A358 Taunton to Southfields Dualling

Bat Hibernation Technical Report

PCF STAGE 2

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Executive summary

The proposed A358 Taunton to Southfields Dualling scheme (hereafter referred to as 'the scheme'), aims to provide a dual carriageway along the length of the A358 between Taunton and Ilminster in Somerset, connecting the A303 at Ilminster to the M5 motorway to the north. The scheme would include grade separated junctions with the purpose of providing a high-quality free flow journey for those using the route, and the removal of at-grade junctions and direct accesses.

In England, all native species of bat are fully protected under the *Conservation of Habitats and Species Regulations 2017* (as amended by the *Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019*) and the *Wildlife and Countryside Act (WCA) 1981* (as amended).

In order to assess which bat species are present in the survey area, and how habitats within it are used by these species, a series of bat surveys (including building and tree assessments, emergence/re-entry surveys and hibernation surveys), were undertaken between 2017 and 2021. This report is primarily concerned with the identification of hibernation roost sites within the zone of influence (ZoI) of the scheme (up to 100m). It was agreed with Natural England (NE) that 100m was an appropriate survey buffer for roost surveys.

To inform the bat hibernation surveys, external and internal building and structure inspections were undertaken to assess the suitability of buildings and structures for hibernating bats within the ZoI of the scheme. These surveys are covered in the Bat Roost report HE551508-MMSJV-EBD-000-RP-LB-0058.

The following surveys were undertaken by Mott MacDonald Sweco Joint Venture (MMSJV) between December 2020 and February 2021 to assess the status of buildings and structures with bat hibernation potential within the ZoI of the scheme:

- internal inspections to assess the presence of, or evidence of hibernation roosts in buildings and structures
- static surveys to assess bat activity in potential hibernation roosting sites

Surveys have not identified the presence of any bat hibernation roosts within the surveyed areas. The surveys were heavily constrained due to restricted access and Covid-19 restrictions, which means that only one building had a full hibernation survey. As a result, further hibernation surveys will be required in winter 2021/22.

This report is to be read in conjunction with the Bat Roost report HE551508-MMSJV-EBD-000-RP-LB-0058.

1. Introduction

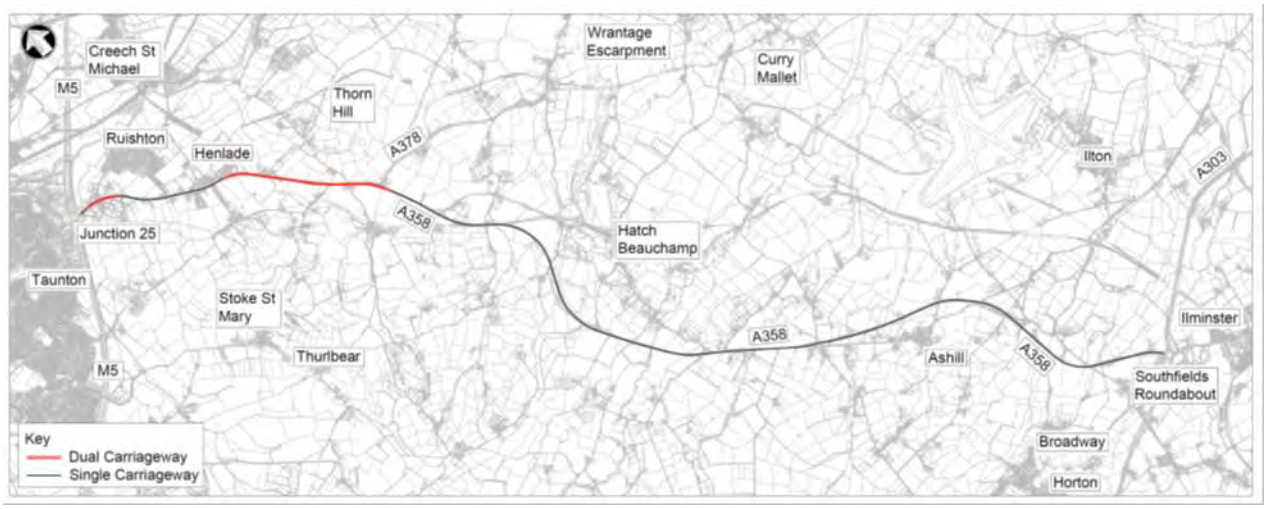
1.1. Background

1.1.1. The A303 / A358 corridor is a vital connection between the south-west, London and the south-east. Due to the population density, employment opportunities, urban concentrations and tourist attractions situated within the south-west, the A303 / A30 / A358 corridor experiences a wide range of traffic flows which lead directly to severe and regular instances of congestion and delay.

1.1.2. The A303 / A30 is part of the strategic road network (SRN) and together with the A358 forms a key strategic link between the South West Peninsular (SWP) and the rest of the south, southeast and London. Although it is dualled over much of its length there are several unimproved single carriageway sections between the M3 motorway at Basingstoke and the M5 at Taunton and Exeter which cause congestion, especially during summer weekends.

1.1.3. The existing A358 between Taunton and Southfields Roundabout is predominantly single carriageway with a short (1.1 miles) dual carriageway section in the vicinity of Thornfalcon and a 3 lane (2+1) section (0.3 miles) immediately to the south of that. It has many side roads and private accesses directly onto it. The national speed limit applies between Southfields and Henlade where it reduces to 30mph; the speed limit increases to 40mph north of Henlade on the approach to M5 junction 25. A plan showing the existing route between Taunton and Southfields is provided in Figure 1:1.

Figure 1:1 : A358 Taunton to Southfields existing road layout

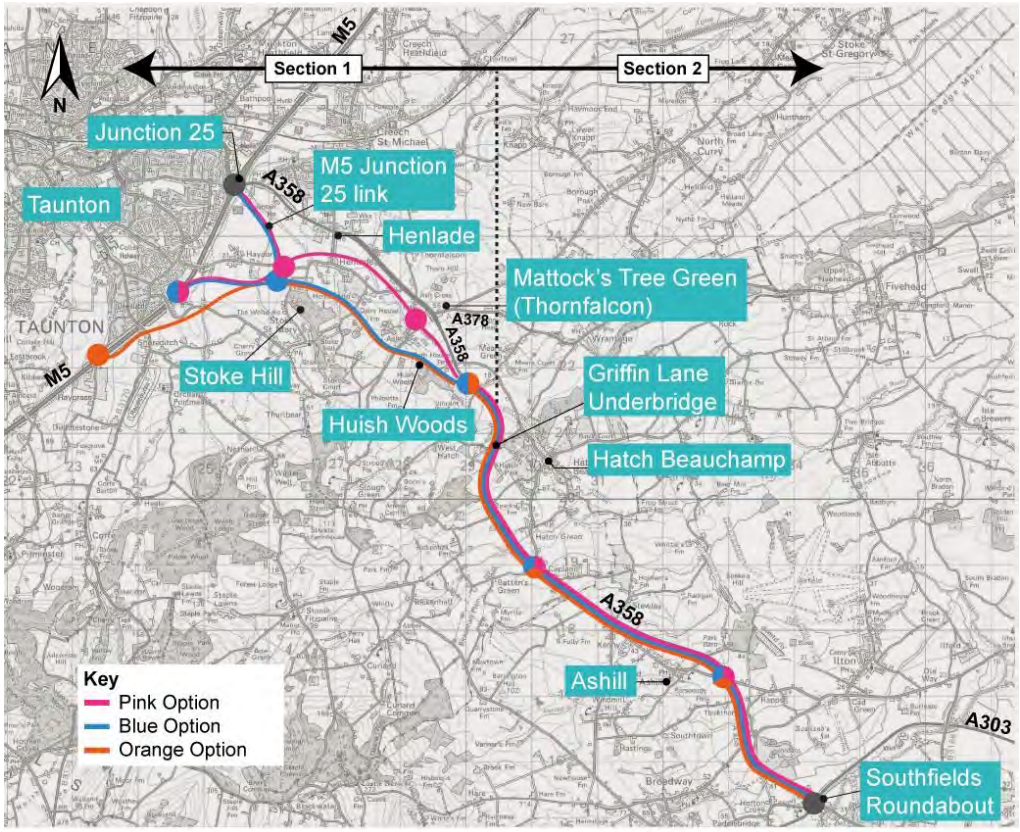


Source: Mott MacDonald Sweco Joint Venture. This Map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Highways England 100030649 2016.

1.1.4. Three potential route options were chosen, Orange, Pink and Blue. At the public consultation in 2017 only the Orange option was presented. A further consultation was held in 2018 in which all three options were presented. The three route options presented at the 2018 consultation are described below:

- The **Pink option** commences at a new junction on the M5 approximately 1.2 miles (2 kilometres) south of junction 25. South-facing slip roads from the M5 would combine to become the new dual carriageway, which runs eastwards and north of Stoke Hill. Here a limited-movement junction is proposed with east-facing slip road connections to the new road which would allow traffic to travel between the new A358 and junction 25 via a new 0.9 mile (1.5 kilometre) dual carriageway link past the planned Nexus 25 site. The proposed route would then follow the existing A358 to Southfields Roundabout enabling the existing road to be upgraded from a single to a dual carriageway. The total length of the Pink option is 9 miles (14.6 kilometres), plus the 0.9 miles (1.5 kilometres) spur leading to M5 junction 25.
- The **Blue option** commences at the M5 approximately 1.2 miles (2 kilometres) south of junction 25 and runs eastwards on a more southerly alignment. At Stoke Hill a junction is proposed similar to that with the Pink option which would allow traffic to travel between the road and junction 25 via a new 1.2 miles (2 kilometres) dual carriageway link past the planned Nexus 25 site. The road would then continue in a south-easterly direction to West Hatch Lane, where an all-movement, grade separated junction is proposed to allow access to Hatch Beauchamp, Henlade and surrounding communities, and the A378. This option is identical to the Pink option from this point onwards to Southfields Roundabout. The total length of the Blue option is 8.7 miles (14.1 kilometres), plus the 1.2 miles (2 kilometres) spur leading to M5 junction 25.
- The **Orange option** commences at the M5 approximately 2.1 miles (3.5 kilometres) south of junction 25 at a proposed new two-bridge roundabout which would form a new all-movements junction between the new A358 and the motorway. The proposed road initially takes a north-easterly course towards Henlade before arcing around the north of Stoke Hill. In contrast to the Blue option, there is no link to junction 25 from this location, and therefore no junction at Stoke Hill. This option is identical to the Blue option from this point onwards. The total length of the Orange option is 9.5 miles (15.3 kilometres).

Figure 1:2 : Route options presented at the public consultations



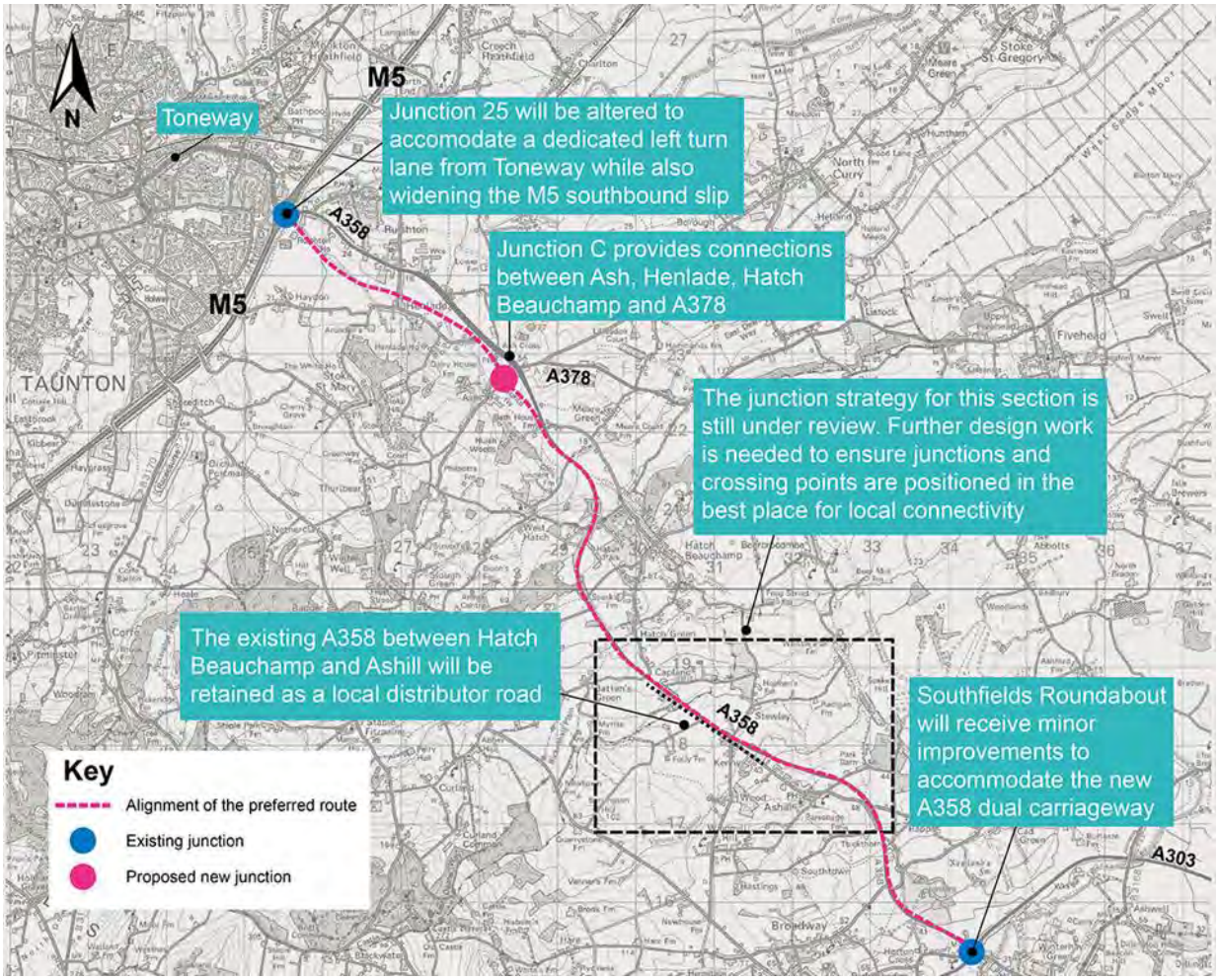
1.2. Scheme proposal

1.2.1. The scheme would provide a dual carriageway along the length of the A358 between Taunton and Ilminster in Somerset, connecting the A303 at Ilminster to the M5 motorway to the north. The scheme would include grade separated junctions and, with the purpose of providing a high-quality free flow journey for those using the route, the removal of at-grade junctions and direct accesses.

1.2.2. The Preferred Route Announcement (PRA) on 13 June 2019 identified the Pink Modified option as the preferred route option (PRO). Please refer to the Scheme Appraisal Report (SAR) for details of the development of the Pink option to the Pink Modified option.

1.2.3. The Pink Modified option would comprise online widening between West Hatch Lane and Southfields Roundabout. This option would involve the re-use of a large amount of the existing A358 corridor, and between West Hatch Lane and Henlade the route would pass close to the A378 junction at Mattocks Tree Green. This would enable direct movement between the proposed road and the A378. The Pink Modified option retains the bypass to Henlade, connects with the A378, and connects directly to junction 25 on the M5. A plan showing the Pink Modified option route is shown in Figure 1:3 below.

Figure 1:3 : Pink Modified option



1.3. Purpose of the report

1.3.1. This Bat Hibernation technical report has been prepared during Stage 2 of the Highways England's Project Control Framework (PCF). This technical report provides an overview of the results of the bat hibernation surveys undertaken between December 2020 and February 2021 within 100m of the Pink Modified option. The report provides methods, constraints and results of the bat hibernation surveys undertaken for the scheme.

1.4. Scope of report

1.4.1. The objective of the report is to present the methodology, constraints and results of the bat hibernation surveys.

1.4.2. The report does not provide any detailed impact assessment or provide recommendations for mitigation as this aspect will be developed by the RDP DIP during PCF Stage 3 of the scheme.

1.4.3. Guidance on ecological assessment recommends that all ecological features that occur within a zone of influence (ZoI) for a proposed scheme are investigated (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018)[1]. All areas within 100m of the Pink Modified option proposed scheme footprint were assessed for potential hibernation roosting features for bats.

1.4.4. This report is to be read in conjunction with the Bat Roost report HE551508-MMSJV- EBD-000-RP-LB-0058.

1.5. Legislation

1.5.1. All native bat species are afforded full protection under the *Conservation of Habitats and Species Regulations 2017 (as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019)*, the *Countryside and Rights of Way (CRoW) Act 2000*, the *Natural Environment and Rural Communities (NERC) Act,* and the *Wildlife and Countryside Act (WCA) 1981* (as amended).

1.5.2. Under Regulation 41 of the *Conservation of Habitats and Species Regulations* it is illegal to:

- Deliberately capture, injure, or kill any UK bat species
- Deliberately disturb bats (in particular, disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, to hibernate or migrate or to affect significantly the local distribution or abundance of the species to which they belong)
- Damage or destroy a breeding site or resting place of any UK bat

1.5.3. Under Schedule 5 of the *Wildlife and Countryside Act 1981* it is illegal to:

- Deliberately capture, injure, or kill a bat
- Intentionally or recklessly disturb a bat in its roost
- Deliberately disturb a group of bats
- Damage or destroy a bat roosting place (even if not occupied at the time)
- Possess or advertise / exchange a bat (dead or alive) or any part of a bat
- Intentionally or recklessly obstruct access to a bat roost

1.5.4. The *Conservation of Habitats and Species Regulations 2017* strengthens protection given under the *WCA 1981*, making it an offence to disturb bats, particularly

[1] Chartered Institute of Ecology and Environmental Management (2018) Guideline for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Costal.

where this may impair their ability to survive, breed, reproduce, hibernate, nurture or rear their young, or significantly affect the local distribution or abundance of a species.

1.5.5. The *CRoW Act 2000* further strengthens the *WCA 1981*, requiring the conservation of biodiversity in accordance with the *Convention on Biological Diversity (CBD) 1992*.

1.5.6. The *NERC Act 2006* places obligation on public authorities to take the conservation of species and habitats of principal importance, for conserving biodiversity, into consideration. Section 41 of the Act contains a list of habitats and species of principal importance in England.

1.5.7. The following bat species are listed as Annex II species within the *EU Habitats Directive 1992*, and therefore are given additional protection:

- Barbastelle *Barbastella barbastellus*
- Bechstein's bat *Myotis* bechsteinii
- Greater horseshoe *Rhinolophus ferrumequinum*
- Lesser horseshoe *Rhinolophus hipposideros*

1.5.8. This means that these species have been assessed as meeting the criteria for site selection of Special Areas of Conservation (SAC) to specifically observe them. Site selection is based on evidence of a large and robust population of one or more of these bat species.

1.6. Status of bats at county level

1.6.1. The are 16 species of bat present in Somerset. These are common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared *Plecotus auritus*, grey long-eared *Plecotus austriacus*, greater horseshoe *Rhonolophus ferrumequinum*, lesser horseshoe *Rhonolophus hipposideros*, Daubenton's bat *Myotis daubentonii*, Natterer's bat *Myotis nattereri*, Bechstein's bat *Myotis bechsteinii*, whiskered *Myotis mystacinus*, Brandt's bat *Myotis brandtii*, barbastelle *Barbastella barbastellus*, Nathusius's pipistrelle *Pipistrellus nathusii*, Leisler's bat *Nyctalus leisleri*, noctule *Nyctalus noctula* and serotine *Eptesicus serotinus*. There are five SACs designated for bats. These are Hestercombe House for the lesser horseshoe population; North Somerset and Mendip Bats, Mendip Limestone Grasslands and Mells Valley for the greater horseshoe bats; and Exmoor and Quantock Oakwoods for the barbastelle and Bechstein's bat populations. All bat species are 'County Notable' species. Greater horseshoe bats are in the *Mendip Local Biodiversity Action Plan* and lesser horseshoe bats are in the *West Somerset Local Biodiversity Action Plan*. The Somerset Biodiversity Strategy includes a group Species Action Plan for bats.

1.6.2. Somerset Bat Group[2] has the following information on the distribution and status of the 16 bat species within the county:

- **Common pipistrelle**: Common throughout Somerset, often roosting in modern houses.
- **Soprano pipistrelle**: Not as frequent as common pipistrelles, but still common and frequently found in damp Somerset woodland, or near water. Good places to see them are the Westhay reserve and Chard Reservoir.
- **Brown long-eared**: Fairly common throughout Somerset, it roosts in open lofts in older buildings or barns.
- **Grey long-eared**: Rare in Somerset. This bat is generally a little larger than the brown long-eared bat and has a dark face. A back from the brink target species. Somerset may be a hotspot for them, but the Somerset Bat Group are still collecting information.
- **Greater horseshoe**: Uncommon in Somerset, However, around 12% of the national breeding colony are roosting in the Mendips, and hibernating in local caves.
- **Lesser horseshoe**: A species locally common in the Mendips, uncommon elsewhere. Prefers to roost in older buildings and stone outbuildings.
- **Daubenton's**: Common throughout Somerset in wet woodlands or near water. Good places to see them are the Bishops Palace moat in Wells, Chard Reservoir or on the River Tone in Taunton.
- **Natterer's**: Uncommon in Somerset. A woodland bat, regularly seen in the Mendips. Roosts in bat boxes and some of the Somerset Bat Group's bat houses.
- **Bechstein's**: These were recorded during the Bat Conservation Trust (BCT) Bechstein's survey, with possible breeding colonies towards the Dorset border.
- **Whiskered**: Uncommon in Somerset. Small roosts in older cottages, little information available on Somerset roosts.
- **Brandt's**: Has been recorded in Somerset, but limited knowledge of their breeding status so far. Believed to be rare in the county.
- **Barbastelle**: Rare in Somerset. Surveys have confirmed it as breeding in the county's ancient woodland.
- **Nathusius' pipistrelle**: A few have been recorded in flight, but little information on breeding in Somerset. Has been found breeding north of the Mendips.
- **Leisler's**: Very little information available, however a roost has recently been discovered in the center of Taunton.
- **Noctule**: Common throughout Somerset. A woodland bat, often roosting in hollow trees or bat boxes.
- **Serotine**: Uncommon and declining in Somerset, now less frequently seen. Feeds over cattle grazed pasture. Likes to roost in Victorian houses with clay tile roofs and deep barge boards.

[2] https://somersetbat.group/bats/somerset/.

1.7. Bat ecology

1.7.1. Bats are sociable animals that can live up to 30 years. During the summer months female bats form maternity colonies which may be in a variety of natural or artificial structures such as houses, trees or bridges depending on the species, to have their young. These tend to be the same site every year. A mature female may produce one offspring every year or so. Maternity roosts disperse in September or October and many bats hibernate in an alternative site, some species using caves, tunnels, bridges or mines or other suitable sites with stable temperatures and high humidity.

1.7.2. Bats are nocturnal and emerge from their roosts at dusk to feed. In the UK all bat species feed on insects. Numerous feeding sites are needed throughout the year as insect availability changes. They can forage several kilometres away from their roost site and often rely on hedgerows, woodland edge, tree lines, copses, and watercourses to commute.

2. Methodology

2.1. Desk study

2.1.1. A detailed biological records search was requested from Somerset Environmental Records Centre (SERC) in 2016, within a 2 kilometre radius of the scheme.

2.1.2. This desk study should be updated during PCF Stage 3 to support the Development Consent Order (DCO) application and should be extended to 10 kilometres, as agreed with Natural England (NE) in the bat survey memo (see Bat Roost technical report HE551508-MMSJV-EBD-000-RP-LB-0058).

2.2. Survey methodology

2.2.1. Please refer to the Bat Roost technical report (HE551508-MMSJV-EBD-000-RP-LB-0058) for the full methodology for external assessment of buildings and structures from ground level, and internal building and structure surveys.

2.2.2. Buildings and bridges within 100m of the proposed construction footprint were assessed for their potential to support roosting bats, including hibernation potential, between 2017 and 2020. During subsequent external and internal inspections, potential roosting features (PRFs) were identified and emergence / re-entry surveys were undertaken in the same years.

2.2.3. Each building or structure was methodically surveyed in order to identify any potential ingress or egress points, noting the following:

- type of feature (for example, missing roof tile)
- size of ingress / egress point
- height and orientation of each feature
- presence of bats in situ
- any sign of bat use, such as scratch marks, urine staining or droppings

2.2.4. This information was used to determine if bats are hibernating within (via presence or evidence of presence) or potentially hibernating in each building or structure, including an initial assessment of the potential for supporting hibernation roosts.

2.2.5. The internal building assessments provided additional information on the suitability of buildings to support roosting bats within the Zone of Influence of the scheme (100m buffer as agreed with NE). Where droppings were identified and could be collected, these were sent off for DNA analysis to confirm the species (except where a confident assessment of the species could be made by a licenced bat ecologist).

2.2.6. Several buildings (as listed below) and their features were determined to have suitable hibernation roosting potential as outlined in section 2.6 of the Bat Roost technical

report (HE551508-MMSJV-EBD-000-RP-LB-0058) and detailed within Appendix H of the Bat Roost technical report (HE551508-MMSJV-EBD-000-RP-LB-0058). These buildings that required further survey, are within 100m of the Pink Modified option, as outlined in Section 3.2 below. Bat hibernation assessments were carried out in line with the *Bat Conservation Trust (BCT) Guidelines*[3], to ascertain bat hibernation presence at the following structures:

- Building 56
- Building 57
- Building 77
- Building 78
- Building 173
- Building 174
- Building 244
- Building 262
- Building 263
- Building 285
- Bridge 4
- Bridge 114

2.2.7. Surveys were undertaken in December 2020 by a suitably qualified bat licenced ecologist, Dave Blakemore (2020-45234-CLS-CLS). These surveys included a detailed inspection of the structures to identify hibernating bats or other evidence of bat occupation, such as droppings or oil staining. All cracks, crevices and voids were searched for hibernating bats using torches, mirrors, and endoscopes.

2.2.8. Static bat detectors (SM4 detectors) were also deployed where suitable within structures with a moderate or high likelihood of bats being present. These surveys were undertaken in January and February 2021, over a two-week period in each month.

2.3. Static analysis

2.3.1. Analysis of the static data was initially run through Kaleidoscope 4.5.5 to carry out an auto ID of the calls. One hibernation static was deployed at one building only, no bats were recorded.

2.4. Constraints

2.4.1. In Appendix I of the Bat Roost technical report, of the six bridges assessed only two were deemed to have hibernation potential. The other bridges along the scheme were not assessed and will need to be surveyed in 2021.

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

2.4.2. It was not possible to survey some structures due to lack of access for various reasons. A preliminary roost assessment has not yet been undertaken on buildings 77, 78, 173, 174 and 285 as access has not been granted. These buildings require surveys in 2021 and may require subsequent hibernation surveys if assessed to have the potential to support hibernating bats.

2.4.3. Bridge 114 could not be inspected for hibernating bats due to a jammed lock. This structure will require hibernation and static surveys in winter 2021/22.

2.4.4. Bridge 4 did not have emergence / re-entry surveys or hibernation survey undertaken; this will need further surveys in 2021.

2.4.5. Buildings 56, 57 and 262 were inspected for hibernating bats but could not be fully assessed due to access issues within the loft spaces such as limited flooring.

2.4.6. No inspection was undertaken in building 244 as the feature identified as having hibernation potential was a cavity wall. However, due to the positioning of the features and professional judgement, it is unlikely that the cavity wall supports a significant number of hibernating bats.

2.4.7. Static detectors were not deployed in any residential properties (buildings 56, 57, 120, 244 and 262) due to the Covid-19 pandemic restrictions. It was decided that repeat visits inside people's homes over several months to deploy and collect static detectors, could put the health and wellbeing of the surveyors and residents at risk. Additionally, the owners of building 120 refused access for the inspection due to Covid-19. These surveys should be undertaken in winter 2021/22.

2.4.8. An automated static detector was deployed within building 263. All the sound files recorded were run through Kaleidoscope, these were then manually checked to confirm no bat calls were recorded.

2.4.9. A summary of the surveys undertaken, and any constraints is outlined below in Table 2:1.

Table 2:1 : Hibernation surveys and constraints

Building / bridge number	Land parcel	Initial external assessment undertaken?	Hibernation internal inspection undertaken?	Static survey undertaken?
Building 56	ST185812	Yes	Yes – not able to be fully assessed	**No – required in 2021/22**
Building 57	ST56479	Yes	Yes – not able to be fully assessed	**No – required in 2021/22**
Building 77	ST207263	**No – required in 2021/22**	**No – required in 2021/22**	**No – required in 2021/22**
Building 78	ST43481	**No – required in 2021/22**	**No – required in 2021/22**	**No – required in 2021/22**
Building 173	ST307743	**No – required in 2021/22**	**No – required in 2021/22**	**No – required in 2021/22**
Building 174	ST307743	**No – required in 2021/22**	**No – required in 2021/22**	**No – required in 2021/22**

Building / bridge number	Land parcel	Initial external assessment undertaken?	Hibernation internal inspection undertaken?	Static survey undertaken?
Building 244	U00053	Yes	No – feature located within cavity wall	**No – required in 2021/22**
Building 262	U00078	Yes	Yes – not able to be fully assessed	**No – required in 2021/22**
Building 263	U00078	Yes	Yes	Yes
Building 285	ST307472	**No – required in 2021/22**	**No – required in 2021/22**	**No – required in 2021/22**
Bridge 4	ST307472	**Yes**	**No – required in 2021/22**	**No – required in 2021/22**
Bridge 114	U00025	Yes	**No – lock jammed, required in 2021/22**	**No – required in 2021/22**

3. Results

3.1. Desk study

3.1.1. Biological records obtained from Somerset Environmental Records Centre (SERC) identified 25 records of hibernation roosts[4] within 2km of the scheme, including those of common pipistrelle, brown long-eared, lesser horseshoe and unidentified bats.

3.1.2. A summary of the results is provided in the Table 3:1 and mapped in Appendix A. The full results of the SERC biological records search are available in the Bat Roost report (HE551508-MMSJV-EBD-000-RP-LB-0058).

Table 3:1 : All hibernation roosts within 2km of the scheme returned by the SERC biological records search

Species	Hibernation roosts
Bats	Ten hibernation roosts, the closest being 78m west of the scheme (recorded in 1992, likely one of Park Farm House, though exact one unknown)
Brown long-eared bat	Seven hibernation roosts, the closest being 698m south-west of the scheme
Common pipistrelle	Three hibernation roost, the closest being 1.04km south-east of the scheme
Lesser horseshoe bat	Four hibernation roosts, the closest being 696m east of the scheme
Serotine	One hibernation roost, 698m south-west of the scheme

3.2. Preliminary bat roost potential assessment

3.2.1. Initial surveys identified five buildings and two bridges with the potential to support hibernating bats. Additionally, five buildings have been identified within 100m of the Pink Modified option that have not yet been assessed as access has not been granted. These are currently assumed to have hibernation potential which will need to be updated when access is granted and these buildings are assessed. The buildings and bridges with the potential to support hibernating bats are outlined in Table 3:2 below and mapped in Appendix B.

Table 3:2 : Survey results for buildings and structures with the potential to support hibernating bats

Building / bridge number	Land parcel	OS Grid Reference	Hibernation survey undertaken?	Roost Potential	Features suitable for hibernation potential	Emergence / re-entry results	Internal inspection results
56	ST185812	ST 26909 23585	Yes	High roost potential with hibernation potential	Wall cavities providing thermal regulation	Day roost confirmed (two common pipistrelles)	Droppings scattered thinly around the roof void – no DNA analysis, likely

[4] Any records recorded within the core hibernation months of December, January and February, were taken as a hibernation roost.

Building / bridge number	Land parcel	OS Grid Reference	Hibernation survey undertaken?	Roost Potential	Features suitable for hibernation potential	Emergence / re-entry results	Internal inspection results
							common pipistrelle
57	ST56479	ST 26902 23605	Yes	High roost potential with hibernation potential	Features in stone wall providing suitable potential	Day roost confirmed (one common pipistrelle)	N/A
77	ST207263	ST 26980 23570	No access - undetermined	No access - undetermined	No access - undetermined	N/A	N/A
78	ST207263	ST 26991 237874	No access - undetermined	No access - undetermined	No access - undetermined	N/A	N/A
173	ST307743	ST 28982 22026	No access - undetermined	No access - undetermined	No access - undetermined	N/A	N/A
174	ST307743	ST 26965 23572	No access - undetermined	No access - undetermined	No access - undetermined	N/A	N/A
244	U00053	ST 31649 117923	No – feature located within cavity wall	Moderate roost potential with low hibernation potential	Wall cavities	Day roost confirmed (one common pipistrelle and two Pipistrelle spp.)	N/A
262	U00078	ST 33220 17176	Yes	High roost potential with hibernation potential	Stone built, roof void offering good thermal regulation	Day roost confirmed (one soprano pipistrelle)	Long-eared bat roost confirmed
263	U00078	ST 33254 17167	Yes	High roost potential with hibernation potential	Small stone building, so good thermal regulation	No roost identified	N/A
285	ST307472	ST 29391 19913	No access- Undetermined	No access - undetermined	No access - undetermined	N/A	N/A
Bridge 4	ST307472	ST 29254 20217	No	High roost potential with hibernation potential	Internal space behind the concreate slabs.	N/A	N/A
Bridge 114	U00025	ST 27859 23128	Yes	Moderate roost potential with moderate hibernation potential	Stone bridge, closed off underneath, offering still air flow and good thermal regulation	No roost identified	N/A

3.2.2. Of these ten structures, three roosts were confirmed during emergence / re-entry surveys, supporting common and soprano pipistrelles and a long-eared roost identified from droppings following an internal inspection.

3.2.3. The Bat Roost report concluded that these roosts were likely day roosts due to the low numbers of bats and/or droppings seen during the surveys.

3.3. Hibernation surveys

Inspections

Building 56

3.3.1. This building's central section is 720 years old, with 16th century and Georgian extensions. Parts of the roof are in poor repair, with gaps under the tiles and cavities in the walls, and lead flashing is present.

3.3.2. The loft was dry and the numerous cavities in the walls were endoscoped, but no bats were found. One area of the roof is blocked off by a partition wall and could not be inspected.

Building 57

3.3.3. A 19th century converted apple barn with stone walls and a tiled roof. The loft was clean and dry, with some boarding. No signs of hibernating bats were identified; however, the most suitable features (the walls at either end of the loft) could not be accessed due to the lack of floorboards in these areas.

Building 262

3.3.4. A stone residential house. The floor of the loft was covered with scattered dry bat droppings and dead flies. Surveyors were only able to access a small area of the roof void, as only two wooden boards have been laid down.

3.3.5. Soprano pipistrelle and long-eared bats were confirmed to be roosting here during emergence / re-entry surveys and internal inspections, so it is likely these droppings (not recent as were dry but not faded) are from the summer and that the loft is used as a day roost.

Building 263

3.3.6. A small stone built shed with a tiled roof. It was dry inside and there were a number of cracks and crevices in the walls, although it is unknown if bats would be able to find their way inside.

3.3.7. Static surveys were subsequently undertaken in this building.

Bridge 114

3.3.8. A stone bridge, with corrugated metal sides and doors on either side, of unknown age. Surveyors were unable to access the bridge due to a jammed lock. An opening was located above one corrugated side and cracks are likely in the stonework, suitable for bats to roost in.

3.3.9. A summary of the results of the hibernation surveys that were undertaken is included below in Table 3:3, and photos are included in Appendix C.

Table 3:3 : Results of hibernation inspection surveys

Feature ID	Date of survey	Temp. °C	Wind (Beaufort Scale)	Cloud cover (0/8)	Rain[5]	Result
Building 56	08/12/2020	3	0	8	0	No bats – not able to be fully assessed
Building 57	08/12/2020	3	0	5	0	No bats – not able to be fully assessed
Building 262	07/12/2020	3	1	8	0	No bats - scattered bat droppings. Not able to be fully assessed
Building 263	07/12/2020	3	0	8	0	No bats
Bridge 114	07/12/2020	3	0	8	0	No access inside

Static analysis

3.3.10. A summary of the results of the static surveys is included below in Table 3:4.

Table 3:4 : Results of hibernation static surveys

Feature ID	Date of 1st static survey deployed	Result	Date of 2nd static survey deployed	Result
Building 56	N/A – residential property (Covid-19 restrictions)	N/A	N/A	N/A
Building 57	N/A – residential property (Covid-19 restrictions)	N/A	N/A	N/A
Building 262	N/A – residential property (Covid-19 restrictions)	N/A	N/A	N/A
Building 263	11/01/2021 – 25/01/2021	No bats	05/02/2021 – 19/02/2021	No bats
Bridge 114	N/A – no access	N/A	N/A	N/A

3.3.11. Static bat detectors could not be set up within most of the buildings due to restrictions surrounding Covid-19. Bridge 114 could not be accessed due to a jammed lock. These buildings and structures will need to be surveyed in winter 2021.

3.3.12. Static surveys were possible at building 263 as this was an uninhabited outbuilding. No bats were recorded during the entire deployment of the static detector. This would indicate that the building is not used by hibernating bats.

[5] Rain scale : 0 - dry, 1 - light drizzle, 2 – Light rain, 3 – moderate rain

4. Conclusion

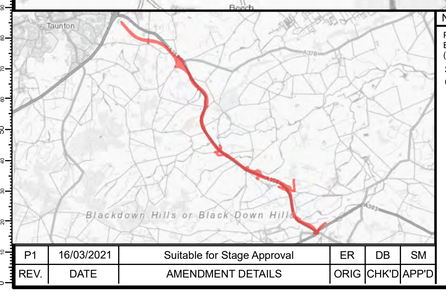
4.1.1. No bat hibernation roosts have been identified within any of the surveyed buildings or structures. However, due to restricted access and Covid-19 restrictions, further hibernation surveys will be required in winter 2021/22. These are outlined below in Table 4:1.

Table 4:1 : Further bat hibernation surveys required

Feature ID	Further surveys
Building 56	Static surveys required in winter 2021/2022 due to limited access for inspections in 2020/2021.
Building 57	Static surveys required in winter 2021/2022 due to limited access for inspections in 2020/2021.
Building 77	Initial assessment required in 2021, possible hibernation surveys required in winter 2021/2022.
Building 78	Initial assessment required in 2021, possible hibernation surveys required in winter 2021/2022.
Building 173	Initial assessment required in 2021, possible hibernation surveys required in winter 2021/2022.
Building 174	Initial assessment required in 2021, possible hibernation surveys required in winter 2021/2022.
Building 244	Internal inspection not possible (cavity wall). Static surveys required in winter 2021/2022.
Building 262	Static surveys required in winter 2021/2022 due to limited access for inspections.
Building 263	No further surveys required.
Building 285	Initial assessment required in 2021, possible hibernation surveys required in winter 2021/2022.
Bridge 4	Further surveys needed in 2021.
Bridge 114	Access required from landowner for hibernation surveys in winter 2021/2022.

Appendix A. Desk study hibernation roost locations

1:25,000 — 0 — 1,000 — 2,000 — 3,000m



REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
P1	16/03/2021	Suitable for Stage Approval	ER	DB	SM

Notes

Pink Modified Scheme, Mott MacDonald (2018)
Bat historical data, Somerset Environmental Record (2020)

Service Layer Credits: Contains OS data © Crown Copyright and database right 2020

Key to symbols

Pink Modified Scheme Option

Species

- Bats
- Brown Long-eared Bat
- Lesser Horseshoe Bat
- Pipistrelle
- Serotine

References drawings

Drawing Status	Suitability
Suitable for Stage Approval	S4

Mott MacDonald Sweco
Stoneham Place
Stoneham Lane
Southampton
SO50 9NW
Tel : +44 (0)23 8062 8800
Fax : +44 (0)23 8062 8801
www.mottmac.com

Client: highways england

Project Title: A358 Taunton to Southfields

Drawing Title: Hibernation Somerset Environmental Record

Scale	Designed	Drawn	Checked	Approved
1:25,000	ER	ER	DB	SM
Original Size	**Date**	**Date**	**Date**	**Date**
A1	16/03/2021	16/03/2021	16/03/2021	16/03/2021

Drawing Number: HE551508 - MMSJV - EBD - 000 - DR - LB - 0224
(HE P/N | Originator | Volume | Location | Type | Role | Number)

Project Ref. No.: 370774

Revision: P1

Appendix B. Hibernation survey locations

Inset Map 1

77 78 57 56

Inset Map 2

173 174

Inset Map 3

262 263

Bridge 4

Bridge 114

285

244

NTS

0 1,000 2,000 3,000m

REV.	DATE	AMENDMENT DETAILS	ORIG	CHK'D	APP'D
P1	18/03/2021	Suitable for Stage Approval	ER	DB	SM

Notes

Pink Modified Scheme, Mott MacDonald (2018)
Bat hibernation, Mott MacDonald (2019)

Service Layer Credits: Contains OS data © Crown Copyright and database right 2020

Key to symbols

- Pink modified scheme option
- 100m buffer

Results

- No evidence of hibernating bats - fully assessed
- No evidence of hibernating bats - not able to be fully assessed
- No result - required in 2021/22
- Not suitable for survey - feature located within cavity wall

References drawings

Drawing Status	Suitable for Stage Approval
Suitability	S4

Mott MacDonald Sweco
Stoneham Place
Stoneham Lane
Southampton
SO50 9NW
Tel : +44 (0)23 8062 8800
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Client: highways england

Project Title: A358 Taunton to Southfields

Drawing Title: Bat hibernation results

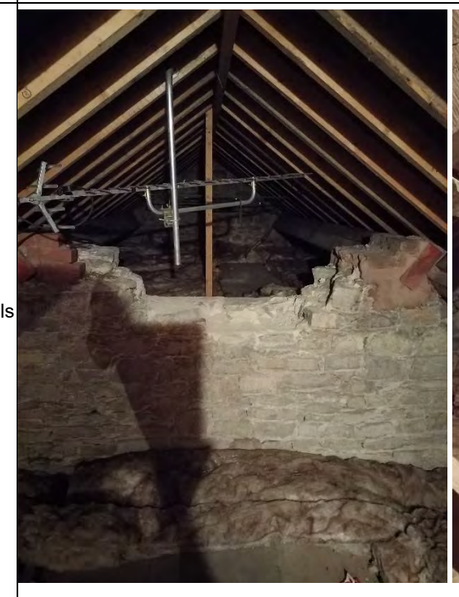
Scale	Designed	Drawn	Checked	Approved
NTS	ER	ER	DB	SM
Original Size: A4	Date: 18/03/2021	Date: 18/03/2021	Date: 18/03/2021	Date: 18/03/2021

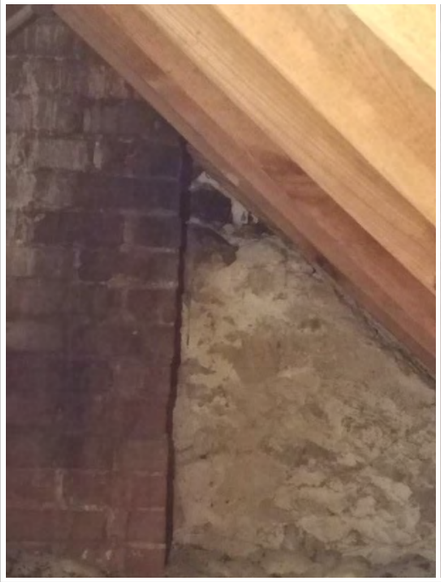
Drawing Number: HE551508 - MMSJV - EBD - 000 - DR - LB - 0223
(HE PIN | Originator | Volume | Location | Type | Role | Number)

Project Ref. No.: 370774

Revision: P1

Appendix C. Survey photos

Building / Bridge	Land Parcel	Notes	Photo
Building 56	ST185812	The building has a central section which is 720 years old. other sections of the building are 16th century and Georgian. Parts of the roof are in poor repair. Lead flashing is present and gaps under roof tiles and cavities in walls. One area of the roof is blocked off by a partition wall and could not be inspected.	
Building 57	ST56479	Converted apple barn. 19th century. Stone walls with tiled roof. Clean and dry, with some boarding. Could not access most suitable features - the walls at either end due to lack of floorboards.	 

Building / Bridge	Land Parcel	Notes	Photo
Building 262	U00078	Stone built residential house. Floor is covered with scattered bat droppings and dead flies. Only able to access a small area of the roof void, as only two wooden boards have been laid down.	  
Building 263	U00078	Small stone built shed with a tiled roof. Dry with a number of cracks and crevices in the walls.	  

Building / Bridge	Land Parcel	Notes	Photo
Bridge 114	U00025	Stone bridge, with corrugated metal sides with doors on either side. Unable to access due to jammed lock. Opening above one corrugated side and likely cracks in stonework that is suitable for bats to roost in.