

Alveston Hill Cycle Route

Bat Survey Report

South Gloucestershire Council

November 2023



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This document has 37 pages including the cover.

Report Validity

In the event of scope or programme changes or if works do not commence within 12 months of the date of this report, then updates to the surveys may be required to ensure the validity of the data, as per Chartered Institute of Ecology and Environmental Management (CIEEM) guidance¹.

Document history

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

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1. Introduction

1.1. Background

AtkinsRéalis was commissioned by South Gloucestershire Council (SGC) to undertake a suite of bat surveys in connection with the proposed Alveston Hill Cycle Route scheme hereafter referred to as the 'Proposed Scheme').

The Proposed Scheme is located between the villages of Alveston and Thornbury (herein referred to as 'the Site'; as shown in **Appendix A**).

A Preliminary Ecological Appraisal (PEA) report completed in April 2023² concluded that the habitats within the Site potentially affected by the Scheme (hedgerow network, trees and a structure) had potential to support bats. This report details the results of the bat surveys completed at the Site in 2023 and can be used to inform design development, Site layout and/or Site investigations. This is a report to outline any avoidance/ mitigation measures and make recommendations in relation to bat species within the Site.

Opportunities to provide biodiversity enhancements in accordance with local, regional and national biodiversity planning strategies are also identified in this report where relevant.

1.2. The Site

The Site, Alveston Hill, is situated between the village of Alveston and the town of Thornbury in the county of South Gloucestershire.

The Site is centred at Ordnance Survey National Grid reference (OSNGR) ST 63442 88851 (as presented in **Appendix A**) and comprises part of two agricultural fields adjacent to/ east of Alveston Hill road (B4061) (Survey Area). A public footpath runs through both fields, to the east of the area covered by the Application Site. Alveston Hill road is lined with trees and shrubs. Thornbury Leisure Centre is located north of the Site.

Habitats adjacent to the Site include agricultural fields, broad-leaved trees and hedgerows, a small pond associated with a drainage ditch with small stream and scrub. Habitats within the wider landscape beyond the Survey Area 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. A large quarry is also located approximately 2.4 km east of the Site.

1.3. The Proposed Scheme

The full Alveston Hill Cycle Route scheme includes the following elements:

1. Two-way cycle track and footway to run along the eastern side of B4061 between Alveston Hill and the A38;
2. Pedestrian and cycling crossings at Down Road and Alveston Hill; and
3. Off-road segregated walking and cycling path linking Thornbury Leisure Centre in the north to Alveston Hill further south.

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. The proposed off-road segregated footpath and cycleway (point 3 above) does not fall under permitted development and therefore requires planning permission. Only the off-road segregated footpath and cycleway is included in this assessment and Survey Area.

This off-road section 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 treatment to the private land beyond. The route includes soft landscaping and opportunities for seating/ recreation spaces for visual amenity and functionality purposes.

In addition to running through a field, the route passes through existing tree groups and hedgerows. Part of these green infrastructure features will need to be removed to facilitate the development include: a section of hedgerow along the south-west boundary of the Site, a section of the hedgerow which runs roughly east to west across the centre of the Site dividing the two field parcels, and complete removal of a hedgerow and two groups of trees in the northern section.

² Atkins (2023) Preliminary Ecological Appraisal Report Alveston Hill Cycle Route. April 2023

At either end of this section of route, it 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 on a habitat survey plan (see **Appendix A**).

1.4. Scope of the Assessment

This report presents the following bat survey information obtained during 2023:

- Transect Surveys (April 26/04/2023; May 18/05/2023; June 26/06/2023; July 24/07/2023; August 22/08/2023; October 26/10/2023 & 27/10/2023);
- Static Detector Recording (April 26/04/2023 – 30/04/2023; May 18/05/2023 – 22/05/2023; June 26/06/2023 – 30/06/2023; July 24/07/2023 – 28/07/2023; August 22/08/2023 – 26/08/2023; October 04/10/2023 – 11/10/2023, and 26/10/2023 – 30/10/2023);
- Emergence Surveys (Building 1 - 05/06/2023; 10/08/2023; 29/08/2023; Trees 1, 2 and 3 - 12/06/2023; 31/07/2023; Trees 1 and 2 – 14/08/2023); and
- Ground Level Tree Assessment (GLTA) – 11/10/2023.

The scope of the assessment was to assess the potential impacts of the Proposed Scheme, either during the construction of operational phase, on foraging, commuting and roosting bats, and therefore make further recommendations for survey and/ or mitigation, as necessary, to minimise impacts on the bat population within the Site.

1.5. Legislation and Relevant Policy

All UK bat species are European Protected Species (EPS)³ and listed on the Conservation of Habitats and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act 1981 (as amended).

These two pieces of legislation make it illegal to:

- Deliberately⁴ capture, injure or kill a bat;
- Deliberately disturb⁵ a bat;
- Damage or destroy a breeding Site or resting place used by a bat; or
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb⁶ a bat in such a place.

Seven species of bat (barbastelle, Bechstein's, noctule, soprano pipistrelle, brown long-eared, greater horseshoe and lesser horseshoe) are listed under section 41 of the 'Natural Environment and Rural Communities (NERC) Act 2006' as Species of Principal Importance for Conservation in England. Section 40 of the NERC Act requires that local and regional authorities have regard to the conservation of biodiversity in England when carrying out their normal functions. Additionally, four UK species (greater horseshoe, lesser horseshoe, barbastelle and Bechstein's bat) are listed under Annex II of the Habitats Directive³ for which one or more Special Area of Conservation (SAC) is designated. Lesser horseshoe bats are listed as a priority species in the South Gloucestershire Biodiversity Action Plan⁷.

Within South Gloucestershire Council's Local Plan Core Strategy⁸, Policy CS9: Managing the Environment and Heritage, sets out the objectives of conserving and enhancing the district's distinctive landscapes, natural environmental resources and biodiversity. This policy states that new development will be expected to conserve and enhance the natural environment, avoiding or minimising impacts on biodiversity and geodiversity and conserve and enhance the character, quality, distinctiveness, and amenity of the landscape. Within South

³ Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) (21/05/1992)

⁴ Deliberate capture or killing is taken to include "accepting the possibility" of such capture or killing.

⁵ Deliberate disturbance of animals includes in particular any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to affect significantly the local distribution or abundance of the species to which they belong.

⁶ Lower levels of disturbance not covered by the Conservation of Habitats and Species Regulations 2017 remain an offence under the Wildlife and Countryside Act 1981 although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided.

⁷ South Gloucestershire Council, 2016. *South Gloucestershire Biodiversity Action Plan 2016-2026* [pdf] Available at: < <https://beta.southglos.gov.uk/static/e25ebdbd66bf0d60a81b9501a5427a7f/Biodiversity-Action-Plan-2016-26.pdf> > [Accessed 22 August 2023]

⁸ South Gloucestershire Council, 2013. *South Gloucestershire Local Plan: Core Strategy 2006-2027* [pdf] Available at: < <https://beta.southglos.gov.uk/static/f149e2bb1bf00a972238eb11eb06d132/South-Gloucestershire-Core-Strategy-2006-2027.pdf> > [Accessed 22 August 2023].

Gloucestershire Council's Policies, Sites and Places (PSP) plan⁹, Policy PSP19: Wider Biodiversity, states that biodiversity gain will be sought from development proposals. Land with low to negligible nature conservation value (such as pasture or arable land) can be used for provision of new semi-natural habitat, which would provide gains for local wildlife.

⁹ South Gloucestershire Council, 2017. *South Gloucestershire Local Plan: Policies, Sites and Places Plan Adopted November 2017*. [pdf] Available at < <https://beta.southglos.gov.uk/static/90efa5d673f208a3109ed111ba963a01/PSP-Plan-Nov2017.pdf>> [Accessed 22 August 2023]

2. Methodology

2.1. Surveyor Competencies

All surveys were led by surveyors who have been assessed to be at least of capable experience in undertaking bat surveys, according to the Chartered Institute of Ecology and Environmental Management (CIEEM) competency framework¹⁰.

2.2. Activity Surveys

All surveys were completed in accordance with best practice guidance¹¹ which was relevant at the time of designing and undertaking the surveys. Since the survey completion, updated guidelines have been released in September 2023¹². These new guidelines have been considered within the Results and Discussion and Recommendation chapters of this report. The survey findings have been reviewed in accordance with this guidance update to ensure that any recommendations for further survey accurately reflect current good practice.

2.2.1. Bat Transect Surveys

One bat transect route was devised by AtkinsRéalis, as shown in B1 in **Appendix B**. The route was designed to cover all habitats within the Site and remainder of the field parcels which were deemed suitable for use by commuting and foraging bats. The weather conditions at the time of each survey are detailed in B2 in **Appendix B**.

The transect surveys were completed once per month between April and October, in line with the required survey effort for a moderate suitability Site¹¹, with dusk surveys completed on 26/04/2023, 18/05/2023, 26/06/2023, 24/07/2023, 22/08/2023, and 26/10/2023, and a pre-dawn survey completed on 27/10/2023. All surveys were completed by two surveyors.

Dusk surveys commenced at sunset and continued for two hours, while the pre-dawn survey in October commenced two hours before sunrise and continued until sunrise. **Error! Bookmark not defined.** Eight listening points were located along the transect route. 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.

Surveyors were equipped with full-spectrum Batlogger M2 bat detectors. Details of the technical settings are provided in **Appendix C**.

2.2.2. Static Detector Surveys

In line with good practice guidelines for surveying a moderate suitability Site¹¹, 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 1 below.

A map illustrating the locations of static detector deployment can be found in B1 in **Appendix B** and recorded weather conditions across the deployment period can be found in B3 in **Appendix B**.

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

Details of the technical settings relating to the bat static detectors are provided in **Appendix C**.

¹⁰ CIEEM (2021). Competency Framework. [Available at: <https://www.cieem.net/competency-framework>]

¹¹ Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London.

¹² Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London.

Table 1. Static Detector Contextual Information

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

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 Wunderground¹³ 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 2. 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	26 th – 30 th April
May	18/05/2023	24/05/2023	5	18 th – 22 nd May
June	26/06/2023	03/07/2023	5	26 th – 30 th June
July	24/07/2023	03/08/2023	5	24 th – 28 th July
August	22/08/2023	29/08/2023	5	22 nd , 25 th - 28 th August
October	04/10/2023	11/10/2023	5	6 th – 10 th October
October	26/10/2023	01/11/2023	5	27 th – 31 st October

2.2.3. Bat Call Analysis

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.

Following the Atkins 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).

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 framework¹⁰. 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.

QA was then completed by sound analysts of at least accomplished level following the CIEEM competency framework. The QA checked 10% of all manual identifications of bat species. In order for the data set to pass

¹³ www.wunderground.com

quality assurance, there had to be a 90% accuracy, or agreement, between the person carrying out QA and the sound analyst.

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.

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.

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 3 below.

Table 3. Species Naming Conventions during Sound Analysis

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

2.3. Emergence Surveys

The walkover survey undertaken in February 2023 to inform the PEA report identified the following buildings and trees with suitability to support roosting bats:

- Moderate suitability: One oak tree (Tree 3); and
- High suitability: One building (B1) and two trees (Tree 1 and Tree 2).

A map illustrating the locations of B1, T1, T2 and T3 can be found in D1 in **Appendix D**.

All other buildings/ trees were found to have negligible potential to support roosting bats during the PEA walkover.

To determine whether the structure and trees identified as having moderate or high suitability for roosting bats support bat roosts, dusk emergence surveys were carried out between June and August 2023.

The number of emergence surveys completed was determined by the structure or tree suitability; moderate suitability structures or trees were subject to two surveys; and high suitability structures or trees were subject to three surveys.

Dusk emergence surveys were undertaken in the evening, from fifteen minutes before sunset until up to 1.5 hours after sunset.

Surveyors were situated to view all aspects of the building and trees, watching for bats emerging from any visible Potential Roost Features (PRFs). Surveyors were supported with the use of bat detectors (Anabat Walkabout and Batlogger M2) as well as infra-red (IR) cameras (Canon XA11 and XA40) and IR lights.

Any bat species and number of bats observed emerging from the building or structure were recorded along with a sketch and photograph of the location on the building/ tree in which the bat emerged from.

The survey details are summarised in D2 in Appendix D.

2.4. Ground Level Tree Assessment Surveys

At the time when the PEA report was written, the scope of works had not been finalised. However, it was identified that following the issue of the report that seven trees and a hedgerow in the northern section of the Site were due to be removed to facilitate the Proposed Scheme. This tree group and hedgerow had not been included in the original PEA scope and therefore a Ground Level Tree Assessment (GLTA) of the trees in the northern section was carried out on 11/10/2023.

A detailed visual examination was carried out for seven trees in the northern section of the Site (see Habitat Survey Plan in **Appendix A**) during daylight hours and was aided with the use of binoculars and a bright torch. The exterior of the trees were searched for Potential Roost Features (PRFs) such as woodpecker holes, rot holes, cracks, dense ivy and flaking bark. Each tree (or groups of trees) were categorised for their suitability to support bats in accordance with the highest value PRF noted on the tree.

2.5. Survey Limitations

2.5.1. General Bat Survey Limitations

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.

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.

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 Site.

2.5.2. Transect Survey Limitations

During the May transect listening points 3, 4, 5 and 6 were only visited once. Due to cattle presence comprising 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 route had been covered once 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), and the lack of tall vegetation within each field parcel which would obscure view across the field/ block the detector from picking up calls, this is not considered to be a significant limitation to the surveys.

The September transect was cancelled due to adverse weather conditions, therefore no transect data was collected during September. However, deployment of the statics was rearranged for the first week of October in order to capture data as close to the month of September as possible. Moreover, in line with current guidelines, transect surveys can occur once per season (Spring – April/ May, Summer – June/ July/ August or Autumn – September/ October), therefore one survey was carried out over the Autumn season.

2.5.3. Static Detector Survey Limitations

Batlogger 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 Site across several months. Moreover, the survey was completed by a bat licenced surveyor who is 'Capable'¹⁰ for sound analysis and bat activity was recorded on paper during the survey therefore it is considered the surveyor had a good understanding of the species recorded during the survey.

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 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.

3. Results

3.1. Activity Surveys

3.1.1. Transect Surveys

A summary of transect survey results is given below, with detailed results provided in Appendix B.4.

The Site, and in particular the habitats found within and around the eastern and western boundaries as well as the central hedgerow which divides the northern and southern fields, were confirmed as providing foraging and commuting habitats for at least eight species of bat: common pipistrelle, soprano pipistrelle, Nathusius', serotine, *Myotis* sp., Leisler's, noctule, *Nyctalus* sp., and *Plecotus* sp.

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.

The highest frequency of calls was recorded during the May 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. This suggests the Site may support foraging and commuting bats during the maternity period.

Observations taken during the transect surveys noted that the hedgerow located in the centre of the Site and the tree line present along the eastern boundary of the southern field saw more frequent bat activity during the surveys. This suggests these are important hedgerows for commuting and foraging bats across the Site and wider landscape. The central hedgerow which divides the north and south fields will be directly impacted by the Scheme, as the proposed cycle route passes through this hedgerow.

3.1.2. Static Detector Surveys

A summary of static detector survey results is given below, with detailed results provided in Appendix B.5.

At least nine species of bat were recorded on each of the static detectors over the entire survey period, comprising barbastelle, serotine, *Myotis* species, noctule, *Nyctalus* species, common pipistrelles, soprano pipistrelles, *Plecotus* sp., and greater horseshoe bats (an Annex II species). Greater horseshoes were recorded on static 1 during October and on static 2 during the August deployment period. Lesser horseshoe bats were recorded on static 1 during October.

Similar to the transect results, common pipistrelle was the most frequently recorded species on both static detectors, making up 43.22% of the total calls recorded across the Site. Barbastelle, serotine, *Plecotus* species, 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).

As with the transect survey results, the highest number of calls were recorded during the May and August surveys. 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.

3.1.3. Activity Survey Summary

Three Annex II species, greater and lesser horseshoe bats and Barbastelle bats were recorded during the static surveys. However, for greater horseshoe bats this was a single pass at static 2 during the August static deployment and two passes on static 1 during the October static deployment. For lesser horseshoe bats the recordings included five passes during both of the October static deployments. There is potential these bats are part of the population associated with the North Somerset and Mendip bats Special Area of Conservation (SAC), Bath and Bradford-on-Avon Bats SAC, the Wye Valley & Forest of Dean Bat Sites SAC or the Wye Valley Woodlands SAC which are within 30 km of the Site; however, there is insufficient evidence to confirm this, and

due to the low number of records, the Site is not considered to represent a key foraging or commuting resource for greater or lesser horseshoe bats.

Habitats present within the Site including native species rich hedgerows with trees, ditches, mixed scrub and bramble scrub have been identified as suitable habitat to support foraging and commuting bats. These features provide connectivity to the wider landscape. The central and western aspects of the Site are currently not lit by artificial lighting and therefore provide a good dark commuting corridor for light-sensitive species such as *Myotis* species, horseshoe species and long-eared bats. On this basis, the Site is considered to be of moderate suitability for commuting and foraging bats.

The Site predominantly supports common pipistrelle bats who use the Site for commuting and foraging, with barbastelle, serotine, *plecotus* species, soprano pipistrelle, noctule, *Myotis* sp., and *Nyctalus* sp. being the 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 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 England¹⁴. Taking into account the moderate habitat suitability for commuting and foraging bats within and adjacent to the Site, and considering the number of bat species recorded during the surveys, including three Annex II species, bats are considered to be important on a County level.

The extent of vegetation clearance includes loss of linear scrub in use by commuting and foraging bats, severance of the central, a southern and a northern hedgerow, and removal of seven trees in the northern section located within the Site to facilitate the approximate 15 m-wide off-road segregated walking and cycling path from Alveston Hill to Thornbury Leisure Centre.

In consideration of the above, foraging and commuting bats are considered to pose a constraint to the Scheme and recommendations have been provided in Section 4 below.

3.2. Emergence Surveys

The presence/ likely absence dusk emergence surveys did not find any evidence of bats using the building (B1) and three trees (T1, T2 and T3) for roosting.

Therefore, it is concluded that this structure and these trees did not support a bat roost at the time of survey, and likely absence can be assumed. Habitats present within the Site are not considered to provide suitable habitat for roosting greater horseshoe bats¹⁵, 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. Moreover, habitats within the Site are also not considered to support roosting lesser horseshoe bats¹⁶, which are usually found in the roofs of larger rural houses and stable blocks offering a range of roof spaces as well as nearby cellars, caves or tunnels where the bats can go torpid in inclement weather. Such spaces have not been recorded to be present within or adjacent to the Site. The building on Site is an open sided barn used for housing livestock. Potential roosting features recorded were assessed as being suitable to support crevice dwelling bats only.

No direct impacts to the building or the three trees subject to emergence surveys are anticipated as a result of the Scheme. No further surveys are recommended.

3.3. GLTA Surveys

Seven trees are to be removed in the northern section (See Habitat Survey Plan in **Appendix A**). One willow tree species located at OSNGR ST6354489273 had 'low' (PRF-I) suitability to support roosting bats due to its poor condition with lifted bark on the limbs of the south eastern aspect (TN17 on Habitat Survey Plan in **Appendix**

¹⁴ 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].


¹⁵ 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

¹⁶ Bat Conservation Trust. Lesser Horseshoe Bat Fact Sheet. Available at: https://cdn.bats.org.uk/uploads/pdf/About%20Bats/lesserhorseshoe_11.02.13.pdf?v=1541085180&_gl=1*pu6xdj*_ga*MTY1MzI5Nzk2MC4xNjkyODg4OTgx*_ga_G28378TB9V*MTY5OTk1MjAzOC4yNC4xLjE2OTk5NTI1MzguMC4wLjA.

A and outlined in **Table 3-1** below). All other trees had no suitability to support roosting bats, therefore no further surveys are recommended. Recommendations for TN17 are outlined in Section 4 below.

In the event of scope or programme changes or if works do not commence within 12 months of the date of this report, further surveys may be required to ensure the validity of the data, as per CIEEM guidance¹⁷.

Table 3-1 - GLTA Results

Tree reference	Description of PRF	Photograph
TN17	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	

¹⁷CIEEM, 2019. Advice Note on the Lifespan of Ecological Reports and Surveys.

4. Recommendations

No evidence of bat roosts has been identified within the Site thus far, therefore it is considered unlikely that bats use structures or trees within the Site for roosting. Bats and their roosts are therefore unlikely to be impacted as a result of the Scheme.

However, the transect and static surveys confirmed that bats, including light sensitive species, use habitats within the Site for foraging and commuting, particularly at the central hedgerow (H2) which is due to be severed to facilitate the Scheme. The suitable habitat throughout the Scheme is well connected to further extensive areas of broadleaved woodland habitat and a network of hedgerows across the wider landscape. Considering the species assemblage, bats are considered to be important on a County level.

Therefore, avoidance, mitigation and enhancement measures are recommended below. The recommendations below, as well as further details, will be outlined within a Landscape Ecology Management Plan (LEMP) once the planning application has been determined.

4.1. Avoidance/ Mitigation

- The Scheme will partially pass through two hedgerows in the southern area of the Site (H1) and in the centre of the Site (H2) and the removal of a hedgerow (H6) in the northern section of the Site, totalling 83m of hedgerow loss. The gap to be created in H2 will be in addition to the existing Public Right of Way's (PRoW) current gap. The creation of additional gaps could sever the hedgerow, making it less suitable as a wildlife commuting corridor. Retention of this key commuting corridor must therefore be achieved via a 'hop-over': bats can be encouraged to fly high over the Scheme by enhanced planting or allowing mature trees to overhang the cycleway/ footpath so that their crowns bridge the gap above;
- New hedgerow should be planted to mitigate for the loss of hedgerow within the Scheme works, and also to enhance the landscape. New hedgerow should be similar to the lost hedgerow, in terms of species composition and richness, providing a wide range of food sources for bats, outline details of which are provided within the hedgerow report;
- As it is currently understood, there will be the loss of 15 trees in total in the northern section adjacent to the leisure centre will be removed. One of these trees (TN17) has 'low' (PRF-I) suitability to support roosting bats. The remaining six trees have no suitability to support roosting bats. A Precautionary Method of Working (PMW) should be produced for tree TN17 prior to the commencement of construction. The PMW will specify the requirement of a bat licensed Ecological Clerk of Works (ECoW) to provide a toolbox talk to contractors, undertake an endoscope inspection of TN17 on the same day of works and will detail the protocol contractors must follow in the unlikely event a bat and/ or bat roost is encountered during works. Should bats be identified during the construction process, it is likely a mitigation licence from Natural England will be required to facilitate works; and
- Retaining ecologically functional 'dark corridors' and key habitats for bats within the Scheme is the most preferred option wherever feasible (in preference to seeking lighting mitigation strategies). As it is currently understood, there is no proposed artificial lighting for this Scheme.

4.2. Enhancement

The Scheme will include ecological enhancement features to align with South Gloucestershire's Core Strategy on protecting and enhancing the landscape for biodiversity. This will include planting of new hedgerows and grassland habitat, and the creation of two new ponds, all of which may benefit bats through providing increased foraging opportunities. The location of the proposed habitat creation is provided within a landscape general arrangement plan in **Appendix E**.

4.2.1. Roosting Provision

- Ecological enhancements could include the installation of species appropriate bat boxes on retained mature trees where appropriate within the Site. Based on species confirmed as being present within the Site, suitable units include 2F Schwegler Bat Box and 2FN Schwegler bat box, or similar. Boxes should be

positioned where they are sheltered from wind and artificial lighting, and within close proximity to suitable commuting and foraging habitat. An ecologist should advise on the locations.

4.2.2. Hedgerow Creation

- Hedgerow planting will reconnect the landscape adjacent to the works and provide important wildlife corridors. Native flower and fruit bearing tree and shrub species of local provenance should be used within the planting to attract terrestrial invertebrates which provide food sources for bats. Planting a variety of species will help to provide diverse habitat and a species rich community.

4.2.3. Grassland Enhancement

- Existing grassland habitat adjacent to woodland and hedgerows will be subject to a management regime to improve the current condition of the grassland, with the aim of providing dense ground level cover for fauna, and foraging habitat for bats, through an increase in prey availability (e.g., insects), due to the increase in wildflowers/flora available.

4.2.4. Pond Creation

- Two new ponds will be created within the Scheme, which will support terrestrial invertebrates which in turn would be a resource of food and support foraging bats.

5. Conclusions

Overall, at least nine species of bats are found to utilise the Site for foraging and commuting, with the majority of activity levels located at the central hedgerow. No roosts have been identified within the Site.

It is concluded that the Scheme is unlikely to significantly impact bats. However, the creation of an additional approximate gap in the southern and central hedgerow will sever these hedgerows, making it less suitable as a wildlife commuting corridor. Retention of these key commuting corridors must therefore be achieved via a 'hop-over' through the addition of planting or allowing mature trees to overhang the cycleway/footpath so that their crowns bridge the gap above.

A Precautionary Method of Working (PMW) should be produced for tree TN17 prior to the commencement of construction. The PMW will specify the requirement of a bat licensed Ecological Clerk of Works (ECoW) to provide a toolbox talk to contractors, undertake an endoscope inspection of TN17 on the same day of works and will detail the protocol contractors must follow in the unlikely event a bat and/ or bat roost is encountered during works.

It is recommended that in order to adhere to local planning policy, enhancements are included within the Scheme. Given the presence of foraging and commuting bats within the Site, it is recommended this includes the creation of new hedgerows and two ponds, and enhancement of existing grassland habitat to provide additional foraging and commuting resources for bats. These new and enhanced habitats would also provide suitable habitat for a number of other species.

In the event of scope or programme changes or if works do not commence within 12 months of the date of this report, further surveys may be required to ensure the validity of the data, as per CIEEM guidance¹⁸.

¹⁸ CIEEM, 2019. Advice Note on the Lifespan of Ecological Reports and Surveys.

Appendices




Appendix A. Proposed Scheme Boundary and Habitat Survey Plans

The Site is indicated by the Survey Area shown on the habitat plan below. Hedgerows H1 (ST 63419 88684), H2 (ST 63557 88979), H3 (ST 63528 89030), H4 (ST 63686 89143), H5 (ST 63549 88840), and H6 (ST 63544 89270) are shown by a green dashed line, labelled with a black circle, on the habitat survey plan below.





Member of the SNC-Lavalin Group



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



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





Member of the SNC-Lavalin Group



Legend

- Application Site boundary
- Scheme route
- Survey area

UK Habitat (lines)

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

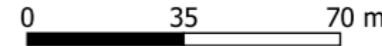
UK Habitat (polygon)

- 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



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

Appendix B. Bat Activity Surveys

B.1. Transect Route and Static Detector Locations Plan



B.2. Transect Surveys: Weather

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

B.3. Static Detector Surveys: Weather

Survey month	Date	Temperature (°C) at sunset	Peak Rain ¹	Peak Bftph ²	Suitability
April	26/04/2023	11	0	2	Good
	27/04/2023	10	1	2	Good
	28/04/2023	15	0	2	Good
	29/04/2023	15	0	2	Good
	30/04/2023	13	1	1	Good
May	18/05/2023	18	0	1	Good
	19/05/2023	17	0	1	Good
	20/05/2023	18	0	1	Good
	21/05/2023	18	0	0	Good
	22/05/2023	18	0	2	Good
June	26/06/2023	17	0	0	Good
	27/06/2023	19	0	1	Good
	28/06/2023	18	1	1	Good
	29/06/2023	17	0	0	Good
	30/06/2023	17	1	1	Good
July	24/07/2023	16	1	0	Good
	25/07/2023	18	0	0	Good
	26/07/2023	16	1	1	Good
	27/07/2023	18	0	1	Good
	28/07/2023	16	0	1	Good
August	22/08/2023	17	0	0	Good
	25/08/2023	13	1	0	Good

Survey month	Date	Temperature (°C) at sunset	Peak Rain ¹	Peak Bftph ²	Suitability
	26/08/2023	13	1	0	Good
	27/08/2023	15	1	0	Good
	28/08/2023	15	0	1	Good
October	06/10/2023	16	2	2	Good
	07/10/2023	16	0	1	Good
	08/10/2023	15	0	1	Good
	09/10/2023	16	0	1	Good
	10/10/2023	15	1	1	Good
	27/10/2023	10	3	1	Good
	28/10/2023	10	2	1	Good
	29/10/2023	11	1	3	Good
	30/10/2023	11	2	1	Good
	31/10/2023	11	3	2	Good

Peak Rain¹ on a scale of 0-5. 0 = dry, 1 = light drizzle, 2 = light rain, 3 = moderate rain, 4 = heavy rain, 5 = torrential rain

Peak Bftph² score 0-12 against the Beaufort scale. 0=calm, 2 = light breeze, 4 = moderate breeze, 6 = strong breeze, 7 = high wind, 9 = strong gale, 12 = hurricane.

B.4. Transect Surveys: Detailed Results

Transect Number	Month	Dusk or Dawn	Transect ID Results														
			BARBAR	BIGBAT	EP T 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
	Early October-23	Dusk	0	0	0	0	0	0	2	0	20	8	0	0	0	0	0
	Late October-23	Pre-dawn	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Transect Totals			0	0	9	3	22	20	83	2	271	15	0	6	0	0	0
Percentage (%)			0	0	2.08	0.69	5.10	4.64	19.25	0.46	62.87	3.48	0	1.39	0	0	0

Transect 1 – 10 bat passes were recorded along the central hedgerow being severed (all either common or soprano pipistrelle species).

Transect 2 – approx. 160 bat passes were recorded along the central hedgerow being severed (99 common pipistrelles, 17 noctules, 24 *Nyctalus* sp, 18 Leisler's, one *Plecotus* sp).

Transect 3 – no data could be processed due to error in file processing

Transect 4 – approx. 16 bat passes were recorded along the central hedgerow being severed (seven serotine, two *Plecotus* sp., three common pipistrelle, one soprano pipistrelle, two *Nyctalus* sp., one Nathusius pipistrelle)

Transect 5 – approx. 24 bat passes were recorded along the central hedgerow being severed (22 common pipistrelle, two *Nyctalus* sp.)

Transect 6 – one bat pass from a soprano pipistrelle was recorded along the central hedgerow being severed.

B.5. Static Detector Surveys: Detailed Results

Static Number	Month	Grid reference	Static 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	
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	0
	August-23		1	0	2	35	0	43	61	0	356	305	1	3	1	0	0	0
	Early October-23		15	0	20	270	0	7	45	0	306	49	0	2	0	0	0	0
	Late October-23		1	0	0	33	0	1	2	0	231	75	0	4	0	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 Atkins Bat Data Analysis Protocol.

Appendix C. Technical Settings

C.1. Batlogger M2 Bat Detector Settings

Setting	Value
Audio Division Ratio	Jan-23
Trigger Window	3 secs
Max Trigger length	15 secs
Save Noise files	ON
Auto-ID Sensitivity	Sensitive
Gain	Medium
Trigger Sensitivity	High
Sample Rate	256K*

(*384k samples per second at 16 bits. Where possible, this sample rate was used.)

C.2. Anabat Walkabout Bat Detector Settings

Setting	Value
Audio Division Ratio	16
Trigger Window	2 secs
Max Trigger length	20 secs
Save Noise files	ON
Auto-ID Sensitivity	19 (Sensitive)
Gain	Setting of the Walkabout is fixed and is not user adjustable. The gain of amplifier is configured to suit the full dynamic range of the microphone, so no adjustment is required.
Trigger Sensitivity	High
Sample Rate	16 bit resolution, 500ksps sample rate

C.3. Song Meter SM4BAT-FS Bat Detector Settings

Setting	Value
Position	Lat: 51.59792 N / Long: -2.52810 W
Trigger Window	3 secs
Max Trigger Length	15 secs
Min Pulse Duration	1.5 ms
Max Pulse Duration	None
Min Trigger Frequency	16 kHz
Trigger Level	12 dB
Save Noise files	ON
Compression	None

Gain	12 dB
16k High Filter	Off
Sample Rate	384 kHz

Appendix D. Building and Tree Emergence Surveys

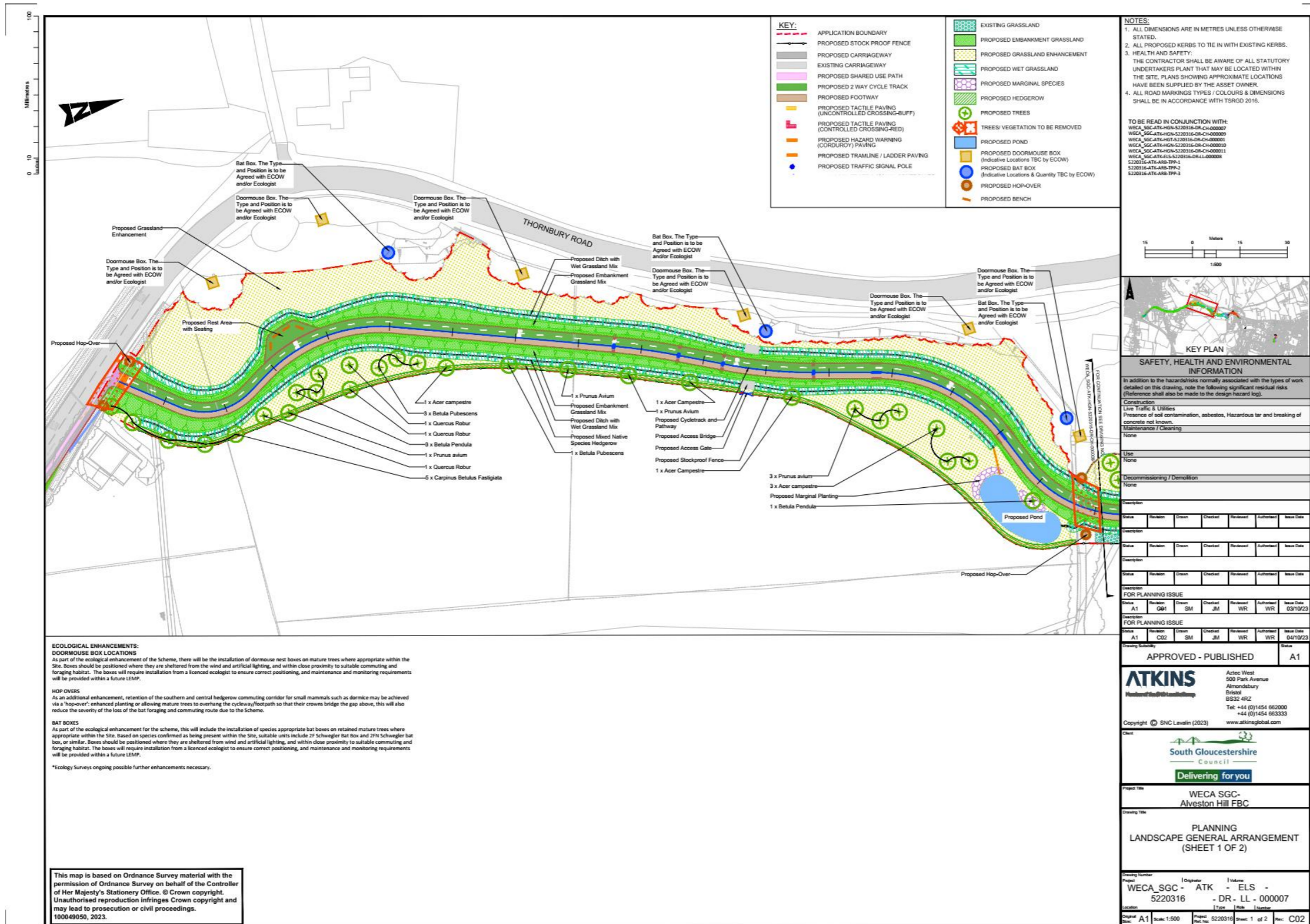
D.1. Location of building and trees

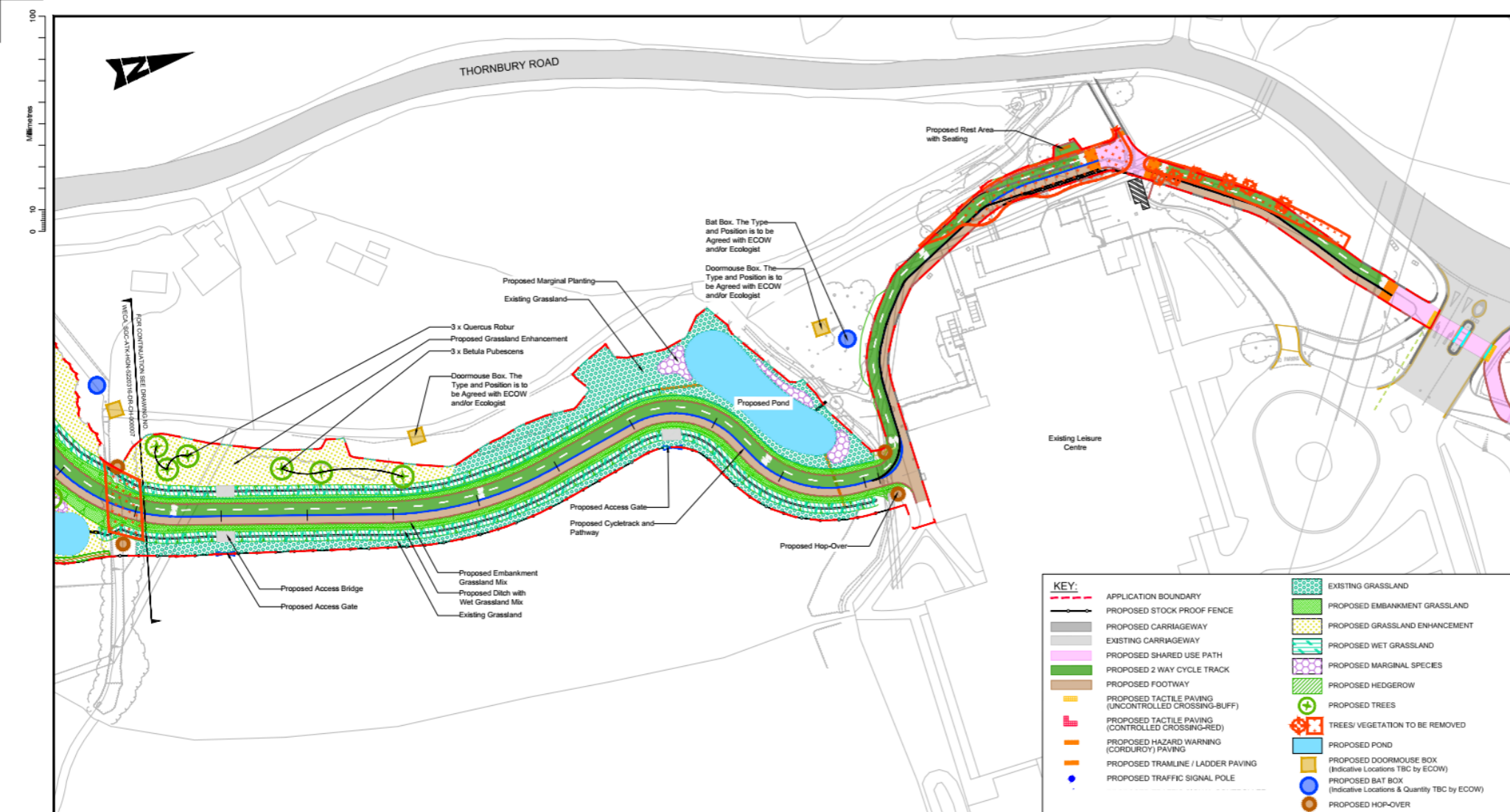


D.2. Emergence Surveys: Weather and Results

Survey date	Building/tree Name	Building/tree Number	OSGR	Survey Number (1, 2, 3)	Survey Type	Times			Weather Conditions at Survey Start					Roosting recorded?	Details of emergence	Limitations/Constraints
						Start Time	End Time	Sunset Time	Temp (degrees C)	Wind (beaufort)	Precipitation (0-5)	Cloud (otkas)	Moon Phase			
05/06/2023	Cow Shed	B1	ST 63424 88697	1 of 3	Emergence (Dusk)	21:06	22:51	21:21	14	2	0	1	Waxing Gibbous	No	NA	None
10/08/2023				2 of 3		20:28	22:12	20:43	20	2	0	4	Waning Crescent			
29/08/2023				3 of 3		19:48	21:33	20:03	17	2	0	7	Waxing Gibbous			
12/06/2023	Ash tree	T1	ST 63384 88743	1 of 3		21:12	22:57	21:27	17	0	0	8	Third Quarter			
	Field Maple	T2	ST 63387 88809													
	Oak tree	T3	ST 63369 88786													
31/07/2023	Ash tree	T1	ST 63384 88743	2 of 3	20:44	22:29	20:59	16	2	0	6	Waxing Gibbous				
	Field Maple	T2	ST 63387 88809													
	Oak tree	T3	ST 63369 88786													
14/08/2023	Ash tree	T1	ST 63384 88743	3 of 3	20:20	22:05	20:35	17	1	0	1	Waning Crescent				
	Field Maple	T2	ST 63387 88809													

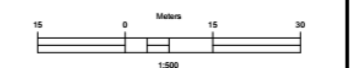
Appendix E. Proposed Habitat Creation





NOTES:
 1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
 2. ALL PROPOSED KERBS TO TIE IN WITH EXISTING KERBS.
 3. HEALTH AND SAFETY:
 THE CONTRACTOR SHALL BE AWARE OF ALL STATUTORY UNDERTAKERS PLANT THAT MAY BE LOCATED WITHIN THE SITE. PLANS SHOWING APPROXIMATE LOCATIONS HAVE BEEN SUPPLIED BY THE ASSET OWNER.
 4. ALL ROAD MARKINGS TYPES / COLOURS & DIMENSIONS SHALL BE IN ACCORDANCE WITH TSRGD 2016.

TO BE READ IN CONJUNCTION WITH:
 WECA_SGC-ATK-HGN-5220316-DR-CH-000007
 WECA_SGC-ATK-HGN-5220316-DR-CH-000009
 WECA_SGC-ATK-HGN-5220316-DR-CH-000001
 WECA_SGC-ATK-HGN-5220316-DR-CH-000010
 WECA_SGC-ATK-HGN-5220316-DR-CH-000011
 WECA_SGC-ATK-HGN-5220316-DR-LL-000007
 5220316-ATK-ARB-TFP-1
 5220316-ATK-ARB-TFP-2
 5220316-ATK-ARB-TFP-3



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction	None
Live Traffic & Utilities	Presence of soil contamination, asbestos, Hazardous tar and breaking of concrete road surfaces.
Maintenance / Cleaning	None
Use	None
Decommissioning / Demolition	None

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
FOR PLANNING ISSUE	S6	FMH	SM	JM	WR	---	03/10/23
FOR PLANNING ISSUE	A1	C01	SM	JM	WR	WR	04/10/23

APPROVED - PUBLISHED A1

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Project Title: **WECA_SGC- Alveston Hill FBC**

Drawing Title: **PLANNING LANDSCAPE GENERAL ARRANGEMENT (SHEET 2 OF 2)**

Drawing Number	Project	Originator	Volume
WECA_SGC - ATK - ELS - 5220316	- DR - LL - 000008		
Location	Type	Scale	Number
A1	1:500	5220316	2 of 2
Original Issue	Scale	Project Ref. No.	Sheet 2 of 2
A1	1:500	5220316	2 of 2
Revised	Scale	Project Ref. No.	Sheet 2 of 2

KEY:

--- APPLICATION BOUNDARY	EXISTING GRASSLAND
--- PROPOSED STOCK PROOF FENCE	PROPOSED EMBANKMENT GRASSLAND
--- PROPOSED CARRIAGEWAY	PROPOSED GRASSLAND ENHANCEMENT
--- EXISTING CARRIAGEWAY	PROPOSED WET GRASSLAND
--- PROPOSED SHARED USE PATH	PROPOSED MARGINAL SPECIES
--- PROPOSED 2 WAY CYCLE TRACK	PROPOSED HEDGEROW
--- PROPOSED FOOTWAY	TREES TREES
--- PROPOSED TACTILE PAVING (UNCONTROLLED CROSSING-BUFF)	TREES/VEGETATION TO BE REMOVED
--- PROPOSED TACTILE PAVING (CONTROLLED CROSSING-RED)	PROPOSED POND
--- PROPOSED HAZARD WARNING (CORDUROY) PAVING	PROPOSED DOORMOUSE BOX (Indicative Locations TBC by ECOW)
--- PROPOSED TRAMLINE / LADDER PAVING	PROPOSED BAT BOX (Indicative Locations & Quantity TBC by ECOW)
--- PROPOSED TRAFFIC SIGNAL POLE	PROPOSED HOP-OVER
	PROPOSED BENCH

PLANTING SCHEDULE

TREES

Topsoil Planting Depth - 600mm (Existing topsoil to be used on site. Imported topsoil to make up the difference).

Botanical Name	Common Name	Supply Height	Girth	Root	Specification	Quantity
<i>Alnus campestre</i>	Field Alder	3.00 - 3.50m	10-12cm	Rootball	2x SS; clear stem min. 200cm; 4 brks	4
<i>Betula pendula</i>	Silver Birch	3.00 - 3.50m	10-12cm	Rootball	2x SS; clear stem 175-200cm; 4 brks	4
<i>Betula pubescens</i>	Dewey Birch	3.00 - 3.50m	10-12cm	Rootball	2x SS; clear stem 175-200cm; 4 brks	7
<i>Carpinus betulus testata</i>	Parishgate Hornbeam	3.00 - 3.50m	10-12cm	Rootball	2x SS; clear stem 175-200cm; 4 brks	5
<i>Prunus spinosa</i>	Wild Cherry	3.00 - 3.50m	10-12cm	Rootball	2x SS; clear stem 175-200cm; 4 brks	8
<i>Quercus robur</i>	Oak	3.00 - 3.50m	10-12cm	Rootball	2x SS; clear stem 175-200cm; 4 brks	8

MARGINAL PLANTING SPECIES - Area 140m²

Topsoil Planting Depth - 300mm (Existing topsoil to be used on site. Imported topsoil to make up the difference).

Botanical Name	Common Name	Supply Height	Density/m²	Quantity
<i>Cardamine pratensis</i>	Cuckoo Flower	Plug 100cc	7	163
<i>Juncus effusus</i>	Soft Rush	Plug 100cc	7	163
<i>Juncus inflexus</i>	Hard Rush	Plug 100cc	7	163
<i>Lycium salicaria</i>	Purple Loosestrife	Plug 100cc	7	163
<i>Silene dioica</i>	Rouge Rose	Plug 100cc	7	163
<i>Ranunculus flammula</i>	Lesser Spearwort	Plug 100cc	7	163

MIXED HEDGEROW - Length 315m

Topsoil Planting Depth - 400mm (Existing topsoil to be used on site. Imported topsoil to make up the difference).
 Plants to be grouped in 3, 5 and 7's of single species and then alternated

Botanical Name	Common Name	Supply Height	Girth	Root	Specification	Quantity
<i>Cornus sanguinea</i>	Dogwood	0.60 - 0.80m	1+1 Transplant	Bareroot	5 per metre, planted in double staggered rows 450mm apart	225
<i>Crataegus monogyna</i>	Hawthorn	0.60 - 1.00m	1+2 Transplant	Bareroot	5 per metre, planted in double staggered rows 450mm apart	225
<i>Eucryphia europaea</i>	Sandale	0.60 - 0.80m	1+2 Transplant	Bareroot	5 per metre, planted in double staggered rows 450mm apart	225
<i>Ligustrum vulgare</i>	Privet	0.60 - 1.00m	Q2 Cutting	Bareroot	5 per metre, planted in double staggered rows 450mm apart	225
<i>Malus sylvestris</i>	Crab Apple	0.60 - 1.00m	1+2 Transplant	Bareroot	5 per metre, planted in double staggered rows 450mm apart	225
<i>Prunus spinosa</i>	Blackthorn	0.60 - 1.00m	1+2 Transplant	Bareroot	5 per metre, planted in double staggered rows 450mm apart	225
<i>Sambucus nigra</i>	Elm	0.60 - 1.00m	1+1 Transplant	Bareroot	5 per metre, planted in double staggered rows 450mm apart	225

GRASSLAND - EMBANKMENT GRASSLAND

Topsoil Planting Depth - 150mm (Existing topsoil to be used on site. Imported topsoil to make up the difference).

Botanical Name	Supplier	Product	Rate	Area
Proposed amenity grassland	Emersgate or similar approved	EG22	25g/m²	7,545m²

GRASSLAND - WET GRASSLAND

Topsoil Planting Depth - only a notional amount of topsoil to be included to the seed, the rest to be sub-soil.

Botanical Name	Supplier	Product	Rate	Area
Proposed meadow for wetlands	Emersgate or similar approved	EMBF	1.5g/m²	7,256m²

GRASSLAND - GRASSLAND ENHANCEMENT

Topsoil Planting Depth - only a notional amount of topsoil to be included to the seed, the rest to be sub-soil.

Botanical Name	Supplier	Product	Rate	Area
Proposed upland meadow mixture	Emersgate or similar approved	EM33	4g/m²	2,831m²
Yellow Rattle	-	-	1g/m²	2,831m²

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