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Member of the SNC-Lavalin Group

Alveston Hill Cycle and Pedestrian Route

Ecological Impact Assessment

South Gloucestershire Council

December 2023

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This document has 96 pages including the cover.

Document history

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Non-technical Summary

Report purpose	This report describes the ecological baseline and evaluates the nature conservation importance of ecological features present within the zone of influence for the Proposed Scheme. The assessment identifies impacts (both positive and negative) on important ecological features, sets out agreed avoidance, mitigation, compensation and enhancement measures and provides details on the significance of effects for each important ecological feature.
Proposed Scheme	The Proposed Scheme comprises an off-road segregated walking and cycling path linking Thornbury Leisure Centre in the north to Alveston Hill further south. This forms part of a wider scheme which will also comprise a 2-way cycle track and footway to run along the eastern side of B4061 between Alveston Hill and the A38 and a pedestrian and cycling crossings at Down Road and Alveston Hill. This EcIA has been produced in relation to the Proposed Scheme only as these works do not meet the requirements to be undertaken in accordance with Permitted Development. Works to construct the Proposed Scheme are anticipated to commence in summer 2024 subject to planning approval and discharge of conditions. The construction phase is anticipated to last approximately 10 months.
Desk studies and field surveys	The assessment detailed within this EcIA has utilised a desk-study and an ecological walkover of the Application Site undertaken in February 2023. In accordance with the findings of the desk study and ecological walkover, Phase 2 surveys for priority species, namely great crested newt, hazel dormouse, bats and hedgerows have been undertaken between April and November 2023.
Ecological features	There are no statutory designated sites within 2 km of the Application Site. There are seven non-statutory sites within 2 km of the Application Site. There are recent records of protected and priority species within 2 km of the Application Site, including badger, amphibians (including great crested newt), bats, birds, invertebrates, and reptiles. Habitats within the Application Site are suitable to support badgers, amphibians, bats (commuting, foraging, and roosting), birds, invertebrates, reptiles and hazel dormouse. Phase 2 surveys have confirmed the Application Site is in use by commuting and foraging bats and have confirmed the likely absence of hazel dormouse and great crested newt. Variegated yellow archangel, an Invasive Non-Native Plant Species (INNPS), has also been identified within the Application Site.
Potential impacts and effects	The Proposed Scheme will result in the permanent loss of 15 trees and approximately 83 m of hedgerow.
Avoidance, mitigation and compensation measures	To compensate for the loss of grassland, tree and hedgerow habitat, the landscaping proposals include planting of additional grassland, native trees and mixed species hedgerow to maintain the availability of these habitats within the Application Site. Construction works are to be completed in accordance with a Precautionary Method of Works (PMW) for reptiles, badgers, bats, and nesting birds. An Ecological Clerk of Works will be employed for the duration of the construction works and pre-construction clearance works to ensure the PMW is implemented. Vegetation clearance is to be undertaken outside of the core bird nesting season, taken to be between March and August inclusive. If this is not possible a pre-works check should be completed in advance of vegetation clearance. The contractor should seek specialist advice regarding the management of INNPS during construction.
Significance of residual effects	No significant residual effects are anticipated as a result of the Proposed Scheme.

Biodiversity enhancement measures	Enhancement measures include the creation of two new ponds designed to benefit wildlife with marginal planting, additional tree and hedgerow planting surplus to the amount lost as a result of the Proposed Scheme, and enhancement of existing grassland, including seeding with yellow rattle to encourage additional forb species. The enhancements also include a minimum installation of five bat boxes and nine hazel dormouse boxes.

Report Validity

In the event of programme changes then updates to the surveys may be required to ensure the validity of the data, as per CIEEM guidance[1].

[1] CIEEM (2019) Advice Note on the Lifespan of Ecological Reports and Surveys

1. Introduction

Terms of Reference

1.1. AtkinsRéalis, was commissioned by South Gloucestershire Council to undertake an Ecological Impact Assessment (EcIA) in connection with an the proposed Alveston Hill Cycle Way scheme off road section (hereafter referred to as the Proposed Scheme).

1.2. The Application Site is located near the village of Alveston, as identified by the planning red line boundary provided with the planning application submission and shown in **Appendix A** (hereafter referred to as the Application Site).

1.3. This report presents the results of the EcIA for the Proposed Scheme and considers both terrestrial and aquatic ecological receptors, which includes designated and non-designated sites, terrestrial and freshwater habitats, plants and species. The assessment has been informed by a desk study and field survey data. This EcIA describes the ecological baseline and evaluates the nature conservation importance of ecological features present within the Zone of Influence (ZoI) for the Proposed Scheme, characterises the impacts on important ecological features, sets out agreed avoidance, mitigation, compensation and enhancement measures, and assesses the significance of the residual effects of the Proposed Scheme on the important ecological features.

1.4. This EcIA has been undertaken with reference to current good practice[2] and forms part of the technical information submitted in support of the full planning application submission.

The Application Site

1.5. The Application Site is situated between the village of Alveston and the town of Thornbury in the County of South Gloucestershire and centred at Ordnance Survey national grid reference ST 63442 88851 with an approximate area of 1.6 Ha.

1.6. The Application Site comprises part of two agricultural fields adjacent to/east of Alveston Hill road (B4061). A public footpath runs through both fields from north to south, to the east of the area covered by the Application Site. Alveston Hill road is lined with trees and shrubs which form the western boundary of the two fields. Thornbury Leisure Centre is located north of the Application Site.

1.7. Habitats adjacent to the Application Site include agricultural fields, broad-leaved trees and hedgerows, a drainage ditch with small stream and scrub. Habitats within the wider landscape predominantly comprise fields which are likely in agricultural use, patches of deciduous woodland and amenity grassland associated with Thornbury Golf Centre and residential and commercial buildings associated with Alveston and Thornbury.

1.8. The Application Site is shown in **Appendix A**.

The Proposed Scheme

1.9. The Proposed Scheme comprises an off-road segregated walking and cycling path linking Thornbury Leisure Centre in the north to Alveston Hill further south.

1.10. This forms part of a wider scheme to create the Alveston Hill Cycle Route which will also include the following elements;

- 2-way cycle track and footway to run along the eastern side of B4061 between Alveston Hill and the A38; and
- Pedestrian and cycling crossings at Down Road and Alveston Hill.

1.11. The proposed works within and alongside the public highway (Points 1 and 2 above) are permitted development under Part 9 Class A (a&b) of the Town and Country Planning General Permitted Development Order (2015) (amended) (GDPO), meaning that formal planning permission is not required and so does not fall into the Proposed Scheme as detailed within this EcIA.

1.12. The section which comprises a proposed off-road segregated footpath and cycleway does not fall under permitted development and therefore requires planning permission. Only the off-road

[2] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

segregated footpath and cycleway is included within the current Application Site boundary and therefore is the Proposed Scheme considered within this assessment.

1.13. The Proposed Scheme which comprises the off-road section (Item 3 in Section 1.9) proposes a 5 m wide path comprising a 3 m wide 2-way cycleway and 2 m wide footpath. These would be side by side but segregated to facilitate easy movement and prevent obstructions to cyclists and pedestrians. The path will have concrete edging and a stock proof fence is proposed to run alongside the east of the path, serving as a perimeter boundary to the private land beyond. The route includes soft landscaping and opportunities for seating and recreation spaces for visual amenity and functionality purposes.

1.14. In addition to running through the two fields, the route passes through existing tree groups and hedgerows. Part of these green infrastructure features will need to be removed to facilitate the development, comprising;

- 19 m to be removed from hedgerow H1 (G001)
- 14 m to be removed from Hedgerow H2 (H007)
- 8 trees to be removed from G009
- 6 no. trees to be removed from G020
- 1 no. tree to be removed from G020-A
- 50 m to be removed from Hedgerow H6 (H021)

1.15. The locations of these areas of vegetation to be removed and associated references have been presented within the Alveston Hill Arboricultural Impact Assessment[3] and associated plans 5220316-ATK-ARB-TPP1, 5220316-ATK-ARB-TPP2 and 5220316-ATK-ARB-TPP3 which have been issued with the planning application and the plans for which have been presented in **Appendix A** of this report.

1.16. At either end of this section of route, the Proposed Scheme will tie into the existing highway. At the time of writing, the preliminary construction design, construction timetable and construction working methods are not finalised. However, an indicative alignment and extent has been provided (see **Appendix A**).

1.17. Landscaping proposals for the Proposed Scheme include the planting of 34 native trees, 140 m^2 of marginal planting, 315 m of mixed hedgerow, 2,256 m^2 wet grassland planting, 2,545 m^2 embankment grassland planting and 2,256 m^2 grassland enhancement planting, including planting of yellow rattle. Landscaping proposals have been presented within the Landscape General Arrangement drawings WECA_SGC-ATK-ELS-5220316-DR-LL000007 and WECA_SGC-ATK-ELS-5220316-DR-LL000008 which have been issued with the Planning Application and presented within Appendix A.

1.18. In addition, two new ponds will be created in line with drainage proposals detailed within the Drainage Strategy[4] submitted with the planning application.

1.19. No lighting is proposed to be installed as part of the Proposed Scheme design.

1.20. The proposed works are anticipated to commence in summer 2024 subject to planning approval and discharge of conditions. The construction phase is anticipated to last approximately 10 months.

Scope of Assessment

1.21. This report presents ecological information obtained during the following:

- A desk-study undertaken on 23rd February 2023;
- An ecological walkover survey on 1st and 2nd February 2023; and
- Surveys for hedgerows and priority species, namely hazel dormouse, great crested newt and bats (activity transect, static deployment and emergence) undertaken between April and October 2023. Detailed survey methods for Phase 2 surveys have been presented in **Appendix B**

[3] Atkins (2023) Alveston Hill Arboricultural Impact Assessment. South Gloucestershire Council. Issued October 2023.
[4] Atkins (2023) Alveston Hill Basis of Design and Drainage Strategy. South Gloucestershire Council. Issued October 2023.

2. Methodology

Desk Study and Consultation

2.1. The geographical area for obtaining ecological data through desk studies has been determined using professional judgement. Baseline data has been gathered from a range of sources through data requests, consultation, and using online resources as outlined below. This included data gathering in relation to statutory and non-statutory designated sites and protected and priority species. The study areas used for the data gathering are detailed in Table 2-1 below. The desk study was undertaken on 23rd February 2023. For species records collected, only those within 10 years of the data collection date have been considered within the assessment.

2.2. The following online resources were accessed:

- Multi-Agency Geographic Information for the Countryside (MAGIC) website[5]; and
- Woodland Trust Ancient Tree Inventory[6].

2.3. Ordnance Survey maps and the Grid Reference Finder website (https://gridreferencefinder.com/) were used to identify the presence of waterbodies within 500 m of the Application Site boundary, in order to establish if the land within and immediately surrounding the Application Site could be used as terrestrial habitat for great crested newt. This species typically uses suitable terrestrial habitat up to 500 m from a breeding pond. However, there is a notable decrease in great crested newt abundance beyond a distance of 250 m from a breeding pond[7].

2.4. Bristol Regional Environmental Records Centre (BRERC) were contacted to request records of protected and priority species and habitats and details of non-statutory designated sites for nature conservation.

2.5. A review of the following ecological reports was undertaken:

- Alveston Hill Cycle Route Preliminary Ecological Appraisal[8];
- Alveston Hill Cycle Route Environmental DNA Survey for Great Crested Newt[9];
- Alveston Hill Cycle Route Bat Survey Report[10];
- Alveston Hill Cycle Route Bat Hazel Dormouse Survey Report[11]; and
- Alveston Hill Cycle Route Hedgerow Survey Report[12].

Table 2-1 – Data search areas

Data type	Search area – distance from Proposed Scheme boundary
Statutory designated sites for nature conservation	2 km
Non-statutory designated sites for nature conservation	2 km
European Protected Species licences	2 km
Priority habitats (including veteran trees and ancient woodland)	1 km
Protected and priority species, including bat records	2 km

[5] https://magic.defra.gov.uk/ (Accessed February 2023)
[6] https://ati.woodlandtrust.org.uk/ (Accessed February 2023)
[7] Natural England (2004) An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt (ENRR576). http://publications.naturalengland.org.uk/publication/134002.
[8] Atkins (2023). Alveston Hill Cycle Route. *Preliminary Ecological Appraisal Report.*
[9] Atkins (2023). Alveston Hill Cycle Route. *Environmental DNA Survey for Great Crested Newt*.
[10] Atkins (2023). Alveston Hill Cycle Route. *Bat Survey Report*.
[11] Atkins (2023). Alveston Hill Cycle Route. *Hazel Dormouse Survey Report.*
[12] Atkins (2023). Alveston Hill Cycle Route. *Hedgerow Survey Report*.

Planning Policy Review

2.6. A review of national and local planning policy relevant to the Proposed Scheme was undertaken as part of the data gathering. The following policy documents were subject to review:

- National Planning Policy Framework 2021[13];
- South Gloucestershire Local Plan – Core Strategy 2006 – 2027[14]; and
- South Gloucestershire Biodiversity Action Plan 2016 – 2026[15].
- Policies, Sites and Places Plan (2017)[16]

2.7. A summary of relevant planning policy is provided in **Appendix C.**

Ecological Field Surveys

2.8. The geographical area for undertaking ecological field surveys has been determined using the current survey guidance, professional judgement and the zones of influence, which have been determined based on the nature of the impacts arising from the Proposed Scheme.

Surveyor Competencies

2.9. All the surveys were led by surveyors who have been assessed[17] to be at least of capable experience following the Chartered Institute of Ecology and Environmental Management (CIEEM) competency framework[18].

Habitats

2.10. An ecological walkover survey of areas within and adjacent to the Application Site, including land up to 250 m from the Application Site boundary where access was allowed (the Survey Area), was undertaken on 1st and 2nd February 2023. An additional area at the northern end of the Site was surveyed on 11th October 2023.

2.11. Habitats were mapped using the UK Habitat Classification (UKHab) system. UKHab is a comprehensive and hierarchical habitat classification system for the UK that has been developed to benefit from recent changes in habitat categorisation, recording and analysis, and is suitable for digitally recording in the field using GIS. It is fully compatible with other major existing classifications, including Priority Habitat types (UKHab Level 4) and Habitats Directive Annex I habitat types[19] (UKHab Level 5).

2.12. All habitats were recorded to at least Level 3 of the UKHab hierarchy, i.e. broad habitats such as neutral grassland or dense scrub. Any Level 4 habitats and Level 5 habitats have also been recorded. In addition, mandatory secondary codes have been recorded (up to secondary code number 49). All habitat features have been digitally mapped, using QGIS, as either polygons, lines or points and assigned to a UKHab Primary Habitat Code.

2.13. An assessment of the possible presence of priority habitats (as defined by CIEEM PEA[2] guidance) was also undertaken during the walkover survey.

2.14. Vascular plant names recorded during this survey follow Stace[20].

2.15. Target notes (TNs) were used to record specific details on the plant species composition of the habitats, current management and quality. TNs were also used to record features of ecological importance (e.g. ponds, complex habitat mosaics).

2.16. Where trees were recorded over 50 m from the Application Site with bat roost potential, only those within 50 m were subject to further survey as appropriate due to the distance of these features from the works.

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[13] Ministry of Housing Communities and Local Government (2021). *National Planning Policy Framework*. Available online at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf.
[14] South Gloucestershire Council (2013) *South Gloucestershire Local Plan – Core Strategy.* Available at: New Local Plan - Core Strategy (southglos.gov.uk)
[15] South Gloucestershire Council (2016) *South Gloucestershire Biodiversity Action Plan.* Available at: Biodiversity-Action-Plan-2016-26.pdf (southglos.gov.uk)
[16] South Gloucestershire Council (2017) *South Gloucestershire Local Plan – Policies, Sites and Places Plan.* Available at: Policies, sites and places plan November 2017 (southglos.gov.uk)
[17] Assessment undertaken by Atkins ecological technical leadership team in accordance with CIEEM competency criteria.
[18] https://www.cieem.net/competency-framework
[19] Council Directive 92/43/EEC (1992) on the conservation of natural habitats and of wild fauna and flora (known as the 'Habitats Directive').
[20] Stace (2019) *New Flora of the British Isles* 4th edition.

Protected and priority species

2.17. An assessment of the possible presence of protected or priority species (as defined by CIEEM PEA guidance), and an assessment of the likely importance of habitat features present that could support such species was also undertaken during the walkover survey.

2.18. Surveyors used current guidance and methodologies, as referenced by CIEEM, for preliminary assessment of species.

2.19. The survey comprised assessing the suitability of the habitats present for, and recording any activity of the following species (in line with current guidance):

- Badgers[21];
- Hazel dormice[22];
- Otters[23,24];
- Water voles[25];
- Breeding, wintering and passage birds[26];
- Reptiles[27];
- Amphibians (terrestrial and aquatic habitats), including an assessment of aquatic habitat for its suitability to support great crested newts using the Habitat Suitability Index (I) assessment[28];
- Priority invertebrates[29];
- Priority plants.

2.20. For bats, the survey undertaken in February 2023 assessed the suitability of trees and buildings within the Survey Area to support bat roosts in accordance with the best practice guidance (Collins, 2016)[30] at the time of survey. Further surveys to assess for the potential presence/ likely absence for bats were designed in line with the 2016 guidance, however updated guidance was released in 2023[31]. Trees assessed in October 2023 have been assessed in accordance with the 2023 survey guidance.

2.21. The 2023 updated survey guidance has renamed transect activity surveys to 'Night-time Bat Walks' requiring one survey per season. Static bat detectors are required to be deployed monthly between April and October for habitats with moderate suitability to support commuting and foraging bats. Therefore, the activity surveys completed in accordance with the 2016 survey guidance are of a greater survey effort than that which is now required under the 2023 survey guidance.

2.22. The 2023 updated survey guidance states that structures with high suitability to support roosting bats should be subject to the dusk emergence survey visits. This has not changed from the previous 2016 survey guidance.

2.23. Trees are now classified as having PRF-I or PRF-M suitability to support roosting bats within the 2023 updated guidance. It has been determined that all trees and buildings have had the correct number of surveys or above the survey requirements for their classification in line with the 2023 survey guidelines.

2.24. Evidence of the presence of the following invasive species was recorded where seen:

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[21] Harris S., Cresswell P. and Jefferies D. (1989) *Surveying badgers*. Mammal Society – No9.
[22] English Nature (2006). *The Dormouse Conservation Handbook (2nd edition)*.
[23] Chanin and Smith (2003). *Monitoring the otter Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No 10. Peterborough, English Nature.
[24] Liles G. (2003). *Otter Breeding Sites. Conservation and Management*. Conserving Natura 2000 Rivers Conservation Techniques Series No. 5. English Nature, Peterborough.
[25] Dean, M. et al (2016) *The Water Vole Mitigation Handbook*. Mammal Society.
[26] Bird Survey & Assessment Steering Group. (2022). *Bird Survey Guidelines for assessing ecological impacts, v.0.1.7*. Available at: https://birdsurveyguidelines.org [Accessed April 2023].
[27]Froglife (1999) *Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife advice sheet 10.
[28] Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000) *Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus)*. Herpetological Journal 10 (4), 143-155 (2000).
[29] At the present time there is no current survey guidance for priority invertebrates. However, surveyors made notes of habitats present and food plants which may be suitable to support priority invertebrates if present.
[30] Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition)*. The Bat Conservation Trust, London.
[31] Collins, J. (ed.) (2023) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition)*. The Bat Conservation Trust, London.

- Evidence of animal species as listed on the Invasive Alien Species (Enforcement and Permitting) Order 2019; signal crayfish, muntjac deer and grey squirrels.
- Evidence of the presence of the following invasive plant species: Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, Himalayan balsam, rhododendron[32], cotoneaster [33]. These are listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and subject to strict legal control.

Phase 2 Surveys

2.25. Based on the results of the desk study and ecological walkover survey, Phase 2 ecological surveys were undertaken to support this EcIA, as detailed in Table 2-2 below.

2.26. Full survey methods are provided in **Appendix B**.

Table 2-2 - Phase 2 surveys

Survey type	Study area - distance from the Application Site boundary.	Rational for Study area	Dates of survey
Great Crested Newt eDNA survey	500 m	Standard area based on best practice guidance.	08/06/2023
Hazel dormouse nest tube surveys	up to 250 m	There are hedgerow connections within the surrounding landscape meaning that the loss of these sections of hedgerow will not fragment the overall network or, isolate dormouse therefore impacts on the local dormouse population are going to be restricted to a localised area and nearby populations only so a survey area to determine presence within 250 m will be sufficient.	25/04/2023 (deployment) 26/05/2023 30/06/2023 28/07/2023 22/08/2023 22/09/2023 19/10/2023 07/11/2023
Bat Emergence Surveys	up to 50 m	Due to the scale of the Proposed Scheme impacts to buildings and trees with bat roost potential are considered to be possible within 50 m of the Application Site. Those present within the wider area are considered to be a sufficient distance to be negatively impacted, therefore a survey area to confirm presence/ likely absence of roosts within 50 m will be sufficient.	Building 1; - 05/06/2023 - 10/08/2023 - 29/08/2023 Tree 1, 2, 3; - 12/06/2023 - 31/07/2023 Tree 1, 2 - 14/08/2023 See **Appendix D** for locations.
Bat Transect Surveys	up to 250 m	There are hedgerow connections within the surrounding landscape meaning that the loss of these sections of hedgerow will not fragment the overall network or, isolate any potential roosting locations (e.g. woodlands/buildings) from any potential food sources (e.g. ponds/gravel pits). Therefore impacts on the local bat population are going to be restricted to a localised area and nearby populations only so a survey area to find	26/04/2023 (dusk) 18/05/2023 (dusk) 26/06/2023 (dusk) 24/07/2023 (dusk) 26/08/2023 (dusk) 26/10/203 (dusk) 27/10/2023 (dawn)

[32] Although there are approximately 1200 species of rhododendron, just one species and one of its hybrids are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended): *Rhododendron ponticum* and *Rhododendron ponticum x Rhododendron maximum*.
[33] There are approximately 100 species of cotoneaster found in the UK, but only five are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended): *Cotoneaster horizontalis*, *Cotoneaster integrifolius*, *Cotoneaster simonsii*, *Cotoneaster bullatus* and *Cotoneaster microphyllus*.

		foraging or commuting routes within 250 m will be sufficient.	
Bat Static Detector Recording	up to 250 m	There are hedgerow connections within the surrounding landscape meaning that the loss of these sections of hedgerow will not fragment the overall network or, isolate any potential roosting locations (e.g. woodlands/buildings) from any potential food sources (e.g. ponds/gravel pits). therefore impacts on the local bat population are going to be restricted to a localised area and nearby populations only so a survey area to find foraging or commuting routes within 250 m will be sufficient.	26/04/2023 – 30/04/2023 18/05/2023 – 22/05/2023 26/06/2023 – 30/06/2023 24/07/2023 – 28/07/2023 22/08/2023 – 26/08/2023 26/10/2023 – 01/11/2023
Ground Level Tree Assessment	up to 250 m	There are hedgerow connections within the surrounding landscape meaning that the loss of these sections of hedgerow and trees will not fragment the overall network or isolate any potential roosting locations (e.g. woodlands/buildings) from any potential food sources (e.g. ponds/gravel pits). Therefore impacts on the local bat population are going to be restricted to a localised area and nearby populations only so a survey area to find potential roosts features within 250 m will be sufficient.	11/10/2023
Hedgerow Surveys	50 m	Standard area based on best practice guidance.	23/06/2023 (H1 – H5) 11/10/2023 (H6)

2.27. Phase 2 surveys have not been undertaken for any other species based on the results of the ecological walkover survey and the scope of works.

Survey Limitations

2.28. This section identifies any limitations to the surveys or assessment and provides an explanation as to the effect of these on the assessment.

General Limitations

2.29. Access was restricted within the Survey Area which also partially overlaps a small area of the Application Site due to the presence of private gardens that were not permitted as shown within the UK Habitat Survey Plan in **Appendix D**.

2.30. The search for waterbodies within 500 m of the Application Site was undertaken by using Ordnance Survey plans and aerial photographs only. These sources may not show all waterbodies within 500 m of the Application Site boundary and, therefore, some waterbodies may not have been identified; however, this is not considered to be a significant limitation to the appraisal as it was possible to undertake phase 2 surveys on the one waterbody present within 250 m of the Application Site and recommendations have been provided accordingly.

2.31. Cryptic taxa such as some species of plant, invertebrates and fungi, could not be adequately surveyed at the time of the survey. These groups require specialist survey, and survey windows are generally highly restrictive. However, when taking into account the desk study results, the nature of the habitats present at the Application Site and in the surrounding landscape, this is not considered to be a significant limitation.

2.32. The list of invasive plant and animal species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) is extensive and these plants and animals are found in a range of different habitats, including aquatic habitats. The UKHab survey checked for the presence of Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, Himalayan balsam, rhododendron, Virginia creeper, variegated yellow archangel, and cotoneaster species. Other invasive plant and

animal species, in particular those associated with aquatic habitats, may not have been recorded. The assessment for potential presence or likely absence of invasive plant and animal species is supported by an assessment of the suitability of habitats present within the Application Site; therefore this is not considered to be a significant limitation.

2.33. The desk study reviewed the Woodland Trust Trusts Ancient Trees inventory. This provides records of veteran trees but is not an exhaustive list and other veteran trees may be present in the area. The ecological walkover survey aimed to identify such features within the Survey Area and as such this is not considered to be a limitation to the appraisal.

2.34. BRERC records are not exhaustive, and the absence of records does not demonstrate the absence of habitats/species. The exact locations of badger setts, bat roost site records at full resolution, otter holts, raptor nest sites and sensitive plant species are treated as confidential information. Bat roost records are summarised to a 1 km resolution. The assessment for potential presence or likely absence of protected and priority species is supported by an assessment of the suitability of habitats present within the Application Site, and further surveys have been recommended where appropriate to support this assessment; therefore this is not considered to be a significant limitation.

2.35. BRERC records provided bat data for the last 10 years, however bat roosts in buildings can persist for longer than 10 years. As the desk study information has been supported by an updated suite of emergence surveys in 2023, this is not considered to be a significant limitation as the current status of the building as a roosting site has been confirmed.

2.36. The UKHab survey took place in February during the winter months. This time of year sees plants in a dormant stage and not in flower due to cold temperatures which may result in limited observation of flora species usually present within the Survey Area during summer months; this was initially considered to be a significant limitation. Further surveys of habitats to be impacted by the Proposed Scheme, i.e. hedgerows have been undertaken during the optimal survey period and no notable species have been recorded within the other impacted habitats such as grassland during these surveys, therefore this is considered appropriate to resolve the limitations posed by the initial UKHab survey.

2.37. Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. The ecological surveys undertaken to support this EcIA have not therefore produced a complete list of plants and animals and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. The above limitation/s has been addressed through taking the precautionary approach within the assessment.

Bat Survey Limitations

2.38. Bat surveys are limited by factors which affect the presence of bats such as the time of year and behaviour. The absence of evidence of any particular bat species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

2.39. There are also limitations on identification of some bats to species level, particularly those of the genera *Myotis* and *Plecotus* sp. This is because of similarities in calls of the different species, and they can be difficult to identify to species level in cases where the bat pass was very brief, very distance and faint and if the bat was not seen. Because of the similarities in call parameters, species of the genera *Myotis* and *Plecotus* sp. were not identified to species level using analysis of recorded bat calls. Additionally, there is significant overlap in the parameters of sonograms for serotine, noctule and Leisler's bat and therefore there is the potential for error in identifying these three species, that were all recorded at the Application Site. However, as all species have been considered present within the assessment site on a precautionary basis, this is not considered to be a significant limitation.

2.40. During the May transect, listening points 3, 4, 5 and 6 were only visited once. Due to cattle presence including a large bull and young calf amongst the small herd in the southern field, this field was not re-entered when it became dark, and surveyors remained in the northern field for safety reasons. All of the transect route had been covered once during this survey, and the minimum recommended survey time was completed. The July transect was also affected by cattle where surveyors altered the locations of stopping points 6 and 7 to avoid cattle. Given the small size of the fields, the range at which the detectors are known to pick up bat echolocation (50 m, subject to direction and recording volume of microphone), and the lack of tall vegetation within each field parcel which would obscure view across the field and/ or block the detector from picking up calls, this is not considered to be a significant limitation to the surveys.

2.41. Transect data and static 2 data for the June surveys could not be processed due to an error in the processing software. This is not considered to be a significant limitation as static 1 in June was

analysed, therefore data is available for this month and there is ample data collected at the Application Site across several months. Moreover, the transect survey was completed by a bat licensed surveyor who is 'Capable'[9] for sound analysis and bat activity including species was recorded on paper during the survey. It is considered the surveyor had a good understanding of the species recorded during the survey and therefore the lack of sonogram data is not considered to be a significant limitation in this instance.

2.42. There was suboptimal weather for the August deployment of the statics and so it was not possible to select five consecutive nights for subsequent static detector sound analysis. However, survey data was collected over a longer period than 5 nights, and so it was still possible to analyse 5 non-consecutive nights of survey data with optimal weather conditions (22nd August, and 25th – 28th August). Therefore, it is not considered to have significantly impacted on the results.

2.43. There was suboptimal weather during the proposed dates for September surveys, therefore a transect survey and static deployment could not be undertaken during this month. Updated bat survey guidelines were published in September 2023. These new guidelines have reduced the requirement for monthly transect surveys to one transect survey per season. As a transect survey was completed in October, the autumn window has still been surveyed, which is in accordance with the most up to date survey guidelines. In addition, the static detectors were deployed at the earliest possible date in October[34] when weather returned to suitable conditions. This was only a few days past the end of September, and the static detectors were then redeployed later in October to capture the October survey data. Therefore, in consideration of this, and the data collected in the remainder of the bat survey season, this is not considered to be a significant limitation.

Dormouse Survey Limitations

2.44. Throughout the surveys a number of tubes were not found, with a maximum of 14 not found during the August survey due to over-grown dense vegetation (see results in **Appendix E**). This is not considered a significant limitation as 50 tubes were deployed over the Scheme ensuring these were placed in the most suitable habitat for dormice. In addition, missing tubes were subsequently found during the September, October and November surveys, September being the highest scoring month within the Index of Probability table for dormouse surveys (see Table B-6 in **Appendix B**). This is therefore not considered to be a significant limitation.

Great Crested Newt Survey Limitations

2.45. Access to the pond was restricted due to dense vegetation, so eDNA samples were only taken from one side of the pond, rather than spread evenly around the perimeter of the waterbody. This is not considered a significant limitation to the survey as the pond was small in size (24 m^2) and areas with habitat suitable to support GCN (such as with submerged vegetation) were able to be sampled during the survey.

Hedgerow Survey Limitations

2.46. One hedgerow, H4, was inaccessible, due to overgrown bramble in front of the hedgerow. Therefore, it was not possible to sample 30 m sections along the length of the hedgerow. Instead, surveyors stood behind the bramble and recorded all species that could be seen within the hedgerow from this position. It was not possible to record any other details, such as associated features, about this hedgerow due to the restricted view of the hedgerow. As hedgerow H4 will not be directly impacted by the Proposed Scheme, this is not considered to be a significant limitation.

2.47. It was only possible to access one side of each hedgerow that was sampled. Therefore, the species identified within each hedgerow only reflects one side. This is not considered a significant limitation to the survey as all hedgerows (excluding H4) were identified as important and species rich.

Nature Conservation Importance

2.48. A number of criteria have become accepted as a means of assessing the nature conservation importance of a defined area of land which are set out in A Nature Conservation Review[35] and include diversity, rarity and naturalness.

2.49. The nature conservation importance or potential importance of an ecological feature is determined within the following geographic context:

[34] This static deployment has not been collected and analysed at the time of writing and therefore has not been included within this revision of the EcIA

[35] Ratcliffe, D. (1977) A Nature Conservation Review. Cambridge University Press.

- International (e.g. Special Areas of Conservation, Special Protection Areas, Ramsar sites);
- National (e.g. Sites of Special Scientific Interest);
- Regional (e.g. Environment Agency regional biodiversity indicators, important features in Natural England Natural Areas);
- Metropolitan, County, Vice-County or Other Local Authority-wide Area (e.g. Local Nature Reserves, Sites of Importance for Nature Conservation);
- Local (undesignated ecological features e.g. old hedges, woodlands, ponds);
- The Application Site and its immediate environs (e.g. small pond, marshy grassland); and
- Negligible (e.g. areas of hardstanding and amenity grassland).

2.50. Features that have been identified to be of less than local importance are not considered to be important ecological features and as such have not been considered within the impact assessment. Where mitigation is required for these features for legal reasons this is detailed in Section 4.

Impact Assessment

2.51. The assessment of the potential effects of the Proposed Scheme takes into account both on-site impacts and those that may occur to adjacent and more distant ecological features.

2.52. The zone of influence is an area within which ecological features may be subject to biophysical changes as a result of the Proposed Scheme. Throughout the EcIA process the zone of influence was regularly reviewed. The zone of influence for the impact assessment is typically the same as the field survey area, as the likely impacts of the Proposed Scheme were considered when establishing the field survey areas. However, this was reviewed during the impact assessment, based on further understanding of the Proposed Scheme impacts and on the results of the desk study, field surveys and consultation. Any changes to the zone of influence are explained in Section 5.

2.53. Where impacts have been identified, details are provided within the assessment to characterise these in terms of their extent and magnitude, duration, frequency and timing, and reversibility. Both positive and negative impacts are discussed. Impacts were also characterised in terms of how they occur, i.e. direct, indirect secondary or cumulative. Impacts can be permanent or temporary and can include:

- Direct loss and degradation of wildlife habitats.
- Fragmentation and isolation of habitats.
- Mortality and injury to species.
- Disturbance to species from noise, light or other visual stimuli.
- Changes to key habitat features.
- Changes to the local hydrology, water quality and/or air quality.

2.54. For designated sites, effects are considered significant when a project and associated activities is likely to either undermine or support the conservation objectives or condition of the site(s) and its features of interest.

2.55. For ecosystems, effects are considered significant when a project and associated activities is likely to result in a change in ecosystem structure and function.

2.56. Consideration is given to whether:

- Any processes or key characteristics will be removed or changed.
- There will be an effect on the nature, extent, structure and function of component habitats.
- There is an effect on the average population size and viability of component species.
- Functions and processes acting outside the formal boundary of a designated site has also been considered, particularly where a site falls within a wider ecosystem e.g. wetland sites.

2.57. Some ecosystems can tolerate a degree of minor changes, such as localised or temporary disturbance or changes in physical conditions, without such changes harming their function or importance. For this EcIA, ecological effects have been considered in the light of any information available about the capacity of ecosystems to accommodate change. Significant effects have been determined as being either negative or positive.

2.58. The conservation importance of undesignated habitats and species within a defined geographical area (International to Local) has been used in this assessment to determine whether the effects of the proposals are likely to be significant:

- For habitats, conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area; and,
- For species, conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

2.59. When assessing potential effects on conservation importance, the known or likely background trends and variations in status have been taken into account. The level of ecological resilience or likely level of ecological conditions, that would allow the population of a species or area of habitat to continue to exist at a given level or continue to increase along an existing trend or reduce a decreasing trend, has been estimated where appropriate to do so.

2.60. The avoidance, mitigation, compensation and/or enhancement measures described within the EcIA have been incorporated into the design and operational phasing programme and taken into account in the assessment of the significance of effects. These mitigation measures include those required to achieve the minimum standard of established good practice together with additional measures to further reduce any negative impacts of the Proposed Scheme. The mitigation measures include those required to reduce or avoid the risk of committing legal offences.

2.61. If the design changes or the agreed mitigation cannot be implemented the effects will need to be reassessed and further surveys may be required. In this event, the conclusion of this EcIA may no longer be valid.

2.62. In addition to measures required to ameliorate negative effects on important ecological features, further biodiversity enhancement measures have been identified and will be incorporated into the Proposed Scheme as it is progressed.

2.63. The impact assessment has taken account of cumulative effects. In order to identify potential projects which could have a cumulative effect a review was undertaken of South Gloucestershire Council Planning Portal[36].

2.64. No relevant projects were identified during the review and as such no cumulative effects are predicted.

Mitigation Hierarchy

2.65. The principles of the mitigation hierarchy[37/38] have been adopted and used when considering impacts and subsequent effects on important ecological features within the zone of influence.

2.66. The principles of the mitigation hierarchy are that in order of preference impacts on biodiversity should be subject to:

- Avoidance;
- Mitigation;
- Compensation; and
- Enhancement.

[36] South Gloucestershire Council. Planning – Simple Search. Available at Simple Search (southglos.gov.uk) [Accessed October 2023].
[37] Department for Communities and Local Development (2018) National Planning Policy Framework, Paragraph 118. https://www.gov.uk/government/publications/national-planning-policy-framework--2
[38] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine, Paragraph 1.19. Chartered Institute of Ecology and Environmental Management, Winchester.

3. Baseline Conditions and Importance

3.1. This section provides a summary of the ecological baseline relevant to the Proposed Scheme recorded during the desk study and field surveys undertaken to inform this EcIA. Full details are provided in **Appendix B**.

Statutory and non-Statutory Designated Sites

3.2. The desk study did not identify any statutory designated sites for nature conservation within 2 km of the Application Site.

3.3. BRERC returned seven records of non-statutory sites for nature conservation within 2 km of the Application Site as detailed within Table 3-1 below.

Table 3-1 - Designated sites within 2 km[39] of the Application Site

Site name	Designation	Location of designated site[40]	Features of interest (including qualifying features of internationally designated sites and reasons for designation for SSSIs)	Importance level
Filnore Woods	Site of Importance for Nature Conservation (SINC)	245 m east	Woodland habitat mosaic.	County
Kington Grove	SINC	850 m west	Broadleaved woodland with sycamore, poplar, ash, beech, field maple, hazel coppice and Lawson's cypress.	County
Lower Hazel Down	SINC	1.2 km south west	Calcareous grassland and broadleaved woodland.	County
Hazel Wood aka Hartygrove Brake	SINC	1.4 km south west	Broadleaved woodland with ash, sycamore, oak, elm suckers and hazel coppice with associated ground flora.	County
Sheepcombe Brake and fields	SINC	1.7 km south west	Calcareous grassland and broadleaved woodland.	County
Crossways Wood	SINC	1.8km north east	Broadleaved woodland with oak, ash and beech, and a hazel coppice.	County
Cleeve Wood	SINC	1.9 km east	Woodland with oak, ash, beech, sycamore, with a holly understory.	County

3.4. No statutory designated sites have been identified within the zone of influence during the desk study; therefore, no impacts are anticipated, and statutory designated sites are not discussed further within this report.

3.5. The habitats for which the non-statutory sites listed in Table 3-1 above have been designated are not anticipated to be impacted by the Proposed Scheme due to the localised nature of the works,

[39] This is the zone of influence for designated sites.
[40] Where designated sites are situated outside of the Application Site boundary, the distance and direction is given to the closest point that the designated site is from the Application Site.

their distance from the Application Site and a lack of hydrological connectivity to the Application Site.

3.6. Filmore Woods SINC is located within the ZoI for bats and hazel dormouse as detailed in Table 2-1 above. These habitats may provide suitable habitat for commuting, foraging and roosting bats, and commuting, foraging and nesting hazel dormouse. Due to the localised vegetation clearance required for the Proposed Scheme, the loss of habitats are not anticipated to result in fragmentation of the overall network or isolate any populations of bats or hazel dormouse which may move between the Application Site and the Filmore Woods SINC.

3.7. In consideration of the above, non-designated statutory sites have not been discussed further within this report.

Irreplaceable Habitats

3.8. The desk study identified one record of ancient woodland within 1 km of the Site comprising Kington Grove Wood at a distance of approximately 850 m to the north-west of the Site. This woodland is ancient-replanted woodland.

3.9. No records of veteran trees were identified through desk study. However, potentially four veteran trees were identified within the Survey Area during the walkover survey (Target Notes 4, 6, 11 and 12). On a precautionary basis, these trees have been valued on the assumption that they are veteran trees and therefore are considered to be of national importance.

3.10. In accordance with the nature of the Proposed Scheme, distance and physical barriers such as roads and buildings between the Application Site and the area of ancient woodland identified during the desk study, this habitat has been scoped out of further assessment.

3.11. Although there are assumed veteran trees within the Survey Area, the Proposed Scheme is not anticipated to impact these trees and therefore they have been scoped out of further assessment and have not been discussed further within this report.

Habitats

3.12. The desk study identified three priority habitats within 1 km of the Application Site, comprising five parcels of traditional orchard.

3.13. A network of hedgerows has been identified during the desk study, of which six were identified within the Survey Area.

3.14. The ecology walkover survey recorded the majority of the Application Site as comprising modified grassland associated with the two agricultural fields, with a small area of tall herb and two hedgerows which are intersected by the Proposed Scheme. At the northern end of the Application Site, the Proposed Scheme passes through an area of lowland mixed deciduous woodland and an area of built-up areas and gardens which is bordered with a line of trees and a hedgerow.

3.15. The wider Survey Area also predominantly comprised modified grassland. To the west of the Application Site there are several patches of lowland mixed deciduous woodland with patches of bramble scrub and tall herb. A shallow stream (also considered a drainage channel) is present flowing north towards a small pond (TN7). There is also a small overflow outlet from the stream at OSNGR ST 63537 89099 which is characterised by tall herb vegetation.

3.16. Hedgerow surveys have been undertaken in June 2023 and October 2023 (see methods in **Appendix B**). All six hedgerows within the Survey Area were determined to be at least 30 years old and were well managed with infrequent cutting. There was variation in adjacent land use between the hedgerows; H2, H3 and H4 all had modified grassland on one side, with other uses including modified grassland and residential land on the other. H1 was adjacent to grazed grassland and a road, and H5 was adjacent to pasture on both sides. H6 was adjacent to modified grassland and a footpath Hedgerows varied in length, however, were all a similar average height and width. H1 had gaps that exceeded 10% of the hedgerow.

3.17. Four hedgerows (H1, H2, H3, H5) were classed as ‘important’ and species rich hedgerows, containing a minimum of five woody species within a 30 m section. The ground flora present included species under Schedule 2 of the Hedgerow Regulations 1997, namely Dogs mercury. Other ground flora species were found only within H5, these included wood false-brome and native bluebell. H4 was inaccessible as per the limitations detailed above, and therefore it was not possible to determine if this was an important hedgerow nor determine species richness, therefore this hedgerow was assumed to be important on a precautionary basis. H6 was determined to not be an important hedgerow due to only two woody species present within a 30 m section.

3.18. Full details of the hedgerow assessments have been presented in **Appendix E**.

3.19. Table 3-2 below provides a summary description of each habitat, identifies those habitats which are listed on Annex 1[41] and/or listed as priority habitats[42], and provides a nature conservation importance for each habitat. The table also provides details of the area of each habitat within the Application Site and the proportion of the Application Site this makes up. Habitats are mapped on the UKHab survey plan presented within **Appendix D** with specific features highlighted by target notes (TN) on the figure, in addition TN descriptions and photographs are provided in **Appendix D**.

[41] http://jncc.defra.gov.uk/page-1523
[42] http://jncc.defra.gov.uk/page-5706

Table 3-2 – Habitat types within 50 m[43] of the Application Site

UKHab habitat type	Location of Habitat[44]	Area of Habitat/ Distance of Linear Feature[45]		Secondary codes[46]	Priority habitat Yes/ No	Importance level	Rationale for valuation
		Ha/ M within the Application Site	% of Application Site				
g4 – modified grassland	Within Application Site and wider Survey Area.	1.39	87.9	10	No	Negligible	This habitat is common and widespread in the local county and has negligible conservation significance. Suitable for foraging birds, and badgers. Limited suitability for widespread species of reptile and amphibians due to regular management and grazing thus providing limited shelter.
g – tall herb	Small area located within the Application Site. Several additional areas located to the west of the Application Site within the Survey Area.	0.02	1.4	n/a	No	Application Site	This habitat is common and widespread within the area and wider landscape. Suitable for foraging birds, widespread species of reptile and amphibians, invertebrates and badgers.
h2a – hedgerow	Three hedgerows located within the Application Site (H1, H2 and H6), three hedgerows located within the	194.3	n/a	n/a	Yes	County	Hedgerow surveys have identified four of six hedgerows within the Survey Area, including both hedgerows within the Application Site, to be important and species

[43] This is the zone of influence for habitats.
[44] Where habitats are situated outside of the Application Site boundary, the distance and direction is given to the closest point that the habitat from is the Application Site.
[45] The area of habitat is only provided for those habitats that fall within the Application Site.
[46] Secondary codes allow the recording of additional information, linked to the Primary Habitats (for example, scattered scrub can be linked with primary habitats such as grassland and heathland).

UKHab habitat type	Location of Habitat[44]	Area of Habitat/ Distance of Linear Feature[45]		Secondary codes[46]	Priority habitat Yes/ No	Importance level	Rationale for valuation
		Ha/ M within the Application Site	% of Application Site				
	Survey Area (H3, H4 and H5)						rich in line with The Hedgerow Regulations 1997. Five of the six hedgerows surveyed meet the criteria for selection of key wildlife sites within Gloucestershire Wildlife Trust[47]. This is due to them satisfying the criteria for the definition of an important hedgerow *and* as they are continuous for at least three field boundaries with more than two connections of lengths, additionally all Hedgerows within the Application Site meet the criteria of priority habitat[48]. Provide habitat connectivity and opportunities for foraging and nesting for a number of species, including nesting birds, bats, widespread species of reptile and amphibian, hazel dormouse, invertebrates and badger.
h3d – bramble scrub	Several patches located within the Application Site and additional areas within the Survey Area.	0.02	1.4	n/a	No	Application Site	This habitat is common within the area and wider landscape. Suitable for foraging birds, widespread species of reptile and amphibians, hazel dormouse, invertebrates and badgers.

[47] Gloucestershire Wildlife Trust. Part 2 – Criteria for Selection of Key Wildlife Sites. Available at: Microsoft Word - Gloucestershire Key Wildlife Sites Handbook Part 2 v4.5 final.docx (gloucestershirewildlifetrust.co.uk)
[48] UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008

UKHab habitat type	Location of Habitat[44]	Area of Habitat/ Distance of Linear Feature[45]		Secondary codes[46]	Priority habitat Yes/ No	Importance level	Rationale for valuation
		Ha/ M within the Application Site	% of Application Site				
r1 – standing open water	Small waterbody located to the west, outside of the Application Site within the Survey Area.	0	n/a	n/a	No	Local	Small pond approximately 24 m^2 which dries annually. Offers some suitability for species of amphibian and invertebrates. This pond does not meet the criteria for Pond priority habitat[49], due to its extent, and lack of notable aquatic species present.
r2 – stream	Running parallel to the west, partially within the Application Site.	4.3	n/a	n/a	No	Local	This habitat is common within the area and wider landscape, the ditch itself is shallow and offers limited suitability for protected and priority species. May support species of amphibian and widespread species of reptile. Considered to be unsuitable to support otter and water vole. This watercourse does not meet the criteria for River priority habitat[50], due to its lack of plant and aquatic species diversity present.
r1e – ditch	Located within the Application Site at the northern extent.	13.8	n/a	n/a	No	Negligible	This habitat is common in the area and has negligible conservation significance.

[49] UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008.
[50] UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008

UKHab habitat type	Location of Habitat[44]	Area of Habitat/ Distance of Linear Feature[45]		Secondary codes[46]	Priority habitat Yes/ No	Importance level	Rationale for valuation
		Ha/ M within the Application Site	% of Application Site				
u1 – built up areas and gardens	Residential properties located to the west, within and adjacent to the Application Site.	0.03	1.8	n/a	No	Negligible	This habitat is common in the area and has limited ecological significance.
u1b5 – buildings	Agricultural building located to the east, outside of the Application Site at the southern extent of the Survey Area.	0	n/a	n/a	No	Application Site	This building may support roosting bats; however no roosts have been confirmed and this habitat is also available in the wider landscape.
u1e – built linear features	Footpaths located within the Application Site. Alveston Hill Road running parallel to the south/ west adjacent to the Application Site.	0.01/ 73	0.5%	n/a	No	Negligible	This habitat is common in the area and has negligible conservation significance.
w1f – lowland mixed deciduous woodland	Several patches located to the west within and adjacent to the Application Site.	0.09	5.8	n/a	No	County	This habitat meets the criteria, for lowland mixed deciduous woodland priority habitat[51] however does not meet the criteria for key wildlife sites within Gloucestershire Wildlife Trust guidelines[52], due to

[51] Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008.
[52] Gloucestershire Wildlife Trust. Part 2 – Criteria for Selection of Key Wildlife Sites. Available at: Microsoft Word - Gloucestershire Key Wildlife Sites Handbook Part 2 v4.5 final.docx (gloucestershirewildlifetrust.co.uk)

UKHab habitat type	Location of Habitat[44]	Area of Habitat/ Distance of Linear Feature[45]		Secondary codes[46]	Priority habitat Yes/ No	Importance level	Rationale for valuation
		Ha/ M within the Application Site	% of Application Site				
							its extent (under 2ha), and lack of key woodland indicator species present. This habitat is suitable for foraging birds, bats, widespread species of reptile and amphibians, hazel dormouse invertebrates and badgers.
w1g6 – line of trees	Line of trees located at the northern end of the Scheme within the Application Site, adjacent to hedgerow H6.	15.2	n/a	n/a	No	Application Site	This habitat is common within the area and wider landscape. Suitable for foraging birds, widespread species of reptile and amphibians, hazel dormouse, invertebrates and badgers.

3.20. Habitats present within the Application Site predominantly comprise modified grassland which will be impacted by the Proposed Scheme offers negligible ecological importance and therefore is not considered further within this report other than for its suitability to support protected and notable species.

3.21. Other habitats comprising tall herb, bramble scrub, a ditch and built linear features located within the footprint of the proposed works will be partially lost to facilitate the installation of the cycleway However, due to the low ecological value of these habitats, they are not considered further within this report other than for suitability to support protected and notable species.

3.22. Priority habitats located within and immediately adjacent to the Application Site comprise hedgerows and lowland mixed deciduous woodland are considered to be of importance on a County Level.

Protected and Priority Species

3.23. This section provides a summary of the results of the desk study ecological walkover survey and the Phase 2 surveys, along with the nature conservation importance for each species or species group. The full results of these are provided in **Appendix E** and where applicable have been presented in figures in Appendix F.

Badgers

3.24. BRERC Provided four recent[53] records of badger within 2 km of the Application Site. The closest record was located approximately 1.65 km to the north of the Application Site in 2016.

3.25. No badger setts or evidence of badgers using the Application Site were identified during the walkover survey. However, the areas of woodland and hedgerows within and adjacent to the Survey Area provide suitable habitat for sett excavation and foraging and commuting opportunities.

3.26. Given no badger setts have been recorded within the Application Site, any badger population supported by the Application Site is considered to be using habitats for commuting / foraging only. As no field signs of badger have been recorded, any population using the Application Site is likely to be doing so infrequently and therefore any potential badger population is considered to be important at the Application Site level only.

Amphibians

3.27. BRERC provided 14 recent records of amphibians within 2 km of the Application Site. These records comprised smooth newt, palmate newt, common frog, common toad and great crested newt (GCN). The closest record of GCN was located approximately 1.4 km to the north-east of the Application Site in 2017.

3.28. No records of any GCN European Protected Species Mitigation Licence (EPSML) were identified from within the search radius during the desk study.

3.29. One pond, herein referred to as ‘Pond 1’ (See TN7 in Appendix D) was identified within the 500 m of the Application Site during the desk study, located 5 m to the west of the Application Site boundary at Ordnance Survey National Grid Reference (OSNGR) ST 63393 88818. No additional waterbodies were identified during the walkover survey.

3.30. The grassland margins and scattered scrub, tall ruderal and hedgerows within the Survey Area have suitability to support amphibians when using terrestrial habitats. The habitats provide some foraging opportunities as well as shelter from predators, whilst the base of hedgerows allows further cover and also acts as a wildlife corridor enabling habitat connectivity. In addition, large fallen trees, dead wood, and tree and shrub root systems provide potential shelter (refugia) and hibernation (hibernacula); all of which are present within and adjacent to the Application Site.

3.31. The results of the GCN eDNA surveys and Habitat Suitability Index (shown in **Appendix E**) confirmed the likely absence of GCN from Pond 1.

3.32. Given the waterbody returned a negative result for GCN, the absence of any other waterbodies within 500 m and the distance of the closest record of GCN from the Application Site, GCN are considered to be likely absent from the Application Site and have been scoped out of further assessment.

3.33. As suitable habitat is present within the Application Site, it is possible that other amphibian species; namely common frog, common toad, smooth newt and palmate newt could be present. Although the

[53] Taken to be within the last 10 years.

population is not known, it is assumed that it is important at the Site level only and is scoped out of further assessment.

Bats

3.34. BRERC provided 21 recent records for bat species within 2 km of the Application Site, of which three are roost records. The closest record was a field record of an unidentified pipistrelle species 285 m to the north-east along Vilner Lane. The closest roost record is a soprano pipistrelle roost located approximately 475 m north-west of the Application Site in August 2014. This record noted that many bats were present, but did not detail the type of roost, however, due to the numbers of bats identified from this roost and the time of year where young are beginning to fly and feed, it may have been in use as a maternity roost. The other two roost records were for a myotis species roost with one individual in 2017 and for a brown long eared bat roost with five individuals in 2019. Given the low numbers it is not anticipated that these were significant roosts.

3.35. One record of a European Protected Species Mitigation Licence (EPSML) in relation to bats was identified within 2 km of the Application Site, comprising a licence for the destruction of a resting place for common pipistrelle between 2017 and 2024, located approximately 1.1 km north of the Application Site.

Roosting

3.36. The walkover survey identified one building and three trees with suitability to support roosting bats, which were classified in accordance with the survey guidance which was applicable at the time of the survey[54] as follows;

- One tree with moderate suitability to support roosting bats (Tree 3, See TN 6 in Appendix E)
- Two trees with high suitability to support roosting bats (Tree, 1, Tree 2, See TN 1 and TN2 in Appendix E)
- One building with high suitability to support roosting bats (Building B1)

3.37. Since the completion of the walkover survey, new 2023 survey guidelines have been released. This guidance now classifies the potential suitability of PRFs in accordance with PRF-I suitability which is a feature only suitable to support individual or low numbers of bats or PRF-M suitability, which is a feature suitable to support multiple bats and therefore has the potential to be used by a maternity colony. A GLTA survey undertaken in October 2023 post the release of new guidance identified one additional tree with low/ PRF-I suitability to support bat roosts (Tree 4).

3.38. Tree species included ash, oak, willow and field maple and features included ivy cladding, lifted bark, rot holes and split branches. The building (B1) comprised a single wooden panel agricultural out-building which was noted to have possible bat droppings on a ledge during the initial ecological walkover. A map illustrating the locations of these trees and the building is provided in **Appendix F**.

3.39. The remaining trees present within and adjacent to the Application Site were recorded to be of low or negligible suitability to support roosting bats.

3.40. Habitats present within the Survey Area are not considered to provide suitable habitat for roosting greater horseshoe bat[55], which are known to typically roost within caves over winter, with females also recorded to use buildings over the summer, typically choosing sites with large entrance holes with access to open roof spaces. Such spaces are typical of large older houses, churches or barns, none of which have been recorded to be present within or adjacent to the Application Site. The structure on the Application Site is an open sided barn used for housing livestock. The barn is not considered suitable to support a notable roost of horseshoe bats due to being exposed during the day and the level of disturbance due to livestock. However, the barn may be used opportunistically as a night roost or feeding perch.

3.41. To determine whether bats use the structure and trees identified within 50 m of the Application Site as having moderate or high suitability to support roosts, dusk emergence surveys were completed between June and August 2023. The three trees and one building have been reclassified in line with the most recent guidance. From this it has been determined that all trees and buildings have had the correct number of surveys or above the survey requirements for their classification in line with the

[54] Bat Conservation Trust released new survey guidelines in September 2023, as detailed within Appendix B
[55] Bat Conservation Trust. Greater Horseshoe Bat Fact Sheet. Available at: https://cdn.bats.org.uk/uploads/pdf/About%20Bats/greaterhorseshoe_11.02.13.pdf?v=1541085179

2023 survey guidelines for PRF-I and PRF-M suitability. Full survey methodologies and results have been presented in Appendix B and Appendix E respectively.

3.42. These presence/ likely absence dusk emergence surveys did not identify any evidence of bats using the building (B1) and three trees (Tree 1, Tree 2, Tree 3) for roosting. Therefore, it is concluded that the structure and trees did not support a bat roost at the time of survey, and likely absence can be assumed.

Commuting and Foraging

3.43. The walkover survey identified commuting and foraging habitat of moderate suitability for bats comprising the hedgerows within and adjacent to the Application Site, open grassland habitat and areas of woodland within the wider Survey Area, which provide connectivity to the wider landscape.

3.44. Transect and static surveys been completed between April and October 2023. The September survey could not be completed due to unsuitable weather conditions as detailed within the limitations. Full survey methods and results, including plans showing the transect route and static detector locations have been presented in Appendix B and Appendix E respectively.

3.45. The transect surveys have confirmed the Application Site provides foraging and commuting habitats for at least eight species of bat: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, serotine, *Myotis* sp., Leisler's, noctule, *Nyctalus* sp., and *Plecotus* sp.

3.46. Common pipistrelle was recorded more frequently than the other species, making up 62.87% of the total passes recorded. The remaining species/ species groups were recorded in low numbers during the transects, with 19.25% of the calls attributed to Nyctalus species, 5.10% to Leisler's, 4.64% to noctule, 2.08% to serotine, 3.48% to soprano pipistrelle, 1.39% to Plecotus sp. bat, 0.69% to Myotis species, and 0.46% to Nathusius' pipistrelle.

3.47. Observations taken during the transect surveys noted that the highest levels of bat activity were recorded along the hedgerow located in the centre of the Application Site and the tree line present along the eastern boundary of the southern field. This suggests these are important hedgerows at the Application Site level for commuting and foraging bats across the Application Site and wider landscape.

3.48. The highest frequency of calls recorded during the transect surveys was during the May survey.

3.49. At least eight species of bat have been recorded on each of the static detectors, comprising common and soprano pipistrelle, *Myotis* species, serotine, *Nyctalus* species, *Plecotus* sp., noctule, and barbastelle, an Annex II species. In addition, greater horseshoe were recorded on Static 2 during the August deployment period and lesser horseshoe bats were recorded on Static 1 in the October deployment.

3.50. Similar to the transect results, common pipistrelle was the most frequently recorded species on both static detectors, making up 43.2% of the total calls recorded across the Application Site. Barbastelle, serotine, *Plecotus sp.*, soprano pipistrelle, noctule, *Myotis* sp., and *Nyctalus* sp. were the other species/ species groups to exceed 50 recordings across the entire survey period, accounting for 1.84%, 2.46%, 1.14%, 12.44%, 9.78%, 18.26% and 10.19% of recordings respectively. The remaining species/ species groups were only recorded in low numbers (under 50 recordings per species/ species group, collectively accounting for 0.62% of total bat recordings).

3.51. As with the transect survey results, the highest number of calls were recorded by the static detectors during the May and August survey. Bats are fully active and feeding in May as females start forming maternity colonies and looking for suitable nursery Sites, such as buildings or trees. Males roost on their own or in small groups. Moreover, during August at six weeks old, the young bats begin to catch insects for themselves and no longer need their mothers' milk. This suggests the Site may support bats during the maternity period.

3.52. The Application Site predominantly supports common pipistrelle bats who use the habitats for commuting and foraging, with Barbastelle, soprano pipistrelle, *Plecotus sp*., noctule, *Myotis* sp., and *Nyctalus* sp. being the only other species/ species groups to exceed 50 recordings across the survey period. At least five other species/ species groups have been recorded to use the Application Site in low numbers (less than 50 recordings across the entire survey period). This species assemblage is typical for grassland and pasture habitats within the south west of England[56].

[56] Reason, P.F. and Wray, S. (2023). UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Chartered Institute of Ecology and Environmental Management, Ampfield. Available from: https://cieem.net/resource/uk-bat-mitigation-guidelines-2023/. [Accessed 15/09/2023].

3.53. Habitats present provide moderate habitat suitability for commuting and foraging bats within and adjacent to the Application Site, supporting a number of bat species recorded during the surveys, including three Annex II species. In consideration of this and accordance with CIEEM Bat Mitigation Guidelines[56], the Application Site, which is located in South-West England supports two widespread species, two less abundant species, four rare species and two very rare species which accounts to a maximum total assemblage score of 26, which is 63% of the maximum assemblage score for the area (taken to be 41). Therefore in accordance with Bat Mitigation Guidelines, bats are considered to be important on a Regional level.

Birds

3.54. BRERC provided 983 recent bird records of 83 species within 2 km of the Application Site. Of these, 57 records comprised species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)[57]: peregrine, hobby, red kite, redwing, brambling, kingfisher, greylag goose, Cetti's warbler, Mediterranean gull, black-tailed godwit, avocet and fieldfare. 79 records of bird species classified in the UK as 'Red' under the Birds of Conservation Concern Red List for Birds[58] have been provided including swift, skylark, greenfinch, linnet, house sparrow, starling, and song thrush.

3.55. The scrub mosaic habitats, hedgerows and mature trees within the Survey Area provide opportunities for nesting and foraging birds. The walkover survey identified woodpecker holes on mature trees and incidental recordings included buzzard, carrion crow, robin, goldfinch, blue tit, great tit and wood pigeon.

3.56. However, no features suitable to support Schedule 1 species identified during the desk study such as barn owl due to the barn being too exposed, kingfisher within the stream due to the absence of suitable banks for burrow creation and low availability of food source or red kite within the small area of woodland were identified within the Survey Area. Additionally heavy grazing from livestock present, is considered to further reduce suitability for nesting and foraging within the Survey Area.

3.57. Taking a precautionary approach, in the absence of detailed survey information, bird species are considered to be of local importance.

Hazel Dormice

3.58. BRERC had no recent hazel dormouse records within 2 km of the Application Site. No recent records of hazel dormouse EPSMLs were identified within 2 km of the Application Site.

3.59. Suitable habitat for hazel dormice has been identified within the hedgerow network, and some suitability has been identified within the woodland present within the Survey Area, which provides opportunities for nesting, foraging and dispersal. The hedgerows appear to provide optimal habitat for dormice, including food source (e.g. hazel, ash, bramble, elder), nesting opportunities (bramble), and coppiced hazel that could provide hibernation opportunities.

3.60. Additionally, hedgerows present within the Survey Area and the wider landscape also provide habitat connectivity between patches of woodland, predominantly to the east and west of the Application Site.

3.61. Hazel dormouse nest tube tunnels were installed in April 2023. The nest tube tunnels have been checked monthly and no evidence of hazel dormouse has been recorded between May 2023 and November 2023 (See **Appendix E**).

3.62. A score of 24 survey points has been accrued between May and November for the nest tube surveys. Absence can only be assumed based on a score of 20[59] or more, therefore this is considered sufficient to assume likely absence of hazel dormouse.

3.63. Given no evidence of hazel dormouse was found during the nest tube surveys, hazel dormouse is considered likely to be absent from the Application Site and have been scoped out of further assessment.

[57] GOV.UK. 2023. Wildlife and Countryside Act 1981 (as amended). [ONLINE] Available at: https://www.legislation.gov.uk/ukpga/1981/69/contents. [Accessed 24 February 2023].
[58] Eaton M., Aebischer N., Brown A., Hearn R., Lock L., Musgrove A., Noble D., Stroud D. & Gregory R. (2015) Birds of conservation concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. In British Birds 108: 708-746.
[59] Bright, P., Morris, P. & Mitchell-Jones, T. (2006). Dormouse Conservation Handbook. Second Edition. English Nature, Peterborough

Invertebrates

3.64. BRERC provided ten notable invertebrate records within 2 km of the Application Site, of which two are priority species[60]; garden tiger moth and shaded broad-bar.

3.65. The scrub mosaic habitats, hedgerows, fallen trees and standing open water habitats within the Survey Area provide suitable habitat for foraging, commuting and breeding for widespread invertebrate species and potentially priority species. The grassland present within the Application Site is heavily managed by livestock and is therefore of very limited suitability for priority invertebrates.

3.66. No evidence of priority invertebrates was recorded during the field survey.

3.67. Although suitable habitat for invertebrates, including priority species identified in the desk study is present within the Application Site, these habitats are widespread within the wider area and given the scale of the works, invertebrates are therefore considered to be of importance on a Site level.

Reptiles

3.68. BRERC provided six recent records of reptiles within 2 km of the Application Site, predominantly comprising slow worm and one record of grass snake. The closest record was a slow worm located approximately 725 m south-west of the Application Site at The Down, Alveston. There is limited connectivity from The Down to the Application Site due to the presence of B-roads (B4461 and B4061) which could be a barrier to species dispersal.

3.69. The scattered scrub, tall ruderal and hedgerow habitats present within the Application Site and the grassland margins and scrub mosaic within the Survey Area are considered to potentially support widespread species of reptile throughout their lifecycle. The tall ruderal and scrub within the Application Site provide foraging opportunities as well as shelter from predators and high temperatures, whilst the base of a hedgerow allows further cover and also acts as a wildlife corridor enabling habitat connectivity, which is necessary to maintaining reptile populations. The modified grassland present within the Application Site is heavily managed by livestock and is therefore of very limited suitability for reptiles.

3.70. Both tree and shrub root systems provide optimal places for species' shelter (refugia) and hibernation (hibernacula); all of which are present within the Survey Area.

3.71. Given the suitable reptile habitat found within the Survey Area, the following widespread reptile species: grass snake, common lizard and slow worm are assumed to be present in low numbers due to a large portion of the Application site being heavily managed by livestock, reducing habitat suitability and the disturbance from pedestrians and dog walkovers it is therefore considered to be important at the Local level.

Otter

3.72. BRERC provided no recent records of otter within 2 km of the Application Site. No recent records of otter EPSMLs were identified within 2 km of the Application Site.

3.73. The stream present within the Application Site is considered to be unsuitable to support otter due to being very shallow, with an absence of in-channel vegetation and food source. This includes suitable features such as cavities beneath tree roots which would be considered suitable to support holts.

3.74. No signs of otter activity were recorded during the survey.

3.75. In the absence of desk study records and suitable habitat to support otter, they are considered to be likely absent from the Application Site and have been scoped out of further assessment.

Water vole

3.76. BRERC provided no recent records of water vole within 2 km of the Application Site.

3.77. The stream present within the Application Site is considered to be unsuitable to support water vole due to being very shallow, heavily shaded by woodland with an absence of in-channel vegetation and food sources, that provides limited feeding and sheltering opportunities for this species.

3.78. No signs of water vole were recorded during survey.

[60] Joint Nature Conservation Committee (JNCC) (2023). UK Biodiversity Action Plan, List of UK BAP Priority Terrestrial Invertebrate Species (2007). [ONLINE] Available at: https://data.jncc.gov.uk/data/98fb6dab-13ae-470d-884b-7816afce42d4/UKBAP-priority-terrestrial-invertebrates.pdf. [Accessed 24 February 2023].

3.79. In the absence of desk study records and suitable habitat to support water vole, they are considered to be likely absent from the Application Site and have been scoped out of further assessment.

Summary of Features of Nature Conservation Importance

3.80. Table 3-3 below provides a summary of the features of nature conservation importance and impacts which are considered within this report. The table also provides details of the zone of influence for the features.

3.81. The following features that have been valued at less than local are not considered to be important ecological features and as such are not discussed further within this report:

- g4 – modified grassland
- g – tall herb
- h3d – bramble scrub
- r1e – ditch
- u1 – built up areas and gardens
- u1b5 – buildings
- u1e – built linear features
- w1g6 – line of trees
- Badger
- Amphibians
- Invertebrates

3.82. In addition, the following features have also been scoped out of the impact assessment, the rational for which is discussed in the relevant sections above:

- Statutory designated sites
- Non-statutory designated sites
- Irreplaceable habitats (ancient woodland and veteran trees)
- r1 – standing open water
- r2 – stream
- Hazel dormouse
- Otter
- Water vole

Table 3-3 - Determination of importance of ecological features and details of their zone of influence

Ecological Feature	Summary of baseline	Maximum zone of influence[61]	Importance level	Rationale for valuation
h2a - hedgerows	Six hedgerows have been identified within the Survey Area, three of which intersect the Application Site. Six hedgerows have been surveyed, of which four were identified as important and species rich in accordance with Hedgerow Regulations 1997. Provides habitat connectivity and opportunities for foraging and nesting for a number of species, including nesting birds, bats, widespread species of reptile and amphibian, badger and hazel dormouse.	Application Site plus 50 m	County	The Proposed Scheme will intersect two important hedgerows (H1 at the southern and of the Application Site and H2 located in the centre of the Application Site) creating a gap of approximately 14m and– 19 m within each hedgerow. At the northern end of the Application Site, approximately 50 m will be removed from hedgerow H6 which is not an important hedgerow.
w1f – lowland mixed deciduous woodland	Lowland mixed deciduous woodland located at the northern extent within and adjacent to the Application Site, with several other patches located within the Survey Area to the west. The tree layer consists of field maple, ash, hazel, oak and sycamore. Species are interspersed with shrubs; predominantly hawthorn, blackthorn, elder and bramble with occasional elm and dogwood, with the ground layer containing species such as dog's mercury, harts-tongue fern, common nettle, lords and ladies and male fern. Provides suitable habitat for birds, bats, widespread species of reptile and amphibians, hazel dormouse, invertebrates and badgers.	Application Site plus 50 m	County	One area comprising approximately 8 trees within lowland mixed deciduous woodland to be cleared to facilitate the Proposed Scheme at the northern end of the Application Site. Areas of lowland mixed deciduous woodland habitat immediately to the west of the Application Site will be retained.
Bats (foraging and commuting)	Emergence surveys have confirmed the likely absence of bat roost(s) within trees and buildings identified within the Survey Area with moderate and high suitability. Habitats present within the Application Site and Survey Area, such as hedgerows and lowland mixed deciduous woodland are considered to be of moderate suitability to support commuting and foraging bats.	Application Site plus 50 m	Regional	Suitable habitats for bats present within the Survey Area are common within the wider local area. Most bat species which are frequently using the Application Site are all common and widespread. However, records of Annex II species, comprising barbastelle, greater horseshoe bat and lesser horseshoe bat have been identified in low numbers during the surveys.

[61] The zone of influence may be different for the construction and operational phases. The maximum zone of influence is given here. Where there are differences between the construction and operational zones of influence these are discussed within the impact assessment.

Ecological Feature	Summary of baseline	Maximum zone of influence[61]	Importance level	Rationale for valuation
	Static detector and transect activity surveys undertaken between April and October 2023 have identified at least eight species to utilise the Survey Area, with common pipistrelle being the most frequently recorded species. Soprano pipistrelle, *Myotis* sp. And *Nyctalus* sp. were the only other species/ species group to exceed 50 recordings.			No evidence of bat roosts have been identified within the ZoI. However, one tree (Tree 4) with PRF-I has not been surveyed as this is not required in line with current survey guidelines. The Site may therefore support roosting bats. The Proposed Scheme will intersect two hedgerows (H1 at the southern and of the Application Site and H2 located in the centre of the Application Site) creating a gap of approximately 14 m – 19 m within each hedgerow. At the northern end of the Application Site, Approximately 50 m will be removed from hedgerow H6, 8 trees within lowland mixed deciduous woodland and 7 individual trees (including Tree 4) are to be removed. The remaining areas of adjacent woodland and hedgerows will not be impacted by the Proposed Scheme. The Application Site is considered to be important for commuting and foraging bats.
Birds	The desk study provided 57 records of Schedule 1 species and 79 records of bird species classified in the UK as 'Red' under the Birds of Conservation Concern 4 Red List for Birds. The scrub mosaic habitats, hedgerows and mature trees within the Survey Area provide opportunities for nesting and foraging birds. However, no features suitable to support Schedule 1 species identified during the desk study were identified within the Survey Area.	Application Site plus 50 m	Local	Suitable habitats for nesting and foraging habitats present within the Survey Area are common within the wider local area. The Proposed Scheme will remove hedgerow and woodland suitable for breeding birds. No breeding bird surveys have been undertaken to inform this assessment; however, incidental sightings have recorded the presence of common species including buzzard, carrion crow, robin, goldfinch, blue tit, great tit and wood pigeon. In the absence of detailed survey data, due to the extent of suitable habitat present within the Application Site being relatively limited and the level of baseline disturbance as a result of the public right of way and the heavy grazing from livestock present within the Application Site, reducing suitability for nesting and foraging, birds have been recorded to be of importance on a local level.

Ecological Feature	Summary of baseline	Maximum zone of influence[61]	Importance level	Rationale for valuation
Widespread species of reptile	Desk study provided six records of widespread species of reptiles. The scattered scrub, tall ruderal and hedgerow habitats present within the Application Site and the grassland margins and scrub mosaic within the Survey Area are considered suitable to support widespread species of reptile throughout their lifecycle. In addition, tree and shrub root systems provide optimal places for refugia and hibernacula. In the absence of specific surveys for reptiles, widespread species of reptile are precautionarily assumed to be present in low numbers.	Application Site plus 50 m	Local	There are suitable habitats present within the Survey Area for widespread species however, those requiring removal for the Proposed Scheme, are considered suboptimal. This is due to grazing in the southern field has reduced area of habitat to the field margins and in the northern field, although there is more tussocky grassland present, particularly at the margins, the Application Site is subject to disturbance from pedestrians and dog walkers. The surrounding habitats within the wider landscape also comprise well managed habitats, including arable land and a golf course. Therefore, if present, reptiles are anticipated to be present in low numbers.

Non-native Invasive Plant Species

3.83. BRERC provided two recent invasive non-native plant species records within 2 km of the Application Site. This included one record of buddleia and one record of wall cotoneaster, both located 770 m north of the Application Site. Wall cotoneaster is listed on Schedule 9 of the Wildlife & Countryside Act 1981 (as amended)[57] in which the establishment of plants listed on the Schedule is prohibited.

3.84. Evidence of invasive non-native plant species (INNPS) was identified during the survey within the Survey Area, namely variegated yellow archangel (TN 10). Other INNPS may be present within the Application Site, however, the timing of the walkover survey (winter) was considered a limitation (see Limitation section above).

4. Design Features and Mitigation Measures

4.1. This section details the features that have been incorporated into the design which are of benefit to biodiversity and the mitigation measures which will be implemented during the construction and operational phase to reduce ecological impacts. In developing the mitigation, the mitigation hierarchy has been following, looking to avoid, minimise or restore in the first instance.

4.2. Features that have been valued at less than local are not considered to be important ecological features and as such have not been considered within the impact assessment. However, if mitigation is required for these features for legal reasons it is detailed within this section.

Design Features

4.3. The following measures have been incorporated into the Proposed Scheme design:

- The Proposed Scheme design has minimised vegetation clearance as far as possible.
- Landscaping proposals for the Proposed Scheme include the planting of 34 native trees, 140 m^2 of marginal planting, 315 m of mixed species hedgerow, 2,256 m^2 wet grassland planting, 2,545 m^2 embankment grassland planting and 2,256 m^2 grassland enhancement planting, including planting of yellow rattle. In addition, two new ponds will be created in line with drainage proposals detailed within the Drainage Strategy submitted with the planning application.
- The Proposed Scheme will pass through two hedgerows within the Application Site creating an approximate 14 m and 19 m gap. This is in addition to the existing Public Right of Way's (PRoW) current gap in the hedgerow. The creation of additional gaps could sever the hedgerows, making them less suitable as a wildlife commuting corridor. Retention of this key commuting corridor will therefore be achieved via a 'hop-over': bats can be encouraged to fly high over the Proposed Scheme by enhanced planting or allowing mature trees to overhang the cycleway/footpath so that their crowns bridge the gap created by the hedgerow losses. Three locations for hop-overs have been proposed as presented within the Landscape General Arrangement drawings in Appendix A.
- There are no proposals to install artificial lighting along the Proposed Scheme which will retain ecologically functional 'dark corridors and key habitats for protected and priority species including bats. However, should this requirement change, the proposals would need to be discussed with an ecologist who can revise the lighting plan. This is due to the presence of Annex II bat species within the Application Site, the ecologist will ensure the lighting proposals do not illuminate the Application Site resulting in disturbance. Lighting designs will utilise the Bat Conservation Trust and Institute of Lighting Professionals (2018)[62] good practice guidance.

Mitigation Measures

4.4. The following general measures will be implemented during the construction phase of the Proposed Scheme:

- Prior to construction a suitably qualified Ecological Clerk of Works (ECoW) will be employed for the duration of construction of the Proposed Scheme and for pre-construction clearance works and will be present on site as required. They will be responsible for implementation of the Precautionary Method of Working (PMW).
- A PMW report for badgers, bats, reptiles and nesting birds will be produced and implemented by the ECoW. The PMW will detail precautionary measures to avoid negative impacts to reptiles, badgers, bats and nesting birds including pre-works surveys and sensitive methods of vegetation clearance.

[62] Bat Conservation Trust, BCT & Institute of Lighting Professionals, ILP (2018) Bats and Artificial Lighting in the UK: Bats in the Built Environment series. Guidance Note 08/18.

- Works will adhere to the Guidance for Pollution Prevention (GPPs)[63] and Construction Industry Research and Information Association (CIRIA) C762 Environmental good practice[64].
- During construction trees will be protected in line with guidelines provided in BS 5837 Trees in relation to Construction[65].
- Where possible, vegetation clearance will be minimised and undertaken outside the core bird nesting season (1 March to 31 August, though it should be noted that variation in dates is possible, for example from geographical variations in climate, or due to a particularly mild winter) to avoid damage or destruction of occupied nests or harm to breeding birds. If this cannot be achieved, works within the core bird nesting season will require an inspection of vegetation to be cleared for breeding birds and their occupied nests by a suitably qualified ecologist no more than 24 hours prior to any works being undertaken. If any nesting birds are identified during the survey, they will be left in situ for their entire nesting period and alternative approaches to the work proposed. This may include leaving an exclusion zone around the nests to avoid disturbance.
- Initial groundworks to areas suitable for reptiles, such as potential refugia and hibernacula, will be undertaken outside the reptile hibernation period (start of November to mid-March) on warm (>10 °C), dry days when reptiles are likely to be active and can disperse on their own accord when they are disturbed from heavy plant working within the Application Site. Further protection measures for reptiles during the active season will be included within the PMW.
- Landscaping will include planting of native trees, species-rich hedgerows and species-rich grassland, to mitigate for the planned losses of these habitats. This will maintain commuting and foraging resources for bats and reptiles, and will be beneficial for birds, amphibians and invertebrates within the Application Site.
- To allow free movement of wildlife across the scheme, the stock proof fencing, must contains appropriate gaps to allow species to disperse across the wider landscape. The width of the gap will be discussed within the design team and agreed with the Ecologist prior to construction.
- Installation of gully pot ladders should be incorporated within the drainage design, through consultation with the Ecologist prior to construction once the exact locations of these are decided. This will prevent amphibians and reptiles potentially becoming trapped and reduce mortality.
- The contractor will seek specialist advice for the appropriate treatment of INNPS (e.g. variegated yellow archangel) and will set out measures to prevent the spread of INNPS in the wild.
- There will be no night-time working (taken to be 30 minutes prior to sunset to 30 minutes after sunrise).
- Storage areas will be kept tidy and free from hazards for wildlife. Plant will be safely stored with appropriate plant nappies/ drip trays.
- Excavations will be covered overnight to present animals from becoming trapped. Where excavations cannot be covered overnight, a plank of wood (or similar) will be placed within the excavation at an angle no greater than 45° to allows a means of escape.
- During construction, if a protected species is found, then works will cease immediately and the ECoW will be contacted for advice.

Biodiversity Enhancements

4.5. The Proposed Scheme includes opportunities for ecological enhancement to align with South Gloucestershire's Core Strategy and enhancing the landscape for biodiversity. New areas of habitat planting have been discussed above within design features, which will be maintained and managed by Gloucestershire County Council. In addition, the following enhancements have been proposed:

- Design features detailed above will also provide biodiversity enhancements across the Site. The two ponds which have been proposed to be created will include design and planting characteristics which will make them suitable to support amphibians, including a surface area of between 100 and 300 m^2, varied depths up to 4m, substantial cover of submerged and marginal

[63] The GPPs provide environmental good practice guidance for the whole UK, and environmental regulatory guidance directly to Northern Ireland, Scotland and Wales only. For businesses in England, regulatory guidance is available from GOV.UK instead.

[64] CIRIA C762 Environmental good practice provides advice on the management of a range of environmental issues that may be encountered on site and presents good practice to reduce the environmental impacts due to construction.

[65] British Standards Institute (2012) BS 5837:2012 Trees in relation to design, demolition, construction.

vegetation and open areas to facilitate courtship behaviour for amphibians, and provide suitable breeding opportunities.

- In addition to the above, landscaping proposals have included areas where existing which is subject to grazing and disturbance grassland will be enhanced, increasing the suitability of the Application Site to be used by species such as bats, amphibians, reptiles, foraging birds and invertebrates.
- Arisings from vegetation clearance should be used to create hibernacula piles which may be used by reptiles, amphibians and other small mammals such as hedgehogs, the exact locations of these piles should be advised by the Ecologist on site, however these would be best placed in proximity to the newly created ponds and hedgerows which will provide connectivity to these enhancement features.
- Installation of a minimum of five species-appropriate bat boxes on retained mature trees within the Application Site. Based on the species confirmed as present on the Application Site to date, suitable units will include 2F Schwegler Bat Box and 2FN Schwegler bat box, or similar. Boxes will be positioned where they are sheltered from wind and artificial lighting, and within close proximity to suitable commuting and foraging habitat. Boxes should be placed on an open section of trunk at a height of at least 3 m above ground level, with a clear drop below the entrance to the box. Boxes should be placed on various aspects to provide a range of climatic conditions. The ECoW should provide advice on installing the boxes, to ensure they are installed correctly. Proposed locations have been presented in the Landscape General Arrangement drawing in Appendix A.
- Installation of a minimum of nine dormouse nest boxes on retained mature trees within the Application Site. Boxes will be positioned where they are sheltered from the wind and artificial lighting, and within close proximity to suitable commuting and foraging habitat. The boxes will require installation from a licenced ecologist to ensure correct positioning. Proposed locations have been presented in the Landscape General Arrangement drawing in Appendix A.

5. Impact Assessment

5.1. This section characterises the impacts and the subsequent effects (both positive and negative) of the Proposed Scheme on the important ecological features within the zone of influence and assesses the significance of the residual effects (both positive and negative) based on the mitigation measures detailed in Section 4. The following confirmed and potential impacts have been identified.

Construction Impacts

- Confirmed permanent habitat loss of 83 m of hedgerow, seven individual trees and eight trees present within lowland mixed deciduous woodland.
- Potential habitat degradation (e.g. through sediment release, pollution events and dust).
- Potential habitat fragmentation affecting movements of protected and priority species, such as commuting and foraging bats.
- Potential injury or mortality of protected and notable species, such as bats, badger, breeding birds and widespread species of reptiles.
- Potential disturbance including noise and vibration to protected and notable species such as breeding birds, commuting and foraging bats and widespread species of reptile.
- Spread of INNPS.

Operational Impacts

- Fragmentation of habitats (primarily as a result of habitat loss until replacement planting has matured, but also due to the installation of the permanent cycleway), resulting in operational impacts to nesting birds, commuting and foraging bats and widespread species of reptiles.

5.2. The Application site is currently used as a public footpath and there are no lighting proposals, however the Proposed Scheme will result in some increase bike and foot traffic across the Site, resulting in operational impacts to nesting birds and widespread species of reptiles. This is not considered to be significant in consideration of the baseline disturbance present across the Site and therefore is not discussed further.

5.3. Based on the impacts identified above, the zones of influence detailed in Section 3 remain unchanged.

Residual Effects

5.4. A summary of the impact assessment, the proposed mitigation, and the residual effects during construction are provided in Table 5-1 as well as details of proposed ecological enhancements.

5.5. If the design changes or the agreed mitigation cannot be implemented the effects will need to be reassessed and further surveys may be required. In this event, the conclusion of this EcIA may no longer be valid.

Table 5-1 - Summary of construction impacts, mitigation and residual effects

Important Ecological Feature	Importance level	Impact description	Proposed mitigation	Residual effects (Importance level affected)	Proposed enhancement/s
h2a - hedgerows	County	Permanent loss of 83 m of hedgerow habitat. Retained hedgerow habitat within and adjacent to the Application Site could be degraded through pollution, events, dust, and sediment release.	GPPs[66] and Construction Industry Research and CIRIA[67]guidance on the control of pollution from construction sites will be followed. Creation of 315 m of native species rich hedgerows within the Application Site. Retained hedgerows will be protected in line with guidelines provided in BS 5837 Trees in relation to Construction.	No significant residual effects anticipated.	Planting of approximately 315 m of hedgerow, therefore creating an additional 232 m of native, species rich hedgerows across the Application Site.
w1f – lowland mixed deciduous woodland	County	Permanent loss of 8 trees within lowland mixed deciduous woodland. Retained lowland mixed deciduous woodland within and adjacent to the Application Site could be degraded through pollution, events, dust, and sediment release.	GPPs[68] and Construction Industry Research and CIRIA[69]guidance on the control of pollution from construction sites will be followed. Planting of 34 no. trees. Retained trees will be protected in line with guidelines provided in BS 5837 Trees in relation to Construction.	No significant residual effects anticipated.	Replacement planting of 34 native trees across the Site.
Bats (foraging and commuting)	Regional	Permanent loss of 83 m of commuting and foraging habitat.	Creation of 315 m of hedgerow habitat within the Application Site which may be utilised by commuting and foraging bats. This will include the creation of three	No significant residual effects anticipated.	Installation of minimum five bat boxes on suitable retained mature trees within the Application Site.

[66] The GPPs provide environmental good practice guidance for the whole UK, and environmental regulatory guidance directly to Northern Ireland, Scotland and Wales only. For businesses in England, regulatory guidance is available from GOV.UK instead.

[67] CIRIA C762 Environmental good practice provides advice on the management of a range of environmental issues that may be encountered on site and presents good practice to reduce the environmental impacts due to construction.

[68] The GPPs provide environmental good practice guidance for the whole UK, and environmental regulatory guidance directly to Northern Ireland, Scotland and Wales only. For businesses in England, regulatory guidance is available from GOV.UK instead.

[69] CIRIA C762 Environmental good practice provides advice on the management of a range of environmental issues that may be encountered on site and presents good practice to reduce the environmental impacts due to construction.

Important Ecological Feature	Importance level	Impact description	Proposed mitigation	Residual effects (Importance level affected)	Proposed enhancement/s
		Fragmentation of commuting corridor and removal of foraging habitat. Killing or injury of bats which may be present within Tree 4 which has not been subject to survey in line with current survey guidelines. Increased noise and vibration disturbance during the construction phase could lead to displacement of bats to similar retained habitats adjoining the Application Site.	'hop-overs' to create habitat continuity over gaps created in hedgerows. PWM to be adhered to under direction of ECoW which will include a pre-works inspection of any trees to be felled by a suitably experienced and licenced ecologist. No night-time working.		Landscaping and design proposals including the creation of two new ponds, enhancement of grassland habitat and an additional 232 m of hedgerows across the Site which will provide foraging opportunities for bats.
Birds	Local	Permanent loss of commuting and nesting habitat (83 m hedgerow, 15 trees). Injury or mortality of foraging and nesting birds during vegetation clearance. No features suitable to support Schedule 1 species identified during the desk study were identified within the Survey Area, therefore risk of impacts to Schedule 1 species is considered to be low. Increased noise and vibration disturbance during construction could lead to displacement of birds to similar retained habitats adjoining the Application Site.	Creation of 315 m of hedgerow habitat and planting of 34 no. native trees within the Application Site. PWM to be adhered to under direction of ECoW. Vegetation clearance will be undertaken outside of the core bird nesting season. If not possible, The ECoW will inspect any vegetation to be cleared for breeding birds and their occupied nests no more than 24 hours prior to any works being undertaken.	No significant residual effects anticipated.	Landscaping proposals have included the creation of 232 m of additional hedgerow, 34 no trees and 2,256 m^2 grassland enhancement. This habitat enhancement will include species rich fruit bearing species to create opportunities for foraging and nesting birds.
Widespread species of reptile	Local	Permanent loss of suitable reptile habitat. Injury or mortality to reptiles during vegetation clearance and as a result of increased presence of machinery	Creation of 315 m of hedgerow habitat within the Application Site. PWM to be adhered to under direction of ECoW.	No significant residual effects anticipated.	Landscaping proposals have included the creation of 231 m of additional hedgerow, 34 no trees and 2,256 m^2 grassland enhancement.

Important Ecological Feature	Importance level	Impact description	Proposed mitigation	Residual effects (Importance level affected)	Proposed enhancement/s
		on site during the construction phase. Increased noise and vibration disturbance during construction could lead to displacement of reptiles to similar retained habitats adjoining the Application Site.			This habitat enhancement will create opportunities for foraging and commuting widespread species of reptiles. Creation of two ponds with marginal vegetation may provide suitable habitat for grass snake, if present. Arisings from vegetation clearance should be used to create hibernacula piles to be used by reptiles. The locations of these piles will be discussed with the ecologist.

5.6. The proposed landscaping mitigation for the Proposed Scheme will provide habitat connectivity for protected and priority species where habitats have been removed to facilitate the cycleway. However, there will be an interim period during which the planted vegetation will need time to settle and mature to create these pathways. Due to the presence of other suitable habitat throughout the Application Site and wider area which allows alternative pathways throughout the Application Site, this is not considered to be a significant residual effect of the operational phase of the Proposed Scheme.

5.7. In addition, as there will be no lighting installed as part of the works, the Site will remain a 'dark corridor' to be used by protected and priority species, in particular commuting and foraging bats including light sensitive Annex II species recorded during the surveys.

Landscape Management and Monitoring Plan

5.8. A detailed Landscape and Ecological Management Plan (LEMP) will be prepared upon determination of the planning application. This document will detail measures and management regimes to be put in place to ensure the success and longevity of the mitigation and biodiversity enhancements proposed. This document will be subject to review by the Local Planning Authority.

6. Conclusion

6.1. This EcIA has been based on desk study data, an ecological walkover survey and Phase 2 species surveys undertaken between February and November 2023.

6.2. The Proposed Scheme will result in the permanent loss of 7 individual trees, 8 trees within lowland deciduous woodland, and approximately 83 m of hedgerow within the Application Site, which have been recorded as suitable to support protected and priority species, including bats, nesting birds, widespread species of reptile, badger, invertebrates and common species of amphibian.

6.3. The Phase 2 surveys have confirmed the likely absence of hazel dormouse and great crested newt from the Application Site. They have also not confirmed the presence of any bat roost(s) within suitable features identified on trees and buildings within the Application Site.

6.4. To compensate for the loss of habitat, landscaping proposals have allowed for the creation of 140 m^2 of marginal planting, 315 m of mixed hedgerow, 2,256 m^2 wet grassland planting, 2,545 m^2 embankment grassland planting and 2,256 m^2 grassland enhancement planting, including planting of yellow rattle and the planting of 34 native trees. In addition, two new ponds will be created in line with drainage proposals detailed within the Drainage Strategy submitted with the planning application.

6.5. A minimum of five species-appropriate bat boxes and nine hazel dormouse boxes will be installed on suitable retained mature trees within the along the western extent of the Application Site.

6.6. In accordance with the above and the mitigation measures set out in Section 5, no significant residual effects are anticipated during the construction and operation phases of the Proposed Scheme.

Report Validity

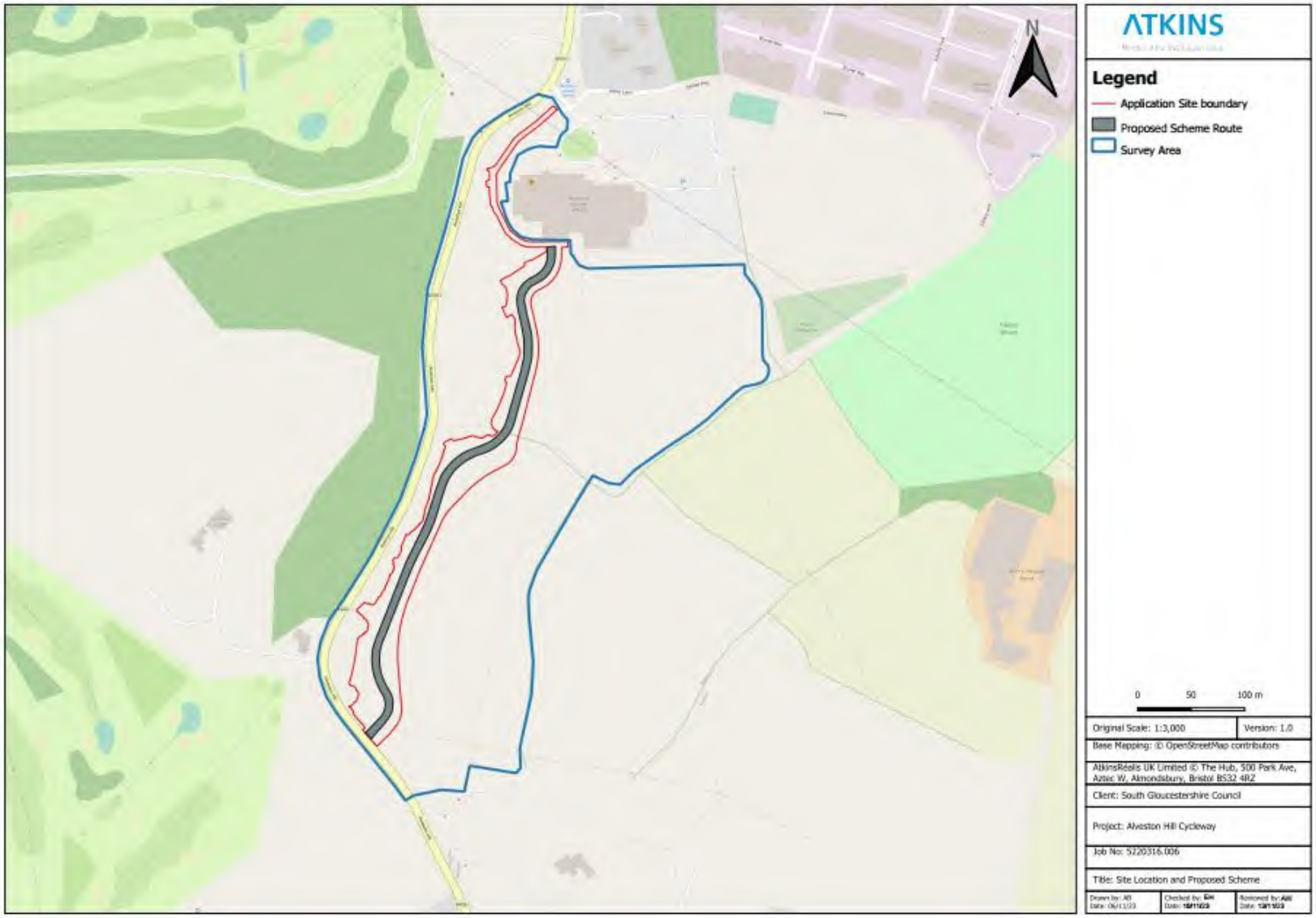
6.7. In the event of programme changes then updates to the surveys may be required to ensure the validity of the data, as per CIEEM guidance[70].

[70] CIEEM (2019) Advice Note on the Lifespan of Ecological Reports and Surveys

Appendices

Appendix A. Scheme Figures

Proposed Scheme Design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ATKINS
Legend
Application Site boundary
Proposed Scheme Route
Survey Area
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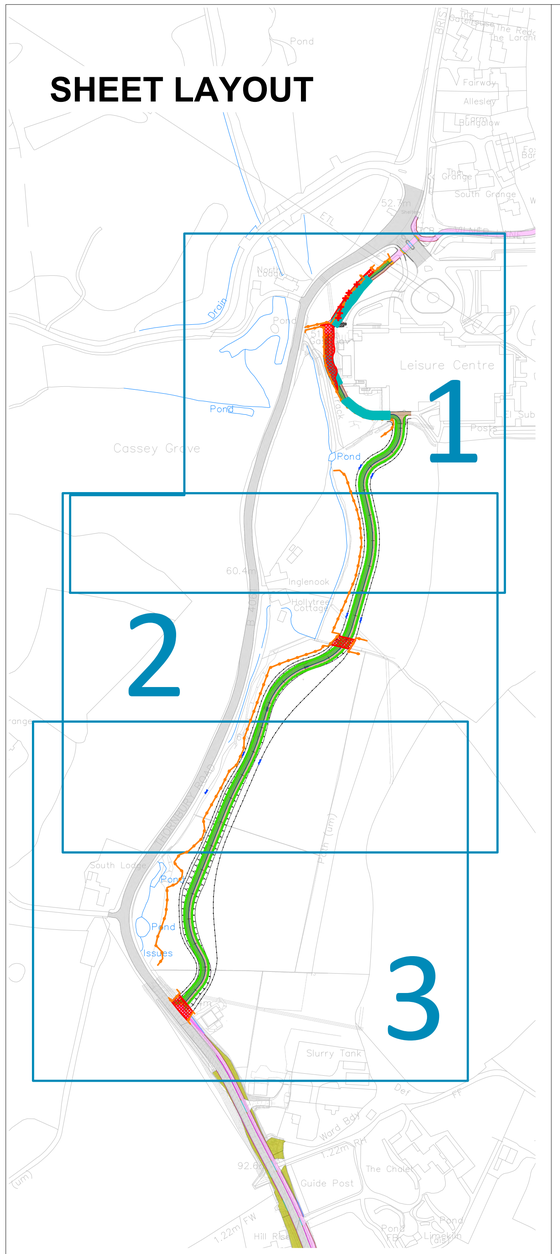
50
100 m
Original Scale: 1:3,000
Version: 1.0
Base Mapping: © OpenStreetMap contributors
AtkinsRéalis UK Limited © The Hub, 500 Park Ave, Aztec W, Almondsbury, Bristol BS32 4RZ
Client: South Gloucestershire Council
Project: Alveston Hill Cycleway
Job No: 5220316.006
Title: Site Location and Proposed Scheme

Tree Protection Plan Drawings

SHEET LAYOUT



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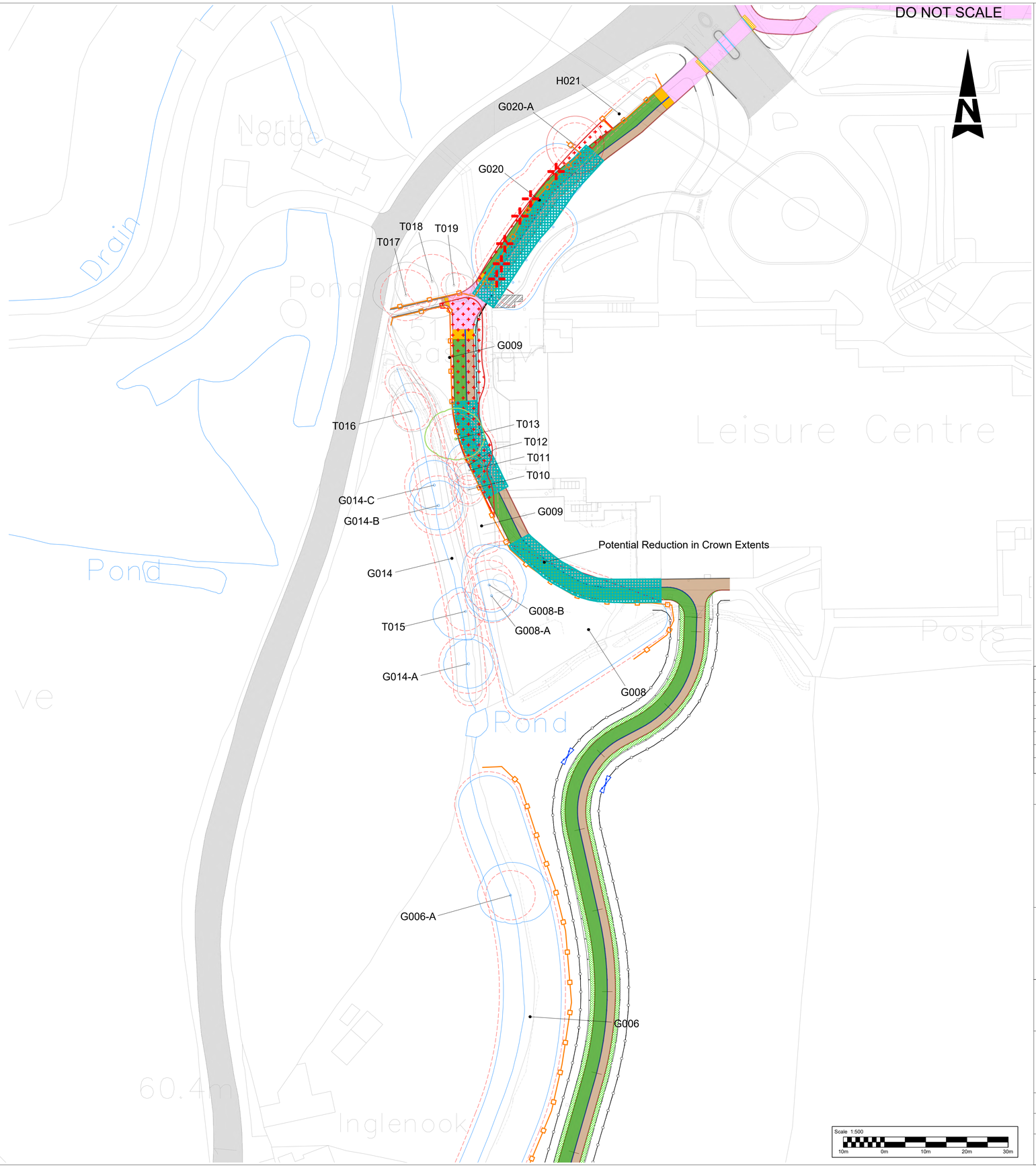

KEY (not to scale)

- Category A tree
- Category B tree
- Category C tree
- Category U tree
- Root Protection Area (RPA)
- T/G/H001 — Tree/group/hedge reference number
- Tree group or hedge - colour according to category as above
- Tree to be removed as part of works
- Tree group to be removed as part of works
- Protective fencing (indicative location only)
- Area of 'no-dig' construction only
- Proposed works

Rev.	Date	Description	By	Chk'd	App'd
P01	29/09/23	ORIGINAL	AA	TD	TD

Drawing Status: FIT FOR INFORMATION

Suitability: S2

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Project Title: ALVESTON HILL

Drawing Title: TREE PROTECTION PLAN SHEET 1 OF 3

Scale	Designed	Drawn	Checked	Authorised
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Original Size	**Date**	**Date**	**Date**	**Date**
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Drawing Number: 5220316-ATK-ARB-TPP-1

Revision: P01

Scale 1:500
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SHEET 1

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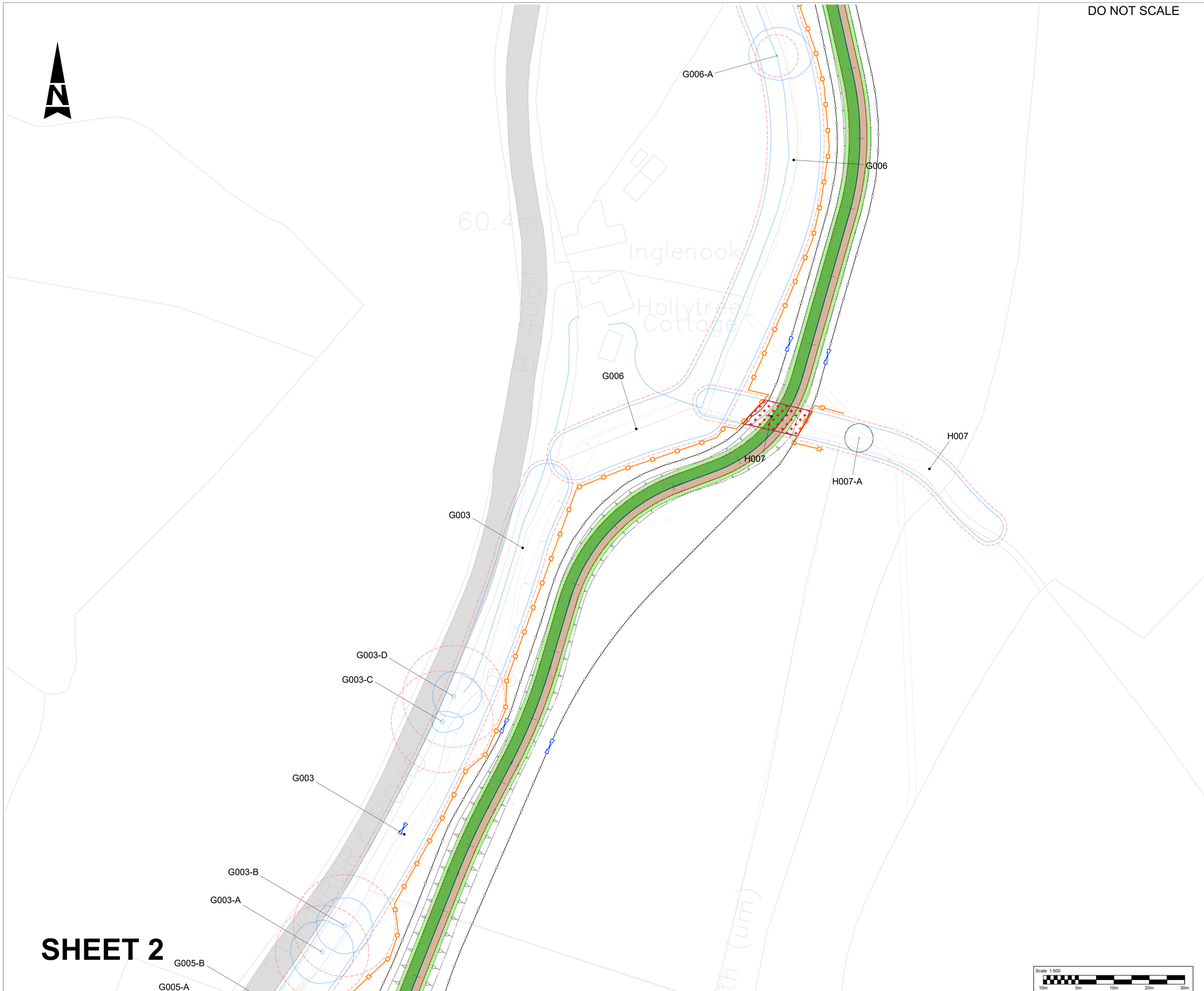

KEY (not to scale)

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- Category B tree
- Category C tree
- Category U tree
- Root Protection Area (RPA)
- T/G/H001 — Tree/group/hedge reference number
- Tree group or hedge - colour according to category as above
- Tree to be removed as part of works
- Tree group to be removed as part of works
- Protective fencing (indicative location only)
- Area of 'no-dig' construction only
- Proposed works

Rev.	Date	Description	By	Chk'd	App'd
P01	29/09/23	ORIGINAL	AA	TD	TD

Drawing Status: FIT FOR INFORMATION

Suitability: S2

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Revision: P01

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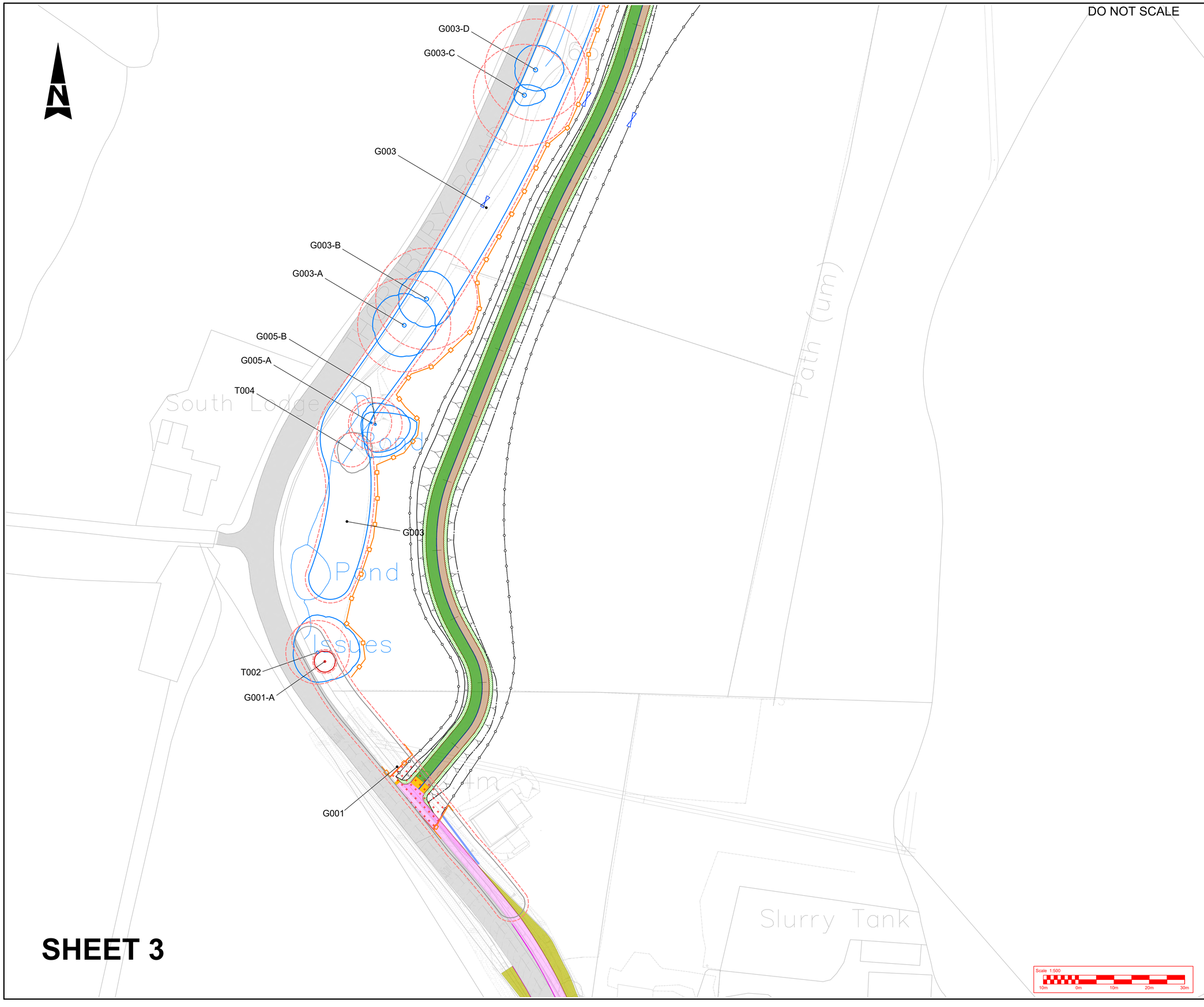

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- Category C tree
- Category U tree
- Root Protection Area (RPA)
- T/G/H001 — Tree/group/hedge reference number
- Tree group or hedge - colour according to category as above
- Tree to be removed as part of works
- Tree group to be removed as part of works
- Protective fencing (indicative location only)
- Area of 'no-dig' construction only
- Proposed works

Rev.	Date	Description	By	Chk'd	App'd
P01	29/09/23	ORIGINAL	AA	TD	TD

Drawing Status: FIT FOR INFORMATION
Suitability: S2

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Project Title: ALVESTON HILL

Drawing Title: TREE PROTECTION PLAN SHEET 3 OF 3

Scale	Designed	Drawn	Checked	Authorised
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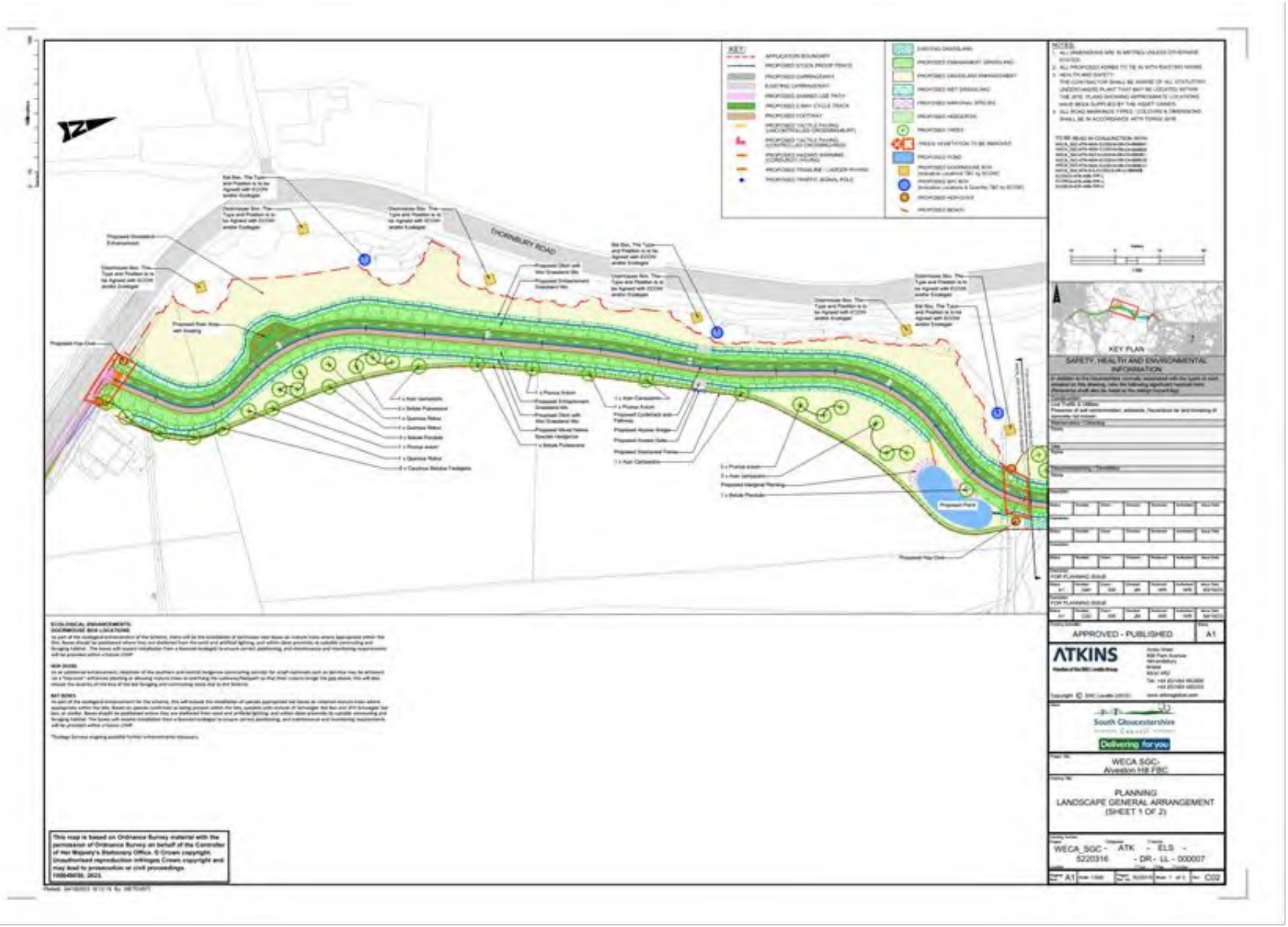
Drawing Number: 5220316-ATK-ARB-TPP-3
Revision: P01

Landscape General Arrangement Drawings


KEY
NOTES
THORNBURY ROAD
KEY PLAN -
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
APPROVED - PUBLISHED
A1
ATKINS
South Gloucestershire
Delivering for you
WECA SGC -
Alveston Hill FBC
PLANNING
LANDSCAPE GENERAL ARRANGEMENT
(SHEET 1 OF 2)
WECA_SGC - ATK - ELS -
5220316 - DR - LL - 000007
C02
ECOLOGICAL ENHANCEMENTS
DORMOUSE BOX LOCATIONS
BAT BOXES
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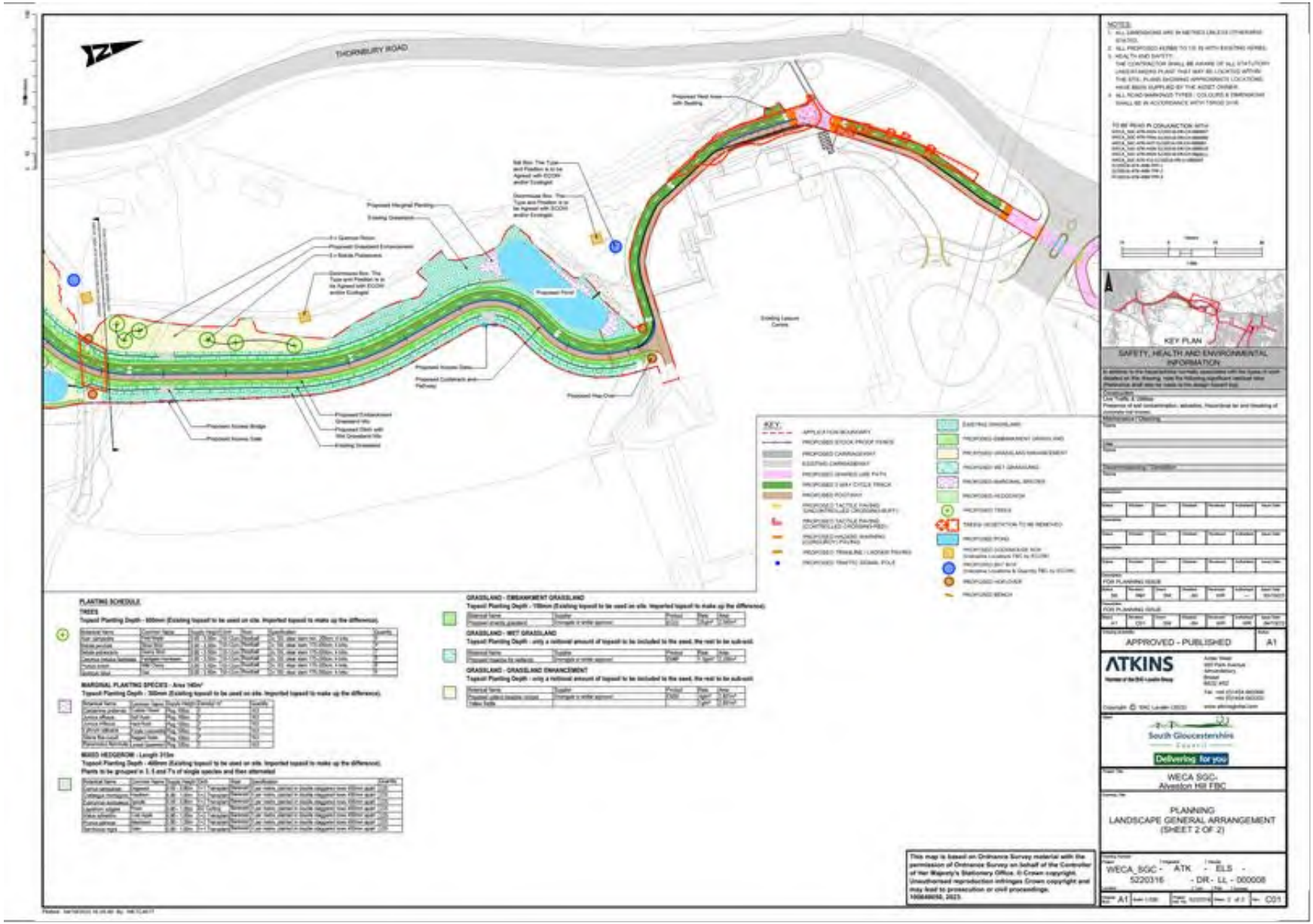
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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
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Alveston Hill FBC
PLANNING
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(SHEET 2 OF 2)
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C01

Appendix B. Phase 2 Survey Methods

Bats

B.1. All bat surveys detailed below have been undertaken in accordance with good practice guidance[71] at the time the surveys were completed[72] and CIEEM competencies for undertaking bat surveys[73].

Preliminary Root Assessment

B.2. The preliminary roost assessment of structures and trees was undertaken on 1st and 2nd February 2023 by competent surveyors.

B.3. The extent of the assessment was based on the zone of influence for this species group and included all trees and structures within the Application Site and a 50 m buffer extending out in all directions from the Application Site boundary where access allowed (the Bat Survey Area).

B.4. The assessment involved a detailed visual examination of structures and trees, which was initially undertaken from ground level, during daylight hours and aided with the use of binoculars and a bright torch.

B.5. For structures, the ground level visual examination involved the identification of potential entry/exit points for bats or other Potential Roost Features (PRFs) such as holes in brickwork, cracks, and gaps in masonry.

B.6. For trees, the ground level visual examination involved the identification of PRFs such as woodpecker holes, rot holes, cracked limbs, dense ivy and flaking bark. Where PRFs were noted, these were subject to a climbed/endoscope inspection to search for evidence of bats or further indication of the potential suitability of each PRF to support bats.

B.7. Based on the location, aspect, orientation and characteristics of the features identified, each structure/tree was assigned a potential suitability value for bats. The assessment of potential suitability was carried out according to good practice guidance[74], which assigns each structure/tree either Negligible, Low, Moderate or High suitability for roosting bats.

Presence/ Likely Absence Surveys

B.8. Structures and trees within the Bat Survey Area identified as having potential suitability to support roosting bats were subject to dusk emergence and/or dawn re-entry surveys to determine the presence/ likely absence of a bat roost. Dusk emergence surveys were undertaken in the evening, from approximately fifteen minutes before sunset until up to two hours after sunset. Dawn re-entry surveys were undertaken from approximately ninety minutes before sunrise and continued until sunrise. The survey details are summarised in Table B-1 below.

Table B-1 - Bat presence/ likely absence surveys summary

Structure/ tree No	Date	Sunset/ sunrise time	Start/end time	Start temperature	Start wind[75]	Start precipitation [76]	Start cloud cover[77]
Building B1	05/06/2023	21:21	21:06/22:51	14	2	0	1
	10/08/2023	20:43	20:28/22:12	20	2	0	4
	29/08/2023	20:03	19:48/21:33	17	2	0	7
Tree 1	12/06/2023	21:27	21:12/22:57	17	0	0	8

[71] Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London
[72] The 4th Edition of the Bat Conservation Trust was published in September 2023. Therefore, surveys were undertaken in accordance with the 3rd Edition as this was the most appropriate guidance at the time of the scoping of surveys.
[73] CIEEM (2013) Competencies for Species Survey: Bats. Chartered Institute of Ecology and Environmental Management, Winchester.
[74] Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London
[75] Wind speed score of 0-12 against Beaufort scale: 0 = calm, 2 = light breeze, 4 = Moderate breeze, 6 = strong breeze, 7 = High wind, 9 = Strong gale, 12 = Hurricane
[76] Precipitation intensity on scale of 0-5: 0 = Dry, 1 = Light drizzle, 2 = Light rain, 3 = Moderate rain, 4 = Heavy rain, 5 = Torrential rain.
[77] Cloud cover on a scale of 0-8: 0 = Sky completely clear, 4 = Sky half cloudy, 8 = Sky completely cloudy

Structure/ tree No	Date	Sunset/ sunrise time	Start/end time	Start temperature	Start wind[75]	Start precipitation [76]	Start cloud cover[77]
Tree 2 Tree 3	31/07/2023	20:59	20:44/22:29	16	1	0	6
Tree 1 Tree 2	14/08/2023	20:35	20:20/22:05	17	2	0	1

Activity Surveys – Transects

B.9. The habitats within the zone of influence for this species group were assessed for their suitability to support foraging and commuting bats. The assessment of potential suitability was carried out according to good practice guidance[78]. which assigns the habitats within the Application Site either Negligible, Low, Moderate or High suitability for foraging/commuting bats.

B.10. Habitats within the Bat Survey Area identified as having potential suitability to support foraging/ commuting bats were subject to transect surveys to identify levels of activity, key foraging and commuting areas, and the bat species present.

B.11. Surveys were undertaken monthly between April and October 2023. This is in line with the best practice guidance[30] at the time of scoping the surveys. Survey guidance has been updated in September 2023[31], which has reduced the number of transect surveys, now called Night-time Bat Walks to requiring one survey per season, therefore survey data collected is above that which would now be required in accordance with best practice.

B.12. One bat transect route was devised by AtkinsRéalis, as shown in Appendix F. The route was designed to cover all habitats within the Application Site and remainder of the field parcels which were deemed suitable for use by commuting and foraging bats.

B.13. Dusk surveys commenced at sunset and continued for two-hours, and dawn surveys commenced two-hours before sunrise. Eight listening points were located along the transect route and have been shown in Appendix F. At each of the listening points the surveyors stopped and recorded bat activity for 5 minutes, focussing on flight-lines, commuting and foraging behaviour, and other relevant contextual information. The survey details are summarised in Table B-2 below.

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

Table B-2 - Bat activity surveys summary

Survey Date	Survey Type	Weather at start of survey						Weather at end of survey					
		Air temperature (˚C)	Humidity (%)	Wind speed[1] (0 – 12)	Wind direction	Cloud cover[2] (0 – 8)	Rain[3] (0 – 5)	Air temperature (˚C)	Humidity (%)	Wind speed[1] (0 – 12)	Wind direction	Cloud cover[2] (0 – 8)	Rain[3] (0 – 5)
26/04/2023	Transect - dusk	10	62	0	N/A	7	0	9	62	0	N/A	7	0
18/05/2023	Transect - dusk	18	45	3	North	7	0	13	77	2	east	8	0
26/06/2023	Transect - dusk	17	65	1	North east	6	0	15	51	0	N/A	6	0
24/07/2023	Transect - dusk	15	78	1	South	5	0	12	72	1	South	2	0
22/08/2023	Transect - dusk	18	64	0	N/A	3	0	16	62	0	N/A	0	0
26/10/2023	Transect – dusk	13	58	1	West	7	0	9	67	1	West	5	0
27/10/2023	Transect – pre-dawn	8	66	2	West	6	0	10	87	1	West	7	1

Activity Surveys – Static Detectors

B.14. Surveys were undertaken monthly between April and October 2023. This is in line with the best practice guidance[30] at the time of scoping the surveys. Survey guidance has been updated in September 2023[31], however the requirement surveying a moderate suitability site has remained one survey per month, therefore survey scope remains in line with best practice.

B.15. The ability to estimate abundance of bats using detector surveys is limited as it requires the differentiation between multiple passes of a single bat, or a single pass of multiple bats. The results produced can indicate relative activity of bats in different habitats based on the number of bat passes over time.

B.16. Two Wildlife Acoustics Song Meter 4 (SM4BAT FS) full spectrum static detectors were deployed for at least five nights per month between April and October 2023. Contextual information associated with the static detectors is detailed in Table B-3 below.

B.17. The locations of the Static detectors have been presented in Appendix F.

B.18. The static bat detectors were set to record bat passes from 30 minutes before sunset to 30 minutes after sunrise.

Table B-3 - Static Detector Contextual Information

Static Detector	Context	Grid Reference
Static 1	Deployed on a hazel tree stem within a hedgerow which forms the eastern boundary of the northern field. The static detector microphone was positioned facing west, into a grass field. The deployment located is connected to a network of hedgerows to the east and a block of woodland to the west.	ST 63751 89027
Static 2	Deployed on an ash tree stem, adjacent to the Alveston Hill road (B4061) in the south-west corner of the Site. The static detector microphone was positioned facing into cattle grazed pasture, with a hedgerow network leading north alongside the B4061 road.	ST 63375 88759

B.19. From the data collected over each deployment period, the dates that were subject to analysis were selected based on consecutive nights (where possible) and where the environmental conditions were considered optimal. Optimal environmental conditions were taken from the local weather station (Alveston - I90579606) on Wunderground[79] and were defined as the following:

- Temperature at sunset > 10˚C;
- Peak wind speed during the night < 3 on the Beaufort scale;
- Peak rain during the night <2 mm per hour

Table B-4 - Deployment and Collection Dates, and nights selected for analysis based on the above criteria

Month in 2023	Deployment Date	Collection Date	Survey nights	Dates analysed (inclusive)
April	26/04/2023	02/05/2023	5	26th – 30th April
May	18/05/2023	24/05/2023	5	18th – 22nd May
June	26/06/2023	03/07/2023	5	26th – 30th June
July	24/07/2023	03/08/2023	5	24th – 28th July
August	22/08/2023	29/08/2023	5	22nd, 25th - 28th August
September	28/09/2023	03/10/2023	5	6th – 10th October

[79] www.wunderground.com

October	26/10/2023	01/11/2023	5	27th – 31st October

Bat Call Analysis

B.20. Recorded calls from transect and static bat detector surveys were first processed by using Anabat Insight (Version 2.0.1) auto ID function to gain a species overview. Using this method, Anabat Insight compares the recorded input files to a built-in reference library of known bat recordings. The programme then makes a determination as to the closest match between the input file and the reference files.

B.21. Following the AtkinsRéalis Bat Data Analysis Protocol (Revision 4), a two-stage process was subsequently undertaken, comprising manual checking of sound files, followed by a manual review for quality assurance (QA).

B.22. Manual identification of species was completed using Kaleidoscope Viewer (version 4.5.4) and Kaleidoscope (version 5.1.8) by sound analysts of at least capable experience following the CIEEM competency framework. This involved checking 10% of calls assigned a common or soprano pipistrelle label by auto ID and checking 100% of calls assigned another species label by auto ID. Additionally, 10% of files labelled as Noise by auto ID were also checked.

B.23. QA was then completed by sound analysts of at least accomplished level following the CIEEM competency framework[73]. The QA checked 10% of all manual identifications of bat species. In order for the data set to pass quality assurance, there had to be a 90% accuracy, or agreement, between the person carrying out QA and the sound analyst.

B.24. Peak species counts can be helpful in understanding a Site's importance to different species. For static detectors and transects, peak numbers per night can be given quite simply by counting the number of sound files with a given species label.

B.25. All species records referred to in this report have undergone the above 2-stage bat call analysis process and can therefore be considered accurate records.

B.26. The species have been referred to with six letter codes comprising the first three letters of the genus and the first three letters of the species, where appropriate, or the first three letters of the genus followed by 'SP' where identification to species level was not carried out. The only exception to these rules is where a big bat call, *i.e.* noctule, serotine or Leisler's, cannot be confidently identified beyond 'Big Bat' and is therefore left as such. These naming conventions can be found in Table B-5 below.

Table B-5 - Species naming conventions during sound analysis

Bat Species or Group	Species Code used in Results
Barbastelle (*Barbastella barbastellus*)	BARBAR
Greater horseshoe (*Rhinolophus ferrumequinum*)	RHIFER
Lesser horseshoe (*Rhinolophus hipposideros*)	RHIHIP
Long-eared species (*Plecotus.* sp)* were not identified to species level	PLESP
Nathusius' pipistrelle (*Pipistrellus nathusii*)	PIPNAT
Common pipistrelle (*Pipistrellus pipistrellus*)	PIPPIP
Soprano pipistrelle (*Pipistrellus pygmaeus*)	PIPPYG
Noctule (*Nyctalus noctula*)	NYCNOC
Leisler's (*Nyctalus leisleri*)	NYCLEI
Serotine (*Eptesicus serotinus)*	EPTSER
Nyctalus species (above) not identified to species level	NYCSP
"Big Bats" **	BIGBAT
Myotis species ***	MYOSP
Unknown bat species ****	BATSP

* *Plecotus* sp. calls are problematic to separate by sound analysis. They were not identified to species level, so could comprise both grey long-eared and *Plecotus* sp.
** Calls that could be serotine or a *Nyctalus* species are referred to as "Big Bats". Some Big Bat calls are problematic to separate by sound analysis, particularly when there are multiple individual Big Bat species present on a Site.
*** The *Myotis* bats are problematic to separate by sound analysis. This group will comprise more than one species, and could include rare bats, such as Bechstein's.
**** Unknown bat species are generally where the only element of an echolocation call present is the social call, or if a small number of weak pulses is recorded, that are from a bat, but that cannot be attributed to a general.

Great Crested Newts

B.27. All great crested newt surveys detailed below have been undertaken in accordance with good practice guidance[80] and CIEEM competencies for undertaking great crested newt surveys[81].

Habitat Suitability Index Assessment

B.28. An HSI[82] assessment was undertaken on 8th June 2023 in accordance with good practice guidance[83].

B.29. The extent of the HSI assessment was based on the zone of influence for this species and included all water bodies within the Application Site and a 500 m buffer extending out in all directions from the Application Site boundary, where access allowed (the Great Crested Newt Survey Area).

B.30. The survey was undertaken by suitably-experienced ecologist(s) with at least one great crested newt survey licenced surveyor present.

B.31. The HSI is a quantitative predictor of habitat suitability for great crested newts. The HSI is a numerical index between 0 and 1, derived from an assessment of ten habitat variables known to influence the presence of great crested newts. These variables include (amongst others): geographic location, water body size and permanence, the presence of predatory fish and wildfowl, availability of suitable terrestrial habitat and the pond count within 1km of the survey pond, and each variable is scored based on its level of suitability. A HSI of 1 indicates optimal habitat (high probability of great crested newt occurrence), whilst a HSI of 0 indicates very poor habitat (minimal probability of great crested newt occurrence). The HSI is calculated on a single water body basis but takes into account surrounding terrestrial habitat and local water body density. If a water body has a very low HSI score (<0.5) then there would typically be a minimal chance of great crested newt presence.

B.32. As stated in good practice guidance[83], the HSI for great crested newts is not a substitute for newt surveys. In general, ponds with high HSI scores are more likely to support great crested newts than those with low scores. However, the system is not sufficiently precise to conclude that any particular pond with a high score will support great crested newts, or that any pond with a low score will not do so. There is a positive correlation between HSI scores and the numbers of great crested newts observed. In general, high HSI scores are likely to be associated with greater numbers of great crested newts. The relationship is not sufficiently strong, however, to allow estimations of the numbers of newts in any particular pond.

Environmental DNA (eDNA)

B.33. The eDNA survey involved the collection of water samples from suitable water bodies within the Great Crested Newt Survey Area to be tested for the presence of great crested newt DNA, which would indicate the species is present in a particular water body (see approved methodology[84] for limitations).

[80] English Nature (2001) Great Crested Newt Mitigation Guidelines.
[81] CIEEM (2013) Competencies for Species Survey: Great Crested Newt. Chartered Institute of Ecology and Environmental Management, Winchester.
[82] Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*) Herpetological Journal 10 (4), 143-155 (2000). Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. The great crested newt Habitat Suitability Index (HSI) is a quantitative measure of aquatic habitat quality for great crested newt. The HSI is a number between 0 and 1, derived from an assessment of ten habitat variables known to influence the presence of newts.
[83] Amphibian and Reptile Groups of the United Kingdom (2010) ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. ARGUK
[84] Biggs, et al (2014) Technical Advice Note for Field and Laboratory Sampling of Great Crested Newt eDNA in Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Appendix 5. Freshwater Habitats Trust, Oxford

B.34. The eDNA water sampling was undertaken on 8th June 2023 by suitably experienced ecologist(s) with at least one great crested newt survey licenced surveyor present.

B.35. Sampling followed an approved methodology[84], recognised by Natural England, that minimises cross-contamination. Field sampling equipment was supplied as sterile kits by the laboratory that was to carry out the DNA analysis (SureScreen Scientifics). In total, 20 water samples were collected from each water body sampled. Areas that may be used by great crested newts for displaying or egg-laying were selected for sampling and the sampling was carried out in daylight hours and in dry weather. Following completion of the sampling, the collected water samples were stored under suitable conditions (as set-out in the approved methodology[84]) before being sent to the laboratory for testing.

Hazel Dormouse

B.36. All hazel dormouse surveys detailed below have been undertaken in accordance with good practice guidance[85] and Chartered Institute of Ecology and Environmental Management (CIEEM) competencies for undertaking hazel dormouse surveys[86].

Habitat Assessment

B.37. An initial hazel dormouse habitat suitability assessment was undertaken during the ecological walkover survey of the Application Site on 1st and 2nd February 2023. This included an assessment of habitat type, structure (for nest building, foraging and dispersal), species composition (availability of food sources) and connectivity with other areas of habitat outside of the Application Site. The assessment of the potential presence of hazel dormouse and suitability of habitats at the Application Site was aided by the use of the desk study information (Ordnance Survey mapping and aerial imagery) to view these habitats in the context of the wider landscape.

Presence/ Likely Absence Survey Using Nest Tubes

B.38. A hazel dormouse nest tube survey was carried out between May and September 2023. Surveys are currently ongoing and will be completed in November 2023.

B.39. A total of 50 artificial nest tubes were placed in areas of suitable habitat (woodland, hedgerow and scrub) throughout the Application Site and adjacent to the Application Site (the Hazel Dormouse Survey Area). Where possible, tubes were spaced between 15 m and 20 m apart. Tubes were fastened underneath horizontal tree/scrub branches (including bramble). The location of tubes and survey areas are shown in Appendix F.

B.40. The tubes were set out on 25th April 2023 and checked monthly up to 22nd September 2023. Survey checks were carried by a surveyor with a hazel dormouse survey licence on the following dates:

- Check 1 – 26th May 2023
- Check 2 – 30th June 2023
- Check 3 – 28th July 2023
- Check 4 – 22nd August 2023
- Check 5 – 22nd September 2023
- Check 6 – 19th October 2023
- Check 7 and collection – 7th November 2023.

B.41. Using 50 tubes as a standard for surveying[87], a combined Index of Probability score can be calculated as an indicator of thoroughness of a hazel dormouse survey. The Index of Probability score is based on the likelihood of a tube being occupied in any specific month and is highest in May, August and September when nest tubes are most frequently occupied as shown in Table B-6. The combined score is calculated by adding together the Index of Probability score for each full month the survey

[85] Natural England Standing Advice: Hazel or common dormice: surveys and mitigation for development projects, accessed April 2023 from: https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects
[86] CIEEM, 2013. *Competencies for Species Survey: Hazel Dormouse.*
[87] Natural England Standing Advice: Hazel or common dormice: surveys and mitigation for development projects, accessed April 2023 from: https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects

tubes are present and is increased or decreased depending on the number of nest tubes deployed[88]. A combined Index of Probability score of 20 or above must be achieved to judge likely absence in any particular survey area. The tubes were deployed between April and November and a combined score of 24[89] has been achieved (for each location) which indicates that a thorough survey was undertaken.

Table B-6 – Index of Probability of finding hazel dormouse in nest tubes in any one month[90]

Month	Index of probability
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2

Hedgerow Survey

B.42. Hedgerow surveys were carried out in June 2023, in accordance with the relevant methods described in The Hedgerow Regulations 1997[91].

B.43. The hedgerow survey was undertaken by suitably experienced AtkinsRéalis ecologists, in accordance with good practice guidance[91] and used the broad definition of a hedgerow developed by the Hedgerow Action Plan Working Group, which defines a hedgerow as "*Any boundary line of trees or shrubs over 20m long and less than 5m wide, provided that at one time the trees or shrubs were more or less continuous. It includes an earth bank or wall only where such a feature occurs in association with a line of trees or shrubs*."

B.44. During the survey the following features were recorded:

- Length of hedgerow;
- Typical height and width of hedgerow;
- Number and length of any gaps;
- Presence of banks, walls and ditches;
- Presence, number and spacing of standard trees;
- Adjacent land use and proximity of ecological features such as ponds, woodlands, or parallel hedgerows, and any connections to other hedgerows not evident on existing maps;
- The presence and abundance of ground flora species listed on Schedule 2 of The Hedgerow Regulations 1997 within representative 30 m sections up to 1 m from the hedgerow base;
- Evidence of past or recent management; and
- Evidence of use by animal species, in particular protected species.

B.45. Following the survey, hedgerows were assessed against the wildlife criteria for determining 'important' hedgerows, as set out in Schedule 1, Part 2 of The Hedgerow Regulations 1997[91]. The identified hedgerows were not assessed against the landscape, heritage and archaeology criteria as these criteria are not within the professional remit of ecology.

[88] The process of determining scores is provided at https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects
[89] 4 + 2 + 2 + 5 + 7 = 20 as per the index of probability table for months April to September.
[90] This table is taken from Natural England Standing Advice, accessed April 2023: https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects. The score system was developed in the following research report: Chanin, P. & Woods, M. 2003. Surveying dormice using nest tubes. Results and experiences from the South West Dormouse Project. English Nature Research Report No. 524. This was incorporated into: Bright, P., Morris, P. & Mitchell-Jones, T. (2006). Dormouse Conservation Handbook. Second Edition. English Nature, Peterborough
[91] The Hedgerows Regulations 1997 (legislation.gov.uk)

- As detailed within The Hedgerow Regulations 1997, in the UK a hedgerow is important for wildlife if it is at least 30 years old and:
- Contains protected species listed in the Wildlife and Countryside Act 1981 (as amended); or
- Contains species that are endangered, vulnerable and rare and identified in the British Red Data books; or
- Has at least seven qualifying woody species present; or
- Has at least six qualifying woody species and has associated with it at least three of the features listed in Table B-7; or
- Has at least six qualifying woody species that include one of the following: black poplar (*Populus nigra ssp. Betulifolia*), large-leaved lime (*Tilia platyphyllos*), small-leaved lime (*Tilia cordata*), wild service-tree (*Sorbus torminalis*); or
- Has at least five qualifying woody species and has associated with it at least four of the features listed in Table B-7; or
- Runs parallel with a bridleway, footpath or Byway Open to all Traffic (BOAT), and has four or more qualifying woody species present and at least two of the features listed in Table B-7.

Table B-7 - The features associated with hedgerows, as set out in The Hedgerow Regulations 1997

Associated Feature	
a)	a bank or wall which supports the hedgerow along at least one half of its length;
b)	gaps which in aggregate do not exceed 10% of the length of the hedgerow;
c)	where the length of the hedgerow does not exceed 50 meters, at least one standard tree;
d)	where the length of the hedgerow exceeds 50 meters but does not exceed 100 meters, at least 2 standard trees;
e)	where the length of the hedgerow exceeds 100 meters, such number of standard trees (within any part of its length) as would when averaged over its total amount to at least one for each 50 meters;
f)	at least 3 woodland species within one meter, in any direction, of the outermost edges of the hedgerow;
g)	a ditch along at least one half of the length of the hedgerow
h)	connections scoring 4 points or more (Connection with another hedgerow scores one point and a connection with a pond or a woodland, in which the majority of trees are a broad-leaved trees, scores 2 points. A hedgerow is connected with something not only if it meets it but also if it has a point within 10 meters of it and would meet it if the line of the hedgerow continued);
j)	a parallel hedge within 15 meters of the hedgerow.

B.46. Where the age of hedgerows was not known, a precautionary approach was taken to the assessment of 'important' hedgerows based on professional judgement. All well-established mature hedgerows were assumed to be at least 30 years old unless there was evidence or knowledge that would cast doubt on this.

B.47. Following the survey, species rich hedgerows were also identified. A hedgerow is classed as 'species'-rich' when it contains a minimum of 5 woody species within each 30m section of hedgerow sampled.

Appendix C. Planning Policy

National Planning Policy Framework, 2019

C.1. The National Planning Policy Framework (NPPF) sets out the Governments planning policies for England and how these are expected to be applied by Local Authorities within their Local Development Frameworks (LDF). The revised National Planning Policy Framework was published in February 2019.

C.2. Chapter 15 of the NPPF 'Conserving and enhancing the natural environment' sets out the requirements to consider biodiversity in planning decisions.

C.3. The paragraphs within Chapter 15 relevant to the Scheme, the key information from which is detailed below:

Para 170: Planning policies and decisions should contribute to and enhance the natural and local environment by

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;

d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Para 171: Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework[92]; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.

Para 172: Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads[93]. The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major

[92] Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a high quality

[93] English National Parks and the Broads: UK Government Vision and Circular 2010 provides further guidance and information about their statutory purposes, management and other matters.

development[94] other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest. Consideration of such applications should include an assessment of:

a) the need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy;
b) the cost of, and scope for, developing outside the designated area, or meeting the need for it in some other way; and
c) any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.

Para 173. Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 172), planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character.

Habitats and biodiversity

Para 174. To protect and enhance biodiversity and geodiversity, plans should:

a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity[95]; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation[96]; and
b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

Para 175. When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts),
b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons[97] and a suitable compensation strategy exists; and
d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity

[94] For the purposes of paragraphs 172 and 173, whether a proposal is 'major development' is a matter for the decision maker, taking into account its nature, scale and setting, and whether it could have a significant adverse impact on the purposes for which the area has been designated or defined.
[95] Circular 06/2005 provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.
[96] Where areas that are part of the Nature Recovery Network are identified in plans, it may be appropriate to specify the types of development that may be suitable within them.
[97] For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.

improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

Para 176. The following should be given the same protection as habitats sites:

a) potential Special Protection Areas and possible Special Areas of Conservation;
b) listed or proposed Ramsar sites[98]; and
c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

Para 177. The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

Local Development Plan

C.4. POLICY PSP19 – WIDER BIODIVERSITY Development Proposals resulting in the loss or deterioration of irreplaceable habitats, including unimproved grassland (lowland hay meadows), ancient woodland, and ancient trees will be refused unless the need for, and benefits of, the development in that location clearly outweigh the loss.

C.5. Where appropriate, biodiversity gain will be sought from development proposals. The gain will be proportionate to the size of the scheme and be secured through an appropriate planning condition or legal undertaking. This will include sites of low nature conservation interest (for example, intensive agricultural land) where new semi-natural habitat (green infrastructure) would provide opportunities and gains for local wildlife. Development proposals, where they would result in significant harm to sites of value for local biodiversity, which cannot be avoided by locating it on an alternative site with less harmful impacts, adequately mitigated or, as a last resort, compensated for, will be refused.

C.6. Sites of value for local biodiversity include (but are not limited to):

- local sites (Sites of Nature Conservation Interest or Regionally Important Geological Sites);
- sites supporting species of fauna or flora protected under the Wildlife and Countryside Act 1981 (as amended), Countryside and Rights of Way Act 2000 or Habitat Regulations 2010;
- sites supporting species and habitats listed on the South Gloucestershire Biodiversity Action Plan (BAP);
- sites supporting species and habitats listed by the Government as being of Principle Importance for Biological Diversity in Britain under Section 41 of the Natural Environment and Rural Communities Act 2006 (Priority Species and Habitats);
- sites supporting birds listed on the Red, Amber or Green Lists of Species of Conservation Concern;
- wildlife corridors or new green infrastructure, which enable the dispersal and favourable status of flora and fauna species; and
- brownfield sites supporting notable assemblages of invertebrates.

[98] Potential Special Protection Areas, possible Special Areas of Conservation and proposed Ramsar sites are sites on which Government has initiated public consultation on the scientific case for designation as a Special Protection Area, candidate Special Area of Conservation or Ramsar site.

Appendix D. UK Habitat Survey Plan and Target Notes

ATKINS
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Legend

- Application Site boundary
- Scheme route
- Survey area

UK Habitat (lines)

- h2a - hedgerow (priority habitat)
- r1e - ditch
- u1e - Built linear features
- r2 - rivers and streams
- w1g6 - line of trees

UK Habitat (polygon)

- g4 - modified grassland
- w1f - lowland mixed deciduous woodland
- h3d - bramble scrub
- u1 - built-up areas and gardens
- u1e - built linear features
- No access

UK Habitat (Secondary Codes)

- g - tall herb

- Target Notes

0 35 70 m

Original scale: 1:1,400	Version: 1.0
Base Mapping: © OpenStreetMap and its contributors	
Atkins Limited © Woodcote Grove, Ashley Road, Epsom, Surrey, KT18 5BW	
Client: South Gloucestershire Council	
Project: Alveston Hill Cycle Scheme	
Job No: 5208124.011	
Title: UK Habitat Survey Plan (1 of 2)	
Drawn by: MA Date: 16/10/2023	Checked by: JL Date: 14/11/2023	Reviewed by: AW Date: 15/11/2023

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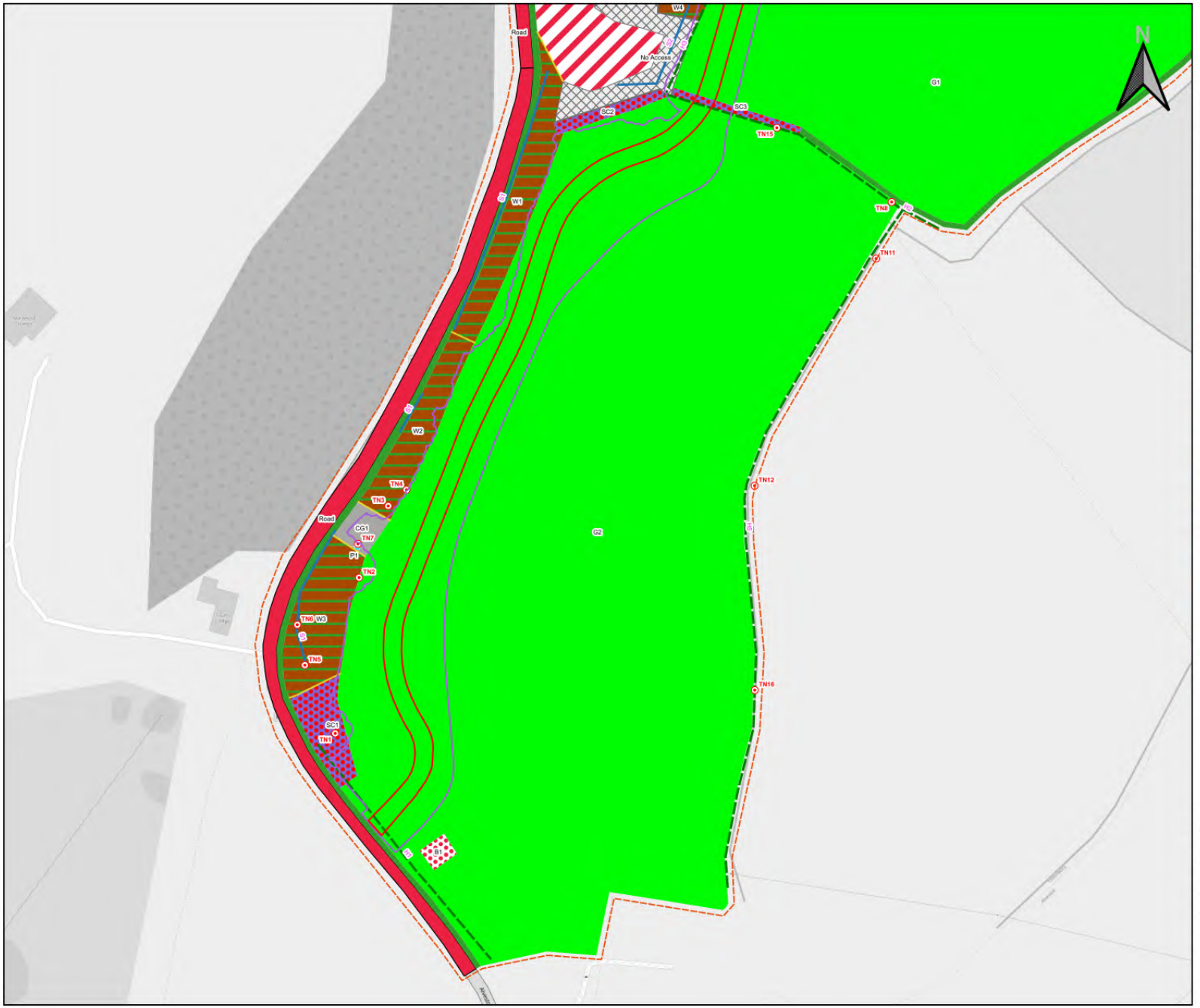

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Legend

- Application Site boundary
- Scheme route
- Survey area

UK Habitat (lines)

- h2a - hedgerow (priority habitat)
- r2 - rivers and streams

UK Habitat (polygon)

- g4 - modified grassland
- w1f - lowland mixed deciduous woodland
- h3d - bramble scrub
- u1 - built-up areas and gardens
- u1b5 - buildings
- u1e - built linear features
- s - sparsely vegetated land
- r1 - standing open water and canals
- No access

UK Habitat (Secondary Codes)

- g - tall herb

- Target Notes

0 35 70 m

Original scale: 1:1,400	Version: 1.0
Base Mapping: © OpenStreetMap and its contributors	
Atkins Limited © Woodcote Grove, Ashley Road, Epsom, Surrey, KT18 5BW	
Client: South Gloucestershire Council	
Project: Alveston Hill Cycle Scheme	
Job No: 5208124.011	
Title: UK Habitat Survey Plan (2 of 2)	
Drawn by: MA Date: 16/10/2023	Checked by: JL Date: 14/11/2023	Reviewed by: AW Date: 15/11/2023

Target Notes and Photographs

Table D-1 - Target notes and photographs

Target Note	Description	Photograph
1	Ash tree (Tree T1) with crevice which may provide a PRF for bats. This was considered to have high suitability for roosting bats in accordance with 2016 BCT guidelines Tree located adjacent to Alveston Hill road at ST6338488743. Feature located on eastern aspect of tree. No bats recorded emerging from feature during surveys undertaken in 2023. Tree suitable to support nesting birds.	
2	Field maple tree (Tree T2 - dead) with large split at back and multiple holes which may provide PRFs for bats. This was considered to have high suitability for roosting bats in accordance with 2016 BCT guidelines Tree located adjacent to Alveston Hill road at ST6338788809. Feature located on eastern and western aspects of tree. No bats recorded emerging from features during surveys undertaken in 2023. Tree suitable to support nesting birds.	

		
3	Large ash covered in ivy located at ST6340588833. This was considered to have low suitability for roosting bats in accordance with 2016 BCT guidelines as any voids or cracks suitable as PRFs may be obscured from ground-level due to the dense ivy, which clads approximately two thirds of the tree. Tree suitable to support nesting birds.	

4	Ash tree (potentially veteran) located at ST6340888842. This was considered to have negligible suitability for roosting bats in accordance with 2016 BCT guidelines. Tree suitable to support nesting birds.	
5	Defunct pond now dried up, and no longer present. Scrub covering the undulated ground. Located at ST6337288770. Suitable to support nesting birds, widespread species of reptiles and invertebrates.	

6	Mature English oak tree (Tree T3) with lifted bark and several holes which may provide PRFs for bats. This was considered to have moderate suitability for roosting bats in accordance with 2016 BCT guidelines. A potential veteran tree. Located at ST6336988786. No bats recorded emerging from feature during surveys undertaken in 2023. Suitable to support nesting birds.	
7	Small waterbody/pond (potentially the end of a blocked stream with still water). Located at ST6339388818. GCN eDNA survey undertaken in June 2023 confirmed absence of GCN from the waterbody. Provides suitable habitat for common species of amphibian and also invertebrates.	

8	Ash tree with woodpecker hole and crevices which may provide PRFs for bats. This was considered to have high suitability for roosting bats in accordance with 2016 BCT guidelines. Tree located 75 m from the Application Site therefore not subject to further survey. Located at ST6359688946. Suitable to support nesting birds.	
9	Dead fallen ash tree located within 'W5' at ST6351989111. Clad with ivy, which has encroached up the trunk and onto the branches. Dead wood has important biodiversity value for a range of species which depend on dead wood for their life functions (e.g. fungi and invertebrates). This tree may also have value for bats, as any voids or cracks suitable as PRFs may be obscured from ground-level due to the dense ivy, which clads approximately two thirds of the tree.	

10	INNPS - Variegated yellow archangel. Located at ST6352289108.	
11	Ash tree with broken limb and access hole with PRF for bats. This was considered to have moderate suitability for roosting bats in accordance with 2016 BCT guidelines. Potentially has veteran status. Tree located 85 m from the Application Site therefore not subject to further survey. Located at ST6359388934.	

12	Mature oak tree. This was considered to have negligible suitability for roosting bats in accordance with 2016 BCT guidelines. No further surveys required. Potentially has veteran status. Located at ST6355088841. Suitable to support nesting birds.	
13	Scattered scrub 'SC4' with grassland that could provide refuge for reptiles. Located at ST 63619 89141.	
14	Restricted access, but grassland, with scrub mosaic providing refuge suitability for reptiles.	No photo, private land.

	Located at ST 63505 89143.	
15	Hedgerow ‘H2’ providing suitability for hazel dormouse, with foraging, nesting and dispersal potential. However, no evidence of dormouse recorded during nest tube surveys. Provides commuting and forging habitat for bats, nesting birds and widespread species of reptiles. Located at ST 63557 88979.	
16	Hedgerow ‘H5’ providing suitability for hazel dormouse, with foraging, nesting and dispersal potential. However, no evidence of dormouse recorded during nest tube surveys. Provides commuting and forging habitat for bats, nesting birds and widespread species of reptiles. Located at ST 63549 88840.	

17	One willow species providing ‘low’ (PRF-I) suitability to support roosting bats due to its poor condition with lifted bark on the limbs of the south eastern aspect. Located at OSNGR ST6354489273	 

Site Plant Species List

Table D-2 - Modified grassland plant species

Species name (Stace[20])	Scientific name
Annual meadow grass	*Poa annua*
Cock’s-foot	*Dactylis glomerata*
Common daisy	*Bellis perennis*
Creeping buttercup	*Ranunculus repens*

Dandelion	*Taraxacum sp.*
Geranium sp.	*Geranium sp.*
Ground ivy	*Glechoma hederacea*
Perennial rye grass	*Lolium perenne*
Small nettle	*Urtica urens*
Spear thistle	*Cirsium vulgare*
White clover	*Trifolium repens*

Table D-3 - Tall ruderal plant species

Species name (Stace[20])	Scientific name
Agros sp	*Agrostis sp.*
Annual meadow grass	*Poa annua*
Bindweed	*Calystegia sepium subsp. roseata*
Broadleaved dock	*Rumex obtusifolius*
Cleavers	*Galium aparine*
Cock's-foot	*Dactylis glomerata*
Common nettle	*Urtica dioica*
Creeping buttercup	*Ranunculus repens*
Lesser celandine	*Ranunculus ficaria*
Small nettle	*Urtica urens*
Thistle	*Cirsium arvense*
Willowherb	*Epilobium*

Table D-4 - Hedgerow plant species

Species name (Stace[20])	Scientific name
Ash	*Fraxinus excelsior*
Blackberry (bramble)	*Rubus fruticosus agg.*
Blackthorn	*Prunus spinosa*
Dogwood	*Cornus sanguinea*
Elder	*Sambucus nigra*
Elm	*Ulmus procera*
Field maple	*Acer campestre*
Hawthorn	*Crataegus monogyna*
Hazel	*Corylus avellana*
Holly	*Ilex aquifolium*
Ivy	*Hedera helix*
Lime sp.	*Tilia sp.*

Malus sp.	*Malus sp.*
Sycamore	*Acer pseudoplatanus*
Traveller's joy	*Clematis vitalba*

Table D-5 - Bramble scrub plant species

Species name (Stace[20])	Scientific name
Blackberry (bramble)	*Rubus fruticosus agg.*
Broadleaved dock	*Rumex obtusifolius*
Buddleia	*Buddleja davidii*
Cleavers	*Galium aparine*
Cocks foot	*Dactylis glomerata*
Common nettle	*Urtica dioica*
Couch grass	*Elytrigia repens*
False oat grass	*Arrhenatherum elatius*
Hemlock	*Conium maculatum*
Herb robert	*Geranium robertianum*
Hogweed	*Heracleum sphondylium*
Ivy	*Hedera helix*
Lords and ladies	*Arum maculatum*
Poa sp.	*Poa. sp*
Small nettle	*Urtica urens*
Thistle	*Cirsium arvense*
Traveller's joy	*Clematis vitalba*
Wood avens	*Geum urbanum*

Table D-6 - Lowland mixed deciduous woodland plant species

Species name (Stace[20])	Scientific name
Ash	*Fraxinus excelsior*
Beech	*Fagus sylvatica*
Blackthorn	*Prunus spinosa*
Blackberry (bramble)	*Rubus fruticosus agg.*
Cleavers	*Galium aparine*
Cow parsley	*Anthriscus sylvestris*
Dog's mercury	*Mercurialis perennis*
Dogwood	*Cornus sanguinea*
Elder	*Sambucus nigra*
Elder	*Sambucus nigra*
English oak	*Quercus robur*

Field maple	*Acer campestre*
Hart's tongue fern	*Phyllitis scolopendrium*
Hawthorn	*Crataegus monogyna*
Hazel	*Corylus avellana*
Hazel	*Corylus avellana*
Hogweed	*Heracleum sphondylium*
Holly	*Ilex aquifolium*
Ivy	*Hedera helix*
Lesser celandine	*Ranunculus ficaria*
Lime sp.	*Tilia sp.*
Lords and ladies	*Arum maculatum*
Male fern	*Dryopteris filix-mas*
Norway maple	*Acer sp.*
Pendulous sedge	*Carex pendula*
Small nettle	*Urtica urens*
Snowdrops	*Galanthus sp.*
Spruce sp.	*Spruce sp.*
Sycamore	*Acer pseudoplatanus*
Traveller's joy	*Clematis vitalba*
Wayfaring Tree	*Viburnum lantana*

Appendix E. Phase 2 Survey Results

Bats

Emergence Surveys

E.1. The bat emergence survey results between June 2023 and August 2023 are summarised in Table E-1 below.

Table E-1 – Bat Emergence survey results

Building/ Tree ID	Building/ Tree ID	Survey Number	Emergence Recorded?
Building B1	05/06/2023	1 of 3	No
	10/08/2023	2 of 3	No
	29/08/2023	3 of 3	No
Tree T1	12/06/2023	1 of 3	No
	31/07/2023	2 of 3	No
	14/08/2023	3 of 3	No
Tree T2	12/06/2023	1 of 3	No
	31/07/2023	2 of 3	No
	14/08/2023	3 of 3	No
Tree T3	12/06/2023	1 of 2	No
	31/07/2023	2 of 2	No

Transect Surveys

E.2. The bat transect survey results between April 2023 and August 2023 are summarised in Table E-2 below. Survey data for September to October is not available at the time of writing and will be included within a revision of this EcIA.

Table E-2 - Bat Transect survey results

Transect Number	Month	Dusk or Dawn	Transect ID Results													
			BAR BAR	BIG BAT	EPT SER	MYO SP.	NYC LEI	NYC NOC	NYC SP.	PIP NAT	PIP PIP	PIP PYG	PIP SP.	PLE SP.	RHI FER	RHI HIP	UNKNOWN
T1	April-23	Dusk	0	0	0	0	0	0	0	0	34	1	0	0	0	0	0
	May-21	Dusk	0	0	3	0	22	19	35	1	113	3	0	2	0	0	0
	June-23	Dusk	No data														
	July-23	Dusk	0	0	6	3	0	1	4	1	29	1	0	2	0	0	0
	August-23	Dusk	0	0	0	0	0	0	42	0	75	1	0	2	0	0	0
	October-23	Dusk	0	0	0	0	0	0	2	0	20	8	0	0	0	0	0
	October-23	Pre-dawn	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Transect Totals			***0***	***0***	***0***	***0***	***9***	***3***	***22***	***20***	***83***	***2***	***271***	***15***	***0***	***6***	***0***
Percentage (%)			***0***	***0***	***0***	***0***	***2.08***	***0.69***	***5.10***	***4.64***	***19.25***	***0.46***	***62.87***	***3.48***	***0***	***1.39***	***0***

Static Detector Surveys

E.3. The bat static detector survey results for Static 1 and Static 2 between April 2023 and August 2023 are summarised in Table E-3 below.

Table E-3 – Bat Static Detector survey results

Static Number	Month	Grid reference	Static ID Results														
			BARBAR	BIGBAT	EPTSER	MYOSP.	NYCLEI	NYCNOC	NYCSP.	PIPNAT	PIPPIP *	PIPPYG *	PIPSP.	PLESP.	RHIFER	RHIHIP	UNKNOWN
1	April-23	ST 63751 89027	0	0	2	5	1	14	29	0	172	46	0	0	0	0	0
	May-23		0	0	14	132	0	147	56	0	285	32	0	13	0	0	0
	June-23		0	0	0	158	7	113	49	10	221	10	0	8	0	0	0
	July-23		0	0	10	43	0	57	45	0	334	52	0	17	0	0	0
	August-23		30	0	0	47	0	59	31	0	69	11	0	2	0	0	0
	Early October-23		40	0	37	94	0	3	31	0	118	6	0	5	2	5	0
	Late October-23		9	0	0	15	0	0	13	0	41	28	0	0	2	5	0
Static 1 Totals			**79**	**0**	**63**	**494**	**8**	**393**	**254**	**10**	**1240**	**185**	**0**	**45**	**4**	**10**	**0**
2	April-23	ST 63375 88759	2	0	1	38	0	8	19	0	42	5	0	0	0	0	0
	May-23		0	0	47	17	0	68	177	0	187	85	0	6	0	0	0
	June-23		No data														
	July-23		0	0	0	87	0	13	12	0	103	2	0	1	0	0	0
	August-23		1	0	2	35	0	43	61	0	356	305	1	3	1	0	0
	Early October-23		15	0	20	270	0	7	45	0	306	49	0	2	0	0	0
	Late October-23		1	0	0	33	0	1	2	0	231	75	0	4	0	0	0
Static 2 Totals			**19**	**0**	**70**	**480**	**0**	**140**	**316**	**0**	**1225**	**521**	**1**	**16**	**1**	**0**	**0**
TOTALS			98	0	133	974	8	533	570	10	2465	706	1	61	5	10	0

* Only 10% of files automatically identified as common and soprano pipistrelle bats were manually checked during sound analysis as per the AtkinsRéalis Bat Data Analysis Protocol.

Great Crested Newt

E.4. The great crested newt survey results are summarised in **Table E-4** below.

Table E-4 - Great Crested Newt HSI Survey Results

Pond ID	Location Score	Pond Area Score	Permanence Score	Water Quality Score	Shade Score	Waterfowl Score	Fish Score	Pond Count Score	Terrestrial Habitat Score	Macrophyte Score	HIS Score	HIS Category
Pond 1	1	0.05	1	0.67	1	1	1	1	0.33	1	0.64	Average

Hazel Dormouse

E.5. The hazel dormouse nest tube survey results are summarised in Table E-5 below.

Table E-5 - Hazel dormouse survey results

Survey Tube	Survey Findings						
	26/05/2023	30/06/2023	28/07/2023	22/08/2023	22/09/2023	19/10/2023	07/11/2023
1	Empty	Empty	Empty	Empty	Empty	Empty	Empty
2	Empty	Empty	Empty	Empty	Empty	Empty	Mouse sp. nest
3	Empty	Empty	Empty	Empty	Empty	Empty	Empty
4	Empty	Empty	Empty	Empty	Empty	Empty	Empty
5	Empty	Empty	Empty	Empty	Empty	Empty	Empty
6	Empty	Empty	Empty	Empty	Empty	Empty	Empty
7	Empty	Empty	Empty	Empty	Empty	Empty	Empty
8	Empty	Empty	Empty	Not found	Empty	Empty	Empty
9	Empty	Empty	Empty	Mouse sp. nest	Empty	Empty	Empty
10	Empty	Empty	Empty	Empty	Empty	Empty	Empty
11	Empty	Empty	Not found	Two wood mice in nest	Empty	Empty	Empty

Survey Tube	Survey Findings						
	26/05/2023	30/06/2023	28/07/2023	22/08/2023	22/09/2023	19/10/2023	07/11/2023
12	Empty	Empty	Not found	Not found	Empty	Not found	Empty
13	Empty	Empty	Not found	Not found	Not found	Empty	Empty
14	Empty	Empty	Not found	Empty	Empty	Empty	Empty
15	Empty	Empty	Not found	Not found	Empty	Empty	Empty
16	Empty	Empty	Not found	Empty	Empty	Empty	Empty
17	Empty	Empty	Not found	Empty	Empty	Empty	Empty
18	Empty	Empty	Empty	Empty	Empty	Empty	Empty
19	Empty	Empty	Empty	Empty	Empty	Empty	Empty
20	Empty	Empty	Empty	Not found	Empty	Empty	Empty
21	Empty	Empty	Empty	Empty	Empty	Empty	Empty
22	Empty	Empty	Empty	Not found	Empty	Empty	Empty
23	Empty	Empty	Empty	Empty	Empty	Empty	Empty
24	Empty	Empty	Empty	Empty	Empty	Empty	Empty
25	Empty	Empty	Empty	Not found	Empty	Empty	Empty
26	Empty	Empty	Empty	Empty	Empty	Empty	Empty
27	Empty	Empty	Empty	Empty	Mouse sp. nest	Mouse sp. nest	Empty
28	Empty	Empty	Empty	Not found	Empty	Empty	Empty
29	Empty	Empty	Empty	Empty	Empty	Empty	Empty
30	Empty	Empty	Empty	Empty	Not found	Not checked for H&S reasons – livestock near tube	Empty
31	Empty	Empty	Empty	Empty	Empty	Mouse sp. nest	Empty
32	Empty	Empty	Empty	Empty	Empty	Empty	Empty

Survey Tube	Survey Findings						
	26/05/2023	30/06/2023	28/07/2023	22/08/2023	22/09/2023	19/10/2023	07/11/2023
33	Empty	Empty	Mouse sp. nest	Mouse sp. nest	Empty	Empty	Empty
34	Empty	Empty	Empty	Empty	Empty	Empty	Empty
35	Empty	Empty	Empty	Empty	Empty	Empty	Empty
36	Empty	Empty	Empty	Empty	Empty	Empty	Empty
37	Empty	Empty	Empty	Empty	Empty	Empty	Empty
38	Empty	Empty	Empty	Empty	Empty	Empty	Empty
39	Empty	Empty	Empty	Empty	Empty	Empty	Empty
40	Empty	Empty	Empty	Empty	Empty	Empty	Empty
41	Empty	Empty	Empty	Empty	Empty	Empty	Empty
42	Empty	Empty	Empty	Not found	Empty	Empty	Empty
43	Empty	Empty	Empty	Empty	Empty	Empty	Empty
44	Empty	Empty	Empty	Not found	Empty	Empty	Empty
45	Empty	Empty	Empty	Not found	Empty	Empty	Empty
46	Empty	Empty	Empty	Empty	Empty	Empty	Empty
47	Empty	Empty	Empty	Empty	Empty	Empty	Empty
48	Empty	Empty	Empty	Not found	Empty	Empty	Empty
49	Empty	Empty	Empty	Not found	Mouse sp. nest	Empty	Empty
50	Empty	Empty	Empty	Not found	Empty	Mouse sp. nest	Empty

Hedgerow Surveys

E.6. The hedgerow survey results, including confirmation whether they are species-rich or important under paragraphs 6 and 7 of The Hedgerow Regulations 1997 are summarised in Table E-6 below.

E.7. Associated features are indicated with (*).

Table E-6 - Hedgerow Survey Results

Hedgerow reference	Grid reference	Length (m)	Height (m)	Width (m)	No. of woody species	Public right of way running parallel	*A bank or wall which supports the hedgerow along ½ of its length	*Gaps which in aggregate <10% of the length of the hedgerow.	*At least one standard tree where the length of the hedgerow <50m.	*At least two standard trees where the length of the hedgerow >50m but <100m.	*A number standard of trees that averages over its total length to at least one for each 50m, in hedgerows > 100m (or at least three woodland species within 1 m)	*A ditch along ½ of the length of the hedge row.	*Connections (with another hedgerow, woodland or pond) scoring 4 points or more.	*A parallel hedge within 15 m of the hedgerow.	No. of associated features	Important hedgerow? Yes/No	Species-rich hedgerow? Yes/No
H1	ST 63419 88684	103	3-4	1.5-2	6	No	Yes	No	No	No	Yes	No	No	Yes	3	Yes	Yes
H2	ST 63557 88979	115	5	3	5.5	Yes	No	Yes	No	No	Yes	No	No	No	2	Yes	Yes

Hedgerow reference	Grid reference	Length (m)	Height (m)	Width (m)	No. of woody species	Public right of way running parallel	*A bank or wall which supports the hedgerow along ½ of its length	*Gaps which in aggregate <10% of the length of the hedgerow.	*At least one standard tree where the length of the hedgerow <50m.	*At least two standard trees where the length of the hedgerow >50m but <100m.	*A number standard of trees that averages over its total length to at least one for each 50m, in hedgerows > 100m (or at least three woodland species within 1 m)	*A ditch along ½ of the length of the hedgerow.	*Connections (with another hedgerow, woodland or pond) scoring 4 points or more.	*A parallel hedge within 15 m of the hedgerow.	No. of associated features	Important hedgerow? Yes/No	Species-rich hedgerow? Yes/No
H3	ST 63528 89030	72	5	2-4	4.5	Yes	No	Yes	No	Yes	No	No	No	No	2	Yes	Yes
H4	ST 63686 89143	140	N/A	N/A	6 (across whole hedgerow)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
H5	ST 63549 88840	271	5	3	5	Yes	No	Yes	No	No	Yes	No	No	No	2	Yes	Yes
H6	ST 63544 89270	64	2 - 3	1.5-2	2	Yes	No	Yes	N/A	Yes	Yes	No	No	No	3	No	No

Appendix F. Phase 2 Survey Figures

Bat Activity Transect and Static Detector Location


N
SP 8
End
Start
SP 1
SP 2
Static 1
SP 7
SP 3
SP 6
Static 2
SP 5
SP 4
ATKINS
Member of the SNC-Lavalin Group
Legend
Static locations
Transect stopping point (SP) locations
Transect route
0
50
100 m
Original Scale: 1:3,000
Version: 1
Base Mapping: © Google Satellite and its contributors
Atkins Limited © 500 Park Avenue, Almondsbury, Bristol, Avon, BS32 4RZ
Client: South Gloucestershire Council
Project: Alveston Hill Cycleway
Job No: 5220316
Title: Bat Transect and Static Detector Locations Plan
Figure No: 1
Drawn by: SH Date: 11/05/23
Checked by: JL Date: 14/11/23
Reviewed by: AW Date: 15/11/23

Hazel Dormouse Nest Tube Locations


N
B4061
Alveston Hill
Wotton Hall
ATKINS
Member of the SNC-Lavalin Group
Legend
Hazel Dormouse
Nest Tube Locations
0
50
100 m
Original Scale: 1:3,000
Version: 1
Base Mapping: © Google Satellite and its contributors
Atkins Limited © 500 Park Avenue, Almondsbury, Bristol, Avon, BS32 4RZ
Client: South Gloucestershire Council
Project: Alveston Hill Cycleway
Job No: 5220316
Title: Dormouse Nest Tube Locations Plan
Figure No: 1
Drawn by: AB
Date: 07/09/23
Checked by: EMc
Date: 11/09/23
Reviewed by: EH
Date: 10/11/23

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