



Llyn Tegid Reservoir Safety Improvements

Bat Roost Potential Survey Report

October 2018

This page intentionally left blank

BAT ROOST POTENTIAL REPORT**CONTENTS**

| | | |
|-----------|---|-----------|
| 1. | INTRODUCTION | 1 |
| 1.1 | Background..... | 1 |
| 1.2 | Site Context and Scope..... | 1 |
| 1.3 | Legislative Framework..... | 2 |
| 1.4 | Environment (Wales) Act 2016..... | 2 |
| 2. | METHODOLOGY | 4 |
| 2.1 | Bat Roost Potential Field Survey | 4 |
| 2.2 | Survey Limitations..... | 5 |
| 3. | RESULTS | 6 |
| 3.1 | Bat Roost Potential Field Survey | 6 |
| 4. | RECOMMENDATIONS | 7 |
| 5. | REFERENCES | 9 |
| | APPENDICES | 10 |
| | APPENDIX A: PRELIMINARY BAT GROUND INVESTIATION PLAN | 10 |
| | APPENDIX B: BAT ROOST POTENTIAL OF TREES | 11 |
| | APPENDIX C: PHOTOGRAPHS TO ACCOMPANY BAT TREE ASSESSMENT | 34 |

Details of document preparation and issue:

| Version no. | Prepared by | Reviewed by | Authorised for issue | Issue date | Issue status |
|-------------|-------------|----------------|----------------------|------------|--------------|
| P01 | Matt Rung | Emma Stevens | Rob Moore | 12/04/18 | FINAL |
| P02 | Matt Rung | Mark Boothroyd | Rob Moore | 12/10/18 | FINAL |
| | | | | | |
| | | | | | |

B&V project no. 122782

Client's reference no. CE0126

Notice:

This report was prepared by Black & Veatch BV Ltd solely for use by Natural Resources Wales. This report is not addressed to and may not be relied upon by any person or entity other than Natural Resources Wales for any purpose without the prior written permission of BV Ltd. BV Ltd, its directors, employees and affiliated companies accept no responsibility or liability for reliance upon or use of this report (whether or not permitted) other than by Natural Resources Wales for the purposes for which it was originally commissioned and prepared.

In producing this report, BV Ltd has relied upon information provided by others. The completeness or accuracy of this information is not guaranteed by BV Ltd.

1. INTRODUCTION

1.1 Background

Natural Resources Wales (NRW) are undertaking a flood risk management appraisal study for Llyn Tegid, Gwynedd, North Wales. Llyn Tegid is a natural lake with approximately 2,950m of embankment. The outflow is controlled by Bala Sluices, which is a gated control structure that controls the combined outflow from Llyn Tegid and the Afon Tryweryn. This allows Llyn Tegid to be used for flood control and to regulate the River Dee downstream.

Llyn Tegid is registered as a Category A Large Raised Reservoir under the Reservoirs Act 1975. As such there are additional legal duties on NRW which include formal inspection by an Inspecting Engineer (IE) from a Reservoir Panel (registered with DEFRA) and compliance with recommendations made by the IE within their report (known as a Section 10 report). Following a Section 10 report in November 2014, modifications to impounding structures at Llyn Tegid are required to satisfy Measures in the Interest of Safety (MIOS).

A Preliminary Ecological Appraisal (Enfys Ecology, 2017) assessed the survey area for bats and stated '*if it is necessary to fell or cut any of the mature trees here then the tree (s) must be subject to a bat inspection*'. Planning permission for the Scheme is anticipated to be sought in Summer 2018.

1.2 Site Context and Scope

The site is situated along the banks of the eastern edge of Llyn Tegid and the River Dee/Tryweryn. The embankments at Llyn Tegid provide a mature, extensive and continuous band of trees close to water which are likely to support a high volume of invertebrate prey for bats. The river corridor is also well connected to the adjacent field boundary network, allowing commuting and dispersal across the wider landscape.

There are individual trees potentially subject to felling to enable the flood protection works within the survey area and an annotated diagram of these can be found in Appendix A.

The survey methodology is detailed in Section 2. The survey results are presented in Section 3 with detailed survey results provided in Appendix B. Recommendations are discussed in Section 4.

At this stage detailed design for the works has not been confirmed therefore this report builds on current design information to provide recommendations. The current scope of works involves protecting the embankments (keep embankments at existing level and install erosion protection on the downstream slopes).

At the time of writing, removal of most of trees on the downstream (landward side) slope and 2-3m past the toe are likely. There is the potential to remove all trees along the upstream (lake side) slope of the embankment and for the purposes of this report this has been assumed. A compound/lay down area will be located in one field to the north west of the Scheme with most trees likely to be undisturbed but trees to the southern corner of the field may need to be removed. Trees likely to be retained during the Scheme works are also shown in Appendix A.

The objective of the survey was to establish which trees that may potentially be felled have bat roost potential. This would allow an assessment of potential impacts to be made, along with proposals for further survey recommendations.

1.3 Legislative Framework

All native UK bat species are fully protected by UK law under Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended), and under Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended).

The relevant sections of the Wildlife and Countryside Act make it an offence to:

- Deliberately kill, injure or capture bats;
- Intentionally, deliberately or recklessly disturb roosting bats or obstruct access to their roosts. Disturbance includes any activity that is likely to impair their ability to survive, breed or reproduce, or to rear or nurture young or to hibernate or to affect significantly the local distribution or abundance of the species to which they belong; and
- Damage or destroy bat roosts (including if bats are absent).

Offences under this legislation carry a maximum penalty of imprisonment for up to six months and/or a fine not exceeding Level 5 on the standard scale, or both (currently up to £5000).

Where it is considered likely that proposals would result in an offence in respect of the Conservation of Habitats and Species Regulations (2010) (as amended), it may be necessary to apply for a European Protected Species Licence (EPSL) in respect of bats from NRW to allow the activity to proceed. A licence can only be issued where the following three tests are satisfied, namely:

- to preserve public health and safety or other imperative reasons of overriding public interest;
- there is no satisfactory alternative; and
- that the proposals will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

1.4 Environment (Wales) Act 2016

In addition to species protected by UK law, searches were made for protected species and notable habitats and species i.e. Section 7: Priority species and Habitats covered by The Environment (Wales) Act 2016,

The following priority bat species of relevance to the Llyn Tegid Scheme are represented within Section 7 of The Environment (Wales) Act and form part of the Bat Action Plan for Wales:

- common pipistrelle;
- soprano pipistrelle bat;
- greater horseshoe;
- lesser horseshoe;
- noctule;
- barbastelle;

- bechstein's; and
- brown long-eared.

The local BAP for Snowdonia National Park Authority [April 2018] contains an action plan for lesser horseshoe bats.

2. METHODOLOGY

2.1 Bat Roost Potential Field Survey

All Black & Veatch bat surveys are undertaken according to standard best practice survey guidelines, which include: The Bat Mitigation Guidelines (2004); The Bat Workers Manual (2004); and The Bat Conservation Trust, Bat Surveys for Professional Ecologists – Good Practice Guidelines 3rd Edition 2016.

A bat roost potential survey was undertaken on 26th/27th/28th March 2018. Black & Veatch Senior Ecologist Matt Rung MCIEEM carried out inspections of trees within the survey area which were considered likely to be directly or indirectly affected by the Scheme proposals.

All trees were inspected externally from the ground, to determine their suitability for access by roosting bats. Close focusing binoculars, powerful spot-lamps and an endoscope were used where necessary and a photographic record was made of trees with roost potential. Photographs are provided in Appendix C. Searches were made for bat presence, including:

- Actual bat presence (live or dead);
- Accumulation of bat droppings;
- Feeding remains (e.g. butterfly wings);
- Smear or scratch marks around roost entrance holes; and
- Urine staining.

Trees

A number of trees were identified within the survey area. The surveyor recorded a general description of each group of tree (e.g. tree species, age, description of features, etc).

Groups of trees identified during the survey were labelled using the following numbering system 'G1', 'G2', 'G3' etc. as shown on Figure 1, Appendix A. Individual trees of interest were labelled using numerical values '1', '2' etc. as shown on Figure 1.

Bat Roost Potential Assessment

Upon completion of the inspections, each tree/group of trees was categorised according to its potential to support roosting bats (termed its 'bat roost potential'). The categories used are: 'Confirmed', 'High', 'Medium', 'Low' and 'Negligible' potential for use by bats. See Table 1 for descriptions of these categories (based on Mitchell-Jones, 2004 and Collins, 2016).

The value of the surrounding habitat for foraging and commuting bats was also quantified on a continuum from low to high in accordance with the BCT Survey Guidelines (Collins, 2016) and used to inform the overall bat roost potential scoring.

Table 1: Bat Roost Potential Assessment Scorings

| Value | Description |
|--------------|--|
| Confirmed | Confirmed signs of bat presence/occupation (droppings, oily staining around entry points, food remnants, odour, scratching) and actual bat presence. |
| High | A structure or tree with one or more potential roost sites that are obviously suitable for use by large numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. |
| Moderate | A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed). |
| Low | A tree of sufficient size and age to contain potential roost features (PRFs) but with none seen from the ground or features seen with only very limited roosting potential. |
| Negligible | Negligible habitat features on site likely to be used by roosting bats |

2.2 Survey Limitations

There were no limitations to this survey.

3. RESULTS

3.1 Bat Roost Potential Field Survey

(a) Tree/Tree Group Assessment

The survey identified a number of trees that were considered to have some potential to be affected by the Scheme's proposals. These were as follows:

- 26 groups of trees; and
- 125 trees.

None of these trees were assessed as having a 'confirmed' bat roost potential i.e. no signs of bat presence (e.g. droppings, urine staining, feeding remains, or actual bats) were recorded at this time.

A summary of the bat roost potential assessment results for the Scheme are provided in Table 2 below.

Table 2: Bat Roost Potential Assessment Scorings

| Bat Roost Potential | Tree groups | Trees |
|---------------------|-------------|------------|
| Confirmed | 0 | 0 |
| High | 0 | 6 |
| Moderate | 1 | 26 |
| Low | 4 | 14 |
| Negligible | 21 | 79 |
| Inaccessible | 0 | 0 |
| TOTAL | 26 | 125 |

Details for each tree can be found in Appendix B and tree locations are shown in Appendix A.

(b) Foraging and Commuting Habitat

It is considered that the survey area supports moderate value foraging and commuting habitats. Although moderate value, the survey area supports pockets of moderate/high quality habitat with rows of trees alongside Llyn Tegid and part of Afon Tryweryn which are linked to hedgerows and the wider landscape. However, the area surrounding the Dee is of less value, the space open and pastoral with scattered trees, and overall the survey area is considered to be moderate value. The survey area is linked to high quality bat habitat to the north of Station Rd with both sides of Afon Tryweryn lined with trees and adjacent to woodland.

There is the potential to remove the line of trees on the embankments at Llyn Tegid/Afon Tryweryn and it is considered that the development is likely have an impact on foraging and/or commuting bats. Further recommendations to assess the level of impact on foraging/commuting bats are outlined in Section 4 and this should be used to inform any mitigation for habitat compensation.

4. RECOMMENDATIONS

The following recommendations are made in respect of bats for the proposed Llyn Tegid Scheme. Please note that any revision to the Scheme design relating to tree or works proposals following issue of this report, may necessitate revision of these recommendations. Recommendations are provided in the below table (Table 4) with survey recommendations made based on both bat roost potential and type of feature (ivy present or absent). In addition to recommendations in Table 4, recommendations are also made with regards to bat commuting and foraging value.

Table 4: Bat Survey Recommendations for Trees/Tree Groups

| Bat Roost Potential and Features Present | Survey Recommendation | Number of Trees and Tree/Group number requiring further survey | Trees not planned to be removed and/or no survey required |
|--|---|--|---|
| High bat roost potential and trees with cavities/splits etc. but little or no ivy present. | Aerial inspection of individual trees or three emergence/re-entry surveys per tree (May-September) | 4 trees (trees 7, 8, 15, 94) | 2 trees (41, 64) |
| Moderate bat roost potential with cavities/splits etc. but little or no ivy present. | Aerial inspection of individual trees or two emergence/re-entry surveys per tree (May-September) | 6 trees (trees 4, 5, 18, 19, 95, 125) | 1 tree (58) |
| Moderate bat roost potential with moderate/dense ivy and sometimes observed cavities/splits etc. | Two emergence/re-entry surveys per tree (May-September); Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy. | 16 trees plus 1 group (trees 12, 32, 33, 34, 53, 54, 55, 96, 97, 99, 103, 104, 105, 106, 115, 116 Group 2 (6 trees) | 3 trees (61, 63, 66) |
| Low bat roost potential trees with moderate covering of ivy having the | Remove trees during winter to avoid individual summer/transition | 7 trees and 2 groups (49, 50, 51, 91, 92, 107, | 4 trees (46, 62, 67, 68). In addition 3 trees and two groups contained low bat roost potential |

| Bat Roost Potential and Features Present | Survey Recommendation | Number of Trees and Tree/Group number requiring further survey | Trees not planned to be removed and/or no survey required |
|---|---|--|---|
| potential to support summer transition roosts and unlikely to support other potential roost features. | roosts (November-March). If this cannot be achieved ivy should be severed at the base and supervise the ivy removal for potential roost features. | 108 Groups 3, 4) | and are potentially due to be removed, but no further survey is considered necessary owing to limited risk to bats (sparse ivy covering for example) (35, 36, 85, Groups 21 and 22) |

Surveys where aerial inspections and emergence/re-entry surveys have been recommended have the potential for just one survey type to be undertaken (either aerial or emergence/re-entry). Aerial inspections have the potential to be quicker involving one climb and inspect but if this fails (health and safety, endoscope can't reach some features) then emergence/re-entry survey may need to be undertaken in addition to aerial inspections.

As the survey area contains moderate value commuting and foraging habitat and this habitat has the potential to be severed, it is recommended that one transect survey per month (April-October inclusive) should be conducted, with at least one of the surveys comprising dusk and pre-dawn within one 24 hour period. In addition to this, two static detectors should be deployed within the survey area per month (April to October inclusive) for five consecutive nights in appropriate weather conditions for bats.

European Protected Species Licence (EPSL). Should the presence of roosting bats be confirmed during any further survey, it may be necessary to apply for a Natural Resources Wales European Protected Species Licence (EPSL). The EPSL includes a full mitigation package, which is likely to include: appropriate timing of works; use of appropriate bat friendly demolition/exclusion methodologies; provision of replacement roosting; and monitoring of replacement roosts. A licence application will take approximately 10-12 weeks to obtain once all necessary surveys have been completed.

Compensation Measures. As trees are planned to be removed as part of the Scheme it is recommended that compensation for features damaged or destroyed during the Scheme is sought.

5. REFERENCES

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

Enfys Ecology (2017) Llyn Tegid Embankments, Bala, Gwynedd: Preliminary Ecological Appraisal

Hundt L (2012) Bat Surveys: Good Practice Guidelines, 2nd edition, Bat Conservation Trust

Mitchell-Jones, A.J, & McLeish, A.P. Ed., (2004) Bat Workers' Manual.

APPENDICES

APPENDIX A: PRELIMINARY BAT GROUND INVESTIATION PLAN



Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.
 Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database rights 2018. Ordnance Survey Licence number 100019741

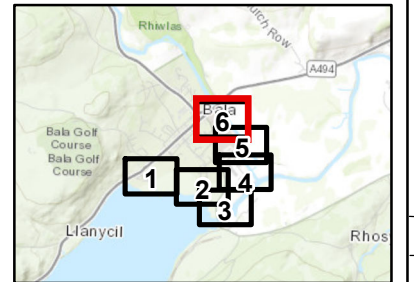
LEGEND:

BAT ROOST POTENTIAL SCORE

- HIGH
- MODERATE
- LOW
- NEGLIGIBLE

TREES NOT PLANNED TO BE REMOVED

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



SAFETY HEALTH AND ENVIRONMENT INFORMATION

IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER

| | |
|------------------------------------|----------------|
| CONSTRUCTION | NOT APPLICABLE |
| MAINTENANCE / CLEARING / OPERATION | NOT APPLICABLE |
| DECOMMISSIONING / DEMOLITION | NOT APPLICABLE |

| Rev | Drawn | Chkd | Rvwd | Apprvd | Date | Description |
|-----|-------|------|------|--------|------------|--------------------------|
| P01 | ZO | MR | EAS | RM | 12/04/2018 | SUITABLE FOR INFORMATION |

Designed by: ZO Date: APRIL 2018

Client

Cyfoeth Naturiol Cymru
Natural Resources Wales

BLACK & VEATCH
Building a world of difference.
Black & Veatch Limited
Registered Office
40 High Street, Ruidli, Surrey RH11 1SE, United Kingdom
Tel: +44(0)1737 774155 E-mail: bv@bv.com

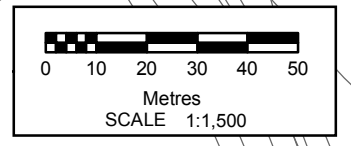
Project

LLYN TEGID

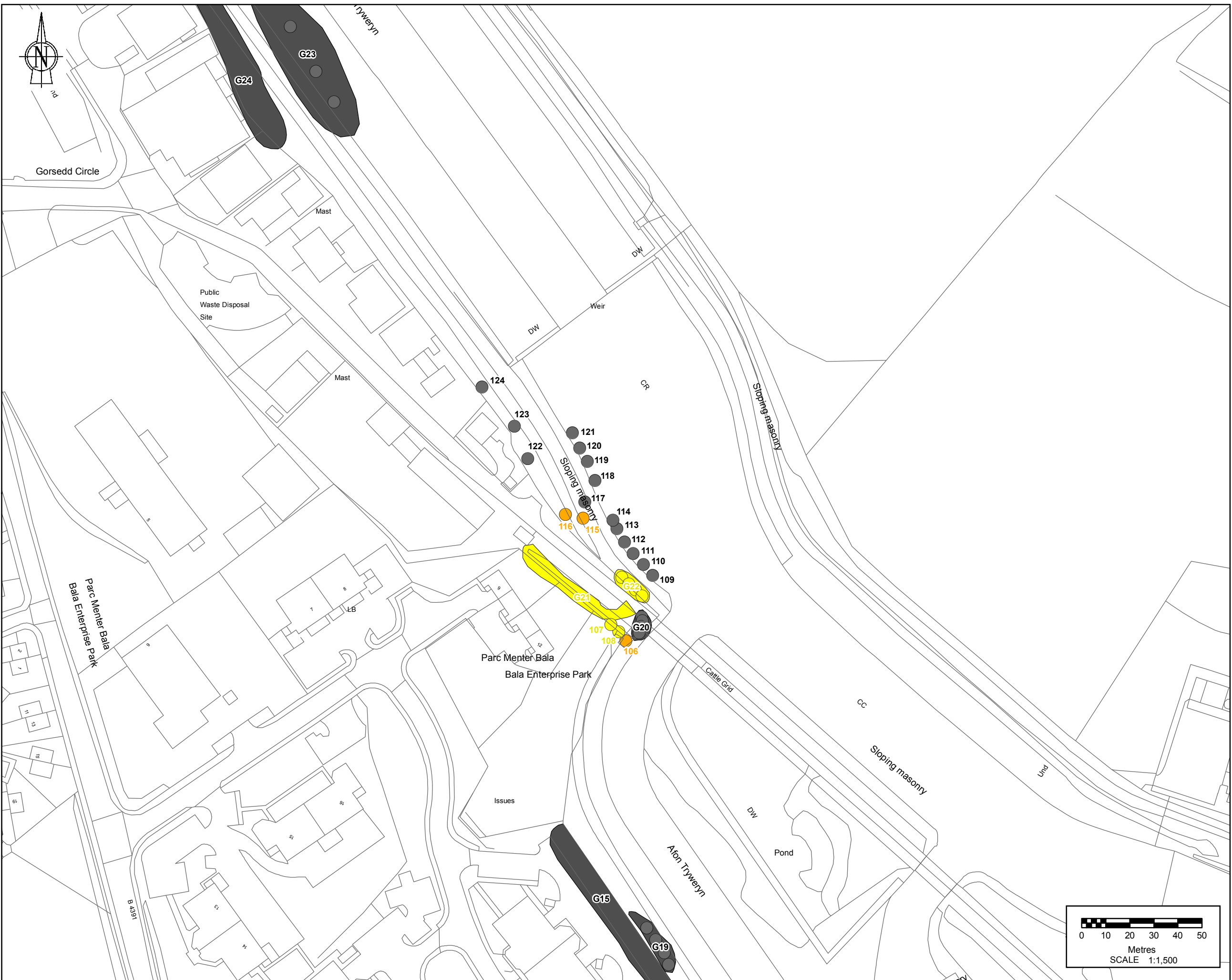
Drawing title:

**PRELIMINARY BAT
GROUND INVESTIGATION PLAN
PAGE 6 OF 6**

Drawing scale: 1:1,500 @A3 Sheet size: A3
 Drawing no. 122782-BV-L-20-XX-DR-X-XXXXX Revision: P01



R:\Projects\122782-LLYN TEGID\Workspaces\Issue_Maps\122782-BV-L-20-XX-DR-X-XXXXX.mxd 08/07/2018 12:04:2018



Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.
 Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database rights 2018. Ordnance Survey Licence number 100019741

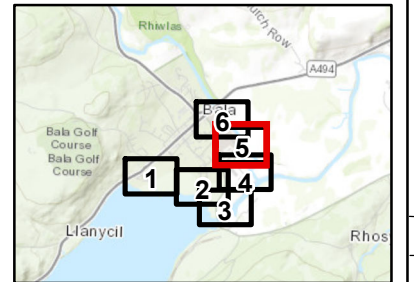
LEGEND:

BAT ROOST POTENTIAL SCORE

- HIGH
- MODERATE
- LOW
- NEGLIGIBLE

TREES NOT PLANNED TO BE REMOVED

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



SAFETY HEALTH AND ENVIRONMENT INFORMATION

IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER

| | |
|------------------------------------|----------------|
| CONSTRUCTION | NOT APPLICABLE |
| MAINTENANCE / CLEARING / OPERATION | NOT APPLICABLE |
| DECOMMISSIONING / DEMOLITION | NOT APPLICABLE |

| Rev | Drawn | Chkd | Rvwd | Apprvd | Date | Description |
|-----|-------|------|------|--------|------------|--------------------------|
| P01 | ZO | | | | 12/04/2018 | SUITABLE FOR INFORMATION |

Designed by: ZO Date: APRIL 2018

Client

Cyfoeth Naturiol Cymru
Natural Resources Wales

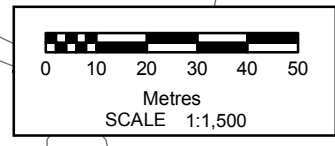
BLACK & VEATCH
Building a world of difference.[®]

Black & Veatch Limited
Registered Office
40 High Street, Redhill, Surrey RH1 1SE, United Kingdom
Tel: +44(0)1737 7741 55 E-mail: bvl@bv.com

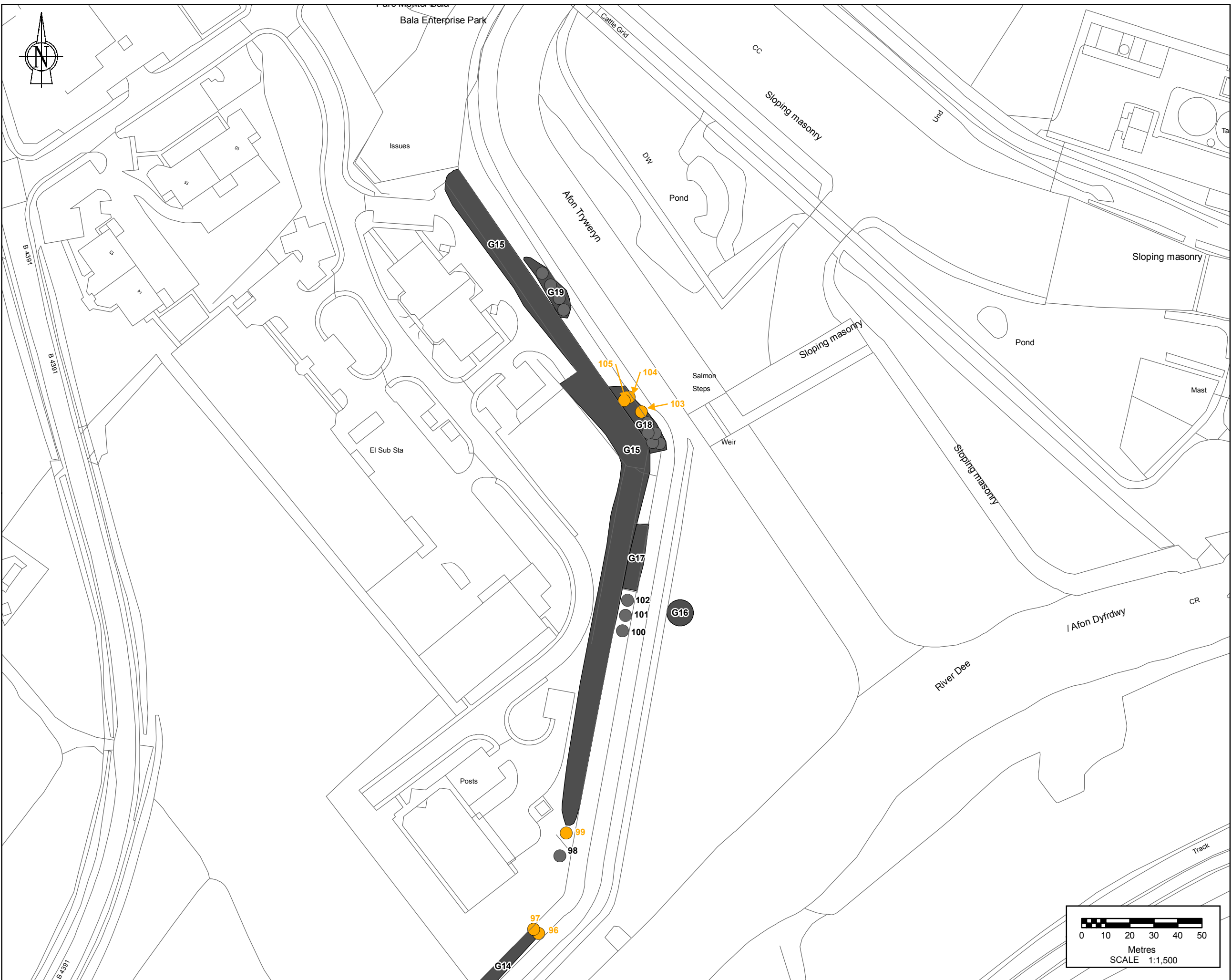
Project: **LLYN TEGID**

Drawing title: **PRELIMINARY BAT GROUND INVESTIGATION PLAN PAGE 5 OF 6**

Drawing scale: 1:1,500 @ A3 Sheet size: A3
 Drawing no. 122782-BVL-Z0-XX-DR-X-XXXXX Revision: P01



R:\Projects\122782-LLYN TEGID\20-XX-DR-X-XXXXX.mxd 08/01/2018



Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database rights 2018. Ordnance Survey Licence number 100019741

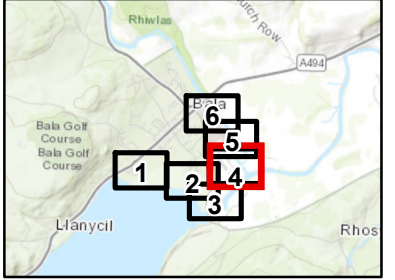
LEGEND:

BAT ROOST POTENTIAL SCORE

- HIGH
- MODERATE
- LOW
- NEGLIGIBLE

TREES NOT PLANNED TO BE REMOVED

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



SAFETY HEALTH AND ENVIRONMENT INFORMATION

IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER

| | |
|------------------------------------|----------------|
| CONSTRUCTION | NOT APPLICABLE |
| MAINTENANCE / CLEARING / OPERATION | NOT APPLICABLE |
| DECOMMISSIONING / DEMOLITION | NOT APPLICABLE |

| | | | | | | |
|-----|-------|------|------|--------|------------|--------------------------|
| P01 | ZO | MR | EAS | RM | 12/04/2018 | SUITABLE FOR INFORMATION |
| Rev | Drawn | Chkd | Rvwd | Apprvd | Date | Description |

Designed by: ZO Date: APRIL 2018

Client

Cyfoeth Naturiol Cymru
Natural Resources Wales

BLACK & VEATCH
Building a world of difference.[®]

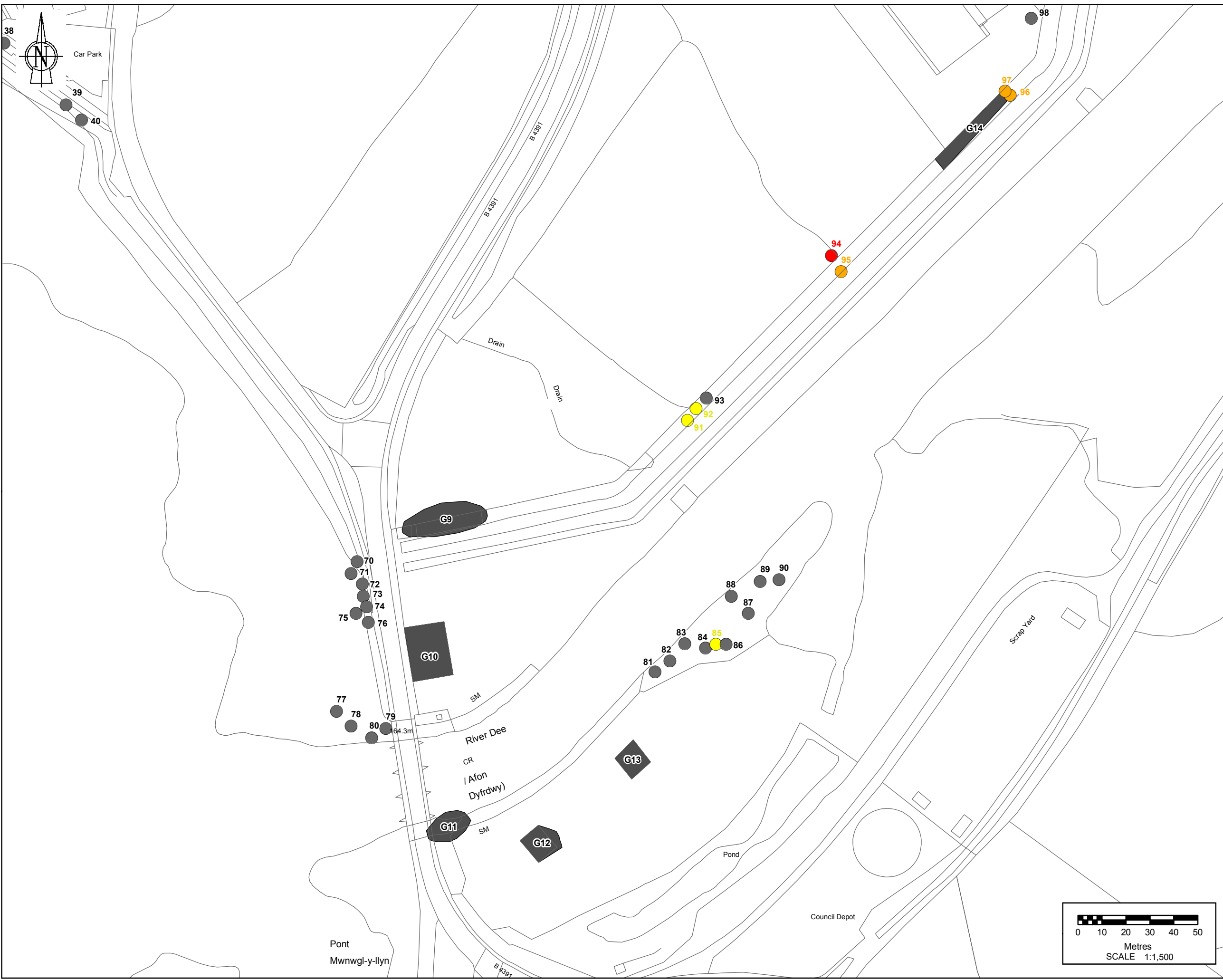
Black & Veatch Limited
Registered Office
40 High Street, Redhill, Surrey RH11 3RH, United Kingdom
Tel: +44(0)1737 7741 55 E-mail: bv@bv.com

Project: **LLYN TEGID**

Drawing title: **PRELIMINARY BAT GROUND INVESTIGATION PLAN PAGE 4 OF 6**

Drawing scale: 1:1,500 @ A3 Sheet size: A3
Drawing no. 122782-BV-LZ-XX-DR-X-XXXXX Revision: P01

R:\Projects\122782-LLYN TEGID\Drawings\122782-BV-LZ-XX-DR-X-XXXXX.mxd 08/17/18 12/04/2018



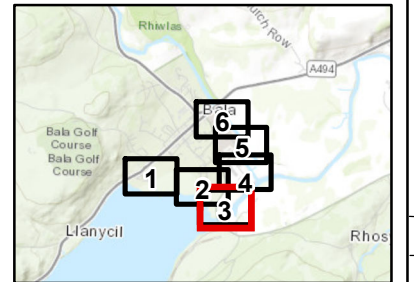
Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.
 Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database rights 2018. Ordnance Survey Licence number 100019741

LEGEND:

BAT ROOST POTENTIAL SCORE

- HIGH
- MODERATE
- LOW
- NEGLIGIBLE
- TREES NOT PLANNED TO BE REMOVED

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



SAFETY HEALTH AND ENVIRONMENT INFORMATION

IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER

| | |
|------------------------------------|----------------|
| CONSTRUCTION | NOT APPLICABLE |
| MAINTENANCE / CLEARING / OPERATION | NOT APPLICABLE |
| DECOMMISSIONING / DEMOLITION | NOT APPLICABLE |

| P01 | ZO | MR | EAS | RM | 12/04/2018 | SUITABLE FOR INFORMATION |
|-----|-------|------|------|--------|------------|--------------------------|
| Rev | Drawn | Chkd | Rvwd | Apprvd | Date | Description |

Designed by: ZO Date: APRIL 2018
 Client: **Cyfoeth Naturiol Cymru Natural Resources Wales**

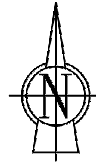
Client Drawing No. _____ Revision _____
BLACK & VEATCH
 Building a world of difference.
 Black & Veatch Limited
 Registered Office
 40 High Street, Redhill, Surrey RH1 1SE, United Kingdom
 Tel: +44(0)1737 774155 E-mail: bv@bve.com

Project: **LLYN TEGID**

Drawing title: **PRELIMINARY BAT GROUND INVESTIGATION PLAN PAGE 3 OF 6**

Drawing scale: 1:1,500 @A3 Sheet size: A3
 Drawing no. 122782-BVL-Z0-XX-DR-X-XXXXX Revision: P01

R:\Projects\122782-LLYN TEGID\Workspaces\2 Issue_Maps\122782-BVL-Z0-XX-DR-X-XXXXX.mxd 08/17/18 12/04/2018



Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database rights 2018. Ordnance Survey Licence number 100019741

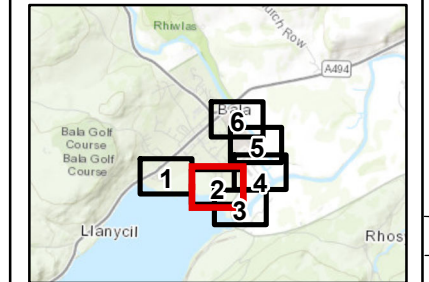
LEGEND:

BAT ROOST POTENTIAL SCORE

- HIGH
- MODERATE
- LOW
- NEGLIGIBLE

TREES NOT PLANNED TO BE REMOVED

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



SAFETY HEALTH AND ENVIRONMENT INFORMATION

IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER

| | |
|------------------------------------|----------------|
| CONSTRUCTION | NOT APPLICABLE |
| MAINTENANCE / CLEARING / OPERATION | NOT APPLICABLE |
| DECOMMISSIONING / DEMOLITION | NOT APPLICABLE |

| | | | | | | |
|-----|-------|------|------|--------|------------|--------------------------|
| P01 | ZO | MR | EAS | RM | 12/04/2018 | SUITABLE FOR INFORMATION |
| Rev | Drawn | Chkd | Rvwd | Apprvd | Date | Description |

Designed by: ZO Date: APRIL 2018

Client

Client Drawing No. _____ Revision _____

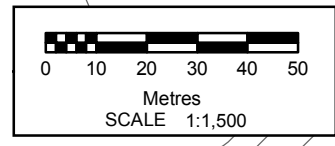
Black & Veatch Limited
Registered Office
40 High Street, Redhill, Surrey RH1 1SE, United Kingdom
Tel: +44(0)1737 7741 55 E-mail: bv@bv.com

Project: **LLYN TEGID**

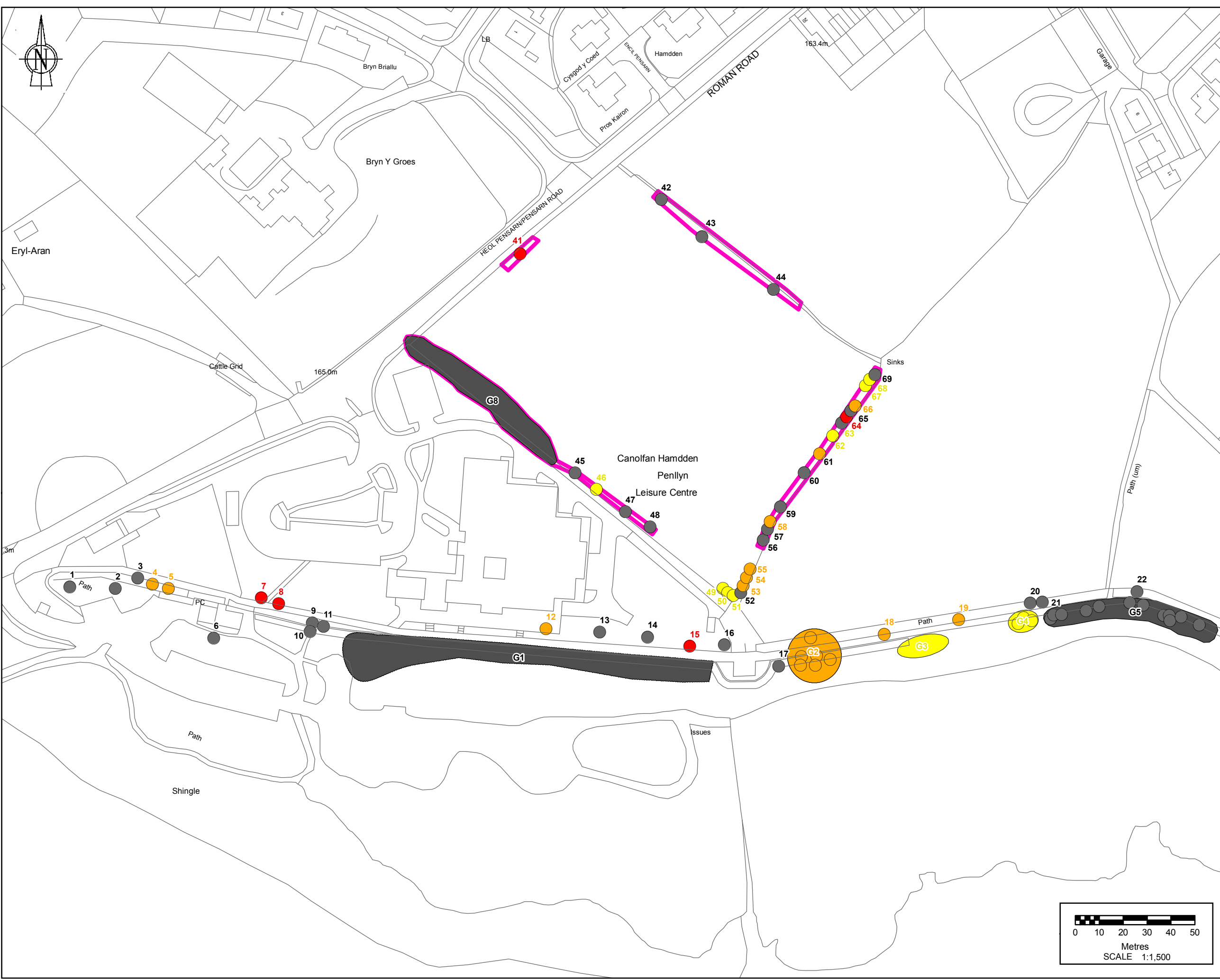
Drawing title: **PRELIMINARY BAT GROUND INVESTIGATION PLAN PAGE 2 OF 6**

Drawing scale: 1:1,500 @ A3 Sheet size: A3

Drawing no. 122782-BV-L-Z0-XX-DR-X-XXXXX Revision: P01



R:\Projects\122782-LLYN TEGID\Issue_Maps\122782-BV-L-Z0-XX-DR-X-XXXXX.mxd 08/17/18 12/04/2018



Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database rights 2018. Ordnance Survey Licence number 100019741

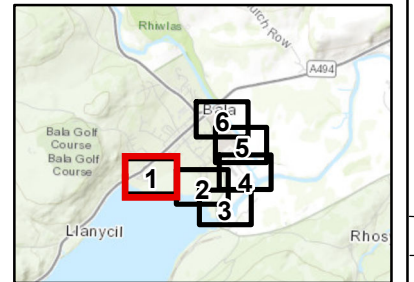
LEGEND:

BAT ROOST POTENTIAL SCORE

- HIGH
- MODERATE
- LOW
- NEGLIGIBLE

TREES NOT PLANNED TO BE REMOVED

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



SAFETY HEALTH AND ENVIRONMENT INFORMATION

IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER

| CONSTRUCTION |
|------------------------------------|
| NOT APPLICABLE |
| MAINTENANCE / CLEARING / OPERATION |
| NOT APPLICABLE |
| DECOMMISSIONING / DEMOLITION |
| NOT APPLICABLE |

| Rev | Drawn | Chkd | Rvwd | Apprvd | Date | Description |
|-----|-------|------|------|--------|------------|--------------------------|
| P01 | ZO | MR | EAS | RM | 12/04/2018 | SUITABLE FOR INFORMATION |

Designed by: ZO Date: APRIL 2018

Client

Client Drawing No. _____ Revision _____

BLACK & VEATCH
Building a world of difference.[®]

Black & Veatch Limited
Registered Office
40 High Street, Redhill, Surrey RH1 1SE, United Kingdom
Tel: +44(0)1737 774155 E-mail: bvl@bv.com

Project

LLYN TEGID

Drawing title:

**PRELIMINARY BAT
GROUND INVESTIGATION PLAN
PAGE 1 OF 6**

Drawing scale: 1:1,500 @ A3 Sheet size: A3

Drawing no. 122782-BVL-Z0-XX-DR-X-XXXXX Revision P01

R:\Projects\122782-LLYN TEGID\122782-BVL-Z0-XX-DR-X-XXXXX.mxd 08/01/2018 12:04:2018

APPENDIX B: BAT ROOST POTENTIAL OF TREES

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|-----------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|---|---------------------|----------|-----|------------|---|--|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| 1 | Cherry | 0.6-1 | 5-7 | M | | | | | | | | No suitable potential roost features (PRF) present | | | | X | Potentially removing | None |
| 2 | Cherry | 0.6-1 | 5-7 | M | | | | | | | | No suitable potential roost features (PRF) present | | | | X | Potentially removing | None |
| 3 | Beech | 1-1.5 | 10-12 | M | | | | | | | | No suitable potential roost features (PRF) present | | | | X | Potentially removing | None |
| 4 | Unknown | 1-1.5 | 10-12 | M | | X | | | | | | Two small sections of loose bark (8m) and possible cavity but couldn't see due to height. | | X | | | Potentially removing | Aerial inspection or emergence/re-entry (2 visits) May-September |
| 5 | Horse chestnut? | 1.5 | 10-12 | M | | | X | | | | | Three upward leaning cavities on all sides 4- | | X | | | Potentially removing | Aerial inspection or emergence/re-entry (2 visits) May-September |



| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|-----------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|---|---------------------|----------|-----|------------|---|---|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | 6m | | | | | | |
| 6 | Horse chestnut? | 0.8-1.2 | 6-8 | M | | | | | | | | No suitable potential roost features (PRF) present | | | | X | Potentially removing | None |
| 7 | Ash | 1.5 | 12 | M | | | X | | | | | One east and downward facing cavity at 6m from ground on main trunk | X | | | | Potentially removing | Aerial inspection or emergence/re-entry (3 visits) May-September |
| 8 | Horse Chestnut | 1-1.5 | 10 | M | X | X | | | | | | Cracks fissures and holes in several places (between 4-8m) | X | | | | Potentially removing | Aerial inspection or emergence/re-entry (3 visits) May-September |
| 9/10/11 | Birch/Ash | 0.8-1.2 | 6-8 | EM/M | | | | | | | | No suitable potential roost features (PRF) present | | | | X | Potentially removing | None |
| 12 | Ash | 1 | 8 | EM/M | | | | X | | | | Ivy cover from ground to 5m. Dense covering and | | X | | | Potentially removing | Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|--------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|--|---------------------|----------|-----|------------|---|--|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | potential to conceal a roost/PRF. | | | | | | |
| 13 | Lime? | 1-1.5 | 8 | M | | | | | | | | No suitable potential roost features (PRF) present | | | | X | Potentially removing | None |
| 14 | Lime? | 1-1.5 | 8 | M | | | | | | | | No suitable potential roost features (PRF) present | | | | X | Potentially removing | None |
| 15 | Ash | 1 | 8 | M | | | X | | | | | Up to 3 cavities on trunk facing west at 5m high | X | | | | Potentially removing | Aerial inspection or emergence/re-entry (3 visits) May-September |
| G1 | Various | 0.3-0.6 | 6-10 | EM/M | | | | | | | | Largely immature species some with ivy covering but no PRF's. Bark is easily visible between trees with ivy covering | | | | X | Potentially removing | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|-------------------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|---|---------------------|----------|-----|------------|---|--|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | and therefore exposed. | | | | | | |
| G2 | Various | 0.3-0.7 | 6-8 | EM | | | | | X | | | Trees with moderate/dense ivy coverage. Possibility of hiding roost features | | X | | | Potentially removing | Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy |
| 16 | Ash | 1-1.5 | 6-10 | | | | | | | | | No suitable potential roost features (PRF) present | | | | X | Potentially removing | None |
| 17 | Ash | 1-1.5 | 8 | M | | | | | | | | No suitable potential roost features (PRF) present | | | | X | Potentially removing | None |
| 18 | Ash | 0.8 | 10-12 | M | | | X | | | | | One south facing cavity 3m off ground | | X | | | Potentially removing | Ground endoscope with ladder/aerial inspection or Emergence/re-entry survey (2 visits) May-September |
| G3 | Various (inc. oak, ash) | 0.6-0.8 | 10 | EM | | | | X | | | | Group of 10 trees with moderate ivy cover but bark visible. Potential to be used as | | | X | | Potentially removing | Removal of trees in winter (November-March). If this cannot be done ivy cutting at the base followed by removal under supervision by a suitably qualified ecologist. |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|----------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|---|---------------------|----------|-----|------------|---|--|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | transient roost. | | | | | | |
| 19 | Ash | 2 | 12 | M | | | X | | | | | One south facing cavity and one north facing cavity 5-6m off ground. | | X | | | Potentially removing | Aerial inspection or emergence/re-entry (2 visits) May-September |
| 20/21 | Horse chestnut | 0.8-1 | 8 | EM/M | | | | | | | | No suitable potential roost features (PRF) present | | | | X | Potentially removing | None |
| G4 | Various | 0.3-0.8 | 6 | Y | | | | | X | | | Moderate ivy on young trees but hard to see bark. Unlikely to conceal a PRF but potential to be used as transient roost within ivy. | | | X | | Potentially removing | Removal of trees in winter (November-March). If this cannot be done ivy cutting at the base followed by removal under supervision by a suitably qualified ecologist. |
| G5 | Ash | 0.3-0.6 | 6-8 | Y | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|----------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|--|---------------------|----------|-----|------------|---|-----------------------|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| 22 | Sycamore | 0.8 | 10 | M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 23 | Sycamore | 0.8 | 8 | M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 24 | Sycamore | 0.8 | 8 | EM/ M | | | | | X | | | Sparse ivy on main trunk but bark easily visible and narrow stems. | | | | X | Potentially removing | None |
| G7 | Ash/sycamore | 0.3-0.6 | 8 | Y/E M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 25 | Sweet chestnut | 1 | 10 | M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 26 | Ash | 0.8 | 8 | EM/ M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 27/28/29 | Sycamore | 0.3-0.6 | 6-8 | EM | | | | | | | | Sparse ivy on multi-trunked tree. | | | | X | Potentially removing | None |



| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|--------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|---|---------------------|----------|-----|------------|---|---|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| 30 | Ash | 0.6-1 | 6-8 | EM | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 31 | Lime? | 0.8 | 10 | EM/M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 32/33 | Ash | 1.5 | 1 | M | | | | | X | | | Moderate/dense ivy present and bark not easily visible. | | X | | | Potentially removing | Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy |
| 34 | ? | 0.8 | 6 | M | | | | | X | | | Moderate/dense ivy present and bark not easily visible. | | X | | | Potentially removing | Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy |
| 35 | Ash | 1 | 10 | M | | | | | X | | | Sparse ivy covering low down on tree and bark clearly visible | | | X | | Potentially removing | None |
| 36 | Sycamore | 1 | 10 | M | | | | | X | | | Sparse ivy covering low down on tree and bark clearly visible | | | X | | Potentially removing | None |
| 37 | Unknown | | | M | | | | | | | | Multi-stemmed. No | | | | X | Potentially removing | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|-----------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|---|---------------------|----------|-----|------------|---|--|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | potential roost features present | | | | | | |
| 38 | Ash | 1 | 8 | M | | | | | | | X | Several very small holes noted but too small for bats to use | | | | X | Potentially removing | None |
| 39/40 | Sycamore | 0.8-1 | 6 | EM/M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 41 | Maple/Plane | 1.5-2 | 12 | M | | | X | | | | | Two cavities on roadside (north) and west of trunk at 5m from the ground. By busy road with possible light pollution. | X | | | | Not being removed | Aerial inspection or emergence/re-entry (3 visits) May-September |
| 42 | Unknown species | 1 | 10 | M | | | | | | | | No potential roost features present | | | | X | Not being removed | None |
| 43 | Unknown species | 0.6 | 8 | M | | | | | | | | No potential roost features | | | | X | Not being removed | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|-----------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|---|---------------------|----------|-----|------------|---|-----------------------|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | present | | | | | | |
| 44 | Unknown species | 0.7 | 7 | M | | | | | | | | No potential roost features present | | | | X | Not being removed | None |
| G8 | Various | 0.3-0.5 | <4 | EM/M | | | | | | | | No potential roost features present | | | | X | Not being removed | None |
| 45 | Holly | 0.6 | 5 | EM/M | | | | | | | | No potential roost features present | | | | X | Not being removed | None |
| 46 | Ash | 1-1.5 | 10 | M | | | | | X | | | Moderate ivy cover with some visible bark and likely not concealing cavities. But could be used a transition roost within ivy | | | X | | Not being removed | None |
| 47 | Cherry | 0.3 | 4 | EM/M | | | | | | | | No potential roost features present | | | | X | Not being removed | None |
| 48 | Elder | 0.3 | 4 | M | | | | | | | | No potential roost | | | | X | Not being removed | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|--------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|---|---------------------|----------|-----|------------|---|--|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | features present | | | | | | |
| 49/50/51 | Ash | 0.6-1 | 8-10 | EM/M | | | | | X | | | Moderate ivy coverage on main trunk and bark visible. But could be used a transition roost within ivy | | | X | | Potentially removing | Removal of trees in winter (November-March). If this cannot be done ivy cutting at the base followed by removal under supervision by a suitably qualified ecologist. |
| 52 | Ash | 0.5 | 7 | EM | | | | | | | | Multi-stemmed. No potential roost features present | | | | X | Potentially removing | None |
| 53/54/55 | Ash | 0.8-1 | 7-9 | M | | | | | X | | | Dense ivy coverage and bark not obviously visible. Could conceal PRF. | | X | | | Potentially removing | Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy |
| 56/57 | Ash | 0.5 | 8 | EM | | | | | | | | No potential roost features present | | | | X | Not being removed | None |
| 58 | Ash | 2 | 12 | M | X | | | | | | | Split on deadwood at 5m | | X | | | Not being removed | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|--------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|--|---------------------|----------|-----|------------|---|-----------------------|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | from ground | | | | | | |
| 59 | Ash | 0.6 | 9 | M | | | | | X | | | Sparse ivy present with bark easily visible | | | | X | Not being removed | None |
| 60 | Ash | 1.5 | 12 | M | | | | | | X | | Upward leaning deadwood that is exposed and shallow | | | | X | Not being removed | None |
| 61 | Ash | 1.5 | 12 | M | | | | X | | | | Dense ivy that could hide features | | X | | | Not being removed | None |
| 62 | Unknown | 0.3-0.6 | 5-7 | Y | | | | X | | | | Young tree with moderate amounts of ivy present but limited potential for bats (only potential for transitional summer roost). | | | X | | Not being removed | None |
| 63 | Ash | 1 | 12 | M | | | | X | | | | Moderate ivy with some bark visible, | | X | | | Not being removed | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|--------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|--|---------------------|----------|-----|------------|---|-----------------------|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | but couldn't be confident a PRF wasn't present. | | | | | | |
| 64 | Ash | 1.5 | 12 | M | | | X | | X | | | Dense ivy that could hide features and cavity 5m from ground north facing. | X | | | | Not being removed | None |
| 65 | Ash | 1 | 12 | M | | | | | | | | No potential roost features present | | | | X | Not being removed | None |
| 66 | Ash | 1-1.5 | 12 | M | | | | | X | X | | Deadwood and moderate ivy cover present that could hide a roost feature | | X | | | Not being removed | None |
| 67/68 | Ash | 1.5 | 12 | M | | | | | X | | | Moderate ivy coverage on main trunk but unlikely to conceal PRF as a lot of bark | | | X | | Not being removed | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|---------------------------|--------------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|---|---------------------|----------|-----|------------|---|-----------------------|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | is visible. | | | | | | |
| 69 | Ash | 1.2 | 10 | M | | | | | | | | No potential roost features present | | | | X | Not being removed | None |
| 70 | Sycamore | 1 | 10 | M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 71/72/ 73/74/ 75/76 | Alder/Sycamore/Ash | 0.3-0.8 | 6-8 | EM | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 77/78/ 80 | Alder | 0.6-1 | 8 | M | | | | | | | | Sparse ivy present but bark clear and no cavities | | | | X | Potentially removing | None |
| 79 | Ash | 0.3 | 6 | EM | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| G9 | Ash | 0.3-0.5 | 6 | EM | | | | | | | | Some trees with sparse ivy but largely clean trees free of PRFs | | | | X | Potentially removing | None |
| G10 | Alder/Ash | 0.3-0.5 | 8 | EM | | | | | | | | No potential roost features | | | | X | Potentially removing | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|------------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|--|---------------------|----------|-----|------------|---|-----------------------|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | present | | | | | | |
| G11 | Ash/oak | 0.3-0.6 | 6-8 | EM | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| G12 | Oak/birch/ald er | 0.3-0.5 | 6-8 | EM | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| G13 | Oak/birch/ald er | 0.3-0.5 | 6-8 | EM | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 81 | N/A | N/A | N/A | Y | | | | | | | | Species too young to support a bat roost | | | | X | Potentially removing | None |
| 82 | N/A | N/A | N/A | Y | | | | | | | | Species too young to support a bat roost | | | | X | Potentially removing | None |
| 83 | N/A | N/A | N/A | Y | | | | | | | | Species too young to support a bat roost | | | | X | Potentially removing | None |
| 84 | N/A | N/A | N/A | Y | | | | | | | | Species too young to support a bat roost | | | | X | Potentially removing | None |
| 86 | N/A | N/A | N/A | Y | | | | | | | | Species too young to support a bat roost | | | | X | Potentially removing | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|--------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|--|---------------------|----------|-----|------------|---|-----------------------|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| 87 | N/A | N/A | N/A | Y | | | | | | | | Species too young to support a bat roost | | | | X | Potentially removing | None |
| 88 | N/A | N/A | N/A | Y | | | | | | | | Species too young to support a bat roost | | | | X | Potentially removing | None |
| 89 | N/A | N/A | N/A | Y | | | | | | | | Species too young to support a bat roost | | | | X | Potentially removing | None |
| 90 | N/A | N/A | N/A | Y | | | | | | | | Species too young to support a bat roost | | | | X | Potentially removing | None |
| 93 | Oak | 0.4 | 5 | EM | | | | | X | | | Sparse ivy present and bark clearly visible. No cavities present and no potential roost features observed. | | | | X | Potentially removing | None |
| 85 | Ash | 1.5 | 10-12 | M | | | X | | | | | Hollow at ground level on each side to 1m. Shallow on inspection so very little bat | | | X | | Potentially removing | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|--------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|--|---------------------|----------|-----|------------|---|--|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | roost potential | | | | | | |
| 91 | Oak | 0.5 | 6 | EM | | | | | X | | | Moderate ivy coverage but bark easily visible so unlikely to conceal a PRF. | | | X | | Potentially removing | Remove during winter (November-March). If this is not possible ivy should be cut at the base followed by removal under supervision by a suitably qualified ecologist |
| 92 | Sycamore | 0.8 | 10 | M | | | | | X | | | Moderate ivy coverage but bark easily visible so unlikely to conceal a PRF. | | | X | | Potentially removing | Remove during winter (November-March). If this is not possible ivy should be cut at the base followed by removal under supervision by a suitably qualified ecologist |
| 94 | Sycamore | 1.5 | 12 | M | | | X | | | | | Two cavities on south side at 2-3m from ground. One woodpecker hole at 6m from ground facing south east. | X | | | | Potentially removing | Aerial inspection or emergence/re-entry (3 visits) May-September |
| 95 | Sycamore | 2 | 12 | M | | X | | | | | | Some loose bark and small holes present at | | X | | | Potentially removing | Aerial inspection or emergence/re-entry (2 visits) May-September |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation | |
|----------|-------------------------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|---|---------------------|----------|-----|------------|---|---|--|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | | |
| | | | | | | | | | | | | 4-5m from the ground. One large upward facing cavity facing south east at 8m from the ground on main trunk. | | | | | | | |
| Group 14 | Various (Sycamore/oak/cherry) | 0.3-0.6 | 6-8 | EM | | | | | X | | | Sparse ivy cover present on some trees but ivy stems narrow. | | | | X | Potentially removing | None | |
| 96/97 | Oak | 0.6 | 7 | EM | | | | | X | | | Dense ivy that could conceal a roost | | X | | | Potentially removing | Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy | |
| 98 | Cherry | 0.5 | 6 | M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None | |
| 99 | Alder | 0.6 | 10 | M | | | | | X | | | Dense ivy that could conceal a roost | | X | | | Potentially removing | Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy | |
| Group 15 | Various (birch/pine/oak) | 0.3-0.5 | 6 | EM | | | | | | | | No potential roost features present | | | | X | Potentially removing | None | |

| Tree Ref | Tree species | DBH (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|--------------------------------|--------------|---------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|--|---------------------|----------|-----|------------|---|---|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| Group 16 | Willow/alder | 0.2-0.4 | 6-8 | Y/EM | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 100 | Alder | 0.6 | 6 | EM/M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 101/102 | Cherry | 0.5 | 6 | | | | | X | | | | Sparse ivy with easily visible bark | | | | X | Potentially removing | None |
| Group 17 | Ash/Cherry | 0.3-0.5 | 6-8 | EM | | | | X | | | | Sparse ivy from ground to 3m but no potential roost features noted or likely to be hidden behind ivy | | | | X | Potentially removing | None |
| Group 18 | Oak | 0.3-0.5 | 6-8 | Y | | | | X | | | | Sparse ivy with easily visible bark | | | | X | Potentially removing | None |
| 103/104/105 (with in Group 18) | Oak? | 0.5-0.6 | 8 | Y/EM | | | | X | | | | Dense ivy that could conceal a roost | X | | | | Potentially removing | Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|-----------------------------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|--|---------------------|----------|-----|------------|---|--|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| Group 19 | Oak | 0.3 | 6-8 | EM | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 106 | Ash | 1-1.5 | 12 | M | | | | | X | | | Dense ivy that could conceal a roost | | X | | | Potentially removing | Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy |
| 107 | Unknown | 0.6 | 4 | EM/M | | | | | X | | | Ivy quite dense but tree is small and low growing. Unlikely to conceal large PRF but could be used as summer transition roost. | | | X | | Potentially removing | Remove during winter (November-March). If this is not possible ivy should be cut at the base followed by removal under supervision by a suitably qualified ecologist |
| 108 | Unknown | 0.6 | 4 | EM/M | | | | | X | | | Ivy quite dense but tree is small and low growing. | | | X | | Potentially removing | Remove during winter (November-March). If this is not possible ivy should be cut at the base followed by removal under supervision by a suitably qualified ecologist |
| Group 20 | Unknown species | 0.60-0.8 | 6-8 | EM/M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| Group 21 | Various (including oak and hazel) | 0.3-1 | 8-12 | EM/M | | | | | X | | | Ivy present but not dense and bark | | | X | | Potentially removing | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|-----------------|--------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|--|---------------------|----------|-----|------------|---|---|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | visible. | | | | | | |
| Group 22 | Unknown | 0.6-0.8 | 8-10 | EM/M | | | | | X | | | Sparse/moderate ivy covering on main trunk and branches | | | X | | Potentially removing | None |
| 109/110/111/112 | Ash | 0.5 | 7 | EM | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 113 | Alder | 0.5 | 8 | EM | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 114 | Ash | 0.6 | 6 | EM | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 115/116 | Ash | 0.6-0.8 | 10 | M | | | | | X | | | Dense ivy covering and potential to conceal a roost/PRF. | | X | | | Potentially removing | Emergence/re-entry (2 visits) May-September; Ivy severing at base followed by supervision by suitably qualified ecologist on removal of ivy |
| 117 | Sycamore | 1 | 10 | M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 118 | Ash | 0.6 | 8 | M | | | | | | | | No potential roost | | | | X | Potentially removing | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|--------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|---|---------------------|----------|-----|------------|---|--|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | features present | | | | | | |
| 119 | Birch | 0.6 | 6 | EM/ M | | | | | X | | | Ivy present but sparse, not dense and bark visible. | | | | X | Potentially removing | None |
| 120/121 | Ash | 0.6 | 6 | EM/ M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 122 | Oak | 0.7 | 8 | M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 123 | Ash | 0.8 | 8 | M | | | | | | | | No potential roost features present | | | | X | Potentially removing | None |
| 124 | Ash | 0.6 | 8 | M | | | | | | | | Multi-stemmed. No potential roost features present. | | | | X | Potentially removing | None |
| 125 | Unknown | 0.8 | 10 | M | X | | | | | | | Large crack on main trunk to 3m and east facing | | X | | | Potentially removing | Ground endoscope survey/aerial inspection or emergence/re-entry surveys 2 visits (May-September) |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|----------------------------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|--|---------------------|----------|-----|------------|---|-----------------------|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| G23 | Willow | 0.3-0.6 | 5-6 | M | | | | | | | | Multi-stemmed. No potential roost features present. | | | | X | Potentially removing | None |
| Group 24 | Various (including ash/alder) | 0.4-1 | 8-10 | M | | | | | X | | | Some trees with sparse ivy but no potential roost features present or likely to be hidden behind ivy | | | | X | Potentially removing | None |
| Group 25 | Various (including sycamore/ash) | 0.6-0.8 | 8-10 | EM/M | | | | | X | | | Some sparse ivy on trees but bark present and no PRFs. Evidence of minor limb cutting on this group. | | | | X | Potentially removing | None |
| Group 26 | Scots Pine | 1.5-2 | 10-14 | M | | X | | | | | | Some loose bark present but very small and very unlikely to support any roost | | | | X | Potentially removing | None |

| Tree Ref | Tree species | DB H (m) | Height (m) | Age (OM / M/ EM/ Y) | Description of Feature | | | | | | | Bats/evidence present Describe | Bat Roost Potential | | | | Proposed Action (Potentially removing/Not removing) | Survey recommendation |
|----------|--------------|----------|------------|---------------------|------------------------|------------|--------------|---------------|-----|--------------|-------|--------------------------------|---------------------|----------|-----|------------|---|-----------------------|
| | | | | | Split | Loose bark | Trunk cavity | Branch cavity | Ivy | Callus rolls | Other | | High | Moderate | Low | Negligible | | |
| | | | | | | | | | | | | type | | | | | | |

APPENDIX C: PHOTOGRAPHS TO ACCOMPANY BAT TREE ASSESSMENT



Tree 4 and 5 (middle and right)



Tree 7/8



Tree 12



Tree 15



Tree 18, 19 on the left of path



Tree 33/34/35 on right (although looks to be only 2 shown here). All similar covering of ivy.



Tree 94, 95



Tree 96/97



Tree 99 on right on near side of fence.



Tree 104/105 in centre



Tree 103 in centre



Tree 106 on right



Tree 115/116 (116 surveyed as one tree)



Tree 125 in foreground with split evident.



Tree 53/54/55. Three large trees in the centre.