

A1 Birtley to Coal House

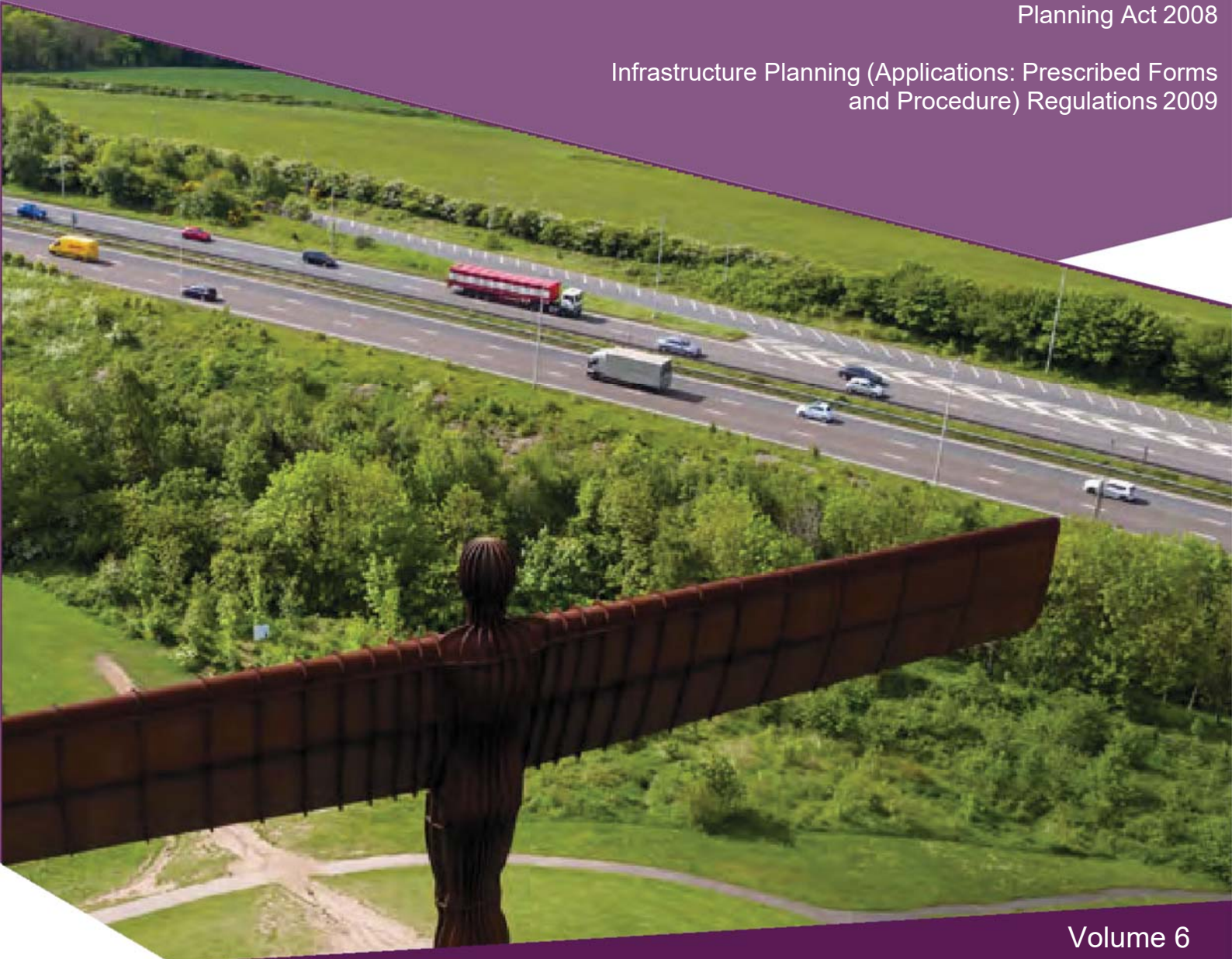
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6.3 Environmental Statement – Appendix 8.5 Bat Survey Report

APFP Regulation 5(2)(a)

Planning Act 2008

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



Infrastructure Planning

Planning Act 2008

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

**A1 Birtley to Coal House
Development Consent Order 20[xx]**

**Environmental Statement -
Appendix**

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DEFRA LOCAL SCALE SURVEY RESULTS

EXECUTIVE SUMMARY

WSP UK Ltd. was commissioned by Highways England to undertake bat emergence / re-entry surveys of several bridges and a DEFRA survey of an underpass to inform the proposals and the Development Consent Order (DCO) for the A1 Birtley to Coal House Scheme (hereafter referred to as 'the Scheme') in Gateshead.

Following the completion of an assessment for bat roost suitability on the structures located along the Scheme, several bridges were identified as having 'Moderate Roost Suitability'. Each bridge was subject to two separate survey visits including a single dusk emergence and a single dawn re-entry survey to determine if bat roosts are present within the structure. This was in accordance with current good practice guidelines (Collins, 2016).

A total of six bridges were subject to survey effort. These were:

- Smithy Lane Overbridge
- Allerdene Bridge
- Eighton Lodge Slip Road underbridge
- Eighton Lodge north underbridge
- Eighton Lodge south underbridge
- Northside Overbridge

Of these structures, a single common pipistrelle bat *Pipistrellus pipistrellus* was confirmed. The bat was located within the underside of Eighton Lodge south underbridge, confirming that a roost is present.

Additionally, Longbank Bridleway underpass was identified as having potential to support bats commuting beneath the A1. As this feature will be directly impacted by the works (due to be extended), the structure was subject to DEFRA Local Scale surveys (crossing point surveys). Longbank Bridleway underpass was initially subject to two crossing point surveys. As a minimum number of bats were recorded to use this structure, a further four surveys were completed.

A Natural England Licence will likely be required to undertake the works to Eighton Lodge south underbridge. This will likely include exclusion of the bats from the roost, prior to the partial demolition and rebuild of the bridge. More details of methods of exclusion will be outlined in full within the mitigation statement to inform the Statement of Common Ground.

As bats have been recorded utilising Longbank Bridleway underpass, it is recommended that a sensitive lighting scheme is required, in order to allow the continued use of the feature and attempt to reduce the fragmentation impacts which may occur by increasing the length of the feature. Monitoring of the use of Longbank Bridleway underpass will be required during construction and over a number of years post-construction.

In addition to these recommendations, consideration has been given to opportunities to enhance the value of the Scheme for bat species.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1. WSP UK Ltd ('WSP') was commissioned by Highways England to undertake bat emergence/ re-entry surveys of several bridges and DEFRA surveys of an underpass in order to inform the proposals and Development Consent Order (DCO) for the A1 Birtley to Coal House Scheme (hereafter referred to as 'the Scheme') in Gateshead, Newcastle upon Tyne.
- 1.1.2. The Scheme is 6.5km in length and will include replacement of Allerdene Bridge. Most of the work will take place within the highway boundary, however, some additional land will be required alongside the A1 at certain points to enable the additional lanes to be constructed.
- 1.1.3. The Scheme will provide additional capacity by widening to four lanes between junction 65 and 67 on the southbound carriageway and three lanes with an additional lane to help manage traffic joining and leaving the A1 between junctions on the northbound carriageway. It also includes a replacement structure of Allerdene Bridge to the immediate south of the current structure, which will tie in to the existing junction 67 Coal House roundabout. The Scheme will also look to install electronic signage to provide driver information along the road.

1.2 ECOLOGICAL BACKGROUND

- 1.2.1. An extended Phase 1 habitat survey was undertaken during March and April 2015 (WSP | PB, 2016b) and updated during September 2018 (WSP, 2018a). Habitats were identified within the Scheme, which are suitable to support bats, including the presence of structures (bridges and underpasses) which may support roosting bats (WSP | PB, 2016a).
- 1.2.2. The update ecological assessment (WSP, 2018) concluded that Longbank Bridleway underpass would be affected by the works. Therefore, an assessment of this structure for its suitability to support commuting bats should be undertaken to determine whether artificial lighting, an increase in length or disturbance from plant and machinery could impact commuting bats.
- 1.2.3. An assessment for bat roost suitability was undertaken on the structures located along the Scheme in November 2017 (WSP, 2018b). This assessment concluded that the structures listed below have 'Moderate Roost Suitability', meaning it was recommended that each structure required further survey and assessment, in accordance with good practice guidance (Collins, 2016).
- 1.2.4. The structures assessed as requiring further survey (and surveys required) are detailed below:
 - Smithy Lane overbridge (Dusk / Dawn Assessment)
 - Allerdene Bridge (Dusk / Dawn Assessment)
 - Eighton Lodge Slip Road underbridge (Dusk / Dawn Assessment)

- Eighton Lodge north underbridge (Dusk / Dawn Assessment)
- Eighton Lodge south underbridge (Dusk / Dawn Assessment)
- Northside Overbridge (Dusk / Dawn Assessment)
- Longbank Bridleway underpass (DEFRA Local Scale Survey)

1.3 BRIEF AND OBJECTIVES

- 1.3.1. Highways England commissioned WSP to complete bat surveys along the Scheme in February 2018. The brief was to:
- Complete dusk emergence, and/or pre-dawn return to roost surveys of built structures with suitability to support bat roosts to establish the presence or likely absence of bat roosts along the Scheme.
 - Complete DEFRA Local Scale Surveys of Longbank Bridleway underpass to determine how the underpass is used for bats crossing the A1.
 - Evaluate the value of the area of the Scheme for bats and make recommendations as to how proposals should account for bats with respect to legislation, planning and biodiversity policy.
- 1.3.2. The results of these surveys, and subsequent recommendations, are included within this report.

2 METHODS

2.1 OVERVIEW

- 2.1.1. Potential Roosting Features (PRFs) were recorded within the bridges / underpass listed in **Table 1** during the bat preliminary roost assessment undertaken in November 2017. Full details regarding the assessment and conclusion of suitability to support roosting bats is detailed within the separate bat assessment report (WSP, 2018).
- 2.1.2. The PRFs were subject to further surveys to record bats emerging from or returning to roost and, in the case of Longbank Bridleway underpass, how bats cross the A1, if present. The level of survey effort employed was conducted with reference to good practice guidelines (Collins, 2016).
- 2.1.3. Given that a bat roost was recorded within Eighton Lodge south underbridge, the level of survey effort was increased in line with current good practice guidelines (Collins, 2016), to allow an assessment of the status of that roost.

2.2 BAT DUSK EMERGENCE / PRE-DAWN RETURN SURVEY

- 2.2.1. Six bridges were identified to have features with suitability to support bat roosts and were subject to further surveys to watch and listen for bats emerging from, or returning to roost. The level of survey effort employed was proportional to the level of suitability for roosts to be present and the number and timing of survey visits is shown in **Table 1** in **Section 3.5** below. Surveyor locations were utilised to fully cover the PRFs on all suitable buildings. These surveyor locations are shown in **Figure 2**.
- 2.2.2. The dusk emergence surveys began 15 minutes before sunset and continued until 120 minutes after sunset. The dawn return to roost surveys began 120 minutes before sunrise and finished at sunrise.
- 2.2.3. The surveyors used Bat Box duet bat detectors to listen to and record echolocation calls of bats observed. During the survey, surveyors mapped the flight-lines used by any bats observed and noted any features used by the bats to exit/enter the buildings. Incidental records of bat activity near the surveyor locations was also collected.

2.3 DEFRA LOCAL SCALE SURVEYS

- 2.3.1. Longbank Bridleway underpass was identified to have potential to be used by bats as a crossing point underneath the A1, therefore, a DEFRA Local Scale survey was undertaken to determine how the structure is used by bats in accordance with DEFRA guidance (Berthinussen & Altringham 2015).
- 2.3.2. The dusk surveys began at sunset and commenced for 60 minutes following sunset. The dawn surveys began 60 minutes prior to sunrise and finished at sunrise.
- 2.3.3. Surveyors used full spectrum bat detectors and were positioned at either end on the underbridge and observed any bat activity, which may have occurred including counts of all

commuting bats, with data on flight height, direction and distance from the underbridge. Notes were also recorded regarding whether bats passed over the road or through the underpass. A standardised DEFRA form was used to collate the data required.

- 2.3.4. Two surveys were initially undertaken to assess if bats “used” the underpass. Use was bats passing through the underpass / over the road or within 5m of the underpass / road. As more than 10 bats were recorded using the underpass (between 1-5 bat passes for rare species, depending upon abundance) a full set of six surveys were undertaken.

2.4 DATA ANALYSIS

DUSK EMERGENCE AND DAWN RE-ENTRY

- 2.4.1. Where needed, the recordings of bat echolocation calls collected during the surveys was analysed using specialist computer software (Kaleidoscope, Analook and Bat Sound), which was utilised to identify bat calls to species / species group level, with calls identified with reference to published data (Russ, 2013).
- 2.4.2. The analysis enables confirmation of species or species groups 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.
- 2.4.3. For *Pipistrellus* species the following criteria based on measurements of peak frequency are used to classify calls:
- Common pipistrelle *Pipistrellus pipistrellus* ≥ 42 and <49 KHz
 - Soprano pipistrelle *Pipistrellus pygmaeus* ≥ 51 KHz
 - Nathusius’ pipistrelle *Pipistrellus nathusii* <39 KHz
 - Common/ soprano pipistrelle ≥ 49 and <51 KHz
 - Common/ Nathusius’ pipistrelle ≥ 39 and <42 KHz
- 2.4.4. 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/ Plecotus* sp.
 - *Nyctalus* sp. (either Leisler’s bat *Nyctalus leisleri* or noctule *Nyctalus noctula*)
 - Serotine *Eptesicus serotinus* /Leisler’s bat
 - Serotine/*Plecotus* sp

DEFRA LOCAL SCALE SURVEYS

- 2.4.5. Bat recordings were auto analysed utilising BatClassify¹ (GPL, Version 3) to classify all bat calls to species level, where possible.

¹ <http://www.bitbucket.org/chrisccott/batclassify>

- 2.4.6. Data sheets were assessed for each surveyor and each survey, to remove duplicate crossing events e.g. bats recorded crossing at the same time, height, distance and direction by more than one surveyor. These events were then assigned a species by comparing times between the data sheets and sound recordings.
- 2.4.7. The threshold utilised for correct identification within BatClassify was >0.9, anything below this threshold was manually checked.
- 2.4.8. Data was then assessed as to whether the bats were recorded “using” the existing feature and if so was it “safe”. Both definitions are adapted from the DEFRA guidance, which are:
- Use of a crossing structures, in this case an underbridge, is defined as bats passing with 5m of the structure or passing beneath the road through the structure; and
 - ‘Safe’ crossing is considered passing through the underbridge below the road or passing over the road at a height of greater than 5m above the road surface.
- 2.4.9. This data was then assessed to gain total numbers and percentages of bats utilising the structure and safe/unsafe passage.
- 2.4.10. Further assessment utilising statistical analysis will be undertaken following the construction and post-construction monitoring surveys.

2.5 DATES OF SURVEY AND PERSONNEL

- 2.5.1. The bat surveys were led by an experienced surveyor who has three years’ experience of ecological survey, including extensive bat survey experience and is a graduate member of the Chartered Institute of Ecology and Environmental Management (CIEEM).
- 2.5.2. The timing of other survey visits and surveyors responsible is summarised in **Table 2-1**.

Table 2-1 - Dates for Bat Dusk Emergence/ Pre-dawn Re-entry Survey Visits

Bridge Ref.	No. Surveyor Positions	Dates of Survey
Eighton Lodge Slip Road underbridge	2	1 st May 2018 - Dusk Emergence
	2	16 th May 2018 - Dawn Re-entry
Eighton Lodge North underbridge	4	2 nd May 2018 - Dawn Re-entry
	4	15 th May 2018 - Dusk Emergence

Bridge Ref.	No. Surveyor Positions	Dates of Survey
Eighton Lodge South ² underbridge	4 ³	2 nd May 2018 - Dusk Emergence
	4	17 th May 2018 - Dawn Re-entry
	2	30 th August 2018 - Dusk Emergence
Allerdene underbridge	2	3 rd May 2018- Dawn Re-entry
	4	16 th May 2018- Dusk Emergence
North Side Overbridge	3	3 rd May 2018- Dusk Emergence
	4	18 th May 2018- Dawn Re-entry
Smithy Lane Overbridge	4	4 th May 2018- Dawn Re-entry
	3	17 th May 2018- Dusk Emergence
Longbank Bridleway Underpass	2	4 th June 2018- Dusk
	2	14 th June 2018 – Dusk
	2	05 th July 2018 – Dusk
	2	06 th July 20108- Dawn
	2	11 th July 2018- Dusk
	2	12 th July 2018 – Dawn

2.6 NOTES AND LIMITATIONS

- 2.6.1. During the dawn re-entry survey for Allerdene Bridge, two surveyors undertook the survey and were located on the south side of the bridge. This was due to not being able to gain access from the north side of the bridge. Alternate access was gained for the dusk emergence survey and so all sides of the bridge were covered (see **Figure 2**). Given the activity recorded and the viewpoints gained, it is considered that the survey is valid.

² The number of surveys were increased to three for Eighton Lodge South, following the confirmation of the presence of a roosting bat

³ Four surveyors were initially utilised for health and safety reasons and to ensure all features / egress points could be viewed. At the time of the initial surveys it was not clear as to whether surveyors would be at risk from lone working. It was considered that surveyor numbers could be lowered to two surveyors as there was no risk to the team.

- 2.6.2. The undersides of Allerdene Bridge and Northside Overbridge were very dark during the surveys and so it was difficult for the surveyors to confirm if bats were emerging or re-entering to a roost. Given the timings of the bat passes recorded (heard after peak emergence periods) and flight lines recorded, it is considered that no emerging bats were missed and the surveys remain valid.
- 2.6.3. Long-eared bats *Plecotus spp.* echolocate more quietly than other bat species and so are often more difficult to detect, meaning this species could have been missed during the survey, but this is not considered to be a significant constraint to the interpretation of the results as surveys were extended to two hours after sunset and two hours before sunrise to pick up any later emerging/returning to roost bats.

3 RESULTS

3.1 OVERVIEW

- 3.1.1. The structures included within this assessment that are located along the Scheme include: Eighton Lodge Slip Road underbridge, Eighton Lodge north underbridge, Eighton Lodge south underbridge, Allerdene Bridge, Northside Overbridge and Smithy Lane Overbridge and Longbank Bridleway underpass.
- 3.1.2. The bat preliminary roost assessment confirmed that the PRFs within these bridges have 'Moderate Roost Suitability' (WSP, 2018). Further surveys confirmed that a roost is present within Eighton Lodge south underbridge, with a single common pipistrelle emerging from a PRF within the soffit of the bridge.
- 3.1.3. It is confirmed that there is a likely absence of roosts from Eighton Lodge Slip Road underbridge, Eighton Lodge north underbridge, Allerdene Bridge, North Side Overbridge and Smithy Lane Overbridge.

3.2 BAT DUSK EMERGENCE / PRE-DAWN RETURN SURVEY

- 3.2.1. A single common pipistrelle was recorded emerging from Eighton Lodge south underbridge during the dusk emergence survey (See **Figure 2**), confirming that a roost is present. Further details of the roost are described in **Table 3-1** below.
- 3.2.2. No bats were recorded emerging from, or returning to roost within Eighton Lodge Slip Road underbridge, Eighton Lodge north underbridge, Allerdene Bridge, Northside overbridge and Smithy Lane Overbridge.

Table 3-1 - Overview of Eighton Lodge South Underbridge Survey Findings

Bridge Ref.	No. of roosts	No. of bats emerged/ accessed	Roosting species	Roost location(s)
Eighton Lodge south underbridge	1	1	Common pipistrelle	Crack in the soffit arch on the east side of the bridge.

- 3.2.3. Details regarding the presence of bat roosts recorded within the surveyed bridges are described in further detail below along with an overview of bat activity recorded during the surveys. Full details of the surveys are provided within **Appendix A**.

EIGHTON LODGE SOUTH UNDERBRIDGE– CONFIRMED BAT ROOST

- 3.2.4. During the emergence survey in May 2018, a common pipistrelle bat was recorded emerging at approximately 21:29 (c. 46 minutes following sunset) from within a crack

located on the soffit arch of the bridge, on the east side. The bat then flew south and commuted to an unknown location beyond the detection or visible range of the surveyors. Further bat activity was recorded during the night with one bat heard in the area ten minutes after the first and only emergence.

- 3.2.5. No further roost regress / re-entry was observed during the dawn re-entry survey and second dusk survey on this bridge.

BAT ACTIVITY DURING SURVEYS – SEVEN BRIDGES

- 3.2.6. Very few bat passes were recorded at all locations during the first round of surveys. However, during the dusk emergence survey at Allerdene Bridge, there were common pipistrelles activity, which were commuting from the south, under the bridge and to the north. This activity started 15 minutes after sunset and ended an hour later.
- 3.2.7. During the dusk emergence survey at Smithy Lane Overbridge, several pipistrelle bats were recorded foraging along the treeline to the south of the bridge. During the dusk emergence survey at Northside Overbridge, many unknown bat species were recorded commuting north over the bridge.

3.3 DEFRA LOCAL SCALE SURVEYS – LONGBANK BRIDLEWAY UNDERPASS

- 3.3.1. The Longbank Bridleway underpass passes beneath the A1 carriageway and is utilised by bats to pass under the Scheme. Species recorded during the DEFRA local surveys include common pipistrelle, soprano pipistrelle, Daubenton's bat *Myotis daubentonii* and *Nyctalus* spp. Species recorded as using the underpass include common pipistrelle and soprano pipistrelle. A total of 241 passes were recorded during the DEFRA local scale surveys, of which 181 had recorded flight lines and were using the structure. **Table 3-2** provides a summary of the findings. **Appendix B** provides a full breakdown of the surveys. A full run-through of the data recorded is provided within **Appendix B**.

Table 3-2 - DEFRA Local Scale Survey Results

Species	Number of Recorded Passes	Number of Flight Lines Using the Structure ⁴	Number of Safe passes ⁵
Common Pipistrelle	238	180 (75.63%)	153 (85%)

⁴ Brackets showing percentage of passes using the structure

⁵ Brackets showing percentage of safe passes using the structure

Species	Number of Recorded Passes	Number of Flight Lines Using the Structure⁴	Number of Safe passes⁵
Soprano Pipistrelle	3	1 (33.33%)	1 (100%)

4 IMPLICATIONS FOR DEVELOPMENT

4.1 OVERVIEW

- 4.1.1. In the absence of mitigation, the Scheme has the potential to affect bats, through direct effects upon the confirmed bat roost within Eighton Lodge south underbridge and the loss of a known commuting route under the Scheme and/or removal or degradation of habitat used by foraging and commuting bats along the Scheme. The legislation and planning policy relevant to bats and their roosts is set out below is therefore relevant. Recommendations as to how the legislation and planning policy may be satisfied are set out in Section 5.

4.2 LEGAL COMPLIANCE

- 4.2.1. Bats and their roosts are afforded a high level of protection under the Conservation of Habitats and Species Regulations 2017 (the 'Habitat Regulations'), the legislation means that it is an offence to:
- Deliberately capture, injure or kill a wild bat;
 - Deliberately disturb wild bats; '*disturbance of animals includes in particular any disturbance which is likely:*
 - (a) *to impair their ability —*
 - (i) *to survive, to breed or reproduce, or to rear or nurture their young; or*
 - (ii) *in the case of animals of a hibernating or migratory species, to hibernate or migrate; or*
 - (b) *to affect significantly the local distribution or abundance of the species to which they belong.*' and
 - Damage or destroy a breeding site or resting place used by this species.
- 4.2.2. Protection is also afforded under the Wildlife and Countryside Act 1981 (as amended) with respect to disturbance of animals when using places of shelter, and obstruction of access to places of shelter.
- 4.2.3. Due to the high level of protection afforded to bats and their habitat, mitigation for bats is governed by a strict licensing procedure administered by Natural England (normally, planning permission must be obtained before a licence can be sought). Licencing is subject to three tests, as defined under the Habitats Regulations 2017, these must also be applied by the planning authority before granting permission for activities affecting bats. For permission to be granted the following criteria must be satisfied:
- The proposal is necessary '*to preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment*';
 - '*There is no satisfactory alternative*'; and
 - The proposals '*will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range*'.

- 4.2.4. Certain species of bats including the noctule bat, brown long-eared bat and soprano pipistrelle bat are also listed as a Species of Principal Importance (SPI) for the Conservation of Biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Under Section 40 of the NERC Act (2006) public bodies (including local planning authorities) have a duty to have regard for the conservation of SPI when carrying out their functions, including determining planning applications.

4.3 PLANNING POLICY COMPLIANCE

- 4.3.1. At the national level the National Planning Policy Framework (NPPF) (2018) forms the basis for planning system decisions with respect to conserving and enhancing the natural environment, including bats; the ODPM circular 06/2005 also provides supplementary guidance, including confirmation that *'the presence of a protected species is a material consideration when a planning authority is considering a development proposal'*.
- 4.3.2. The NPPF sets out, amongst other points, how at an overview level the *'planning system should contribute to and enhance the national and local environment by:*
- *...recognising the wider benefits of ecosystem services; and*
 - *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...'*
- 4.3.3. A list of principles which local planning authorities should follow when determining planning applications is included in the NPPF, and includes the following:
- *'if significant harm resulting from a development cannot be avoided...adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
 - *- ...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...unless the need for, and benefits of, the development in that location clearly outweigh the loss...'*
- 4.3.4. At a local level, the Local Plan is the future Plan for Gateshead to deliver Vision 2030. The Local Plan is made up of several documents including:
- Planning for the Future – Core Strategy and Urban Core Plan for Gateshead and Newcastle Upon Tyne, 2010-2030 (Adopted March 2015);
 - Gateshead Unitary Development Plan (UDP) - Remaining Saved Policies (March 2015); and
 - Other supplementary documents.
- 4.3.5. The following policies are in the Local Plan documents and are relevant to the Scheme.

CS18 Green Infrastructure and the Natural Environment

4.3.6. A high quality and comprehensive framework of interconnected green infrastructure that offers ease of movement and an appealing natural environment for wildlife will be achieved by:

- Maintaining, protecting and enhancing the integrity, connectivity, multi-functionality and accessibility of the Strategic Green Infrastructure Network;
- Protection, enhancement and management of green infrastructure assets which include:
 - Addressing gaps in the network and making improvements in Opportunity Areas;
 - Improving and extending linkages to and within the Strategic Green Infrastructure Network; and
 - Protecting and enhancing open spaces, sport and recreational facilities in accordance with agreed standards in line with National Policy.

DC1 Environment

4.3.7. Planning permission will be granted for new development where it:

- Achieves an improved landform, landscape or more beneficial after-use;
- Does not have an adverse impact on statutorily protected species;
- Takes opportunities to undertake advance planting/screening;
- Does not significantly pollute the environment with dust, noise, light, emissions, out-fall, or discharges of any kind; and
- Includes a waste audit or site waste management plan, where large volumes of waste or secondary aggregates are likely to be produced during development.

ENV44 Woodland, Trees and Hedgerows

4.3.8. Works that will damage or lead to the loss of trees which contribute to the amenity of an area, or which enhance the character and/or appearance of a Conservation Area, or have a significant wildlife interest, will not normally be permitted. Healthy trees which contribute to the character of an area and which are under threat will be protected by means of Tree Preservation Orders or conditions attached to planning permissions.

4.3.9. Proposals for works to trees will be considered based on the following criteria:

- The condition of the trees;
- The contribution of the trees to the local landscape and/or character of an area;
- The nature conservation value of the trees, woodland or hedgerows;
- The impact that the trees have on existing structures and the amenity value enjoyed by individual occupiers;
- The extent and content of replanting proposals; and
- The extent and impact of the works.

4.3.10. In addition, schemes that will protect, maintain, manage and enhance existing woodland, trees and hedgerows will be generally encouraged.

ENV46 The Durham Biodiversity Action Plan

- 4.3.11. The delivery of relevant targets for species and habitats in the Durham Biodiversity Action Plan will be actively pursued in considering development proposals.

ENV47 Wildlife Habitats

- 4.3.12. Wherever possible, all types of wildlife habitats will be protected and enhanced. Land management practices beneficial to wildlife will be encouraged in line with the Durham Biodiversity Action Plan. New development will be laid out and landscaped to be beneficial to wildlife. Proposals should avoid the use of non-native or inappropriate species in sensitive locations. Where there is evidence of damaging species that are invasive to existing habitats, these should be removed.

ENV49 Sites of Nature Conservation Importance

- 4.3.13. Sites of Nature Conservation Importance will be protected from adverse development wherever possible.

ENV51 Wildlife Corridors.

- 4.3.14. A network of wildlife corridors will be protected by resisting development or recreational use which would seriously impair their integrity or value to wildlife. Exceptionally, damaging developments may be allowed where habitats would be enhanced or where suitable replacement land is provided to retain the integrity of the corridor.
- 4.3.15. Certain species of bats are also priority species in the UK Biodiversity Action Plan (UKBAP) which was formally transposed into the UK-Post 2010 biodiversity framework (2012) that puts all species listed as SPI under NERC, 2006. Pipistrelle species, the most common species recorded during the emergence/ re-entry surveys, are listed in the Newcastle City Council (NCC) BAP and have a specific Species Action Plan (SAP).
- 4.3.16. Mitigation, compensation and enhancement measures are recommended in Section 5 to enable the Scheme to be compliant with the above legislation and planning policy.

5 RECOMMENDATIONS

5.1 AVOIDANCE AND MITIGATION MEASURES

BAT ROOSTS

- 5.1.1. Where possible, it is recommended that the soffit arch crack known to be used by one roosting bat in Eighton Lodge south underbridge is retained and incorporated into the Scheme design. Should this not be feasible, it will be necessary to mitigate potential negative effects that would otherwise result from the removal of features and provide replacement roosting opportunities.
- 5.1.2. When determining a DCO Application, which is necessary for this Scheme, in relation to a proposal that will affect bats and/or their roosts the local planning authority must ensure that they are satisfied that three tests, as set out in Regulation 53 of the Habitat Regulations 2017 (as amended), are likely to be met (see **Section 5.2**). To satisfy the third test, if roosts will be directly affected by works a mitigation strategy should be prepared, based on recommendations within this report, showing that it will be feasible to progress the Scheme and maintain the favourable conservation status of bat species identified on Site. Once the DCO has been obtained, this strategy may then be refined and form the basis of a licence application to Natural England to permit the commencement of works affecting known bat roosts.
- 5.1.3. It is recommended that the mitigation strategy includes the following key components:
- Provision of alternative roosting opportunities such as bat boxes along the whole length of the Scheme as the surveys showed that pipistrelle species use the woodlands' edges for foraging and commuting. Bat boxes should also be provided within the woodlands closest to Eighton Lodge south underbridge and the existing bat roost;
 - The bat boxes should be installed in positions where they are out of reach of people from the ground (to limit interference) and high enough to deter cats and other predators (without being placed too high as this makes maintenance more difficult and can leave the boxes exposed to weather, particularly strong winds). In practice, placing them between 3 metres and 4.5 metres from the ground is optimal; and
 - Boxes should be placed in a range of locations at slightly different heights and facing in slightly different directions to give a choice of roost site options (Mitchell-Jones, 2004). The direction of the boxes should be selected to avoid facing them into the prevailing weather and will preferably be positioned facing in a southerly direction (i.e. south-west through south to south-east) where they will receive a good degree of sunlight.
- 5.1.4. As the Scheme requires the roost located in Eighton Lodge south underbridge to be disturbed, via the partial demolition and rebuild of the bridge, it is recommended that this be avoided during the hibernation period (core months include mid-November to mid-March, inclusive). It is recommended that should this approach be undertaken that a mitigation statement is produced to inform the works.

- 5.1.5. If the destruction of the roost is needed for the Scheme to be completed then a Natural England licence will need to be obtained for the works to be undertaken and exclusion of the bats from the roost may also be necessary. More details of methods of exclusion will be outlined in full within the licence application.
- 5.1.6. To minimise the potential for killing, injury or disturbance to bats, and to mitigate for the loss of potential roosting opportunities for bats during both the construction and post development (operational) phases of the Scheme, the following recommendations would be adopted:

FORAGING AND COMMUTING HABITAT

- 5.1.7. All the woodlands and trees which are present along the edge of the A1 should be retained, as far as possible, in order to retain the foraging and commuting habitat which was used by bats during the dusk emergence / dawn re-entry surveys.

SENSITIVE LIGHTING

- 5.1.8. Longbank Bridleway underpass is utilised by commuting bats to pass under the Scheme. To reduce the impacts of fragmentation, it is recommended that a sensitive lighting scheme is designed to allow this continued use, once the underpass has been extended.
- 5.1.9. Lighting both during the construction phase and operational phase of the Scheme could have a negative effect upon bat activity. It is recommended that the lighting strategy for the Scheme seeks to:
- Use the minimum light levels necessary for the relevant task / function, this may equate to reducing light intensity, and/or using the minimum number or light sources or minimum column height;
 - Use hoods, louvres or other luminaire design features to avoid light spill onto any areas of woodland and vegetation located throughout the length of the Scheme and newly created areas of vegetation likely to be used by foraging and commuting bats;
 - Use narrow spectrum light sources where possible to lower the range of species affected by lighting, specifically avoiding shorter wave length blue light, using instead warm/neutral colour temperature <4,200 kelvin lighting (BCT, 2014a); and
 - Use light sources that emit minimal ultra-violet light to avoid attracting night-flying invertebrate species which in turn may attract bats to the light.
- 5.1.10. Where possible, consideration should also be given to varying the lighting levels in particularly ecologically valuable areas. For example, it may be possible to reduce lighting levels or perhaps even switch installations off after certain times e.g. between 00:00 and sunrise in the vicinity of tree lines of proposed landscaping. This use of “adaptive lighting” can tailor the installation to suit human health and safety as well as wildlife needs (BCT, 2014a).

5.2 MONITORING

5.2.1. Given that Longbank Bridleway underpass is utilised by commuting bats, monitoring of the structure will be required during and post-construction, in line with DEFRA guidelines (Berthinussen & Altringham 2015). It is recommended that this takes the form of:

- Six survey visits per year, with two during June and four during July;
- The six visits to consist of four dusk visits and two dawn visits;
- A single year of monitoring during the construction period; and
- Visits on years 0, 3, 5 and 10 post-construction.

5.3 ECOLOGICAL ENHANCEMENT MEASURES

5.3.1. Planning policy promotes the inclusion of ecological enhancement; accordingly, it is recommended that consideration is given to the following enhancement measures:

- Inclusion of nectar-rich plant species in soft landscaping areas that are attractive to night-flying insects to enhance foraging opportunities for bats.
- Creation of linear vegetation (tree-lines and hedgerows) within the Landscaping Mitigation Plan to provide additional commuting corridors across the Scheme for bats.
- Provision of standing water-bodies to provide an additional foraging resource for bats using the Scheme, which may benefit *Myotis* and *Nyctalus* bats in particular.
- Installation of bat bricks or bat tubes (above those required for mitigation and compensation of the known roosts) into the fabric of any new structures and/or installation of additional bat boxes to suitable retained trees and habitat to increase the roosting opportunities within the Scheme for bats.

6 CONCLUSIONS

- 6.1.1. During the dusk emergence / dawn re-entry surveys, a single common pipistrelle bat was recorded emerging from Eighton Lodge south underbridge from within the soffit arch on the eastern side, confirming that a roost is present for low numbers of roosting bats.
- 6.1.2. No bats roosts were recorded to be present within Eighton Lodge Slip Road underbridge, Eighton Lodge north underbridge, Allerdene Bridge, Northside Overbridge and Smithy Lane Overbridge.
- 6.1.3. To minimise the disturbance upon the bat roost located within Eighton Lodge south underbridge, it is recommended any works should be avoided during the hibernation period. If this approach is taken and the roost can be retained, a mitigation statement would be required. If the roost is due to be lost, a Natural England Licence would be required for these works to be undertaken.
- 6.1.4. As Longbank Bridleway underpass is utilised by commuting bats, a sensitive lighting regime is required. In addition, during and post construction monitoring is required of the structure in line with DEFRA guidelines (Berthinussen & Altringham 2015).
- 6.1.5. In addition to these recommendations, consideration has been given to the opportunities available to enhance the value of the Scheme for bat species.

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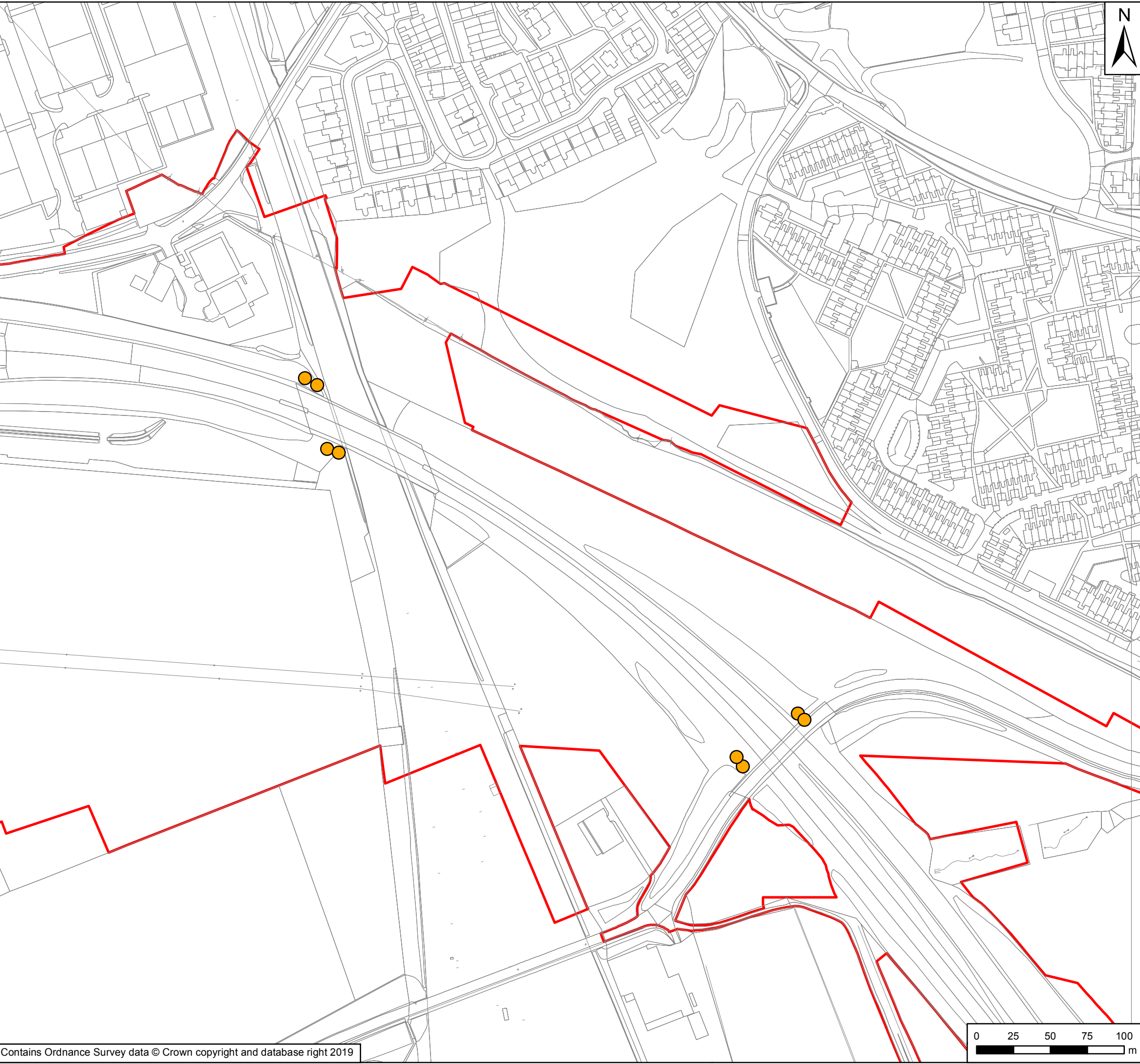
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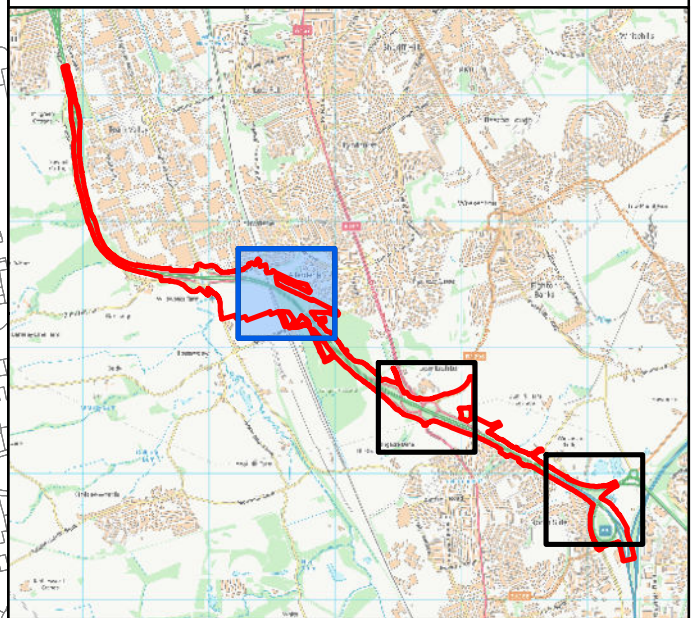
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Key

- Scheme Footprint
- Roost
- Surveyor Location



Rev	Date	Description	By	Chk'd	App'd
P03	Apr 2019	Third Issue	GH	JR	KS
P02	Mar 2019	Second Issue	GH	JR	KS
P01	Dec 2018	First Issue	GH	JR	NJA

Suitability: _____ Status: _____
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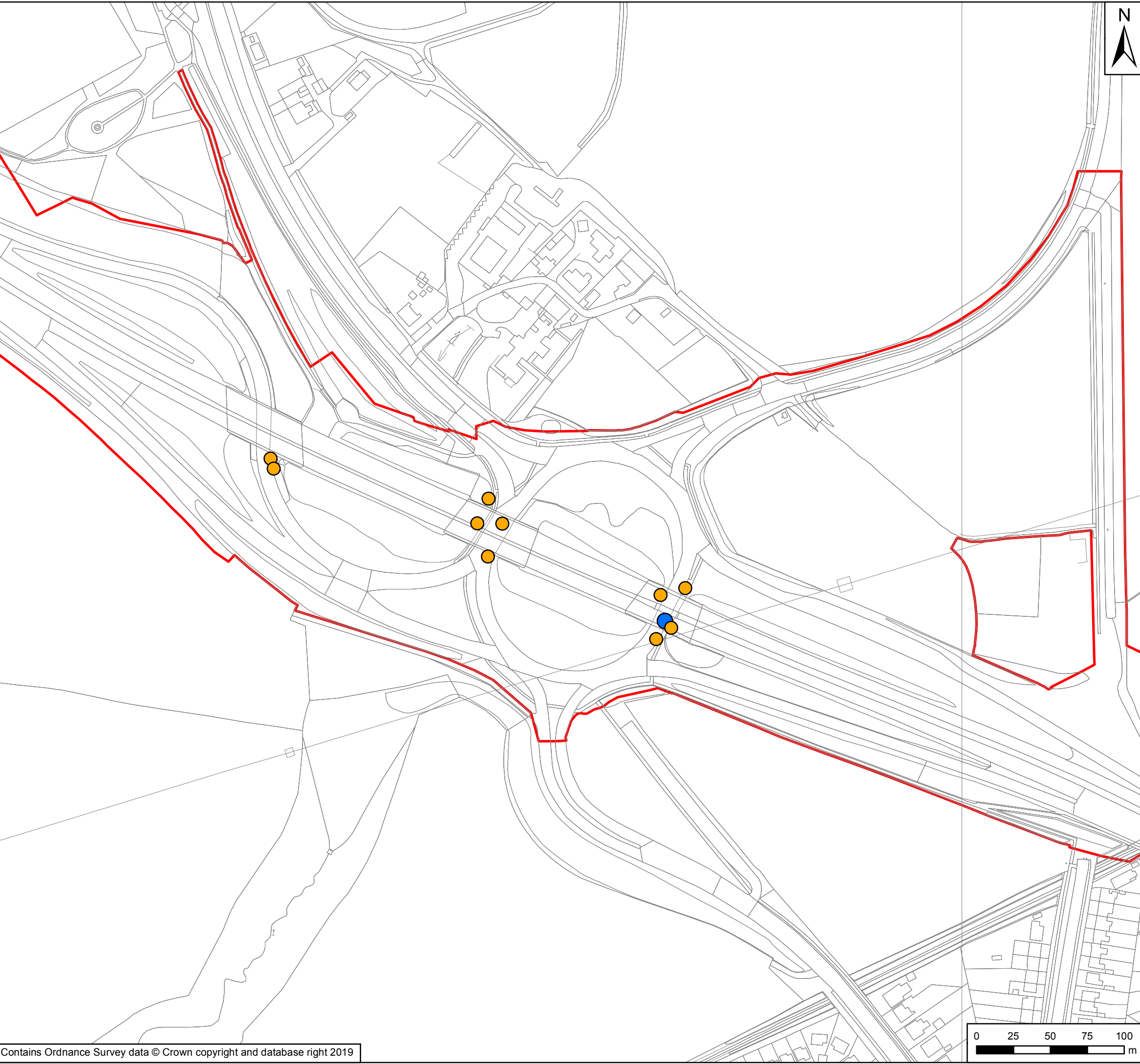
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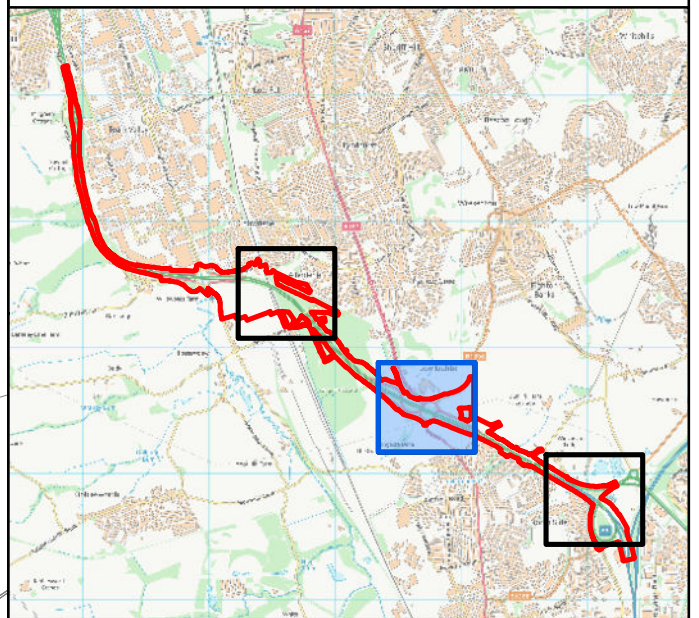
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- Key**
- Scheme Footprint
 - Roost
 - Surveyor Location



Rev	Date	Description	By	Chk'd	App'd
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P02	Mar 2019	Second Issue	GH	JR	KS
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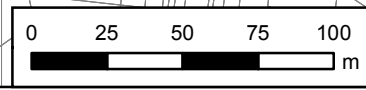
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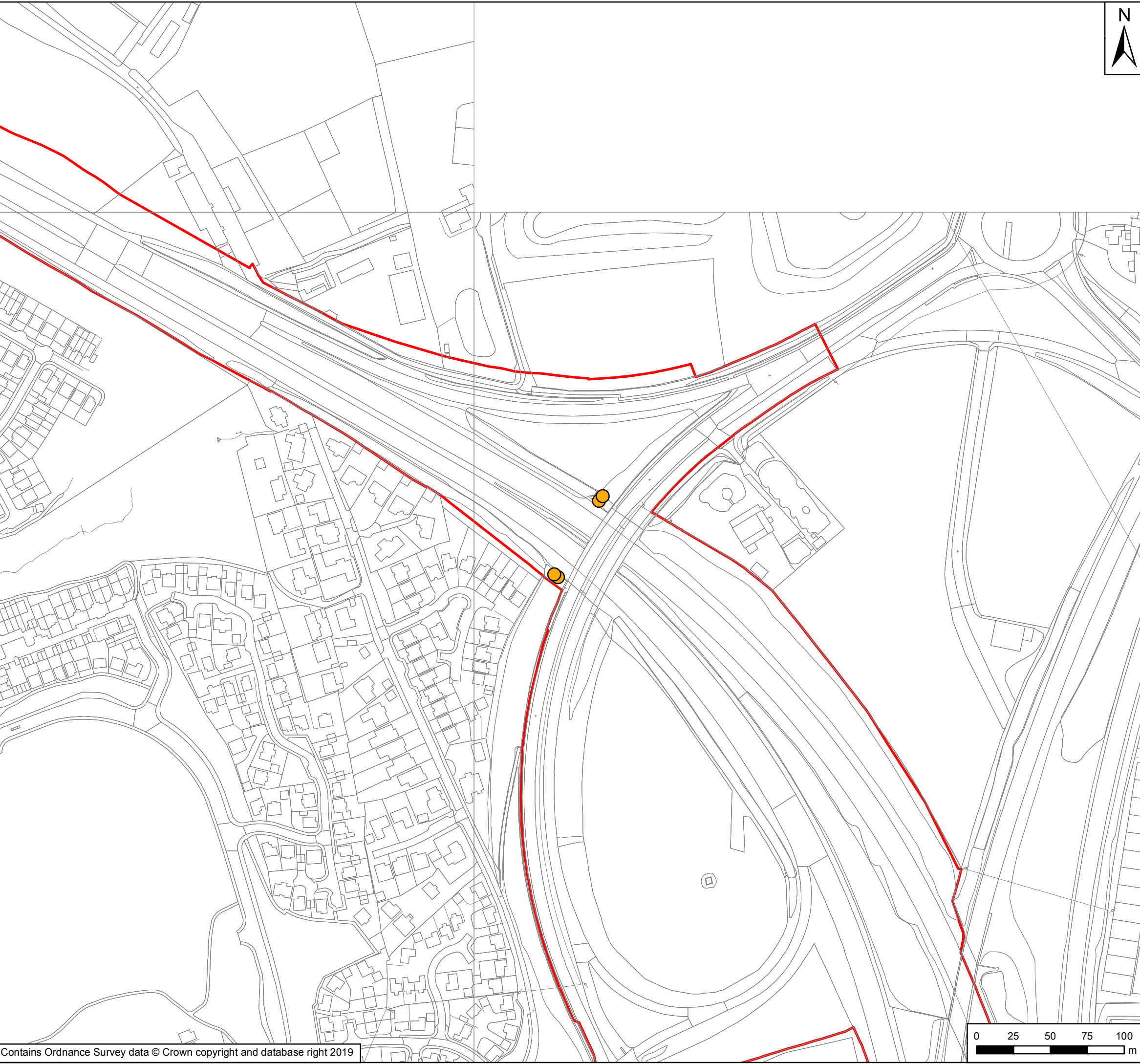
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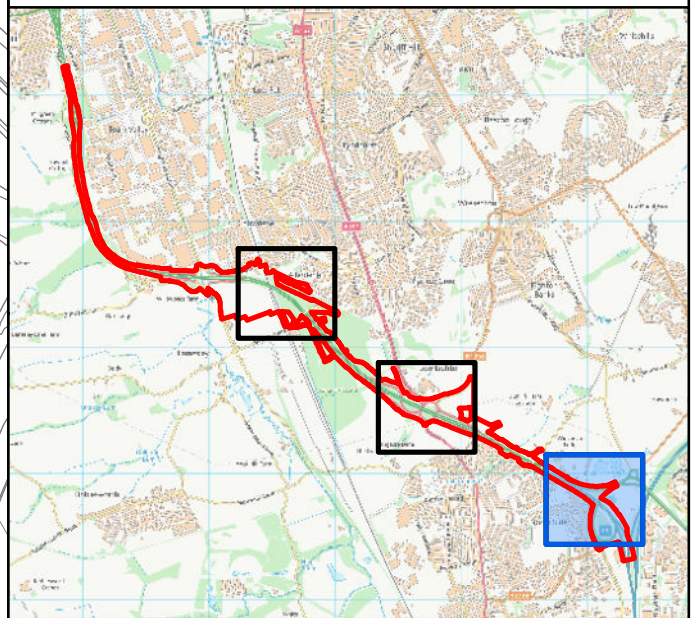
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- Key**
- Scheme Footprint
 - Roost
 - Surveyor Location



Rev	Date	Description	By	Chk'd	App'd
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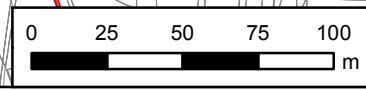


Project Title: **A1 Birtley to Coal House Scheme**

Drawing Title: **Figure 2.3 Bat Survey Locations and Results**

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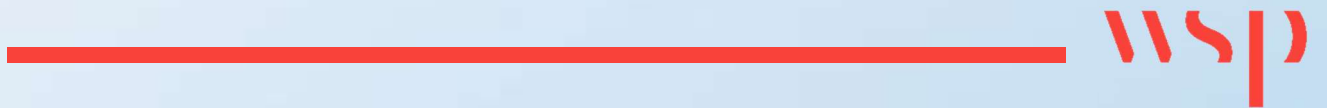
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Appendix A

RAW DATA



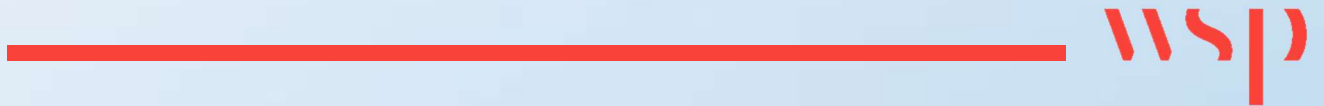
Bridge Reference	Survey Date	Type of Survey	No. of surveyors	Survey Start Time	Dusk/Dawn Time	Survey End Time
Eighton Lodge Slip Road underbridge	01/05/18	Dusk emergence	2	20:26	20:41	22:41
	16/05/18	Dawn Re-entry	2	02:58	04:58	05:13
Eighton Lodge North underbridge	02/05/18	Dawn Re-entry	4	03:25	05:25	05:40
	15/05/18	Dusk Emergence	4	20:52	21:07	23:07
Eighton Lodge South underbridge	02/05/18	Dusk Emergence	4	20:28	20:43	22:43
	17/05/18	Dawn Re-entry	4	02:56	04:56	05:11
	30/08/18	Dusk Emergence	2	19:47	20:02	22:02
Allerdene underbridge	03/05/18	Dawn Emergence	2	03:45	05:23	06:01
	16/05/18	Dusk Emergence	4	20:54	21:09	23:09
North Side Overbridge	03/05/18	Dusk Emergence	4	20:30	20:45	22:45
	18/05/18	Dawn Re-entry	4	02:54	04:54	05:09
Smithy Lane Overbridge	04/05/18	Dawn Re-entry	4	03:19	05:20	05:36
	17/05/18	Dusk Emergence	4	20:55	21:10	23:10

Bridge Reference	Survey Date	Start temp. (C)	End temp. (C)	Wind (start/end) (beaufort)	Rain (start/end) ⁶	Cloud Cover (start/end) (oktas)
Eighton Lodge Slip Road underbridge	01/05/18	10.0	9.7	2 / 2	0 / 0	7 / 7
	16/05/18	9.0	8.6	4 / 2	1 / 0	8 / 8
Eighton Lodge North underbridge	02/05/18	8.0	7.5	4 / 4	0 / 1	8 / 8
	15/05/18	15.1	14.0	0 / 2	0 / 0	8 / 8
Eighton Lodge South underbridge	02/05/18	8.6	6.9	3 / 2	0 / 0	1 / 1
	17/05/18	5.0	5.0	1 / 1	0 / 0	0 / 1
	30/08/18	14	11	1/1	0/0	2/1
Allerdene underbridge	03/05/18	6.4	6.6	0 / 0	0 / 0	4 / 2
	16/05/18	9.0	5.3	0 / 0	0 / 0	0 / 0
North Side Overbridge	03/05/18	10.0	10.0	3 / 2	0 / 0	7 / 7
	18/05/18	3.0	2.0	1 / 1	0 / 0	0 / 0
Smithy Lane Overbridge	04/05/18	7.0	7.0	4 / 3	0 / 0	8 / 8
	17/05/18	10.0	4.0	1 / 1	0 / 0	0 / 0

⁶ 0= none, 1= drizzle, 3= moderate, 4= heavy

Appendix B

DEFRA LOCAL SCALE SURVEY RESULTS



Visit	Date	Surveyor	Record	Time	Height above road/ below road (M)	Above or Below road	Safe or unsafe	Distance from Feature (M)	Side of Feature	Direction Crossing	Species
1	04/06/2018	AJ	1	21:49:00	-3	Below	Safe	0	N		Ppip
1	04/06/2018	AJ	2	21:54:00	-3	Below	Safe	0	N	S-N, N-S	Ppip
1	04/06/2018	AJ	3	21:57:00	-3	Below	Safe	0	N	S-N	Ppip
1	04/06/2018	AJ	4	21:59:00	-3	Below	Safe	0	N	S-N	Ppip
1	04/06/2018	AJ	5	22:01:00	-3	Below	Safe	0	N	S-N	Ppip
1	04/06/2018	AJ	6	22:06:00	-3	Below	Safe	0	N	S-N	Ppip
1	04/06/2018	AJ	7	22:12:00	-3	Below	Safe	0	N	S-N	Ppip
1	04/06/2018	AJ	8	22:14:00	-3	Below	Safe	0	N	S-N, W-E	Ppip
1	04/06/2018	AJ	9	22:15:00	-3	Below	Safe	0	N	S-N	Ppip
1	04/06/2018	AJ	10	22:18:00	-3	Below	Safe	0	N	S-N	Ppip
1	04/06/2018	AJ	11	22:19:00	-3	Below	Safe	0	N	S-N	Ppip
1	04/06/2018	AJ	12	22:23:00	-3	Below	Safe	0	N	S-N, N-S	Ppip
1	04/06/2018	AJ	13	22:25:00	-3	Below	Safe	0	N	S-N	Ppip
1	04/06/2018	AJ	14	22:27:00	-3	Below	Safe	0	N	S-N	Ppip
1	04/06/2018	AJ	15	22:28:00		Unknown	Unknown				Ppip
1	04/06/2018	AJ	16	22:34:00	-3	Below	Safe	0	N	S-N	Ppip
1	04/06/2018	AJ	17	22:36:00		Unknown	Unknown				Ppip
1	04/06/2018	RMc	1	21:47:00		Unknown	Unknown				Ppip
1	04/06/2018	RMc	2	21:47:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	3	21:50:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	4	21:51:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	5	21:53:00	-3	Below	Safe	0	S		Ppip
1	04/06/2018	RMc	6	21:55:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	7	21:57:00	-3	Below	Safe	0	S	S-N, N-S	Ppip

Visit	Date	Surveyor	Record	Time	Height above road/ below road (M)	Above or Below road	Safe or unsafe	Distance from Feature (M)	Side of Feature	Direction Crossing	Species
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1	04/06/2018	RMc	9	21:59:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	10	21:59:00	3	Above	Unsafe	0	S	S-N	Ppip
1	04/06/2018	RMc	11	22:05:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	12	22:05:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	13	22:06:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	14	22:11:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	15	22:12:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	16	22:14:00		Unknown	Unknown	0	S	S-N	Ppip
1	04/06/2018	RMc	17	22:14:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	18	22:15:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	19	22:18:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	20	22:23:00	-3	Below	Safe	0	S	S-N	Ppip
1	04/06/2018	RMc	21	22:24:00	-3	Below	Safe	0	N	N-S	Ppip
1	04/06/2018	RMc	22	22:25:00	3	Above	Unsafe	0	S	S-N	Ppip
1	04/06/2018	RMc	23	22:27:00	3	Above	Unsafe	10	E	E-W	Ppip
1	04/06/2018	RMc	24	22:35:00	-3	Below	Safe	0	N	N-S	Ppip
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2	14/06/2018	AJ	2	22:09:00	-4	Below	Safe	0	E	E-W	Ppip
2	14/06/2018	AJ	3	22:12:00	-4	Below	Safe	0	E	E	Ppip
2	14/06/2018	AJ	4	22:13:00	-4	Below	Safe	0	E	E	Ppip
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2	14/06/2018	AJ	6	22:17:00	-4	Below	Safe	0	E	W-E	Ppip
2	14/06/2018	AJ	7	22:19:00	-4	Below	Safe	0	E	E-W	Ppip

Visit	Date	Surveyor	Record	Time	Height above road/ below road (M)	Above or Below road	Safe or unsafe	Distance from Feature (M)	Side of Feature	Direction Crossing	Species
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2	14/06/2018	AJ	9	22:22:00	-4	Below	Safe	0	E	W-E	Ppip
2	14/06/2018	AJ	10	22:25:00	-4	Below	Safe	0	E	E-W	Ppip
2	14/06/2018	AJ	11	22:27:00	-4	Below	Safe	0	E	E-W	Ppip
2	14/06/2018	AJ	12	22:30:00	-4	Below	Safe	0	E	E	Ppip
2	14/06/2018	AJ	13	22:31:00	-4	Below	Safe	0	E	E	Ppip
2	14/06/2018	AJ	14	22:33:00	-4	Below	Safe	0	E	E-W	Ppip
2	14/06/2018	AJ	15	22:35:00	-4	Below	Safe	0	E	E	Ppip
2	14/06/2018	AJ	16	22:38:00	-4	Below	Safe	0	E	W	Ppip
2	14/06/2018	AJ	17	22:40:00	-4	Below	Safe	0	E	E	Ppip
2	14/06/2018	AJ	18	22:45:00	-4	Below	Safe	0	E	E	Ppip
2	14/06/2018	AJ	19	22:45:00	-4	Below	Safe	0	W	W	Ppip
2	14/06/2018	DC	1	20:45	0	Below	Safe	0	S	N-S, S-N	Ppip
2	14/06/2018	DC	2	21:18	0	Below	Safe	0	S	N-S, S-N	Ppip
2	14/06/2018	DC	3	00:00:35	0	Below	Safe	0	S	N-S, S-N	Ppip
2	14/06/2018	DC	4	00:01:30	0	Below	Safe	0	S	N-S, S-N	Ppip
2	14/06/2018	DC	5	00:03:32	0	Below	Safe	0	S	S-N	Ppip
2	14/06/2018	DC	6	00:04:36	0	Below	Safe	0	S	S-N	Ppip
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Visit	Date	Surveyor	Record	Time	Height above road/ below road (M)	Above or Below road	Safe or unsafe	Distance from Feature (M)	Side of Feature	Direction Crossing	Species
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2	14/06/2018	DC	14	00:11:57	0	Below	Safe	0	S	S-N, N-S	Ppip
2	14/06/2018	DC	15	00:13:21	0	Below	Safe	0	S	N-S	Ppip
2	14/06/2018	DC	16	00:14:54	0	Below	Safe	0	S	S-N	Ppip
2	14/06/2018	DC	17	00:15:47	0	Below	Safe	0	S		Ppip
2	14/06/2018	DC	18	00:18:35	0	Below	Safe	0	S	S-N	Ppip
2	14/06/2018	DC	19	00:01:40	0	Below	Safe	0	S	N-S	Ppip
2	14/06/2018	DC	20	00:02:35	0	Below	Safe	0	S	S-N	Ppip
2	14/06/2018	DC	21	00:04:00	0	Below	Safe	0	S	S-N	Ppip
2	14/06/2018	DC	22	00:06:55	0	Below	Safe	0	S	S-N	Ppip
2	14/06/2018	DC	23	00:10:54	0	Below	Safe	0	S	N-S	Ppip
2	14/06/2018	DC	24	00:12:29	0	Below	Safe	0	S	S-N	Ppip
2	14/06/2018	DC	25	00:15:03	1	Below	Safe	0	S	S-N	Ppip
3	05/07/2018	AK	1	21:58:00	2.5	Above	Unsafe	5	S	S-N	Ppip
3	05/07/2018	AK	2	21:59:00	3	Above	Unsafe	6	S	S-N	Ppip
3	05/07/2018	AK	3	22:00:00	3	Below	Safe	Underpass		N-S, S-N	Ppip
3	05/07/2018	AK	4	22:01:00	2.5	Below	Safe	Underpass		N-S, S-N	Ppip
3	05/07/2018	AK	5	22:01:00	2	Below	Safe	Underpass		N-S, S-N	Ppip
3	05/07/2018	AK	6	22:02:00	3	Below	Safe	Underpass		N-S	Ppip
3	05/07/2018	AK	7	22:03:00	3	Above	Unsafe	3		S-N	Ppip
3	05/07/2018	AK	8	22:03:00	3	Above	Unsafe	5		N-S, S-N	Ppip
3	05/07/2018	AK	9	22:04:00	2.5	Below	Safe	3		S-N	Ppip
3	05/07/2018	AK	10	22:05:00	3	Below	Safe	Underpass		N-S	Ppip
3	05/07/2018	AK	11	22:06:00	2.5	Below	Safe	Underpass		N-S	Ppip

Visit	Date	Surveyor	Record	Time	Height above road/ below road (M)	Above or Below road	Safe or unsafe	Distance from Feature (M)	Side of Feature	Direction Crossing	Species
3	05/07/2018	AK	12	22:06:00	2	Above	Unsafe	4		S-N	Ppip
3	05/07/2018	AK	13	22:06:00	2	Above	Unsafe	4		S-N	Ppip
3	05/07/2018	AK	14	22:06:00	2.5	Above	Unsafe	4		S-N	Ppip
3	05/07/2018	AK	15	22:06:00	3.5	Below	Safe	Underpass		N-S	Ppip
3	05/07/2018	AK	16	22:07:00	3	Below	Safe	Underpass		N-S	Ppip
3	05/07/2018	AK	17	22:07:00	3	Above	Unsafe	3		S-N, N-S	Ppip
3	05/07/2018	AK	18	22:08:00	2.5	Above	Unsafe	1		N-S, S-N	Ppip
3	05/07/2018	AK	19	22:08:00	2.5	Below	Safe	Underpass		N-S	Ppip
3	05/07/2018	AK	20	22:09:00	2.5	Below	Safe	Underpass		N-S	Ppip
3	05/07/2018	AK	21	22:09:00	3	Above	Unsafe	1		S-N	Ppip
3	05/07/2018	AK	22	22:10:00	2.5	Below	Safe	Underpass	S	N-S, S-N	Ppip
3	05/07/2018	AK	23	22:11:00	3	Below	Safe	4	S	S-N, N-S	Ppip
3	05/07/2018	AK	24	22:12:00	3	Above	Unsafe	3	S	S-N	Ppip
3	05/07/2018	AK	25	22:12:00	2.5	Above	Unsafe	3	S	S-N	Ppip
3	05/07/2018	AK	26	22:13:00	4.5	Below	Safe	Underpass	S		Ppip
3	05/07/2018	AK	27	22:13:00	3	Below	Safe	Underpass	S		Ppip
3	05/07/2018	AK	28	22:15:00	3	Above	Unsafe	3	S	S-N	Ppip
3	05/07/2018	AK	29	22:15:00	2.5	Below	Safe	Underpass	S		Ppip
3	05/07/2018	AK	30	22:16:00	2.5	Above	Unsafe	2	S	S-N	Ppip
3	05/07/2018	AK	31	22:17:00	6	Above	Unsafe	2	S	S-N	Ppip
3	05/07/2018	AK	32	22:17:00	2.5	Above	Unsafe	2	S	S-N	Ppip
3	05/07/2018	AK	33	22:18:00	5	Above	Unsafe	3	S	S-N-E	Ppip
3	05/07/2018	AK	34	22:19:00	3	Below	Safe	Underpass	S	N-S	Ppip
3	05/07/2018	AK	35	22:19:00	3	Above	Unsafe	3	S	S-N	Ppip

Visit	Date	Surveyor	Record	Time	Height above road/ below road (M)	Above or Below road	Safe or unsafe	Distance from Feature (M)	Side of Feature	Direction Crossing	Species
3	05/07/2018	AK	36	22:19:00	2.5	Below	Safe	Underpass	S		Ppip
3	05/07/2018	AK	37	22:20:00	5	Below	Safe	Underpass	S	N-S, S-N	Ppip
3	05/07/2018	AK	38	22:20:00	3	Above	Unsafe	3	S	S-N	Ppip
3	05/07/2018	AK	39	22:22:00	3	Above	Unsafe	4	S	S-N	Ppip
3	05/07/2018	AK	40	22:23:00	3	Above	Unsafe	4	S	S-N	Ppip
3	05/07/2018	AK	41	22:23:00	2	Above	Unsafe	4	S	S-N	Ppip
3	05/07/2018	AK	42	22:24:00	3	Below	Safe	Underpass	S	N-S, S-N	Ppip
3	05/07/2018	AK	43	22:25:00	2.5	Below	Safe	Underpass	S	N-S	Ppip
3	05/07/2018	AK	44	22:25:00	2.5	Above	Unsafe	3	S	S-N	Ppip
3	05/07/2018	AK	45	22:25:00	2.5	Above	Unsafe	3	S	S-N	Ppip
3	05/07/2018	CG	1	22:10:20	-1	Below	Safe	2	NW	NW	Ppip
3	05/07/2018	CG	2	22:10:40	-1	Below	Safe	2	NW	SE	Ppip
3	05/07/2018	CG	3	22:11:30	-1	Below	Safe	2	NW	NW	Ppip
3	05/07/2018	CG	4	22:12:50	-1	Below	Safe	3	NE	NE	Ppip
3	05/07/2018	CG	5	22:13:30	-1	Below	Safe	3	NE	SW	Ppip
3	05/07/2018	CG	6	22:15:14	-2	Below	Safe	5	NE	NE	Ppip
3	05/07/2018	CG	7	22:16:18	-2	Below	Safe	5	NE	NE	Ppip
3	05/07/2018	CG	8	22:17:27	-1	Below	Safe	2	NE	SW	Ppip
3	05/07/2018	CG	9	22:17:37	-2	Below	Safe	5	NE	NE	Ppip
3	05/07/2018	CG	10	22:18:42	-2	Below	Safe	5	NE	NE	Ppip
3	05/07/2018	CG	11	22:21:50	-3	Below	Safe	5	NE	NE	Ppip
3	05/07/2018	CG	12	22:23:30	-4	Below	Safe	6	NE	NE	Ppip
3	05/07/2018	CG	13	22:25:26	-3	Below	Safe	4	NE	NE	Ppip
3	05/07/2018	CG	14	22:27:48	-2	Below	Safe	3	NE	NE	Ppyg

Visit	Date	Surveyor	Record	Time	Height above road/ below road (M)	Above or Below road	Safe or unsafe	Distance from Feature (M)	Side of Feature	Direction Crossing	Species
3	05/07/2018	CG	15	22:29:12	-4	Below	Safe	5	NE	NE	Ppip
3	05/07/2018	CG	16	22:29:30	-2	Below	Safe	4	NE	NE	Ppip
3	05/07/2018	CG	17	22:32:20	-4	Below	Safe	6	NE	NE	Ppip
3	05/07/2018	CG	18	22:33:45	-4	Below	Safe	6	NE	NE	Ppyg
3	05/07/2018	CG	19	22:38:22	-5	Below	Safe	6	NE	NE	Ppip
4	06/07/2018	CG	1	03:39:00	-3	Below	Safe	4	NE	NE	Ppip
4	06/07/2018	CG	2	03:46:20	-2	Below	Safe	1	NE	SW	Ppip
4	06/07/2018	CG	3	03:47:02	-2	Below	Safe	1	NE		Ppip
4	06/07/2018	CG	4	03:50:55	-2	Below	Safe	4	NE	SW	Ppip
4	06/07/2018	CG	5	03:52:26	-2	Below	Safe	4	NE	SW	Ppip
4	06/07/2018	CG	6	03:54:30	-2	Below	Safe	3	NE	SW	Ppip
4	06/07/2018	CG	7	03:56:54	-3	Below	Safe	2	NE	SW	Ppip
4	06/07/2018	CG	8	03:57:40	-3	Below	Safe	6	NE	NE	Ppyg
4	06/07/2018	CG	9	03:58:20	-3	Below	Safe	3	NE	SW	Ppip
4	06/07/2018	CG	10	03:59:09	-2	Below	Safe	1	NE		Ppip
4	06/07/2018	CG	11	03:59:49	-2	Below	Safe	4	NE	NE	Ppip
4	06/07/2018	CG	12	04:01:20	-3	Below	Safe	0	NE		Ppip
4	06/07/2018	CG	13	04:05:20	-3	Below	Safe	2	NE	SW	Ppip
4	06/07/2018	AK	1	03:37:00	4	Below	Safe	Underpass	S	N-S-E	Ppip
4	06/07/2018	AK	2	03:39:00			unknown				Ppip
4	06/07/2018	AK	3	03:39:00			unknown				Ppip
4	06/07/2018	AK	4	03:46:00	2.5	Below	Safe	Underpass	S	N-S	Ppip
4	06/07/2018	AK	5	03:46:00	4	Below	Safe	Underpass	S	N-S, S-N	Ppip
4	06/07/2018	AK	6	03:47:00	2	Below	Safe	Underpass	S	N-S	Ppip

Visit	Date	Surveyor	Record	Time	Height above road/ below road (M)	Above or Below road	Safe or unsafe	Distance from Feature (M)	Side of Feature	Direction Crossing	Species
4	06/07/2018	AK	7	03:51:00	2	Below	Safe	Underpass	S	N-S	Ppip
4	06/07/2018	AK	8	03:52:00	4	Above	Unsafe	1	S	S-N	Ppip
4	06/07/2018	AK	9	03:53:00	3.5	Below	Safe	Underpass	S	N-S, S-N	Ppip
4	06/07/2018	AK	10	03:53:00	4	Below	Safe	Underpass	S	N-S-E	Ppip
4	06/07/2018	AK	11	03:55:00	3.5	Below	Safe	Underpass	S	N-S, S-N	Ppip
4	06/07/2018	AK	12	03:55:00	4	Below	Safe	Underpass	S	N-S	Ppip
4	06/07/2018	AK	13	03:55:00			unknown				Ppip
4	06/07/2018	AK	14	03:56:00	2	Above	Unsafe	2	S	S-N	Ppip
4	06/07/2018	AK	15	03:56:00	1	Below	Safe	Underpass	S	N-S-E	Ppip
4	06/07/2018	AK	16	03:57:00	2	Below	Safe	Underpass	S	N-S-N	Ppip
4	06/07/2018	AK	17	03:57:00	2	Below	Safe	Underpass	S	N-S-N	Ppip
4	06/07/2018	AK	18	03:57:00	2	Below	Safe	Underpass	S	N-S-N	Ppip
4	06/07/2018	AK	19	03:58:00	2	Below	Safe	Underpass	S	N-S-N	Ppip
4	06/07/2018	AK	20	03:58:00	1	Below	Safe	Underpass	S	N-S	Ppip
4	06/07/2018	AK	21	03:58:00	3	Below	Safe	Underpass	S	N-S	Ppip
5	11/07/2018	GB	1	00:10:15	Under	Below	Safe	0	North	S-N	Ppip
5	11/07/2018	GB	2	00:50:00	Under	Below	Safe	0	North	S-N	Ppip
5	11/07/2018	GB	3	00:03:00	Under	Below	Safe	0	North	S-N	Ppip
5	11/07/2018	GB	4	00:03:30	Under	Below	Safe	0	North	S-N	Ppip
5	11/07/2018	GB	5	00:05:25	Under	Below	Safe	0	North	S-N	Ppip
5	11/07/2018	GB	6	00:07:20	Under	Below	Safe	0	North	S-N	Ppip
5	11/07/2018	GB	7	00:10:00	Under	Below	Safe	0	North	S-N	Ppip
5	11/07/2018	GB	8	00:02:09	Under	Below	Safe	0	North	S-N	Ppip
5	11/07/2018	GB	9	00:05:00	Under	Below	Safe	0	North	S-N	Ppip

Visit	Date	Surveyor	Record	Time	Height above road/ below road (M)	Above or Below road	Safe or unsafe	Distance from Feature (M)	Side of Feature	Direction Crossing	Species
5	11/07/2018	GB	10	00:07:20	Under	Below	Safe	0	North	S-N	Ppip
5	11/07/2018	GB	11	00:09:00	4	Above	Unsafe	4	S-N	S-N	Ppip
5	11/07/2018	AE	1	22:00	-5	Below	Safe	1	S		Ppip
5	11/07/2018	AE	2	22:06	-5	Below	Safe	1			Ppip
5	11/07/2018	AE	3	22:11	-6	Below	Safe	2	S		Ppip
5	11/07/2018	AE	4	22:13	-5	Below	Safe	1	S		Ppip
5	11/07/2018	AE	5	22:15	-5	Below	Safe	1			Ppip
5	11/07/2018	AE	6	22:18	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	
5	11/07/2018	AE	7	22:18	-6	Below	Safe	2	S	S-N	Ppip
5	11/07/2018	AE	8	22:20	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	
5	11/07/2018	AE	9	22:21	-6	Below	Safe	2	S		Ppip
5	11/07/2018	AE	10	22:21	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	
5	11/07/2018	AE	11	22:22	-5	Below	Safe	1	S		Ppip
5	11/07/2018	AE	12	22:23	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	
5	11/07/2018	AE	13	22:26	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	
5	11/07/2018	AE	14	22:29	-6	Below	Safe	1	S		Ppip
5	11/07/2018	AE	15	22:30	-6	Below	Safe	1			Ppip
5	11/07/2018	AE	16	22:33	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	
5	11/07/2018	AE	17	22:38	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	
5	11/07/2018	AE	18	22:41	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	
6	12/07/2018	GB	1	03:53	Under	Below	Safe	0	North	N-S	Ppip
6	12/07/2018	GB	2	03:55	Under	Below	Safe	0	North	N-S	Ppip
6	12/07/2018	GB	3	03:58	Under	Below	Safe	0	North	N-S	Ppip
6	12/07/2018	GB	4	04:02	Under	Below	Safe	0	North	N-S	Ppip

Visit	Date	Surveyor	Record	Time	Height above road/ below road (M)	Above or Below road	Safe or unsafe	Distance from Feature (M)	Side of Feature	Direction Crossing	Species
6	12/07/2018	GB	5	04:07	Under	Below	Safe	0	North	N-S, S-N	Ppip
6	12/07/2018	GB	6	04:07	Under	Below	Safe	0	North	N-S	Ppip
6	12/07/2018	GB	7	04:10	Under	Below	Safe	0	North	N-S	Ppip
6	12/07/2018	GB	8	04:14	Under	Below	Safe	0	North	S-N	Ppip
6	12/07/2018	GB	9	04:15	Under	Below	Safe	0	North	N-S, S-N	Ppip
6	12/07/2018	GB	10	04:19	Under	Below	Safe	0	North	N-S	Ppip
6	12/07/2018	GB	11	04:24	Under	Below	Safe	0	North	N-S	Ppip
6	12/07/2018	AE	1	03:46:00	-6	Below	Safe	1		S-N	Ppip
6	12/07/2018	AE	2	03:53:00	-5	Below	Safe	1		N-S	Ppip
6	12/07/2018	AE	3	03:55:00	-5	Below	Safe	1		N-S	Ppip
6	12/07/2018	AE	4	03:58:00	-6	Below	Safe	1		N-S	Ppip
6	12/07/2018	AE	5	03:59:00	-3	Above	Unsafe	0			Ppip
6	12/07/2018	AE	6	04:02:00		Below	Safe	1		S-N	Ppip
6	12/07/2018	AE	7	04:05:00	-6	Below	Safe	1	South		Ppip
6	12/07/2018	AE	8	04:07:00	-5	Below	Safe	2			Ppip
6	12/07/2018	AE	9	04:10:00		Below	Safe	1			Ppip
6	12/07/2018	AE	10	04:10:00	-5	Below	Safe	0			Ppip
6	12/07/2018	AE	11	04:12:00	-5	Below	Safe	1			Ppip
6	12/07/2018	AE	12	04:13:00	-6	Below	Safe	0			Ppip
6	12/07/2018	AE	13	04:15:00	-5	Below	Safe	2	S	N-S	Ppip
6	12/07/2018	AE	14	04:16:00	-6	Below	Safe	1	S	S-N	Ppip
6	12/07/2018	AE	15	04:16:00	-5	Below	Safe	2	S	N-S, S-N	Ppip
6	12/07/2018	AE	16	04:17:00		Below	Safe	1			Ppip
6	12/07/2018	AE	17	04:20:00	-5	Above	Unsafe	0			Ppip

Visit	Date	Surveyor	Record	Time	Height above road/ below road (M)	Above or Below road	Safe or unsafe	Distance from Feature (M)	Side of Feature	Direction Crossing	Species
6	12/07/2018	AE	18	04:21:00		Below	Safe	1		N-S, S-N	Ppip

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