3	Zone
1:3,000	M42

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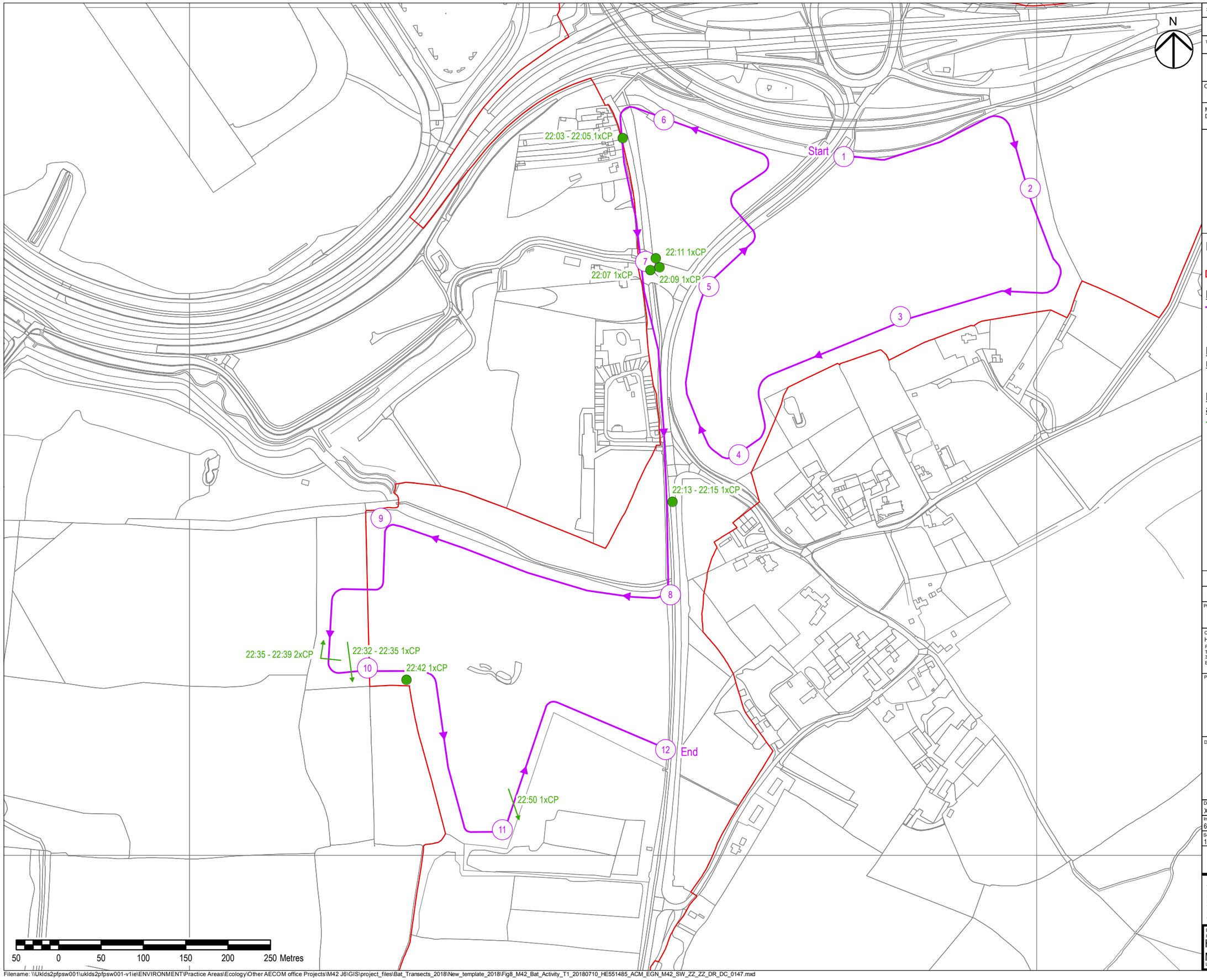
Drawing Number				Rev
Highways England Pin	Originator	Volume		
HE551485	-ACM	-EGN-		P01
M42_SW_ZZ_ZZ	- DR-DC-0146			
Location	Type / Role / Number			

Filename: \\Ukld s2pfpsw001\ukld s2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig7_M42_Bat_Activity_T5_20180618_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0146.mxd



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MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Common pipistrelle CP

Bat flight (with species, record time and number of bats)

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of: highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (8) Bat Survey Transect 1 Dusk 10/07/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	X	12/10/2018

Internal Project No	Suitability
60543032	X
Scale @ A3 1:4,000	Zone X

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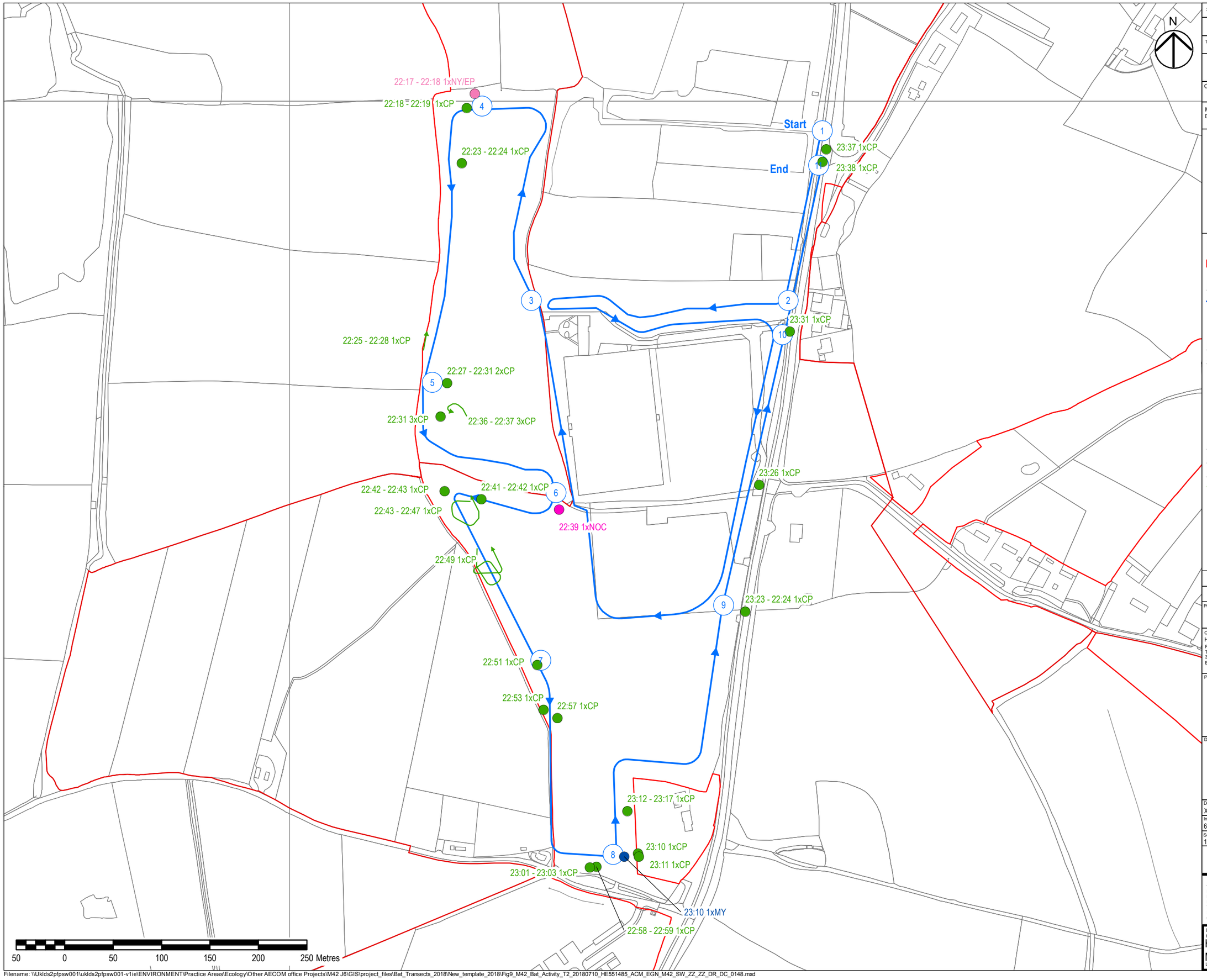
Drawing Number: Highways England Prn HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type | Role | Number - DR-DC-0147 | Rev P01

Filename: \\Ukds2pfpsw001\ukds2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig8_M42_Bat_Activity_T1_20180710_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0147.mxd



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CONSTRUCTION

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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Common pipistrelle CP

Noctule Noc

Nyctalus/Eptesicus sp. NY/EP

Myotis MY

Bat flight (with species, record time and number of bats)

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of: highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (9) Bat Survey Transect 2 Dusk 10/07/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	12/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3: 1:3,500	Zone: M42

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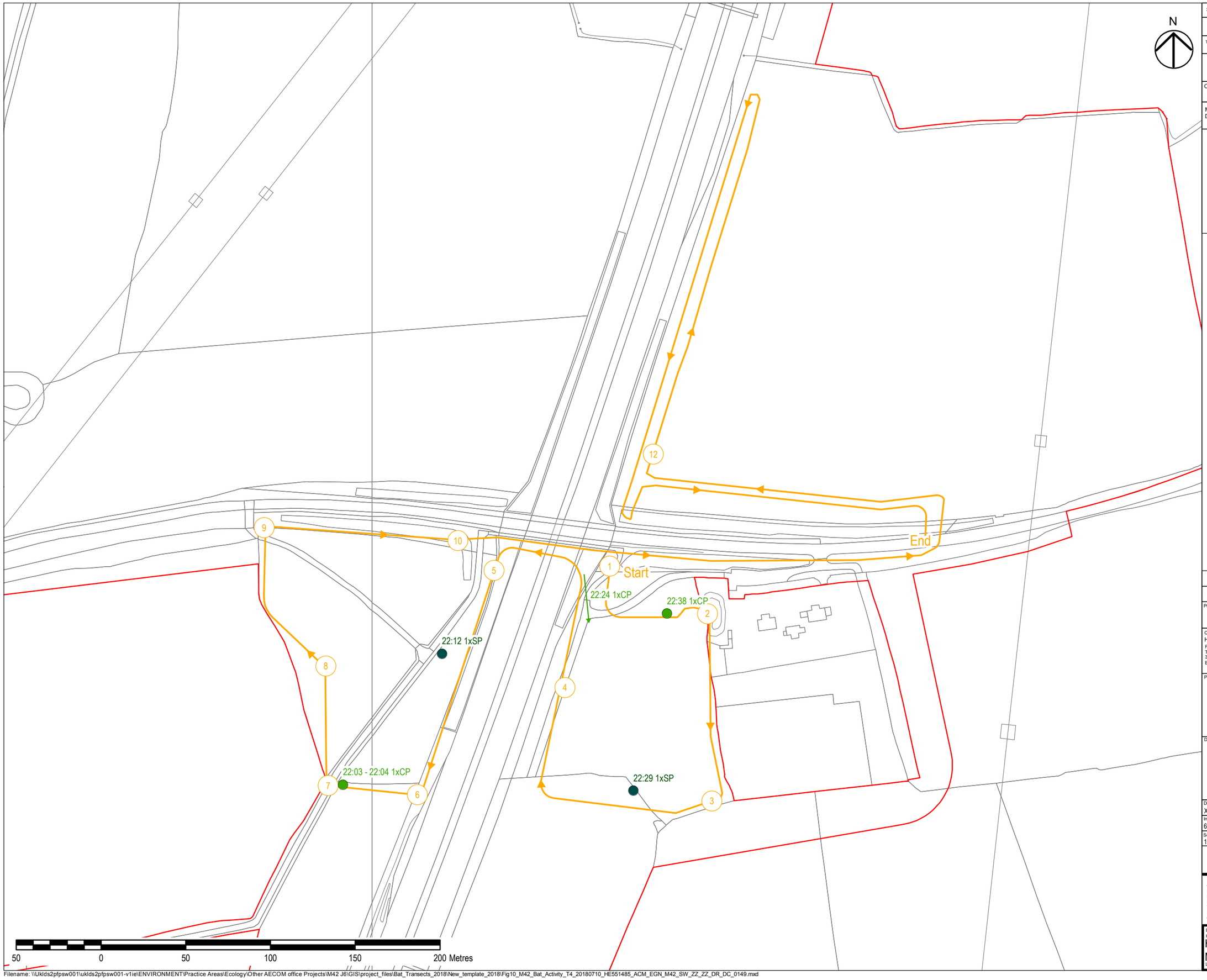
Drawing Number: Highways England Pin | Originator | Volume
HE551485 -ACM -EGN-
M42_SW_ZZ_ZZ - DR-DC- 0148
Location | Type | Role | Number

Rev: P01

Filename: \\Ukds2pfpsw001\ukds2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig9_M42_Bat_Activity_T2_20180710_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0148.mxd



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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Bat flight (with species, record time and number of bats)

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (10) Bat Survey Transect 4 Dusk 10/07/18

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3: 1:2000	Zone: M42

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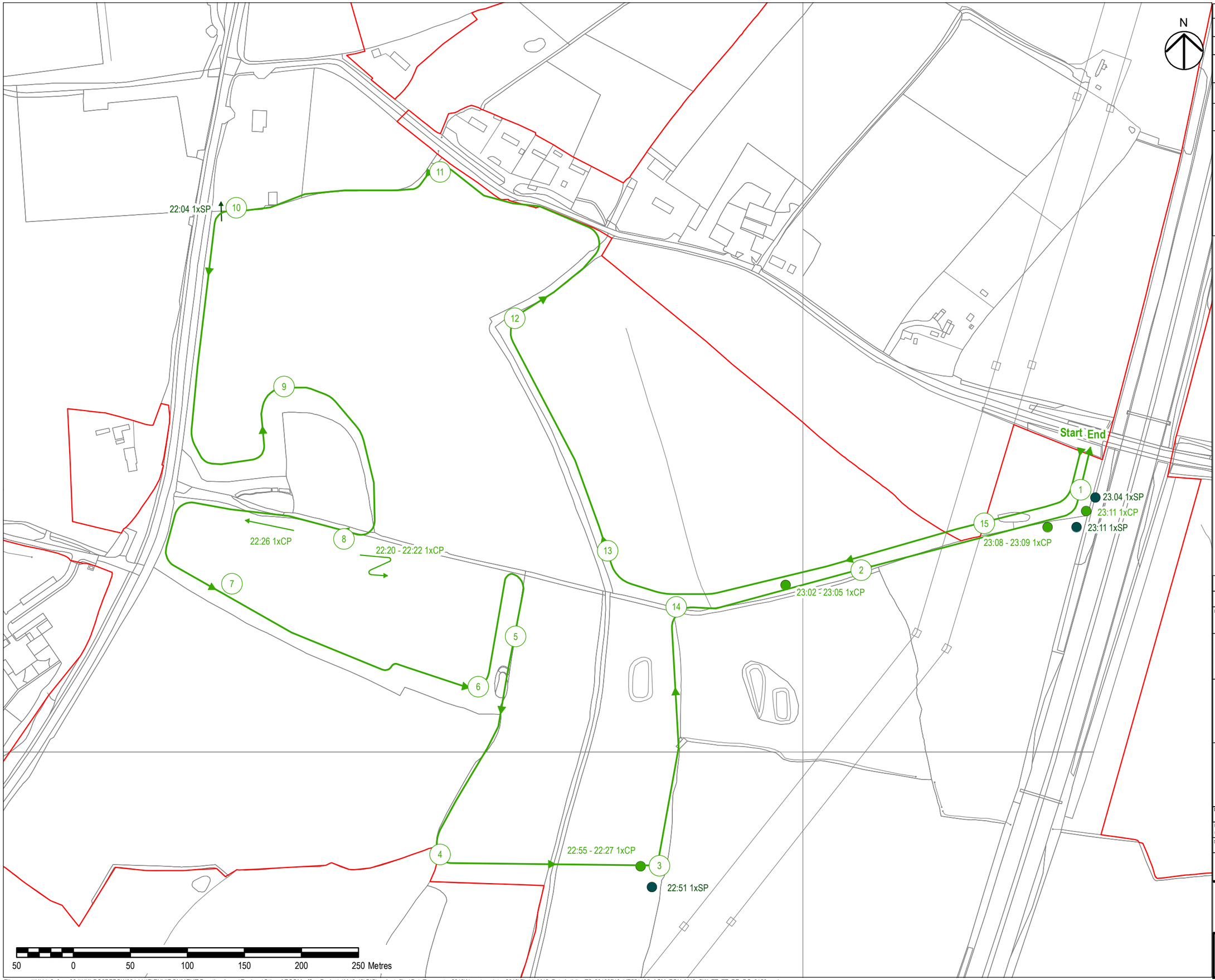
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type - | Role DR | Number DC-0149

Rev: P01

Filename: \\Ukids2pfpsw001\ukids2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig10_M42_Bat_Activity_T4_20180710_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0149.mxd



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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Bat flight (with species, record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (11) Bat Survey Transect 5 Dusk10/07/18

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3	Zone
1:3,000	M42

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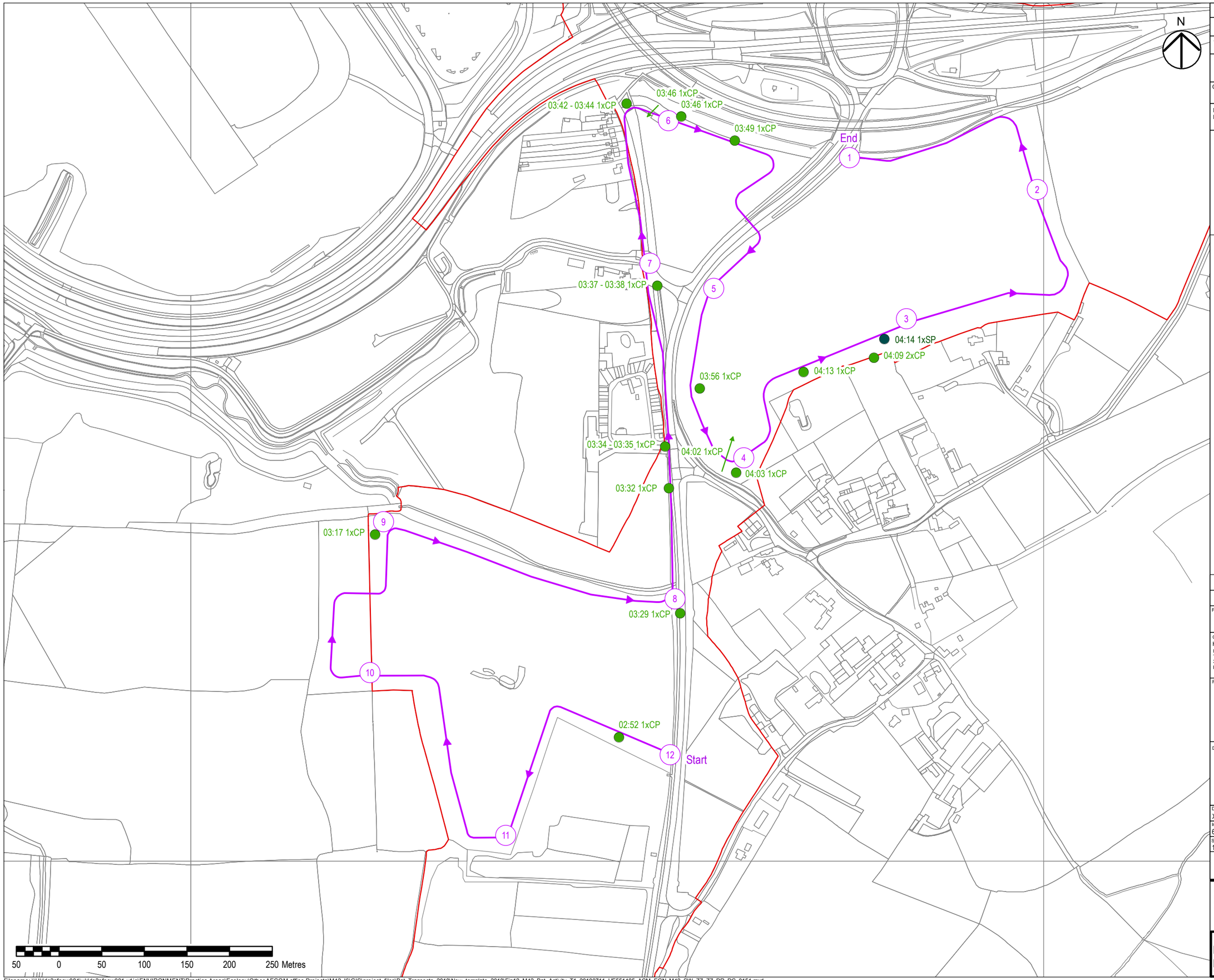
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type - | Role DR | Number DC-0150 | Rev P01

Filename: \\Ukds2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig11_M42_Bat_Activity_T5_20180710_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0150.mxd



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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

NOTES
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4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.

LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Bat flight (with species, record time and number of bats)

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (12) Bat Survey Transect 1 Dawn 11/07/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	X	10/10/2018

Internal Project No	Suitability
60543032	X
Scale @ A3: 1:4,000	Zone: X

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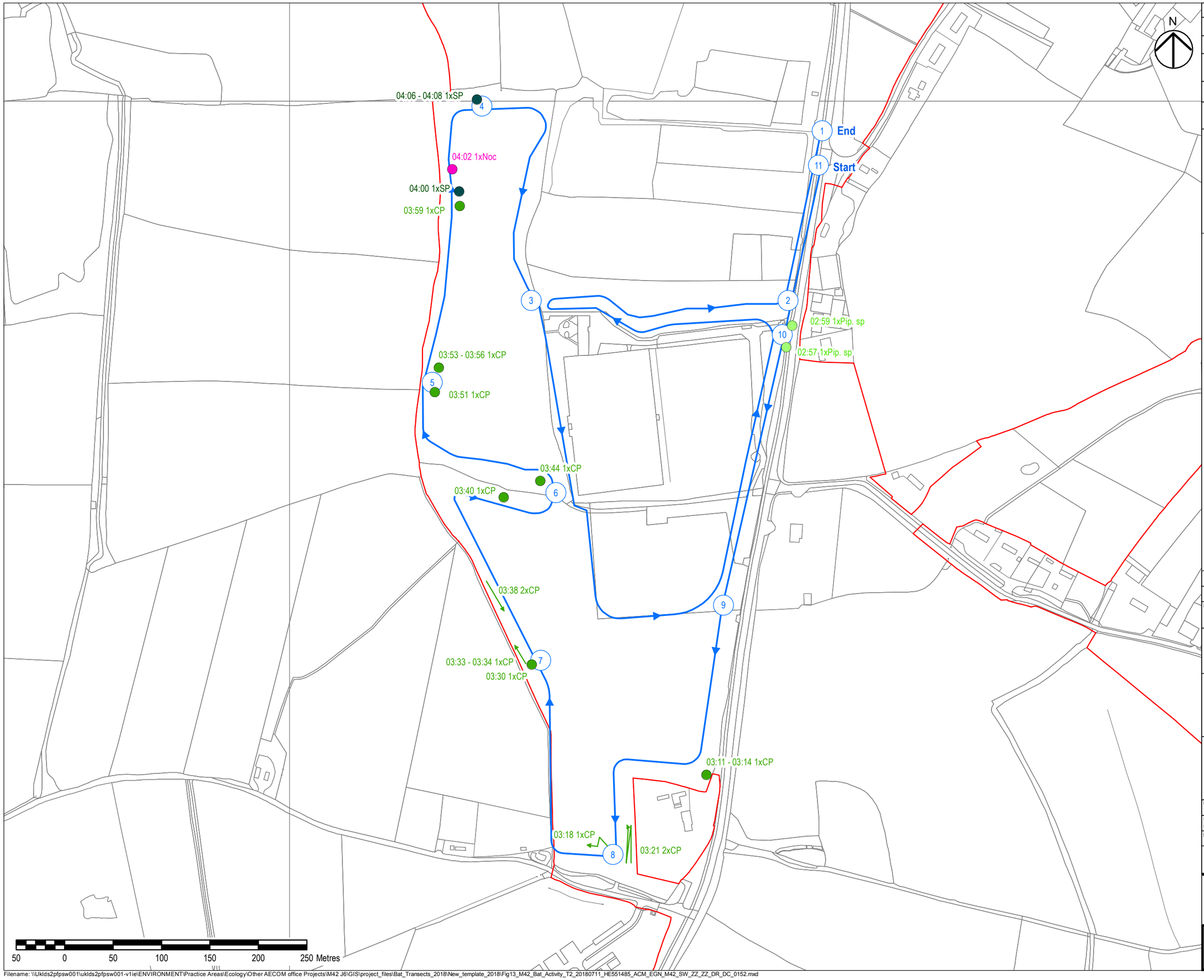
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type - | Role DR | Number DC-0151

Rev: P01

Filename: \\Ukds2pfpsw001\ukds2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig12_M42_Bat_Activity_T1_20180711_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0151.mxd



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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Pipistrelle species Pip. sp

Noctule Noc

Bat flight (with species, record time and number of bats)

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (13) Bat Survey Transect 2 Dawn 11/07/18

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3 1:3,500	Zone M42

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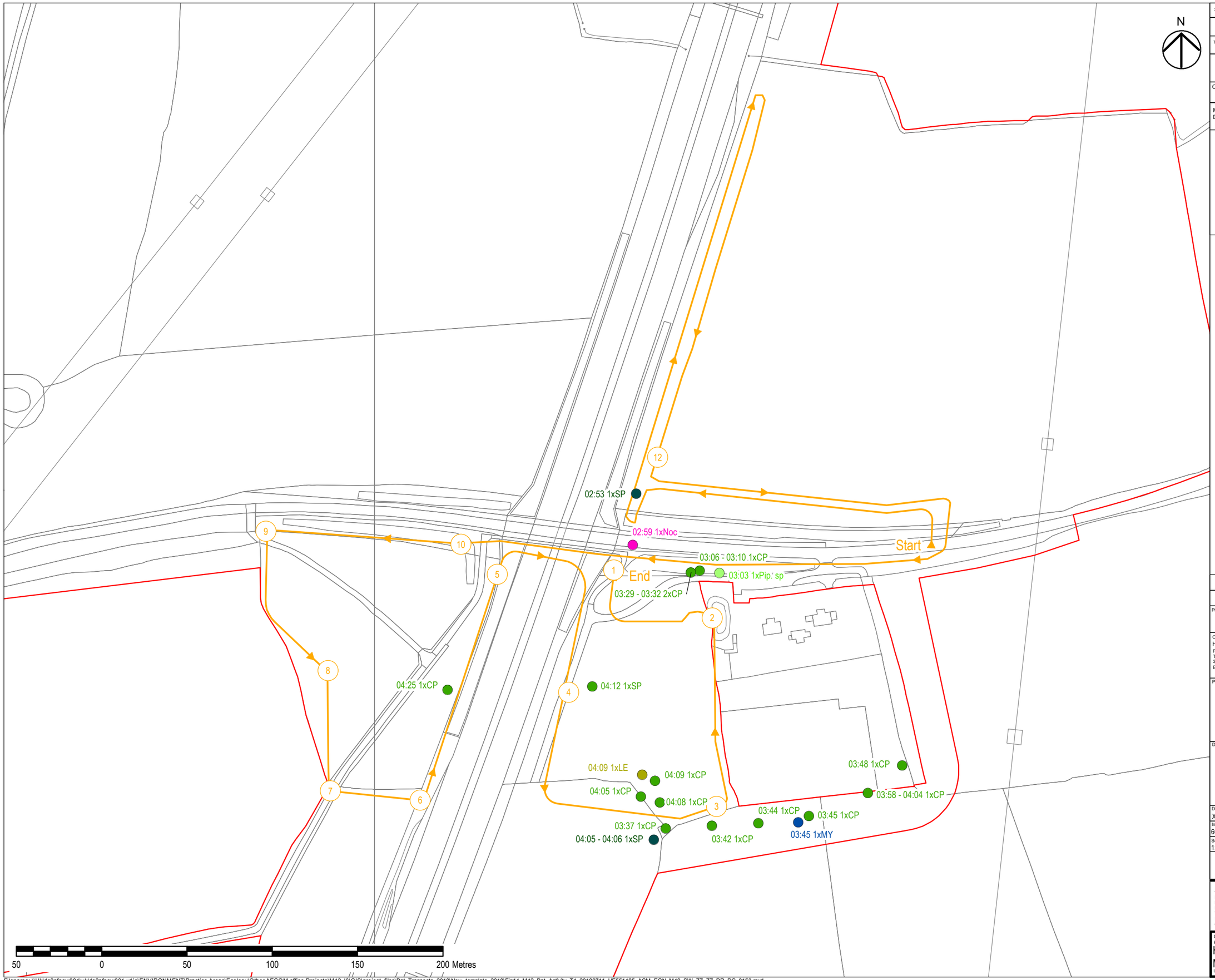
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type | Role | Number - DR-DC-0152 | Rev P01

Filename: \\Ukds2pfpsw001\ukds2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig13_M42_Bat_Activity_T2_20180711_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0152.mxd



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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

NOTES
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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

- Soprano pipistrelle SP
- Common pipistrelle CP
- Pipistrelle species Pip. sp
- Noctule Noc
- *Myotis* MY
- Long-eared LE

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (14) Bat Survey Transect 4 Dawn 11/07/18

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3 1:2,000	Zone M42

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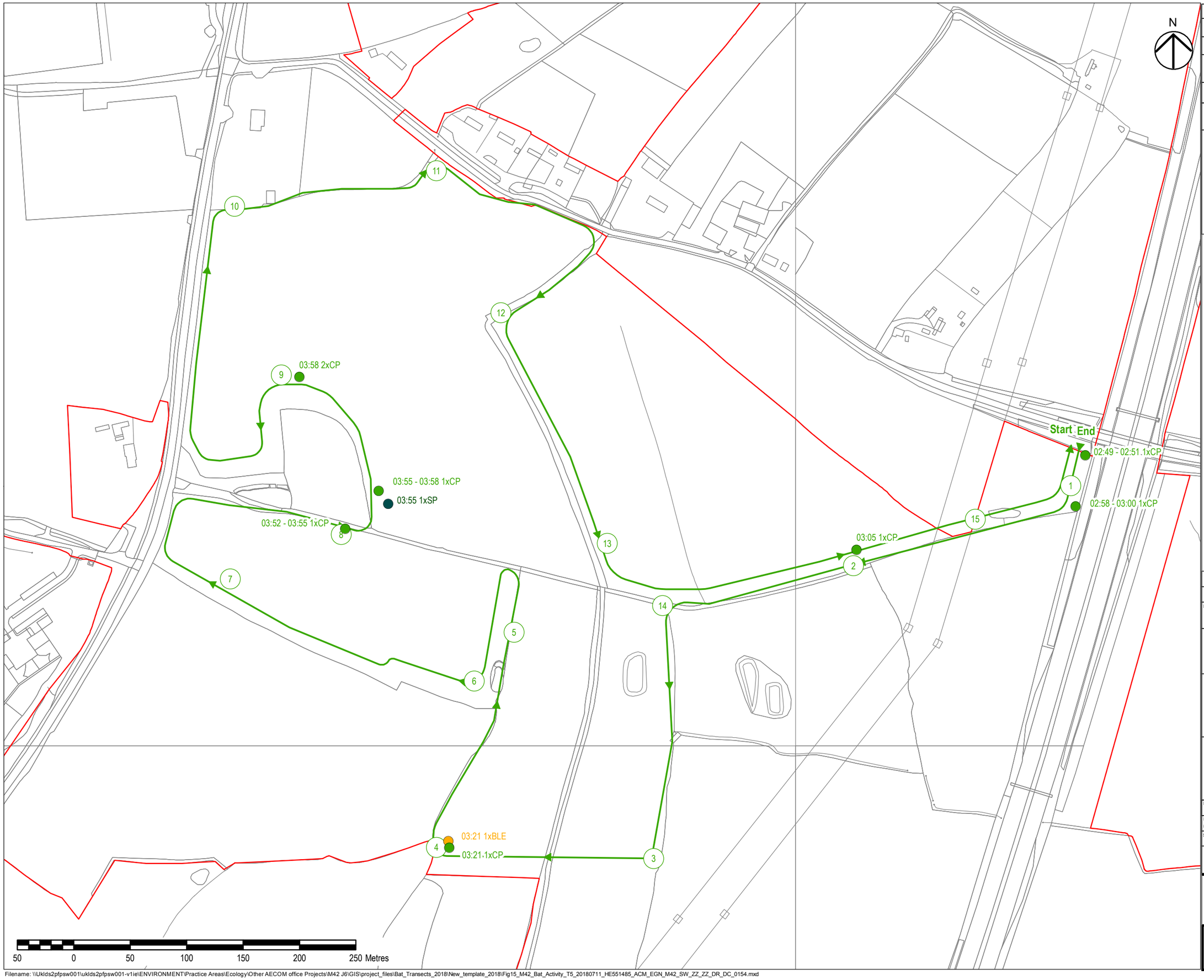
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type - | Role DR | Number DC-0153
Rev: P01

Filename: \\Ukds2pfpsw001\ukds2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig14_M42_Bat_Activity_T4_20180711_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0153.mxd



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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Brown long-eared BLE

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (15) Bat Survey Transect 5 Dusk11/07/18

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3 1:3,000	Zone M42

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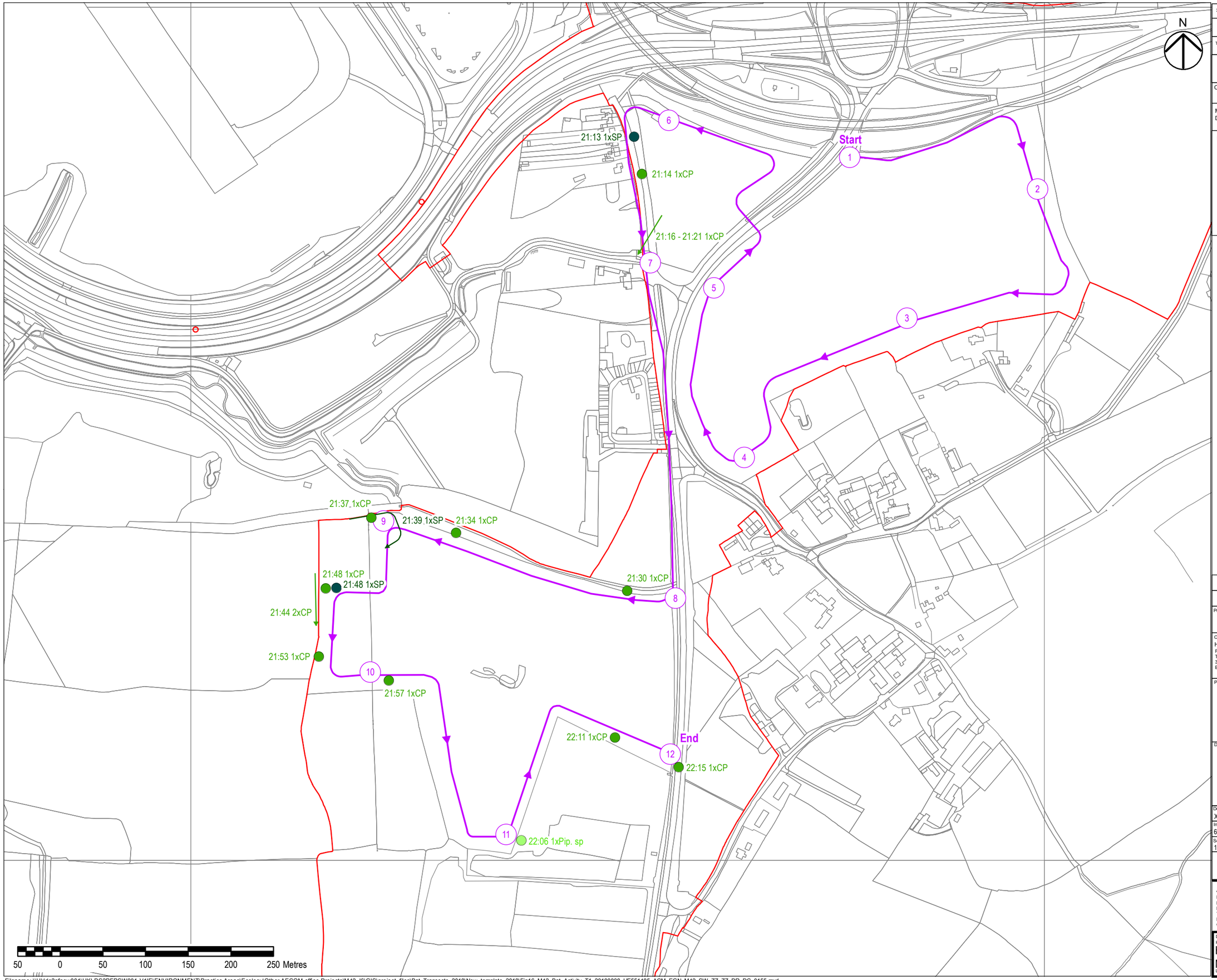
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type | Role | Number - DR-DC-0201 | Rev P01

Filename: \\Ukld s2pfpsw001\ukld s2pfpsw001-v1ie\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig15_M42_Bat_Activity_T5_20180711_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0154.mxd



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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Pipistrelle species Pip. sp

Bat flight (with species, record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of: highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (16) Bat Survey Transect 1 Dusk 08/08/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3: 1:4,000	Zone: M42

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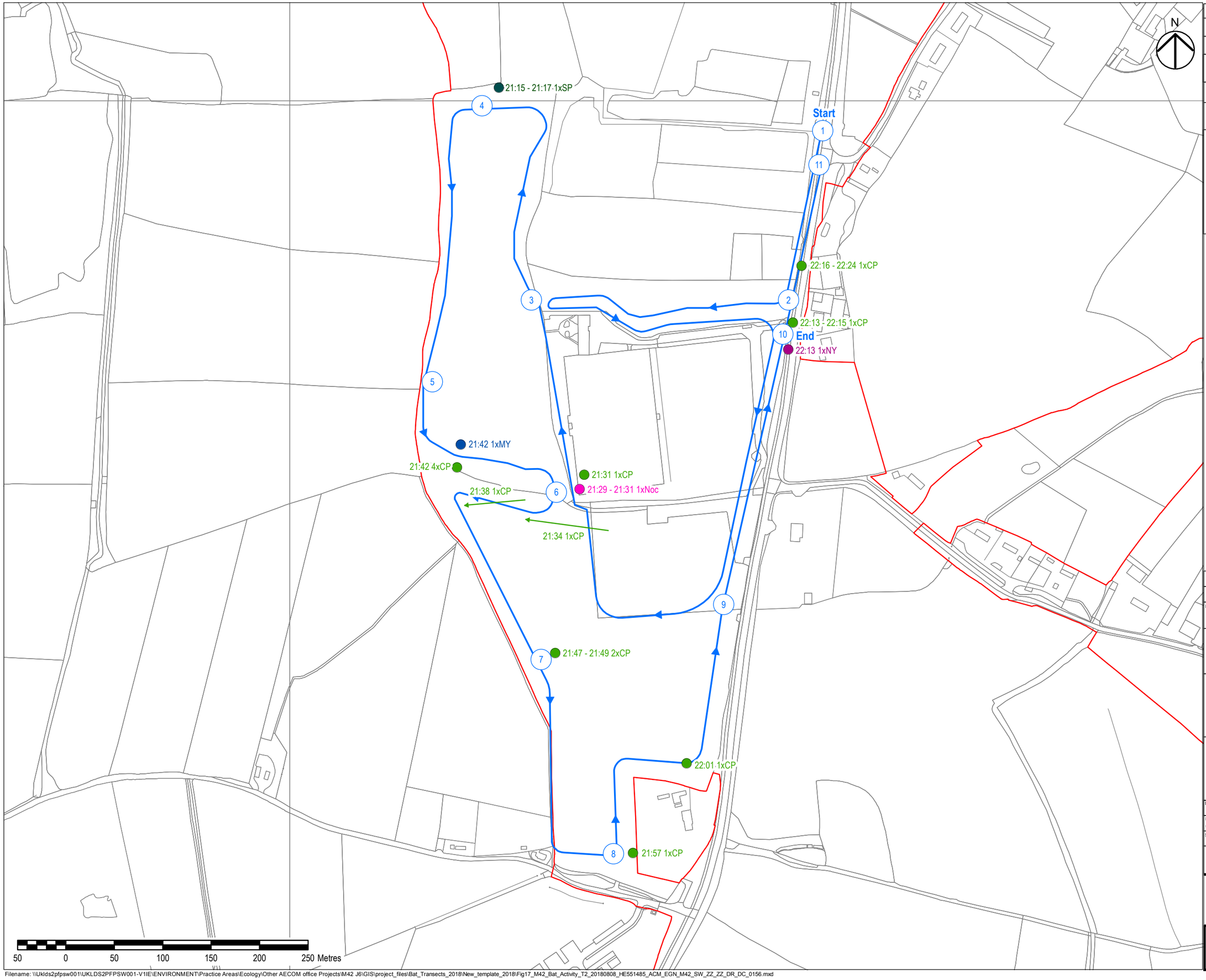
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type - DR | Role - DC | Number -0202 | Rev P01

Filename: \\Ukds2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig16_M42_Bat_Activity_T1_20180808_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0155.mxd



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Legend

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Noctule Noc

Nyctalus NY

Myotis MY

Bat flight (with species, record time and number of bats)

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of: highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (17) Bat Survey Transect 2 Dusk 08/08/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3: 1:3,500	Zone: M42

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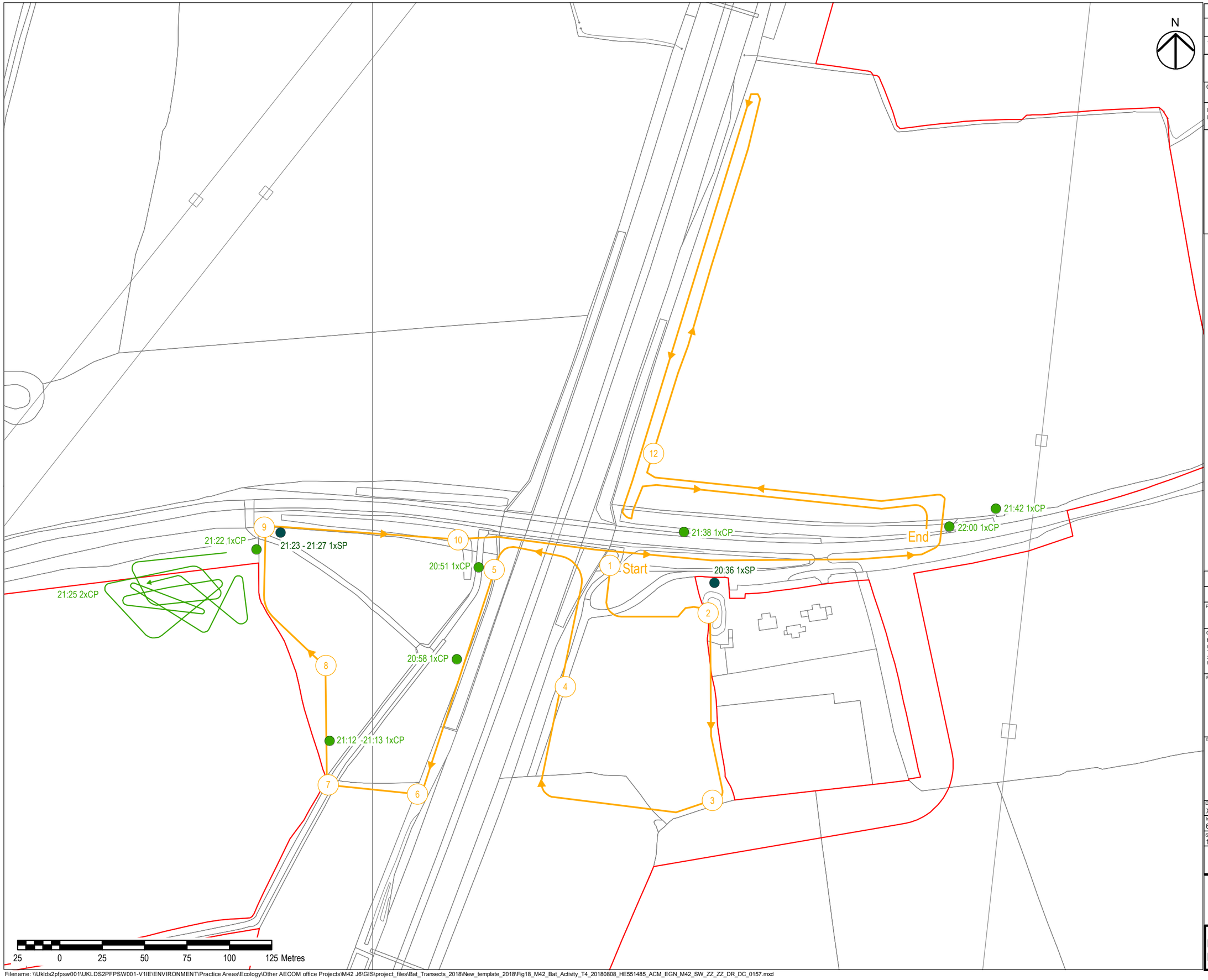
Drawing Number: Highways England Pin | Originator | Volume | Location | Type | Role | Number
HE551485 -ACM -EGN- M42_SW_ZZ_ZZ - DR-DC-0203

Rev: P01

Filename: \\Ukds2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig17_M42_Bat_Activity_T2_20180808_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0156.mxd



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CONSTRUCTION
MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Bat flight (with species, record time and number of bats)

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of: highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (18) Bat Survey Transect 4 Dusk 08/08/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3: 1:2,000	Zone: M42

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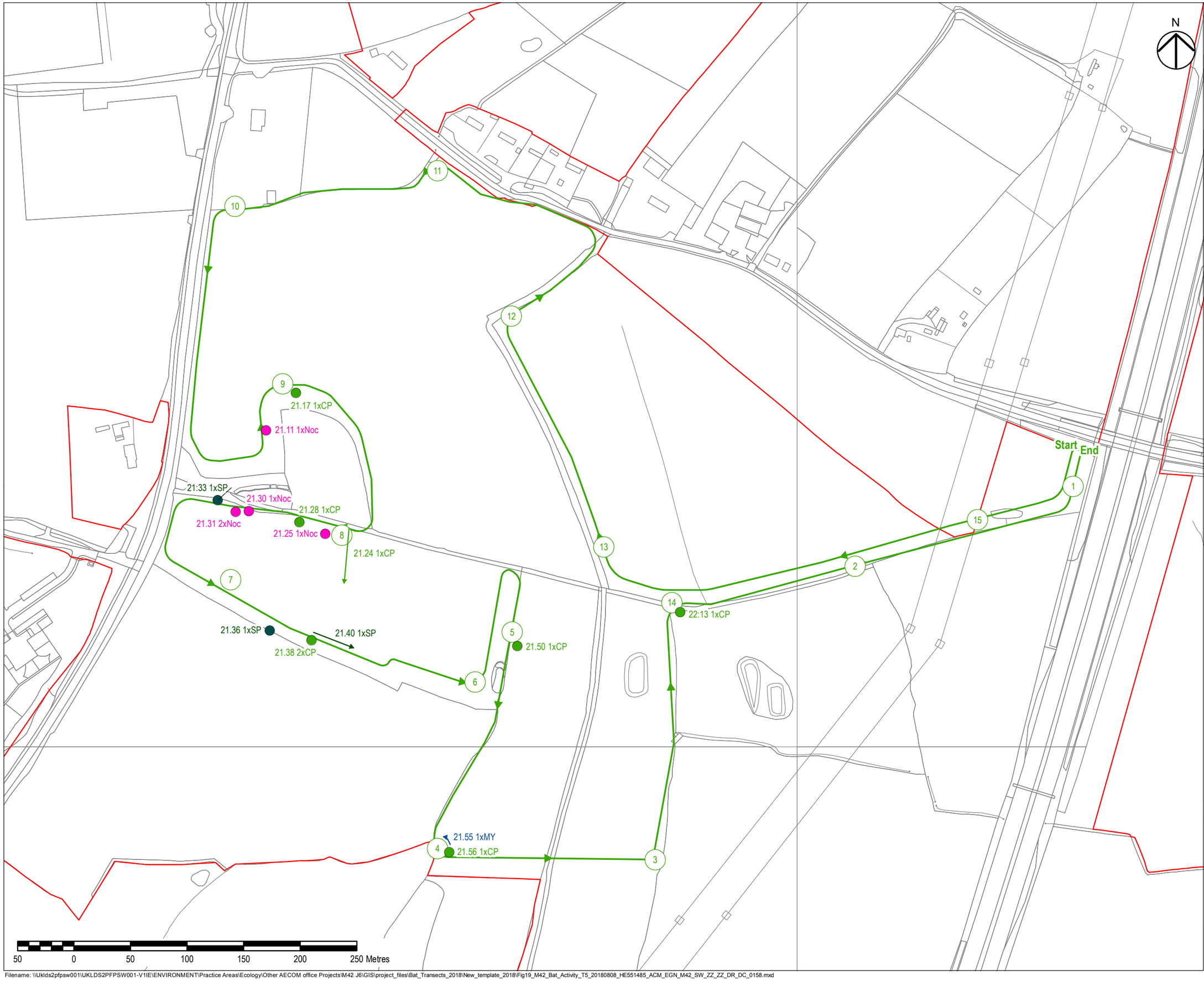
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type | Role | Number - DR-DC-0204 | Rev P01

Filename: \\Ukds2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig18_M42_Bat_Activity_T4_20180808_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0157.mxd



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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Noctule Noc

Bat flight (with species, record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Myotis MY

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (19) Bat Survey Transect 5 Dusk 08/08/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3 1:3,000	Zone M42

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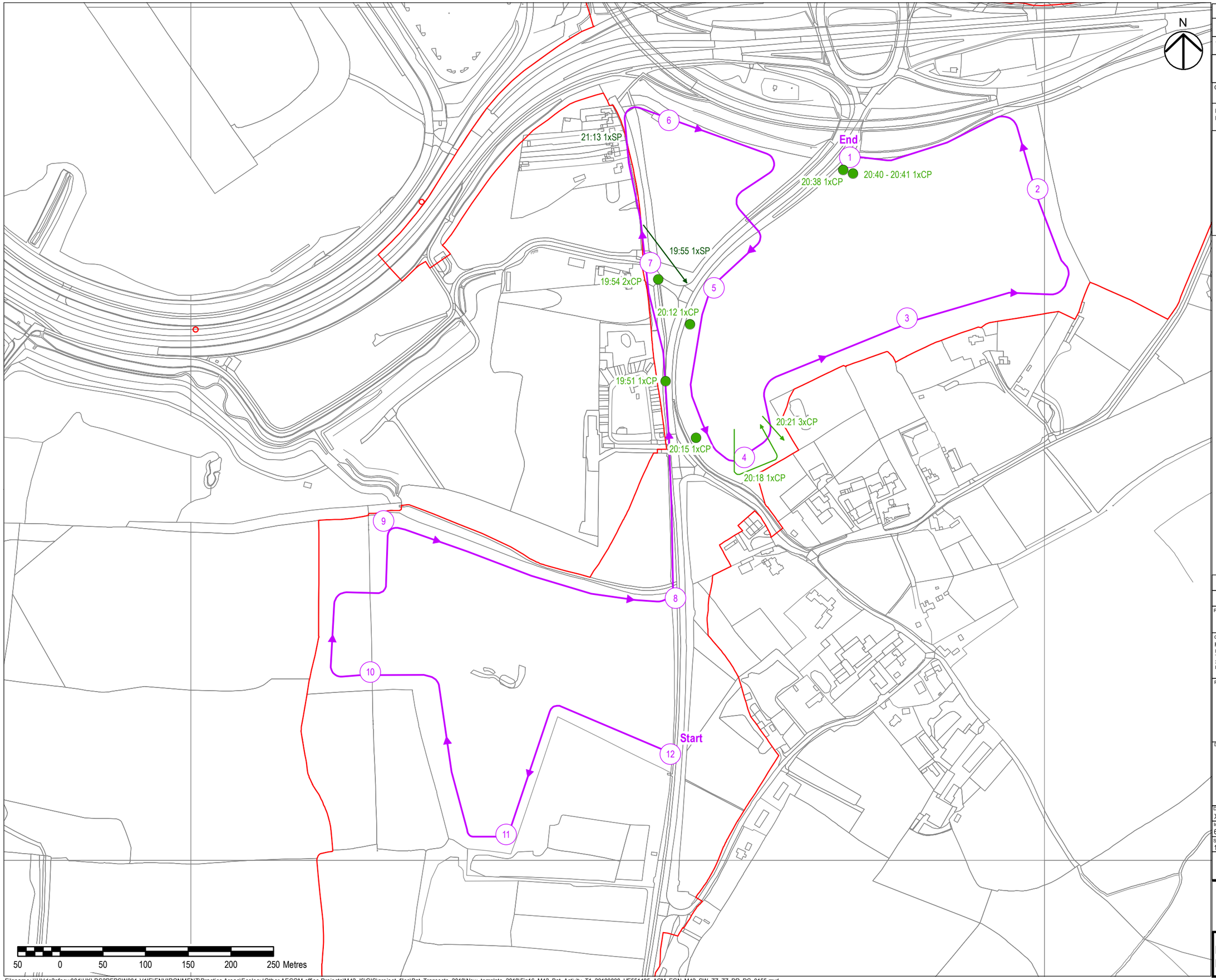
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type - | Role DR | Number DC-0205 | Rev P01

Filename: \\Ukds2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig19_M42_Bat_Activity_T5_20180808_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0158.mxd



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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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LEGEND

Scheme boundary

Bat transect

Transect

Stop point

Bat species (with record time and number of bats)

Common pipistrelle CP

Bat flight (with species, record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of: highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (20) Bat Survey Transect 1 Dusk 12/09/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3: 1:4,000	Zone: M42

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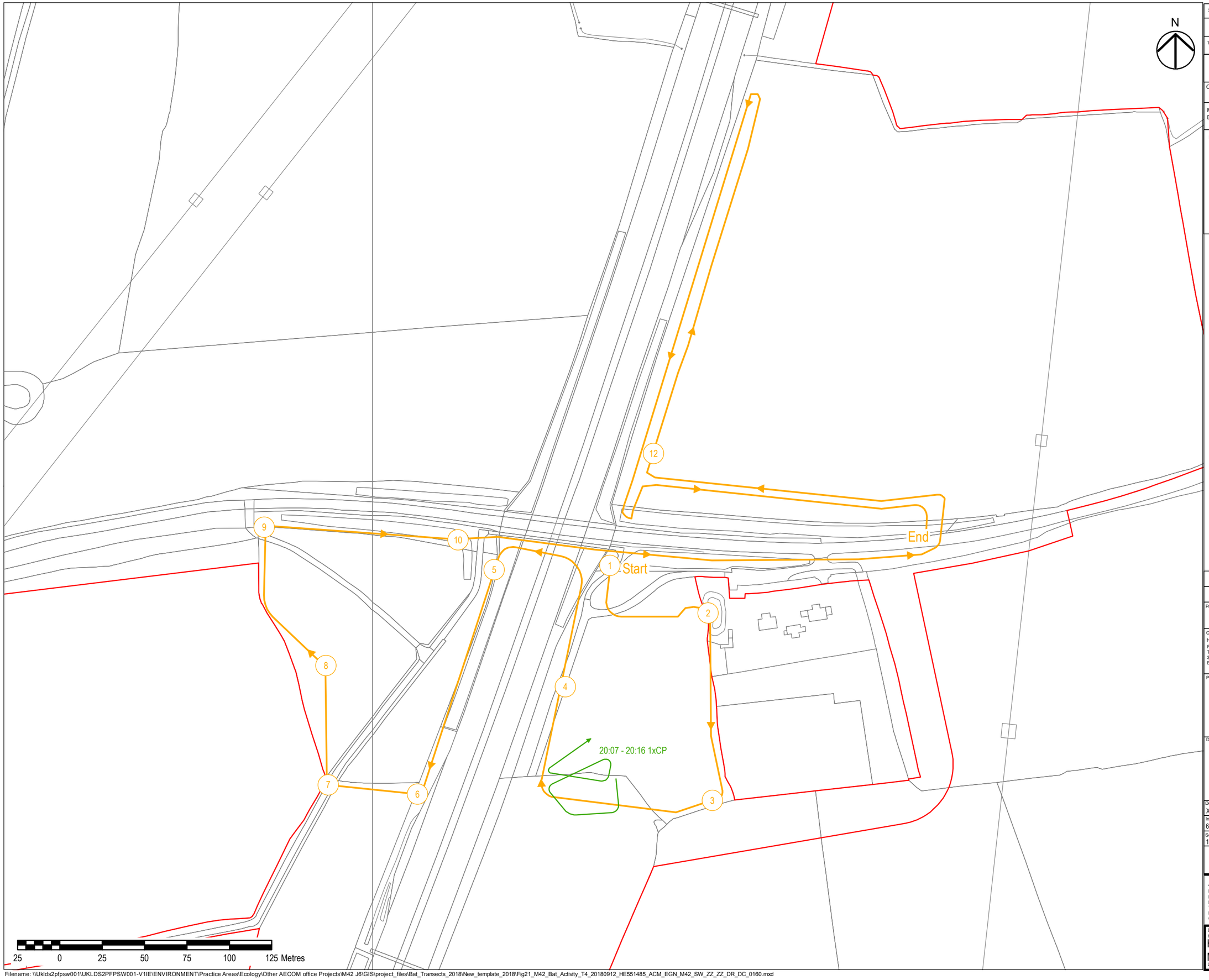
Registered office: Midpoint, Alencon Link, Basingstoke, Hampshire RG21 7PP

Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type - | Role DR | Number DC-0206 | Rev P01

Filename: \\Ukld s2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig16_M42_Bat_Activity_T1_20180808_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0155.mxd



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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

NOTES
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4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.

LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat flight (with species, record time and number of bats)

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (21) Bat Survey Transect 4 Dusk 12/09/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3	Zone
1:2,000	M42

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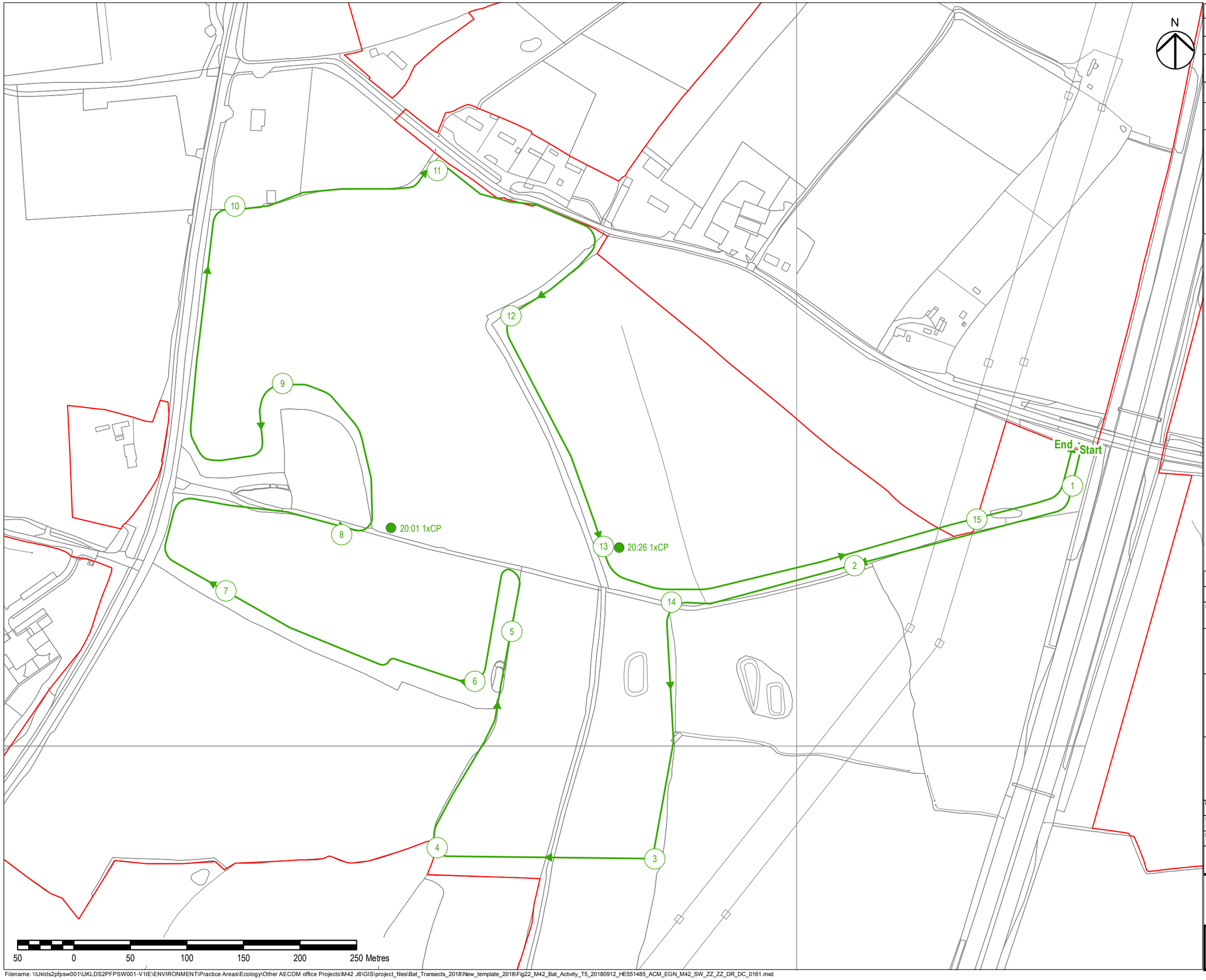
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type - | Role - | Number DR-DC-0207

Rev: P01

Filename: \\Ukld s2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig21_M42_Bat_Activity_T4_20180912_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0160.mxd



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MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.

LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (22) Bat Survey Transect 5 Dusk 12/09/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3: 1:3,000	Zone: M42

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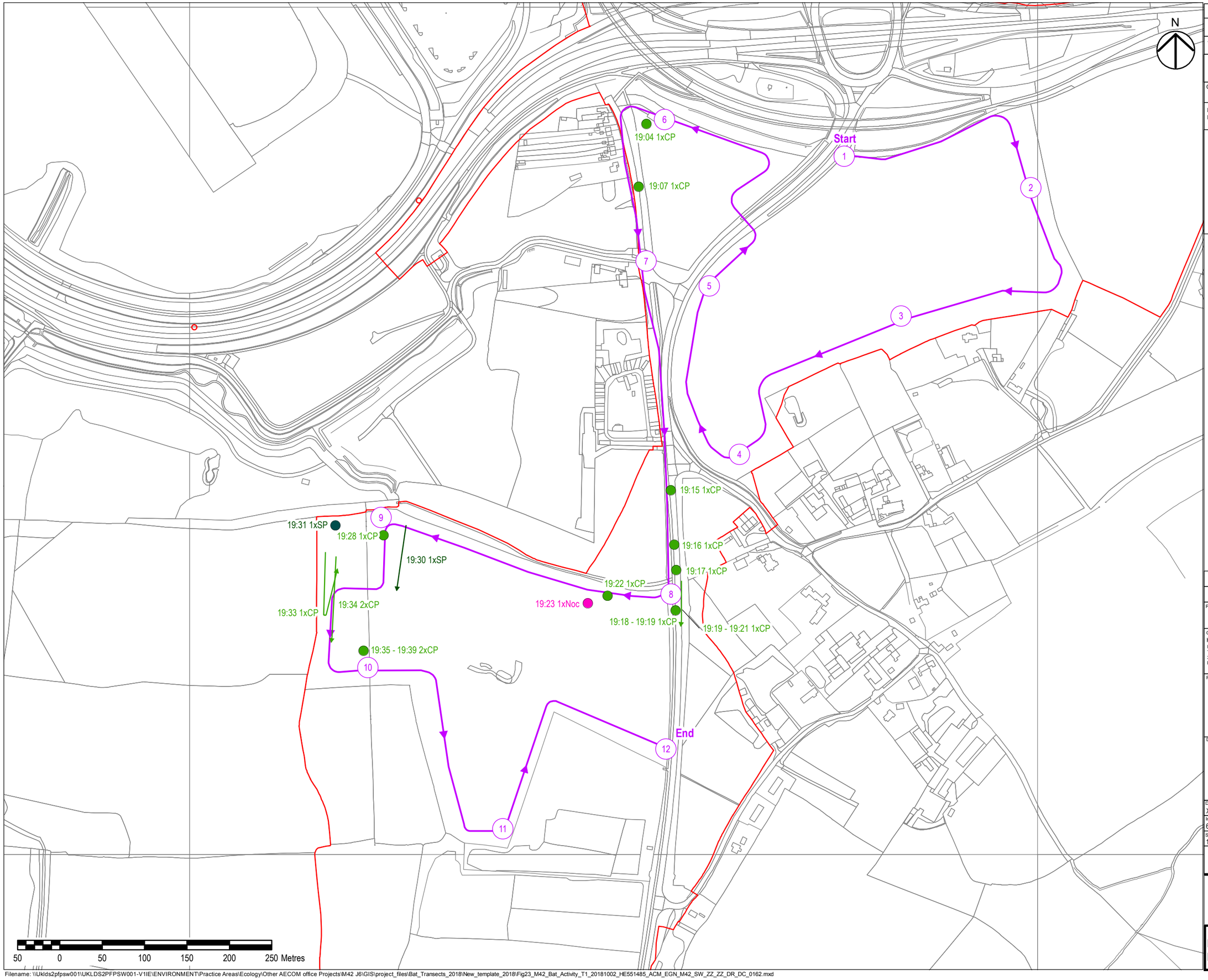
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type - | Role DR | Number DC-0208 | Rev P01

Filename: \\Ukds2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig22_M42_Bat_Activity_T5_20180912_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0161.mxd



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MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP
Common pipistrelle CP
Noctule Noc

Bat flight (with species, record time and number of bats)

Soprano pipistrelle SP
Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (23) Bat Survey Transect 1 Dusk 02/10/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3	Zone
1:4,000	M42

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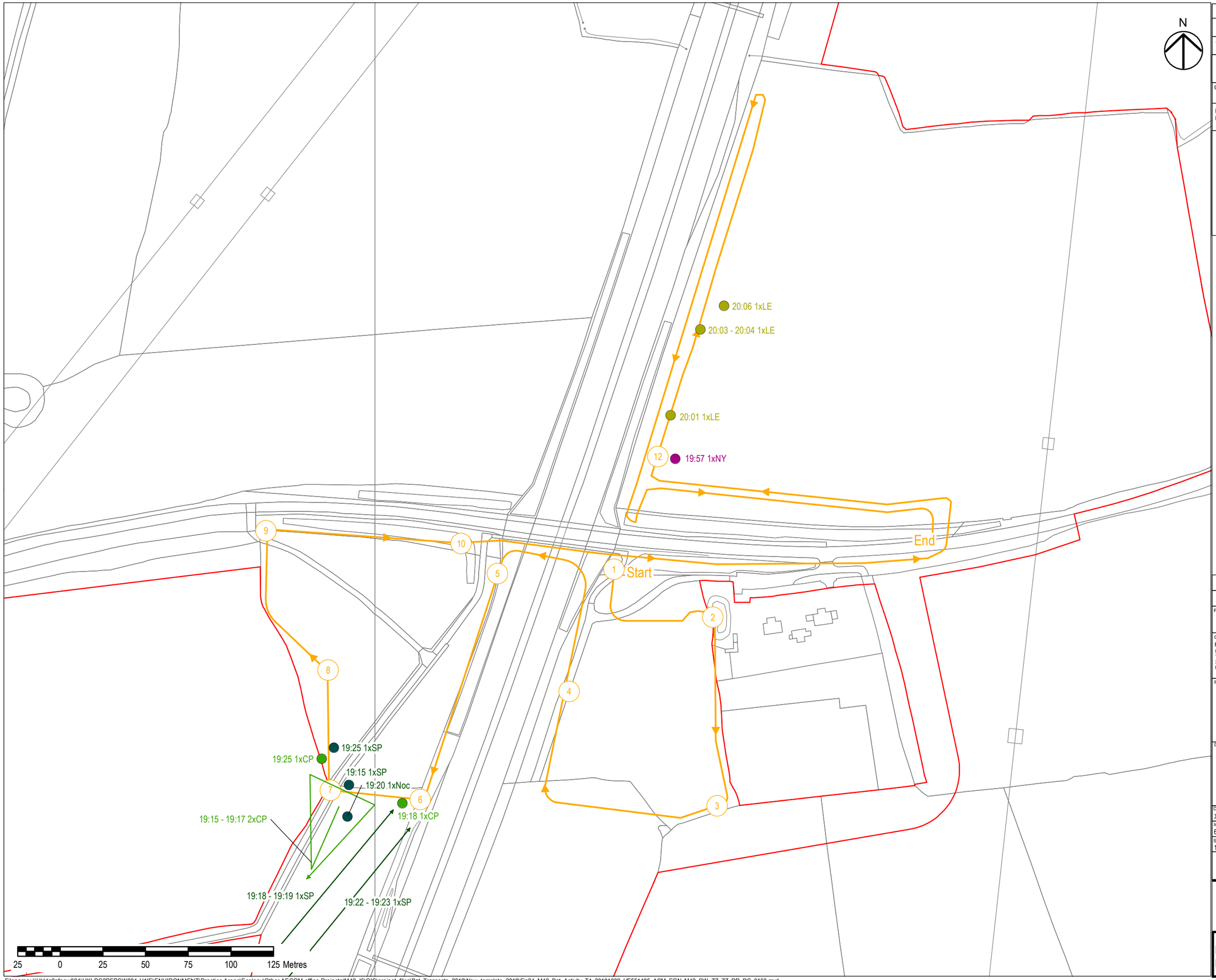
Drawing Number
Highways England Pin | Originator | Volume
HE551485 -ACM -EGN-
Location | Type | Role | Number
M42_SW_ZZ_ZZ - DR-DC-0209

Rev: P01

Filename: \\Ukld s2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_Transects_2018\New_template_2018\Fig23_M42_Bat_Activity_T1_20181002_HE551485_ACM_EGN_M42_SW_ZZ_ZZ_DR_DC_0162.mxd



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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Nyctalus NY

Leisler's LE

Bat flight (with species, record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (24) Bat Survey Transect 4 Dusk 02/10/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3	Zone
1:2,000	M42

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Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -EGN- | Location M42_SW_ZZ_ZZ | Type | Role | Number - DR-DC-0210 | Rev P01

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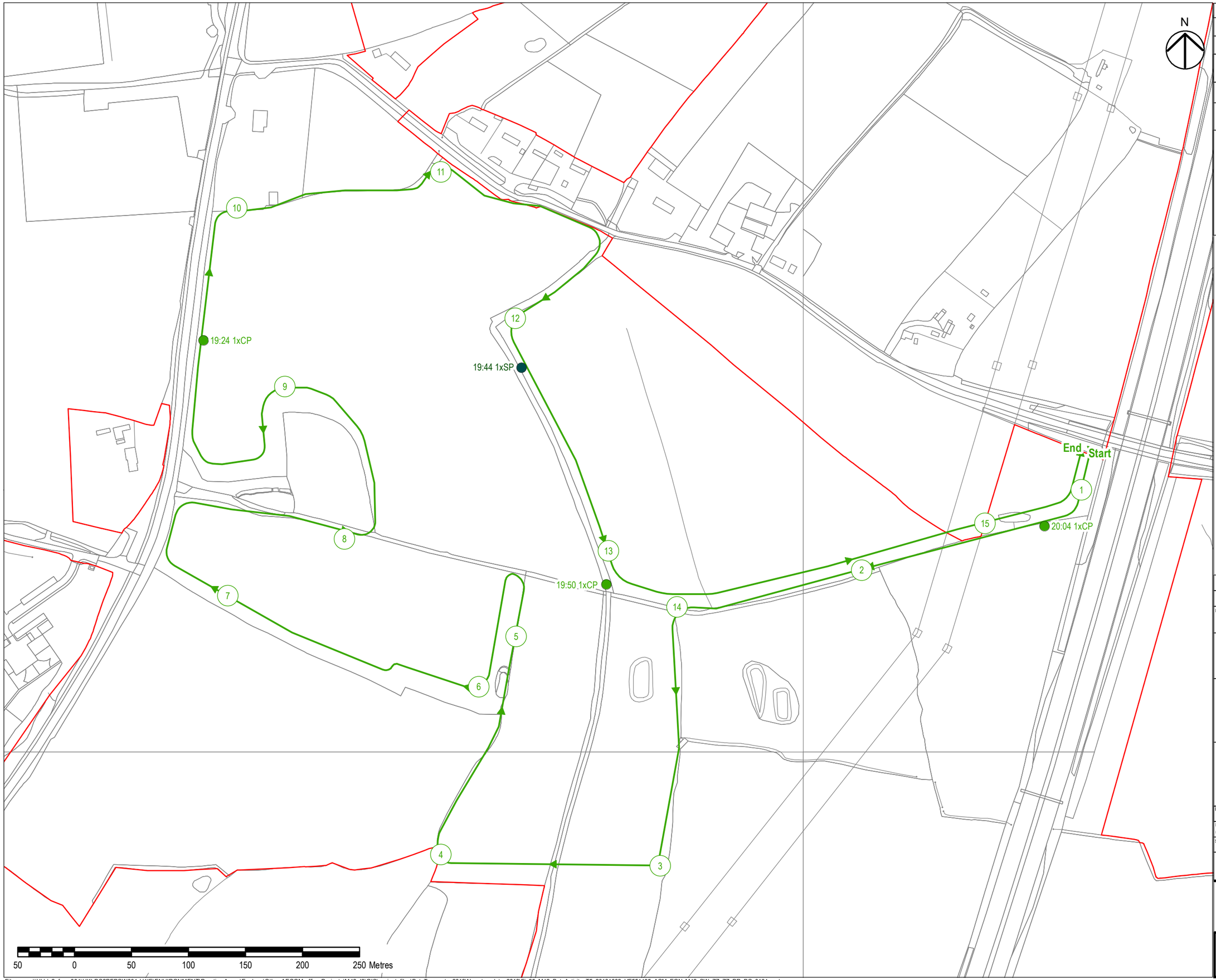

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LEGEND

Scheme boundary

Bat transect route

Transect

Stop point

Bat species (with record time and number of bats)

Soprano pipistrelle SP

Common pipistrelle CP

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Figure 9.5E (25) Bat Survey Transect 5 Dusk 02/10/2018

Designed	Drawn	Checked	Approved	Date
X	CAA	GSB	PB	15/10/2018

Internal Project No	Suitability
60543032	S2
Scale @ A3	Zone
1:3,000	M42

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Drawing Number				Rev
Highways England Pin	Originator	Volume		
HE551485	-ACM	-EGN-		P01
Location	Type	Role	Number	
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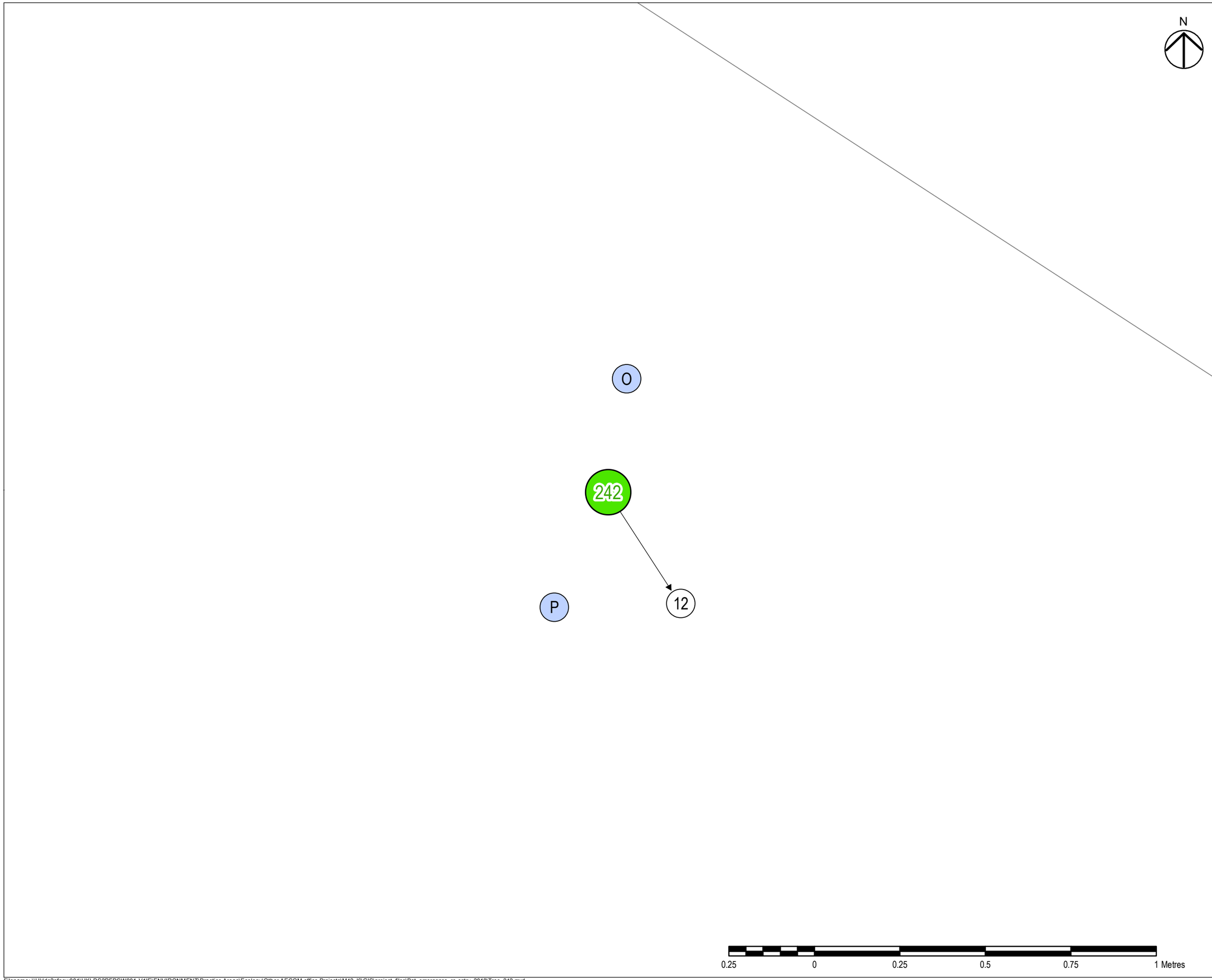
Figure 9.5F (a) Bat Emergence/Re-Entry Surveys



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LEGEND

- Tree (with reference)
- Surveyor location (with reference)
- Bat emergence/re-entry (with reference)
- Bat flight line (with direction)

Revision Details	By / Check	Date	Suffix

Purpose of Issue

FINAL

Client

Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of highways england

Project Title

M42 JUNCTION 6 IMPROVEMENT

Drawing Title

Bat Emergence/re-entry survey
Tree 242

Designed	Drawn	Checked	Approved	Date
X	CAA	X	X	28/08/2018

Internal Project No	Suitability
60543032	X
Scale @ A3	Zone
1:10	X

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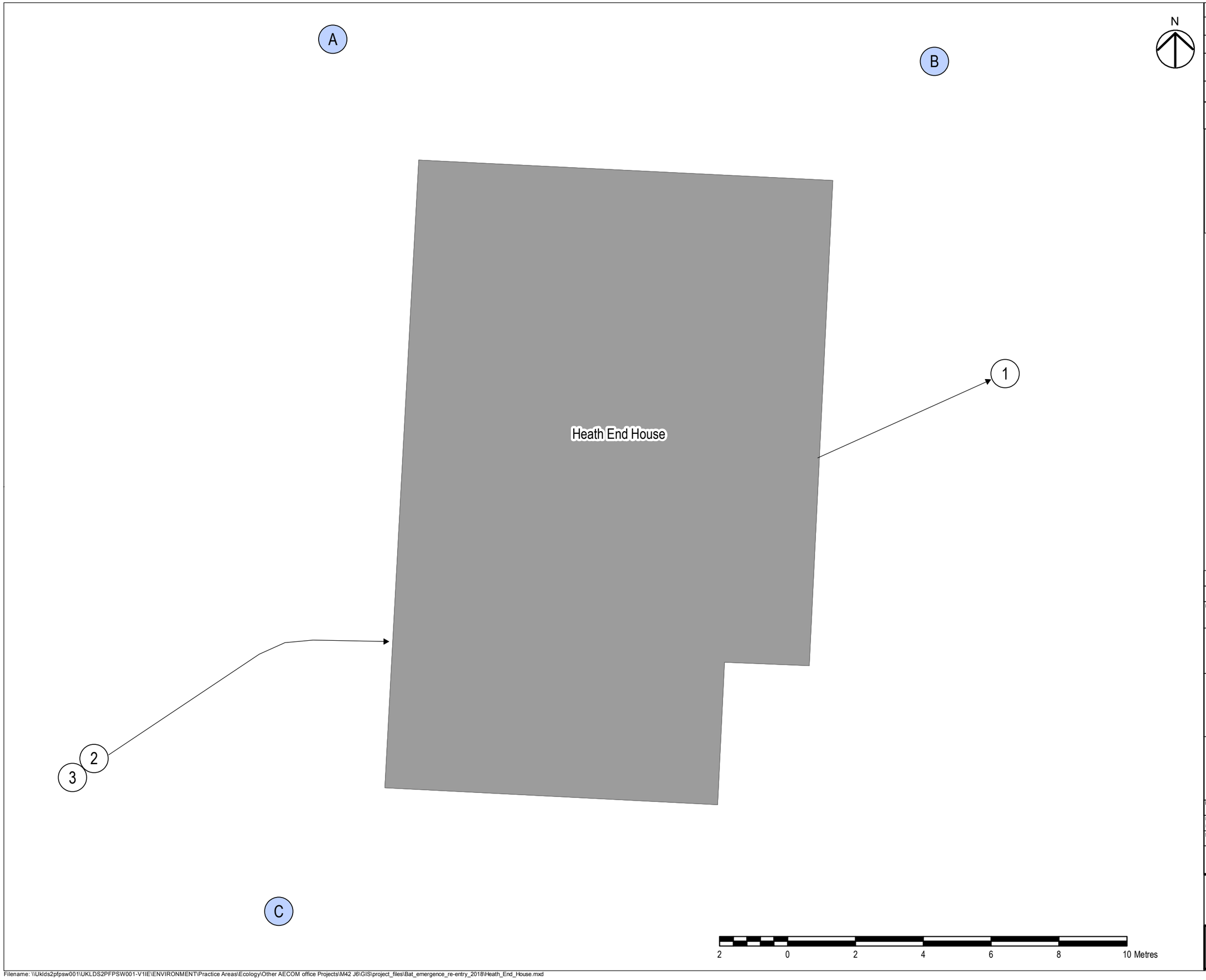
Drawing Number

Highways England Pin	Originator	Volume	Location	Type	Role	Number	Rev
HE551485	-ACM	-HGN-M42_ML_PR_CR		- DR-CH-	00	XX	P01

Filename: \\Ukds2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_emergence_re-entry_2018\Tree_242.mxd



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LEGEND

- Surveyor location (with reference)
- Bat emergence/re-entry (with reference)
- Bat flight line (with direction)
- Building

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client
Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Bat Emergence/re-entry survey Heath End House

Designed	Drawn	Checked	Approved	Date
X	CAA	X	X	28/08/2018

Internal Project No	Suitability
60543032	X
Scale @ A3	Zone
1:4,000	X

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Drawing Number				Rev
Highways England Pin	Originator	Volume		
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Location		Type	Role / Number	
M42_ML_PR_CR		- DR-CH-00XX		

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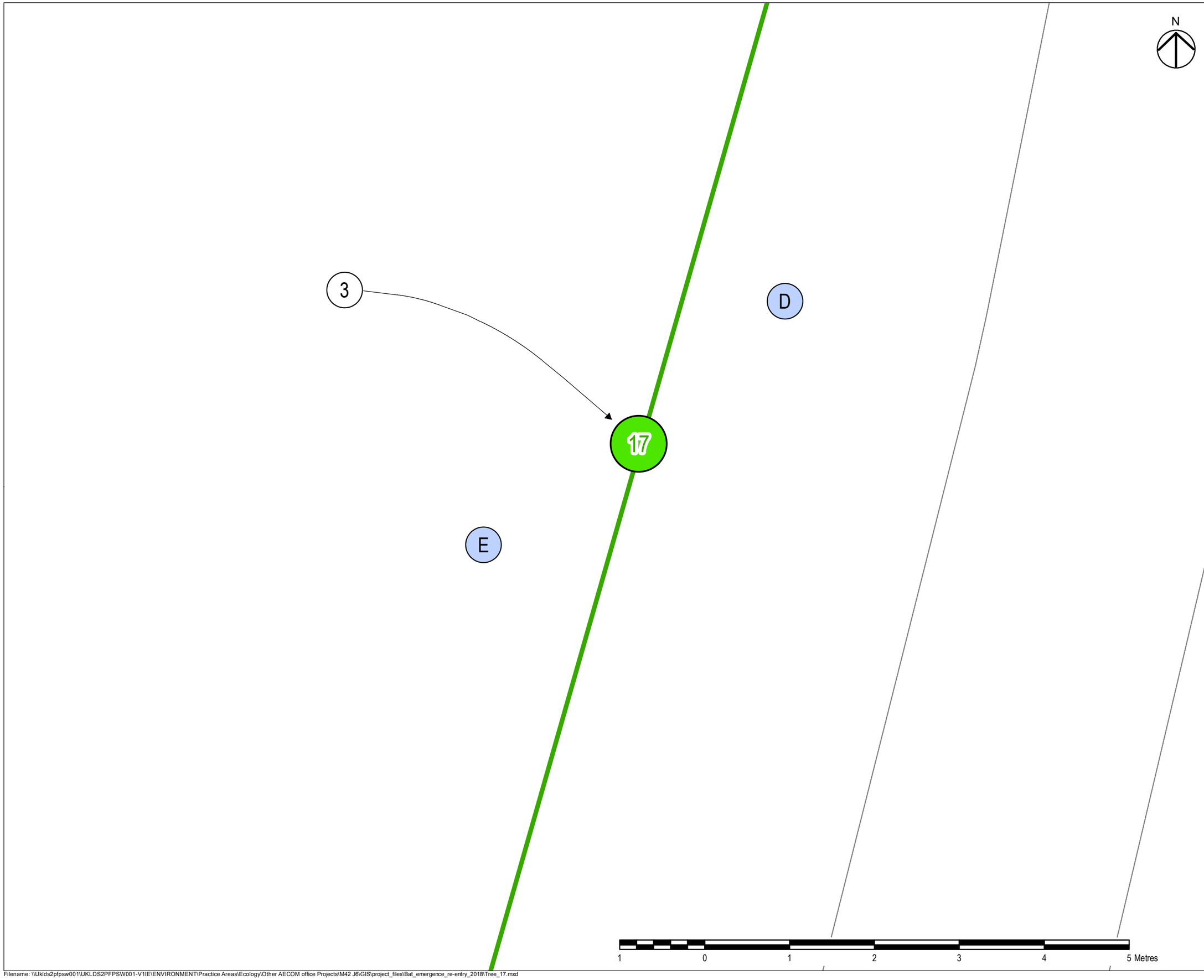

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LEGEND

- Tree (with reference)
- Surveyor location (with reference)
- Bat emergence/re-entry (with reference)
- Bat flight line (with direction)
- Hedgerow

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Bat Emergence/re-entry survey Tree 17

Designed	Drawn	Checked	Approved	Date
X	CAA	X	X	28/08/2018

Internal Project No	Suitability
60543032	X
Scale @ A3	Zone
1:40	X

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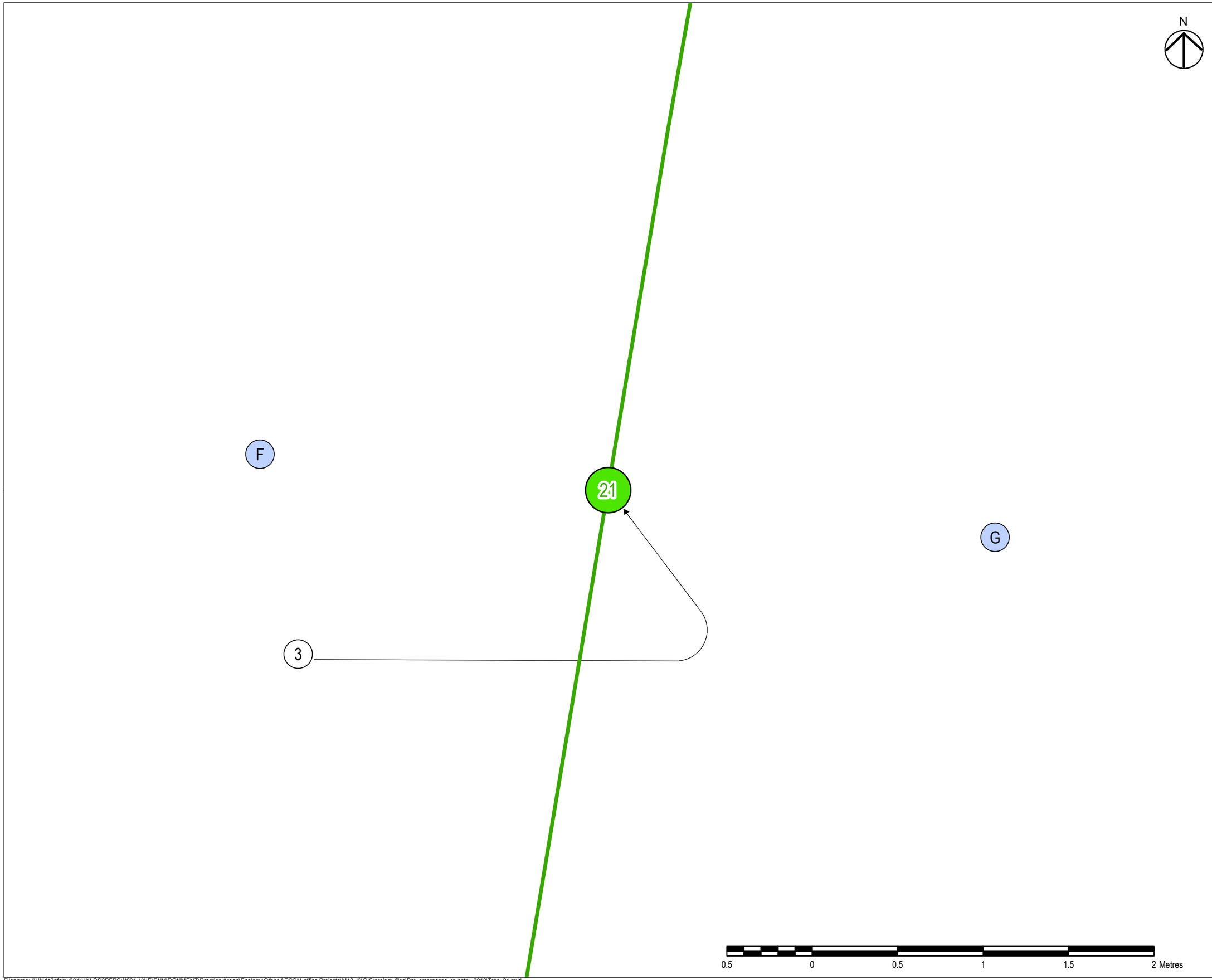
Drawing Number: Highways England Pin | Originator | Volume | Location | Type | Role | Number
HE551485 -ACM -HGN- M42_ML_PR_CR - DR-CH-00XX

Rev: P01

Filename: \\Ukds2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_emergence_re-entry_2018\Tree_17.mxd



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LEGEND

- Tree (with reference)
- Surveyor location (with reference)
- Bat emergence/re-entry (with reference)
- Bat flight line (with direction)
- Hedgerow

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Bat Emergence/re-entry survey Tree 21

Designed	Drawn	Checked	Approved	Date
X	CAA	X	X	28/08/2018

Internal Project No	Suitability
60543032	X
Scale @ A3: 1:20	Zone: X

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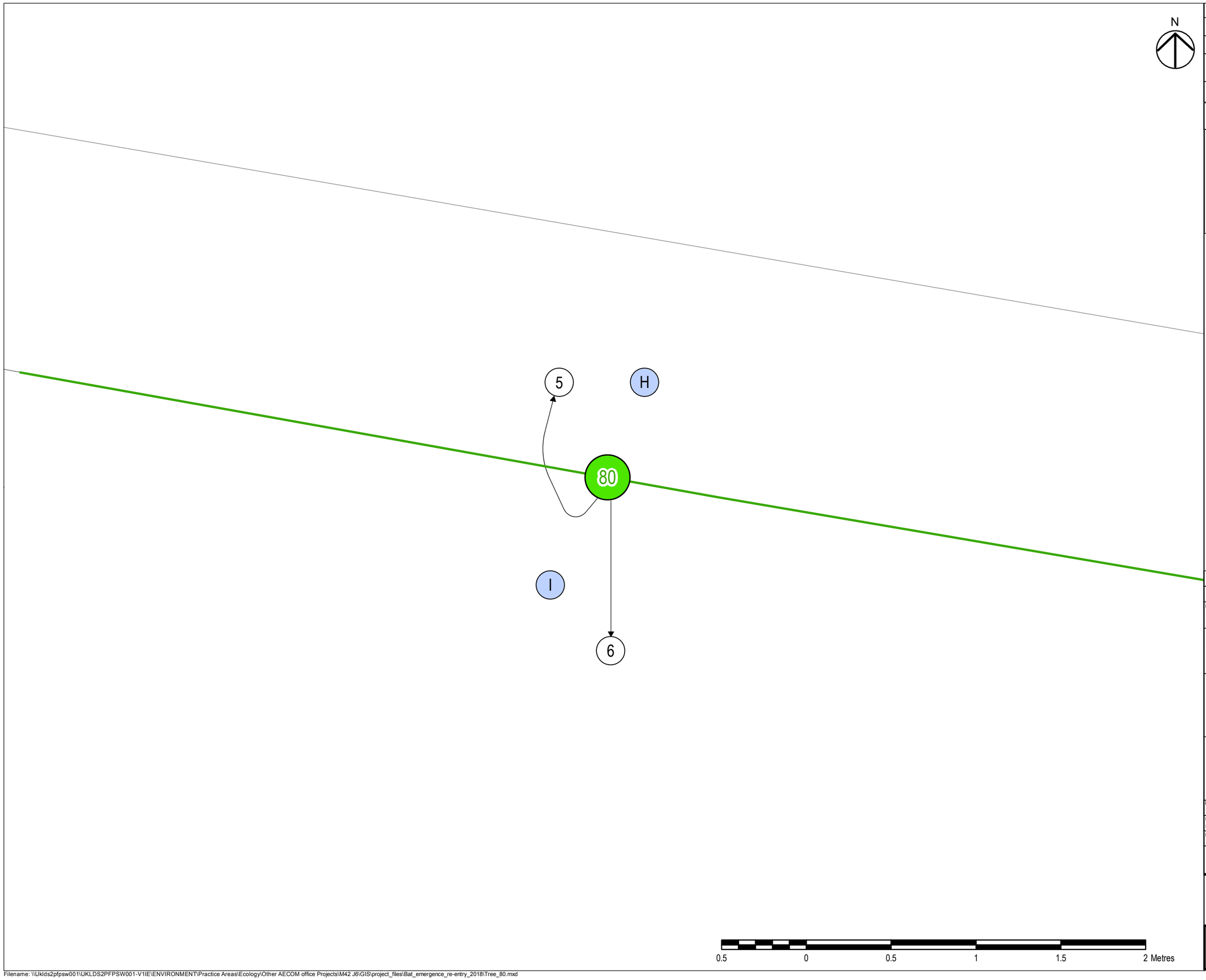
Registered office: Midpoint, Alencon Link, Basingstoke, Hampshire RG21 7PP

Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -HGN- | Location M42_ML_PR_CR | Type - | Role DR- | Number CH-00XX

Rev: P01

Filename: \\Ukds2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_emergence_re-entry_2018\Tree_21.mxd



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

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CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.

2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.

3. ALL DIMENSIONS IN MILLIMETRES, ALL CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.

4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR

LEGEND

- Tree (with reference)
- Surveyor location (with reference)
- Bat emergence/re-entry (with reference)
- Bat flight line (with direction)
- Hedgerow

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Bat Emergence/re-entry survey Tree 80

Designed	Drawn	Checked	Approved	Date
X	CAA	X	X	28/08/2018

Internal Project No	Suitability
60543032	X
Scale @ A3: 1:20	Zone: X

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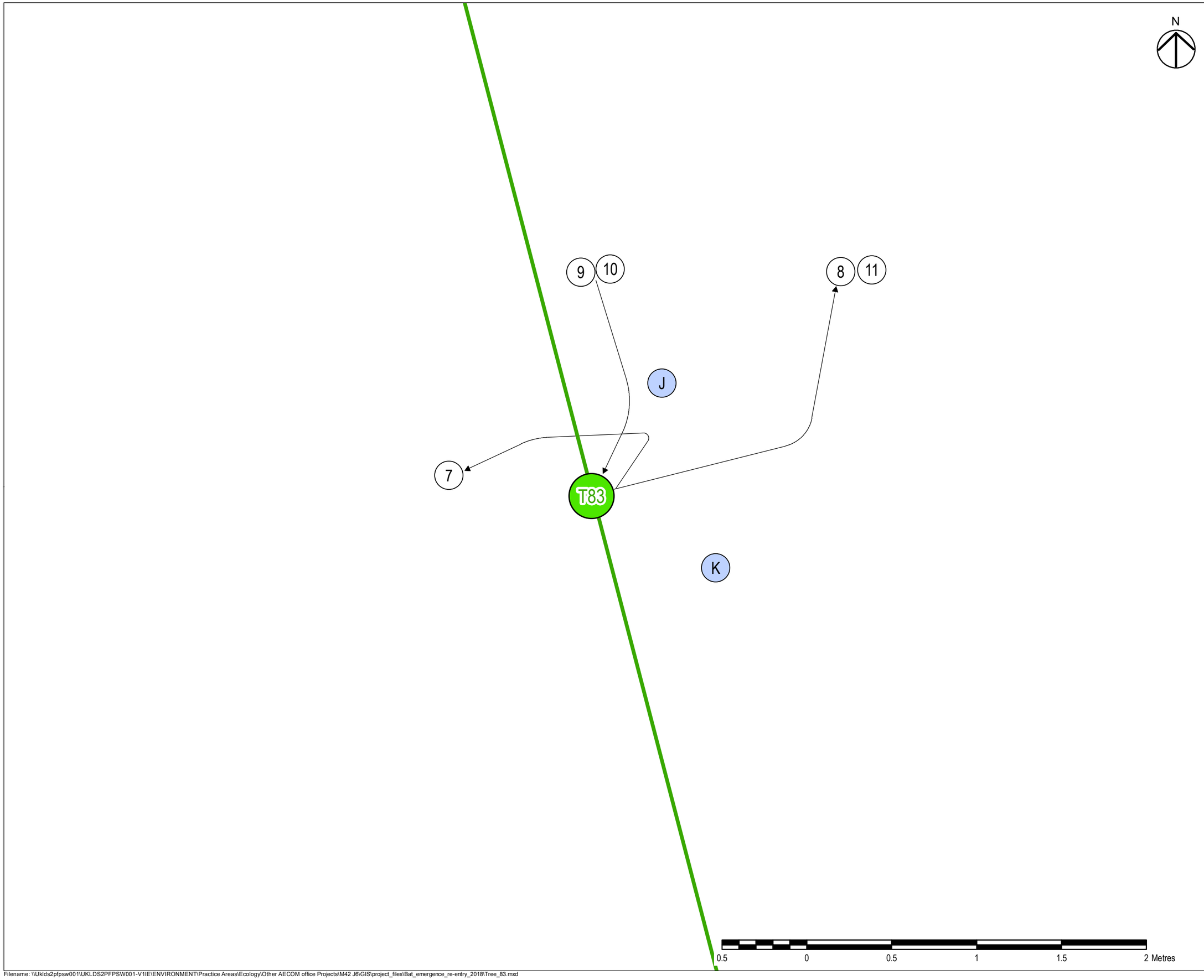
AECOM Infrastructure & Environment UK Limited
Registered in England Registered number: 880328
Registered office: Midpoint, Alencon Link, Basingstoke, Hampshire RG21 7PP

Drawing Number: Highways England Pin | Originator | Volume
HE551485 -ACM -HGN-
M42_ML_PR_CR - DR-CH-00XX
Location | Type | Role | Number

Rev: P01

Filename: \\Ukds2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_emergence_re-entry_2018\Tree_80.mxd



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LEGEND

- Tree (with reference)
- Surveyor location (with reference)
- Bat emergence/re-entry (with reference)
- Bat flight line (with direction)
- Hedgerow

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England, Floor 5, Two Colmore Square, 38 Colmore Circus, B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Bat Emergence/re-entry survey Tree 80

Designed	Drawn	Checked	Approved	Date
X	CAA	X	X	28/08/2018

Internal Project No	Suitability
60543032	X
Scale @ A3: 1:20	Zone: X

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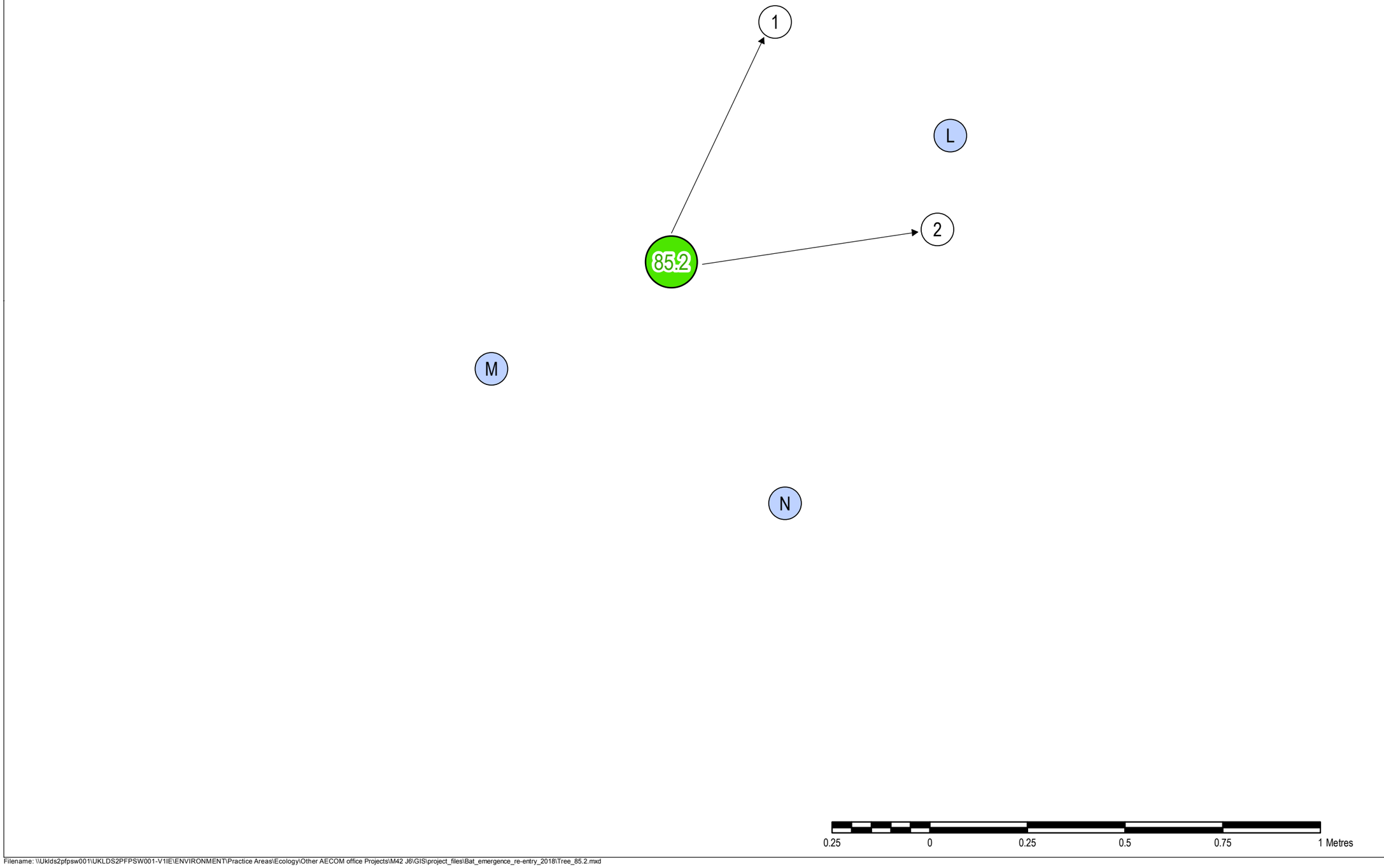
Drawing Number: Highways England Pin HE551485 | Originator -ACM | Volume -HGN- | Location M42_ML_PR_CR | Type - | Role DR | Number -CH-00XX | Rev P01

Filename: \\Ukds2pfpsw001\UKLDS2PFPSW001-V1IE\ENVIRONMENT\Practice Areas\Ecology\Other AECOM office Projects\M42 J6\GIS\project_files\Bat_emergence_re-entry_2018\Tree_83.mxd



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MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

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LEGEND

- Tree (with reference)
- Surveyor location (with reference)
- Bat emergence/re-entry (with reference)
- Bat flight line (with direction)

Revision Details	By / Check	Date	Suffix

Purpose of Issue: FINAL

Client: Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
B4 6BN

Working on behalf of highways england

Project Title: M42 JUNCTION 6 IMPROVEMENT

Drawing Title: Bat Emergence/re-entry survey Tree 85.2

Designed	Drawn	Checked	Approved	Date
X	CAA	X	X	28/08/2018

Internal Project No	Suitability
60543032	X
Scale @ A3	**Zone**
1:10	X

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Rev: P01

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