



Llywodraeth Cymru  
Welsh Government



# A55(T) Chester to Bangor Trunk Road: Abergwyngregyn to Tai'r Meibion Improvement

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ENVIRONMENTAL STATEMENT  
VOLUME 2: TECHNICAL APPENDIX C  
ECOLOGY AND NATURE CONSERVATION  
PUBLIC RELEASE VERSION





**This Technical Appendix contains the following documents, which support Chapter 5.4 (Nature Conservation) of the Environmental Statement:**

- A55(T) Abergwyngregyn to Tai'r Meibion Red Kite Survey report (EDC, 2017)
- A55(T) Abergwyngregyn to Tai'r Meibion Breeding Bird Survey report (EDC, 2016)
- A55(T) Abergwyngregyn to Tai'r Meibion Bat Underpass Activity report (YGC, 2016)
- A55(T) Abergwyngregyn to Tai'r Meibion Bat Transect Survey report (EDC, 2015)
- A55(T) Abergwyngregyn to Tai'r Meibion Bat Transect Survey report (EDC, 2011)
- A55(T) Abergwyngregyn to Tai'r Meibion Bat Activity and Breeding Bird Survey report (EDC, 2008)
- A55(T) Abergwyngregyn to Tai'r Meibion Otter and Badger Survey report (YGC, 2015)
- A55(T) Abergwyngregyn to Tai'r Meibion Extended Badger and Otter Survey report (EDC, 2007)
- A55(T) Abergwyngregyn to Tai'r Meibion Otter and Water Vole Survey report (Gwynedd Consultancy, 2008)
- A55(T) Abergwyngregyn to Tai'r Meibion Great Crested Newt Survey report (Gwynedd Consultancy, 2008)
- A55(T) Abergwyngregyn to Tai'r Meibion Tree Survey report (Mynydd Timber Services, 2016)
- A55(T) Abergwyngregyn to Tai'r Meibion Phase 1 Habitat Survey report (YGC, 2016)
- Roman (Henfordd) Road and A55(T) Access Road Protected Species Survey report (EDC, 2008)
- A55(T) Abergwyngregyn to Tai'r Meibion Protected Species Survey report (EDC, 2007)
- Roman (Henffordd) Road Extended Phase 1 Habitat Survey report (EDC, 2006)
- A55(T) Abergwyngregyn to Tai'r Meibion Protected Species Survey report (Tim Hodnett and Richard Castell, 2005)





The Cottage  
Bodrhyddan Hall  
Rhuddlan  
Denbighshire  
LL18 5SB

## **RED KITE SURVEY**

**A55 Road Improvement:  
Abergwyngregyn and Junction 12 (Tal-y-bont)  
GWYNEDD**

**APRIL 2017**

**Author:** Richard Castell *BSc*  
**Version:** 1.3

ecological  
design  
consultants

01745 591208 Tel....Mobile 07778 134930  
E. Mail [tim@aedc.co.uk](mailto:tim@aedc.co.uk)

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FIGURE 1: SURVEY AREA

## 1.0 INTRODUCTION

### 1.1 Background and Commission

1.1.1 A breeding bird survey of the site conducted by EDC in 2016 recorded Red Kite *Milvus milvus* within the work zone of the A55 road-widening scheme between Abergwyngregyn and Tal-y-bont. Given the availability of suitable breeding habitat it was suspected that these birds likely nest close to where the survey registered them.

1.1.2 The original BBS survey that was undertaken during the 2016 season was subsequently extended to include observational surveys for Red Kite within the proposed zone, to determine if the works associated with the widening of the A55 were likely to cause disturbance to this Schedule 1 bird species at its nest. The results of the survey were included within the 2016 BBS survey.

### 1.2 The Survey Area

1.2.1 Pastoral agriculture dominates the land either side of this stretch of the A55. Mixed species hedgerows form the majority of the field boundaries and there are several pockets of mature mixed species woodland. Eight narrow streams run from south to north across the survey area. Three farmyards and three domestic dwellings, one of the dwellings Wig Bach has been demolished, leaving an area of vacant ground.

1.2.2 The extent of the survey area is presented in Figure 1

### 1.3 Legislation and Policy

1.3.1 All birds, their nests and eggs are protected by the *Wildlife and Countryside Act 1981* (as amended) and it is an offence, with certain exceptions, to intentionally or recklessly kill, injure or take any wild bird; intentionally or recklessly take, damage or destroy or otherwise interfere with the nest of any wild bird while it is in use or being built; intentionally or recklessly obstruct or prevent any wild bird from using its nest; or intentionally or recklessly kill take or destroy the egg of any wild bird.

1.3.2 *Schedule 1* of the *Wildlife and Countryside Act* lists birds protected by special penalties at all times. It is an offence to intentionally or recklessly disturb any wild bird listed in *Schedule 1* while it is nest-building or is at or near a nest with eggs or young; or disturb the dependent young of such a bird.

### 1.4 Survey Aims

1.4.1 Survey aimed to ascertain whether Red Kite was likely breeding within the survey area and if so, to attempt to identify the general location of their nest site to determine if works associated with the road scheme would result in disturbance to the nest site.

## 2.0 METHODOLOGIES

### 2.1 Background Data Search

2.1.1 The 2016 breeding bird survey report was reviewed to provide an indication of the locations within the survey area where Red Kite had been registered. Enquiries were also made to personal contacts who monitor Red Kite breeding sites in Gwynedd.

### 2.2 Field Survey

2.2.1 The survey methodology drew on guidance provided in *Raptors: A Field Guide to Surveys and Monitoring* (Hardy et al 2006) and *Bird Monitoring Methods* (Gilbert et al 1998). Two survey visits were made at a time when Red Kite breeding activity was likely to have started.

2.2.2 The first visit was made on 31<sup>st</sup> March 2017 (10.00-14.00 hrs). At this stage of the Red Kite breeding season nest building and/or courtship flights might be observed, this activity usually centred close to the nest site. Regular registrations of Red Kite during this survey visit were used to narrow the survey area for subsequent survey visits.

2.2.3 The second survey was conducted on 13<sup>th</sup> April 2017 (11.30-15.30 hrs) when the Red Kite egg incubation period was likely to have commenced. At this stage of the breeding cycle the male bird does not stray far from the breeding site and can be observed bring prey items back to the nest to feed the female.

2.2.4 Each survey visit was conducted for four hours utilising suitable vantage points that provided views across all areas of suitable breeding habitat within the survey area. Vantage points were selected along roads to allow for maximum mobility between them. The period spent at each vantage point was variable but was typically limited to an hour during the first survey visit but extended (at a reduced number of vantage points) during the second survey visit. The locations of the vantage points is presented in the confidential addendum to this report.

2.2.5 During the survey visits each time a Red Kite was observed its position was plotted onto a plan of the survey area. From this point the extent of the bird's flight-line was also marked. For each registration a note was made of the time when the bird was first noted and the relevant vantage point from where the bird was seen.

### 2.3 Survey Conditions

2.3.1 The survey was undertaken during daylight hours. Weather conditions are presented in Table 1.

**Table 1: Survey weather conditions**

Date	Temp (°C)	Precipitation	Cloud cover	Wind (km/h)	Visibility (km)
31/03/2017	11-12	Mainly dry	Partly cloudy	35-44 S	9.3
13/04/2017	11	Mainly dry	Mostly cloudy	18-25 SSW	10.6

## 2.4 Limitations to Survey

2.4.1 Views from the selected vantage points were sometimes limited because of the both the terrain and the wooded nature of the hillsides. Some, however, notably VP01 and VP02, between them provided extensive views along most of the length of the survey area.

## 3.0 RESULTS

### 3.1 Background Data Search

3.1.1 A BBS survey was undertaken along the same transects during the 2008 nesting season. Red Kite was not recorded by that survey. Anecdotal information was, however, provided of single Red Kite breeding site in the wider area. That site was used for breeding in 2015 and 2016.

### 3.2 Field Survey

3.2.1 Because of the scarcity of this species and its vulnerability to persecution and unwanted disturbance at the nest site, the detailed maps of the survey results are not presented in this report but have been provided as confidential (not for public release) appendices to this report. A summary of the results, however, is provided below.

3.2.2 Red Kite was detected on both survey visits. Each of these registrations was of a single male whose activity was concentrated around one area. On the second survey visit he was observed with prey in his talons on a very direct flight-line towards a suitable nesting area. He was observed landing in trees and then departing without the prey very soon afterwards – it is almost certain that this was a delivery to the nest of food for the incubating female.

## 4.0 EVALUATION

4.1 Expert survey results presented in *A Review of Disturbance Distances in Selected Bird Species* (Ruddock & Whitfield 2007) recommend a disturbance protection buffer of 300 m radius around any Red Kite nest site. The work areas for the widening scheme are significantly greater than 300 m from the potential nest site identified by this survey. Anecdotal evidence of previous

years nesting along the coastal area has come to light, however these sites where also recorded outside of the 300 m buffer zones. It is therefore extremely unlikely that any work activity in relation to the A55 improvement scheme would result in disturbance to any Red Kite nest.

## 5.0 RECOMMENDATIONS

**5.1 Recommendation:** There must be no work activity between February and August (inclusive) within the 300-metre buffer zone indicated in drawing 0435\_KT03 attached to the confidential addendum to this report.

**Reason:** To avoid disturbance of any nesting Red Kite.

## 6.0 REFERENCES

CAMPBELL, B. & FERGUSON-LEES, J. (1972), *A Field Guide to Birds' Nests*. Constable.

CRAMP, S and SIMMONS, K. E. L. (eds.) (2004), *BWPI: Birds of the Western Palearctic interactive (DVD-ROM)*. BirdGuides & Oxford University Press.

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HARRISON, C. & CASTELL, P. (2002), *A Field Guide to Bird Nests, Eggs and Nestlings of Britain and Europe (New Edition)*. Collins.

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RUDDOCK, M. & WHITFIELD, D.P. (2007), *A Review of Disturbance Distances in Selected Bird Species (A report from Natural Research (Projects) Ltd to Scottish Natural Heritage)*.

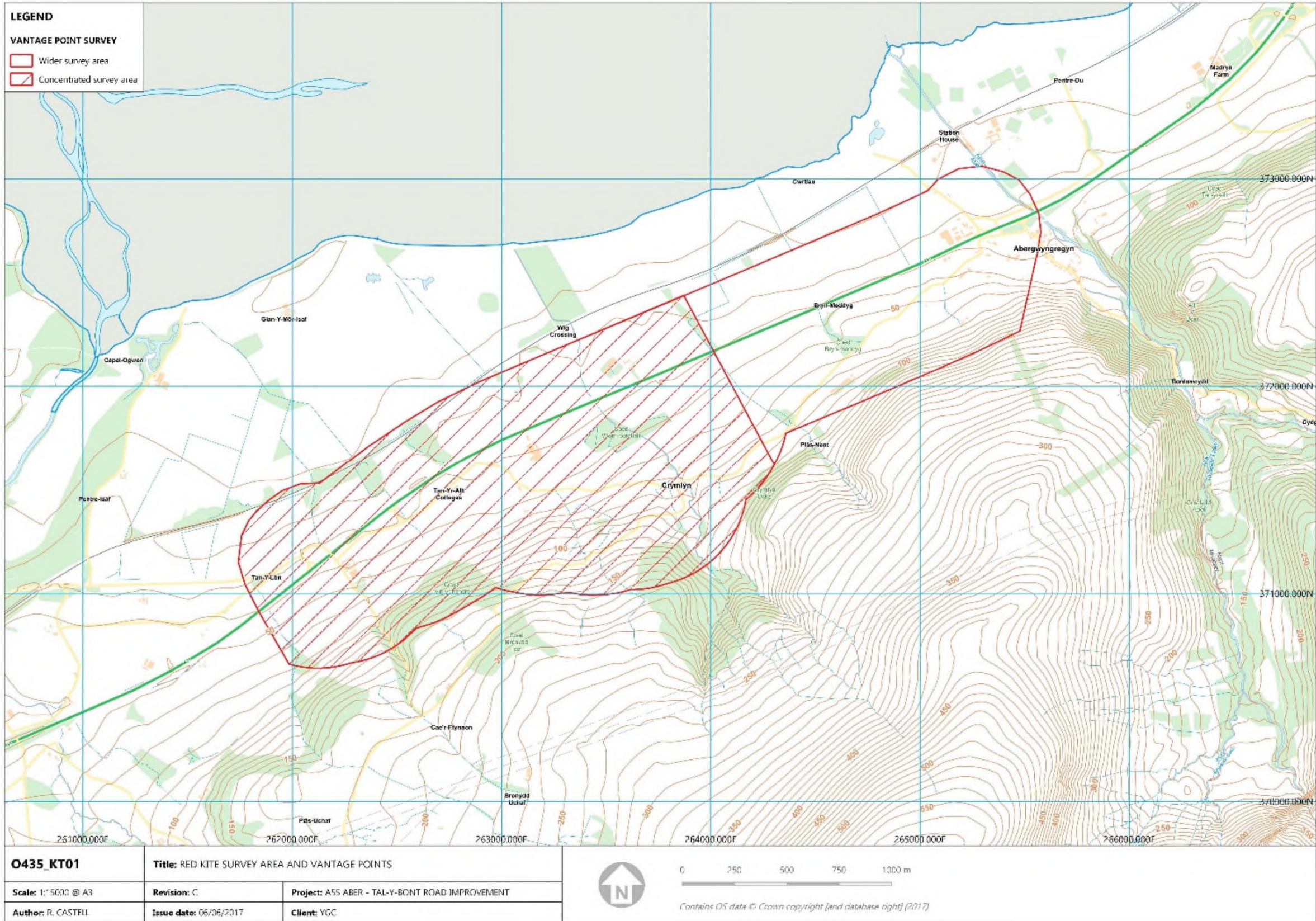


Figure 1



The Cottage  
Bodrhyddan Hall  
Rhuddlan  
Denbighshire  
LL18 5SB

## **BREEDING BIRD SURVEY**

**A55: Abergwyngregyn and Junction 12 (Tal-y-Bont)  
GWYNEDD**

ecological  
design  
consultants

## **AIM**

The aim of the survey is to establish the presence of nesting bird activity to the northern and southern side of the carriageway, including the proposed access tracks. To set two linear transects to either side of the carriageway as set out in the BTO/JNCC/RSPB breeding bird survey methodologies.

- To identify and record where feasible active nest sites, with specific attention to any areas which will be disturbed during the proposed works
- To establish likely times where any recorded site will be free from activity and advise accordingly
- To undertake a set of transects at a minimum period of two weeks to log any activity not recorded on the first transect due to birds incubating egg
- To identify species of local and national concern
- To offer proposals to reduce impact or mitigate for loss of important nesting sites that may be impacted upon during the proposed works.

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### **BREEDING BIRD SURVEY**

#### **1.0 INTRODUCTION**

- 1.1 Site
- 1.2 Existing Data
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#### **5.0 RESULTS-RED KITE**

#### **6.0 RECOMMENDATIONS-RED KITE**

#### **7.0 CONCLUSION**

#### **APPENDICIES**

- APPENDIX 1: Site Plan
- APPENDIX 2: BBS Methodology
- APPENDIX 3: BBS Field Data
- APPENDIX 4: Tables
- APPENDIX 5: Mapped Kite Activity

## **1.0 INTRODUCTION**

YGC commissioned a breeding bird survey (BBS) in relation to the proposed scheme. The survey was undertaken on land either side of the A55 between Abergwyngregyn and Junction 12 (Tal-y-Bont). Tim Hodnett, Ian Roberts and Lawrence Hunter have between 17 and 30 years of field survey experience and have undertaken several surveys over the last 10 years in relation to the proposed A55 widening scheme and associated works. The surveys aimed to identify and record the bird species present during the peak-breeding season and, where possible, confirm breeding and identify key areas of bird activity.

### **1.1 Site**

Pastoral agriculture dominates the land either side of this stretch of the A55. Mixed species hedgerows form the majority of the field boundaries and there are several pockets of mature mixed species woodland. Eight narrow streams run from south to north across the survey area. Three farmyards and three domestic dwellings lie close to the transect lines, one of the dwellings Wig Bach has been demolished, leaving an area of vacant ground.

### **1.2 Existing Data**

A BBS survey was undertaken along the same transects during the 2008 nesting season, the data sets from that survey have been used as reference in the preparation of this survey.

### **1.3 Survey Areas**

The survey was conducted along the transect lines marked on the site plan included in Appendix 1. The survey area included land 250m either side of these transects.

### **1.4 Legal Protection**

All wild birds, their nests and their eggs are protected by the Wildlife & Countryside Act 1981. It is an offence (with certain exceptions), to intentionally kill, injure or take any wild bird (this includes chicks); to take, damage or destroy any wild bird's nest while it is use or being built; and to take or destroy the egg of any wild bird. The definition of a wild bird is 'any bird of a kind which is resident in or a visitor to Great Britain in a wild state'. For certain species general licenses are available from Natural Resources Wales (NRW) for an authorised person to lawfully carry out the actions outlined above providing that it is in the overriding interest of public health or air safety and that all other attempts to prevent the problem caused by the species have failed.

## 2.0 METHODOLOGIES

2.1 The site was surveyed following the BTO/RSPB/JNCC “Breeding Bird Survey” methodologies (Full details of the methodology are provided in **Appendix 2**). The survey technique had to be modified slightly as the site was too large for this method to be followed exactly.

2.2 Due to the transect lengths, the surveys have to be undertaken over two mornings. The order in which the transects were undertaken addresses the health and safety constraints identified during the risk assessments undertaken prior to survey. The order of survey is that sections A3-10 and section C were walked on BBS01 followed by sections A 1 &2 and section D on day two of the survey, this was repeated for BBS02. For each visit the same transect route was slowly walked recording species within the survey area by sighting and/or song/calls.

2.3 Survey visits were conducted on the following dates:

EARLY VISIT (BBS01): 29/04/2016 – Southern side, sections A3-10 and Northern side, sections C1-10. 30/04/2016 – Southern side, sections A1 and 2 and Northern side, sections D1-5

LATE VISIT (BBS02): 27/05/2016 – Southern side, sections A3-10 and Northern side, sections C1-10. 31/05/2016 – Southern side, sections A1 and 2 and Northern side, sections D1-5

2.4 No night visits were undertaken during this series of transects following the night bat transects which recorded a negative for tawny and barn owl within the work corridors.

### 2.4 Limitations:

- Traffic noise from the A55 potentially obscured bird song where transects passed close to this road. It was noted that the density of traffic has increased since the 2008 surveys, which also has increased noise levels. The increase of traffic was relative to the ferry sailings from Holyhead and commuter traffic.
- Tall hedgerows occasionally obscured views across the whole of the transect area and some birds may have been missed.
- Private gardens and farmyards were not walked through during the survey and some birds may have been missed.
- Dry cold start to this year's bird nesting season, slightly suppressing breeding activity.

### 3.0 RESULTS

3.1 A total of 41 bird species were recorded during the survey. Of these, 17 species were confirmed breeding with a further 17 species unconfirmed but probable breeders. (See **Table 1, Appendix 4**). Of the species recorded during the survey 8 are red-list species of high conservation concern having suffered either a rapid (>50%) decline in UK breeding population or a rapid (>50%) contraction of UK breeding range over last 25 years. A further 10 species have been included on the amber-list of medium conservation concern having suffered either a moderate (25-49%) decline in UK breeding population or a moderate (25-49%) contraction of UK breeding range over last 25 years. A summary of the species lists is as follows:

#### Red Data

- Herring Gull, *Larus argentatus*
- Grey Wagtail *Motacilla cinerea*
- Song Thrush *Turdus philomelos*
- Mistle Thrush *Turdus viscivorus*
- Yellowhammer *Emberiza citrinella*
- House Sparrow *Passer domesticus*
- Linnet *Carduelis cannabina*

#### Amber Data Listing

- Shelduck *Tadoma tadoma*
- Lesser Black-backed Gull *Larus fuscus*
- Swift *Apus apus*
- Swallow *Hirundo rustica*
- House Martin *Delichon urbicum*
- Dunnock *Prunella modularis*
- Goldcrest *Regulus regulus*
- Mallard *Anas platyrhynchos*
- Common Gull *Larus canus*
- Red Kite *Milvus milvus*

#### NERC Section 42 list

- Linnet *Carduelis cannabina*
- Yellowhammer *Emberiza citrinella*
- Herring Gull, *Larus argentatus*
- House Sparrow *Passer domesticus*
- Song Thrush *Turdus philomelos*

None of the species recorded during the transects are listed within either Gwynedd LBAP or the TREBAP

- 3.2 Birds were recorded throughout the survey area. However, the areas of improved grassland, which dominate the survey area, supported few birds in terms of species and abundance. Most of the birds observed in these areas were either in flight (flying over, or insect foraging in the case of the *Hirundines*), or recorded along the hedgerows dividing the fields. The hedgerows immediately adjacent to the A55 supported lower densities of birds than hedges away from the A55. Hedges following the northern boundary of the A55 were considerably wider than those along the southern boundary and contained more trees. Consequently the northern hedges supported more birds and provided better nesting habitat.
- 3.3 The density of birds and variety of species increased dramatically in areas of woodland or along hedgerows with mature trees or around areas of habitation. BBS field data corresponding to each transect section can be seen in **Appendix 3**. These should be viewed in conjunction with the Site Plan (**Appendix 1**) and the Habitat Recording Forms (**Appendix 3**).
- 3.4 The main variations between the 2008 and the 2016 survey were that 7 of the original species had not been recorded, the surveyors were surprised that neither Raven or Long-tailed Tit had been recorded, and that Starlings were also not evident. However 10 more species had been identified, including Red Kite. Table 1 (**Appendix 4**)

#### **4.0 RECOMMENDATIONS**

- 4.1 The typical nesting season for birds in Britain runs from late-March to early-August though a few species will breed a month or two either side of these dates. Therefore, any planned vegetation / tree clearance works should be timetabled to occur outside this time-bracket.
- 4.2 Loss of nesting habitat in the form of hedgerows should be mitigated for by the replanting of wide, mixed species hedges. For maximum nesting potential these hedges should be managed in such a manner as to produce a hedge c.2-3m tall and a minimum of 1.5m wide. This is the main nesting habitat for song thrush.
- 4.3 If it is necessary to remove any mature trees then nesting opportunities for cavity nesting species will be reduced. This loss can be compensated for by the provision of nest boxes targeting red/amber list species such as house sparrow and starling. Likewise, nest boxes can be utilised under any bridges to provide nest sites for grey wagtail.
- 4.4 Following the recoding of a single individual adult Red Kite during both survey periods and following consultations with the client, it was recommended that further survey was to be undertaken to attempt to establish if this species was nesting within the proximity of the proposed work areas and if so assess the potential impact.

## 5.0 RESULTS-RED KITE

- 5.1 Visual observation posts (VP) were set up prior to dawn, 3:45 am, on 21 June 2016, so observations could be undertaken at a distance and relative elevation to establish early movement by this bird species, potentially leaving a nest site, within or adjacent to the proposed work areas.
- 5.2 An individual bird was recorded flying eastwards at 6 am away from the initial observation point. The bird was an adult with similar markings to those previously recorded during the BBS transects. The flight activity is as recorded within **Appendix 5**
- 5.3 The VP was repositioned towards Abergwyngregyn, on high ground, however no sightings of the original bird were observed. At 8 am a second bird was identified flying in form approximately Wig Bach, flying parallel to the carriageway just over the field edge. The bird was identified as a previous seasons juvenile.
- 5.4 The juvenile Kite was observed feeding on the ground on a rabbit carcass for approximately 1 hour before flying back towards the western end of survey area. The bird was observed over mature trees outside of the western survey boundary. The bird made contact with the first Kite before the adult bird went back to roost and the juvenile flew north.
- 5.5 The VP was changed again to the western end around and just to the north of the identified roost point of the adult, however no nest sites were identified, nor any further sightings of either bird, the survey completed at 11:30 am.
- 5.6 No evidence of nesting was identified within or immediately adjacent to the proposed work areas during the survey period.

## 6.0 RECOMMENDATIONS-RED KITE

- 6.1 Based on the observations of the VP surveys, the surveyors suggest that the behaviour identified by the two Kites is of newly paired birds, one bird with adult plumage and the second bird with juvenile plumage from the previous seasons breeding, potentially setting up a future breeding site. The area has sufficient supporting habitats for this species with plenty of carrion species being recorded during the BBS transects.
- 6.2 It is too late in the season for this pair to breed this year; however it is highly likely if the birds return next season that a nest site and breeding could take place. It is the surveyor's view that the area that has most potential for nest sites is the area the birds have been recorded roosting, within very mature trees west of the construction area. It is recommended that pre work check surveys are undertaken if works are to be undertaken or ongoing during the

2017 season to ensure that a nest site of this schedule 1 protected species is not disturbed.

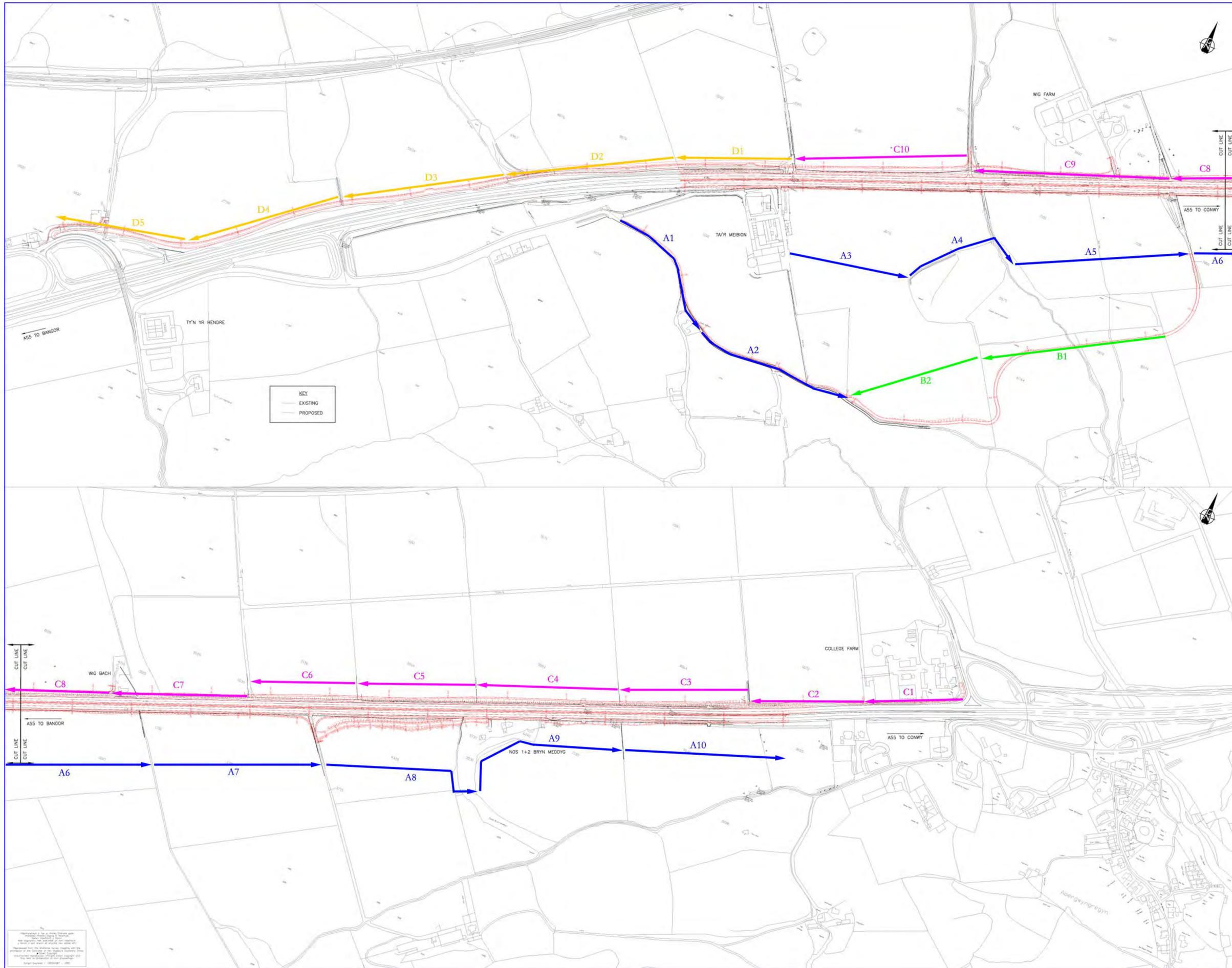
## **7.0 CONCLUSION**

- 7.1 The survey recorded a typical suite of common birds that one would expect to find in this habitat. Although a number of the species are red- and amber-listed, including two schedule 1 birds, Barn Owl 2008 surveys and Red Kite 2016 surveys, none of the species noted are particularly rare. The highest level of bird activity and abundance was recorded in areas of woodland found along the transect line. The majority of the survey area however is formed by improved, sheep-grazed grassland and presents few nesting opportunities for birds. It does however provide good foraging habitat.
- 7.2 Following the woodland and farmyards, hedgerows provide the next best nesting habitat for birds, with those on the northern boundary of the A55 generally being better than those to the south. However, hedges further from the A55 appeared to support more birds than those close to this road, this is probably due to increased road noise levels.
- 7.3 Providing that works to remove any potential nesting habitat (trees, hedgerows, scrub and buildings etc.) are timetabled outside the main bird nesting season, it is unlikely that the scheme will have a major affect on the breeding bird population as suitable nesting habitat is available in the surrounding land. However, any nesting habitat removed as part of the scheme should be replaced once works have been completed and managed thereafter to suit the requirements of nesting birds.

Tim Hodnett  
June 2016

## **APPENDIX 1**

Site Plan  
And  
Survey Transects



CLIENT/CLIENT :

**NODIADAU/NOTES**

- All dimensions in millimetres unless otherwise stated.
- All levels in metres above Ordnance Datum.
- All chainages in metres.

**KEY**

- EXISTING
- PROPOSED

**CYNGOR GWYNEDD COUNCIL**

**CYFADRAN YR AMGYLCHEDD**  
ENVIRONMENT DIRECTORATE

*Cyfarwyddwr Strategol Amgylchedd / Strategic Director of Environment*  
Dewi V Rowlands  
B.Sc. M.Sc. D.M.S. CEng F.I.C.E. M.I.H.T.

**YMGYNGHORIAETH GWYNEDD GWYNEDD CONSULTANCY**

**PROJECT/SCHHEME**  
A55 CHESTER TO BANGOR TRUNK ROAD: ABERGWYNGREGYN TO TA'R MEIBION IMPROVEMENT

**TITL LLEINIAU/DRAWING TITLE**  
GENERAL ARRANGEMENT

DISYBLIADUR CAR / DRAWING BY:	AM/EH	DISYBLIADUR / DATE DRAWN:	27/11/07
DISYBLIADUR SŵN / CHECKED BY:		DISYBLIADUR SŵN / DATE CHECKED:	
Ysgrif / Scale:	1 : 1	Ysgrif / Scale:	1 : 2000

Rhif Lliniad / Drawing No. 161/GA/528

## **APPENDIX 2**

### Breeding Bird Survey (BBS) Methodology



# BREEDING BIRD SURVEY INSTRUCTIONS



## Tips to volunteers:

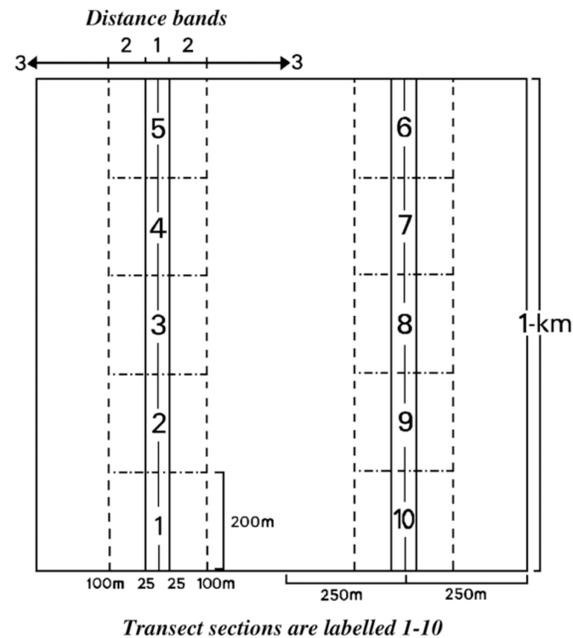
### For all users:

1. Do not record birds you see or hear before or after your transect line (i.e. behind your first 200m section or in front of your last 200m section).
2. Record all birds to the sides of your transect line.
3. Record all birds from your transect line that you can see or hear that are to the sides of your transect line, even if they are in adjacent 1-km squares.
4. Record habitat details each year. If you are only able to fill in the first two columns on the habitat form, this is still extremely useful.

### For paper-form users only:

5. Ensure that only the number of birds recorded is written in each box on the count summary forms. Additional information such as "+" or "many" complicates the forms and should be avoided.
6. Birds can be listed in any order on the Count Summary Sheet.
7. Please put your forms in the following order on completion - from top to bottom: habitat, summary 1, summary 2, mammal, field 1, field 2. This will help speed up the processing of forms.

## Finding and marking a route



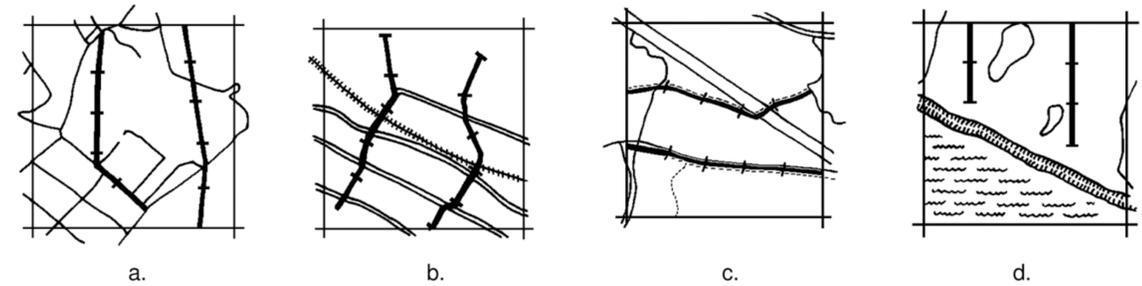
If the square has been surveyed before, your RO should provide you with a sketch map of the counting route (the transect line) taken by the previous BBS observer. This route must be followed to ensure consistency of recording on that square (i.e. if a different route is taken, different birds will probably be recorded). If the route has to be changed because you can no longer get access to it, please consult your RO and return the completed Habitat Recording Form, with a sketch map of the new route on it. If the square has never been covered before (your RO will tell you this), you will need to create your own transect route across it.

The transect line should ideally consist of two parallel lines, north-south or east-west, each 1-km long. **Please ensure that the route followed is the same as in previous years.** Transect lines should be roughly 500 metres (m) apart and 250m in from the edge of the square. Each transect line should be divided into 5 equal sections of 200m in length,

making a total of ten (2x5), numbered 1 to 10. It is important to note the starting points of each transect section either by using permanent landmarks (trees, hedges, boulders, houses etc) or by using temporary markers (coloured tape or cord etc).

In practice, your transect lines are likely to deviate from the 'ideal' because of problems with access, or barriers such as roads, rivers, and canals: possible solutions are given below. Once you have decided upon a route, it is of the greatest importance that the same route is followed year after year. In cases where the transect lines deviate considerably from the 'ideal', at no point should the two lines be closer together than 200m. **Minor intrusions into adjacent squares are perfectly acceptable and may provide the only practical way to carry out the survey. Please record the exact route taken in the box provided on the green habitat form.**

**Examples of transect routes:** bold lines indicate suggested transect route with divisions in 200m sections. Note that the start and finish of the transects need not be at a square boundary.



- a. NO0861 (Tayside): mostly open fields, but limited places to cross stone walls.
  - b. SP9808 (Herts): mostly urban; access restricted to roads and paths; only 2 places to cross the obstructions.
  - c. SU8291 (Bucks): footpaths mimicking ideal pattern but running W-E avoid problem caused by M40.
  - d. TV5496 (E Sussex): part of the square contains sea, however, 5 200m sections on land can be covered N-S.
- Note: if less than 4 200m sections lie on land the square must be treated as uncoverable.**

## SUMMARY OF FIELDWORK

March - April	Reconnaissance visit to set up or check census route and complete habitat recording form.
Early April - mid-May	Complete 'early' transect count.
Mid-May - late June	Complete 'late' transect count.

*N.B. The fieldwork should begin and end later in more northerly parts of the UK.*

## When to visit

The main part of the breeding season, roughly between 1st April and 30th June, in the lowlands of southern Britain, should be divided into two counting periods (early season visit = April to mid-May; late season visit = mid-May to late June) and one visit should be made in each half. **Visits should be at least 4 weeks apart.** The first should coincide with the main activity period of the resident breeding birds in an area, while the second should take place after the arrival of the latest migrant breeding birds. At higher altitudes or further north, visits should be shifted later in the season, but the final transect count should be completed by mid-July. From late June, counts will almost certainly include a much greater proportion of unidentified young birds, and most species will have reduced or stopped singing, making detection more difficult.

**Counts should ideally start between 6am and 7am, and no later than 9am.** Please try to keep the starting times similar within a breeding season and across years, preferably to within half-an-hour. Please also try to keep the visit dates similar across the years. Counts will be more productive earlier in the day, with birds generally becoming quiet and inactive during the middle of the day (11am to 3pm). Starting times can be shifted to begin later in more remote and less accessible areas. If survey times extend beyond midday please use the 24-hour clock.

## Weather

Please do not attempt to census birds in conditions of heavy rain, poor visibility or strong wind. Birds generally become inactive in windy and wet conditions. However, activity often increases considerably after rain showers and therefore showery weather is generally okay for conducting surveys. Please record weather conditions in the boxes provided on the forms that describe cloud cover, rain, wind speed, and visibility. Choose one number (1-3) from each of the four headings below and enter these in the box provided on the Field Recording Sheets. If the weather conditions change during your survey visit, please select a single weather category that best represents the overall conditions.

Cloud cover	Rain	Wind	Visibility
0 – 33% = 1	None = 1	Calm = 1	Good = 1
33 – 66% = 2	Drizzle = 2	Light = 2	Moderate = 2
66 – 100% = 3	Showers = 3	Breezy = 3	Poor = 3

## Recording birds

Please record all the birds you encounter as you walk along the two linear transects. Birds should be noted in the appropriate distance category, measured at right angles to the transect line. Do not record birds that are behind you as you begin a census or beyond the end of the transect.

From your chosen starting point walk the transect route at a slow and methodical pace, pausing briefly to listen for bird songs and scan for birds flying overhead. Please note the starting and finishing times of each transect (using a 24-hour clock, e.g. 0630 for 6:30am, 1300 for 1pm). As a guide an average visit should last around an hour and a half. Record all the birds you see and hear on the field recording sheets in the appropriate transect sections 1-10 and in the appropriate distance category (see below). The transect is divided into 200m sections for convenience; please don't worry about birds at the boundary of two sections: record them in the one that seems more appropriate, but not in both. At the end of the first half (section 5) of the transect record the time and then make your way to the start of the second half of the transect route. Commence recording again through sections 6-10. Try not to record the same individual bird twice, e.g. a Mistle Thrush that can be heard singing from several 200m sections should be recorded once, where it was first detected.

We would strongly encourage observers to use the standard BTO species codes (see Appendix 2). Please familiarise yourself with the most likely codes before you go into the field. If a species is not listed in Appendix 2, please give the full common name. There is no need to record the activity or sex of the birds, although you may wish to do so. Where possible, distinguish juvenile birds from adults (e.g. B.juv, juvenile Blackbird), because **juveniles should not be entered onto BBS-Online or the Count Summary sheets**. Please also note any feral species.

Birds should be recorded in one of the following four categories when they were first noted:

1. within 25 metres either side of the line;
2. between 25 and 100 metres either side of the line;
3. more than 100 metres either side of the line **including birds outside the 1-km square boundary;**  
or
- F. birds in flight only (at any distance).

Please note that distances are measured perpendicular to the transect line (i.e. at right angles to the line). A bird seen 200m ahead of the observer but close to the transect line should be recorded in

category 1. We recommend that observers measure out distance categories (25m and 100m) using a combination of a tape measure and pacing to familiarise themselves with these before fieldwork begins. Category F, *Birds in flight*, relates to those flying over. Draw an arrow through the species' two-letter code to indicate that it is in flight (e.g. ~~BZ~~). If a bird is seen to take off or land it should be recorded in the appropriate distance category (1-3) at that position. **Skylarks in display flight and hovering Kestrels should be recorded in the relevant distance category. Record Swifts, Swallows and martins in the flight category, unless they are seen to land or fly into a nest site.**

## Juvenile birds

Juvenile birds can be recorded on the Field Recording Sheets, but must NOT be entered onto BBS-Online or the Count Summary Sheets. If you have difficulty distinguishing adult and young birds simply estimate, to the best of your ability, how many adults were present. We appreciate that mixed-aged flocks of crows or Starlings, for example, will present problems later in the season and ask that you observe and record with great care. Colonial nesters should be entered separately on BBS-Online or in the box provided at the end of the Count Summary Sheet (paper-form users only).

## Example of a completed Field Recording Sheet (birds recorded)

Recording birds in the field					Transferring counts onto summary sheets				
100m	25m	25m	100m		100m	25m	25m	100m	
3	2	1	2	3	3	2	1	2	3
SL	B.	2B. ↑	3R.	B.	SL	<del>B.</del>	2B. ↑	<del>3R.</del>	<del>B.</del>
1					2				

## Colonial nesting birds

Birds nesting in dense colonies within the square (e.g. Rook, Sand Martin and gulls) will not be adequately censused using the standard method, and we ask observers to count or estimate the number of nests in the whole 1-km square. Colony counts should be conducted separately from the transect counts. Please include counts of adult birds seen at these colonies during your normal line-transect counts (i.e. record the number of adults seen during your two line-transect counts **as well as** the number of active nests counted on your separate colony counts).

## Habitat recording

**Habitat recording is an essential part of the BBS** because it allows changes in bird numbers to be related to changes in habitat. **Habitat forms must be completed each year** using the coding scheme that is common to a range of BTO projects. This is shown on the back of the green form and can be used without specialist knowledge. We advise that habitat details are recorded on your reconnaissance visit or following a count. Please do not record birds and habitat at the same time.

Habitat should be recorded separately for each of the 10 200m transect sections. Please record what you feel to be the most appropriate codes for each section (i.e. the area within a box 200m long by 50m wide). Codes allow you to describe both the predominant habitat, termed the **First habitat** on the form, and the secondary habitat termed the **Second habitat**. In many cases two habitats will have equal importance and the order they are entered does not matter. For each habitat, choose one habitat code from each of levels 1 and 2, and up to two codes from levels 3 and 4. Please complete as much detail as you feel able: the first two levels are most important.

## Appendix 2. BTO Bird Species Codes

The example below describes an area of arable farmland. Transect 1 comprises tilled land with a hedgerow without trees, an active farmyard, with autumn cereal growing. There is no secondary habitat and so this is left blank. Transect section 2 is a similar area containing woodland. The first habitat codes are the same and the second codes are for woodland i.e. coniferous, young plantation with low disturbance, moderate shrub layer and sparse field layer. Note that the **Shrub layer** comprises woody plants less than 5m tall and the **Field layer** comprises herbaceous, non-woody plants. If there is no appropriate code in levels 3 or 4 please put a dash ('-') in that column.

Transect Section	First habitat					Second habitat						
	Levels:					Levels:						
	1	2	3	4		1	2	3	4			
1	<b>E</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>7</b>							
2	<b>E</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>6</b>	<b>1</b>	<b>A</b>	<b>2</b>	<b>5</b>	<b>8</b>	<b>2</b>	<b>6</b>

AC Arctic Skua	GA Gadwall	LE Long-eared Owl	SM Sand Martin
AE Arctic Tern	GX Gannet	LT Long-tailed Tit	SS Sanderling
AV Avocet	GW Garden Warbler	MG Magpie	TE Sandwich Tern
BO Barn Owl	GY Garganey	MA Mallard	VI Savi's Warbler
BY Barnacle Goose	GC Goldcrest	MN Mandarin	SQ Common Rosefinch
BA Bar-tailed Godwit	EA Golden Eagle	MX Manx Shearwater	SP Scaup
BR Bearded Tit	OL Golden Oriole	MR Marsh Harrier	CY Scottish Crossbill
BS Bewick's Swan	GF Golden Pheasant	MT Marsh Tit	SW Sedge Warbler
BI Bittern	GP Golden Plover	MW Marsh Warbler	NS Serin
BK Black Grouse	GN Goldeneye	MP Meadow Pipit	SA Shag
TY Black Guillemot	GO Goldfinch	MU Mediterranean Gull	SU Shelduck
BX Black Redstart	GD Goosander	ML Merlin	SX Shorelark
BJ Black Tern	GI Goshawk	M. Mistle Thrush	SE Short-eared Owl
B. Blackbird	GH Grasshopper Warbler	MO Montagu's Harrier	SV Shoveler
BC Blackcap	GB Great Black-backed Gull	MH Moorhen	SK Siskin
BH Black-headed Gull	GG Great Crested Grebe	MS Mute Swan	S. Skylark
BN Black-necked Grebe	ND Great Northern Diver	N. Nightingale	SZ Slavonian Grebe
BW Black-tailed Godwit	NX Great Skua	NJ Nightjar	SN Snipe
BV Black-throated Diver	GS Great Spotted Woodpecker	NH Nuthatch	SB Snow Bunting
BT Blue Tit	GT Great Tit	OP Osprey	ST Song Thrush
BU Bluethroat	GE Green Sandpiper	OC Oystercatcher	SH Sparrowhawk
BL Brambling	G. Green Woodpecker	PX Peafowl/Peacock	AK Spotted Crake
BG Brent Goose	GR Greenfinch	PE Peregrine	SF Spotted Flycatcher
BF Bullfinch	GK Greenshank	PH Pheasant	DR Spotted Redshank
BZ Buzzard	H. Grey Heron	PF Pied Flycatcher	SG Starling
CG Canada Goose	P. Grey Partridge	PW Pied Wagtail	SD Stock Dove
CP Capercaillie	GV Grey Plover	PG Pink-footed Goose	SC Stonechat
C. Carrion Crow	GL Grey Wagtail	PT Pintail	TN Stone-curlew
CW Cetti's Warbler	GJ Greylag Goose	PO Pochard	TM Storm Petrel
CH Chaffinch	GU Guillemot	PM Ptarmigan	SL Swallow
CC Chiffchaff	FW Guineafowl (Helmeted)	PU Puffin	SI Swift
CF Chough	HF Hawfinch	PS Purple Sandpiper	TO Tawny Owl
CL Cirl Bunting	HH Hen Harrier	Q. Quail	T. Teal
CT Coal Tit	HG Herring Gull	RN Raven	TK Temminck's Stint
CD Collared Dove	HY Hobby	RA Razorbill	TP Tree Pipit
CM Common Gull	HZ Honey Buzzard	RG Red Grouse	TS Tree Sparrow
CS Common Sandpiper	HC Hooded Crow	KT Red Kite	TC Treecreeper
CX Common Scoter	HP Hoopoe	ED Red-backed Shrike	TU Tufted Duck
CN Common Tern	HM House Martin	RM Red-breasted Merganser	TT Turnstone
CO Coot	HS House Sparrow	RQ Red-crested Pochard	TD Turtle Dove
CA Cormorant	JD Jackdaw	FV Red-footed Falcon	TW Twite
CB Corn Bunting	J. Jay	RL Red-legged Partridge	WA Water Rail
CE Corncrake	K. Kestrel	NK Red-necked Phalarope	W. Wheatear
CI Crested Tit	KF Kingfisher	LR Lesser Redpoll	WM Whimbrel
CR Crossbill	KI Kittiwake	RK Redshank	WC Whinchat
CK Cuckoo	KN Knot	RT Redstart	WG White-fronted Goose
CU Curlew	LM Lady Amherst's Pheasant	RH Red-throated Diver	WH Whitethroat
DW Dartford Warbler	LA Lapland Bunting	RE Redwing	WS Whooper Swan
DI Dipper	L. Lapwing	RB Reed Bunting	WN Wigeon
DO Dotterel	TL Leach's Petrel	RW Reed Warbler	WT Willow Tit
DN Dunlin	LB Lesser Black-backed Gull	RZ Ring Ouzel	WW Willow Warbler
D. Dunnock	LS Lesser Spotted Woodpecker	RP Ringed Plover	OD Wood Sandpiper
EG Egyptian Goose	LW Lesser Whitethroat	RI Ring-necked Parakeet	WO Wood Warbler
E. Eider	LI Linnet	R. Robin	WK Woodcock
FP Feral Pigeon	ET Little Egret	DV Rock Dove	WL Woodlark
ZL Feral/hybrid goose	LG Little Grebe	RC Rock Pipit	WP Woodpigeon
ZF Feral/hybrid mallard type	LU Little Gull	RO Rook	WR Wren
FF Fieldfare	LO Little Owl	RS Roseate Tern	WY Wryneck
FC Firecrest	LP Little Ringed Plover	RY Ruddy Duck	YW Yellow Wagtail
F. Fulmar	AF Little Tern	RU Ruff	Y. Yellowhammer



## **APPENDIX 3**

Breeding Bird Survey  
(BBS) Field Data





100m	25m	25m	100m
3	2	1	2
		Cc BC WP WK CH B. CH B. R.	
Notes on mammals, colonies, etc.			

100m	25m	25m	100m
3	2	1	2
		C. Hg Hg C. x2 C. x3 D. Y x2	C. x2
Note start time			
Notes on mammals, colonies, etc.			



100m	25m	25m	100m
3	2	1	2
		Hg x12 Hg x12 C.	C.
	Hg x1		
Notes on mammals, colonies, etc.			

BREAK

100m	25m	25m	100m
3	2	1	2
		Note end time R. R. B. B2 BC Hg x12 MA CH BC GC Hg x3	CC C. B. M. x2
Notes on mammals, colonies, etc.			

100m		25m	25m		100m	
3	2	1	2	3		
	M. →	GT C. x2 CH	B. D. CC WR C. →			
Notes on mammals, colonies, etc.						

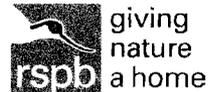
100m		25m	END	25m	100m	
3	2	1	2	3		
		Note end time				
		R.	Go x3 →	C. →		
Notes on mammals, colonies, etc.						

100m		25m	25m		100m	
3	2	1	2	3		
			HG x3 → C. C. x3 → C. x2 →			
Notes on mammals, colonies, etc.						

100m		25m	25m		100m	
3	2	1	2	3		
			C. x2 →	C. → HG → B.		
		GL	S. SL → R. →	GT → BT		
Notes on mammals, colonies, etc.						



# BTO/JNCC/RSPB BREEDING BIRD SURVEY FIELD RECORDING SHEET



Observer name	TIM HUDNETT / LAURENCE HUNTEL IAN ROBERTS	Obs. code (office use only)
1-km square reference (e.g. TL1234)	TRANSECT C BBS 01/N	Early or Late visit (E or L) <u>E</u>
Visit date (must be in April, May or June)	29 / 04 / 2016	First transect start time : First transect finish time :
Weather codes 1, 2 or 3	Cloud <u>1</u> Rain <u>1</u> Wind <u>1</u> Visibility <u>1</u>	Second transect start time : Second transect finish time :

### Distance categories:

1. 0 – 25 metres from the transect line.
2. 25 – 100 metres from the transect line.
3. More than 100 metres from the transect line (whether within the 1-km square boundary or not).
- F. Birds in flight only, at any distance (record on sheets using an arrow, e.g. BZ).

- Please make a note of any **mammals** that you see, or any evidence of mammals.
- Do not record birds that can be identified as **juveniles** (of the current year).
- Please record breeding **colonies** (e.g. Rooks) and estimate the number of nests.

Each box below represents one transect section (1 – 10), divided into distance bands (not drawn to scale).

100m	25m	25m	100m
3	2	1	2 3
		C.A. P.W. P.D. P.D. R.O. C.D. <b>START</b> (note start time)	
Notes on mammals, colonies, etc.			

100m	25m	25m	100m
3	2	1	2 3
		R.O. x3 H.G. C.D. P.W. P.D. C. x2	
Notes on mammals, colonies, etc.			

100m	25m	25m	100m	
3	2	1	2	3
		C. A		
Notes on mammals, colonies, etc.				

100m	25m	25m	100m	
3	2	1	2	3
		WP ↖	C. x3 ↖	Su x6 ↖
		C. x2 ↖		
Note start time				
Notes on mammals, colonies, etc.				



100m	25m	25m	100m	
3	2	1	2	3
		L1 x6 R.		
		D. C. ↖ PW ↖	C9 ↖	
Notes on mammals, colonies, etc.				

BREAK

100m	25m	25m	100m	
3	2	1	2	3
Note end time				
		D. x2.		
Notes on mammals, colonies, etc.				







# BTO/JNCC/RSPB BREEDING BIRD SURVEY FIELD RECORDING SHEET



BTO  
Looking out for birds



JNCC  
Joint Nature Conservation Committee



giving nature a home

Observer name	TIM HODNETT/LAWRENCE HUNTER IAN ROBERTS	Obs. code (office use only)	
1-km square reference (e.g. TL1234)	TRANSECT A BBS 02/S	Early or Late visit (E or L)	E
Visit date (must be in April, May or June)	27 / 05 / 2016	First transect start time	:
Weather codes 1, 2 or 3	Cloud	First transect finish time	:
	Rain	Second transect start time	:
	Wind	Second transect finish time	:
	Visibility		

### Distance categories:

1. 0 – 25 metres from the transect line.
2. 25 – 100 metres from the transect line.
3. More than 100 metres from the transect line (whether within the 1-km square boundary or not).
- F. Birds in flight only, at any distance (record on sheets using an arrow, e.g. BZ).

- Please make a note of any **mammals** that you see, or any evidence of mammals.
- Do not record birds that can be identified as **juveniles** (of the current year).
- Please record breeding **colonies** (e.g. Rooks) and estimate the number of nests.

Each box below represents one transect section (1 – 10), divided into distance bands (not drawn to scale).

100m	25m	25m	100m
3	2	1	2
		HS HS R. HS R. SL KT JD START (note start time)	B. D. CG
Notes on mammals, colonies, etc.			

100m	25m	25m	100m
3	2	1	2
	B. C. B. x2	CH CH C. B. B. B. x2	CH JD C. x2 MG JD SL HG
Notes on mammals, colonies, etc.			

100m	25m	25m	100m	
3	2	1	2	3
		R <sub>0</sub> x2 ↗		
	BT ↗	WK R.		
Notes on mammals, colonies, etc.				

100m	25m	25m	100m	
3	2	1	2	3
		CG ↗		
		Note start time		
Notes on mammals, colonies, etc.				



100m	25m	25m	100m	
3	2	1	2	3
	GL x2	R. ↗		
		R <sub>0</sub> x2 ↗	GO	
		ST x2 ↗		
		ST ↗	C.	
Notes on mammals, colonies, etc.				

BREAK

100m	25m	25m	100m	
3	2	1	2	3
		Note end time		
	WP ↗	HG ↗	D.	
		R <sub>0</sub> x2 ↗		
	C. ↗	R.		
	C. ↗			
Notes on mammals, colonies, etc.				





# BTO/JNCC/RSPB BREEDING BIRD SURVEY FIELD RECORDING SHEET



BTO  
Looking out for birds



JNCC  
Joint Nature Conservation Committee



giving nature a home

Observer name	TIM HODNETT / LAWRENCE HUNTER IAN ROBERTS	Obs. code (office use only)	
1-km square reference (e.g. TL1234)	TRANSECT C BBS 02/N	Early or Late visit (E or L)	E
Visit date (must be in April, May or June)	27 / 05 / 2016	First transect start time	:
Weather codes 1, 2 or 3	Cloud	First transect finish time	:
	Rain	Second transect start time	:
	Wind	Second transect finish time	:
	Visibility		

### Distance categories:

1. 0 – 25 metres from the transect line.
2. 25 – 100 metres from the transect line.
3. More than 100 metres from the transect line (whether within the 1-km square boundary or not).
- F. Birds in flight only, at any distance (record on sheets using an arrow, e.g. BZ).

- Please make a note of any **mammals** that you see, or any evidence of mammals.
- Do not record birds that can be identified as **juveniles** (of the current year).
- Please record breeding **colonies** (e.g. Rooks) and estimate the number of nests.

Each box below represents one transect section (1 – 10), divided into distance bands (not drawn to scale).

100m	25m	25m	100m
3	2	1	2 3
		SL x3 FP x2 JD x2 C CH SL x3 HM x10 START (note start time)	
H.			
Notes on mammals, colonies, etc.			

100m	25m	25m	100m
3	2	1	2 3
		SL x2 D. x3 D.	
Notes on mammals, colonies, etc.			

100m	25m	25m	100m	
3	2	1	2	3
<div style="text-align: center; margin-top: 100px;">↑</div>				
Notes on mammals, colonies, etc.				

100m	25m	25m	100m	
3	2	1	2	3
<div style="text-align: center; margin-top: 100px;">↑</div>				
Notes on mammals, colonies, etc.				

100m	25m	25m	100m	
3	2	1	2	3
<div style="text-align: center; margin-top: 100px;">↑</div>				
Notes on mammals, colonies, etc.				

100m	25m	25m	100m	
3	2	1	2	3
BREAK				
<div style="text-align: center; margin-top: 100px;">↑</div>				
Notes on mammals, colonies, etc.				

B.  
↓

Note start time



GR  
  
Ro  
x2  
↓  
  
Mg  
↓  
  
Ro  
  
B.

C.  
x2

BREAK

Note end time D.

Ro ↓    CH. ↓

100m	25m	25m	100m	
3	2	1	2	3
		Ro x2 Ro CH Ro x2 Ro Ro	Ro x2 CR Hg	
Notes on mammals, colonies, etc.				

100m	25m	END	25m	100m
3	2	1	2	3
		Note end time Ro C. GS GS	D. B. Hg HM D. x2 HS x2	
Notes on mammals, colonies, etc.				

100m	25m	25m	100m	
3	2	1	2	3
		R. C. ID HM C. x2		
Notes on mammals, colonies, etc.				

100m	25m	25m	100m	
3	2	1	2	3
		H. CH Ro x2 C. x2 Ro x10 R. HS x6	Su x2 WP	
Notes on mammals, colonies, etc.				





## APPENDIX 4

Tables

**TABLE 1: Cumulative Species Summary with Breeding Codes and UK Conservation Status as of December 2015**

	Scientific Name	Common Name	BTO Code	UK Status	BBS01/N	BBS01/S	BBS02/N	BBS02/S
1	<i>Tadoma tadoma</i>	Shelduck	SU	AMBER	*	P	H	*
2	<i>Buteo buteo</i>	Common Buzzard	BZ		P	P	H	*
3	<i>Larus argentatus</i>	Herring Gull	HG	RED	O	O	O	O
4	<i>Larus fuscus</i>	Lesser Black-backed Gull	LB	AMBER	*	O	*	*
5	<i>Columba oenas</i>	Stock Dove	SD	AMBER	*	*	*	*
6	<i>Columba palumbus</i>	Wood Pigeon	WP		H	H	H	H
7	<i>Strix aluco</i>	Tawny Owl	TO		*	*	*	*
8	<i>Tyto alba</i>	Barn Owl	BO	AMBER	*	*	*	*
9	<i>Apus apus</i>	Swift	SI	AMBER	*	*	O	*
10	<i>Dendrocopos major</i>	Great Spotted Woodpecker	GS		*	*	H	NY
11	<i>Hirundo rustica</i>	Swallow	SL	AMBER	O	O	O	FY
12	<i>Delichon urbicum</i>	House Martin	HM	AMBER	*	*	H	*
13	<i>Motacilla alba</i>	Pied Wagtail	PW		P	O	O	O
14	<i>Motacilla cinerea</i>	Grey Wagtail	GL	RED	*	O	*	RF
15	<i>Troglodytes troglodytes</i>	Wren	WR		H	H	H	H
16	<i>Prunella modularis</i>	Dunnock	D.	AMBER	H	N	H	N
17	<i>Erithacus rubecula</i>	Robin	R.		H	N	H	N
18	<i>Turdus philomelos</i>	Song Thrush	ST	RED	O	*	*	*
19	<i>Turdus viscivorus</i>	Mistle Thrush	M.	RED	O	H	O	*
20	<i>Turdus merula</i>	Blackbird	B.		S/H	S/H	S/H	S/H
21	<i>Sylvia atricapilla</i>	Blackcap	BC		S/H	S/H	*	S/H
22	<i>Phylloscopus collybita</i>	Chiffchaff	CC		S/H	S/H	*	S/H
23	<i>Regulus regulus</i>	Goldcrest	GC	AMBER	O	S/H	*	*
24	<i>Ficedula hypoleuca</i>	Pied Flycatcher	PF		*	*	*	*
25	<i>Parus major</i>	Great Tit	GT		*	H	*	H
26	<i>Parus caeruleus</i>	Blue Tit	BT		H	H	H	FY
27	<i>Aegithalos caudatus</i>	Long-tailed Tit	LT		*	*	*	*
28	<i>Certhia familiaris</i>	Treecreeper	TC		*	*	*	H
28	<i>Pica Pica</i>	Magpie	MG		H	H	H	H
30	<i>Corvus monedula</i>	Jackdaw	JD		H	H	H	H
31	<i>Corvus frugilegus</i>	Rook	RO		H	H	FY	FY

**TABLE 1: Cumulative Species Summary with Breeding Codes and UK Conservation Status as of December 2015**

	Scientific Name	Common Name	BTO Code	UK Status	BBS01/N	BBS02/N	BBS01/S	BBS02/S
32	<i>Corvus corax</i>	Raven	RN		*	*	*	*
33	<i>Corvus corone</i>	Carrion Crow	C.		H	H	H	H
34	<i>Stimulus vulgaris</i>	Starling	SG	RED	*	*	*	*
35	<i>Passer domesticus</i>	House Sparrow	HS	RED	*	O	O	H/N
36	<i>Fringilla coelebs</i>	Chaffinch	CH		O	O	H	H
37	<i>Carduelis carduelis</i>	Goldfinch	GO		P	H	O	H
38	<i>Carduelis chloris</i>	Greenfinch	GR		O	*	H	*
39	<i>Emberiza citrinella</i>	Yellowhammer	Y.	RED	P	*	*	*
40	<i>Streptopelia decaocto</i>	Collared Dove	HY		P	*	*	*
41	<i>Carduelis cannabina</i>	Linnet	LI	RED	H	*	*	*
42	<i>Branta canadensis</i>	Canada Goose	CG		O	*	*	*
43	<i>Columba livia domestica</i>	Feral Pigeon	FP		*	O	O	*
44	<i>Anas platyrhynchos</i>	Mallard	MA	AMBER	*	O	*	*
45	<i>Larus canus</i>	Common Gull	CG	AMBER	*	*	O	O
46	<i>Milvus milvus</i>	Red Kite	KT	AMBER	*	*	*	H
47	<i>Silvia curruca</i>	Lesser Whitethroat	LW		*	*	*	S
48	<i>Ardea cinerea</i>	Grey Heron	H.		*	*	O	*

CONFIRMED BREEDING	17
PROBABLY BREEDING	17+17=34
POSSIBLY BREEDING	17+17+0=34

UK Status as of  
December 2015

#### BREEDING CODES

- O** Bird **O**bserved (seen or heard); no more knowledge of the species' status or of habitat suitable for breeding
- H** Species present in suitable nesting **H**abitat; no other indication of breeding
- S** **S**inging Male, or breeding calls heard
- P** **P**air observed in suitable nesting habitat
- D** **D**isplay or courtship
- N** Bird visiting a probable **N**est site
- B** Birds seen **B**uilding a nest, carrying nesting material, or excavating nest cavity
- A** **A**gitated behaviour or anxiety calls from adults suggesting a nest or young nearby
- DD** **D**istraction **D**isplay or injury feigning from adult birds
- UN** **U**sed **N**est (from current season); or eggshells
- ON** **O**ccupied **N**est in use (e.g. High nest or nesting hole whose contents cannot be deduced)
- FY** Adults carrying **F**ood or **Y**oung
- RF** **R**ecently **F**ledged young, still dependant on parents
- FS** Adults carrying **F**aecal **S**ac away from nest
- NE** **N**est with **E**ggs, or adult sitting on nest
- NY** **N**est with **Y**oung, or downy young of nidifugous species

**TABLE 2: Individual Species Count for North Side (N) and South side (S) of A55**

	Scientific Name	Common Name	BTO Code	INDIVIDUAL COUNT						
				BBS01/N	BBS01/S	BBS02/N	BBS02/S	N Total	S Total	Sp. TOTAL
1	<i>Tadoma tadoma</i>	Shelduck	SU	0	3	2	0	2	3	5
2	<i>Buteo buteo</i>	Common Buzzard	BZ	2	2	3	0	5	2	7
3	<i>Larus argentatus</i>	Herring Gull	HG	24	157	4	4	28	161	189
4	<i>Larus fuscus</i>	Lesser Black-backed Gull	LB	0	2	0	0	0	2	2
5	<i>Columba oenas</i>	Stock Dove	SD	0	0	0	0	0	0	0
6	<i>Columba palumbus</i>	Wood Pigeon	WP	14	3	5	4	19	7	26
7	<i>Strix aluco</i>	Tawny Owl	TO	0	0	0	0	0	0	0
8	<i>Tyto alba</i>	Barn Owl	BO	0	0	0	0	0	0	0
9	<i>Apus apus</i>	Swift	SI	0	0	1	0	1	0	1
10	<i>Dendrocopos major</i>	Great Spotted Woodpecker	GS	0	0	2	2	2	2	4
11	<i>Hirundo rustica</i>	Swallow	SL	11	1	21	12	32	13	45
12	<i>Delichon urbicum</i>	House Martin	HM	0	0	16	0	16	0	16
13	<i>Motacilla alba</i>	Pied Wagtail	PW	2	1	1	4	3	5	8
14	<i>Motacilla cinerea</i>	Grey Wagtail	GL	0	1	0	2	0	3	3
15	<i>Troglodytes troglodytes</i>	Wren	WR	3	4	1	2	4	6	10
16	<i>Prunella modularis</i>	Dunnock	D.	9	2	9	3	18	5	23
17	<i>Erithacus rubecula</i>	Robin	R.	7	14	5	5	12	19	31
18	<i>Turdus philomelos</i>	Song Thrush	ST	1	0	0	0	1	0	1
19	<i>Turdus viscivorus</i>	Mistle Thrush	M.	1	6	4	0	5	6	11
20	<i>Turdus merula</i>	Blackbird	B.	12	18	6	12	18	30	48
21	<i>Sylvia atricapilla</i>	Blackcap	BC	1	4	0	1	1	5	6
22	<i>Phylloscopus collybita</i>	Chiffchaff	CC	2	3	0	2	2	5	7
23	<i>Regulus regulus</i>	Goldcrest	GC	0	3	0	0	0	3	3
24	<i>Ficedula hypoleuca</i>	Pied Flycatcher	PF	0	0	0	0	0	0	0
25	<i>Parus major</i>	Great Tit	GT	0	5	0	2	0	7	7
26	<i>Parus caeruleus</i>	Blue Tit	BT	3	1	1	9	4	10	14
27	<i>Aegithalos caudatus</i>	Long-tailed Tit	LT	0	0	0	0	0	0	0
28	<i>Certhia familiaris</i>	Treecreeper	TC	0	0	0	1	0	1	1
28	<i>Pica Pica</i>	Magpie	MG	3	1	4	6	7	7	14
30	<i>Corvus monedula</i>	Jackdaw	JD	31	7	14	11	45	18	63
31	<i>Corvus frugilegus</i>	Rook	RO	41	4	25	7	66	11	77

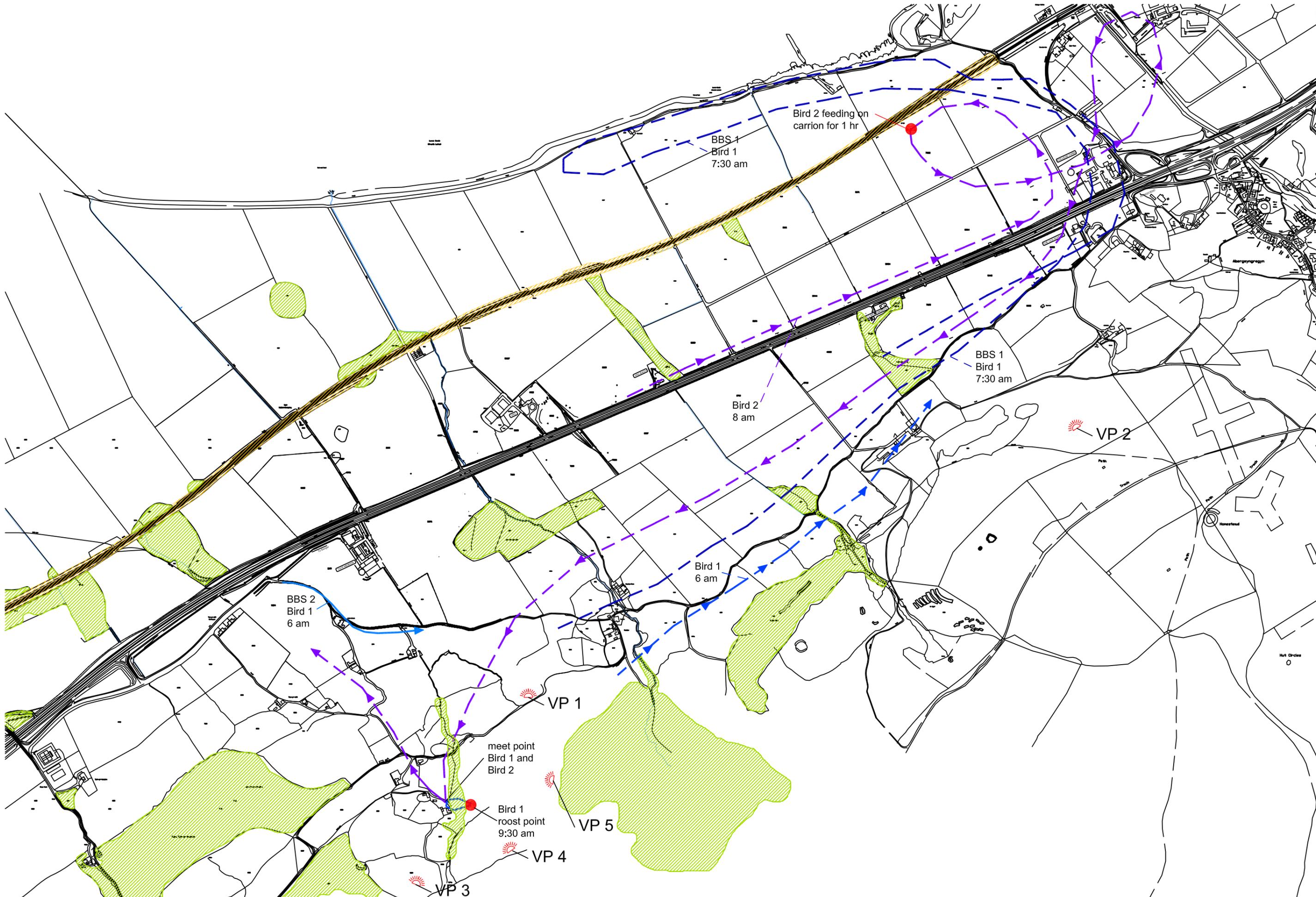
**TABLE 2: Individual Species Count for North Side (N) and South side (S) of A55**

	Scientific Name	Common Name	BTO Code	INDIVIDUAL COUNT						
				BBS01/N	BBS01/S	BBS02/N	BBS02/S	N Total	S Total	Sp. TOTAL
32	<i>Corvus corax</i>	Raven	RN	0	0	0	0	0	0	0
33	<i>Corvus corone</i>	Carrion Crow	C.	22	27	13	13	35	40	75
34	<i>Stimulus vulgaris</i>	Starling	SG	0	0	0	0	0	0	0
35	<i>Passer domesticus</i>	House Sparrow	HS	0	1	8	6	8	7	15
36	<i>Fringilla coelebs</i>	Chaffinch	CH	6	8	4	6	10	14	24
37	<i>Carduelis carduelis</i>	Goldfinch	GO	4	5	1	1	5	6	11
38	<i>Carduelis chloris</i>	Greenfinch	GR	2	0	1	0	3	0	3
39	<i>Emberiza citrinella</i>	Yellowhammer	Y.	2	0	0	0	2	0	2
40	<i>Streptopelia decaocto</i>	Collared Dove	HY	4	0	0	0	4	0	4
41	<i>Carduelis cannabina</i>	Linnet	LI	6	0	0	0	6	0	6
42	<i>Branta canadensis</i>	Canada Goose	CG	3	0	0	0	3	0	3
43	<i>Columba livia domestica</i>	Feral Pigeon	FP	0	1	2	0	2	1	3
44	<i>Anas platyrhynchos</i>	Mallard	MA	0	1	0	0	0	1	1
45	<i>Larus canus</i>	Common Gull	CG	0	0	7	3	7	3	10
46	<i>Milvus milvus</i>	Red Kite	KT	0	0	0	2	0	2	2
47	<i>Silvia curruca</i>	Lesser Whitethroat	LW	0	0	0	1	0	1	1
48	<i>Ardea cinerea</i>	Grey Herron	H.	0	0	2	0	2	0	2
				<b>216</b>	<b>285</b>	<b>162</b>	<b>121</b>	<b>369</b>	<b>400</b>	<b>769</b>

Species recorded 2008 surveys, but not recorded 2016 surveys
Extra Species recorded during the 2016 surveys

## **APPENDIX 5**

### Mapped Kite Activity



A55 (T) Road Improvement - Tai'r Meibion to Aber - APPENDIX 5



# A55(T) ABERGWYNGREGYN TO TAI'R MEIBION IMPROVEMENT

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TAI'R MEIBION AND WIG FARM  
UNDERPASSES  
BAT ACTIVITY SURVEYS

2015 & 2016

CPF: 5055  
Client: Welsh Government

## Document Control Sheet

<b>Document Author:</b>	Christian Middle MCIEEM
<b>Project Manager:</b>	Dave Meller

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Date	Version No.	Summary of Changes
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### Approvals

Approved by	Signature	Date	Version
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### Distribution

Name	Title	Date	Version
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ISO9001:2008  
FS526386



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# A55(T) Abergwyngregyn to Tai'r Meibion Improvement Tai'r Meibion and Wig Farm Underpasses Bat Activity Survey

October 12th to November 10th 2015

## **Executive Summary**

In response to the Welsh Government's proposed A55(T) Abergwyngregyn to Tai'r Meibion Improvement a suite of protected species surveys has been undertaken within the zone of influence of the proposed scheme during 2015 and 2016, including otter and badger ("A55(T) Abergwyngregyn to Tai'r Meibion Improvement Otter and Badger Survey", YGC, 2015) and bats ("Bat Surveys; A55, Abergwyngregyn to Tai'r Meibion Improvement" report, Ecological Design Consultants (EDC), 2015).

The EDC survey identified a Common Pipistrelle bat roost comprised of ten individuals within the Tai'r Meibion Farm property and one record of a Lesser Horseshoe bat using the Tai'r Meibion underpass and provided subsequent recommendations for further ecological survey work regarding the use of both the Tai'r Meibion and Wig farm underpasses by bats. Therefore, YGC undertook an additional static passive recording bat activity surveys using Anabat Express recording equipment, at the location of the two existing farm underpasses that provide access under the A55(T) and that are situated within the footprint of the proposal at the Tai'r Meibion and Wig Farm properties from the 12<sup>th</sup> October to the 10<sup>th</sup> November 2015. Bat activity surveys were then repeated throughout the 2016 survey season using both human manual surveyors, dusk activity surveys and a single dawn activity survey and static passive recording methodologies in May (31<sup>st</sup> manual dusk), July (5<sup>th</sup> manual dusk and 8<sup>th</sup> to 13<sup>th</sup> static passive), September (22<sup>nd</sup> manual dusk and dawn activity surveys) and October (7<sup>th</sup> to 14<sup>th</sup> static passive).

In summary, the YGC bat activity surveys detailed in this report focus on the use of the two farm underpasses beneath the A55(T) by bats and has recorded a total of a minimum of five separate bat species that include; Lesser Horseshoe (*Rhinolophus hipposideros*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Common Pipistrelle (*Pipistrellus pipistrellus*), Brown Long Eared (*Plecotus auritus*) and potentially more than one species of Myotis bat that could be interpreted from sonogram recordings as Natterer's (*Myotis nattereri*) and / or Whiskered (*Myotis mystacinus*) bats. Therefore the use of both the Tai'r Meibion and the Wig farm underpasses by numerous bat species as foraging resources and commuting routes is confirmed.

The most frequently recorded bat species was Common Pipistrelle recorded within Tai'r Meibion underpass. It is concluded that the level of activity of this species recorded at this location is potentially indicative of, consistent with and considered potentially likely to be associated with the number of individuals (10) recorded roosting in Tai'r Meibion farm house by EDC in September 2015. Therefore consultation with NRW is required with regard to potential disturbance to the Common Pipistrelle bat roost within Tai'r Meibion farm property as a result of the proposed main works that include the extension of the underpasses in order to determine if a European Protected Species (EPS) licence is required for the works associated with the main works in the vicinity of Tai'r Meibion farm.

The 2016 YGC static passive activity survey undertaken from 7-14 October recorded a higher number of Lesser Horseshoe bat passes (Passes = Number of 15 Second Anabat Express Ultrasound Bat Call Recordings and not numbers of individuals) than at any other time during the course of the 2015 and 2016 YGC surveys in both underpasses, with 25 passes being recorded in the Tai'r Meibion underpass and 10 passes being recorded in the Wig underpass. The higher number of passes of the species may potentially indicate a seasonal movement of the species between transitional and hibernation roosts. The number of all other bat species recorded (Soprano Pipistrelle, Noctule and Brown Long Eared) either as visual observations on human manual surveys and / or static passive recorded bat passes within both the underpasses is considered to be consistent with a low number of bats foraging and / or commuting within the habitat.

Due to the relatively high number of *Myotis* species bat calls recorded during the course of the surveys further assessment and inspection of the relatively high potential trees located adjacent to the underpasses to the north of the A55 for evidence of roosting bats and / or their potential to support roosting bats is recommended during the pre-construction surveys for otter and badger in order to ascertain if a potential *Myotis* bat species roost is located in the immediate vicinity of the scheme that may necessitate further assessment regarding licensing and mitigation requirements.

Consultation with Natural Resources Wales (NRW) regarding the potential disturbance to bat foraging and commuting activity within both underpasses as a result of the proposed works to widen the carriageway and subsequently both underpasses has been undertaken and mitigation measures agreed by the provision of bat guidance hurdle fencing that is to be installed wherever hedgerow vegetation and linear features are removed that leads into both the underpasses. In addition, no night time working or directional lighting illuminating the underpasses or site compounds are to be located in the vicinity of the underpasses.

## **1.0 Introduction**

### **1.1 Site Description**

The habitats present within the Zone of Influence of the proposal have been described in detail in previous reports such as the '*A55(T) Abergwyngregyn to Tai'r Meibion Improvement Otter and Badger Survey*' (YGC,2015).

In summary, the habitats present to the north of the A55(T) chiefly comprise lowland improved pasture intensively grazed with livestock with small pockets of isolated mature broadleaved trees and fragmented mixed broadleaved woodland copses and scrub, with hedgerows and / or slate and wire fences and ditch-lined boundaries as the topography of the land descends towards the coast. To the south of the A55(T) the lowland improved grassland is also intensively grazed by livestock with isolated mature broadleaved trees and fragmented mixed broadleaved woodland copses and scrub with hedgerows and / or slate and wire fences, ditch-lined and cloddiau boundaries as the land gradually rises towards the uplands of the Carneddau range.

The Tai'r Meibion and Wig farm underpasses were constructed at the same time as the section of the A55(T) road above them during the 1960's, to facilitate access to the agricultural land on both sides of the A55(T) and the movement of livestock and farm vehicles beneath the road from the afore-mentioned farms.

#### ***Tai'r Meibion Farm Underpass***

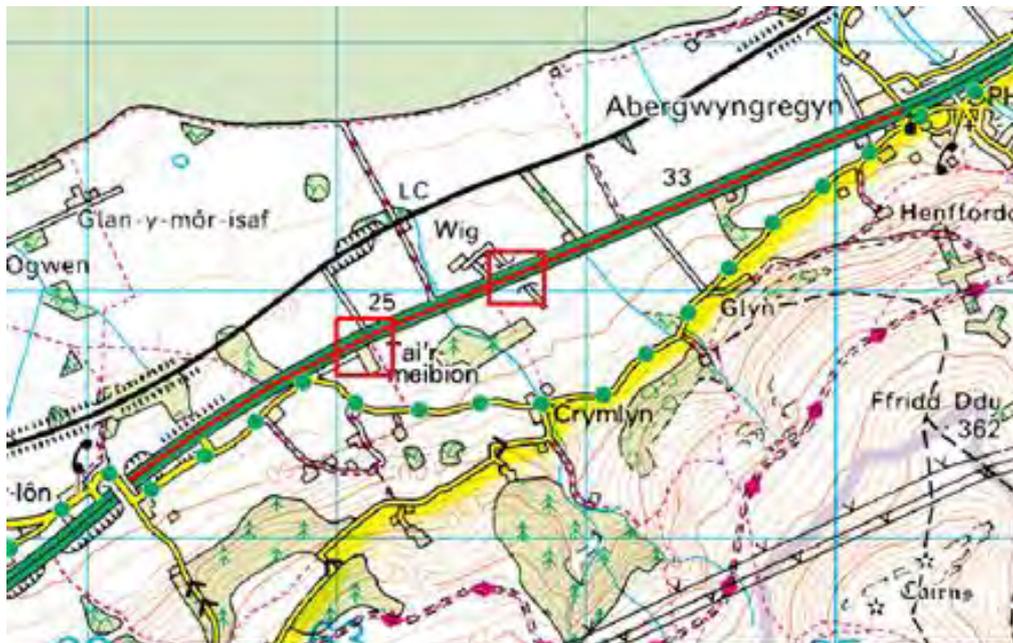
The underpass is situated at the western extent of the proposed section of carriageway improvement and is approximately 3.5m wide by 2.5m high and formed from reinforced concrete (see Figure 1 and Appendix II, Site Photographs). The concrete has a very smooth finish with no discernible gaps, cracks or crevices that could support roosting bats at the time of the survey. At times this underpass is used as a sheep fold for holding grazing stock, evident by the accumulation of animal droppings and debris from hooves and confirmed in a conversation between the author and the resident farmer. No sheep were present during the course of the survey visits. However sheep may have been present at other times between the survey periods.

Regularly maintained hedgerows are present and run parallel to and along the length of the A55(T) road and link to both sides of the underpass with the exception of the small section directly above the underpass which is formed from a standard structure parapet on both sides of the road to the north and south. The underpass therefore links the land on both sides of the A55(T) at Tai'r Meibion farm and is connected by vegetated boundaries to the wider area of habitat outside the scope of this bat activity survey. Both sides of the underpass are accessed by descending concrete ramps with adjacent steeply graded and grazed improved grassland banks to the south and two hedgerow lined tracks to the north that then progress north towards the coast and west parallel to the A55(T).

### **Wig Farm Underpass**

This underpass is situated in the central area of the proposed improvement and is approximately 3.5m wide by 2.5m high and formed from reinforced concrete (see Figure 1 and Appendix II, Site Photographs). The concrete has a very smooth finish with no discernible gaps, cracks or crevices that could support roosting bats at the time of the survey. This underpass does not appear to be used for holding stock and no animal droppings were recorded at this location.

Regularly maintained hedgerows with large gaps are present and run parallel to and along the length of the A55(T) road but do not link to both sides of the underpass at this location. The underpass therefore links the land on both sides of the A55(T) at Wig farm and is connected by vegetated boundaries to the wider area of habitat outside the scope of this bat activity survey. Both sides of the A55(T) at Wig farm and both sides of the underpass are accessed by descending concrete ramps with adjacent steeply graded and grazed improved grassland banks to the north and south.



**Figure 1:** Extent of the A55(T) Abergwyngregyn to Tai'r Meibion Improvement (shown by bold red line) showing the locations of Tai'r Meibion and Wig Farm Underpasses (highlighted by red squares).

### **1.2 Proposed Works**

The proposed A55(T) improvement works seek to address the existing sub-standard nature of the road such as the narrow highway width, which will subsequently entail the widening of the existing underpasses located at Tai'r Meibion and Wig farms by approximately 12m and 6m to the north respectively.

The proposed works also address safety issues with regard to the highway's vertical alignment and residential access points exiting directly on to the trunk road on both the east and west bound carriageways during the main works and flooding issues by improvements to drainage and the construction of an open cut-off channel to the south of the A55(T) during the advance works phase. The proposed works will include the removal of direct access points on to the A55(T) from the adjacent residential properties within the footprint of the proposal, that include Wig farm and others to the east on the west-bound carriageway such as Bryn Meddyg, and will be replaced by suitable alternatives.

### **1.3 Aim of Survey**

The purpose of the surveys was to record and identify any bat activity associated with the A55(T) Tai'r Meibion and Wig farm underpasses and to identify the bat species present and to assess any potential impacts with regard to the bat species present and the nearest known

recorded bat roosts. This follows on from the recommendations made in the “*Bat Surveys; A55, Abergwyngregyn to Tai'r Meibion Improvement*” report (EDC, October 2015), which identified bat activity at the locations of the two underpasses in addition to bat activity recorded on walked transects throughout the wider area of habitat included within the scope and remit of that survey.

In addition, the purpose of the surveys was to contribute to the collection of ecological baseline data regarding bats and the preparation of the Environmental Impact Assessment (EIA) and Environmental Statement for the above proposal. Baseline survey data are used to identify ecological constraints associated with bats with regard to the proposed improvement and subsequent recommendations are then provided with regard to scheme design and the EIA process including reference to potential mitigation measures as appropriate.

## **2.0 Methodology**

### **2.1 Summary of Survey Methods**

The methodology for the 2015 surveys detailed in this report, departed from the accepted methodology regarding timing of bat activity surveys as described by the Bat Conservation Trust's, '*Bat Surveys Good Practice Guidelines*', 2nd Edition 2012 due to the receipt of the commissioned “*Bat Surveys; A55, Abergwyngregyn to Tai'r Meibion Improvement*” bat activity report (EDC, October 2015); which recommended the immediate installation of static passive bat ultrasound recording equipment within both the Tai'r Meibion and Wig farm underpasses in response to recording potential use of the Wig underpass by a single Lesser Horseshoe bat during the course of the walked bat activity transect survey undertaken in September 2015.

Prior to the commencement of the YGC bat activity survey of the A55(T) underpasses undertaken in October and November 2015, consultation with NRW was undertaken and confirmation obtained that NRW support in principle the addition of this survey.

During the both the 2015 and the 2016 surveys static and passive Anabat Express units were secured in place within the centre of each of the farm underpasses on the western walls, using metal security loops installed at an approximate height of 2m to avoid any potential disturbance with regard to farm traffic and / or livestock.

The Anabat Express units were set to automatically record bat ultrasound from sunset to sun rise using '*night mode*' and visited once weekly to change batteries and to download any data recorded. The Anabat Express data sets were subsequently analysed and interpreted in order to identify the bat species present using the Analoop software provided by the manufacturer and in order to potentially provide an indication of the type and nature of the bat activity such as foraging and / or commuting behaviour if possible.

The methodology of the surveys undertaken throughout both 2015 and 2016 were agreed in advance with NRW and conform to the Bat Conservation Trust's, '*Bat Surveys for Professional Ecologists, Good Practice Guidelines*', 3<sup>rd</sup> Edition 2016. The activity surveys were undertaken at three key periods within the bat activity season May, July and September and consisted of manual human surveyor dusk activity surveys and a single manual human surveyor pre-dawn activity survey, followed and supported by periods of passive static recording where possible. See section 6.2 Constraints on Survey Equipment Used.

### **2.2 Pre-survey Data Search**

A pre-survey data search of historical biodiversity records was commissioned from Cofnod Biological Information Service by YGC in May 2015 prior to the commencement of the EDC bat activity and emergence surveys. The 2015 EDC survey report provided additional pre-survey data gained from the previously undertaken EDC bat activity surveys at the site. Consultation with S. Dyer, local Licensed Bat Worker was also undertaken by the author to gain information on any other known bat roosts in proximity to the location of the proposal.

### **2.3 Surveyor Information**

The installation of the Anabat Expresses and collection, analysis and interpretation of the data recorded during the course of the YGC bat activity surveys detailed in this report was undertaken and led by Christian Middle (YGC ecologist) who has worked as an ecologist

since 2000, with particular regard to bats, and is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) since 2008. Nancy Wilkinson (ecologist with 8 years of experience of bat surveys), Rhydian Roberts (senior environment officer with 6 years of experience of bat surveys), Bethan Moseley (Technical Assistant with 4 years of experience of bat surveys) and Eifion Davies (Technical Assistant with 4 years of experience of bat surveys) assisted with the surveys.

In order to ascertain information on the interpretation and potential separation of *Myotis* bat species, consultation and sound analysis workshops were held with S. Dyer, local Bat Worker regarding the sonograms of bat calls from ultrasound recordings made during the course of the surveys.

This report details the findings of the static passively recorded bat activity surveys undertaken in 2015 and as such the only element that involved subjective human interpretation is the analysis of the subsequent ultrasound recordings made from bat echolocation calls. This report also details the findings of the surveys undertaken throughout 2016 which were comprised a combination of static passive recording and human manual surveyors, which involved subjective human interpretation of the bat calls and recorded activity.

## **2.4 Field Surveys**

### **2.4.1 Habitat Surveys**

No specific habitat surveys of the wider area of habitat other than that of the Tai'r Meibion and Wig farm underpasses have been repeated in 2016 or since the habitat survey undertaken by EDC in 2015. See section 2.4.3, Activity Surveys.

### **2.4.2 Roost Surveys**

No specific roost emergence or inspection surveys have been undertaken during the course of the YGC 'Tai'r Meibion and Wig Farm Underpasses Bat Activity Surveys 2015 & 2016' which is the subject of this report.

### **2.4.3 Activity Surveys**

This report details the findings of the static passive recorded bat activity associated with the habitat of the Tai'r Meibion farm and Wig farm underpasses from 10<sup>th</sup> October to 12<sup>th</sup> November 2015. This report also details the findings of the human manual surveyor dusk activity surveys undertaken on 31<sup>st</sup> May, 5<sup>th</sup> July and 22<sup>nd</sup> September (dawn and dusk) 2016 as well as a period of static passive recorded bat activity from 7<sup>th</sup> to 14<sup>th</sup> October 2016.

## **3.0 Survey Results**

### **3.1 Pre-Survey Data Search**

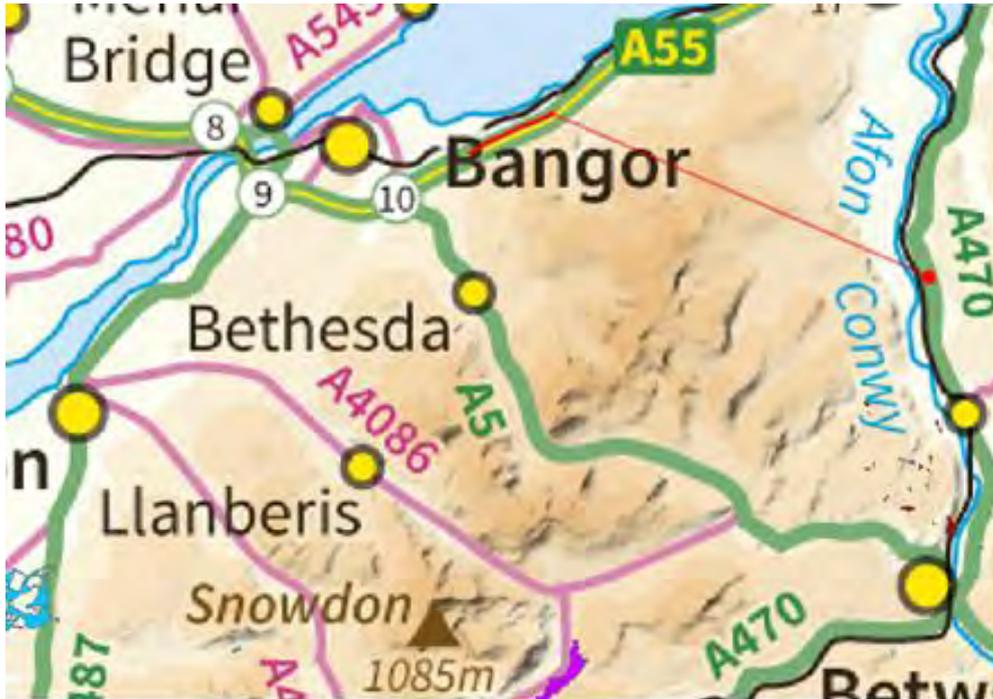
In addition to the historical biodiversity records commissioned from Cofnod consultation was undertaken with S. Dyer (local Licensed Bat Worker) following the YGC bat activity survey undertaken in October and November 2015 with regard to bat records in proximity to the proposal. The details of records regarding bat species and bat roosts are provided in section 3.1.2 Protected Species.

#### **3.1.1 Protected Sites**

The Design Manual for Roads and Bridges (DMRB) provides guidance (Volume 11 Environmental Assessment, Section 4: Assessment of Implications on European sites) on assessing the impacts of trunk road improvement proposals on European protected sites and requires that all Special Areas of Conservation (SAC) designated specifically for bats including Lesser Horseshoe within 30km, are assessed for their potential impacts on bats and other European protected species.

The nearest protected sites designated for bats within 30km of the proposed improvement are specifically designated for Lesser Horseshoe bats and are located at:

- Gwydyr Forest Mines SAC situated 15.1km to the southeast
- Meirionnydd Oak Woods and Bat Sites SAC situated 17.8km to the south, and
- Glynllifon SAC situated approximately 21km to the southwest. See Figure 2.



**Figure 2:** Location of the A55(T) Abergwyngregyn to Tai'r Meibion Improvement (shown in red) in relation to the nearest European protected sites designated for Lesser Horseshoe bats), Gwydyr Forest Mines SAC shown in dark red to the southeast, Meirionnydd Oak Woods and Bat Sites SAC shown in purple to the south and Glynllifion SAC shown in blue to the southwest).

- Gwydyr Forest Mines SAC supports hibernation roosts of Lesser Horseshoe bats but is not considered to be connected or have any links to the habitat within the footprint of the proposal due to topography including its distance of approximately 15.1km to the southeast.
- Meirionnydd Oak Woods and Bat Sites SAC supports hibernation roosts of Lesser Horseshoe bats but is not considered to be connected or have any links to the habitat within the footprint of the proposal due to topography including its distance of approximately 17.8km to the southeast.
- Glynllifion SAC supports both maternity and hibernation roosts of Lesser Horseshoe bats but is not considered to be connected or have any links to the habitat within the footprint of the proposal due to topography including its distance of approximately 21km to the southeast.

### 3.1.2 Protected Species

The historical biodiversity records search identified two records of Lesser Horseshoe bat roosts in proximity to the proposal; the closest being located at Pen y Bryn, Abergwyngregyn (NGR SH6585072787) approximately 0.5km to the east of the proposal dating from 2013. The second closest record is for Penrhyn Castle (NGR SH602719), located approximately 2km west of the proposal and dated 1986. No further details on the characteristics of these roosts (i.e. maternity and / or hibernation) are provided.

The nearest known Lesser Horseshoe bat hibernation roost (32 individuals) is located in Coed Braichmelyn, Bethesda at (NGR 263067, 365371) and is situated approximately 5.9km to the south of the proposal. Lesser Horseshoe bats are known to use the Afon Ogwen river valley including the lower reaches and it is considered likely that a maternity roost of the species is present in the locality (pers. comm. S. Dyer, local Licensed Bat Worker, November 2015).

The nearest known Whiskered bat roost (75 individuals) identified by the historical biodiversity records search is located at (NGR 6597072342) Bronant, Abergwyngregyn located approximately 835m to the southeast from the eastern extent of the proposal from 2010.

The nearest known record of Serotine (*Eptesicus serotinus*) bat highlighted by the historical biodiversity records search is located at NGR639721, foraging over the site of the former Wig Bach property (now demolished) in the centre of the proposal from 2011.

The nearest known Natterer's bat roost is a potential maternity roost and is located at NGR 60845, 70239 at Plas Maes y Groes, Tal y Bont and is situated approximately 1.6km from the western extent of the proposal (pers. comm. S. Dyer, local Licensed Bat Worker, November 2015).

The nearest record of a Brown Long Eared bat roost (17 individuals) to the proposal identified by the historical biodiversity records search is situated at NGR 65327263 at St. Bodfan's Church, Abergwyngregyn from 2006 and is located approximately 92m to the southeast from the eastern extent of the proposal. In addition, a Brown Long Eared maternity roost is located at NGR SH653726 in an adjacent property and situated approximately 88m to the east from the eastern extent of the proposal, also from 2006.

The nearest record of a Common Pipistrelle bat roost (10 individuals) is located at Tai'r Meibion Farm at NGR 263128, 371719 recorded during emergence surveys undertaken by EDC in September 2015 and is situated on the south side of the A55(T) directly adjacent to the proposal.

The nearest records of foraging Common and Soprano Pipistrelle bats to the proposal highlighted by the historical biodiversity records search are located at NGR 639721 at the site of the former Wig Bach property (now demolished) in the centre of the proposal from 2011.

The bat activity walked transect survey undertaken by EDC (September 2015) identified Lesser Horseshoe bat activity and recorded a potential single pass of the species at the Wig Underpass. However, the Anabat SD2 recording equipment used during the EDC survey was not placed inside the underpasses but located directly outside the entrances to them and was only in position for the duration of the walked bat activity transects. On completion of the transect surveys the static recorders were collected. In addition, the EDC bat activity survey also recorded single passes of Soprano and Common Pipistrelle, Noctule, Myotis species and Lesser Horseshoe bat on the static recorder at the entrance to the Wig Underpass. The EDC static recorder at the entrance to the Tai'r Meibion Underpass recorded multiple passes for Common Pipistrelle and single passes for Soprano Pipistrelle and Myotis species and a single pass of a Serotine bat.

## **3.2 Field Surveys**

### **3.2.1 Habitat Description**

The underpasses are situated in the central and western areas of the proposal and are approximately 3.5m wide by 2.5m high and formed from reinforced concrete (see Appendix II, Site Photographs). The concrete has a very smooth finish with no discernible gaps, cracks or crevices that could support roosting bats at the time of the survey.

At times the Tai'r Meibion underpass is used as a sheep fold for holding grazing stock, evident by the accumulation of animal droppings and debris from hooves which as a result attracts insects therefore creating an area of potentially suitable bat foraging habitat. Regularly maintained hedgerows are present and run parallel to and along the length of the A55(T) road linking both sides of each underpass, although there are significant gaps in the hedgerow connections to the north of the Wig underpass.

Both sides of the underpasses are accessed by descending concrete ramps with adjacent steeply graded and grazed improved grassland banks to the south and hedgerow lined tracks and open un-vegetated fence lines that then progress north descending towards the coast and south rising towards the uplands of Snowdonia National Park.

### 3.2.2 Roost Surveys

No roost surveys have been undertaken as part of the YGC survey undertaken in October and November 2015 or in 2016; the scope and remit of which was limited to recording and interpreting any bat activity associated with the Tai'r Meibion and Wig farm underpasses and assessment of potential impacts on the nearest known bat roosts.

### 3.2.3 2015 & 2016 Activity Surveys

The maximum number of bat passes (number of 15 second recordings of the highest amplitude echolocation calls recorded by the Anabat Express) recorded during the course of the 2015 passive static surveys was 234 Myotis bat species passes that were recorded in the Tai'r Meibion underpass during the first week of the bat activity survey in October 2015. In comparison, a maximum of 17 Myotis bat species passes were recorded in the Wig underpass during the first week of the 2015 static passive bat activity survey (see Table 1: A55(T) Tai'r Meibion and Wig Farm Underpasses Anabat Express Data).

It is concluded that a low proportion of the 234 Myotis species passes recorded in October 2015 are likely to have potentially been produced by commuting bats, however, it is considered more likely that the majority of the passes recorded have occurred as a result of a low number of bats foraging within and around the entrances to the underpasses. This conclusion is supported by the visual observations of the human manual surveyor surveys undertaken in 2016 which confirmed that only a maximum number of 4 bats (4 x Soprano pipistrelle on 22.9.16) were recorded at any one time within the Tai'r Meibion underpass.

The maximum number of Myotis bat species observed by human manual surveyors flying through the Tai'r Meibion underpass during the 2016 surveys was 9 on 22.9.16. In comparison, the maximum number of Myotis bat species flying through the Wig underpass was 7 on 31.5.16. The ultrasound recordings of the Myotis species made during the course of the 2015 and 2016 YGC bat activity surveys when analysed, display several characteristics similar to the sonograms produced by Natterer's (*Myotis nattereri*) bats. However, it is possible that more than one of the Myotis bat species have been recorded during the course of the survey, such as Whiskered (*Myotis mystacinus*) and separation of the Myotis species may only be confirmed by further human observation and heterodyne bat detector surveys and analysis of bat call data recorded.

Lesser Horseshoe bat activity, interpreted and concluded as commuting flight activity was also recorded during the 2015 and 2016 surveys in the form of numerous passes of the species through both the Tai'r Meibion and Wig underpasses. A maximum number of 7 Lesser Horseshoe bat passes were recorded in the Tai'r Meibion Underpass in the first week of the 2015 bat activity survey (see Table 1: 2015 A55(T) Tai'r Meibion and Wig Farm Underpasses Anabat Express Data), in comparison to the maximum number of 4 Lesser Horseshoe bat passes recorded in the Wig Underpass during the course of one week. The maximum number of 4 Lesser Horseshoe bat passes recorded in the Wig Underpass was recorded during both the first and second week of the 2015 bat activity survey.

The Lesser Horseshoe bat passes were consistently recorded in both of the underpasses every week for the period that the data were collected and analysed in 2015 for the survey duration, see Table 1: Number of Bat Passes Recorded at Tai'r Meibion and Wig Farm Underpasses in 2015. The Lesser Horseshoe bat passes were recorded with significant time periods between each echolocation call made and recorded, which potentially indicates commuting flight activity rather than foraging activity. However, no Lesser Horseshoe bat passes were recorded during the 2016 surveys by human manual surveyors during the dusk and dawn activity surveys. Despite this the maximum number of Lesser Horseshoe bat passes recorded in both the 2015 and 2016 surveys was recorded in 2016 during the 7<sup>th</sup> to 14<sup>th</sup> October static passive recording period, with 25 passes of Lesser Horseshoe being recorded in the Tai'r Meibion underpass and 10 passes being recorded in the Wig underpass. In this instance, due to the reasonably significant time periods (hours and not minutes or seconds) between the recordings of Lesser horseshoe bat calls, this suggests commuting flight activity rather than foraging activity and could potentially infer or indicate movement of individuals between known and / or unknown transitional and hibernation roosts.

Noctule bat activity was recorded in the form of numerous bat passes with a maximum count of 33 passes being recorded at the location of the Wig underpass during the first week of the 2015 survey recordings, in comparison to a maximum of 10 passes recorded at the Tai'r Meibion underpass in the second week of the 2015 survey recordings. In consultation with S. Dyer regarding the interpretation and analysis of potential Noctule bat calls it was concluded that they are not the echo location calls of other big bat species with similar frequencies such as Serotine that the subsequent sonogram records can sometimes be confused with. Noctule bat activity was also recorded during the 2016 surveys on both heterodyne and Anabat Express detectors but none were observed commuting through either of the farm underpasses or visually recorded adjacent to them, therefore it is concluded that these species were foraging and or commuting in the wider area of habitat adjacent to the A55(T).

A maximum number of 5 Brown Long Eared bat passes were recorded during the second week of the 2015 bat activity survey recordings made at the Tai'r Meibion underpass in contrast to no Brown Long Eared bat passes being recorded in the Wig underpass. The maximum number of Brown Long Eared bats observed by human manual surveyors flying through the Tai'r Meibion underpass during the 2016 surveys was 1 on 31.5.16. In comparison, no Brown Long Eared bat species were observed flying through the Wig underpass. Whereas, the maximum number of Brown Long Eared bats recorded during the static passive recording period in October 2016 was 9 in the Tai'r Meibion underpass and 0 in the Wig underpass.

The maximum number of Common Pipistrelle bat passes recorded in 2015 was 168 in the Tai'r Meibion underpass during the third week of the bat activity survey; whereas no bat passes of Common Pipistrelle were recorded at all in the Wig Underpass during the course of the 2015 surveys. The maximum number of Common Pipistrelle bats observed by human manual surveyors flying through the Tai'r Meibion underpass during the 2016 surveys was 11 on 22.9.16. In comparison, the maximum number of Common Pipistrelle bats observed flying through the Wig underpass was 25 on 31.5.16. Whereas, the maximum number of Common Pipistrelle bats recorded during the static passive recording period in October 2016 was 173 in the Tai'r Meibion underpass and 1 in the Wig underpass.

The 2015 maximum number of Soprano Pipistrelle bat passes was also recorded in the Tai'r Meibion underpass with a high count of 18 passes being recorded in the second week of the 2015 activity survey, in contrast to the highest count of 3 Soprano Pipistrelle bat passes in the Wig underpass also recorded during the same week (see Table 1: 2015 A55(T) Tai'r Meibion and Wig Farm Underpasses Anabat Express Data). The maximum number of Soprano Pipistrelle bats observed by human manual surveyors flying through the Tai'r Meibion underpass during the 2016 surveys was 4 on 31.5.16. In comparison, the maximum number of Soprano Pipistrelle bats observed flying through the Wig underpass was 8 on 31.5.16.

The maximum number of actual bats recorded and observed flying through the Tai'r Meibion and Wig farm underpasses recorded by human manual surveyors throughout the 2016 dusk and dawn activity surveys is provided in Table 3: Maximum Number of Bats Recorded Commuting Through Tai'r Meibion and Wig Farm Underpasses in 2016.

It should be noted that the bat activity surveys undertaken by EDC in May and September 2015 recorded a single individual Serotine bat to both the north and south of the A55(T) on one occasion in each respective month. However, no Serotine bat calls were recorded during the course of the 2015 and 2016 survey detailed in this report and all big bat species recorded are confirmed as Noctule.

**Table 1: Number of Bat Passes Recorded at Tai'r Meibion and Wig Farm Underpasses in 2015 (Passes = Number of 15 Second Anabat Express Ultrasound Bat Call Recordings)**

<b>2015 Recording Period Dates, Survey Type &amp; Temp.</b>	<b>Bat Species Recorded</b>	<b>Tai'r Meibion underpass (Number of Bat Passes)</b>	<b>Wig underpass (Number of Bat Passes)</b>
12-19.10.2015 Static passive activity survey.  Min. Temp. 6.5°C Max. Temp.12.2°C	Myotis species	234	17
	<b><i>Lesser Horseshoe</i></b>	<b>7</b>	<b>4</b>
	Common Pipistrelle	39	0
	Soprano Pipistrelle	11	0
	Noctule	9	33
	Brown Long Eared	2	0
19-26.10.2015 Static passive activity survey.  Min. Temp.8.7°C Max. Temp.11.5°C	Myotis species	78	14
	<b><i>Lesser Horseshoe</i></b>	<b>6</b>	<b>4</b>
	Common Pipistrelle	48	0
	Soprano Pipistrelle	18	2
	Noctule	10	1
	Brown Long Eared	5	0
26.10-2.11.2015 Static passive activity survey.  Min. Temp.13.7°C Max. Temp.15.7°C	Myotis species	46	7
	<b><i>Lesser Horseshoe</i></b>	<b>2</b>	<b>1</b>
	Common Pipistrelle	168	0
	Soprano Pipistrelle	14	3
	Noctule	6	5
	Brown Long Eared	3	0
2-10.11.2015 Static passive activity survey.  Min. Temp.14.1°C Max. Temp.17.2°C	Myotis species	32	3
	<b><i>Lesser Horseshoe</i></b>	<b>2</b>	<b>1</b>
	Common Pipistrelle	103	0
	Soprano Pipistrelle	7	2
	Noctule	6	2
	Brown Long Eared	1	0

**Table 2: Number of Bat Passes Recorded at Tai'r Meibion and Wig Farm Underpasses in 2016 (Passes = Number of 15 Second Anabat Express Ultrasound Bat Call Recordings)**

2016 Recording Period Dates, Survey Type & Temp.	Bat Species Recorded	Tai'r Meibion Underpass (Number of Bat Passes)	Wig Underpass (Number of Bat Passes)
31.5.2016 Manual Surveyor dusk activity survey. Min. Temp. 12.9°C Max. Temp. 11.2°C	Myotis species	7	27
	<b>Lesser Horseshoe</b>	<b>0</b>	<b>0</b>
	Common Pipistrelle	10	25
	Soprano Pipistrelle	0	8
	Noctule	0	2
	Brown Long Eared	1	0
May 2016 Static passive activity survey. Min. Temp. - Max. Temp. -	Myotis species	<i>No Anabat Express units available.</i>	
	Lesser Horseshoe		
	Common Pipistrelle		
	Soprano Pipistrelle		
	Noctule		
	Brown Long Eared		
5.7.2016 Manual Surveyor dusk activity survey. Min. Temp. 6.5°C Max. Temp. 12.2°C	Myotis species	3	0
	<b>Lesser Horseshoe</b>	<b>0</b>	<b>0</b>
	Common Pipistrelle	9	2
	Soprano Pipistrelle	4	0
	Noctule	0	0
	Brown Long Eared	0	0
8-13.7.2016 Static passive activity survey. Min. Temp. - Max. Temp. -	Myotis species	<i>No Anabat Express data recorded due to battery failure.</i>	
	Lesser Horseshoe		
	Common Pipistrelle		
	Soprano Pipistrelle		
	Noctule		
	Brown Long Eared		
22.9.2016 Manual Surveyor pre-dawn activity survey. Min. Temp. 11.9°C Max. Temp. 13.7°C	Myotis species	9	0
	<b>Lesser Horseshoe</b>	<b>0</b>	<b>0</b>
	Common Pipistrelle	11	0
	Soprano Pipistrelle	1	0
	Noctule	0	0
	Brown Long Eared	0	0
22.9.2016 Manual Surveyor dusk activity survey. Min. Temp. 12.9°C Max. Temp. 13.1°C	Myotis species	2	0
	<b>Lesser Horseshoe</b>	<b>0</b>	<b>0</b>
	Common Pipistrelle	4	1
	Soprano Pipistrelle	3	0
	Noctule	1	0
	Brown Long Eared	0	0
7-14.10.2016 Static passive activity survey. Min. Temp. 9.2°C Max. Temp. 14.2°C	Myotis species	115	14
	<b>Lesser Horseshoe</b>	<b>25</b>	<b>10</b>
	Common Pipistrelle	173	1
	Soprano Pipistrelle	10	1
	Noctule	5	7
	Brown Long Eared	9	0

**Table 3: Maximum Number of Bats Recorded Commuting / Foraging within Tai'r Meibion and Wig Farm Underpasses in 2016 (human manual surveyor surveys only).**

Bat Species	Tai'r Meibion underpass (Max. Number of Bats Recorded Flying through & Survey Date)	Wig underpass (Max. Number of Bat Recorded Flying Through & Survey Date)
Myotis species	9 (22.9.16)	7 (31.5.16)
<b>Lesser Horseshoe</b>	<b>0</b>	<b>0</b>
Common Pipistrelle	11 (22.9.16)	2 (31.5.16)
Soprano Pipistrelle	4 (5.7.16)	1 (31.5.16)
Noctule	0	0
Brown Long Eared	1 (31.5.16)	0

**Table 4: Number of Bats Recorded Commuting / Foraging within Tai'r Meibion and Wig Farm Underpasses in 2016 (human manual surveyor surveys only).**

2016 Survey Date	Bat Species	Tai'r Meibion Underpass (Number of Bats)	Wig Underpass (Number of Bats)
31.5.2016	<b>Lesser Horseshoe</b>	<b>0</b>	<b>0</b>
	Myotis species	1	7
	Soprano pipistrelle	2	1
	Common pipistrelle	9	2
	Brown Long Eared	1	0
5.7.2016	<b>Lesser Horseshoe</b>	<b>0</b>	<b>0</b>
	Myotis species	2	0
	Soprano pipistrelle	4	0
	Common pipistrelle	6	2
	Brown Long Eared	1	0
22.9.2016 (pre-dawn)	<b>Lesser Horseshoe</b>	<b>0</b>	<b>0</b>
	Myotis species	9	0
	Soprano pipistrelle	3	0
	Common pipistrelle	9	0
	Brown Long Eared	0	0
22.9.16 (dusk)	<b>Lesser Horseshoe</b>	<b>0</b>	<b>0</b>
	Myotis species	6	0
	Soprano pipistrelle	4	0
	Common pipistrelle	11	0
	Brown Long Eared	0	0

#### 4.0 Priority UK BAP and TREBAP Species

There are 7 species of bat identified as Priority Species within the UK Biodiversity Action Plan (UKBAP), Lesser Horseshoe bat, Greater Horseshoe (*Rhinolophus ferrumequinum*) bat, Bechstein's (*Myotis bechsteinii*) bat, Barbastelle (*Barbastella barbastellus*) bat, Greater Mouse-Eared (*Myotis myotis*) bat and both the Common and Soprano Pipistrelle bats and are listed in Table 5: Priority UK BAP Bat Species below.

The species that have either been recorded during the 2015 and 2016 field surveys or are considered to be potentially present within the survey area are highlighted within Table 5: Priority UK BAP Bat Species. The North and Mid Wales Trunk Road Agency's (NMWTRA) Trunk Road Estate Biodiversity Action Plan (TREBAP) includes all UK bat species.

**Table 5: Priority UK BAP Bat Species**

Priority UK BAP Species	Recorded within Survey Area	Potentially Present within Survey Area
Lesser Horseshoe Bat ( <i>Rhinolophus hipposideros</i> )	✓	
Common Pipistrelle ( <i>Pipistrellus pipistrellus</i> )	✓	
Soprano Pipistrelle ( <i>Pipistrellus pygmaeus</i> )	✓	
Greater Horseshoe ( <i>Rhinolophus ferrumequinum</i> )		✓
Barbastelle ( <i>Barbastella barbastellus</i> )		✓
Bechstein's ( <i>Myotis bechsteinii</i> )		Unlikely
Greater Mouse-Eared ( <i>Myotis myotis</i> )		No

There are 3 species of bat identified as Priority Species within the Gwynedd Local Biodiversity Action Plan (LBAP), Lesser Horseshoe bat and both the Common and Soprano Pipistrelle bats and are listed in Table 6: Gwynedd LBAP Bat Species. The species that have either been recorded during the 2015 and 2016 field surveys or are considered to be potentially present within the survey area are highlighted within Table 6 below.

**Table 6: Gwynedd LBAP Bat Species**

Gwynedd LAP Species	Recorded within Survey Area	Potentially Present within Survey Area
Lesser Horseshoe Bat ( <i>Rhinolophus hipposideros</i> )	✓	
Common Pipistrelle ( <i>Pipistrellus pipistrellus</i> )	✓	
Soprano Pipistrelle ( <i>Pipistrellus pygmaeus</i> )	✓	

### 5.0 The Environment (Wales) Act 2016 Section 7 Bat Species

Public authorities have a duty to 'have regard for' the species and habitats listed under Section 7 of The Environment (Wales) Act 2016. The following species of bat shown in Table 7: Section 7 Bat Species, have either been recorded historically or during the 2015 and 2016 activity surveys, or are considered to be potentially present within the survey area.

**Table 7: Section 7 Bat Species**

Section 7 Bat Species	Recorded within Survey Area	Potentially Present within Survey Area
Lesser Horseshoe ( <i>Rhinolophus hipposideros</i> )	✓	
Common Pipistrelle ( <i>Pipistrellus pipistrellus</i> )	✓	
Soprano Pipistrelle ( <i>Pipistrellus pygmaeus</i> )	✓	
Noctule ( <i>Nyctalus noctula</i> )	✓	
Brown Long-Eared	✓	

<i>(Plecotus auritus)</i>		
Greater Horseshoe <i>(Rhinolophus ferrumequinum)</i>		✓
Barbastelle <i>(Barbastella barbastellus)</i>		✓
Bechstein's <i>(Myotis bechsteinii)</i>		Unlikely

Additional bat species that have been recorded previously or that are likely to be potentially present within the Zone of Influence of the proposal but that were not recorded during the course of the bat activity surveys undertaken by YGC in 2015 and 2016 and that are not listed as either Priority UK BAP or Gwynedd LBAP bat species or as Section 7 bat species include Serotine, Natterer's, Daubenton's, Whiskered and Brandt's.

## 6.0 Assessment

### 6.1 Constraints on Survey Information

Anabat detectors use a method of recording known as 'zero crossing' which results in a limitation with the range of the microphone that only records the loudest signal it receives in preference to the quieter signals. Myotis bat species and Brown Long Eared bats are renowned for producing very quiet ultrasound calls which are often missed or not recorded in preference to the higher amplitude ultrasound calls of other bat species such as Pipistrelle species and Noctule. It is however, considered that all bat species active within and in the vicinity of the underpasses have been recorded.

The Myotis species group of bats contains 6 species within the UK; Natterer's, Daubenton's, Bechstein's, Whiskered, Alcahloe's and Brandt's. The calls of Myotis bat species are notoriously difficult to separate and identify as individual species from sonogram ultrasound recordings. Therefore recordings made by these species during the course of the survey are grouped together and recorded as Myotis species.

In order to address this limitation heterodyne bat detectors were also used in conjunction with recording equipment to support and corroborate recorded data with human visual observations and audible sounds produced by the heterodyne detectors, which are more sensitive and receptive to even low amplitude bat echolocation ultrasound calls than the zero crossing recording devices.

### 6.2 Constraints on Survey Equipment Used

A limitation of bat activity surveys undertaken with static passive recording equipment such as the Anabat Express, is that although bat activity is recorded and a number of bat passes provided (number of 15 second recordings of the highest amplitude echolocation calls recorded by the Anabat Express), information on the numbers of individual bat species and / or species groups cannot be gained without corroboration and support from the observations of human surveyors. However, with experience of analysing echolocation data and sonograms, conclusions can be drawn with regard to the type of activity likely to be occurring such as foraging and / or commuting and therefore an indication of the potentially low or high numbers of bats present can be estimated.

Both Noctule and Serotine bat species display similarities in foraging, flight, size and echolocation frequency which is also reflected in their respective sonograms. The Anabat Analook analysis software does not display the full spectrum of sound recorded and the similarity in the calls and frequency cross over can make specific individual separation of the calls challenging. Where recorded calls cannot be clearly defined in subsequent analysis for Noctule or Serotine bat species, the calls are recorded as 'Big Bat'. However, no calls recorded during the course of this bat activity survey were considered to be produced by Serotine bats.

The weather conditions during each night of the bat activity surveys during 2015 were not recorded (with the exception of temperature (the lowest temperature recorded was 6.5°C)) as

no human surveyors were present. However, night time weather conditions in both October and November 2015 were unseasonably mild with higher than average temperatures, rainfall and wind speeds. Weather conditions were recorded during the human manual dusk and dawn activity surveys throughout the 2016 surveys. Minimum and maximum temperatures were recorded on all surveys, manual and static passive, throughout the 2016 surveys.

No passive static recording was undertaken in June following the manual dusk activity survey on 31.5.16 due to the unavailability of the Anabat Express units.

In addition, no passive static data was recorded during the 8-13.7.16 survey period due to battery failure of the Anabat Express units. However, this error was rectified prior to the start of the following subsequent surveys undertaken from 22.9.16.

### **6.3 Potential Impacts of Development**

#### **6.3.1 Designated Sites**

It is not expected that there will be impacts to any of the protected sites designated for bats due to their respective distances from the proposal. The nearest protected site designated for bats is the Plas Maenan SSSI located approximately 14.6km to the southeast.

In addition, the species and numbers of individual bats and type of bat roosts identified by the historical biodiversity record search, previous surveys and the results of the recent underpass bat activity surveys in proximity to the proposal do not suggest or indicate any significant potential links to the designated sites. However, it must be noted that previously cited information regarding the movement of Lesser Horseshoe bats states that the average movement between summer and winter roosts for the species is between 5 and 10km, although the longest recorded distance is 153km (Schober and Grimmberger 1989).

#### **6.3.2 Roosts**

##### ***Common Pipistrelle Bat Roost – Tai'r Meibion Farm***

A potential impact of the proposal is the potential disturbance to the nearest known identified bat roost of Common Pipistrelle bats (10 individuals) located in Tai'r Meibion Farm property situated directly adjacent to the south of the proposal, identified by the previous survey undertaken by EDC. It was concluded by EDC that this was not a breeding colony of bats at the time that the survey was undertaken (September). Common pipistrelle bats may therefore be present at this roost site during the winter hibernation period. However, the movement of bats from this roost is currently unknown and therefore they are at potential risk of disturbance as a result of the proposal.

##### ***Brown Long Eared Bat Maternity Roost - NGR 653726 and St. Bodfan's Church***

A potential impact of the proposal is the potential disturbance to the nearest known identified maternity bat roost. The maternity roost is of Brown Long Eared bats and is situated approximately 88m to the east from the eastern extent of the proposal in a residential property adjacent to St. Bodfan's Church, Abergwyngregyn. A second Brown Long Eared bat roost (17 individuals) is also located within St. Bodfan's Church situated approximately 92m to the southeast from the eastern extent of the proposal. Brown Long Eared bats however, are known for foraging very close to their roost sites and prefer dark well vegetated areas in which to forage. Due to the foraging preferences of this species in close proximity to their roosts, it is considered unlikely that either of the roost locations would be directly affected as a result of the proposal. However, commuting routes between these roost sites and other unknown roosts such as hibernation roosts for this species may be disrupted as a result of the proposal.

##### ***Lesser Horseshoe Bat Roosts – Pen y Bryn, Penrhyn Castle and Coed Braichmelyn***

It is considered unlikely that the roost located at Pen y Bryn, Abergwyngregyn 500m to the east of the eastern extent of the proposal, the roost located at Penrhyn Castle, Llandygai 2km to the west and the hibernation roost located Coed Braichmelyn, Bethesda 5.9km to the south would be directly affected by the proposal. However, commuting routes between these roost sites and other unknown roosts such as maternity roosts for this species may be disrupted as a result of the proposal.

### **Whiskered Bat Roost - Bronant**

It is considered unlikely that the roost located at Bronant, Abergwyngregyn 835m to the southeast from the eastern extent of the proposal would be directly affected by the proposal. However, commuting routes between this and other unknown roost sites such as maternity or hibernation roosts for this species may be disrupted as a result of the proposal.

### **Natterer's Bat Potential Maternity Roost - Plas Maes y Groes**

It is considered unlikely that the potential maternity roost located at Plas Maes y Groes 1.6km from the western extent of the proposal would be directly affected by the proposal. However, commuting routes between this and other unknown roost sites such as hibernation roosts for this species may be disrupted as a result of the proposal.

### **Unknown Roosts**

Due to the relatively high maximum numbers of Myotis bat species commuting and foraging through the underpasses (9 in Tai'r Meibion underpass on 22.9.16 and 7 in Wig underpass on 31.5.16) in comparison to the other bat species recorded excluding Common Pipistrelle (the most frequently recorded bat); it is considered possible that a Myotis bat species roost may potentially be located in the vicinity of the underpasses, for instance in the numerous relatively high potential bat trees that are present and located to the north of the A55(T) but outside the footprint of the scheme.

### **6.3.3 Foraging and Commuting Habitat**

It is considered unlikely that Noctule bats commute through either of the farm underpasses due to their habitat preferences for foraging at relatively high altitudes either over open or edge habitats and woodland canopies. It is also concluded that the recordings of Noctule bats made during the course of the surveys are of foraging and / or commuting individuals that were likely to be located a reasonable distance away from the locations of the underpasses where the surveys were undertaken, and as a result of the high amplitude of the calls of this bat species which can be recorded from a significant distance away in comparison to other bat species such as Lesser Horseshoe, which has been cited as being out of range of bat detectors within 5-10m (*pers.comm.* Andrews 2016). Supporting this conclusion is the fact that no individual Noctule bats were observed by the human manual surveyors on any of the surveys undertaken by YGC. It is therefore considered unlikely that there would be any significant effect on commuting or foraging Noctule bats as a result of the proposal.

It is also considered unlikely that Serotine bats would be significantly affected by the proposal due to the lack of any recordings or observations of the species during any of the YGC surveys undertaken to date despite being recorded once in the 2015 EDC surveys.

Lesser Horseshoe bats are known to commute adjacent to linear features such as hedgerows and to revert to flying very close to ground level (0.5m – 2m) in the absence of canopy vegetation. The nearest known roosts for this species are located at Abergwyngregyn to the southeast and Penrhyn Castle to the northwest. As the underpasses are situated in between these two sites it is therefore considered possible that they form part of a regularly used commuting bat flight route between these roosts. Alternatively, the relatively consistent and higher number of Lesser Horseshoe bat passes subsequently recorded during the 2015 October / November and the 2016 October static passive recording periods may potentially indicate a movement of bats between transitional and hibernation roosts and / or unknown roosts that are located closer to the proposal than either of the roosts located at Penrhyn Castle and / or Abergwyngregyn such as Talybont and Crymlyn.

The relatively high number of records of Myotis bat species may potentially indicate that a roost site is located close to the underpasses and the proposed works. However, no Myotis roosts were identified in the 2015 EDC surveys and the relatively high potential trees located within the fields immediately north of the A55 provide the only potentially suitable features in the close vicinity of underpasses (see section 7.1 Further Survey).

Therefore the proposal has the potential to impact on Lesser Horseshoe, Pipistrelle species, Myotis species, Brown Long Eared, Noctule and possibly Serotine (not recorded during the 2016 surveys but identified during the 2015 EDC transect surveys) bat species commuting

and foraging habitats, including both farm underpasses but in particular the Tai'r Meibion farm underpass where the majority of all bat species passes have been recorded, by:

- disruption of commuting bat flight lines and foraging bat habitat through and within the Tai'r Meibion and Wig Farm underpasses during their proposed extension by approximately 12m to the north and 2m to the south at Tai'r Meibion underpass and 6m to the north and 2m to the south at Wig underpass,
- disruption of commuting bat flight lines and foraging bat habitat along linear or continuous lines of vegetation such as the hedgerows (that lead to both underpasses) and other vegetated and ditch lined boundaries present directly adjacent to the A55(T) and those connected to them throughout the length of the proposal.

#### **6.4 Legislation and Policy Guidance**

##### ***The Conservation of Habitats and Species Regulations 2010, as amended***

These Regulations implement the Council Directive 92/43/EEC 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (EC Habitats Directive) in the UK. Annex II of the Directive lists animal and plant species of Community interest, the conservation of which requires the designation of Special Areas of Conservation (SACs); Annex IV lists animal and plant species of Community interest in need of strict protection. All bat species are listed in Annex IV; some are listed in Annex II.

The bat species listed on Annex II are as follows;

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

##### ***The Wildlife and Countryside Act 1981 (as amended)***

The Wildlife and Countryside Act 1981 (as amended) was enacted to transpose into UK law the Convention on the Conservation of European Wildlife and Natural Habitats (commonly referred to as the 'Bern Convention'). The Act has been amended several times and only a small number of offences now apply to bats, which are listed in Schedule 5.

Of relevance to the Proposed Improvement, this makes it an offence to:

- Intentionally or recklessly disturb a bat while it is occupying a structure or place of shelter or protection.
- Intentionally or recklessly obstruct access to a structure or place used by a bat for protection or shelter.

As a result of the legislation summarised above, and in the context of the Proposed Improvement, it is an offence to:

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

##### ***The Environment (Wales) Act 2016***

The Environment (Wales) Act 2016 imposes a duty on all Local Planning Authorities to conserve and enhance biodiversity. Section 7 imposes a duty to conserve biodiversity, "Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity." Section 7 of the Act explains that, "Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". The duty applies to all local authorities

and extends beyond just conserving what is already there to carrying out, supporting and requiring actions that may also restore or enhance biodiversity.

## **7.0 Recommendations and Mitigation**

### **7.1 Further Survey**

It is recommended that the relatively high potential trees located adjacent to the underpasses to the north of the A55 (which are not to be removed for the proposals) are assessed for evidence of roosting bats and / or their potential to support roosting bats during the scheme pre-construction surveys in order to ascertain if a Myotis bat species roost (Natterer's and Daubentons - Myotis bat species are documented preferring to use tree roosting sites in autumn, winter and spring) is located in the immediate vicinity of the scheme that may necessitate further assessment regarding licensing and mitigation requirements.

### **7.2 Mitigation Measures**

#### **7.2.1 Proposed Mitigation for Roost Sites**

Consultation with NRW has been undertaken with regard to the Common Pipistrelle bat roost located within the Tai'r Meibion Farm property and it has been confirmed that no EPS licence to disturb bats is required as long as the following conditions stated are adhered to.

- No lighting in the vicinity of the Tai'r Meibion Common pipistrelle roost.
- No lighting in the vicinity of the underpasses off the A55 carriageway.
- No night time working or directional lighting illuminating the underpasses or site compounds are to be located in the vicinity of the underpasses.
- Underpasses to be kept open and free from significant obstruction throughout construction including winter period.
- All vegetation to be removed leading into the underpasses to be replaced by temporary bat guidance hurdle fencing prior to sunset each day until translocated or replanted.

#### **7.2.2 Proposed Mitigation for Foraging and Commuting Habitat**

The following recommendations are made for the Tai'r Meibion and Wig Farm Underpasses that have been confirmed as commuting and foraging bat habitat by the bat activity recorded during the course of the surveys undertaken by YGC in 2015 and 2016:

- The bat activity recorded in the surveys undertaken to date identified the use of both underpasses by Lesser Horseshoe, Myotis species, Common and Soprano Pipistrelle and Brown Long Eared bats and is likely to be used as a commuting route between different roost sites and / or foraging areas. It is therefore considered essential that both underpasses are kept free from significant obstruction (supports will be required for the concrete form work to achieve extension of the underpasses) at all times throughout the construction period, including the winter hibernation period (when bats are still active on milder nights); between sunset and sunrise in order to avoid preventing bats from using the underpasses and to reduce the potential impact of forcing them to fly over the A55(T) carriageway.
- The loss of any hedgerows and linear features leading directly into the underpasses is to be mitigated by the installation of suitable navigational features for bats such as wooden hurdle fencing that is to be in place prior to sunset or at the end of each working day (whichever is the sooner) throughout construction including the winter hibernation period as bats are still active especially during mild winter conditions.

In order to reduce impacts to commuting bat flight routes no external lighting, night time working or location of site compounds should take place during construction of the proposal on the approaches to the underpasses or to boundary habitats off the route of the A55(T) carriageway.

### **7.3 Mitigation Licences**

Consultation with NRW has been undertaken with regard to the bat activity within both underpasses and it has been confirmed that no EPS licence to disturb bats is required as long as the conditions stated above in section 7.2.1 are adhered to.

## 8.0 Summary

- The YGC bat activity survey undertaken throughout the 2016 survey season from May to October inclusive confirmed a minimum of five separate bat species foraging and / or commuting activity within both the Tai'r Meibion and Wig farm underpasses that include; Lesser Horseshoe, Soprano Pipistrelle, Common Pipistrelle, Brown Long Eared and potentially more than one species of Myotis bat, that could potentially be interpreted from sonogram recordings as Natterer's and / or Whiskered bats.
- The most frequently recorded bat species was Common Pipistrelle recorded within Tai'r Meibion underpass. It is concluded that the level of activity of this species recorded at this location is potentially indicative of, consistent with and considered potentially likely to be activity associated with the number of individuals (10) recorded roosting in Tai'r Meibion farm house by EDC in September 2015.
- The 2016 YGC static passive activity survey undertaken from 7-14 October recorded a higher number of Lesser Horseshoe bat passes than at any other time during the course of the 2015 and 2016 YGC surveys in both underpasses, with 25 passes being recorded in the Tai'r Meibion underpass and 10 passes being recorded in the Wig underpass. The higher number of passes of the species may potentially indicate a seasonal movement of the species between transitional and hibernation roosts.
- The number of all other bat species recorded (Soprano Pipistrelle, Noctule and Brown Long Eared) either as visual observations on human manual surveys and / or static passive recorded bat passes within both the underpasses is considered to be consistent with a low number of bats foraging and / or commuting within the habitat.
- Consultation with NRW has been undertaken with regard to the Common Pipistrelle bat roost located within the Tai'r Meibion Farm property and it has been confirmed that no EPS licence to disturb bats is required as long as the following conditions stated are adhered to.
  - No lighting in the vicinity of the Tai'r Meibion Common pipistrelle roost.
  - No lighting in the vicinity of the underpasses off the A55 carriageway.
  - No night time working or directional lighting illuminating the underpasses or site compounds are to be located in the vicinity of the underpasses.
  - Underpasses to be kept open and free from significant obstruction throughout construction including winter period.
  - All vegetation to be removed leading into the underpasses to be replaced by temporary bat guidance hurdle fencing prior to sunset each day until translocated or replanted.
- Due to the relatively high number of Myotis species bat calls recorded during the course of the surveys, further assessment and inspection of the relatively high potential trees located adjacent to the underpasses to the north of the A55 (which are not to be removed for the proposals) for evidence of roosting bats and / or their potential to support roosting bats is recommended during the pre-construction surveys for otter and badger to ascertain if a potential Myotis bat species roost is located in the immediate vicinity of the scheme that may necessitate further assessment regarding licensing and mitigation requirements.
- Consultation with Natural Resources Wales (NRW) regarding the potential disturbance to bat foraging and commuting activity within both underpasses as a result of the proposed works to widen the carriageway and subsequently both underpasses has been undertaken and mitigation measures agreed by the provision of bat guidance hurdle fencing that is to be installed wherever hedgerow vegetation is removed that leads into both the underpasses. In addition, no night time working or directional lighting illuminating the underpasses or site compounds are to be located in the vicinity of the underpasses.

## Appendix I

### Site Photographs



**Photograph 1:** View of southern access to Tai'r Meibion Underpass looking north.



**Photograph 2:** View of northern access to Tai'r Meibion Underpass looking south.



**Photograph 3:** View of southern access to Wig Underpass looking north.



**Photograph 4:** View of northern access to Wig Underpass looking south.

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## Bat Surveys; A55, Abergwyngregyn to Tai'r Meibion Improvement

**Site:** A55  
Abergwyngregyn  
Gwynedd

**Client:** YGC  
Council Offices  
Shire Hall Street  
Caernarfon  
LL55 1SH

**Ref:** 0435 – A55 - Bat Transect Report 2015–v3

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### 1.0 **INTRODUCTION**

#### 1.1 **Summary**

Several habitat and species surveys have been undertaken in relation to the proposed A55 road widening scheme between Tal y Bont and Abergwyngregyn over several years, the object of this survey report is to update the survey information in relationship to current survey guidance and requirements and to review the recommendations based on the new survey data.

#### 1.2 **Aim**

To undertake a desk top study in line with DMRB, Volume 11, section 4, guidance for assessing the likely significant effects of schemes on European Natura 2000 sites, to include all SACs designated for Lesser Horseshoe Bats within 30km of a scheme and to produce a report accordingly and to offer mitigation to avoid or negate any impacts identified.

To undertake day time check surveys based on previous assessment of adjacent properties to the scheme to log any variations.

To undertake transect surveys; aim of the survey is to establish activity levels adjacent to the northern and southern side of the proposed widening scheme. Using standard transect methodology, static monitoring and emergence surveys of identified roosts, log activity using frequency division detectors and recording devices to enable sonograph analysis.

To highlight species foraging distribution and attempt to record any emergence activity from roosts in the vicinity of the carriageway.

To identify any specific crossing points used by bats, with specific attention to the existing underpasses that may be required to be extended.

To assess impact on any recorded activity at the existing underpasses and offer solutions to negate any impacts that are highlighted

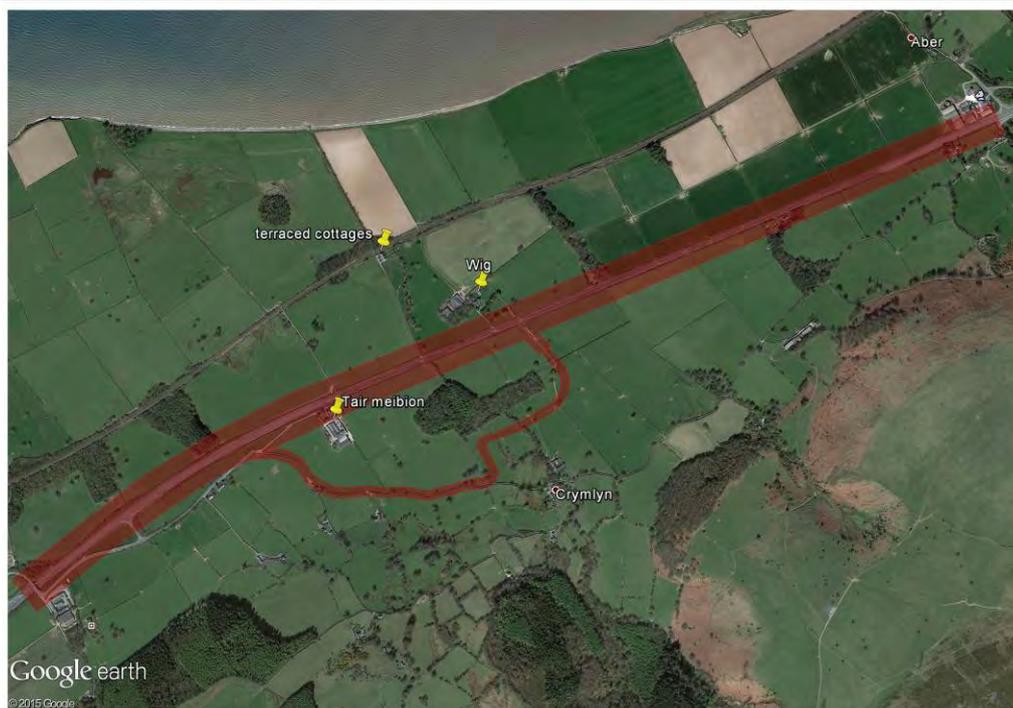
To highlight any trees which have a potential or actual use by bats and offer mitigation proposals.

To establish impacts due to breaks in existing hedgerows from either the proposed widening or farm access tracks.

To offer mitigation to negate potential impacts to recorded linear corridors identified during the surveys.

## 1.2 Survey Area

This survey area mirrors the previous transect surveys as undertaken in 2008. The survey area is as mapped in fig 1. Three transects were walked on the eastern section of the carriageway and three transects on the western section of the carriageway. The surveyors familiarised the survey route during day time hours and during the building emergence reviews.



*Fig 1- aerial view of survey area.*

Static monitoring was carried out at the two underpasses, eastern adjacent to Wig Farm and western adjacent to Tai'r Meibion Farm. Single night emergence surveys were undertaken at Wig Farm, Tai'r Meibion Farm and the terraced cottages adjacent to Wig Farm, (Wig Crossing Cottages).

The proposed new farm access track which connects from the Wig underpass to the roman road, on the southern side of the A55 has been realigned, since previous surveys. Transects were therefore undertaken along the roman road and the new track alignment to log any variations to previous surveys.

The A55 transects were aligned as close to the carriageway as safely feasible. Due to safety concerns it was necessary, to re evaluate the Health and Safety (H&S) risk whilst undertaking the surveys at night.

On assessment of the H&S risk, all transects would be undertaken on the field side of the carriageway hedgerows where feasible, those areas which could not be accessed would be walked on the carriageway verge. This requirement controlled the transect directions. *i.e.* towards the oncoming traffic flow.

The transects were split into two halves and circular routes were designed, one to the western half of the survey area and one to the eastern half eastern half of the survey area. The start point was the Wig Farm underpass, the western team walked west on the northern carriageway, crossed the Tal y bont bridge and returned to the Wig underpass east along the southern carriageway. The eastern team crossed the carriageway via the underpass and walked east along the southern carriageway, crossed the road at the Abergwyngregyn Junction and returned west along the northern carriageway to Wig.

Emergence surveys and general activity surveys were undertake at Wig Farm, Tai'r Meibion and the Wig Crossing Cottages. Previous surveys had identified a potential presence for Serotine bats in the area, it was agreed that a resurvey of these properties and areas would be undertaken to establish if this species (recently confirmed as being recorded in North Wales) had taken residence in these properties.

A day time walkover survey was undertaken to the realigned section of the farm access track from the Wig underpass to the Roman Road. The survey was to identify potential tree stock that could be used by bats and the proximity of the proposed track to the tree stock.

The Roman road surveys were a repeat of previous surveys to identify foraging activity and potential emergence from any of the mature tree stock; this was extended to cover the realigned track and the adjacent tree stock.

### 1.3 Existing Data

Previous surveys undertaken during the 2008 and the 2011 seasons by EDC had identified foraging adjacent to the road system for the following bat species:

Pipistrelle *Pipistrellus pipistrellus/pygmaeus*

Brown Long-eared *Plecotus auritus*

Myotis *Myotis sp.*

Noctule *Nyctalus noctula*

Serotine *Eptesicus serotinus*

No historic data are available for roosting bats within the survey area, however surveys have identified individual bat species within the Abergwyngregyn valley area and to the west of the survey area for Pipistrelle, Whiskered, Brandt's, Daubenton's,

Long-eared and Lesser Horseshoe. The Lesser Horseshoe bats have been recorded at Penrhyn Castle, Abergwyngregyn and Llanfairfechan.

It is also expected that the general area will support the following locally recorded species

Daubenton's *Myotis daubentonii*

Whiskered/Brandt's *Myotis mystacinus/brandtii*

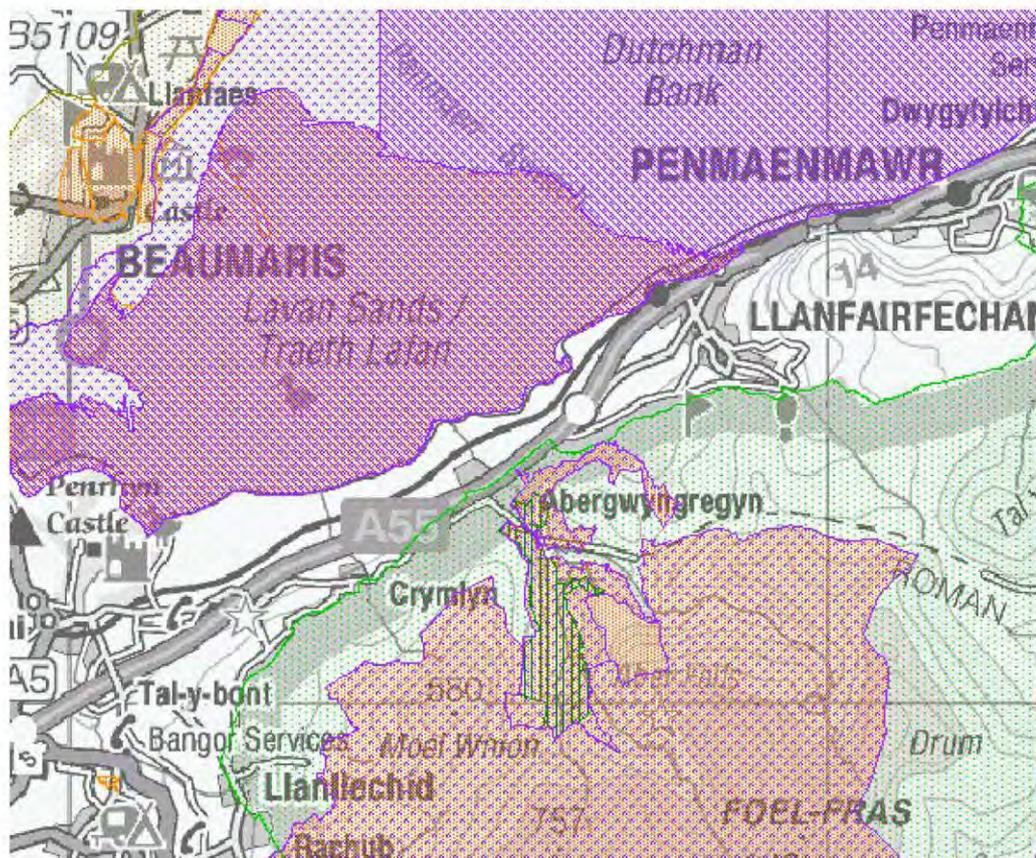
Natterer's *Myotis nattereri*

Both Serotine *Eptesicus serotinus*, and Greater Horseshoe *Rhinolophus ferrumequinum* are now recorded along the North Wales coast.

#### 1.4 Designated Protected Sites

In line with the requirements of DMRB guidance on accessing the impacts of schemes on European Natura 2000 sites, within 2km, including all SACs designated for Lesser Horseshoe Bats within 30km, the desk top survey has identified the following adjacent designated sites, however none of the sites are designated for Lesser Horseshoe bat. An extract of the site designation boundaries is included in figs 2 and 3.

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Fig 2: overview of designated sites.

Sites north of the scheme:

- SPA: Traeth Lafan / Lavan Sands
- SAC: Y Fenai a Bae Conwy / Menai Straits
- SSSI: Traeth Lafan.

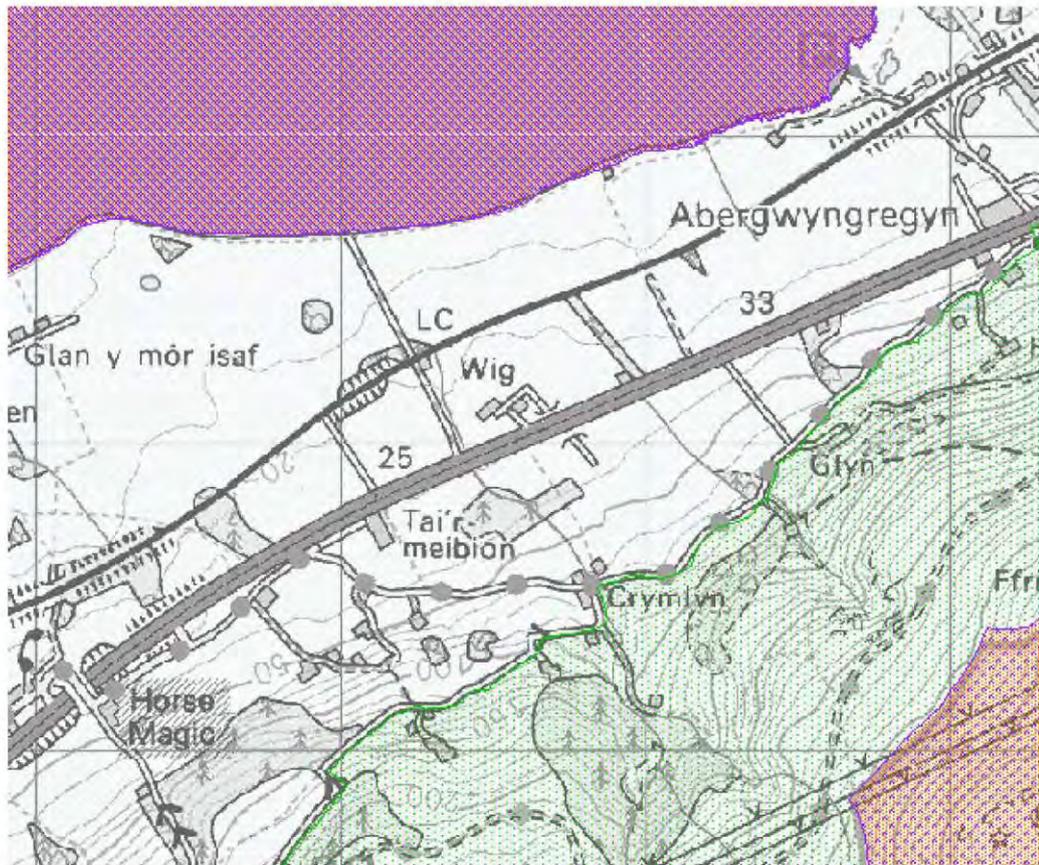
All of the above sites are coastal sites with the nearest boundary to the road works being approx. 0.63km. None of the coastal sites have bat designations however; the sites will have to be considered for other impacts of the scheme.

Sites south of the scheme:

- National Park: Snowdonia
- SSSI: Eryri / Coedydd Aber
- SAC: Eryri / Coedydd Aber
- NNR: Snowdonia

Similarly to the northern sites the nearest boundary is the Snowdonia National Park boundary, 0.08km at its nearest point at the eastern end of the scheme, the other designations being associated with the upland areas and the Abergwyngregyn valley system. None of the sites have designations for bats.

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Fig 3: proximity of designated sites.

The nearest designated sites for bats within 30 km are

SSSI: Plas Maenan

The site is designated for Lesser Horseshoe bats and consists of both winter and summer roosts. It is considered not to have any connectivity with the proposed scheme, due to the local topography. The site is located approximately 15 km away to the south east, on the other side of the Snowdonia National Park.

SAC: Gwydir Forest Mines

The site is designated for Lesser Horseshoe bats. Similarly to Plas Maenan, it is considered not to have any connectivity with the proposed scheme, due to the local topography. The site is located approximately 16 km away to the south east, on the other side of the Snowdonia National Park.

SAC: Glynllifion

The site is designated for Lesser Horseshoe bats and consists of both winter and summer roosts. It is considered not to have any connectivity with the proposed scheme due to the local topography. The site is located approximately 22 km away to the south west.

SAC: Meirionnydd Oakwoods and Bat Sites

The site is designated for Lesser Horseshoe bats. Similarly to Gwydir Forest Mines, it is considered not to have any connectivity with the proposed scheme, due to the topography. The site is located approximately 19 km away to the south, within the Snowdonia National Park.

None of the surveys to date have identified any activity with regards to Lesser Horseshoe bats. No breeding sites or hibernation sites are recorded locally; the scheme does not impact on any sites suitable for either breeding or hibernation sites for this species and does not impact on any woodland identified as primary foraging habitat for this species.

#### 1.4 **Site Description**

The habitat classifications have been identified in previous survey reports. The site descriptions are kept brief in this report and refer the reader to previous reports, 0435-report-2 (February 2007), 0435-report-4 (July 2008), that identify the habitats and site descriptions in greater detail.

*Northern Area* – a mix of improved grassland with primary use as grazing pasture and fenced off mixed species woodlands and copse. The boundaries are a mix of hedge and ditch, hedge, and post and wire fencing. The area is generally undeveloped other than farms and railway cottages.

*Southern Area* – a mix of improved grassland which rises towards the foot hills on the northern side of the Carneddau. Blocks of mixed species woodland linked by hedgerows, stream beds and stock fencing. Single carriageway lanes set within cloddiau.

*Roman Road* - The section of Roman (Henffordd) Road surveyed gently climbs from west to east and is bordered on both sides by improved grassland grazed by sheep. The road is approximately 3 metres wide and has a metalled surface though grass grows in the centre of the road suggesting it carries little traffic. The boundaries of the road are formed by a combination of stone-built banks to about 50cm in height and above these mature, managed hedgerows approximately 2 metres tall. A single narrow, shallow drain runs from the south under the road approximately midway along the survey section. Mature trees are located within the hedgerow bank from the converted chapel to the track connection point. The trees are a mix of mature Ash and Oaks.

*Farm Access Track* – This section of the survey crosses improved and semi-improved grassland. The grassland is managed by stock, a mix of cattle and sheep. The field boundaries are formed from a slate plank and wire fence. The fields' record individual stands of mature Oak trees, noted and recorded within a separate arboricultural survey. Approximately central to the route, the track crosses a stream which runs from the south to the north and into Coed Wern-porchell. The stream is tree lined, predominantly Alder.

*Eastern Underpass – Wig Farm* – The underpass is approximately 3.5 m wide by 2.5 m high and runs under the A55 from Wig farm to the southern land holdings. The underpasses are formed from reinforced concrete, with a smooth surface; no suitable features that could be potentially used by bats were identified within the underpasses at the time of survey. Both sides of the underpasses are accessed via ramps with graduated sides. This underpass has tracks that run parallel to the ramps leading to road access gates onto the trunk road. Both of the access tracks are hedge lined, and the hedges connect to the hedgerow field boundaries to the north and south.

*Western Underpass – Tai'r Meibion* – The underpass is similar in size and construction to the eastern underpass, but runs parallel to the farm yard on the southern side of the A55. During the surveys, the underpass was being used as a sheep fold, with sheep being recorded within the underpass. It can be seen from the survey results that the static detector recorded higher temperatures, resulting from the sheep. The hedgerows are similarly situated along side the underpass.

## 2.0 **METHODOLOGIES**

2.1 The following surveys, in accordance with the Bat Conservation Trust's Guidance for surveyors and were agreed with Natural Resources Wales during pre-survey scoping consultation in spring 2015.

- Activity survey transect on northern side of carriageway (x3 nights across spring, summer and autumn)
- Activity survey transect on southern side of carriageway (x3 nights across spring, summer and autumn)
- Static data loggers on cattle underpasses (x3 nights)
- Evening emergence survey of Wig farm and Wig Crossing cottages (for Serotines)

2.2 A follow up visual survey and emergence survey at Wig Farm, Wig Crossing Cottages and Tai'r Meibion farm and a walkover survey and assessment of the proposed

realignment of the access track from Wig underpass to the Roman Road were carried out, along with follow up transect surveys to the carriageway and static surveys to the existing underpasses. The surveys were designed to identify any variation to the previous surveys log and report any variations from the previous surveys.

- 2.3 The transect surveys were carried out using both heterodyne detectors and frequency division detectors. The frequency division detectors used were Anabat detectors developed by Titley Scientific. A SD1 and a SD2 detector were used linked to a GPS unit and logged on palm top computers. Both the GPS log and the frequency calls were analysed on software supplied by the manufacturer.

The Anabat detector has limitations with the range of the microphones and only records the louder signal. To attempt to balance the loss of signal Bat Box Duet detectors are used in tandem with the Anabat, however the output from these detectors is not recorded and is only used as an audible reference.

Both Noctule and Serotine display similarities in foraging, flight, size and echolocation. The Anabat analysis software does not display the full spectrum of sound recorded, and this similarity in the calls and frequency cross over can make specific individual separation of the calls difficult. Where calls cannot be clearly defined for the species the calls are logged as 'Big Bat'. Similarly the Myotis species calls are also difficult to separate into individual species, where the species cannot be specifically identified, these calls are logged as Myotis sp.

- 2.4 Anabat Express static frequency division detector/recorders were placed at each of the underpasses for the duration of the road transects to log any activity in the vicinity of the underpasses. The static recorders were set to record continuously during the period of survey and also log temperature over the recording period.

## 2.5 Variation to Transect

Due to the highways authority's concerns regarding safety, the transects have been reassessed from a health and safety aspect. Where feasible the transect routes follow the field side of the carriageway hedgerows unless access is restricted, in which case, the transects revert to the verge side of the carriageway. All transects are now arranged so as to always walk towards the oncoming traffic flow. The transects have been split similar to previous transects in an eastern section and a western section with the split line being the farm underpass at Wig farm. The transects are circular from this point. This year was seasonally dry with temperatures remaining mild into the autumn season. Previously observational surveys of the underpasses had been undertaken, these have been replaced by static monitoring using Anabat Express recorders.

The survey transects are shown on the following drawing references (see Appendix 5.2)

Fig A - 0435-Transect Routes East

Fig B - 0435-Transect Routes West

Fig C - 0435-Transect Routes Roman-Track

### 3.0 RESULTS

#### 3.1 Eastern Transect – Results

3.1.1 Date: 28/05/2015  
Sunset: 21:25  
End Civil Twilight (dusk) 22:13

Transect survey start 21:15  
Temp at Start 15.25 deg. C  
Transect Survey finish 22:52  
Temp at Finish 12.25 deg. C  
Wind (Beaufort) 0 (still)  
Wind (direction) N/A  
Cloud Cover Overcast  
Rain None

As with previous surveys little activity was recorded on the southern section of the carriageway until entering the village of Abergwyngregyn. The village itself recorded both 45 kHz and 55 kHz Pipistrelle foraging along the Roman Road. The odd Pipistrelle was recorded adjacent to Bryn Meddyg. The northern side of the carriageway as previous surveys recorded an individual Whiskered and an individual Serotine bat foraging over the fields.

3.1.2 Date: 15/07/2015  
Sunset: 21:34  
End Civil Twilight (dusk) 22:22

Transect survey start 21:20  
Temp at Start 16:00 deg. C  
Transect Survey finish 22:59  
Temp at Finish 12.75 deg. C  
Wind (Beaufort) 0 (still)  
Wind (direction) N/A  
Cloud Cover Overcast  
Rain None

Similar to May the southern carriageway did not record any bat activity until entering Abergwyngregyn. The July survey recorded more 'big bat' activity within the fields to the north of the carriageway. A single large bat thought to be Serotine was seen and recorded foraging over the fields. It was within these fields that cattle were recorded. It is known that larger bats forage on larger insect prey, Cockchafer, Large Moth and Beetle. Areas that support cattle also record large beetles.

3.1.3 Date: 10/09/2015  
Sunset: 19:42  
End Civil Twilight (dusk) 20:18

Transect survey start 19:30  
Temp at Start 20.50 deg. C  
Transect Survey finish 21:01  
Temp at Finish 17.25 deg. C

Wind (Beaufort)	0 (still)
Wind (direction)	N/A
Cloud Cover	Overcast
Rain	None

Although temperatures were holding up, little foraging activity was recorded during the transects, and involved mainly smaller bat species with most of the activity being recorded just west of Abergwyngregyn. The survey recorded an increase in *Myotis* calls, foraging along the Roman Road.

### 3.2 Western Transect – Results

3.2.1	Date:	28/05/2015
	Sunset:	21:25
	End Civil Twilight (dusk)	22:13

	Transect survey start	21:15
	Temp at Start	15.25 deg. C
	Transect Survey finish	22:52
	Temp at Finish	12.25 deg. C
	Wind (Beaufort)	0 (still)
	Wind (direction)	N/A
	Cloud Cover	Overcast
	Rain	None

Previous surveys have recorded 'big bats' foraging on the northern side of the carriageway; however this transect did not record any big bats. Only individual foraging activity was recorded for 45 kHz Pipistrelle, a single contact on the northern carriageway, along the Roman Road and adjacent to the Tai'r Meibion underpass.

3.2.2	Date:	15/07/2015
	Sunset:	21:34
	End Civil Twilight (dusk)	22:22

	Transect survey start	21:20
	Temp at Start	16.00 deg. C
	Transect Survey finish	22:59
	Temp at Finish	12.75 deg. C
	Wind (Beaufort)	0 (still)
	Wind (direction)	N/A
	Cloud Cover	Overcast
	Rain	None

Similar to May the northern side of the carriageway recorded little activity for either big or small bats. On the southern side of the carriageway, and specifically the Roman Road section from the Tal y Bont bridge back to Tai'r Meibion, both 45 and 55 kHz Pipistrelle were recorded foraging.

3.2.3	Date:	10/09/2015
	Sunset:	19:42
	End Civil Twilight (dusk)	20:18

Transect survey start	19:30
Temp at Start	20.50 deg. C
Transect Survey finish	21:01
Temp at Finish	17.25 deg. C
Wind (Beaufort)	0 (still)
Wind (direction)	N/A
Cloud Cover	Overcast
Rain	None

This transect recorded the least passes along the transect corridor, with a few passes for Pipistrelle adjacent to Tai'r Meibion.

### 3.3 Eastern Static – Wig Farm Underpass

3.3.1 Date:	28/05/2015
Sunset:	21:25
End Civil Twilight (dusk)	22:13

The static detector recorded three passes over the period, all considered being single passes. For 55 kHz Pipistrelle and Myotis species see table 1 (Appendix 5.1).

3.3.2 Date:	15/07/2015
Sunset:	21:34
End Civil Twilight (dusk)	22:22

Similar to the May survey, only three passes were recorded, two for 45 kHz Pipistrelle and a single pass by Noctule, this is assumed at a distance from the detector by the short duration of the recorded pulses, see table 2 (Appendix 5.1).

3.3.3 Date:	10/09/2015
Sunset:	19:42
End Civil Twilight (dusk)	20:18

The activity levels increased during this period, however this was not reflected in the transect surveys along the carriageways. A single pass for Lesser Horseshoe was recorded, this is the first time over all of the survey periods that this species has been recorded, see table 3 (Appendix 5.1).

### 3.4 Western Static – Tai'r Meibion Underpass

3.4.1 Date:	28/05/2015
Sunset:	21:25
End Civil Twilight (dusk)	22:13

As noted, this underpass has been used as a sheep fold. It is assumed that the increased activity within the underpass is directly related to the sheep being present. The presence did reflect in the air temperatures and this underpass retained a slightly higher ambient temperature at the end of the sampling period. Multiple passes were recorded over a period of 35 mins. for 45 kHz Pipistrelle, it is the surveyors view that this is associated to foraging, see table 4 (Appendix 5.1).

3.4.2 Date:	15/07/2015
Sunset:	21:34

End Civil Twilight (dusk) 22:22

Similar activity was recorded within this underpass as May, the majority of the activity was for single passes by 45 kHz Pipistrelle, 55 kHz and individual Myotis calls were also recorded during this period see table 5 (Appendix 5.1).

3.4.3 Date: 10/09/2015  
Sunset: 19:42  
End Civil Twilight (dusk) 20:18

As with the eastern underpass, activity assessed to be foraging activity was recorded within and around the underpass, however little activity was recorded on the road transects during this period. A single pass for Serotine was recorded, assessed to be a fly past at distance from the detector, see table 6 (Appendix 5.1).

### 3.5 Wig Farm Emergence

The previous surveys had identified foraging activity for Serotine and Noctule along the northern carriageway. It was assessed at that time that there was a potential for Serotine to roost within Wig Farm. An emergence survey was undertaken at Wig farm on the 12<sup>th</sup> August 2015. Three surveyors were positioned around the main house and one surveyor monitored the farm buildings for similar activity. All of the surveyors were in contact via portable radios to enable activity to be relayed, i.e. direction of flight etc. to the other surveyors. Several passes for Pipistrelle were recorded during the survey but no emergence from the property was identified. The Pipistrelle bats appeared from the tree line to the south of the farm.

### 3.6 Tai'r Meibion Emergence

Previous emergence surveys for this property had resulted in a negative result, however the September survey identified a small roost for 45 kHz Pipistrelle (approx. 10 individuals) from the southern gable of the property. It is assessed that the roost is a non-breeding group; this is based on this year's late breeding season.

### 3.7 Wig Crossing Cottages

Similar to the other properties previous surveys had recorded a negative emergence for the cottages. No emergence was recorded at the time of survey; however a few individual bats were seen foraging around the buildings and general area, mainly along the lane and the railway line.

### 3.8 Roman (Henffordd) Road

3.8.1 Walkover Survey – The first section of the survey along the metalled section of the road is as previously reported, the road is a single track road, lined with hedgerows. The northern hedgerow is set off a clawdd at road level, with the road level being approximately level with the northern fields. The southern hedgerow sits atop a dry stone/clawdd retaining wall to the fields beyond. The field level is approximately 1.2 to 1.5 m above road level. Both of the hedgerows are considered to be species rich and recorded individual trees along the survey length. The tree stock varies from semi-mature ash and oak to mature oaks, all of the trees recorded some potential for roosting and nesting birds.

The new farm access track has been realigned slightly, turning off the eastern section of the road and then running north across semi-improved pasture towards the woodland block before turning east, parallel with the woodland, crossing a tree lined stream, (over an existing ford) with mainly alders, and then across another semi-improved pasture, which records wax caps before turning north to connect to the Wig underpass. The fields record several mature oaks, all of which have a bat and bird potential. Similarly the alders along the stream also recorded some defects that could potentially be used by roosting bats.

- 3.8.2 Transect - As previous surveys the hedge-lined section recorded several passes for 45 and 55 kHz Pipistrelle and Whiskered bat. The activity was assessed to be foraging (from the feeding buzzes recorded) as opposed to travelling. All of the activity was below hedge top level and little activity was assessed to be on the field sides of the hedgerow. The metalled road retains heat; this with the protection of the hedgerow makes this area more favourable for smaller flying insects and moths, as opposed to the more open less protected field side of the road.

The field transects recorded Noctule flying over at high level, and Pipistrelle foraging along the stream bed and foraging around the mature oaks. Although emergence was not recorded from any of the trees, the timing of the recordings of some of the Pipistrelle would suggest that the bats had emerged close by as opposed to flying in from elsewhere to forage. As noted in the walkover survey the large oaks have potential to support roosting bats.

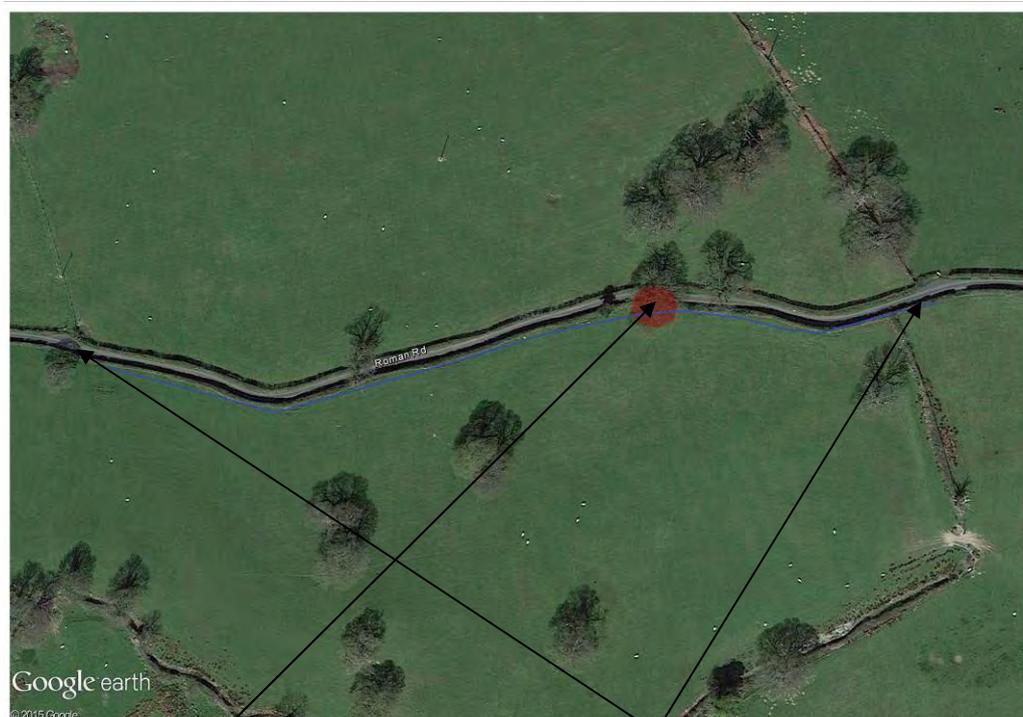
#### **4.0 RECOMMENDATIONS AND CONCLUSIONS**

- 4.1 The eastern and western carriageway transects have recorded foraging along and adjacent to the carriageway. Previous surveys did identify some over flight of the carriageway, mainly by 'big bat' species and some Pipistrelle, this however was not recorded during this seasons surveys, other than high level flight by individual 'big bats' flying to foraging grounds. As previously identified hedgerows generally are considered to be of ecological value for many species. The hedgerows offer wind protection for smaller flying insects and moths, which tend to favour the protected or sheltered sides of the hedgerows, this can be reflected in the foraging behaviour of the smaller bat species. Some species will forage over grassland and pasture, notably Whiskered, Serotine and Noctule. Any net loss of hedgerow is to be mitigated as part of the proposed schemes
- 4.2 The introduction of the new access tracks particularly to the northern side of carriageway would benefit from twin hedging, i.e. either side of the track, where feasible. This approach will offer sheltered foraging corridors and would be considered as a conservation gain to the scheme.
- 4.3 It is recommended that the existing hedgerows are either translocated with supplementary planting within the gaps, or where this is not feasible, replacement hedgerows are planted, preferably prior to the removal of the existing hedgerows, again where feasible. If planting cannot be undertaken before the completion of the road works then artificial hedging should be provided for connectivity and the hedgerows replanted with the largest viable stock on completion of the works.
- 4.4 Similar to previous surveys the numbers of bats recorded foraging along the carriageway during the transects was considered to be low, and no bats were recorded crossing the trunk road during the surveys, other than at high level. It is therefore the surveyors view that the proposed widening of the paved surface by

approximately 2m overall will have no considerable impact on the present flight behaviour for the bat species recorded and therefore the impact on the favourable conservation status of bats migrating across the road in this way is considered to be negligible.

- 4.5 The static surveys at the underpasses did record reasonable levels of activity in and around the underpasses. As the surveys were static no visual records of activity are available, so therefore the assessment of the type of activity recorded by the detectors is subjective. However it can be assumed that the probability for the smaller bats using the underpasses to cross the road is likely. It was found that the existing concrete construction offers no potential for roosting by bats due to its smooth composition. The effect of extending of the underpasses is therefore considered to be negligible on the favourable conservation status of this species.
- 4.6 The last survey of the eastern underpass recorded a single pass for Lesser Horseshoe bat. Due to the position and direction of the detector microphone, and the directional echolocation of Lesser Horseshoe bats, this would suggest that the bat was transecting the highway via the underpass. It is well recorded that if canopy cover is not available for this species they revert to flying adjacent to linear features at very low levels down to 600 mm above the ground. The timing of the record is relative to seasonal behaviour and would suggest a migratory behaviour between roosts following the end of the breeding season. This species is recorded at Abergwyngregyn to the south-east and Penrhyn Castle to the north-west, the underpass is approximately central between these two sites. It has therefore been advised that static detectors are deployed within the underpasses to record through to the end of October to attempt to log any further post breeding season transitional movement.
- 4.7 If it is found that other passes are recorded it would suggest that the underpasses are being used as access points between sites. It is therefore imperative that at all times during the construction works the underpasses are not blocked or altered in such a way that would deter the bats from using the underpasses and force a flight path across the carriageway. Similarly if any existing hedgerows, fence line, linear feature etc. are removed for construction purposes, then at the end of each work day or before sunset, whichever is the sooner a temporary substitute fence/barrier is to be placed along the original lines, this is to ensure that these flight corridors are maintained throughout the project. It is recommended that this practice continues through the winter months as bats have been recorded moving sites during warm spells.
- 4.8 Noctule/Serotine have been recorded foraging over the grassland during all of the surveys. The surveys have not identified any impact by the proposed scheme on any trees or structures that are considered suitable to support roosts for these species. Noctule are considered to be a locally transient species utilising several tree roost sites over the season. It is considered that the proposed works will have a negligible impact on the favourable conservation status for these species.
- 4.9 The proposed widening of the Roman Road to gain access to the proposed Wig underpass track will impact on the hedgerows. The widening will result in the loss of one of the hedgerows. It is the surveyors understanding that the proposals favour the widening on the northern side of the road. The latest transects recorded foraging activity for three species of bat along the road. It has been found that smaller prey species, particularly weak fliers are to be found on the leeward side of hedgerows in adverse conditions. It is considered that if the entire northern

hedgerow is removed this will open up the road structure considerably and that the retained latent heat within the road structure will be lost more quickly. It is recommended that the top eastern section of the road which recorded most activity has the southern hedgerow removed. Even when the hedge has been removed the field embankment will protect the road to a degree reducing the impact. The suggested cut off point from north to south hedgerow is noted on Fig 4.



Trees to be lost

section of hedge to be lost

*Fig 4: Suggested length of hedgerow to be removed, southern side.*

- 4.10 The proposed alignment of the widening of the Roman Road would seem to result in the loss of two mature Oaks, if the scheme adopts the recommendation in item 4.10 this would result in the loss of a single oak tree.
- 4.11 All of the trees recorded along the Roman Road and adjacent to the proposed track recorded a potential for use by bats, it is therefore recommended that the track is aligned so as not to impact on these mature trees as far as possible.
- 4.12 Where the proposed track crosses the stream, it is recommended that the track is aligned to use the existing fording point, as some of the tree stock along the stream offers a potential for roosting bats.
- 4.13 Prior to any trees being removed or managed a full survey of all the defects to the trees are to be undertaken by the use of an endoscope. Emergence surveys cannot fully assess presence or absence.
- 4.14 All trees along or adjacent to the proposed new road or track alignments or within the construction zone should receive full tree protection, (BS 5837) this is to ensure machinery does not damage any sections of low lying canopy that may record roosts.

- 4.15 The loss of any trees that record a presence or potential for use by bats should be fully mitigated by installing suitably approved tree bat boxes, and the replanting of stock.
- 4.16 The loss of hedgerows particularly to the Roman Road and the connecting hedgerows to the underpasses should be replaced with the largest hedge stock available at replanting. It is recommended that a minimum planting rate of 7 plants per metre run.
- 4.17 The previous surveys identified a possible presence for Serotine, it can be confirmed that this species has been identified in North Wales along with a recorded breeding roost in the last few years. Genetic analysis has confirmed that the North Wales bats are a specific gene strain within its range and that Serotine has been present historically.
- 4.18 The previous records for 'Big Bat' had been recorded to the north of the northern carriageway predominantly. It was previously advised that further works be undertaken to attempt to confirm Serotine presence within the survey area and undertake follow up emergence surveys to confirm presence/non-presence within buildings being identified as potential roosts. The sonograms would suggest that Serotine are present within the area. However the results of the emergence surveys were negative at the time of survey.

**E.D.C.**

October 2015

## **5.0 APPENDIXES**

- 5.1 Static Detector Survey Results
- 5.2 Transect Areas – Fig A, B, and C
- 5.3 Logged recordings on Aerial Plan – East, West and Roman Road
- 5.4 Aerial Photographs of East and West Underpasses

## **5.1 Static Detector Survey Results**

Anabat Express 4		Underpass east		Table 1	
date	28 May 2015				
time start	21:29	temp start	15.25c		
time finish	23:00	temp finish	11.75c		
Position	Time from to		Species	Passes	Notes
Underpass east	22:23	22:24	Ps	1	single pass
	22:24	22:25	My	1	single pass
	22:25	22:26	Ps	1	single pass

Anabat Express 4		Underpass east		Table 2	
date	15 July 2015				
time start	21:41	temp start	16.00c		
time finish	22:48	temp finish	12.75c		
Position	Time from to		Species	Passes	Notes
Underpass east	21:58	21:59	Pp	1	single pass
	22:21	22:22	Pp	1	single pass
	22:56	22:57	Nn	1	single pass, at altitude

Anabat Express 4		Underpass east		Table 3	
date	10 Sept 2015				
time start	19:35	temp start	20.50c		
time finish	21:05	temp finish	17.25c		
Position	Time from to		Species	Passes	Notes
Underpass east	20:14	20:15	Ps	1	single pass
	20:19	20:20	Nn	1	single pass
	20:42	20:43	My	1	single pass
	20:47	20:48	Rh	1	single pass
	20:48	20:49	Ps,My	1	single pass
	20:53	20:54	BB	1	single pass, at hight
	20:54	20:55	Nn	1	single pass, at hight
	21:01	21:02	Pp	1	single pass
	21:03	21:04	Pp	1	single pass

Anabat Express 3		Underpass west			Table 4
date	28 May 2015				
time start	21:44	temp start	15.25c		
time finish	22:30	temp finish	12.25c		
Position	Time from to		Species	Passes	Notes
Underpass west	21:54	22:30	Pp	multiple	foraging in underpass

Anabat Express 3		Underpass west			Table 5
date	15 July 2015				
time start	21:36	temp start	16.50c		
time finish	23:14	temp finish	14.75c		
Position	Time from to		Species	Passes	Notes
Underpass west	22:11	22:12	Ps	1	single pass
	22:18	22:19	Pp	3	multiple
	22:23	22:24	Pp	1	single pass
	22:27	22:28	Pp	1	single pass
	22:28	22:29	Pp	1	single pass
	22:29	22:30	Pp	1	single pass
	22:33	22:34	Pp	2	multiple
	22:34	22:35	Pp	3	multiple
	22:35	22:36	Pp	1	single pass
	22:37	22:38	Pp	1	single pass
	22:46	22:47	Pp	1	single pass
	22:47	22:48	Pp	3	multiple
	22:48	22:49	Pp	2	multiple
	22:49	22:50	Pp	4	multiple
	22:50	22:51	Pp	1	single pass
	22:51	22:52	Pp	1	single pass
	22:52	22:53	Pp	4	multiple
	22:53	22:54	Pp	2	multiple
	22:54	22:55	Ps	2	multiple
	22:55	22:56	Ps	9	multiple
	22:56	22:57	Ps	6	multiple
	22:57	22:58	My/Pp	6/1	multiple
	22:58	22:59	Ps	3	multiple
	22:59	23:00	Ps	3	multiple
	23:06	23:07	Pp	1	single pass
	23:09	23:10	My	1	single pass

Anabat Express 3		Underpass west		Table 6	
date	10 Sept 2015				
time start	19:34	temp start	20.75c		
time finish	21:04	temp finish	22.25c		
Position	Time from to		Species	Passes	Notes
Underpass west	20:04	20:05	Ps	1	single pass
	20:06	20:07	Ps	1	single pass
	20:17	20:18	Pp	1	single pass
	20:20	20:21	Es	1	single pass
	20:22	20:23	Pp	1	single pass
	20:23	20:24	Ps	1	single pass
	20:26	20:27	Pp	1	single pass
	20:28	20:29	Pp	1	single pass
	20:32	20:33	My	1	single pass
	20:33	20:34	Pp	1	single pass
	20:35	20:36	Pp	1	single pass
	20:39	20:40	My	1	single pass
	20:45	20:46	Ps	1	single pass
	20:46	20:47	My	1	single pass
	21:01	21:02	Pp	1	single pass

Anabat Express		Fair Meibion			
date	09 Sept 2015				
time start	19:46	temp start	19:25		
time finish	20:47	temp finish	16:25		
Position	Time from to		Species	Passes	Notes
Fair Meibion	19:54	20:23	Pp	multiple	emergence, none breeding
	20:48	20:49	Ps	1	single
	20:52	20:53	My	1	single
	20:57	20:08	Pp	1	single

Anabat Express		Wig Crossing Cottages			
date	09 Sept 2015				
time start	19:53	temp start	19:00		
time finish	20:48	temp finish	18:50		
Position	Time from to		Species	Passes	Notes
Wig Cottages	20:25	20:26	Ps	2	multiple
	20:26	20:27	Ps	3	multiple
	20:26	20:28	Pp	8	multiple
	20:28	20:37	Pp,Ps	multiple	multiple - no emergence
	20:38	20:41	Pp	9	multiple
	20:42	20:46	Pp,Ps	7	multiple
	20:51	20:53	Ps,My	multiple	multiple
	20:53	20:54	Ps	1	single
	20:58	20:59	My	1	single

Anabat Express		Wig			
date	12 Aug 2015				
time start	20:56	temp start	20:75		
time finish	21:41	temp finish	14:75		
Position	Time from to		Species	Passes	Notes
Wig	21:07	21:09	Nn	1	single
	21:10	21:11	Pp	3	multiple
	21:27	21:28	Ps	1	single
	21:36	20:37	Pp	2	multiple

## KEY

Pp	<i>Pipistrellus pipistrellus</i>
Ps	<i>Pipistrellus pygmaeus</i>
My	<i>Myotis sp.</i>
Nm	<i>Nyctalus noctula</i>
Es	<i>Eptesicus serotinus</i>
Rh	<i>Rhinolophus hipposideros</i>
BB	Big Bat (Serotine, Noctule, Leisler's)

## 5.2 Transect Areas – Fig A, B, and C



A55 (T) Road Improvement - Eastern Transect --- Transect Route

A55 (T) Road Improvement - Tai'r Meibion to Aber

Fig A



A55 (T) Road Improvement - Western Transect — — — Transect Route



A55 (T) Road Improvement - Roman Road/Access Track - - - Transect Route

### **5.3 Logged recordings on Aerial Plan – East, West and Roman Road**



Aber

Ps-Sept15

Pp-Sept15

Es-May15

Mm-Sept15 Pp,Ps-May 15

Pp,Ps-Sept15

Pp,Ps,Mn-July15

Mm-May15

Ps-May 15

Es,Mm-July15

Es-July15

Ps-July15

Pp-May15

Wig

Ps-July15

Ps-May15



terraced cottages

Wig

Ps-July15

Ps-May15

Nn-July15

Ps-July15

Pp-July15

Mm-July15

Ps-July15

Pp-May15  
Pp-July15

Pp-July15

Pp-July15

Ps-July15

Tair meibion

Pp,Ps-July15

Pp-May15

Pp-July15

Pp-May15

Pp-July15

Crymlyn



Tair meibion

Pp-Sept15  
Ps-Sept15  
Pp-Sept15  
Ps-Sept15

Pp-Sept15  
Pp-Sept15  
Ps-Sept15

Nn-Sept15

Ps-Sept15

Pp-Sept15  
Mm-Sept15  
Mm-Sept15  
Mm-Sept15  
Mm-Sept15

Ps-Sept15  
Pp,Ps-Sept15  
Ps-Sept15  
Pp-Sept15  
Ps-Sept15  
Mn-Sept15

## 5.4 Aerial Photographs of East and West Underpasses





## Bat Surveys, Land Adjacent to A55, Talybont to Aber.

**Site:** A55  
Abergwyngregyn  
Gwynedd

**Client:** Environment Directorate  
Gwynedd Consultancy  
Council Offices  
Shire Hall Street  
Caernarfon  
LL55 1SH

**Ref:** 0435 – report/6-11-v2

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### 1.0 **INTRODUCTION**

#### 1.1 **Summary**

Several habitat and species surveys have been undertaken in relation to the proposed A55 road widening scheme over several years, the object of this survey report is to update the survey information in relationship to current survey guidance and requirements and to review the recommendations based on the new survey data.

#### 1.2 **Aim**

To undertake a desk top in line with DMRB guidance for assessing the impacts of schemes on European Natura 2000 sites, to include all SACs designated for LH Bats within 30km of a scheme and to produce a report accordingly and to offer mitigation to negate any impacts identified.

To undertake day time check surveys based on previous assessment of adjacent properties to the scheme to log any variations.

- To undertake transect surveys; aim of the survey is to establish activity levels adjacent to the northern and southern side of the proposed widening scheme. Using standard transect methodology, static monitoring and emergence surveys of identified roosts, log activity using frequency division detectors and recording devices to enable sonograph analysis.

- To highlight species foraging distribution and attempt to record any emergence activity from roosts that align the carriageway.
- To identify any specific crossing points used by bats, with specific attention to the existing underpasses that may require to be widened.
- To assess impact on any recorded activity at the existing underpasses and offer solutions to negate any impacts that are highlighted
- To highlight any trees which have a potential or actual use by bats and offer mitigation proposals.
- To establish impacts due to breaks in existing hedgerows from either the proposed widening and farm access tracks.
- To offer mitigation to negate potential impacts to recorded linear corridors identified during the surveys.

## 1.2 Survey Area

This survey mirrors the previous transect surveys as undertaken previously, the survey area is as mapped in fig 1. Two transects were walked on the northern side of the carriageway and two transects on the southern carriageway. The surveyors familiarised the survey route during day time hours and during the building assessment reviews.



*Fig 1- aerial view of transect area.*

The transects intersected with areas of habitat that offered the greater foraging potential for bats, and intersect flight corridors from potential roost sites.

Limitations to the chosen routes being the Health and Safety of the operative working adjacent to an active carriage way at night.

### 1.3 Existing Data

Previous surveys undertaken during the 2008 season by EDC had identified foraging adjacent to the road system for the following species:-

Pipistrelle *Pipistrellus pipistrellus/pygmaeus*  
Brown Long-eared *Plecotus auritus*  
Myotis *Myotis sp.*  
Noctule *Nyctalus noctula*

Recent emergence surveys at Wig Bach by Green Man Ecology, April 2011, have recorded calls highly suggestive of the species Serotine *Eptesicus serotinus*

No historic data is available for roosting bats within the survey area, however surveys have identified individual bat species within the Aber valley area and to the west of the survey for Pipistrelle, Daubenton's, Long-eared and Lesser Horseshoe.

It also expected that the general area will support the following locally recorded species:-

Daubenton's *Myotis daubentonii*  
Whiskered/Brandt's *Myotis mystacinus/brandtii*  
Natterer's *Myotis nattereri*

Both Serotine *Eptesicus serotinus*, Greater Horseshoe *Rhinolophus ferrumequinum* are now recorded along the North Wales coast.

### 1.4 Designated Protected Sites

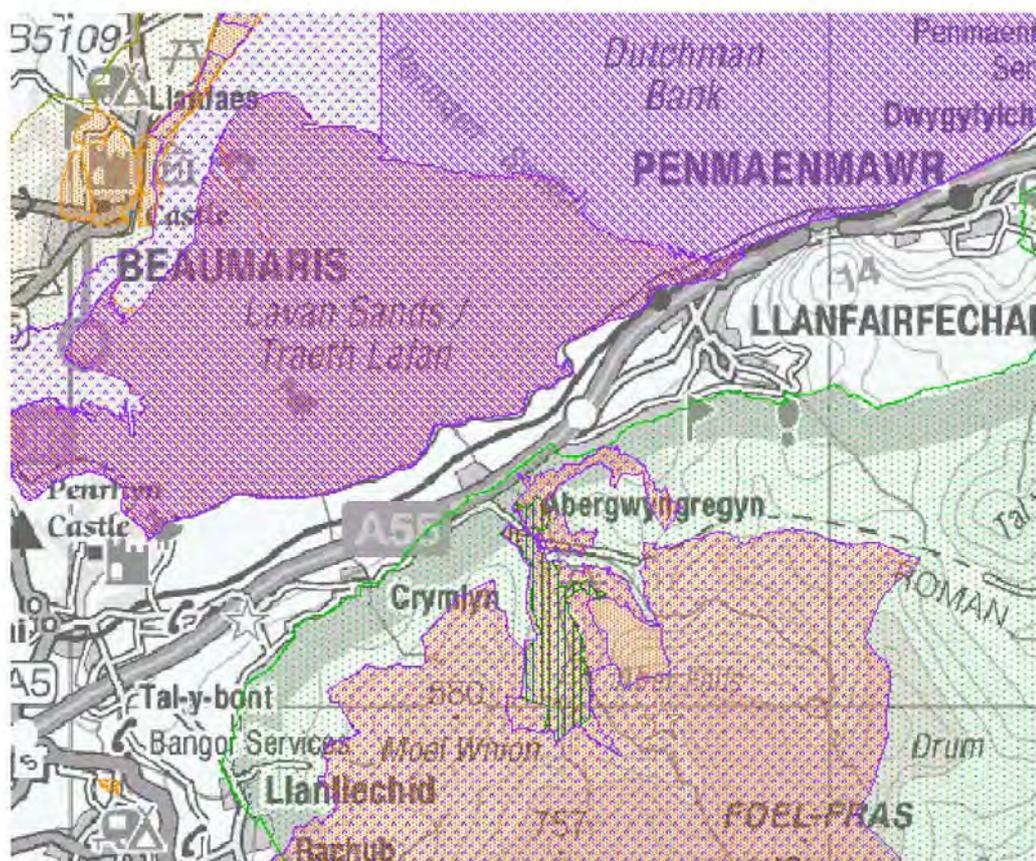
In line with the requirements of DMRB guidance on accessing the impacts of schemes on European Natura 2000 sites, including all SACs designated for LH Bats within 30km, the following desk top survey has identified the following adjacent designated sites, however none of the sites are designated for Lesser Horseshoe bat. An extract of the site designation boundaries is included in figs 2 and 3.

Sites north of the scheme:

SPA: Traeth Lafan / Lavan Sands  
SAC: Y Fenai a Brae Conwy / Menai Straits  
SSSI: Traeth Lafan.

All of the above sites are coastal sites with the nearest boundary to the road works being approx. 0.63km. None of the coastal sites have bat designations however; the sites will have to be considered for other impacts of the scheme.

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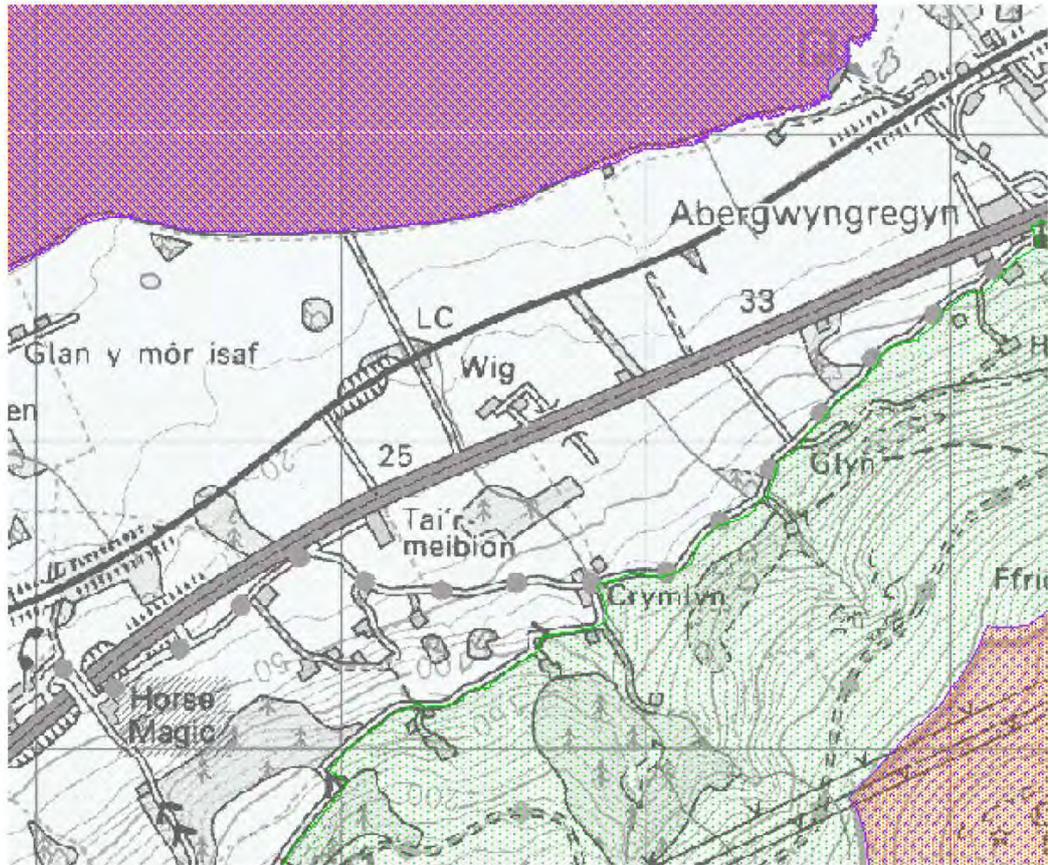
*Fig 2: overview of designated sites.*

Sites south of the scheme:

National Park:	Snowdonia
SSSI:	Eryri / Coedydd Aber
SAC:	Eryri / Snowdonia / Coedydd Aber
NNR:	Snowdonia

Similarly to the northern sites the nearest boundary is the Park boundary, 0.08km at its nearest point at the eastern end of the carriageway, the other designations being associated with the upland areas and the Aber valley system. None of the sites have designations for bats.

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*Fig 3: proximity of designated sites.*

The nearest designated site for bats within 30 km are,

SSSI: Plas Maenan

The site is designated for Lesser Horseshoe bats and consists of both winter and summer roosts. It is considered not to have any connectivity with the proposed scheme, due to the local topography. The site is located approximately 15 km away to the south east, on the other side of the Snowdonia National Park.

SAC: Gwydir Forest Mines

The site is designated for Lesser Horseshoe bats. Similarly to Plas Maenan, it is considered not to have any connectivity with the proposed scheme, due to the local topography. The site is located approximately 16 km away to the south east, on the other side of the Snowdonia National Park.

SAC: Glynllifion

The site is designated for Lesser Horseshoe bats and consists of both winter and summer roosts. It is considered not to have any connectivity

with the proposed scheme; due to the local topography. The site is located approximately 22 km away to the south west.

SAC: Meirionnydd Oakwoods and Bat Sites

The site is designated for Lesser Horseshoe bats. Similarly to Gwydir Forest Mines, it is considered not to have any connectivity with the proposed scheme, due to the topography. The site is located approximately 19 km away to the south, on the other side of the Snowdonia National Park.

None of the surveys to date have identified any activity with regards to Lesser Horseshoe bats. No breeding sites or hibernation sites are recorded locally; the scheme does not impact on any sites suitable for either breeding or hibernation sites for this species and does not impact on any woodland identified as primary foraging habitat for this species.

#### 1.4 **Site Description**

The habitat classifications have been identified in previous survey reports. The site descriptions are kept brief in this report and refer the reader to previous reports that identify the habitats and site description in greater detail.

*Northern Area* – a mix of improved grassland with primary use as grazing pasture and fenced of mixed species woodlands and copse. The boundaries are a mix of hedge and ditch, hedge, and post and wire fencing. The area is generally undeveloped other than farms and railway cottages.

*Southern Area* – a mix of improved grassland which rises towards the foot hills on the northern side of the Carneddau. Blocks of mixed species woodland linked by hedgerows, stream beds and stock fencing. Single carriageway lanes set within hedged clawdd road side embankments.

### 2.0 **METHODOLOGIES**

2.1 A follow up visual survey of previously identified buildings adjacent to the road scheme to establish any variation, and to assess any change that may be impacted by the proposed widening of the main carriageway; the introduction and realignment of access tracks and roads to the land and property either side of the carriageway. To undertake static surveys to log emergence behaviour to highlighted areas, to undertake linear transect surveys to identify foraging grounds and linear corridors.

2.2 The surveys were carried out using both heterodyne detectors and frequency division detectors. The frequency division detectors used were Anabat detectors developed by Titley Scientific. A SD1 and a SD2 detector were used linked to both a GPS unit and logged on palm top computers. Both the GPS log and the frequency calls were analysed on software supplied by the manufacturer.

The Anabat detector has limitations with the range of the microphones and only records the louder signal, to attempt to balance the loss of signal Bat Box Duet detectors are used in tandem with the Anabat, however the output from these detectors are not recorded and is only used as an audible reference.

Both Noctules and Serotines display similarities in foraging, flight, size and echolocation. The Anabat analysis software does not display the full spectrum of sound recorded, this with similarity in the calls and frequency cross over can make specific individual separation of the calls difficult.

### 3.0 **RESULTS**

#### 3.1 **Northern Transect**

This survey transect ran between the road crossing at Tal y Bont to the Agricultural college at Aber. The walk over survey did not identify any trees which offered potential for roosting bats. The fields to the northern section of the survey area are predominantly managed as grazing pasture. The fields average approximately 5 Ha in area and are enclosed by a modern hedge and stock fence to the verge of the A55, which was planted at its introduction. The fields and woodland blocks have linear boundaries running north which are a mix of hedgerow and stock fence, these features link to the main railway line embankment, the railway line runs parallel to the A 55.

#### 3.2 **Southern Transect**

This survey transect runs up the lane to the south of Tai'r Meibion, before running back north towards the A55. The transect then runs alongside the A 55 (T) towards Aber. The habitats are similar to those found on the northern side of the A 55 (T) the fields vary in size, with the fields nearer to Aber being slightly smaller. The field boundaries vary between hedgerows and stock fencing. The area is generally semi-improved grazing pasture with blocks of woodland.

#### 3.3 **Variation to Transect**

The previous transect lines were followed, however the transects were changed, in that they were split into east and west surveys. The split point was the underpass adjacent to Wig farm. One survey team followed the southern survey line and the second survey team followed the northern survey line way, both teams met at the Wig farm underpass, changed sides and reversed the transects. This methodology was used for both the western and eastern section. The timing of the transects was also changed to later in the season, as both adult and this years juvenile bats should be identified hopefully increasing the sample size and logging any variation to flight path due to season. This year's season has been exceptionally dry with temperatures remaining mild into the autumn season.

#### 3.4 **Transects**

##### ***East Transect***

Date:	08/09/2011
Sunset:	19.47
End Civil Twilight (dusk)	20.23
Transect survey start	18.57
Wind (Beaufort)	0 (still)
Wind (direction)	N/A
Cloud Cover	Overcast

Rain

None

Most of the activity recorded was along the northern carriageway, the early recordings were for 45kHz Pipistrelle along the hedgerow between the Agricultural College and Bryn Meddyg Cottages. A single recording for Long-eared was logged opposite Bryn Meddyg Cottages.

From Bryn Meddyg Cottages the calls increased for Noctule, these were both seen and recorded, several bats were also seen foraging over the carriageway, this is quite common for this species.

As the surveys approached Wig a single emergence was recorded for Wig Bach, for Pipistrelle 55 KHz.

Following secondary consultations with other bat experts it has been confirmed that some of the calls logged support the possibility of the species Serotine being resident in the locality of Wig farm. Previous surveys have also identified possible Anabat records for this species. Based on the timings of the recordings, it is suspected at this stage that the buildings at Wig farm are most likely to support a small roost for this species. The expected roost size for this species is normally between 15 to 30 individuals. The bat is a crevice dweller favouring buildings with steep gables.

The return transects recorded a decline in recordings the further east the surveyors travelled and disappeared well before Bryn Meddyg Cottages. The transect recordings are logged on a Google Earth Overlay plan attached to this report.

### ***Underpass***

As previous surveys, the underpass recorded a negative on all transects for fly through behaviour. The surveys did however record 45 kHz Pipistrelle foraging on both sides of the carriageway.

### ***West Transect***

Date:	09/09/2011
Sunset:	19.45
End Civil Twilight (dusk)	20.20
Transect survey start	19:10
Wind (Beaufort)	0 (still)
Wind (direction)	N/A
Cloud Cover	Overcast
Rain	None

Similar to the eastern survey the northern side of the carriage way recorded the greater sample size. The early recordings unfortunately were not logged by the Anabat software and therefore do not appear on the transect map.

The first sightings were for Noctule approximately 360 m east of the road bridge, the bats were seen foraging over the grassland with very low dives below the hedgerow height. The sightings and soundings increased the nearer the surveyors got to Wig farm.

As per the previous survey, some of the calls logged support the possibility of the species Serotine being resident in the locality of Wig. The timings coincided approximately with the previous evening.

The return transect recorded some soundings for possible Serotine opposite Wig farm but before Tai'r Meibion. No other soundings were recorded on the return transects.

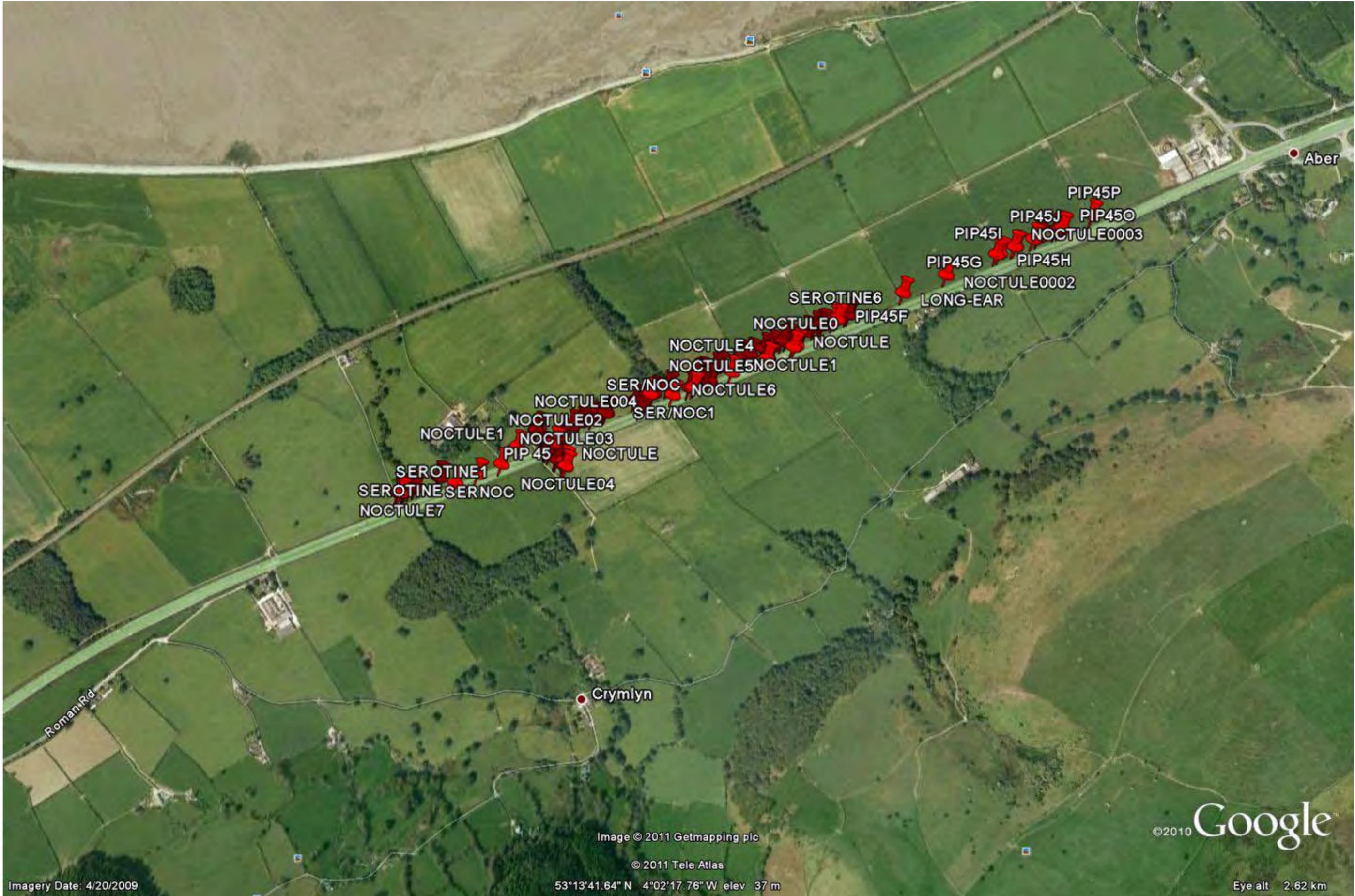
#### **4.0 RECCOMENDATIONS AND CONCLUSIONS**

- 4.1 All of the surveys to date have recorded bats foraging along the hedgerows on both sides of the carriageways, predominantly Pipistrelle, but both Myotis and Long-eared species have been logged. Hedgerows generally are considered to be of ecological value for many species and it is imperative that any impacts to the existing hedgerows must be mitigated for to ensure no direct impact on the favourable conservation status for this species.
- 4.2 It is recommended that alternative hedgerows are planted, preferably prior to the removal of the existing hedgerows were feasible, if not artificial hedging should be provided for connectivity and the hedgerows replanted with the largest viable stock on completion of the works.
- 4.3 The numbers of Pipistrelle, Myotis and Long-eared bats recorded foraging along the carriage way during the transects undertaken is considered to be low, and only a single bat has been observed crossing the existing road. The proposals for widening the carriage way by approximately 2m overall will have no considerable impact on the present flight behaviour for these bat species recorded and therefore the impact of the favourable conservation status of bats migrating across the road in this away is considered to negligible.
- 4.4 The surveys undertaken at the underpasses record a negative use, the existing concrete construction offers no potential for roosting by bats due to its smooth composition. The extending of the underpasses is therefore considered to be negligible on the favourable conservation status of this species.
- 4.5 It is considered that the extended sections of the underpass sections could be improved to favour use by bats by following the guidance with regards to forming roost sites in bridge and underpass structures, thus offering a conservation benefit, in line with biodiversity action plans.
- 4.6 Noctules have been recorded foraging over the grassland during all of the surveys. The surveys have not identified any impact by the road scheme on any trees that are considered suitable to support a roost site for this species. Noctules are considered to be a locally transient species utilising several tree roost sites over the season. It is considered that the proposed works will have a negligible impact on the favourable conservation status for this species.
- 4.7 It is not known at this stage that the recent records for Serotine along the North Wales coast is due to previous miss interpretation of bat detector calls, the more sophisticated equipment now being used or that this species has extended its range north in the last few years due to climate warming.
- 4.8 At present only a single individual has been sighted within a hibernation site in the St Asaph area and some DNA sampling of droppings in Llandulas area

has confirmed presence. The calls recorded to date are highly suggestive and most of the calls recorded are a combination of the species Noctule and Serotine. The records suggest a presence throughout the summer season, April through June to September.

- 4.9 The Serotine recordings seem at this stage to be centred on Wig farm. Little is known about the roost structure for this bat species, which seems to vary and often co inhabit roosts with Noctules, however these roosts have been found in buildings. It is therefore recommended that further survey work is undertaken next season to attempt to identify the roost site for this species to enable a full assessment of impact to be undertaken.

**E.D.C.**  
September 2011



SEROTINE1  
SEROTINE SERNOC  
NOCTULE7

NOCTULE1  
NOCTULE03  
PIP 45  
NOCTULE

NOCTULE004  
NOCTULE02  
SER/NOC  
SER/NOC1

SER/NOC  
NOCTULE6

NOCTULE4  
NOCTULE5  
NOCTULE1

SEROTINE6  
NOCTULE0  
PIP45F

PIP45G  
PIP45H  
NOCTULE0002  
LONG-EAR

PIP45I  
PIP45J  
PIP45O  
NOCTULE0003

PIP45P

Crymlyn

Roman Rd

Aber

Image © 2011 Getmapping plc

© 2011 Tele Atlas

53°13'41.64" N 4°02'17.76" W elev 37 m

©2010 Google

Eye alt 2.62 km

Imagery Date: 4/20/2009



The Cottage  
Bodrhuddan Hall  
Rhuddlan  
Denbighshire  
LL18 5SB

**BAT ACTIVITY SURVEY**

**BREEDING BIRD SURVEY**

**A55: Abergwyngregyn to Tai'r Meibion  
GWYNEDD**

ecological  
design  
consultants

## AIM

### **Bat**

The aim of the survey is to establish activity levels adjacent to the northern and southern side of the proposed widening scheme. Using standard transect methodology, static monitoring and emergence surveys of identified roosts, log activity using frequency division detectors and recording devices to enable sonograph analysis.

- To highlight species foraging distribution and attempt to record any emergence activity from roosts that align the carriageway.
- To identify any specific crossing points used by bats, with specific attention to the existing underpasses that may require to be widened.
- To assess impact on any recorded activity at the existing underpasses and offer solutions to negate any impacts that are highlighted
- To highlight any trees which have a potential or actual use by bats and offer mitigation proposals.
- To establish impacts due to breaks in existing hedgerows from either the proposed widening and farm access tracks.
- To offer mitigation to negate potential impacts to recorded linear corridors identified during the surveys.

### **Bird**

The aim of the survey is to establish the presence of nesting bird activity to the northern and southern side of the carriageway, including the proposed access tracks. To set two linear transects to either side of the carriageway as set out in the BTO/JNCC/RSPB breeding bird survey methodologies.

- To identify and record where feasible active nest sites, with specific attention to any areas which will be disturbed during the proposed works
- To establish likely times where any recorded site will be free from activity and advise accordingly
- To undertake a secondary set of transects at a minimum period of two weeks to log any activity not recorded on the first transect due to birds incubating egg
- To identify species of local and national concern
- To offer proposals to reduce impact or mitigate for loss of important nesting sites that may be impacted upon during the proposed works.

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- 1.2 Existing Data
- 1.3 Survey Areas
- 1.4 Legal Protection

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**3.0 RESULTS**

**4.0 RECOMMENDATIONS**

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- APPENDIX 3: BBS Field Data
- APPENDIX 4: Tables

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- 6.1 Site
- 6.2 Existing Data
- 6.3 Survey Areas
- 6.4 Legal Protection

**7.0 METHODOLOGIES**

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**BREEDING BIRD SURVEY ..... Section 1**

## 1.0 INTRODUCTION

Gwynedd County Council commissioned a breeding bird survey (BBS) of land either side of the A55 between Abergwyngregyn and Tai'r Meibion. Richard Castell BSc who has over 30 years field experience studying the breeding ecology of European birds conducted the survey assisted by Lawrence Hunter. The survey aimed to identify and record the bird species present during the peak-breeding season and, where possible, confirm breeding and identify key areas of bird activity.

### 1.1 Site

Pastoral agriculture dominates the land either side of this stretch of the A55. Mixed species hedgerows form the majority of the field boundaries and there are several pockets of mature mixed species woodland. Four narrow streams run from south to north across the survey area. Three farmyards and three domestic dwellings lie close to the transect lines.

### 1.2 Existing Data

Nesting birds are recorded but no detailed BBS data are available.

### 1.3 Survey Areas

The survey was conducted along the transect lines marked on the site plan included in Appendix 1. The survey area included land 250m either side of these transects.

### 1.4 Legal Protection

All wild birds, their nests and their eggs are protected by the Wildlife & Countryside Act 1981. It is an offence (with certain exceptions), to intentionally kill, injure or take any wild bird (this includes chicks); to take, damage or destroy any wild bird's nest while it is use or being built; and to take or destroy the egg of any wild bird. The definition of a wild bird is 'any bird of a kind which is resident in or a visitor to Great Britain in a wild state'.

For certain species general licenses are available from Natural England for an authorised person to lawfully carry out the actions outlined above providing that it is in the overriding interest of public health or air safety and that all other attempts to prevent the problem caused by the species have failed.

## 2.0 METHODOLOGIES

2.1 The site was surveyed following the BTO/RSPB/JNCC "Breeding Bird Survey" methodologies (Full details of the methodology are provided in **Appendix 2**). The survey technique had to be modified slightly as the site was too large for this method to be followed exactly.

2.2 Due to the length of the survey route it was only possible to effectively survey one side of the A55 per morning session. Consequently each "visit" was conducted on 2 consecutive mornings. For each visit the same transect route was slowly walked recording species within the survey area by sighting and/or song/calls.

2.3 Survey visits were conducted on the following dates:

EARLY VISIT (BBS01):	23/05/2008 – Southern side of A55	(West to East)
	24/05/2008 – Northern side of A55	(East to West)
LATE VISIT (BBS02):	19/06/2008 – Southern side of A55	(West to East)
	20/06/2008 – Northern side of A55	(East to West)

2.4 Night visits were made during each BBS and recorded calls of tawny owl were broadcasted into areas of woodland in an attempt to solicit a response from and thus record this nocturnal species. Woodlands on the northern side of the A55 were surveyed in this manner during BBS01, and those on the southern side during BBS02.

2.5 **Limitations:**

- Traffic noise from the A55 potentially obscured bird song where transects passed close to this road.
- Tall hedgerows occasionally obscured views across the whole of the transect area and some birds may have been missed.
- Private gardens and farmyards were not walked through during the survey and some birds may have been missed.

### 3.0 RESULTS

3.1 A total of 37 bird species were recorded during the survey (38 including a dead barn owl found close to the A55). Of these, 17 species were confirmed breeding with a further 16 species unconfirmed but probable breeders. (See **Table 1, Appendix 4**). Of the species recorded during the survey 3 are red-list species of high conservation concern having suffered either a rapid ( $\geq 50\%$ ) decline in UK breeding population or a rapid ( $\geq 50\%$ ) contraction of UK breeding range over last 25 years. A further 11 species have been included on the amber-list of medium conservation concern having suffered either a moderate (25-49%) decline in UK breeding population or a moderate (25-49%) contraction of UK breeding range over last 25 years.

3.2 Birds were recorded throughout the survey area. However, the areas of improved grassland, which dominate the survey area, supported few birds in terms of species and abundance. Most of the birds observed in these areas were either in flight (flying over, or insect foraging in the case of the *Hirundines*), or recorded along the hedgerows dividing the fields. The hedgerows immediately adjacent to the A55 supported lower densities of birds than hedges away from the A55. Hedges following the northern boundary of the A55 were considerably wider than those along the southern boundary and contained more trees. Consequently the northern hedges supported more birds and provided better nesting habitat.

3.3 The density of birds and variety of species increased dramatically in areas of woodland or along hedgerows with mature trees or around areas of habitation. BBS field data corresponding to each transect section can be seen in **Appendix 3**. These should be viewed in conjunction with the Site Plan (**Appendix 1**) and the Habitat Recording Forms (**Appendix 3**). A tawny owl was recorded in woodland at the eastern end of Transect A8 during the morning BBS01 visit. Recorded tawny owl calls broadcasted during the nocturnal visits were successful in gaining a response from owls in all areas of woodland except for the wood at the western end of Transect D2 where traffic noise may have rendered the broadcast ineffective. A young owl was heard calling from the woodland adjacent to Transect A5 during the night visit of BBS02.

3.4 The remains of a barn owl, probably the victim of a collision with traffic, was found on transect C5 to the north of the A55 suggesting that the species is present in the locality, however, breeding could not be confirmed though it is probable given the surrounding landscape and habitat.

#### **4.0 RECOMMENDATIONS**

- 4.1 The typical nesting season for birds in Britain runs from late-March to early-August though a few species will breed a month or two either side of these dates. Therefore, any planned vegetation / tree clearance works should be timetabled to occur outside this time-bracket.
- 4.2 Loss of nesting habitat in the form of hedgerows should be mitigated for by the replanting of wide, mixed species hedges. For maximum nesting potential these hedges should be managed in such a manner as to produce a hedge c.2-3m tall and a minimum of 1.5m wide. This is the main nesting habitat for song thrush.
- 4.3 If it is necessary to remove any mature trees then nesting opportunities for cavity nesting species will be reduced. This loss can be compensated for by the provision of nest boxes targeting red/amber list species such as house sparrow and starling. Likewise, nest boxes can be utilised under any bridges to provide nest sites for grey wagtail.

#### **5.0 CONCLUSION**

- 5.1 The survey recorded a typical suite of common birds that one would expect to find in this habitat. Although a number of the species are red- and amber-listed, none of the species noted are particularly rare. The highest level of bird activity and abundance was recorded in areas of woodland found along the transect line. The majority of the survey area however is formed by improved, sheep-grazed grassland and presents few nesting opportunities for birds. It does however provide good foraging habitat.
- 5.2 Following the woodland and farmyards, hedgerows provide the next best nesting habitat for birds, with those on the northern boundary of the A55 generally being better than those to the south. However, hedges further from the A55 appeared to support more birds than those close to this road.
- 5.3 Providing that works to remove any potential nesting habitat (trees, hedgerows, scrub and buildings etc.) are timetabled outside the main bird nesting season, it is unlikely that the scheme will have a major affect on the breeding bird population as suitable nesting habitat is available in the surrounding land. However, any nesting habitat removed as part of the scheme should be replaced once works have been completed and managed thereafter to suit the requirements of nesting birds.

Richard Castell  
June 2008

**BAT FLIGHT SURVEY**

..... **Section 1**

## 6.0 INTRODUCTION

### 6.1 Site

The habitat classifications have been identified in previous survey reports. The site descriptions are kept brief in this report and refer the reader to previous reports that identify the habitats and site description in greater detail.

*Northern Area* – a mix of improved grassland with primary use as grazing pasture and fenced of mixed species woodlands and copse. The boundaries are a mix of hedge and ditch, hedge, and post and wire fencing. The area is generally undeveloped other than farms and railway cottages.

*Southern Area* – a mix of improved grassland which rises towards the foot hills on the northern side of the Carneddau. Blocks of mixed species woodland linked by hedgerows, stream beds and stock fencing. Single 6.carriageway lanes set within hedged clawdd road side embankments.

### 6.2 Existing Data

Previous surveys have recorded sightings of bird species. Some of the surveys have identified potential roosts and nest sites within trees that may be impacted by the proposed works.

No historic data is available for roosting bats within the survey area, however surveys have identified individual bat species within the Aber valley area and to the west of the survey for Pipistrelle, Daubenton's, Long-eared and Lesser Horseshoe.

It is expected that the general area will support the following locally recorded species:-

Pipistrelle *Pipistrellus pipistrellus/pygmaeus*  
 Brown Long-eared *Plecotus auritus*  
 Lesser Horseshoe *Rhinolophus hipposideros*  
 Daubenton's *Myotis daubentonii*  
 Whiskered/Brandt's *Myotis mystacinus/brandtii*  
 Natterer's *Myotis nattereri*  
 Noctule *Nyctalus noctula*

The Noctule bat, though recorded within the county, has only been recorded roosting within trees.

### 6.3 Survey Areas

A transect to the northern side of the carriageway was walked during daylight hours to establish night time access, similarly a transect to the southern side of the carriageway was established. The transects where to intersect with areas of habitat that offered the greater foraging potential for bats and intersect flight corridors from potential roost sites. The transects are as set out on fig A, appendix 5

## 6.4 Legal Protection

All species of bat are protected under the Wildlife and Countryside act 1981 and the European Habitats Directive 1994 and amendments. The protection in brief is as follows:-

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

It is recommended that the legislation is read in context to the works proposed.

## 7.0 METHODOLOGIES

7.1 Walk over surveys were carried out to record potential roosts that may be impacted by the proposed widening of the main carriageway; the introduction and realignment of access tracks and roads to the land and property either side of the carriageway. Static observation and detector surveys were undertaken to log emergence behaviour to highlighted areas. Night time linear transect surveys were undertaken to identify foraging grounds and flight corridors.

### 7.1 Limitations

- Health and Safety considerations with regard to undertaking work at night.
- Proximity to highway.
- Access across field boundaries and private gardens.

## 8.0 RESULTS

### 8.1 Northern Transect

This survey transect ran between the road crossing at Tal y Bont to the Agricultural college at Aber. The walk over survey did not identify any trees which offered potential for roosting bats. The fields to the northern section of the survey area are predominantly managed as grazing pasture. The fields average approximately 5 Ha in area and are enclosed by a modern hedge and stock fence to the verge of the A55, which was planted at its introduction. The fields and woodland blocks have linear boundaries running north which are a mix of hedgerow and stock fence, these features link to the main railway line embankment, the railway line runs parallel to the A 55.

## 8.2 Southern Transect.

This survey transect runs up the lane to the south of Tai'r Meibion, before running back north towards the A55. The transect then runs alongside the A 55 (T) towards Aber. The transect is then reversed back towards Tai'r Meibion following the 'C' class road. At the entrance to Crymlyn Farm the transect runs north following the line of alders to the edge of Coed Wern-porchell, before turning west and rejoining the 'C' class road. The habitats are similar to those found on the northern side of the A 55 (T) the fields vary in size, with the fields nearer to Aber being slightly smaller. The field boundaries vary between hedgerows and stock fencing. The area is generally semi-improved grazing pasture with blocks of woodland.

## 8.3 General Observations

The survey areas record low density development, comprising of farms and small cottages. The potential for use by bats is therefore increased due to the scarcity of suitable building type roosts. It is therefore assumed that most linear movement would be recorded from these buildings to the more suitable foraging habitats.

The proposed introduction of the access tracks and the widening of the road will result in the loss of some of these linear features. The detector transects logged activity over two evening periods, 24 May 2008 and 19 June 2008. The transects were reversed to allow for emergence variation. The results of the surveys are as set out in the attached log.

Three specific areas were identified during the walk over surveys which could have a higher impact on bats locally, the existing underpasses, works adjacent or affecting Wig Bach and the line of alders between Crymlyn Farm to Coed Wern-porchell.

## 8.4 Underpasses

Individual static surveys were undertaken at the entrances to the existing two underpasses. The static observations recorded activity adjacent to the underpasses. No bats were observed or recorded at the time of the surveys using the underpasses.

## 8.5 Wig Bach

A static observation was also undertaken around the property, Wig Bach, no activity associated with emergence patterns were observed or recorded.

## 8.6 Alders

The proposed farm access road cuts through the line of alders that runs from Crymlyn Farm to Coed Wern-porchell. Some of the alders though not considered to be mature stock, recorded knot holes and defects suitable for use by bats. The transect surveys and static observations, did record good levels of activity on the eastern side of these alders, but no emergences from the alders were recorded during the survey periods.

## 8.7 Flight Activity

Most of the activity recorded was associated with foraging behaviour; only one Pipistrelle was observed and recorded flying over the A55. Directional flight behaviour was recorded by a Myotis bat, possibly Natterer's coming from the Tai'r Meibion underpass on the northern side of the carriageway and following the track towards the railway line.

## 9.0 RECOMMENDATIONS

- 9.1 The existing carriageway records linear hedgerows to both verges from Tai'r Meibion to Aber, other than a small section of stone wall to the east of Tai'r Meibion. It is not clear at this stage to what extent of this hedgerow will be lost during the proposed widening scheme. The proposals however do include the reinstatement of any hedgerow lost on completion of the scheme.

The surveys only recorded one event of a single Pipistrelle foraging along the southern hedgerow. The loss of this section of hedgerow is considered to be of a low impact in the long term, if this linear feature is to be reinstated on completion of the works.

- 9.2 None of the underpasses recorded use by bats at the time of survey, however it is still possible that bats may access between the northern and southern side of the carriageway through the underpasses. It is therefore recommended that where feasible the underpasses remain open for flight by bats during the construction period. The existing underpasses are formed from concrete and offer no roost potential for bats. These underpasses could be improved to allow bats potential for use. This can be achieved by fixing wbp plywood baffles on the side walls abutting the soffits. The baffles should be set approximately 25 mm off the wall and be 300 mm deep. The ply should be rough faced on the inner side to allow for bats to gain hold.
- 9.3 Several sections of the abutting hedgerows on the northern carriageway will be removed to allow the new tracks and access roads to be formed. These construction openings should be kept to a minimum. If it is found that the length of loss is greater than 20 m, it is recommended that temporary artificial flight hedges are placed across the gaps at night. These flight hedges can be formed by weaving the cut brush into sections of Herris fencing. Placement of these features should be discussed when the extent of the works is known.
- 9.4 The linear line of Alders which run adjacent to a stream bed from Crymlyn Farm to Coed Wern-porchell, offer some potential for roosting bats. The surveys did not record any emergence from these trees, however some of the knot holes could be used by individual bats as solitary roosts or for over wintering. It is notoriously difficult to identify roosts used by individual bats, due to seasonal use and varying emergence. Standard emergence surveys can not fully identify this type of roost. It is therefore recommended that any trees identified at the time having potential for use are to be section felled in the presence of a licensed consultant. If any bats emerge during the operation CCW should be notified and further advice taken.
- 9.5 Several existing properties border onto the verges of the A55, it is not clear at this stage to what level of impact of the proposed road widening of the scheme will have on these properties. During the transect surveys several

properties were observed from the verge of the carriageway for emergence and general bat activity around the buildings. None of the properties observed recorded emergence at the time of survey. It is however recommended that when the level of impact is known, full surveys of these properties should be undertaken.

## **10.0 CONCLUSION**

- 10.1 No roosts were identified at the time of surveys; most of the activity recorded was for foraging and directional flight to foraging grounds by bats. Very few of the recordings highlighted activity along the carriageway hedgerows, with most of the activity being associated with flight perpendicular to the carriageway. It was found that the activity was wind dependant and all recordings were on the leeward side of the tree lines and hedgerows.
- 10.2 Only one bat was seen crossing the high way during the survey. The proposed widening of the carriageway is no greater than that found to the east and west of the existing carriageway. It is therefore concluded that the proposed works will not have an increased impact than that of the remaining existing sections of the highway.
- 10.3 The loss of the hedgerows during the construction period will be short term, assuming that the hedgerows are to be reinstated in the new alignment; this in the long term will negate the short term impacts. The use of temporary artificial hedging will lessen this impact locally.
- 10.4 It is advised that the recommendations put forward in this report are adhered to, to ensure that the works being carried out are not in breach of the Wildlife Legislation and that the proposals will not have a significant impact on the locally recorded species.

Tim Hodnett.  
June 2008

## **APPENDIX 1**

Site Plan  
And  
Survey Transects

CLEINT/CLEINT :

**NODIADAU/NOTES**

- 1. All dimensions in millimetres unless otherwise stated.
- 2. All levels in metres above Ordnance Datum.
- 3. All changes in metres.



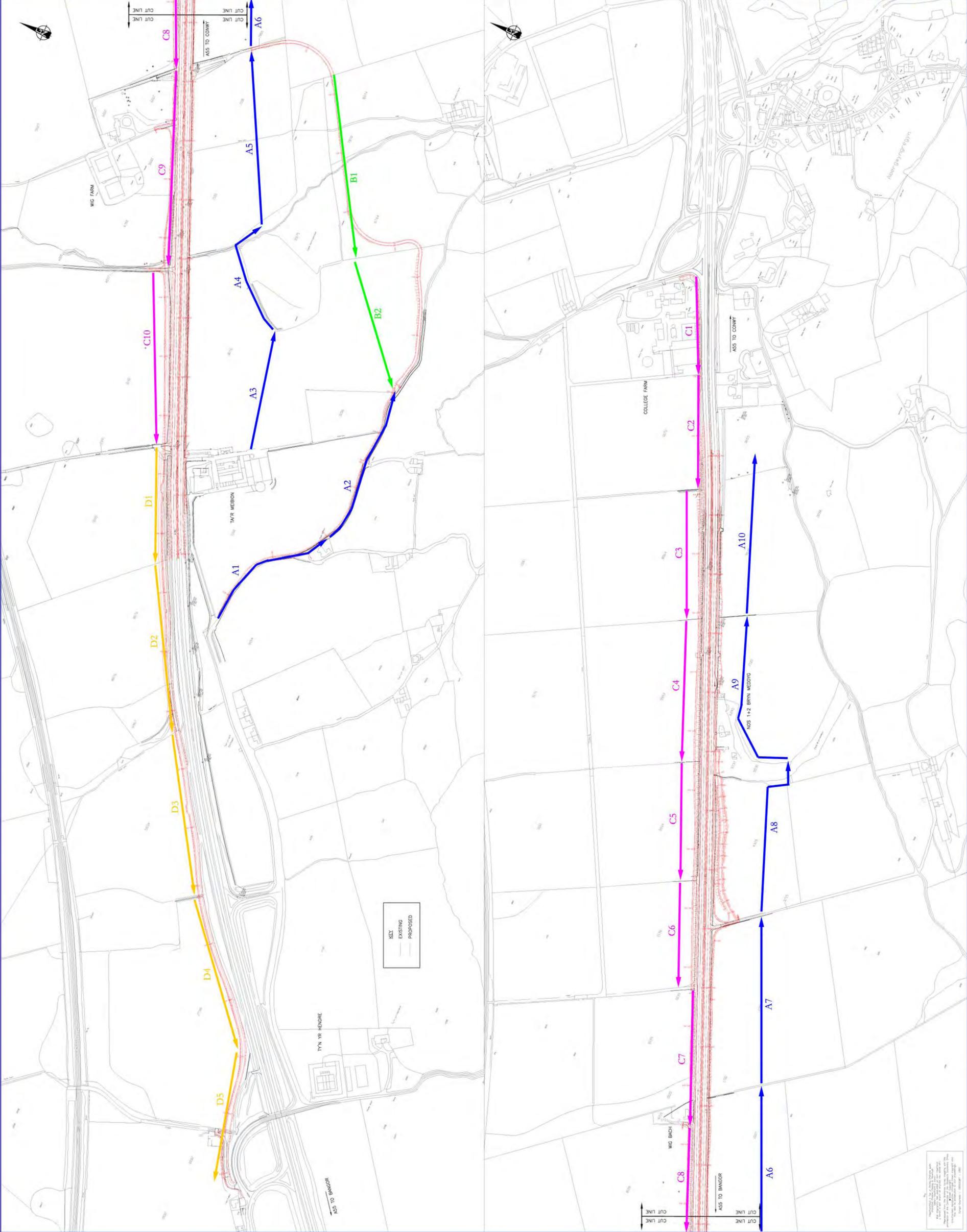
CYFRAN YR  
AMCYLCHEDD  
ENVIRONMENT  
DIRECTORATE

Cyngor Gwynedd  
COUNCIL  
CYNGOR GWYNEDD  
COUNCIL

YMGYNGORAEITH GWYNEDD  
GWYNEDD CONSULTANCY

**GENERAL ARRANGEMENT**

DATE	27/11/07
SCALE	1:2000
PROJECT NO.	161/GA/528
DRAWING NO.	161/GA/528
REVISION	
DATE	
BY	
CHECKED	
APPROVED	



## **APPENDIX 2**

### Breeding Bird Survey (BBS) Methodology



# BREEDING BIRD SURVEY INSTRUCTIONS



## Tips to volunteers:

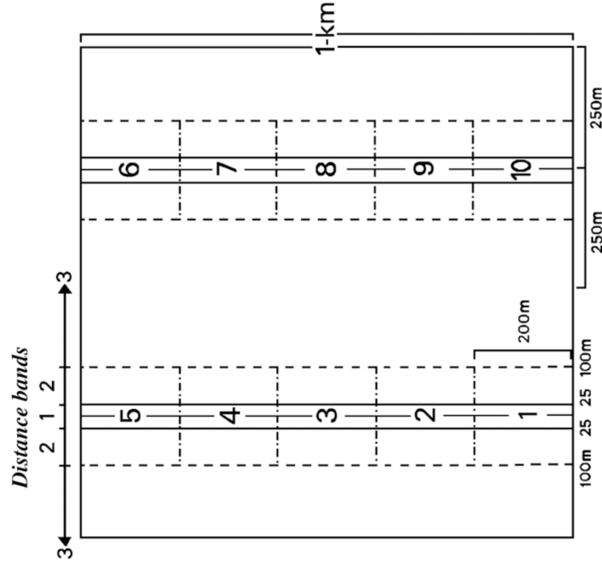
### For all users:

1. Do not record birds you see or hear before or after your transect line (i.e. behind your first 200m section or in front of your last 200m section).
2. Record all birds to the sides of your transect line.
3. Record all birds from your transect line that you can see or hear that are to the sides of your transect line, even if they are in adjacent 1-km squares.
4. Record habitat details each year. If you are only able to fill in the first two columns on the habitat form, this is still extremely useful.

### For paper-form users only:

5. Ensure that only the number of birds recorded is written in each box on the count summary forms. Additional information such as "+" or "many" complicates the forms and should be avoided.
6. Birds can be listed in any order on the Count Summary Sheet.
7. Please put your forms in the following order on completion - from top to bottom: habitat, summary 1, summary 2, mammal, field 1, field 2. This will help speed up the processing of forms.

## Finding and marking a route



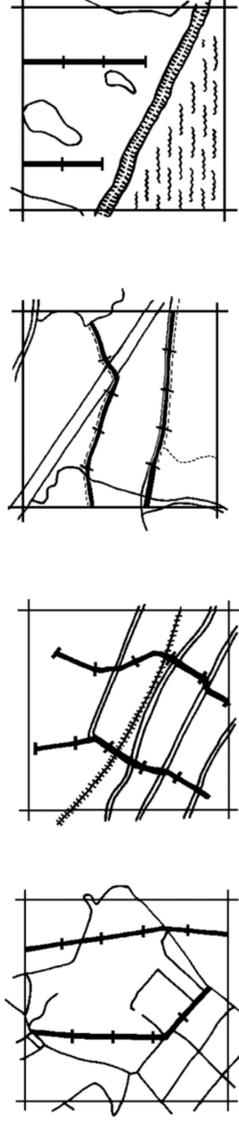
If the square has been surveyed before, your RO should provide you with a sketch map of the counting route (the transect line) taken by the previous BBS observer. This route must be followed to ensure consistency of recording on that square (i.e. if a different route is taken, different birds will probably be recorded). If the route has to be changed because you can no longer get access to it, please consult your RO and return the completed Habitat Recording Form, with a sketch map of the new route on it. If the square has never been covered before (your RO will tell you this), you will need to create your own transect route across it.

The transect line should ideally consist of two parallel lines, north-south or east-west, each 1-km long. **Please ensure that the route followed is the same as in previous years.** Transect lines should be roughly 500 metres (m) apart and 250m in from the edge of the square. Each transect line should be divided into 5 equal sections of 200m in length,

making a total of ten (2x5), numbered 1 to 10. It is important to note the starting points of each transect section either by using permanent landmarks (trees, hedges, boulders, houses etc) or by using temporary markers (coloured tape or cord etc).

In practice, your transect lines are likely to deviate from the 'ideal' because of problems with access, or barriers such as roads, rivers, and canals: possible solutions are given below. Once you have decided upon a route, it is of the greatest importance that the same route is followed year after year. In cases where the transect lines deviate considerably from the 'ideal', at no point should the two lines be closer together than 200m. **Minor intrusions into adjacent squares are perfectly acceptable and may provide the only practical way to carry out the survey. Please record the exact route taken in the box provided on the green habitat form.**

**Examples of transect routes:** bold lines indicate suggested transect route with divisions in 200m sections. Note that the start and finish of the transects need not be at a square boundary.



a. NO0861 (Tayside): mostly open fields, but limited places to cross stone walls.

b. SP9808 (Herts): mostly urban; access restricted to roads and paths; only 2 places to cross the obstructions.

c. SU8291 (Bucks): footpaths mimicking ideal pattern but running W-E avoid problem caused by M40.

d. TV5496 (E Sussex): part of the square contains sea, however, 5 200m sections on land can be covered N-S.

**Note: if less than 4 200m sections lie on land the square must be treated as uncoverable.**

## SUMMARY OF FIELDWORK

March - April	Reconnaissance visit to set up or check census route and complete habitat recording form.
Early April - mid-May	Complete 'early' transect count.
Mid-May - late June	Complete 'late' transect count.

*N.B. The fieldwork should begin and end later in more northerly parts of the UK.*

## When to visit

The main part of the breeding season, roughly between 1st April and 30th June, in the lowlands of southern Britain, should be divided into two counting periods (early season visit = April to mid-May; late season visit = mid-May to late June) and one visit should be made in each half. **Visits should be at least 4 weeks apart.** The first should coincide with the main activity period of the resident breeding birds in an area, while the second should take place after the arrival of the latest migrant breeding birds. At higher altitudes or further north, visits should be shifted later in the season, but the final transect count should be completed by mid-July. From late June, counts will almost certainly include a much greater proportion of unidentified young birds, and most species will have reduced or stopped singing, making detection more difficult.

**Counts should ideally start between 6am and 7am, and no later than 9am.** Please try to keep the starting times similar within a breeding season and across years, preferably to within half-an-hour. Please also try to keep the visit dates similar across the years. Counts will be more productive earlier in the day, with birds generally becoming quiet and inactive during the middle of the day (11am to 3pm). Starting times can be shifted to begin later in more remote and less accessible areas. If survey times extend beyond midday please use the 24-hour clock.

## Weather

Please do not attempt to census birds in conditions of heavy rain, poor visibility or strong wind. Birds generally become inactive in windy and wet conditions. However, activity often increases considerably after rain showers and therefore showery weather is generally okay for conducting surveys. Please record weather conditions in the boxes provided on the forms that describe cloud cover, rain, wind speed, and visibility. Choose one number (1-3) from each of the four headings below and enter these in the box provided on the Field Recording Sheets. If the weather conditions change during your survey visit, please select a single weather category that best represents the overall conditions.

Cloud cover	Rain	Wind	Visibility
0 – 33% = 1	None = 1	Calm = 1	Good = 1
33 – 66% = 2	Drizzle = 2	Light = 2	Moderate = 2
66 – 100% = 3	Showers = 3	Breezy = 3	Poor = 3

## Recording birds

Please record all the birds you encounter as you walk along the two linear transects. Birds should be noted in the appropriate distance category, measured at right angles to the transect line. Do not record birds that are behind you as you begin a census or beyond the end of the transect.

From your chosen starting point walk the transect route at a slow and methodical pace, pausing briefly to listen for bird songs and scan for birds flying overhead. Please note the starting and finishing times of each transect (using a 24-hour clock, e.g. 0630 for 6:30am, 1300 for 1pm). As a guide an average visit should last around an hour and a half. Record all the birds you see and hear on the field recording sheets in the appropriate transect sections 1-10 and in the appropriate distance category (see below). The transect is divided into 200m sections for convenience; please don't worry about birds at the boundary of two sections: record them in the one that seems more appropriate, but not in both. At the end of the first half (section 5) of the transect record the time and then make your way to the start of the second half of the transect route. Commence recording again through sections 6-10. Try not to record the same individual bird twice, e.g. a Mistle Thrush that can be heard singing from several 200m sections should be recorded once, where it was first detected.

We would strongly encourage observers to use the standard BTO species codes (see Appendix 2). Please familiarise yourself with the most likely codes before you go into the field. If a species is not listed in Appendix 2, please give the full common name. There is no need to record the activity or sex of the birds, although you may wish to do so. Where possible, distinguish juvenile birds from adults (e.g. B.juv, juvenile Blackbird), because **juveniles should not be entered onto BBS-Online or the Count Summary sheets**. Please also note any feral species.

Birds should be recorded in one of the following four categories when they were first noted:

1. within 25 metres either side of the line;
  2. between 25 and 100 metres either side of the line;
  3. more than 100 metres either side of the line **including birds outside the 1-km square boundary**;
- or
- F.** birds in flight only (at any distance).

Please note that distances are measured perpendicular to the transect line (i.e. at right angles to the line). A bird seen 200m ahead of the observer but close to the transect line should be recorded in

category 1. We recommend that observers measure out distance categories (25m and 100m) using a combination of a tape measure and pacing to familiarise themselves with these before fieldwork begins. Category F, *Birds in flight*, relates to those flying over. Draw an arrow through the species' two-letter code to indicate that it is in flight (e.g. ~~BZ~~). If a bird is seen to take off or land it should be recorded in the appropriate distance category (1-3) at that position. **Skylarks in display flight and hovering Kestrels should be recorded in the relevant distance category. Record Swifts, Swallows and martins in the flight category, unless they are seen to land or fly into a nest site.**

## Juvenile birds

Juvenile birds can be recorded on the Field Recording Sheets, but must NOT be entered onto BBS-Online or the Count Summary Sheets. If you have difficulty distinguishing adult and young birds simply estimate, to the best of your ability, how many adults were present. We appreciate that mixed-aged flocks of crows or Starlings, for example, will present problems later in the season and ask that you observe and record with great care. Colonial nesters should be entered separately on BBS-Online or in the box provided at the end of the Count Summary Sheet (paper-form users only).

## **Example of a completed Field Recording Sheet (birds recorded)**

### Recording birds in the field

	100m	25m	100m
3	2	1	3
SL	B.	↑	B.
		3R.	
		2B.	

1

### Transferring counts onto summary sheets

	100m	25m	100m
3	2	1	3
SL	-B.	↑	-B.
		3R.	
		2B.	

2

## Colonial nesting birds

Birds nesting in dense colonies within the square (e.g. Rook, Sand Martin and gulls) will not be adequately censused using the standard method, and we ask observers to count or estimate the number of nests in the whole 1-km square. Colony counts should be conducted separately from the transect counts. Please include counts of adult birds seen at these colonies during your normal line-transect counts (i.e. record the number of adults seen during your two line-transect counts **as well as** the number of active nests counted on your separate colony counts).

## Habitat recording

**Habitat recording is an essential part of the BBS** because it allows changes in bird numbers to be related to changes in habitat. **Habitat forms must be completed each year** using the coding scheme that is common to a range of BTO projects. This is shown on the back of the green form and can be used without specialist knowledge. We advise that habitat details are recorded on your reconnaissance visit or following a count. Please do not record birds and habitat at the same time.

Habitat should be recorded separately for each of the 10 200m transect sections. Please record what you feel to be the most appropriate codes for each section (i.e. the area within a box 200m long by 50m wide). Codes allow you to describe both the predominant habitat, termed the **First habitat** on the form, and the secondary habitat termed the **Second habitat**. In many cases two habitats will have equal importance and the order they are entered does not matter. For each habitat, choose one habitat code from each of levels 1 and 2, and up to two codes from levels 3 and 4. Please complete as much detail as you feel able: the first two levels are most important.

The example below describes an area of arable farmland. Transect 1 comprises tilled land with a hedgerow without trees, an active farmyard, with autumn cereal growing. There is no secondary habitat and so this is left blank. Transect section 2 is a similar area containing woodland. The first habitat codes are the same and the second codes are for woodland i.e. coniferous, young plantation with low disturbance, moderate shrub layer and sparse field layer. Note that the **Shrub layer** comprises woody plants less than 5m tall and the **Field layer** comprises herbaceous, non-woody plants. If there is no appropriate code in levels 3 or 4 please put a dash ('-') in that column.

Transect Section	First habitat				Second habitat			
	Levels:				Levels:			
	1	2	3	4	1	2	3	4
1	E	4	2	6	7			
2	E	4	2	6	6	1	A	2 5 8 2 6

## Appendix 2. BTO Bird Species Codes

AC Arctic Skua	GA Gadwall	LE Long-eared Owl	SM Sand Martin
AE Arctic Tern	GX Gannet	LT Long-tailed Tit	SS Sanderling
AV Avocet	GW Garden Warbler	MG Magpie	TE Sandwich Tern
BO Barn Owl	GY Garganey	MA Mallard	VI Savi's Warbler
BY Barnacle Goose	GC Goldcrest	MN Mandarin	SQ Common Rosefinch
BA Bar-tailed Godwit	EA Golden Eagle	MX Manx Shearwater	SP Scaup
BR Bearded Tit	OL Golden Oriole	MR Marsh Harrier	CY Scottish Crossbill
BS Bewick's Swan	GF Golden Pheasant	MT Marsh Tit	SW Sedge Warbler
BI Bittern	GP Golden Plover	MW Marsh Warbler	NS Serin
BK Black Grouse	GN Goldeneye	MP Meadow Pipit	SA Shag
TY Black Guillemot	GO Goldfinch	MU Mediterranean Gull	SU Shelduck
BX Black Redstart	GD Goosander	ML Merlin	SX Shorelark
BJ Black Tern	GI Goshawk	M. Mistle Thrush	SE Short-eared Owl
B. Blackbird	GH Grasshopper Warbler	MO Montagu's Harrier	SV Shoveler
BC Blackcap	GB Great Black-backed Gull	MH Moorhen	SK Siskin
BH Black-headed Gull	GG Great Crested Grebe	MS Mute Swan	S. Skylark
BN Black-necked Grebe	ND Great Northern Diver	N. Nightingale	SZ Slavonian Grebe
BW Black-tailed Godwit	NX Great Skua	NJ Nighthjar	SN Snipe
BV Black-throated Diver	GS Great Spotted Woodpecker	NH Nuthatch	SB Snow Bunting
BT Blue Tit	GT Great Tit	OP Osprey	ST Song Thrush
BU Bluethroat	GE Green Sandpiper	OC Oystercatcher	SH Sparrowhawk
BL Brambling	G. Green Woodpecker	PX Peafowl/Peacock	AK Spotted Crake
BG Brent Goose	GR Greenfinch	PE Peregrine	SF Spotted Flycatcher
BF Bullfinch	GK Greenshank	PH Pheasant	DR Spotted Redshank
BZ Buzzard	H. Grey Heron	PF Pied Flycatcher	SG Starling
CG Canada Goose	P. Grey Partridge	PW Pied Wagtail	SD Stock Dove
CP Capercaillie	GL Grey Plover	PG Pink-footed Goose	SC Stonechat
C. Carrion Crow	GL Grey Wagtail	PT Pintail	TN Stone-curlew
CW Cetti's Warbler	GJ Greylag Goose	PO Pochard	TM Storm Petrel
CH Chaffinch	GU Guillemot	PM Ptarmigan	SL Swallow
CC Chiffchaff	FW Guineafowl (Helmeted)	PU Puffin	SI Swift
CF Chough	HF Hawfinch	PS Purple Sandpiper	TO Tawny Owl
CL Cirl Bunting	HH Hen Harrier	Q. Quail	T. Teal
CT Coal Tit	HG Herring Gull	RN Raven	TK Temminck's Stint
CD Collared Dove	HY Hobby	RA Razorbill	TP Tree Pipit
CM Common Gull	HZ Honey Buzzard	RG Red Grouse	TS Tree Sparrow
CS Common Sandpiper	HC Hooded Crow	KT Red Kite	TC Treecreeper
CX Common Scoter	HP Hoopoe	ED Red-backed Shrike	TU Tufted Duck
CN Common Tern	HM House Martin	RM Red-breasted Merganser	TT Turnstone
CO Coot	HS House Sparrow	RQ Red-crested Pochard	TD Turtle Dove
CA Cormorant	JD Jackdaw	FV Red-footed Falcon	TW Twite
CB Corn Bunting	J. Jay	RL Red-legged Partridge	WA Water Rail
CE Corncrake	K. Kestrel	NK Red-necked Phalarope	W. Wheatear
CI Crested Tit	KF Kingfisher	LR Lesser Redpoll	WM Whimbrel
CR Crossbill	KI Kittiwake	RK Redshank	WC Whinchat
CK Cuckoo	KN Knot	RT Redstart	WG White-fronted Goose
CU Curlew	LM Lady Amherst's Pheasant	RH Red-throated Diver	WH Whitethroat
DW Dartford Warbler	LA Lapland Bunting	RE Redwing	WS Whooper Swan
DI Dipper	L. Lapwing	RB Reed Bunting	WN Wigeon
DO Dotterel	TL Leach's Petrel	RW Reed Warbler	WT Willow Tit
DN Dunlin	LB Lesser Black-backed Gull	RZ Ring Ouzel	WW Willow Warbler
D. Duncock	LS Lesser Spotted Woodpecker	RP Ringed Plover	OD Wood Sandpiper
EG Egyptian Goose	LW Lesser Whitethroat	RI Ring-necked Parakeet	WO Wood Warbler
E. Eider	LI Linnet	R. Robin	WK Woodcock
FP Feral Pigeon	ET Little Egret	DV Rock Dove	WL Woodlark
ZL Feral/hybrid goose	LG Little Grebe	RC Rock Pipit	WP Woodpigeon
ZF Feral/hybrid mallard type	LU Little Gull	RO Rook	WR Wren
FF Fieldfare	LO Little Owl	RS Roseate Tern	WY Wryneck
FC Firecrest	LP Little Ringed Plover	RY Ruddy Duck	YW Yellow Wagtail
F. Fulmar	AF Little Tern	RU Ruff	Y. Yellowhammer



## **APPENDIX 3**

Breeding Bird Survey  
(BBS) Field Data



















# BREEDING BIRD SURVEY

# FIELD RECORDING SHEET

\* please return with other forms

Please do not write in the shaded boxes.

PLEASE USE BLOCK CAPITALS

Observer name		RICHARD CASTELL / Lawrence Hunter	
1-km square reference (eg SK1898)		N/A	
County code (eg GBSY)		N/A	
Visit date (DD:MM:YY) (eg 02:05:03)		2 0 : 0 6 : 0 8	
TRANSECT: C	Weather (1,2 or 3)	Cloud	Visibility
	2	2	1
Start time (HH:MM)	Finish time	Rain	Wind
_____	_____	1	2

- Distance categories:
- 1. 0-25 metres from the transect line,
  - 2. 25-100 metres from the transect line,
  - 3. More than 100 metres from the transect line whether within the 1-km square boundary or not
- F. Birds in flight only (at any distance) [record on sheets using an arrow, eg **BZ**.]

**N.B. Record singing Skylarks in the distance category, not as in flight.**  
**Record breeding colonies (Rooks, Sand Martins and gulls) and estimate the number of nests.**

[NB: Boxes are not drawn to scale]

100m	25m	25m	100m	25m	25m	100m
3	2	1	3	2	1	3
4						
GR ↗						
JD ↗						

100m	25m	25m	100m	25m	25m	100m
3	2	1	3	2	1	3
6						

100m	25m	25m	100m	25m	25m	100m
3	2	1	3	2	1	3
1						
CH ↗						
GO ↗						
HS						
PW						
JD(x2) ↗						
SL(x3) ↗						
CH GO(x3) ↗						
JD ↗						
↑						
CH						
B. HS						

100m	25m	25m	100m	25m	25m	100m
3	2	1	3	2	1	3
3						
GR ↗						
CH(x2) ↗						
HS						

100m	25m	25m	100m	25m	25m	100m
3	2	1	3	2	1	3
2						
GR ↗						
C. ↗						
SD(x2)						
GO ↗						
CH(x2)						

START



100m	25m	25m	25m	100m
3	2	1	2	3
		BT ↗		
		4		
		GO	CH	BC

100m	25m	25m	25m	100m
3	2	1	2	3
		BT		
		3		
			CH	

100m	25m	25m	25m	100m
3	2	1	2	3
		GT		
		B.		
		GO (x2)		
		5		
		MG	B.	ST
				GS ↗

## APPENDIX 4

Tables

**TABLE 1: Cumulative Species Summary with Breeding Codes and UK Conservation Status**

	Scientific Name	Common Name	BTO Code	UK Status	BBS01/N	BBS01/S	BBS02/N	BBS02/S
1	<i>Tadorna tadorna</i>	Shelduck	SU	AMBER	*	P	*	*
2	<i>Buteo buteo</i>	Common Buzzard	BZ		*	ON	H	NY
3	<i>Larus argentatus</i>	Herring Gull	HG	AMBER	O	O	O	O
4	<i>Larus fuscus</i>	Lesser Black-backed Gull	LB	AMBER	O	O	O	O
5	<i>Columba oenas</i>	Stock Dove	SD	AMBER	P	*	P	P
6	<i>Columba palumbus</i>	Wood Pigeon	WP		H	H	H	H
7	<i>Strix aluco</i>	Tawny Owl	TO		H/S	H	*	H/S/RF
8	<i>Tyto alba</i>	Barn Owl	BO	AMBER	DEAD	*	*	*
9	<i>Apus apus</i>	Swift	SI		H	H	H	H
10	<i>Dendrocopos major</i>	Great Spotted Woodpecker	GS		H	H	H	H
11	<i>Hirundo rustica</i>	Swallow	SL	AMBER	P	NY	N	RF
12	<i>Delichon urbicum</i>	House Martin	HM	AMBER	H	H	H	H
13	<i>Motacilla alba</i>	Pied Wagtail	PW		H	H	RF	H
14	<i>Motacilla cinerea</i>	Grey Wagtail	GL	AMBER	H	P	*	RF
15	<i>Troglodytes troglodytes</i>	Wren	WR		S/H	S/H	S/H	S/H
16	<i>Prunella modularis</i>	Duncock	D.	AMBER	S/P/A	S/P/A	S/P	S/P
17	<i>Erithacus rubecula</i>	Robin	R.		S/H	S/P/A	S/P	RF
18	<i>Turdus philomelos</i>	Song Thrush	ST	RED	S/P/A	S/P/A	S	S
19	<i>Turdus viscivorus</i>	Mistle Thrush	M.	AMBER	H	*	*	*
20	<i>Turdus merula</i>	Blackbird	B.		S/P	S/P	S/H	S/P
21	<i>Sylvia atricapilla</i>	Blackcap	BC		S	S	S	S
22	<i>Phylloscopus collybita</i>	Chiffchaff	CC		S	NE	S	S
23	<i>Regulus regulus</i>	Goldcrest	GC	AMBER	S	S	S	S
24	<i>Ficedula hypoleuca</i>	Pied Flycatcher	PF		*	*	*	P/A
24	<i>Parus major</i>	Great Tit	GT		H	ON	H	RF
26	<i>Parus caeruleus</i>	Blue Tit	BT		H	H	H	RF
26	<i>Aegithalos caudatus</i>	Long-tailed Tit	LT		RF	RF	*	H
28	<i>Certhia familiaris</i>	Treecreeper	TC		*	*	*	P/A
29	<i>Pica pica</i>	Magpie	MG		H	H	H	H
30	<i>Corvus monedula</i>	Jackdaw	JD		H	H	H	RF
31	<i>Corvus frugilegus</i>	Rook	RO		H	NY/RF	H	H
32	<i>Corvus corax</i>	Raven	RN		H	*	*	*
33	<i>Corvus corone</i>	Carriion Crow	C.		H	H	H	RF

	Scientific Name	Common Name	BTO Code	UK Status	BBS01/N	BBS01/S	BBS02/N	BBS02/S
34	<i>Sturnus vulgaris</i>	Starling	SG	RED	H	NY	H	H
35	<i>Passer domesticus</i>	House Sparrow	HS	RED	H	NY	H	RF
36	<i>Fringilla coelebs</i>	Chaffinch	CH		S/P/A	NY	P	P
37	<i>Carduelis carduelis</i>	Goldfinch	GO		S/P	S/P	S/P	S/P
38	<i>Carduelis chloris</i>	Greenfinch	GR		S/P/A	S/P/A	RF	RF

CONFIRMED BREEDING	17
PROBABLY BREEDING	17+14 = 31
POSSIBLY BREEDING	17+14+2 = 33

RED TEXT - REFERS TO NOCTURNAL SURVEY

#### BREEDING CODES

- O** Bird Observed (seen or heard); no more knowledge of the species' status or of habitat suitable for breeding
- H** Species present in suitable nesting **Habitat**; no other indication of breeding
- S** Singing male, or breeding calls heard
- P** Pair observed in suitable nesting habitat
- D** Display or courtship
- N** Bird visiting a probable **Nest** site
- B** Birds seen **Building** a nest, carrying nesting material, or excavating nest cavity
- A** Agitated behaviour or anxiety calls from adults suggesting a nest or young are nearby
- DD** Distraction **Display** or injury feigning from adult birds
- UN** Recently **Used Nest** (from current season); or eggshells
- ON** Occupied **Nest** in use (e.g. High nest or nest in hole whose contents cannot be deduced)
- FY** Adults carrying **Food** for **Young**
- RF** Recently **Fledged** young, still dependant on parents
- FS** Adults carrying **Faecal Sac** away from nest site
- NE** Nest with **Eggs**, or adult sitting on nest
- NY** Nest with **Young**, or downy young of nidifugous species

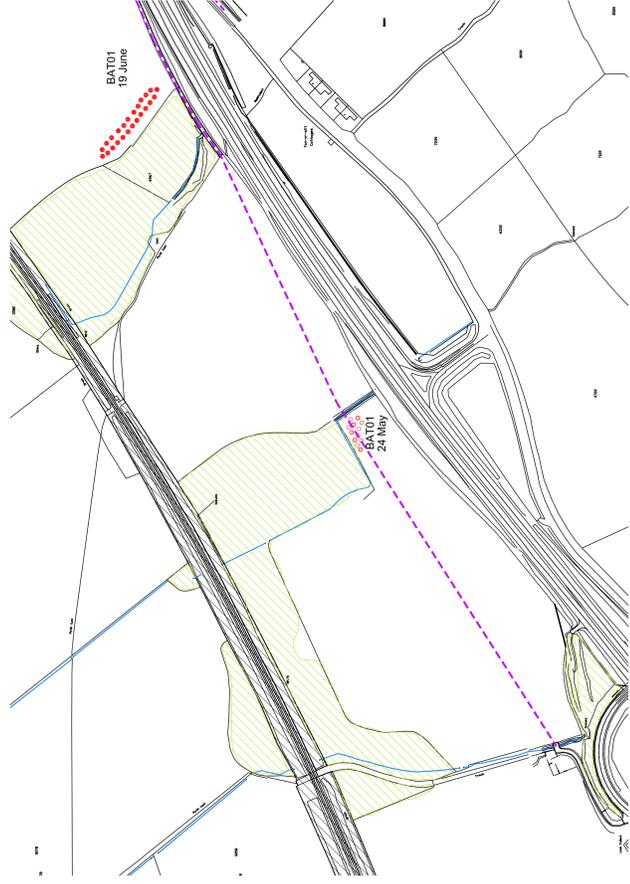
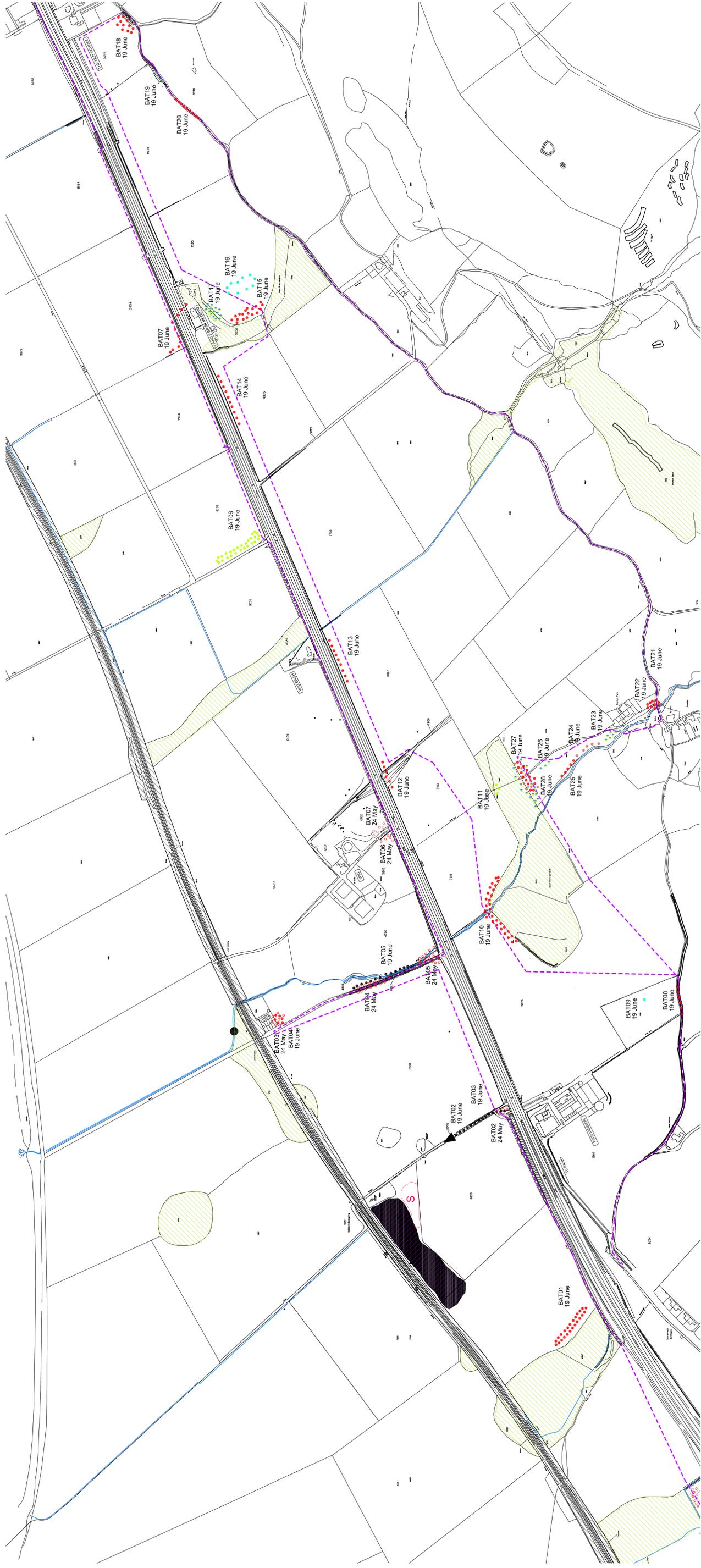
**TABLE 2: Individual Species Count for North side (N) and South side (S) of A55**

Scientific Name	Common Name	BTO Code	INDIVIDUAL COUNT							S Total	Sp. TOTAL
			BBS01/N	BBS02/N	BBS01/S	BBS02/S	N Total	S Total	Sp. TOTAL		
1 <i>Tadorna tadorna</i>	Shelduck	SU	0	0	2	0	0	0	2	2	
2 <i>Buteo buteo</i>	Common Buzzard	BZ	0	1	2	3	1	1	5	6	
3 <i>Larus argentatus</i>	Herring Gull	HG	5	1	4	3	6	7	13	13	
4 <i>Larus fuscus</i>	Lesser Black-backed Gull	LB	1	1	2	4	2	6	8	8	
5 <i>Columba oenas</i>	Stock Dove	SD	3	2	0	1	5	1	6	6	
6 <i>Columba palumbus</i>	Wood Pigeon	WP	2	0	5	4	2	9	11	11	
7 <i>Strix aluco</i>	Tawny Owl	TO	1	0	1	2	1	3	4	4	
8 <i>Tyto alba</i>	Barn Owl	BO	1	0	0	0	1	0	1	1	
9 <i>Apus apus</i>	Swift	SI	3	0	0	0	3	0	3	3	
10 <i>Dendrocopos major</i>	Great Spotted Woodpecker	GS	2	1	0	1	3	1	4	4	
11 <i>Hirundo rustica</i>	Swallow	SL	14	15	14	23	29	37	66	66	
12 <i>Delichon urbicum</i>	House Martin	HM	5	0	0	8	5	8	13	13	
13 <i>Motacilla alba</i>	Pied Wagtail	PW	1	2	1	2	3	3	6	6	
14 <i>Motacilla cinerea</i>	Grey Wagtail	GL	1	0	3	2	1	5	6	6	
15 <i>Troglodytes troglodytes</i>	Wren	WR	4	3	7	6	7	13	20	20	
16 <i>Prunella modularis</i>	Duncock	D.	5	0	2	2	5	4	9	9	
17 <i>Erithacus rubecula</i>	Robin	R.	2	3	7	1	5	8	13	13	
18 <i>Turdus philomelos</i>	Song Thrush	ST	3	2	1	2	5	3	8	8	
19 <i>Turdus viscivorus</i>	Mistle Thrush	M.	1	0	0	0	1	0	1	1	
20 <i>Turdus merula</i>	Blackbird	B.	2	4	4	2	6	6	12	12	
21 <i>Sylvia atricapilla</i>	Blackcap	BC	2	2	3	1	4	4	8	8	
22 <i>Phylloscopus collybita</i>	Chiffchaff	CC	1	0	3	1	1	4	5	5	
23 <i>Regulus regulus</i>	Goldcrest	GC	0	0	1	3	0	4	4	4	
24 <i>Ficedula hypoleuca</i>	Pied Flycatcher	PF	0	0	0	2	0	2	2	2	
24 <i>Parus major</i>	Great Tit	GT	1	2	1	0	3	1	4	4	
26 <i>Parus caeruleus</i>	Blue Tit	BT	2	8	3	7	10	10	20	20	
26 <i>Aegithalos caudatus</i>	Long-tailed Tit	LT	1	0	2	0	1	2	3	3	
28 <i>Certhia familiaris</i>	Treecreeper	TC	0	0	0	2	0	2	2	2	
29 <i>Pica pica</i>	Magpie	MG	2	1	3	1	3	4	7	7	
30 <i>Corvus monedula</i>	Jackdaw	JD	12	6	7	21	18	28	46	46	
31 <i>Corvus frugilegus</i>	Rook	RO	11	0	9	3	11	12	23	23	

	Scientific Name	Common Name	BTO Code	INDIVIDUAL COUNT							
				BBS01/N	BBS02/N	BBS01/S	BBS02/S	N Total	S Total	Sp.TOTAL	
32	<i>Corvus corax</i>	Raven	RN	0	0	1	0	0	0	1	1
33	<i>Corvus corone</i>	Carrion Crow	C.	7	8	15	6	15	21	36	36
34	<i>Sturnus vulgaris</i>	Starling	SG	3	0	2	0	3	2	5	5
35	<i>Passer domesticus</i>	House Sparrow	HS	2	3	5	3	5	8	13	13
36	<i>Fringilla coelebs</i>	Chaffinch	CH	9	12	16	22	21	38	59	59
37	<i>Carduelis carduelis</i>	Goldfinch	GO	3	9	2	2	12	4	16	16
38	<i>Carduelis chloris</i>	Greenfinch	GR	10	3	3	1	13	4	17	17
				<b>122</b>	<b>89</b>	<b>131</b>	<b>141</b>	<b>211</b>	<b>272</b>	<b>483</b>	<b>483</b>

## **APPENDIX 5**

### **Bat Detector Transect Site Plan**



**Key To Species**

- Pipistrelle (45kHz)
- Pipistrelle (55kHz)
- Long-eared
- Noctule
- Whiskered
- Whiskered/Brandt's
- ▲ Direction of Flight
- - - Transect Route

**Bat Activity Plan May June 2008**

1/2500 @ A1

**A55 (T) Road Improvement - Tai'r Meibion to Aber**

**Fig A**

## **APPENDIX 6**

Bat Detector Transect  
Flight Tables

## A55 (T) Tai'r Meibion to Aber Road Improvement

### Bat Activity Log

24 May 2008

page 1

Ref	Date	Species	Comment
BAT 0.1	24 May	Pipistrelle (45 and 55 kHz)	Both 45and 55 kHz Pipistrelle bats foraging to the woodland edge
BAT 0.2	24 May	Pipistrelle 45 kHz	Individual foraging over track adjacent to underpass
BAT 0.3	24 May	Pipistrelle 45 kHz	Individual foraging adjacent to railway cottages
BAT 0.4	24 May	Pipistrelle 45 kHz	Individual foraging along lane access to railway cottages
BAT 0.5	24 May	Pipistrelle 45 kHz	Individual foraging at junction of lane to the A55
BAT 0.6	24 May	Pipistrelle 45 kHz	Individual foraging at junction of access to Wig off the A55
BAT 0.7	24 May	Pipistrelle 55 kHz	Individual foraging at junction of access to Wig off the A55

**Bat Activity Log****19 June 2008**

page 1

Ref	Date	Species	Comment
BAT 0.1	19 June	Pipistrelle 45 kHz	Pipistrelle foraging adjacent to woodland
BAT 0.2	19 June	Myotis/Natterer's	Flight to feeding ground along track from underpass
BAT 0.3	19 June	Noctule	Feeding within range of detector, no sighting
BAT 0.4	19 June	Pipistrelle 45 kHz	Individual foraging adjacent to railway cottages
BAT 0.5	19 June	Long-eared	feeding along hedge line to lane to railway cottages
BAT 0.6	19 June	Whiskered	feeding on leeward side of hedgerow
BAT 0.7	19 June	Pipistrelle 45 kHz	Pipistrelle seen crossing the road from the south
BAT 0.8	19 June	Pipistrelle 45 kHz	feeding between hedgerows to lane
BAT 0.9	19 June	Noctule	Feeding within range of detector, no sighting
BAT 1.0	19 June	Pipistrelle 45 kHz	feeding along woodland edge
BAT 1.1	19 June	Whiskered/Brandt's	feeding within woodland edge
BAT 1.2	19 June	Pipistrelle 45 kHz	crossed access to underpass parallel to highway
BAT 1.3	19 June	Pipistrelle 45 kHz	feeding along hedgerow to carriageway
BAT 1.4	19 June	Pipistrelle 45 kHz	feeding along hedgerow to carriageway
BAT 1.5	19 June	Pipistrelle 45 kHz	several bats feeding along woodland edge
BAT 1.6	19 June	Noctule	Feeding over field below tree line
BAT 1.7	19 June	Whiskered/Brandt's	feeding within woodland edge
BAT 1.8	19 June	Pipistrelle 45 kHz	feeding along hedgerow to lane
BAT 1.9	19 June	Whiskered/Brandt's	feeding along lane
BAT 2.0	19 June	Pipistrelle 45 kHz	feeding between hedgerows to lane
BAT 2.1	19 June	Whiskered/Brandt's	feeding along lane
BAT 2.2	19 June	Pipistrelle 45 kHz	feeding around entrance to farm
BAT 2.3	19 June	Whiskered/Brandt's	feeding along line of Alders
BAT 2.4	19 June	Pipistrelle 55 kHz	feeding along line of Alders
BAT 2.5	19 June	Pipistrelle 45 kHz	feeding along line of Alders

**Bat Activity Log****19 June 2008****page 2**

Ref	Date	Species	Comment
BAT 2.6	19 June	Whiskered/Brandt's	feeding along line of trees
BAT 2.6	19 June	Pipistrelle (45 and 55 kHz)	Both 45and 55 kHz Pipistrelle bats foraging to the woodland edge
BAT 2.6	19 June	Whiskered/Brandt's	feeding within woodland edge



A55(T)  
ABERGWYNGREGYN TO  
TAI'R MEIBION  
IMPROVEMENT

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OTTER AND BADGER SURVEY  
2015

CPF: 5055  
Client: Welsh Government

## Document Control Sheet

<b>Document Author:</b>	Christian Middle MCIEEM
<b>Project Manager:</b>	Dave Meller

### Revision History

Date	Version No.	Summary of Changes
04/08/2015	0.01	First draft

### Approvals

Approved by	Signature	Date	Version
Rhydian Roberts		04/08/2015	0.01

### Distribution

Name	Title	Date	Version
Dave Meller	Project Manager	4/08/2015	0.01

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# A55(T) Abergwyngregyn to Tai'r Meibion Improvement Otter and Badger Survey

## 1.0 Introduction

An otter and badger survey was undertaken by YGC ecologist Christian Middle MCIEEM (full member of the Chartered Institute of Ecology and Environmental Management) in May 2015 as part of the field work surveys to inform the Environmental Impact Assessment (EIA) for the proposed A55(T) Abergwyngregyn to Tai'r Meibion Improvement.

The survey area is comprised of areas of land both to the north and south of the A55(T) between Abergwyngregyn to the east and the Talybont to the west, Gwynedd at NGR SH262049, 371275 and 265252, 372768 (see Figure 1).

The purpose of the survey was to identify field evidence of otter and badger and suitable habitat for reptiles within the study area and to update the previous survey for otter and badger undertaken in 2007 by Timothy Hodnet to establish the ecology baseline for these species in order contribute to the Environmental Impact Assessment (EIA) for the above scheme. These baseline findings are then used to identify ecological constraints associated with the proposed improvement and subsequent recommendations are provided with regard to scheme design and EIA process including reference to potential mitigation measures as appropriate.

An ecological survey scoping document sent to Welsh Government, NMWTRA and Gwynedd Council in April 2015 stated that Water Vole, Dormouse and Great Crested Newt surveys have been scoped out of the 2015 surveys on the basis of negative results during the previous surveys and lack of previous records for these species within the vicinity.

Therefore this document updates the baseline information for otter and badger.

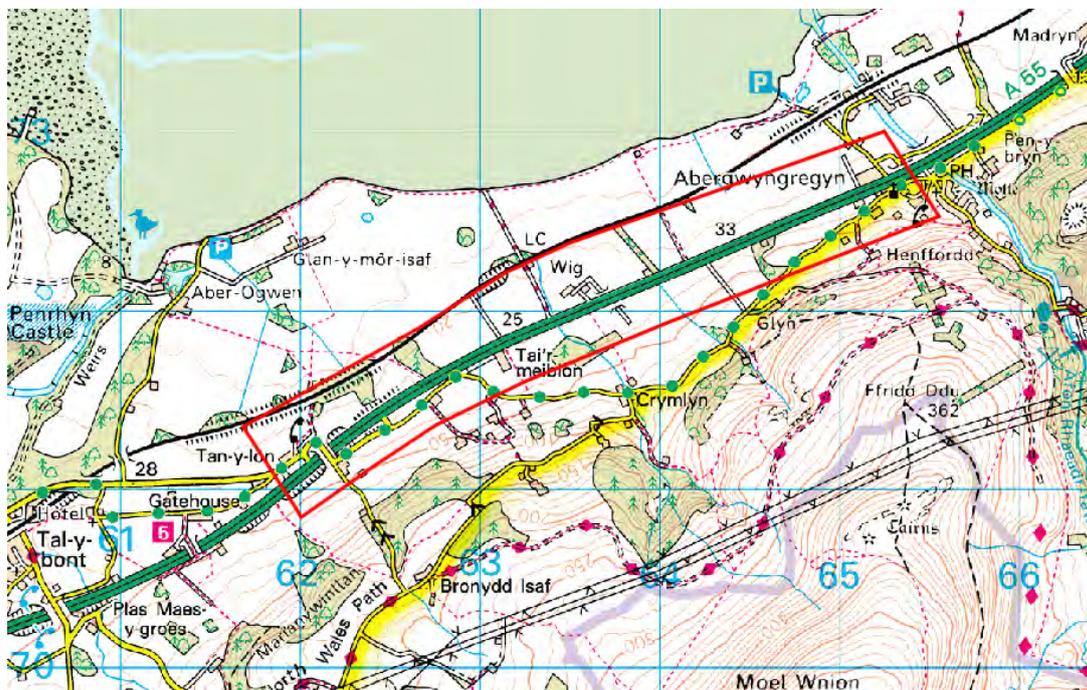


Figure 1: Location of A55 Abergwyngregyn to Tai'r Meibion Otter and Badger Survey Area.

## 2.0 Legal Protection

Otters are protected as European Protected Species (EPS) under Regulation 39 of the Conservation of Habitats and Species Regulations 2010, as amended, commonly known as the Habitat Regulations. Otters are also protected under the Wildlife and Countryside Act 1981 (as amended).

Badgers and their habitat are afforded protection on a domestic level through the Protection of Badgers Act 1992. They are also included on Schedule 6 of the Wildlife and Countryside Act 1981 (as amended), and Appendix III of the Bern Convention (DMRB, Volume 10, Section 1, Part 5, HA 59/92 Amendment to Chapter 5.3. 2009). See Appendix II for Legislation concerning badgers.

The habitats of the reptile species likely to be present at this site are protected under the Wildlife and Countryside Act 1981 (as amended). The sand lizard and smooth snake are fully protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010, as amended, but are only known and present from a few sites throughout the UK and do not occur in the habitat found within the survey area for this site.

Nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended) The Act makes it an offence (with exception to species listed in Schedule 2) to intentionally:

- kill, injure, or take any wild bird,
- take, damage or destroy the nest of any wild bird while that nest is in use or being built (also [take, damage or destroy the nest of a wild bird included in Schedule ZA1] under the Natural Environment and Rural Communities Act 2006), or
- take or destroy an egg of any wild bird.

### **3.0 Survey Methodology**

The survey methodology followed for both otter and badger conforms to the methodology described in DMRB, Volume 10, Section 4, Part 4, HA81/99, May 1999 and Volume 10, Section 1, Part 5, HA 59/92 (Amendment to Chapter 5.3), February 1997 respectively.

The following field evidence and characteristics for otter and badger were specifically searched for:

- suitable habitat for and field signs of otter (*Lutra lutra*) activity (e.g. holts, resting places, spraints, tracks, feeding remains, runs and pathways);
- suitable habitat for and field signs of badger (*Meles meles*) activity (e.g. setts, footprints, boundary breaches with trapped guard hairs, dung-pits/latrines, runs and pathways).

Suitable habitat for reptile species such as common lizard (*Lacerta vivipara*), slow worm (*Anguis fragilis*), grass snake (*Natrix natrix*) and adder (*Vipera berus*) was also identified and recorded.

In addition to the protected species mentioned above and in accordance with the guidelines of the Chartered Institute of Ecology and Environmental Management (CIEEM) evidence of any protected and/or invasive species found during the course of the survey has been highlighted in this report.

### **5.0 Limitations to the Survey**

Ecological surveys are limited by factors which affect the presence of plants and animals, such as the time/season of year and the migration patterns and behaviour of animals. Consequently, the ecological survey data contained within this report may change since the date that the survey was undertaken. However, it is considered that the results of the ecological survey undertaken have allowed for the identification of protected and invasive species throughout the survey area.

The weather conditions on the days preceding the survey and the days that the site was visited to undertake the survey did not pose any limitations.

Access to extremely small parts of the survey area was not possible due to the presence of dense scrub vegetation in some areas and deeply cut narrow channelled eroded watercourses with overhead scrub in others. However, despite this it is concluded that the survey area has been surveyed with confidence and the key evidence of otters and badgers within the survey area recorded accurately.

A limitation to some areas of the field survey was also posed by the extent of land owner way leaves obtained which provided reduced access permission to some parts of the survey corridor to that stated in the DMRB survey methodology quoted in section 3.0 above.

In addition, the previous 2007 badger survey reported anecdotal evidence of a number of active badger setts, one outlying sett located to the north and west of the A55(T) and one outlying and one main sett located to the southeast of the A55(T). However, the presence and / or activity status of these setts could not be confirmed as these locations are located outside of the survey area and land access agreements for this project.

## 6.0 Survey Results

### 6.1 Otter

Evidence of the activity of otters within the survey area was recorded in the form of fresh, recent and old otter spraints found on boulders and rocks within watercourses, throughout the northern half of the survey area; see survey plans in Appendix I and Site Photographs in Appendix II.

In addition, two potential otter resting sites were recorded during the course of the survey, also located within the northern half of the survey area to the north of the A55(T). However, no direct evidence such as spraints and / or foot prints was recorded at these locations to confirm this conclusion.

One potential otter resting site is located within exposed roots beneath an undercut bank adjacent to the Afon Wig main river to the north of the railway line. A previous survey undertaken in 2007 stated that the remains of a partially collapsed artificial otter holt was recorded at this location. However, no evidence of an artificial otter holt could be found at this location during the recent survey.

The second potential otter resting place is located within dense scrub vegetation on a small un-named watercourse to the north of the now removed Wig Bach property.

No feeding remains or footprints of otter were recorded during the course of the survey.

### 6.2 Badger

Evidence of badger was recorded throughout the survey area with a concentration of activity being [REDACTED] see survey plans in Appendix I and Site Photographs in Appendix II. However, no evidence of badgers crossing over the top of the A55 carriageway was recorded within the survey area.

The continued use of a main badger sett recorded during the previous 2007 survey [REDACTED]

Further evidence of badgers was recorded in the form of an annex sett to the main sett [REDACTED] and is comprised of a total of 4 entrance holes, three active (again evidenced by discarded bedding and freshly disturbed earth) and one inactive.

A small number of badger latrines were recorded to the [REDACTED] and contained a low number of fresh scats, typically no more than 3 fresh scats an each location.

Numerous badger boundary breaches including those passing through traditional slate fences were recorded throughout the survey area to both the north and south. In addition, a low number of badger foraging scrapes were also recorded throughout the survey area to both the north and south.

To the [REDACTED] a limited amount of badger evidence was recorded with a single annex or subsidiary sett comprised of two active and one inactive entrance holes being located in the [REDACTED] part of the survey area.

### **6.3 Reptiles**

The habitats considered suitable for reptiles within the survey area are primarily confined to the more open vegetation within the A55(T) highway corridor and other adjacent boundary habitats present, together with small pockets of scrub and larger areas of semi-mature and mature broadleaved woodland.

The scrub habitats within the A55(T) corridor are concluded to potentially provide the highest quality reptile habitat present within the survey area with additional lower quality areas of habitat present such as other boundary habitats, scrub, semi-mature and mature woodland. The heavily stocked and grazed improved grassland that lies directly adjacent to most of the habitat types present throughout the majority of the survey area are concluded to provide little or no potential for reptiles.

However, due to access limitations and health and safety concerns regarding access to the A55(T) corridor where single lanes closures would be required in order to complete a reptile survey, it has been concluded that an assumption of the presence of the most common species of reptile at the site that includes species such as common lizard, slow worm and grass snake will be made.

## **7.0 Other Protected Species**

### **7.1 Bats**

A separate survey and assessment of the potential effects on bats is being undertaken by an external bat specialist. A large number of mature trees are present along with farm buildings and residential properties that contain suitable features for roosting bats.

### **7.2 Fish**

It is considered possible that salmonid fish including brown / sea trout, salmon and European eel are potentially present within the watercourses that flow through the survey area from south to north and that pass under existing A55, especially the Afon Wig. However, the movement of fish such as trout and salmon is likely to be restricted to the south of the A55(T) due to the presence of the steeply graded concrete culverts immediately to the south of the A55(T) resulting in obstacles that restrict the movement and passage of fish.

### **7.3 Breeding Birds**

Mature and semi-mature woodland, scrub and boundary habitats and farm and residential buildings provide suitable habitats for a variety of breeding birds within the survey area.

Birds recorded during the course of the survey include sparrow hawk, buzzard, kestrel, black cap, blue tit, great tit, swallow, house martin and heron.

### **7.4 Invertebrates**

During the course of the survey the following invertebrate species were recorded;

- Orange tip butterfly.

## 8.0 Invasive Plant Species

The Schedule 9 invasive plant species Japanese Knotweed (*Fallopia japonica*) and *Rhododendron ponticum* are present in stands and smaller individual plants throughout the survey area (see Survey Plans in Appendix I).

In addition, two individual plants of American Skunk Cabbage (*Lysichiton americanus*) (recommended by Plant Life to be included on the Schedule 9 invasive plant species list) were recorded within the survey area (see Survey Plans in Appendix I).

## 9.0 Gwynedd BAP Species and Habitats

All Local Authorities are obliged to consider the species and habitat listed in the Local Biodiversity Action Plan. Therefore the following species and habitats are listed as priority species and habitats in the Gwynedd Local Biodiversity Action Plan (LBAP) and are, or are potentially, present within the survey area and will contribute to informing the ecological scoping process for the EIA.

### Gwynedd LBAP Species recorded within the survey area

Otter  
Newts  
Bumblebees  
Bluebell

### Gwynedd LBAP Species potentially present within the survey area

Polecat  
Brown hare  
Bats  
Barn owl  
Dragonfly / Damselfly species  
Lapwing  
Farmland birds  
Green woodpecker  
Lampreys  
Salmonids

### Gwynedd LBAP Habitats recorded within the survey area

Wet woodland  
Scrub woodlands  
Lowland meadows & pasture  
Hedgerows  
Transport corridors  
Buildings  
Gardens  
River Corridors  
Lakes, ponds & ditches

## 10.0 NERC Act Section 42 Species and Habitats

All public bodies, including Welsh Government and Gwynedd Council as scheme stakeholders, have a duty to 'have regard for' the species and habitats listed under Sections 40 and 42 of the Natural Environment and Rural Communities (NERC) Act 2006. As such the following such habitats and species are present, or are considered to be potentially present, within the survey area and will contribute to informing the ecological scoping process for the EIA).

### NERC Section 42 Species recorded within the survey area

Otter

### NERC Section 42 Species potentially present within the survey area

Bat species  
West European hedgehog

Brown hare  
Polecat  
Common cuckoo  
Kestrel  
House sparrow  
Dunnock  
Common bullfinch  
Common starling  
Song thrush  
Northern lapwing  
European eel  
River lamprey  
Brown / Sea trout  
Slow-worm  
Common toad  
Common lizard  
Grass snake  
Large garden bumblebee

#### **NERC Section 42 Habitats recorded within the survey area**

Wet woodland  
Lowland mixed deciduous woodland  
Hedgerows  
Lowland meadows  
Rivers  
Open mosaic habitats on previously developed land

## **11.0 Conclusions**

### **11.1 Otter**

From the evidence of otter collated in the field during the course of the survey it is considered unlikely that the potential resting places found form breeding holts due to the lack of direct evidence such as spraints, foot prints and feeding remains. High quality foraging habitat however, is continuous along the coast and the habitat north of the railway line that forms the northern survey boundary provides areas of more isolated scrub and woodland that could potentially support a breeding holt.

It is concluded that due to the majority of otter evidence being recorded within the northern half of the survey area to the north of the existing A55(T) and the distinct lack of otter evidence to the south of the A55(T); that the activity and movement of otters within the study area is currently being restricted to the north of the A55(T) by the impassable culverts that are present to allow the numerous small un-named watercourse to flow under the A55 trunk road and flow out to sea.

Currently, if otters desire to travel south to the other side of the A55(T) at times of high rainfall and / or spate flows then it is considered likely that they would cross the A55(T) carriageway rather than using the small culverts that contain stock prevention grills, shear step falls and which would quickly become impassable due to the volume of water passing through them during such events.

### **11.2 Badger**

The majority of the evidence of badgers during the course of the survey was recorded to the [REDACTED] with a main set being located in this part of the survey area.

It is concluded that the large badger set with 10+ active entrance holes and 30+ inactive entrance holes is a historic main sett that has been present at this location for a significant period of time prior to the previous survey undertaken in 2007 and is concluded to have been occupied at this location for at least the past 20-30 years.

However, the number of actively used sett entrance holes (10+ active and 30 + inactive) and the low number of fresh badger scats deposited in latrines, potentially indicates a low number or low density of badgers occupying the sett and using the surrounding habitat.

A smaller active sett with three recently used entrance holes is concluded as an annex to the main sett above and is [REDACTED]

No evidence of badgers crossing over the top of the A55 carriageway was recorded within the survey area.

A significantly reduced amount of badger activity was recorded within the [REDACTED]

The previous 2007 badger survey reported anecdotal evidence of a number of active badger setts, [REDACTED]

[REDACTED] However, the presence and / or activity status of these setts could not be confirmed as these locations are located outside of the survey area and land access agreements for this project.

In addition, it was concluded in the previous 2007 survey that the presence of traditional slate fencing forming many of the boundaries within the survey area prevent the movement of badgers and act as badger exclusion fencing. However, numerous instances of badger boundary breaches through this style of fence were recorded during the course of the survey.

### **11.3 Reptiles**

The most suitable areas of habitat for reptiles within the survey area are formed by the scrub habitat within the current A55(T) corridor and other associated boundary habitats and areas of scrub and semi-mature woodland.

Due to health and safety concerns regarding access to the A55(T) roadside (see section 5.0 Limitations to the Survey) it has been concluded that the boundary habitats and less intensively managed areas of the highway are likely to support an assemblage of the more common species of reptile such as common lizard, slow worm and grass snake.

### **11.4 Fish**

It is concluded that migratory fish such as the salmonids salmon and brown / sea trout and European eel are likely to be present in the northern half of the survey area within the numerous watercourses that flow beneath the A55(T) to the sea.

It is also concluded that the passage of fish is restricted upstream and to the south of the A55(T) due to the presence of culverts with shear fall steps and other associated design features that render culverts such as those present as impassable obstacles to these fish species.

## **12.0 Mitigation and Habitat Enhancement Recommendations**

The following mitigation and habitat enhancement recommendations should be considered further as the design develops and EIA process continues whilst maintaining consultation with NRW regarding the more sensitive aspects.

### **12.1 Otter**

It is recommended that even though the majority of the watercourses are considered to provide low quality foraging habitat for otters, replacement culverts beneath the A55(T) carriageway would allow the safe movement of the species to an enlarged range of available habitat to the south of the highway.

Mammal proof fencing should also be installed accordingly, in order to guide otters towards safe crossing points and prevent access onto the carriageway.

## **12.2 Badger**

It is recommended that the design of the proposed access road on the [REDACTED] [REDACTED] is developed to minimize the potential impacts on the annex badger sett located within the current highway boundary, and consultation with NRW undertaken to determine whether a licence to disturb badgers and their setts (as a minimum if the sett is avoided) or to destroy (in the worst case scenario) the sett is required.

It is also recommended that mammal proof fencing is installed accordingly in order to prevent badgers from accessing the carriageway.

There are no habitat enhancement measures for badgers due to the availability of suitable habitat present within the study area.

## **12.3 Reptiles**

It is recommended that no work occurs in habitats considered suitable for reptiles (all boundary, verge, scrub and woodland habitats) during the winter hibernation period (November to March inclusive) and without a watching brief for these species.

It is also recommended that the design and management of the soft estate within the area of the proposed improvement is developed accordingly to off-set the loss of currently suitable reptile habitat which may be lost during construction.

## **12.4 Fish**

It is recommended that no work is undertaken that affects watercourses during the fish spawning season November to April inclusive and that fish passes are fitted to the culverts of all watercourses that flow under the A55(T) throughout the survey area in order to allow the unrestricted movement and passage of fish.

Consultation with NRW should also be undertaken with regard to the potential requirement of fish rescues on all watercourses prior to any in channel works beginning.

It is recommended that all obstacles to the movement and passage of spawning and migratory fish such as the impassable culverts and revetments located in all watercourses throughout the survey area immediately to the south of the existing A55(T) should be removed in order to allow the movement of fish to an enlarged area of available habitat.

## **12.5 Soft Estate Habitats**

It is recommended that due to the presence of a varied assemblage of wildflowers within the current soft estate of the A55(T) and boundary habitats that habitats affected or newly constructed verges are re-seeded with a wildflower mix containing bluebells, lesser stitchwort, red campion, common knapweed, ramsons, primrose, cowslips, meadowsweet and oxeye daisy in order to retain and enhance the biodiversity of flowering species at this location and to provide an increased foraging resource for LBAP species such as Bumblebees.

## **13.0 Recommendations for Further Survey Work**

### **13.1 Otter**

No otter holts or resting places are located in the vicinity of the proposed works, therefore no Natural Resources Wales European Protected Species licence is required for the works to progress.

However, it is recommended that a pre-construction survey for otter is undertaken to confirm and update the findings contained within this report if the proposed works are not progressed within 12 months of the issue of this report.

### **13.2 Badger**

It is recommended that a pre-construction survey for badgers is undertaken to confirm and update the findings contained within this report and in order to confirm the activity status of setts recorded that maybe disturbed or destroyed as a result of the proposed works and / or if the proposed works are not progressed within 12 months of the issue of this report.

# **Appendix I**

## **Otter and Badger Survey Plans**



## Appendix II

### Site Photographs



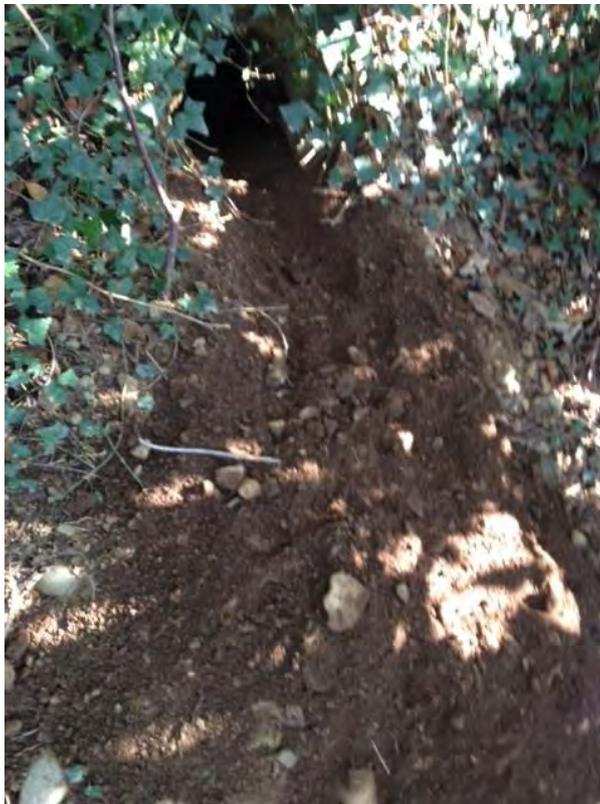
**Photograph 1:** View of outlying badger sett within [REDACTED]



**Photograph 2:** Close up view of outlying badger sett within [REDACTED]



**Photograph 3:** View of active badger sett entrance holes within [REDACTED]



**Photograph 4:** View of active badger sett entrance holes at location of main sett to [REDACTED]



**Photograph 5:** View of active badger sett entrance holes within [REDACTED]



**Photograph 6:** View of active badger sett entrance holes at location of [REDACTED]



**Photograph 7:** View of two inactive badger sett entrance holes.



**Photograph 8:** Zoomed in view of badger footprint.



**Photograph 9:** View of badger boundary breach with guard hairs.



**Photograph 10:** View of badger boundary breach with guard hairs.



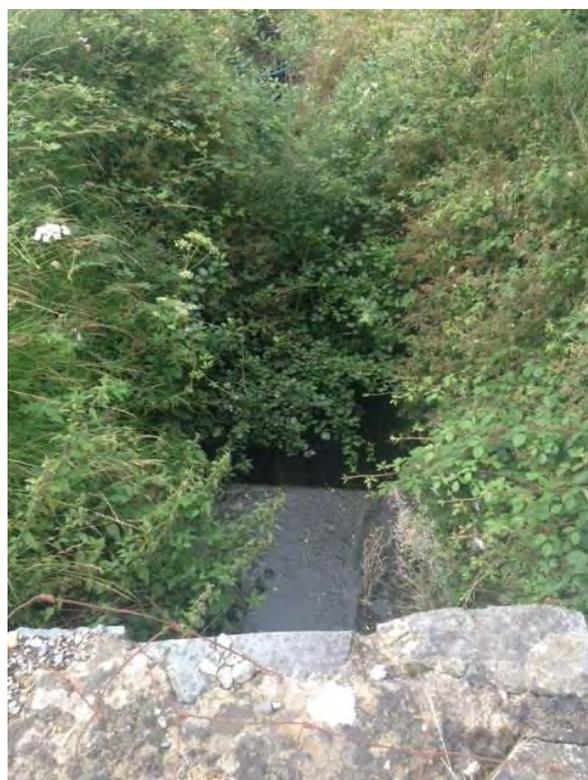
**Photograph 11:** View recent otter spraint on rock within watercourse to north of survey area and A55(T).



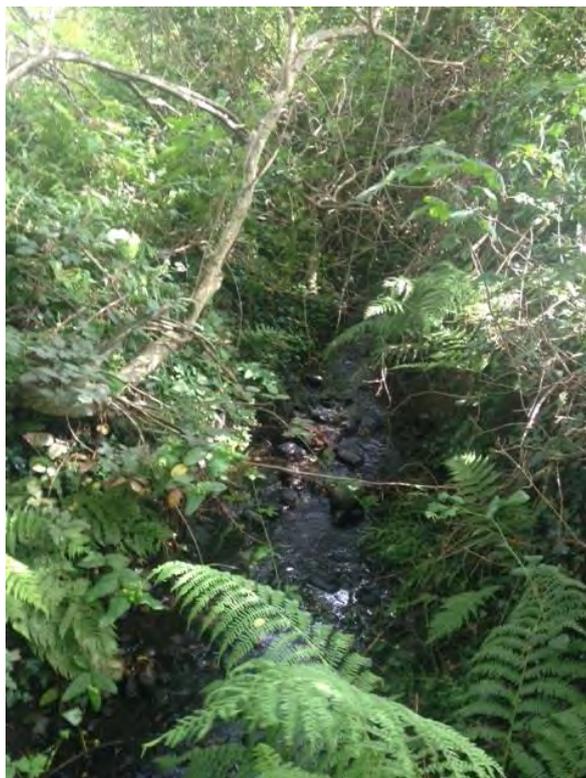
**Photograph 12:** View of culvert to south of A55(T) that forms impassable obstruction to otter and fish.



**Photograph 13:** View of detail of typical shear culvert step flowing under A55(T) to the south and that form impassable obstructions to otter and fish.



**Photograph 14:** View of typical small un-named watercourse with deep cut erosion from flows through culverts beneath A55(T) and restricted access for survey and shear fall step forming impassable obstacle to otters and fish.



**Photograph 15:** View of typical small un-named watercourse with deep cut erosion from flows through culverts beneath A55(T) and restricted access for survey.



**Photograph 16:** View of typical small un-named watercourse with deep cut erosion from flows through culverts beneath A55(T) and restricted access for survey.



**Photograph 17:** View of American Skunk Cabbage on small un-named watercourse to south of survey area.

## References

Highways Agency. 2009. *Design Manual for Roads and Bridges (DMRB)*.

Institute of Environmental Assessment. 1995. *Guidelines for Baseline Ecological Assessment*.

Hodnet, T. 2007. *Extended Badger and Otter Survey. A55 Abergwyngregyn Gwynedd*.

**EXTENDED BADGER SURVEY AND OTTER SURVEY**

**Site:** A55  
Abergwyngregyn  
Gwynedd

**Client:** Environment Directorate  
Gwynedd Consultancy  
Council Offices  
Shire Hall Street  
Caernarfon  
LL55 1SH

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**1.0 INTRODUCTION****1.1 Aim**

Following consultations with CCW, post the field survey undertaken by ourselves during February 2007, CCW have requested an extended survey to attempt to plot the range of the recorded clan occupying the main sett within [REDACTED]. The survey was to identify any crossing points to the existing trunk road and to establish use of any potential foraging grounds to the southern side of the carriageway. The survey was also to include a field investigation of 8 waterways as noted on plan ref: Fig. 1.2 for signs of activity by Otter and as logged on 0435-FS-1.

**1.2 Survey Area****Badger**

*Area 1* – land adjacent to the northern (eastbound lane) boundary of the A55 running from west to east from grid line SH 615 to SH 650 (eastings), extending between the carriageway to the south and the rail track to the north. This included a narrow corridor of land adjacent to the northern boundary fence of the railway corridor, to identify crossing points.

*Area 2* – an area of land to the south of the Tal-y-bont Bridge and the bridge area, to identify evidence of crossing and territorial boundaries. Access to the land in the ownership of Ty'n yr Hendre was limited due to foot and mouth restrictions at the time of survey.

## **Otter**

Water courses denoted 1 to 8 on Fig 1.2 and as logged on 0435-FS-1.

### **1.3 Existing Data**

Previous surveys have identified activity in the general area of the proposed works. The previous recordings have been plotted for reference on plan 0435-FS-1 for reference.

No previous data for Otter was available for the A55 corridor at the time of writing this report.

### **1.4 Site Description**

The habitat classifications have been identified in previous survey reports. The site descriptions are kept brief in this follow up report and refer the reader to previous reports that identify the habitats and site description in greater detail.

*Area 1* – a mix of improved grassland with primary use as grazing pasture and fenced of mixed species woodlands and copse. The boundaries are a mix of hedge and ditch, hedge, and post and wire fencing. The areas are generally undeveloped other than farms and railway cottages.

*Area 2* – a mix of improved grassland which rises towards the foot hills on the northern side of the Carneddau and areas of mixed species woodland.

*Stream 1* – located at the western end of the survey area. The stream appears from a culvert under the A55 by the Tal y Bont Bridge and runs north in a deep eroded cut formed by flash floods. The banks ease as the stream enters the woodland adjacent to the railway embankment. At this point the stream is shallow and narrow and is over cast with the lower branches and scrub. The stream emerges into grassland and runs north forming part of the field boundaries. One side of the stream is grazed with other being formed by hedgerow. The base of the stream is unvegetated with a gravel base. The stream joins stream 2 and flows to the northwest before petering out within fields before the shore line.

*Stream 2* – this stream runs from the carriageway along the side of a hedgerow before turning to the west and then to the south to the railway. The stream is just in board of the woodland edge. The stream is narrow and shallow with little marginal vegetation. The stream appears on the northern side of the railway track through a culvert and forms a narrow drainage ditch which abuts the hedgerow.

*Stream 3* – this stream runs from the carriage way and appears from a culvert under the concrete field track parallel to the carriageway. The stream runs through the pine plantation. It is over covered by Rhododendron for most of its length before disappearing within a ditch parallel to the rail line.

*Stream 4* – this stream runs north from the rail line and forms a drainage ditch which runs in a straight line across the improved grassland to the sea.

*Stream 5* – this stream starts above the Nant-Heilyn plantation and flows north towards the A55. The stream is open for most of its length with a gravel base. The banks vary from open grassland, to linear lines of alder plantation, before flowing through Coed Wern. The banks of the stream through the woodland are open but are formed from grasses and areas of bluebell. The stream leaves the woodland and flows to a culvert under the A55. It appears from the culvert similarly to stream 1; the stream bed has been eroded by flash floods, leaving steep cut sides. The stream flows across managed grassland before flowing under the railway via a culvert. It appears on the other side and flows around the northern edge of a small copse before running north along side a track to the sea. Most of this area is heavily vegetated with scrub and ruderal plants.

*Stream 6* – this is a small stream which runs from the A55 through a small strip of woodland before turning to the east to form a field ditch, then turns north along a field boundary until it abuts the railway embankment. The stream follows the railway to the east before being culverted underneath the railway. The stream reappears on the northern side and forms a drainage ditch which runs into the sea.

*Stream 7* – this is a short length of field ditch which joins stream 6 at the railway culvert.

*Stream 8* – this stream is a small field ditch which runs from the A55 north towards the rail line where it abuts the embankment, the ditch runs west before petering out.

## **2.0**      **METHODOLOGIES**

### **2.1**      **Badger** *Meles meles*

Walk over survey to record setts, pathways, latrines, foraging activity and associated feeding habitat. Emphasis was placed on identifying any pathways or access points across the road used by this species. These were then followed to record any further evidence of badger activity.

### **2.2**      **Otter** *Lutra lutra*

Walk over survey to record linear and static water bodies and terrestrial habitat capable of supporting populations of this species. Any suitable water bodies identified were subjected to terrestrial searches for holts, spraints, footprints, feeding remains and slipways.

### 3.0 **RESULTS**

#### 3.1 **Badger**

*Areas 1* – signs of badger activity were recorded primarily to the west of the previously recorded main sett [REDACTED]. A single outlier sett was recorded [REDACTED]. Most of the foraging activity was within the open pasture. Most of the badger hair traces found were associated with the wire fencing on the eastern side of [REDACTED] and [REDACTED]. It is worth noting that the fencing to the western side of [REDACTED] is formed from traditional slate slabs, which are set into the ground and placed apart with a vertical gap of approximately 150 mm. The top edges of the slate slabs are secured in line with twisted wire. This type of fence seems to act as a barrier to the badgers. Similarly the newly replaced Railtrack fencing is acting as badger exclusion fence. The Railtrack fence has not been replaced where [REDACTED]. The old fence has gaps which give access to the Railtrack land. The results of the survey together with the previous survey results, would suggest that this clan is active within the rail corridor and the farm land pasture between the rail track and the A55 corridor. No evidence was found which suggests that this clan of badgers is crossing the main road or venturing north of the railway land. Anecdotal evidence of two outlying setts was given by the land owner of Ty'n yr Hendre Farm; these outliers are located [REDACTED].

*Area 2* – this area of survey was limited due to access, however the immediate crossing point of the Tal y Bont Bridge recorded no evidence of use by badgers crossing the road or exiting the fields to the south of the road. The land owner of Ty'n yr Hendre farm did give anecdotal evidence of a main sett and a 2 hole outlying sett [REDACTED]. The positions of these setts are recorded on the attached survey plan.

#### 3.2 **Otter**

*Stream 1* – no evidence of this species was recorded.

*Stream 2* – no evidence of this species was recorded.

*Stream 3* – no evidence of this species was recorded.

*Stream 4* – no evidence of this species was recorded.

*Stream 5* – the remains of an artificial holt was recorded on the northern side of the copse. The copse abuts the northern boundary of the Railtrack land on the opposite side of the railway by Wig Cottages. No recent evidence of use by this species was recorded in this area or to any other sections of the river. The artificial holt is sited at the base of an ash tree, with direct access from the stream under a low branch. The roof of the holt is partially collapsed and displaced.

*Stream 6* – no evidence of this species was recorded.

*Stream 7* – no evidence of this species was recorded.

*Stream 8* – no evidence of this species was recorded.

In general the streams are narrow, and recorded shallow water levels at the time of survey. Most of the streams are field drainage ditches sited adjacent and parallel to the field boundaries. Cover is limited with few suitable areas for use as rest ups or holts. It cannot be ruled out that otters may be using the streams as access corridors; however no large water bodies with fish stocks are recorded to the southern side off the A55 within the survey areas. The seashore, the Afon Ogwen estuary and the pools at the Ogwen Nature Reserve offer greater foraging for this species.

#### **4.0 POTENTIAL IMPACTS**

##### **4.1 Badger**

As previously commented, the proximity of the badger sett to the proposed works is by far the most important issue: The use of heavy machinery is not permitted within 30m of an active badger sett unless licensed. The sett located within the [REDACTED] has been recently surveyed to log all of the present sett entrances. This should give a better understanding of the layout of the sett and its actual position relative to the proposed works.

The survey results suggest that this clan is active within the corridor between the A55 and the railway. The new rail track fence will have an impact on badgers foraging along its northern boundary with reduced access to the embankment. It is not known at the time of writing this report, what Railtrack's policy is with regard to badgers and their Health and Safety Policies.

At present badgers can gain access to the northern verge of the A55 road way. The proposals are to widen the carriageway and realign some of the present property access roads off the high way. The start position of the road widening is to the [REDACTED] and should not directly affect the sett in the long term. However the level of infrastructure works and land take areas during the construction works are not as yet confirmed. The positioning of haul roads will be critical, so as not to impinge on the present foraging areas of this clan. The proposed relief road, which will run parallel to the northern boundary of the A55 will connect to the existing concrete access road adjacent to [REDACTED]. This work will impact on the present foraging activity along the northern road boundary and verge.

##### **4.2 Otter**

No evidence of activity for this species was recorded at the time of survey, however it cannot be ruled out that the streams are not used as commuting corridors. At present the culverts are small in section and during flood conditions any otters tracking these streams and wishing to go south of the carriageway will not use the culverts but over run the carriageway.

## **5.0 MITIGATION PROPOSALS**

### **5.1 Badger**

Due to the proximity of the main sett to the road works it is recommended that a badger licence is obtained from DEFRA for a license to carry out works under the supervision of a suitably experienced consultant ecologist. At present the extent of the short term construction works is as yet not fully quantifiable until a contractor has been appointed. However conflict will arise between the present badger access points [REDACTED] and the proposals to link a relief road to this crossing point. It is advised that a Badger exclusion fence is erected on the southern boundary of the plantation. Alternative access points should be created within the slate fencing on the western boundary of [REDACTED]. Temporary bridges should be erected over the stream in the woodland to direct badgers to these new access points. Depending on the proposed construction methods for this relief road and the proposed alignment of any haul roads in this area, the extent of the exclusion fence may have to be reviewed to prevent any badgers entering construction areas.

The northern edge of the relief road [REDACTED] should be planted out to its full length with an area of hedgerow and scrub headland to form extra foraging and cover.

On completion of the works, all efforts must be made to allow badgers access to their traditional foraging pathways along the A55 embankment and beyond. A contingency fund should be set aside for the erection of a badger exclusion fence to the high way. This should be expended if it is found that road kills are recorded in this section increases.

### **5.2 Otter**

The survey recorded no activity for this species, however if any road kills are recorded then fencing should be considered to prevent access across the carriageway. The fencing should be so positioned so as to direct the otters to the existing underpasses.

## **6.0 CONCLUSIONS**

It is in the surveyor's opinion that the findings with relation to the Badger survey are as follows:

The main sett located [REDACTED] and the recorded outlying setts on the [REDACTED] make up a single clans territory, with the main road and the rail track, at present acting as natural boundaries. Little evidence supports any crossing of this clan to either the northern side of the rail track or to the southern side of the A55. The anecdotal records for a main sett and outliers to [REDACTED] suggest that this area accommodates a second clan. The surveys on the southern side of the survey area records little badger activity until the woodland behind [REDACTED]. Local anecdotal records suggest that a third main sett is located [REDACTED]

[REDACTED] This area is directly south of

the survey records for [REDACTED] and suggests that this recorded activity is associated with a third clan. Neither of these clans will be affected by the proposals.

## **7.0**      **LIMITATIONS**

### **7.1**      **Badger**

Access to the land on the southern side of the A55 was restricted due to concerns of the local land owner in respect to foot and mouth. Access was agreed to the northern land in ownership.

The optimum time for survey for undertaking Badger surveys is February to April, coinciding with a peak territorial activity and a period when vegetation growth is at a minimum, therefore enhancing the probability of detection of field signs. A secondary but less pronounced peak occurs in October. Surveys can be undertaken outside of these favourable periods but field signs will be both less abundant and less obvious.

**A.D.C.**  
August 2007

# Abergwyngregyn to Tai'r Meibion A55 Improvements

## Otter and Water Vole Survey

### Introduction

A repeat survey for water voles and otters was carried out on the watercourses adjacent to the A55 between Abergwyngregyn and Tai'r Meibion on 27<sup>th</sup> May 2008, prior to the planned road improvements. An approximate 100m stretch (flowing to or from the A55) of each watercourse was surveyed and was conducted following recent heavy rain and in overcast conditions. A previous survey had been carried out by Timothy Hodnett in August 2007 with no field signs of either of these Protected Species being found.

### Habitat Descriptions

**Stream 1** - Flows north of the A55 forming the boundary between improved grassland fields grazed by cattle and/or sheep. Fenced on both sides with scrub vegetation. Approximately 0.5m wide, very shallow and quick flowing within a shear cut channel approximately 1.75m deep with a gravel bed. The stream contains very little aquatic, emergent or marginal vegetation. It is very overgrown with bramble and extremely shaded.

The habitat provided by this watercourse is not particularly suitable for water voles being fast flowing, shallow, over shaded, rocky banks unsuitable for burrowing and lacking suitable vegetation for feeding and cover. This watercourse potentially provides suitable cover and a possible commuting route for otters to other areas in the locality. However, the suitability of the stream and the immediately surrounding habitat offers limited opportunities in the way of foraging potential for this species.

**Stream 2** - Flows north of the A55 forming the boundary between improved grassland fields grazed by sheep. Fenced on both sides with overgrowth of bramble and hedgerow on west bank. Approximately 0.5m wide, very shallow and quick flowing within a shear cut channel approximately 1.75m deep with a gravel bed. The stream contains very little aquatic, emergent or marginal vegetation. It is very overgrown with bramble and extremely shaded.

The habitat provided by this watercourse is not particularly suitable for water voles being fast flowing, shallow, over shaded, rocky banks unsuitable for burrowing and lacking suitable vegetation for feeding and cover. This watercourse potentially provides suitable cover and a possible commuting route for otters to other areas in the locality. However, the suitability of the stream and the immediately surrounding habitat offers limited opportunities in the way of foraging potential for this species.

**Stream 3** - Flows north of the A55 into pine plantation from under farm track culvert parallel to A55. Approximately 0.25m wide, very shallow and slow flowing with a silt and mud bed. The stream contains very little aquatic, emergent or marginal vegetation and is extremely overgrown and very shaded by Rhododendron.

The habitat provided by this watercourse is not particularly suitable for water voles being shallow, very over shaded, ungraded banks unsuitable for burrowing and lacking suitable vegetation for feeding. This watercourse potentially provides suitable cover and a possible commuting route for otters to other areas in the locality. However, the suitability of the stream and the immediately surrounding habitat offers limited opportunities in the way of foraging potential for this species.

**Stream 4** – Flows in a culvert north from the A55 and emerges north of the railway and continues to the sea, forming the boundary between improved grassland grazed by sheep. Adjacent to hedgerow on east bank. Approximately 0.5m wide, shallow and quick flowing with a rocky bed. The stream contains very little aquatic, emergent or marginal vegetation.

The habitat provided by this watercourse is not particularly suitable for water voles being fast flowing, shallow, rocky banks unsuitable for burrowing and lacking suitable vegetation for feeding and cover. This watercourse potentially provides suitable cover and a possible commuting route for otters to other areas in the locality. However, the suitability of the stream and the immediately surrounding habitat offers limited opportunities in the way of foraging potential for this species.

**Stream 5** – Afon Wig. Flows north of the A55 forming the boundary between improved grassland fields grazed by sheep and cattle. Approximately 1.5m wide, up to 0.5m deep and with a rocky gravel and silted mud bed. Adjacent to hedgerow with mature trees on west bank. The stream contains very little aquatic, emergent or marginal vegetation. The watercourse is predominantly open but is shaded in parts by overgrowth of scrub vegetation and mature trees. A partially collapsed and disused artificial otter holt was recorded during the previous survey but was not evident on the ground on 27/5/2008.

The habitat provided by this watercourse is potentially suitable for water voles though sub optimal being fast flowing, shallow, over shaded, rocky banks unsuitable for burrowing and lacking suitable vegetation for feeding and cover. This watercourse potentially provides suitable cover and a possible commuting route for otters to other areas in the locality. However, the suitability of the stream and the immediately surrounding habitat offers limited opportunities in the way of foraging potential for this species.

**Stream 6** – Flows north of the A55 through small deciduous woodland. Adjacent to garden and dry stone wall on west bank. Approximately 0.5m wide, shallow and quick flowing with a silted and rocky bed. The stream contains very little aquatic, emergent or marginal vegetation. The watercourse is extremely overgrown and shaded by the woodland.

The habitat provided by this watercourse is not particularly suitable for water voles being shallow, very over shaded, ungraded and stone walled banks unsuitable for burrowing and lacking suitable vegetation for feeding. This watercourse potentially provides suitable cover and a possible commuting route for otters to other areas in the locality. However, the suitability of the stream and the immediately surrounding habitat offers limited opportunities in the way of foraging potential for this species.

**Stream 7** - Flows north to the A55 through small deciduous woodland. Fenced on both sides. Adjacent to garden on east bank. Approximately 0.5m wide, shallow and quick flowing with a gravel, rock and silt bed. The stream contains very little aquatic, emergent or marginal vegetation. The watercourse is extremely overgrown and shaded by the woodland.

The habitat provided by this watercourse is not particularly suitable for water voles being fast flowing, shallow, very over shaded, rocky banks unsuitable for burrowing and lacking suitable vegetation for feeding. This watercourse potentially provides suitable cover and a possible commuting route for otters to other areas in the locality. However, the suitability of the stream and the immediately surrounding habitat offers limited opportunities in the way of foraging potential for this species.

**Stream 8** - Flows north of the A55 forming the boundary between improved grassland fields grazed by cattle. Adjacent to a hedgerow on the east bank. Approximately 0.25m wide, very shallow and slow flowing within a steeply cut channel approximately 1.75m deep with a mud and rock bed. The stream contains very little aquatic, emergent or marginal vegetation.

The habitat provided by this watercourse is not particularly suitable for water voles being fast flowing, shallow, over shaded, rocky banks unsuitable for burrowing and lacking suitable vegetation for feeding and cover. This watercourse potentially provides suitable cover and a possible commuting route for otters to other areas in the locality. However, the suitability of the stream and the immediately surrounding habitat offers limited opportunities in the way of foraging potential for this species.

## **Method and Results**

### **Water Voles**

Each stream was individually assessed for the suitability of habitat and the field signs of water voles such as burrows, tracks, latrines and feeding stations. No evidence of the activity or presence of water voles was recorded on any of the watercourses surveyed.

## **Otters**

Each stream was individually assessed for the suitability of habitat and the field signs of otters such as tracks, feeding remains, spraints, holts and rest areas. No evidence of the activity or presence of otters was recorded on any of the watercourses surveyed.

*Stream 1* - No evidence of either water voles or otters was recorded.

*Stream 2* - No evidence of either water voles or otters was recorded.

*Stream 3* - No evidence of either water voles or otters was recorded.

*Stream 4* - No evidence of either water voles or otters was recorded.

*Stream 5* - No evidence of either water voles or otters was recorded.

*Stream 6* - No evidence of either water voles or otters was recorded.

*Stream 7* - No evidence of either water voles or otters was recorded.

*Stream 8* - No evidence of either water voles or otters was recorded.

## **Conclusions and Recommendations**

No evidence of the activity or presence of either water voles or otters was recorded on any of the streams surveyed. Despite the recent heavy showers, low level flows were observed in all watercourses. Much of the streams substrates were exposed and field signs of both species would have been potentially visible.

The lack of any evidence to confirm the existence of water voles on these watercourses indicates that there is therefore no likely impact for this species that could result from the planned works.

Despite the lack of any evidence to confirm the existence of otters on any of the watercourses surveyed, they are known to be present and active in the area. An otter fatality was recorded on this section of the A55 in approximately 1999. However, it is unlikely that there would be any impact on this species resulting from the planned works, as the culverts are remaining where they are and will only be extended in line with the improvements. There are therefore no recommendations for this species.

Christian Middle. 28<sup>th</sup> May 2008.

**Great Crested Newt Survey  
Report**

**A55 Ponds Between  
Talybont and Abergwyngregyn,  
Gwynedd.**

**For Gwynedd Consultancy**

**By Christian Middle**

**26<sup>th</sup> April 2008**

Christian Middle

6 Tan y Foel, Carneddi, Bethesda, Gwynedd. Tel: 01248 605025 / 07701048638.

## **Introduction**

Following your request on the 18<sup>th</sup> April 2008 to carry out Great Crested Newt Surveys on the land adjacent to the A55 between Tal-y-bont and Abergwyngregyn, Gwynedd; I am writing to provide details of the results of those surveys which have now been completed on your behalf for the proposed road works by the Welsh Development Agency.

The survey was carried out during a number of repeated visits to the site and the surrounding area in accordance with the requirements of the Countryside Council for Wales (CCW) between 22<sup>nd</sup> and 26<sup>th</sup> April 2008.

## **Method and Results**

The three ponds highlighted for survey on the information provided, numbered 2, 11 and 12 were assessed for the suitability of surveying for Great Crested Newts (GCN) (*Triturus cristatus*) with bottle traps and/or torch light after dark on the 22nd April 2008. The survey consisted of four nights bottle trapping and four nights of surveying by torch light after dark, on days with suitable weather conditions. A number of additional potential ponds were also visited and assessed for their suitability to be included within the survey.

Grid Reference SH 617710 – Well marked on Ordnance Survey map. Shallow rapidly flowing stream bordering improved grassland and mature broadleaved woodland. No standing still water. No suitable habitat for GCN.

Grid Reference SH 624713 – Well marked on Ordnance Survey map. Not evident on ground. No suitable habitat for GCN.

Grid Reference SH 630712 – Well marked on Ordnance Survey map. Not evident on ground. No suitable habitat for GCN.

Grid Reference SH 626717 - Well marked on Ordnance Survey map. Not evident on ground. No suitable habitat for GCN.

Pond 11. Grid Reference SH 631719 – No pond. A shallow ditch and surrounding wet improved grassland flows into a culverted stream that flows under and adjacent to a farm track. A well marked on the Ordnance Survey Map and situated on opposite side of the track was also assessed for its suitability of habitat for GCN but was not evident on the ground other than a small dry depression. Neither area contained standing water and were deemed unsuitable habitat for GCN and therefore not included within the survey.

Pond 12. Grid Reference SH 636721 – No pond. An old drained walled pond exists with a shallow stream flowing rapidly through the habitat that is situated in a small wooded

copse adjacent to farm buildings. No standing still water was present and therefore the habitat was deemed unsuitable for GCN and was not included within the survey.

Pond 2. Grid Reference SH 638718 (See Appendix 1 for photograph.) – Small overgrown and silted pond approximately 2 x 3m and 1m deep with 5% open water. A small amount of slow flowing water passes through the pond. The pond is situated within marshy semi-improved grassland, adjacent to a small mature broadleaved woodland and contains an abundant growth of floating sweet-grass (*Glyceria fluitans*) and brooklime (*Veronica beccabunga*). Despite the habitat being potentially suitable for GCN, no eggs were found on the aquatic vegetation present. 8 traps set.

Pond A. Grid Reference SH 653726 (See Appendix 1 for photograph.) – Medium open pond approximately 7 x 16m and 2m deep with 95% open water. A rapidly flowing stream enters and exits the pond at opposite ends and contains open deep areas together with silted banks with aquatic vegetation such as water mint (*Mentha aquatica*), marsh marigold (*Caltha palustris*) and fool’s water-cress (*Apium nodiflorum*) Despite the habitat being potentially suitable for GCN, no eggs were found on the aquatic vegetation present. 20 traps set.

Two ponds were concluded as potentially suitable habitat for GCN, Pond 2 and Pond A. A third pond, Pond 12 was included in the Torch survey for the first night only when it was decided that this too was unsuitable habitat for GCN and withdrawn from the survey.

**Table 1. Great Crested Newts Pond Survey Results**

		<b>Date</b>	<b>Min. –Max. Temp.</b>	<b>Date</b>	<b>Min. –Max. Temp.</b>	<b>Date</b>	<b>Min. –Max. Temp.</b>	<b>Date</b>	<b>Min. –Max. Temp.</b>
<b>Pond</b>	<b>No. of Traps</b>	22/4/08	7-18 °C	23/4/08	7-17 °C	24/4/08	7-15 °C	25/4/08	8 - 14 °C
		<b>Torch</b>	<b>Bottle</b>	<b>Torch</b>	<b>Bottle</b>	<b>Torch</b>	<b>Bottle</b>	<b>Torch</b>	<b>Bottle</b>
<b>2</b>	8	0	2PM 2SF	0	3PM 2PF	1PM	3PM 1PF 1SF	0	6PM 1PF 1SM 1SF
<b>A</b>	20	9PM 4PF	11PM 4PF	5PJ 21PM 8PF	1PJ 13PM 6PF	9PM 2PF	5PM 2PF 1SF	2PJ 6PM 3PF	2PM 1PF
<b>12</b>	0	0	-	-	-	-	-	-	-

Key: GCN – Great Crested Newt. P – Palmate Newt (*Triturus helveticus*). S – Smooth Newt (*Triturus vulgaris*). M - Male. F – Female. J – Juvenile.

## **Summary and Conclusions**

The two most common species of newt, Smooth and Palmate were recorded in both of the ponds surveyed. However, their presence does not require any form of mitigation as these two species have not been allocated any legal protection status.

No GCN were recorded at any of the ponds during either the torchlight or bottle trap parts of the survey and no GCN eggs were found during the search on the aquatic vegetation present. In conclusion there are no requirements for the mitigation of GCN as their presence on the site has not been confirmed.

Christian Middle  
28th<sup>th</sup> April 2008

The information contained within this report may be copied or reformatted. However, no alterations to the text or the information contained therein, should be made without prior arrangement and agreement with the author.

## Appendix 1



**Pond 2.**



**Pond A.**

## **Appendix 2**

### **Great Crested Newts**

Great Crested Newts are protected under Schedule 5 of the Wildlife and Countryside Act 1981 and under Schedule 2 of the Conservation Regulations 1994 (Habitats Regulations Directive). Great Crested Newts are protected from deliberate disturbance, killing, injury or capture. Their habitat such as breeding ponds, resting places or any place used for shelter or protection is protected against damage or destruction.

The Wildlife and Countryside Act 1981 makes it an offence to;

- Intentionally kill, injure or take a Great Crested Newt.
- Possess or control any live or dead specimen or anything derived from a Great Crested Newt.
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a Great Crested Newt.
- Intentionally or recklessly disturb a Great Crested Newt while it is occupying a structure or place which it uses for that purpose.

The Habitat Regulations make it an offence to;

- Deliberately capture or kill a Great Crested Newt.
- Deliberately disturb a Great Crested Newt.
- Deliberately take or destroy the eggs of a Great Crested Newt.
- Damage or destroy a breeding site or resting place of a Great Crested Newt.

It is a requirement of the law that all works on site must cease immediately and a licence obtained from and issued by CCW if Great Crested Newts are found.

# Mynydd Timber Services Limited

18 Tan y Bwlch. Mynydd Llandegai, Bangor. Gwynedd. LL57 4DX

Company Number 5250394  
VAT Number 709 5762 09

## Pre-development Arboricultural Report (revision 3)

For:

Ymgynghoriaeth Gwynedd Consultancy  
(YGC Project 5055 - Preliminary Drainage Works)

03th October 2016

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## APPENDICES:

Appendix I 5055 Tree Survey Data Tables

Appendix II 5055 Tree Survey Data Tables - Additional

Appendix III BS5837:2012 Cascade Chart for Tree Quality Assessment

Appendix IV Tree Protective Fence Detail

Appendix V Tree Protection Notices

Appendix VI List of Common and Botanical Names

Appendix VII Temporary Ground Protection Detail

## **1. BACKGROUND INFORMATION**

### **1.1. Description of Proposed Development.**

Preliminary drainage works in advance of major road widening and access improvements from J12-J13 on A55 trunk road.

### **1.2. Brief.**

To carry out a tree survey in accordance with BS 5837 2012, in order to assess the implications posed by any arboricultural features on the site in relation to the above development, and to detail any necessary measures to be taken in order to both facilitate the development, and to protect any arboricultural features that are to be retained.

### **1.3. References:**

The British Standard Institute publication: BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations' is referred to throughout this report. This is a nationally recognised standard typically used by Local Planning Authorities (LPAs) to assess planning applications. It is frequently referred to in planning conditions to enforce protection or control of works that may be harmful to trees both on and off the site.

### **1.4. Terms and Definitions**

- 1.4.1. Arboricultural Impact Assessment (AIA) – Evaluates any constraints found in the survey in relation to the proposed development.
- 1.4.2. Arboricultural Method Statement (AMS) – Demonstrates how any operations in close proximity to trees that are to be retained can be carried out with minimal adverse impact.
- 1.4.3. Root Protection Area (RPA) – These represent below ground constraints. Work in these areas works should be avoided where possible. Where work in these areas cannot be avoided, it should be carried out in accordance with an Arboricultural Method Statement.
- 1.4.4. Tree Constraints Plan (TCP) – This plan shows above and below ground constraints that may impact on a planning proposal such as the tree branch spread and Root Protection Areas.
- 1.4.5. Tree Protection Plan (TPP) – This shows the layout of protective measures for retained trees. This drawing is intended to be used for planning purposes and also as a reference on-site.

## 2. EXECUTIVE SUMMARY

### 2.1. Survey.

A site survey was carried out by Mynydd Timber Services in August and September 2015, and additional areas were surveyed in September 2016. A total of 172 arboricultural features were recorded, including 117 trees, 31 groups of trees and 24 hedgerows. The majority of the trees recorded are recorded in Groups.

There was a broad mix of trees at different life stages, consisting of native and naturalised species. The majority of the trees were assigned category A and category B, with 29 category C and 6 category U trees.

### 2.2. Arboricultural Implications.

2.2.1. The new drainage ditch to the east of Tai'r Meibion will require the removal of approximately 6.5 metres of Hedgerow (H156) to facilitate its construction and install new fencing.

2.2.2. One category U tree (T104) and two category C trees (T103 and T157) are within the proposed development footprint and must be removed to facilitate construction.

2.2.3. The new drainage ditches to the west of Bryn Meddyg encroach onto the Root Protection Area (RPA) of one Category B tree (T105).

2.2.4. The new drainage ditch to the east of Bryn Meddyg will require the removal of approximately 7.5 metres of Hedgerow (H161) to facilitate its construction and install new fencing.

2.2.5. The excavations associated with the installation of an increased diameter drainage pipes may impact the young shelter-belt plantation (G160).

2.2.6. Access to site at Access point 4 incurs into the RPA of one Category B tree (T171.)

### 2.3. Tree Protection Measures Required.

2.3.1. Tree protection fencing as detailed on the Tree Protection Plan.

2.3.2. Ground protection as detailed on the Tree protection plan.

2.3.3. Pruning of one Category B tree (T171.) to avoid damage by construction traffic.

2.3.4. Supervision of all works as detailed in the Arboricultural Method Statement.

2.4. Conclusion.

The arboricultural impact is relatively low as demonstrated in the Arboricultural Impact Assessment, and any negative impact to the trees can be satisfactorily mitigated as proposed in the Arboricultural Method Statement and associated Tree Protection Plan.

### **3. ARBORICULTURAL IMPACT ASSESSMENT**

3.1. Introduction.

BS 5837:2012 provides a methodology for determining the above and below ground constraints presented by trees on and adjacent to the site. These have been recorded on the following appended documents.

3.2. Associated Documents.

3.2.1. Tree Constraints Plan (TCP)

3.2.2. Tree Survey Data Tables

3.2.3. Tree Survey Data Tables - Additional

3.3. Tree Survey.

3.3.1. The Landscape in general.

The site currently consists of hedgerows, woodland groups, tree lines and individual isolated trees within agricultural land.

3.3.2. Survey Methodology.

Data was collected in accordance with the requirements of British Standard 5837:2012. All observations were from ground level without detailed or invasive investigations. Measurements were taken using a diameter tape and laser measure. Where this was not possible or reasonably practical, measurements have been estimated by eye.

The trees were surveyed and assessed impartially and irrespective of the proposed development. Management recommendations should be implemented regardless of any proposed development for reasons of sound arboricultural management or safety.

Appendix III shows the methodology set out in BS5837:2012 for categorising trees according to their quality.

BS 5837:2012 requires retention of better quality (category A and B trees) where possible. Planning permission overrides a Tree Preservation Order and Conservation Area. Furthermore, trees are a material consideration in the UK planning system irrespective of their legal status. It is therefore not considered necessary to highlight or give additional merit to trees that have legal protection. Trees in land adjacent to the site are considered where they may be impacted by development. For example when roots or branches encroach onto the site.

Trees may be recorded as a tree group or woodland where the canopies touch, the trees have more group value than individual merit, they are part of a formal landscape feature like an avenue, or it is impractical to record them individually. Trees within groups or woodlands etc. are only recorded individually where it is necessary to distinguish them from others.

### 3.4. Observations.

#### 3.4.1. Below Ground Constraints.

The proposed new drainage features encroach into the RPA of **T105**. As approximately 40% of the RPA of this tree is likely to be affected by excavations it is recommended that this tree be reduced to a pollard, but it's remaining stem to be included within the tree protection fencing. Arboricultural methodology can be adopted as a precaution to protect any roots exposed during excavations.

The RPA of **T171** incurs into access route for the site. Temporary ground protection is required to protect its roots.

The RPA's of **T172, T173, T174, G175** and **T176** incur into the proposed access route and proposed location of headwall ( drawing F112B). Temporary ground protection is required to protect their roots, or the access route and location of headwall could be moved to avoid the RPA's.

The RPA of **G160**, a mixed broad-leaf shelter belt plantation (Category A, semi mature) between the carriageway and the post and rail fence to the east of **T157** can be safely protected from compaction or other disturbance with tree protection fencing erected within the plantation area according to the tree protection plan. It is not planned to remove any of these young trees to facilitate the development.

The RPAs of all other trees can be safely protected from compaction or other disturbance with tree protection fencing.

#### 3.4.2. Above Ground Constraints.

The north and north east sides of the canopy of **T171** Sessile Oak (Category B mature) may interfere with access onto site at The Old School, Abergwyngregyn, and therefore a reduction of its canopy on these sides to allow clear access is recommend.

The canopies of the remaining retained trees can be protected with the proposed tree protection fencing.

#### 3.4.3. Trees to be removed.

The development footprint does not allow the retention of **T103** Alder (Category C mature), **T104** Alder (Category U semi-mature) both to the west of Bryn Meddyg, and **T157** Sessile Oak (Category C ) to the east of Bryn Meddyg.

The development footprint requires the removal of approximately 7.5 metres of hedgerow **H161** Hawthorn (Category C mature) from its junction with **H97**.

The development footprint requires the removal of approximately 6.5 metres of hedgerow **H156** Hawthorn, Sycamore and Goat willow - (Category C mature) from its junction with hedgerow **H155**, to the east of Stream 5.

#### 3.4.4. Trees to be Pruned.

**T105** & **T171** will require tree surgery.

#### 3.5. Conclusion.

The arboricultural impact is relatively low, and can be mitigated with the tree works detailed in the Tree Works Schedule, the protective barriers as shown on the Tree Protection Plan and the arboricultural supervision as set out in the Arboricultural Method Statement.

## 4. ARBORICULTURAL METHOD STATEMENT

### 4.1. Description of intended works in close proximity to trees.

#### 4.1.1. To the east of Tai'r Meibion

S1 and S2, (YGC Drawing 5055/GA/505) – Excavation of new ditch and construction of earth bund and Outfalls and their connection to an existing watercourse (Stream 5) From a point 312m to the west, and extending 139m to the east of H156.

#### 4.1.2. To the west of Bryn Meddyg.

S8 (YGC Drawing 5055/GA/507) – Excavation of new ditch and construction of earth bund from a point 40m southwest of the tree line and boundary, and its connection to an existing watercourse (Stream 7) within the tree line.

#### 4.1.3. To the west of The Old School.

S9 (YGC Drawing 5055/GA/503) - Excavation of new ditch and construction of earth bund through the site of an existing hedgerow H161 to the vicinity of T157.

S10 (YGC Drawing 5055/GA/504)– excavation of ditch from vicinity of T157 eastwards for 100 metres, and the installation of new 400mm diameter underground drainage pipe, chambers, headwalls and outfall in the vicinity of T157 and G160.

#### 4.1.4. To the south of The Old School.

Access point 4 (YGC Drawing 5055/GA/504)- Access point for construction traffic in the vicinity of **T172, T173, T174, G175 and T176.**

Field drainage system (YGC Drawing 5055/GA/508) Installation of new 450mm carrier pipe and construction of new headwall in the vicinity of **G175 and T176.**

### 4.2. Tree Works.

4.2.1. All tree works should be carried out by professional arboricultural contractors with appropriate qualifications, experience and public liability insurance. The work should be carried out in accordance with British Standard document number 3998:2010 “Recommendations for Tree Work”.

- 4.2.2. Where possible, all arisings should be retained on site, in the case of branch wood and stems over 100mm in diameter, these should be cut into handle-able lengths, no longer than 1 meter long, and stacked within area to be enclosed within tree protection barriers for retention as deadwood habitat.
- 4.2.3. Branch wood less than 100 mm in diameter should be chipped and the chip retained on site either in piles or removed according to directions of the chief environmental officer.
- 4.3. Excavations within Root Protection Areas.
- 4.3.1. Where the development footprint encroaches onto the RPA of T105, any excavation should be undertaken with great care, and arboricultural supervision will be required for all works in this area. Any tree roots found during excavations, up to a diameter of 25mm can be pruned back with sharp secateurs leaving a wound of the smallest diameter possible. If any roots over 25mm are found, these must be retained undamaged, wrapped in Hessian and re-buried as soon as possible. Root pruning is to be carried out by the project arboriculturalist only.
- 4.4. Tree Protection.
- 4.4.1. Tree Protection Barriers.

The barriers shall be installed and removed in accordance with the timing of operations detailed below, and laid out as specified on the Tree Protection Plan. The notices detailed in Appendix V should be used to create all weather notices that must be fixed to the tree protection barriers at suitable intervals.

Appendix IV shows three specifications for tree protection barriers. The left hand diagram shows the default specification: A vertical and horizontal scaffold framework braced to resist impacts. The vertical tubes are spaced at a maximum interval of 3m and these are driven securely into the ground. Welded mesh panels are securely attached to the frame.

During installation it is important to consider the position of below ground services and structural roots, which must not be damaged. Where these constraints prevent the use of this specification, the following alternative specification should be used: 2 metre tall welded mesh panels standing in rubber or concrete feet joined using a minimum of two anti-tamper couplers installed so they can only be removed from inside the protected area. The fence couplers should be at spaced least 1 m apart, but uniformly across the whole barrier. These panels must be supported within the protected area with struts attached to a base plate secured by ground pins

This specification is illustrated in Appendix IV (top right diagram).

Where the fencing is installed above retained hard surfacing and or it is otherwise not feasible to use ground pins (e.g. due to underlying services or structural roots), the struts can be mounted on a block trays. This specification is illustrated in Appendix IV (bottom right diagram).

No alterations or variations shall be made to the approved tree protection measures without written approval from the senior environmental officer (Mr Chris Jones) following consultation with the project arboriculturalist.

#### 4.4.2. Ground protection.

The objective of temporary ground protection is to avoid the compaction of soil, which can arise from the single passage of a heavy vehicle, especially in wet conditions, so that tree root function is not impaired.

Temporary ground protection shall be installed and removed in accordance with the timing of operations detailed below, and located as specified on the Tree Protection Plan.

The temporary ground protection should be capable of supporting any traffic entering the site without being distorted or causing compaction of underlying soil.

For wheeled or tracked construction traffic exceeding 2 tons gross weight, pre-cast reinforced concrete slabs or other proprietary systems to an engineering specification designed to accommodate the likely load to which it will be subjected is required.

An example proprietary temporary root protection matting system is illustrated in Appendix VII.

#### 4.5. Timing and order of operations.

4.5.1. The development must be carried out in the following order. Each step must be completed before moving onto the next:

1. Preliminary Tree Works as set out in the Tree Works Schedule.
2. Installation of Tree Protection Barriers and Temporary Ground protection as specified on the Tree Protection Plan.
3. Construction works undertaken in accordance with the Arboricultural Method Statement.

4. Removal of the remaining ground protection and barriers on completion of all works.

4.6. Prohibited Activities.

**The following must not be carried out under any circumstances:**

Cutting down, uprooting, damaging or otherwise destroying any retained tree.

Lighting a fire within 10 metres of the canopy of any retained tree.

Equipment, signage, fencing, tree protection barriers, materials, components, vehicles or structures shall not be attached to or supported by a retained tree.

Mixing cement, use of chemical toilets and other use or storage of anything that would be harmful to trees shall not take place within, or close to a Root Protection Area (RPA). The distance away from the RPA must be sufficient, and the slope of the site must be such that contamination of soil in the RPA would not occur if there were spillage, seepage or displacement.

No plant machinery or equipment or vehicle with a hydraulic arm such as a mini digger shall be operated within striking distance of the stem and branches or the RPA of any retained tree, with the exception of **T105** as described in paragraph 4.3.1.

4.7. Arboricultural Supervision.

4.7.1. Arboricultural monitoring and supervision will be required as detailed in the table below:

Stage of Process	Requirement
<p>Prior to commencement of works.</p>	'Tool box talk' to all personnel on site.
	Supervision of preliminary arboricultural operations.
	Supervision of erection of tree protection fencing.
	Supervision of installation of temporary ground protection over RPA of T171 at Access point 4.
	Identification of machine exclusion zone.
<p>Works to the east of Tai'r Meibion (YGC Drawing 5055/GA/505)</p> <p>Specifically:</p> <p>S1 and S2 – Excavation of new ditch and construction of earth bund from a point 312m southwest of the hedgerow and extending 139m to the northeast , and its connection to an existing watercourse (Stream 5) adjacent to the hedgerow.</p>	<p>Full supervision of works.</p>
<p>Works to the west of Bryn Meddyg (YGC Drawing 5055/GA/507)</p> <p>Specifically:</p> <p>S8 – Excavation of new ditch and construction of earth bund from a point 40m southwest of the tree line and boundary, and its connection to an existing watercourse (Stream 7) within the tree line.</p>	<p>Full supervision of works.</p>

Table continued overleaf.

Stage of Process	Requirement
<p>Works to the west of The Old School. (YGC Drawing 5055/GA/503)</p> <p>Specifically:</p> <p>S9 - Excavation of new ditch and construction of earth bund through the site of an existing hedgerow H161 to the vicinity of T157</p>	<p>Full supervision of works.</p>
<p>Works to the west of The Old School. (YGC Drawing 5055/GA/504)</p> <p>Specifically:</p> <p>S10 - Excavation of ditch from vicinity of T157 eastwards for 100 metres, and the installation of new 400mm diameter underground drainage pipe, chambers, headwalls and outfall in the vicinity of T157 and G160.</p>	<p>Full supervision of excavation works within close proximity of any RPA's.</p>
<p>To the south of The Old School. (YGC Drawing 5055/GA/504)</p> <p>Specifically:</p> <p>Access Point 4 – Pruning of T171.</p>	<p>Supervision of tree works.</p>
<p>On completion of works.</p>	<p>Supervision of removal of tree protection fencing.</p>
	<p>Check final ground levels.</p>
	<p>Send audit report form to Chief Environment Officer.</p>

#### 4.8. Responsibilities.

Successful implementation of tree protection measures and long term tree retention depends on co-ordination between the client and key personnel involved in the development.

##### 4.8.1. The client and agent shall ensure that:

- The site manager and all other personnel are provided with this document;
- All planning conditions relating to underground works, services, trees and landscaping are cleared before development commences;
- All requirements of this Tree Protection Scheme are adhered to;
- The site manager is updated of any approved changes or variations to this document.

The client and site manager shall ensure that:

- A copy of this document together with the associated Tree Protection Plan is easily accessible for site personnel to refer to before and during the time construction activity is taking place;
- All personnel working on the site are made aware of the tree protection plan and arboricultural method statements covering any activities they will undertake. This duty includes delegating the task of briefing personnel in the absence of the site manager;
- Site personnel are updated of any approved changes or variations to the approved tree protection measures;
- Personnel work in accordance with this document at all times, or in accordance with approved variation;
- The tree protection measures are left in place until the construction phase of development is completed, except with the written consent of the senior environmental officer (Mr Chris Jones).

#### 4.6. Procedures for Incidents.

##### 4.6.1. If any breach of the approved tree protection measures occurs:

The senior environment officer shall be immediately notified.

The site manager must be informed.

Swift action must be taken to halt the breach and prevent any further breach.

Damage mitigation measures appropriate to the scale of the incident will be deployed where required.

## 5. CONTACT INFORMATION

Name	Position	Address	Telephone
Mr John Jones	Project Engineer (YGC)	YGC, Stryd y Jêl, Caernarfon, Gwynedd, LL55 1SH.	Tel: 01286 679792
Mr Chris Jones	Chief Environment Officer (YGC)	YGC, Stryd y Jêl, Caernarfon, Gwynedd, LL55 1SH.	Tel: 01286 679792 Ext: 32792
Mr Mathew Harris	Project Arboriculturalist	Mynydd Timber Services Ltd.	01248 601032
Mr John Sweeny	Project Arboriculturalist	18 Tan y Bwlch, Mynydd Llandegai, LL57 4DX	07985548725

SITE: A55 Tal-y-Bont to Abergwyngregin				CLIENT: YGC											DATE: 17/09/15													
No	Type	TAG	Hgt (m)	Crown spread (m)				Height Canopy (M)	Height of 1st Branch (M)	Bearing of 1st branch	DBH1	DBH2	DBH3	DBH4	DBH5	Average DBH (more than 5 stems)	No stems (more than 5)	Species	Age	Estimated remaining contribution (yrs)	Condition	General Observations	Standard		RPA		BS5837 Quality	
				N	E	S	W																Area (m²)	Radius (m)				
1	Tree	1526	8.7	4.45	5.3	3.3	3.2	2	GL						130	8	Ash (Fraxinus excelsior)	Y	20+	Fair	Coppiced tree. Ground level change to South. Growing through fence.	61.16	4.41	B	2			
2	Hedge		2								135						Leyland cypress (Cupressocyparis leylandii)	Y	40+	Good	Heavy pruning this year has resulted in some leaf dieback.	8.24	1.62	C	2			
3	Group		10					3			175						Sessile oak (Quercus petraea), Goat willow (Salix caprea), Sycamore (Acer pseudoplatanus), Ash (Fraxinus excelsior)	SM	40+	Fair	Mixed broadleaf tree group. canopy extends over fenceline by 1m average. flail pruning has been carried out where adjacent to roads.	13.85	2.10	B	2,3			
4	Group		10								123						Sessile oak (Quercus petraea), Goat willow (Salix caprea), Sycamore (Acer pseudoplatanus), Ash (Fraxinus excelsior)	Y	40+	Fair	Growing on culvert bank.	6.84	1.48	B	2,3			
5	Tree	1527	7.5	4.5	4.8	4.6	2.5	1	1N		365						Ash (Fraxinus excelsior)	Y	10+	Fair	Growing on culvert bank.	60.27	4.38	C	2,3			
6	Group		9	9				2			325	185	110	220	430		Wych elm (Ulmus glabra), Elder (Sambucus nigra), Sycamore (Acer pseudoplatanus), Ash (Fraxinus excelsior), Hawthorn (Crataegus Monogyna), Blackthorn, Holly (Ilex aquifolium), crab apple (Malus sylvestrus), Scots pine (Pinus sylvestrus).	SM	20+	Good	Northern edge forms part of old hedgerow growing from clawdd wall. contains approximately 12 multi stem Wych elms.	174.28	7.45	A	2,3			
7	Hedge		2								75						Hawthorn (Crataegus Monogyna)	Y	40+	Good	Recently planted (1990's) and well managed. Post and rail fence on northern boundary.	2.54	0.90	B	2,3			
8	Group		7	2.4							300	240					Ash (Fraxinus excelsior), Silver birch (Betula pendula), Sessile oak (Quercus petraea), Goat willow (Salix caprea), Hawthorn (Crataegus Monogyna), Sycamore (Acer pseudoplatanus), Elder (Sambucus nigra), Scots pine (Pinus sylvestrus), Crab apple (Malus sylvestrus).	SM	40+	Good		66.77	4.61	A	2			
9	Hedge		1.75								140						Hawthorn (Crataegus Monogyna), Goat willow (Salix caprea), Dog rose (Rosa canula)	M	40+	Good	Old field boundary with remnants of slate posts embedded. Managed.	8.87	1.68	B	1,2			
10	Group		8	1				2			300						Ash (Fraxinus excelsior), Sycamore (Acer pseudoplatanus)	SM	40+	Good	Concrete roadway 4m wide running 80m on northern boundary.	40.72	3.60	B	2,3			
11	Group		15														Beech (Fagus sylvatica), Sycamore (Acer pseudoplatanus), Silver birch (Betula pendula), Corsican pine (Pinus nigra), Alder (Alnus glutinosa), Rhododendron ponticum, Ash (Fraxinus excelsior), Gorse (Ulex), Rowan (Sorbus aucuparia)	M	40+	Good	On SW corner circa 100 year old beech hedgerow with 7 major stems within 18m of corner. Evidence of hedge laying 50+ years ago.	0.00	0.00	A	2,3			



42	Tree	1558	22	4	5	3.3	2.9	4.7	4.1	S	615									Corsican pine (Pinus nigra)	M	40+	Good	forestry tree	171.10	7.38	B	2	
43	Tree	1559	6	2.1	4.1	2.3	1	1.8	1.6	S	115										Ash (Fraxinus excelsior)	Y	10+	Fair	Extensive squirrel damage on stem and branches	5.98	1.38	C	2
44	Tree	1560	6	2.9	2.9	2.2	3	1.5	1	N	170										Sycamore (Acer pseudoplatanus)	Y	10+	Poor	Extensive squirrel damage on stem and branches	13.07	2.04	U	
45	Tree	1561	8	1.5	3.7	2.7	1.7	2	0.7	E	260										Silver Birch ( Betula pendula)	Y	20+	Fair	No visible defects.	30.58	3.12	B	2
46	Tree	1562	8	2.4	4.1	2.1	1.6	1.8	0.4	E	165										Silver Birch ( Betula pendula)	Y	20+	Fair	No visible defects.	12.32	1.98	B	2
47	Tree	1563	6	2.5	3.5	4.2	3.3	2	1.2	S	215										Sessile oak (Quercus petraea)	Y	20+	Poor	Extensive squirrel damage on stem and branches	20.91	2.58	C	2
48	Tree	1564	12	7.3	6.9	6.6	6.5	1	0	N	555										Beech (Fagus sylvatica)	M	40+	Good	Part of historic layed hedge.	139.35	6.66	A	2,3
49	Hedge		1.8		1			1			100										Hawthorn ( Crataegus Monogyna)	M	40+	Good	Managed hedge, rpa is average for feature.	4.52	1.20	B	2,3
50	Hedge		2	0.5				1			125										Ash (Fraxinus excelsior), Sycamore (Acer pseudoplatanus), Hawthorn ( Crataegus Monogyna)	SM	20+	Good	Managed hedge, rpa is average for feature.	7.07	1.50	B	2,3
51	Hedge		2	0				1			125										Ash (Fraxinus excelsior), Sycamore (Acer pseudoplatanus), Hawthorn (Crataegus Monogyna)	SM	20+	Good	Managed hedge, rpa is average for feature.	7.07	1.50	B	2,3
52	Tree	1565	13	6	6	6.2	4.7	1.8	2	S	895										Sessile oak (Quercus petraea)	M	40+	Good	Large cavity from ground level to 1.1m on West side.	362.4	10.74	A	1,2,3
53	Tree	1566	12	6.6	6.8	6.5	5.3	1.9	1.8	S	845										Sessile oak (Quercus petraea)	M	40+	Fair	Tree hollow with openings to Southwest and North. Ground level eroded by 200mm in 0.5m radius around stem.	323.0	10.14	A	1,2,3
54	Group		9	5	4	1	4	0.75	0.5	E	240										Alder (Alnus glutinosa), Ash (Fraxinus excelsior), Sycamore (Acer pseudoplatanus), understorey of Hawthorn (Crataegus Monogyna), Elder (Sambucus nigra), Blackthorn (Prunus spinosa).	SM	40+	Good	Tree group incorporates hedge on S and W boundaries.	26.06	2.88	B	2,3
55	Tree	1567	15	10.7	7.5	9	8	1.8	1.8	W	1070										Sessile oak (Quercus petraea)	M	40+	Good	Stream running from south to north 1m to west.	517.94	12.84	A	1,2,3
56	Tree	1568	14	12	5	4	9	1.8	1.8	S	890										Sessile oak (Quercus petraea)	M	40+	Good	Large decaying Ash stump 1m on south side.	358.34	10.68	A	1,2,3
57	Hedge		2					1			150										Hawthorn (Crataegus Monogyna)	M	40+	Good	Managed hedge, rpa is average for feature.	10.18	1.80	B	1,2,3
58	Tree	1569	9	4.3	4.5	3	3.2	1.8	1.8	E	280										Sessile oak (Quercus petraea)	SM	40+	Good	Fence on east side pressing on stem.	35.47	3.36	A	1,2
59	Tree	1570	8	4.4	4.8	3.8	3.4	2	2	W	245										Sessile oak (Quercus petraea)	SM	40+	Good	Fence on east side pressing on stem.	27.15	2.94	A	1,2
60	Hedge		1					0			125										Blackthorn (Prunus spinosa), Sycamore (Acer pseudoplatanus), Ash (Fraxinus excelsior).	SM	20+	Fair	Managed hedge, rpa is average for feature.	7.07	1.50	B	2,3
61	Hedge		1.8					0			200										Beech (Fagus sylvatica), with smaller amounts of Holly (Ilex aquifolium), Hawthorn ( Crataegus Monogyna)	M	20+	Fair	Managed hedge, rpa is average for feature.	18.10	2.40	B	1,2,3
62	Tree	1571	21	8	7.6	7.3	5.4	2	3	S	790										Sycamore (Acer pseudoplatanus)	M	40+	Good	Saplings sprouting from base.	282.3	9.48	A	1,2,3
63	Group		2.5	1.2	1	1.2	1.5	0	0												75 6 mixed ornamentals inc Laburnum Variegated Holly etc	SM	20+	Good	Well managed feature with 6 individual shrubs spaced at~3m.	15.27	2.20	A	2,3
64	Tree	1572	7.8	3.7	3.5	3.6	3.1	0.5	0.5	W	120										Monkey puzzle ( Araucaria Araucana)	SM	40+	Good	Some dieback of small branches in crown.Crown suppressed to north by large sycamore.	6.51	1.44	B	1,2

65	Tree	1573	19	8	9.7	7.8	6.8	1.6	1.8	E	850							Sycamore (Acer pseudoplatanus)	M	20+	Fair	Cavity visible on northwest side from ground level to 0.5 and opens again from 2.5m to 5m above ground level, 60mm wide.	326.85	10.20	B	1,2,3
66	Tree	1574	21	9.6	11	10	9	1.2	2	S	1295							Horse chestnut (Aesculus Hippocastanum)	M	40+	Good	Leafminer infestation.minor Cankers visible on stem 2m on E side.	758.67	15.54	A	1,2,3
67	Tree	1575	19	9	11	11	10	1.2	1.8	S	1300							Horse chestnut (Aesculus Hippocastanum)	M	40+	Good	Leaf miner infestation.	764.54	15.60	A	1,2,3
68	Hedge		3	0	0.5	0	0.5	0	0		150							Beech (Fagus sylvatica) Ash (Fraxinus excelsior), Sycamore (Acer pseudoplatanus), Holly (Ilex aquifolium), Elder (Sambucus nigra).	M	40+	Good	older hedgerow pre 1985.	10.18	1.80	B	2,3
69	Tree	1576	16	9	10	8.5	8	3.5	3	S	890							Sycamore (Acer pseudoplatanus)	M	40+	Good	No visible defects.	358.34	10.68	A	1,2,3
70	Tree	1577	19.5	9.6	8.7	6.4	7.8	3.5	1.8	N	1000							Sycamore (Acer pseudoplatanus)	M	40+	Good	Cavity at ground level on southwest side.	452.39	12.00	A	1,2,3
71	Tree	1578	13	10	8.5	7	8	2	2	E	890							Sessile oak (Quercus petraea)	M	40+	Fair	Cavity through base from southwest to northeast 0.75m high and 0.5m wide at base. Heartwood appears sound.	358.34	10.68	A	1,2,3
72	Group		3	1	2	2	2	1			200							Hawthorn ( Crataegus Monogyna), Blackthorn (Prunus spinosa), Cherry (Prunus Padius),	M	20+	Good	Remnants of old hedgerow, managed to utility spec. (ohl)	18.10	2.40	B	2,3
73	Group		12.5		2.4	0	3.7	2			275							Leyland cypress (x Cupressocyparis leylandii) with 1 birch (Betula pendula), 2 grey poplar(Populus x canescens). feature recorded up to first Goat willow (Salix caprea).	SM	20+	Fair	Unmanaged hedgerow group with 25 stems in 26m from A55.	34.21	3.30	B	2,3
74	Group		11	4.5	3.5	1.8	2.5	1			470							Leyland cypress (x Cupressocyparis leylandii), (3) Rowan (Sorbus aucuparia), Sitka (Picea sitchensis), Bird cherry( Prunus padus) , Ash (Fraxinus excelsior), Yew(Taxus baccata) (windblown from South)	SM	20+	Fair	Garden trees not in management. Cherry windblown from S leaning into Rowans.	99.93	5.64	B	2,3
75	Tree	1579	12	4.2	4	3.2	4.3	1	0.6	S	210							Wych Elm (Ulmus Glabra).	SM	20+	Good	No visible defects.	19.95	2.52	A	1
76	Group		15					1.8			400							Oak (Quercus petraea), Ash (Fraxinus excelsior), Norway Maple (Acer platanoides), Wych Elm (Ulmus glabra), Hawthorn ( Crataegus Monogyna)	SM	40+	Good	Woodland group of broadleaf trees forming S edge of feature. Notable feature is a line of 6 Norway maple at ~3m spacings runing parallel 7m from A55.	72.38	4.80	B	1,2,3
77	Tree	1580	8	2	1	1.5	4	3.5	3.5	N	130							Ash (Fraxinus excelsior)	SM	20+	Good	Growing on eastern edge of watercourse.	7.65	1.56	B	2
78	Tree	1581	19	7.4	4	3.2	3.4	6	5.5	S	620							Scots Pine (Pinus sylvestrus)	M	20+	Fair	lean to NE of 15°, Crack from gl to 2m on NE side with insect attack on sapwood. Basal swelling from gl to 2m.	173.90	7.44	B	2,3
79	Tree	1582	14	0.5	0.5	4.4	5	5	3	S	240							Ash (Fraxinus excelsior)	SM	20+	Fair	Suppressed tree.	26.06	2.88	B	2
80	Tree	1583	15	5.7	7.5	2	3.2	7	4	E	230	230						Ash (Fraxinus excelsior)	SM	40+	Good	Twin stem	47.86	3.90	B	2
81	Tree	1584	13	3	1	1.5	2.5	8	6	E	190							Ash (Fraxinus excelsior)	SM	40+	Fair	Tall stem, small crown. typical woodland tree.	16.33	2.28	B	1,2
82	Tree	1585	14	3.1	4	3.4	2.1	8	6	W	250							Ash (Fraxinus excelsior)	SM	40+	Fair	Tall stem, small crown. typical woodland tree.	28.27	3.00	A	1,2
83	Tree	1586	13	4	3	1.5	3	8	8	E	220							Ash (Fraxinus excelsior)	SM	40+	Fair	Tall stem, small crown. typical woodland tree.	21.90	2.64	B	1,2

84	Tree	1587	10	3.5	4.5	2.5	4	6	2	W	160							Wych Elm (Ulmus glabra).	SM	20+	Good	Good specimen of Wych Elm.	11.58	1.92	A	1,2
85	Group	1588	12	5	4	1	2.5	1.8	1.2	N	150							1 Ash (Fraxinus excelsior) and 2 Norway Maples (Acer platanoides) in compact group all suffering from cavity, decay, and or squirrel damage.	SM	10+	Poor	group vulnerable if left asege trees.	10.18	1.80	U	
86	Hedge		2	0		2		2	0		100							Blackthorn (Prunus spinosa), Hawthorn (Crataegus monogyna), Wych elm (Ulmus glabra), Ash (Fraxinus excelsior), Sycamore (Acer pseudoplatanus)	SM	40+	Fair	Hedgerow planted circa 1985, with colonisation by natives in addition to planted hedge. maintained from field side.	4.52	1.20	B	2,3
87	Group		11	6	7	5.5	3.5	1	1	W	200	470						Ash (Fraxinus excelsior)	M	20+	Poor	Heavy pruning, decay in middle stem and canker on W stem. Oak understorey.	118.03	6.13	B	2,3
88	Tree	1589	11	4	4	2.5	1.5	0	0	E	250	260						Sycamore (Acer pseudoplatanus)	SM	40+	Fair	Ground level changes affecting this multistem.	58.86	4.33	B	2,3
89	Tree	1590	6.5	5	3.5	1.6	3	1	1	W	300							Ash (Fraxinus excelsior)	SM	20+	Fair	No visible defects.	40.72	3.60	B	2,3
90	Tree	1591	7	4	5	3	2.5	1.2	1.2	W	340							Sessile oak (Quercus petraea)	SM	40+	Fair	Damage to bark at ground level up to 0.5m on S side.	52.30	4.08	B	2,3
91	Tree	1592	8	6	7	4	4.5	1	1	E	750							Sessile oak (Quercus petraea)	M	40+	Fair	Heavy Ivy infestation.	254.47	9.00	A	1,2,3
92	Tree	1593	9	4.5	4	2.5	3	1	1	E	240	220						Sycamore (Acer pseudoplatanus)	SM	40+	Fair	Ground level changes affecting this multistem.	47.95	3.91	B	2,3
93	Group		4.5	1.51	0	3	0	0.2	1		150	100						Hazel (Corylus avellana), Ash (Crataegus Monogyna), Holly (Ilex aquifolium), Sea buckthorn (Hippophae), Elder (Sambucus nigra), Hawthorn (Crataegus Monogyna), Wayfaring tree (Viburnum lantana), Snowberry (Symphoricarpos)	SM	40+	Good	Belt of mixed broadleaf species screening planted circa 1985.	9.05	1.70	B	2,3
94	Tree	1594	8	3.5	2.8	1.2	1	3.5	3	E	120							Ash (Fraxinus excelsior)	Y	40+	Poor	Left as a standard where hedge has been coppiced from west extent of barns to eastern extent of barns.	6.51	1.44	C	2,3
95	Tree	1595	7	3	3	3.5	2	1.7	1.5	N	140							Ash (Fraxinus excelsior)	Y	40+	Fair	Left as a standard where hedge has been coppiced from west extent of barns to eastern extent of barns	8.87	1.68	B	2,3
96	Hedge		2		0.5		0.5	0			150							Leyland cypress (x Cupressocyparis leylandii)	SM	40+	Fair	Within boundary of sunnybank house.	10.18	1.80	B	2,3
97	Hedge		2	1.5		0.5		0			125							Hawthorn (Crataegus Monogyna), Sycamore (Acer pseudoplatanus), Ash (Fraxinus excelsior), Elder (Sambucus nigra)	SM	40+	Good	Hedgerow planted circa 1985, with colonisation by additional species to planted hedge. maintained from field side.	7.07	1.50	B	2,3
98	Tree	1596	8	2.5	2	3	2.5	1.5	1.5	S	190							Ash (Fraxinus excelsior)	SM	40+	Fair	Approx 2.5m from edge of carriageway.	16.33	2.28	B	2,3
99	Group		8	3.25	2	1.5	2	0			150	150						Sycamore (Acer pseudoplatanus), Elder (Sambucus nigra)	SM	20+	Fair	Approx 3.5m from edge of carriageway.	20.36	2.55	B	2,3
100	Group		12	2.5	3	4	3.5	2			250							Wych elm (Ulmus glabra), Hawthorn (Crataegus Monogyna), Sycamore (Acer pseudoplatanus)	SM	40+	Fair	Tree group emerges from old hedgeline.	10.18	1.80	B	2,3
101	Tree	1597	11	4.3	5.4	5.2	4	2.5	2.4	E	540							Sycamore (Acer pseudoplatanus)	SM	40+	Good	Good specimen, heavily branched from 2.5m.	131.92	6.48	B	1,2,3
102	Tree	1598	13	5.5	5	4	3.5	1.8	0.5	W	360	260	250	325				Multistem Alder (Alnus glutinosa)	SM	40+	Good	No visible defects.	165.27	7.25	B	2,3

103	Tree	1599	9	5	3	1	4	1	0.3W	450									Alder (Alnus glutinosa)	M	20+	Fair	Large cavity on S side 250mm wide from gl to 3 m. Suppressed to S by T104.	91.61	5.40	U	
104	Tree	1600	9	6	5	1.5	4.3	1	0.1W	280	290	490							Alder (Alnus glutinosa) multistem from coppice stool.	SM	20+	Fair	Decay cavity 1m long visible at 3m on central stem.	182.13	7.61	C	2,3
105	Tree	1601	10	5	6	2	8	1.8	0.5W	480									Sessile oak (Quercus petraea)	SM	40+	Fair	Co dominant stem at 90° to main stem at 1.7m. Suppressed on S side. Forms important windbreak for garden to E.	104.23	5.76	B	1,2,3
106	Tree	1602	14.5	7.1		4.5	7.2	1.2	1.2N	580									Sessile oak (Quercus petraea)	M	40+	Good	Within old hedgerow, fencing wire wrapped around stem.	152.18	6.96	A	1,2,3
107	Tree	1603	13	4	5	3	1.5	2.5	2.5E	400									Sitka Spruce (Picea sitchensis)	SM	40+	Fair	Suppressed to west by tree 105	72.38	4.80	B	2
108	Tree	1604	11	6.1	6.8	6	4			500									Common alder (Alnus glutinosa)	M	40+	Fair	Suppressed to west by tree 108	113.10	6.00	B	2,3
109	Tree	1605	6.5	6.5	3	2.5	4	1.6	0.5N	200									Common alder (Alnus glutinosa)	SM	40+	Fair	Suppressed, but forms part of windbreak for gardens to east.	18.10	2.40	B	2
110	Group		4.5	3.5	2	1	1.5	0		100	120	80	90						Sycamore (Acer psuedoplatanus), Elder (Sambucus nigra), Goat willow (Salix caprea), Rhododendron ponticum.	SM	20+	Fair	Forms part of windbreak for gardens to E.	17.60	2.37	B	2,3
111	Group		4	2	1.8	1.2	2	1	0.5E	250	100								Hawthorn ( Crataegus Monogyna) group	M	20+	Fair	Remnant of older hedgerow.	32.80	3.23	B	2,3
112	Group		7	3.8	4	4	3.5	1.8		160	150	120	100						Ash (Fraxinus excelsior) group	SM	40+	Fair	No visible defects.	32.80	3.23	B	2,3
113	Group		6.7	3	2	2	2.5			150	200	80	100						Ash (Fraxinus excelsior) and Sycamore(Acer psuedoplatanus) group.	SM	40+	Fair	No visible defects.	35.69	3.37	B	2,3
114	Group		6.3	3.5	4	3.5	2	3	1W	200	210	150							Ash (Fraxinus excelsior) and Sycamore (Acer psuedoplatanus) group.	SM	40+	Fair	No visible defects.	48.22	3.92	B	2,3
115	Hedge		1.8	1		0.3		0.5	0.5	120									Hawthorn ( Crataegus Monogyna) hedge with occasional Ash (Fraxinus excelsior)	SM	20+	Fair	Hedge has been pruned back to the same point over many seasons an is suffering, becoming sparse in places, but recovers in towards west where managed less severely.	6.51	1.44	B	2,3
116	Tree	1612	14	8	9	9.5	5	1.9	1.6W	1360									Sessile oak (Quercus petraea)	OM	40+	Poor	Stags headed, crack 1.35m from ground level on west side. small cavity on northwest side 0.36m high with fungal fruiting body visible inside. Compaction around stem . Recent cultivation in field probable case of induced stress and decline.	836.74	16.32	A	1,2,3
117	Tree	1613	13	6	4.5	10	9.5	2	2E	910									Sessile oak (Quercus petraea)	M	40+	Fair	Ganoderma fruiting body at base on north side. Large wounds from 3m above ground level on north side.	374.62	10.92	A	1,2,3
118	Hedge		1.5		1.5		0.5	0.3		90									Hawthorn ( Crataegus Monogyna), Elder (Sambucus nigra), Wych Elm (Ulmus glabra), Ash (Fraxinus excelsior)	SM	40+	Fair	Beginning to decline due to repeated pruning to same level.	3.66	1.08	B	2,3
119	Tree	1614	22	12.2	12.8	12.3	9.7	2	2E	1270									Sessile oak (Quercus petraea)	M	40+	Good	Most impressive tree within development area.	729.66	15.24	A	1,2,3
120	Tree	1615	21.7	10	7.3	9	10.3	2.5	2.5S	1310									Sessile oak (Quercus petraea)	M	40+	Fair	In decline with extensive epicormic growth throughout crown. Ganoderma fruiting bodies visible in decaying buttress on south side.	776.35	15.72	A	1,2,3
121	Group		1.9					0.9		160									Hawthorn ( Crataegus Monogyna), Elder (Sambucus nigra)	OM	20+	Fair	Remnants of old hedgerow in two distinct groups spread over 16m, with 5m gap between groups.	11.58	1.92	B	2,3

122	Tree	1616	13.4	7	6	6	8	2	1.9	S	1100						Sessile oak (Quercus petraea)	M	40+	Fair	Cavity at base southwest side 100mm x 70mm wide .Cavity at 1.6m to 3.6m on southeast side, 200mm + wide.	547.39	13.20	A	1,2,3
123	Tree	1617	20	9.5	9.6	10	10.4	1.62	2	W	1260						Sessile oak (Quercus petraea)	M	40+	Good	Ganoderma fruiting bodies visible in buttresses at ground level to south, east and north, historic pollard at 2m .	718.21	15.12	A	1,2,3
124	Group		18				7.4		2		780						Ash (Fraxinus excelsior), Wych elm (Ulmus glabra), Silver birch (Betula pendula), Hawthorn (Crataegus monogyna), Sycamore (Acer psuedoplatanus), Alder (Alnus glutinosa), Norway maple (Acer platanoides).	M	40+	Good	No visible defects.	275.23	9.36	A	1,2,3
125	Tree	1618	9	3	5	4	3	2	1	N	370						Common alder (Alnus gultinosa)	M	20+	Fair	No visible defects.	61.93	4.44	B	2,3
126	Tree	1619	10	4	5	4	3.4	1.8	0	W	380						Hawthorn ( Crataegus Monogyna)	M	20+	Fair	No visible defects.	65.33	4.56	B	2,3
127	Tree	1620	13	9	8.3	8.4	7.3	1.8	1.4	W	760	770					Common alder (Alnus gultinosa)	OM	40+	Fair	Old coppice stool, now twin stem, cavity through stem to northeast.	529.52	12.98	A	1,2,3
128	Tree	1621	8	4.1	2.5	3.6	4.5	2	1.4	S	510						Common alder (Alnus gultinosa)	M	40+	Good	Heavy Ivy infestation.	117.67	6.12	B	2,3
129	Group		8	5	3		5				340						Common alder (Alnus gultinosa) x 3. Ash ( Fraxinus excelsior) Hawthorn ( Crataegus monogyna) x 6	M	20+	Fair	Group of smaller tree's within Development area.	52.30	4.08	B	2,3
130	Tree	1622	17	9.1	8	5	9	3	2	N	445	460					Ash (Fraxinus excelsior)	M	40+	Good	No visible defects.	185.31	7.68	B	1,2,3
131	Tree	1624	9.5	8	9	4	2.5	1	1	E	300	290					Common alder (Alnus gultinosa)	M	20+	Fair	Large branch at 2m growing into T130. Hanging branch at 2m to northwest.	78.76	5.01	B	2,3
132	Tree	1625	10	3	3.5	4	3	3	3.2	W	350	210					Common alder (Alnus gultinosa)	M	40+	Fair	Heavy Ivy infestation.	75.37	4.90	B	2,3
133	Tree	1626	13	8	6	5.2	4	2	1	S	600						Common alder (Alnus gultinosa)	M	40+	Fair	Moderate Ivy infestation.	162.86	7.20	B	2,3
134	Tree	1627	11.75	4.75	5	5	3	1.8	2	E	440						Ash Fraxinus excelsior	M	40+	Fair	Heavy Ivy infestation. large cavity on east 1m to 2m above ground level.	87.58	5.28	C	3
135	Tree	1628	20	12.4	12.4	8	12.7	3	3	W	1380						Sessile oak (Quercus petraea)	OM	20+	Fair	Ganoderma fruiting bodies visible between root buttresses to east & north, and on east side at 3.6m. Large branches snapped out at 4m on south & east side.	861.53	16.56	B	1,2,3
136	Tree	1629	16	10.6	12.5	11.6	9.8	1.9	2.5	W	1280						Sessile oak (Quercus petraea)	M	40+	Good	Ganoderma fruiting bodies visible on base to south, east & north. Large branch ripped out at 3.8 on south side. Hanging branch at 10m in centre of tree.	741.19	15.36	A	1,2,3
137	Hedge		1.2								100						Hazel (Corylus avellana) Rowan (Sorbus aucuparia), Sessile oak (Quercus petraea), Sycamore (Acer psuedoplatanus), Ash (Fraxinus excelsior) , Blackthorn (Prunus spinosa),	SM	40+	Good	Hedgerow has been managed by flailing.	4.52	1.20	B	2,3

138	Hedge		1.3								100						Hazel (Corylus avellana), Ash (Fraxinus excelsior), Sycamore (Acer psuedoplatanus), Elder (Sambucus nigra), Blackthorn (Prunus spinosa)	SM	40+	Good	Hedgerow has been managed by flailing.	4.52	1.20	B	2,3
139	Tree	1630	18	11.5	9	9.5	9.5	5.5	3.5	W	1240						Sessile oak (Quercus petraea)	M	40+	Good	Moderate Ivy infestation.	695.59	14.88	A	1,2,3
140	Tree	1631	14	9.5	13	13	7	2	2.5	S	1200						Sessile oak (Quercus petraea)	M	40+	Good	Moderate Ivy infestation.	651.44	14.40	A	1,2,3
141	Tree		7	1.5	2	2	2.5	3	2.7	W	280						Holly (Ilex aquifolium)	SM	20+	Fair	Supporting large Dog rose throughout crown.	35.47	3.36	B	2,3
142	Tree	1632	17	11	8	10	4.8	4.9	3.75	S	1250						Sessile oak (Quercus petraea)	M	40+	Good	Heavy Ivy infestation.	706.86	15.00	A	1,2,3
143	Tree	1633	11	6	5	6	5.6	1.8	1.8	E	720						Sessile oak (Quercus petraea)	SM	40+	Good	Large tear wound at 2m on west side.	234.52	8.64	A	
144	Tree	1634	14	5	10.9	6	6.4	1.8	1.9	W	720						Ash (Fraxinus excelsior)	M	20+	Fair	Twin stem with decay cavity on base stem from 200mm to 1.4m on E side.	234.52	8.64	C	2,3
145	Tree	1635	14	9.5	11	3.8	7.7	2	2.5	N	460	420	430				Ash (Fraxinus excelsior)	M	20+	Fair	Multistem with large occluding cavity in cavity on base to E . 4m dia at .3m agl. Cavity with decay on E stem at 1m to 3m. HV 11m to N.	259.17	9.08	B	2,3
146	Hedge		2		1		1.2				80						Hawthorn (Crataegus monogyna) , Ash (Fraxinus excelsior).	SM	40+	Fair		2.90	0.96	B	2,3
147	Tree	1636	11	5	4.5	3	3	3.5			550						Ash (Fraxinus excelsior)	SM	40+	Good	Large stem growing on top of roadside boundary wall, causing damage to wall below base of tree.	136.85	6.60	B	2,3
148	Group		8	2.8	2	2.5	3	1.8			290	410	170	260			Leyland cypress (x Cupressocyparis leylandii), Ash (Fraxinus excelsior), Rowan (Sorbus aucuparia), Variegated Holly (Ilex aquifolium), Cherry laurel (Prunus laurocerasus).	SM	40+	Good	Well maintained group to southeast of old chapel/house.	157.75	7.09	B	2,3
149	Hedge		2.5		1.3	1.5		0.4			160	200	180				Ash (Fraxinus excelsior), Goat Willow (Salix caprea), Bay (Laurus nobilis), Elder (Sambucus nigra), Privet (Ligustrum), Berberis, Leyland cypress (x Cupressocyparis leylandii), Eucalyptus.	SM	40+	Good	Well maintained hedge in garden.	44.33	3.76	B	2,3
150	Hedge		2			1.5					70						Laurel (Laurus nobilis), Sycamore (Acer psuedoplatanus), Leyland cypress (x Cupressocyparis leylandii)	SM	40+	Good	Well maintained hedge in garden. Stone wall 1m high on A5055 side .	2.22	0.84	B	2,3
151	Tree	1637	13.3	8.1	6.7	5.2	6.5	2		2N	890						Small leaved lime (Tilia Cordata)	M	40+	Good	Ivy infestation, with die back of small (50mm dia) branches in upper crown.	358.34	10.68	A	1,2,3
152	Tree	1638	18	8	9.3	3.3	6.6	2		3N	750						Sycamore (Acer psuedoplatanus)	M	40+	Good	Moderate ivy infestation.	254.47	9.00	B	2,3
153	Tree	1639	15	3	6.2	4.2	8.66	3.5		2.5W	650						Horse chestnut (Aesculus Hippocastanum)	M	20+	Poor	Large decay cavity in main stem at 2m up to 4m. main stem has decayed and is absent from this point on. Leaf miner infestation.	191.13	7.80	C	2,3
154	Group		15	6	6	2	7	3			650						Small leaved lime (Tilia Cordata), Sycamore (Acer psuedoplatanus), Horse chestnut (Aesculus Hippocastanum)	M	20+	Fair	Group along eastern boundary of garden from T153 to farm yard.	191.13	7.80	B	2,3

155	Hedge		2	1.5		1		0.4								Hawthorn ( Crataegus Monogyna), Ash (Fraxinus excelsior), Elder (Sambucus nigra), Sycamore (Acer psuedoplatanus).	SM	40+	Good	10m Gap 64m from E corner/ stream crossing A5055.	6.51	1.44	B	2,3
156	Group		7	3	3	5	6	1.3								Hawthorn ( Crataegus Monogyna), Sycamore (Acer psuedoplatanus), Goat willow (Salix caprea)	M	40+	Fair	Group runs along east side of water course.	43.47	3.72	B	2,3



SITE: A55 Tal-y-Bont to Abergwyngregin				CLIENT: YGC											DATE: 24/09/16											
№	Type	TAG	Hgt (m)	Crown spread (m)				Height Canopy (M)	Height of 1st Branch (M)	Bearing of 1st branch	DBH1	DBH2	DBH3	DBH4	DBH5	Average DBH (more than 5 stems)	Ne stems (more than 5)	Species	Age	Estimated remaining contribution (yrs)	Condition	General Observations	Standard		BS5837 Quality	
				N	E	S	W																Area (m²)	Radius (m)		
157	Tree	690	7.6	4.6	4.9	3.2	3.8	1.8	1.5	E	620						Sessile oak	M	10+	Poor	Hollow stem pollarded at 2.7m. Open cavity to 1.5m on N side. Approx 50% of stem wall missing at ground level. Wire fence embedded in west side	173.90	7.44	C	2,3	
158	Tree	691	9	5.8	6.3	6.5	5.9	1.5	2.5	W	850						Sessile oak	M	40+	Fair	Fungal fruiting bodies Inonotus Dryadeus at ground and 0.45m on N side. Extensive cavities in upper canopy. Retrenchment of canopy. Evidence of compaction under canopy on E side from sheep feeding and sheltering.	326.85	10.20	A	1,2,3	
159	Tree	692	7	5.5	5	5.1	2.7	1.6	2	S	710						Sessile oak	OM	20+	Poor	Possible lightning damage on NW side of stem from ground level into canopy. Die back throughout canopy, extensive compaction under canopy on E side from sheep feeding and sheltering.	228.05	8.52	C	2,3	
160	Group		6	3.5	3	2.7	3	0.5	0.5						130	6	Ash, Holly, Hazel, Cherry, Elder, Oak, Goat willow, Guelder rose, Blackthorn, Snowberry, Sycamore.	SM	40+	Good	Shelter belt planting extending from 53.23288,-4.02433 eastwards to 53.23346,-4.0226 . Evidence of coppice management of hazel stools.	45.87	3.82	A	1,2,3	
161	Hedge		2m	1.25	1.5	1	1				75	60	80	50	120		Hawthorn , with isolated Sycamore stems.	M	20+	Fair	Boundary hedge planted to West of stone wallstone wall. 11 Kv over head line above hedgerow.	14.71	2.16	C	2,3	
162	Group		7	6	5.5	3	3.5	2			380		450	250			Sessile oak	Y	40+	Fair	Group planting within enclosure	185.21	7.68	B	1,2,3	
163	Tree	693	11	6.1	4.8	6.5	6.5	2.5	2	W	525						Ash	SM	40+	Fair	Probably self seeded between wall and carriageway. Damage to crown by high vehicles on S side.	124.69	6.30	B	1,2,3	
164	Tree	694	11.5	7	8	7	6.5	2	1	W	425	315	285	220			Ash	SM	40+	Fair	Probably self seeded between wall and carriageway. Damage to crown by high vehicles on S side.	185.24	7.68	B	1,2,3	
165	Hedge		2	1	3.5	1	3	0.5			300						Hawthorn	SM	20+	Fair	Probably self seeded, managed.	40.72	3.60	B	2,3	
166	Tree	695	9	6.5	7.1	5	6	1.8	1.8	W	310	310	240				Ash	SM	20+	Fair	Probably self seeded, Canopy damaged by high vehicles on S side..	113.01	6.00	B	1,2,3	
167	Tree	696	10.8		6.1	5.5	4.5	2	1.8	W	320	450					Ash	SM	20+	Good	Probably self seeded	137.93	6.63	B	1,2,3	
168	Tree	697	12.5	6.8	7.4	5.7	4.8	1.8	2.2	S	1060						Sessile oak	M	40+	Fair	Isolated tree in field, root system probably damaged by cultivation and compaction. Hollow stem at ground level.	508.30	12.72	B	1,2,3	
169	Tree	698	9.8	4.5	7	5	6.5	2	1.8	W	685						Sycamore	SM	40+	Fair	Probably self seeded	212.27	8.22	B	2,3	
170	Hedge		2.5	2		1					100	65	40	80	120		Hazel , Blackthorn, Elder, Sycamore, Ash, Hawthorn.	SM	40+	Fair	Managed hedgerow. Concrete lined storm drain 0.5m deep and 1.1m wide restricting rooting towards roadside from 53.22065,-4.06298 West to Hendre junction.	16.57	2.30	B	2,3	
171	Tree	749	14	6.2	7.3	5.7	4.9	1.8	2	NE	600						Sessile oak	M	40+	Good	Growing on embankment between C class road and watercourse in field	162.86	7.20	B	2,3	
172	Tree	785	14	5.6	5	5	2	3	2	E	500	350	300				Sycamore	M	20+	Fair	multi stems growing on embankment between road and watercourse.	209.2	8.161	B	2,3	
173	Tree	786	13	6.3	4.5	4.5	5	3	2.5	N	500						Sycamore	M	20+	Fair	Growing on embankment	113.1	6	C	2,3	

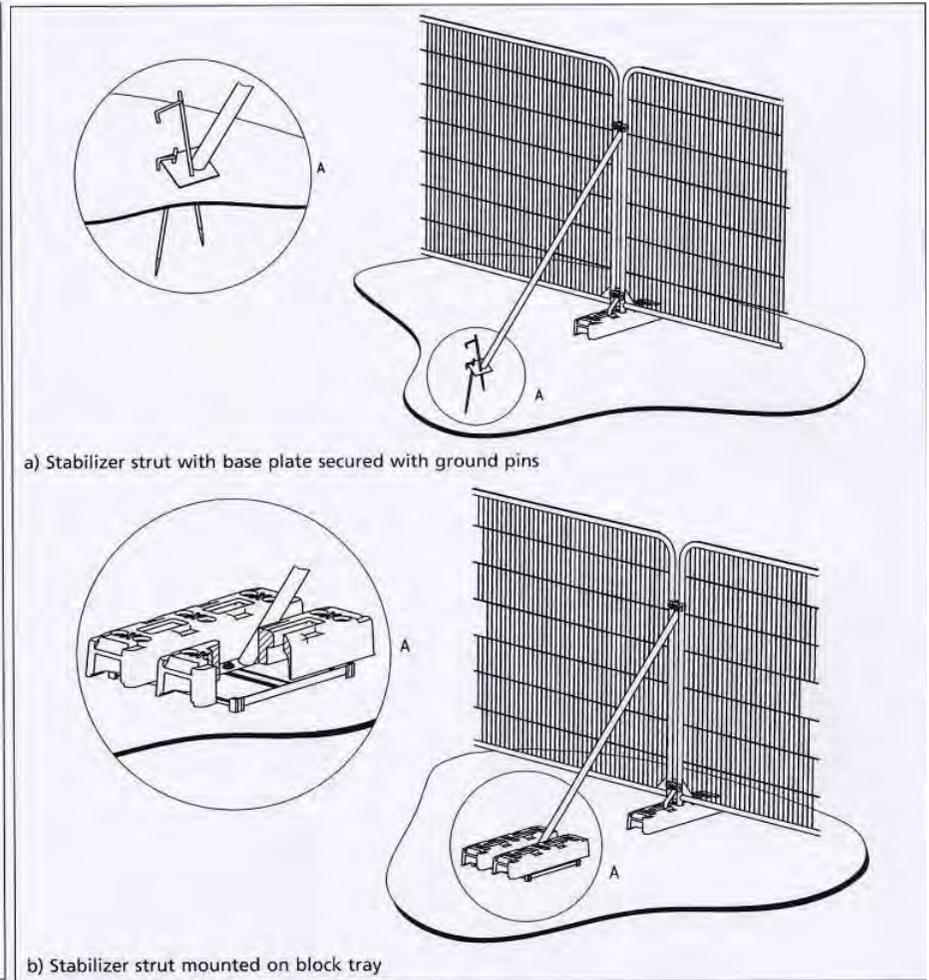
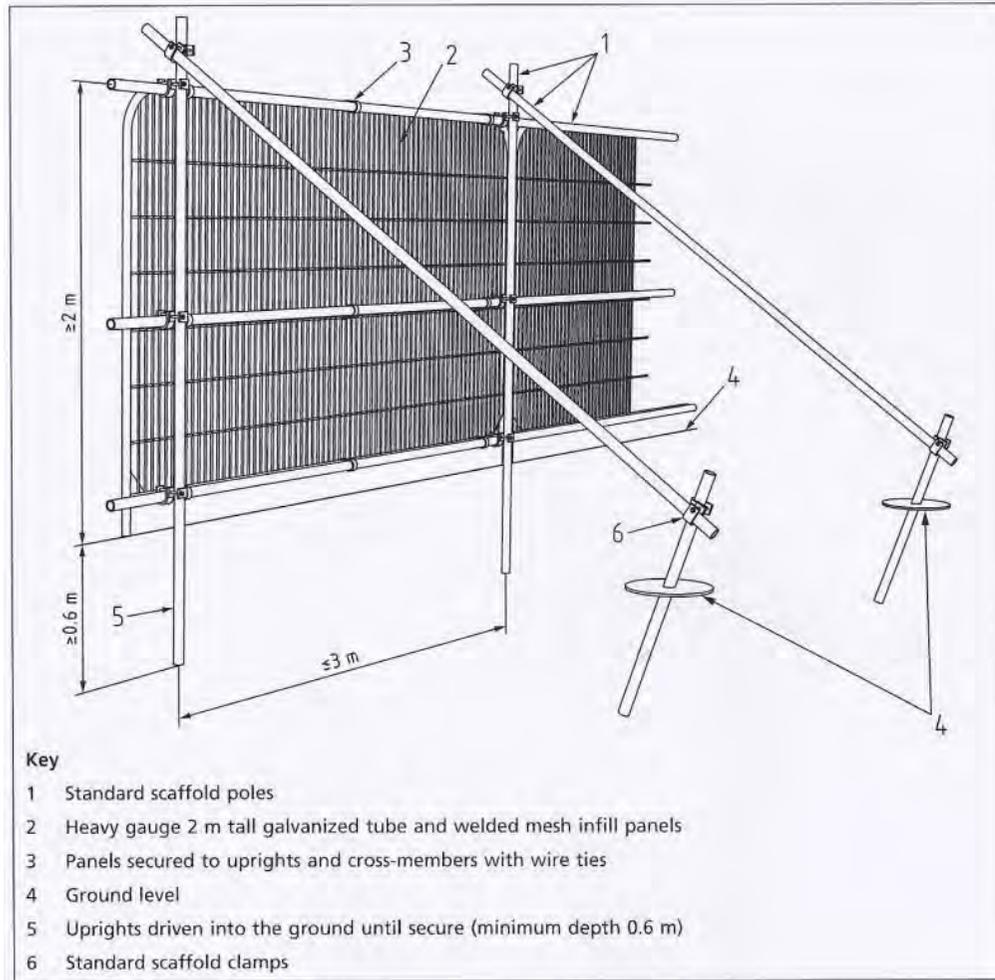
174	Tree	787	19	9.6	8	10	9.6	2	2.3	S	950						Ash	M	40+	Fair	Large ash tree, pollarded.	408.3	11.4	B	2,3
175	Group		9	5	1	4	3	3	2.5	W	300	200	250	270	230		Sycamore	SM	20+	Poor	multi stems growing on embankment between road and watercourse.	144	6.77	C	3
176	Tree	789	18	12	10	7	6	3	3	E	980						Sessile oak	M	40+	Fair		434.5	11.76	A	2,3



## Appendix III: BS5837:2012 Cascade Chart for Tree Quality Assessment

<b>TREES FOR REMOVAL</b>				
<b>Category and Definition</b>	<b>Criteria</b>			<b>Identification on Plan</b>
<b>Category U</b> Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	<ul style="list-style-type: none"> <li>• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other U Category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)</li> <li>• Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline.</li> <li>• Trees infected with pathogens of significance to the health and/or safety of other trees nearby) e.g. Dutch elm disease), or very low quality trees suppressing adjacent trees of better quality.</li> </ul> <p style="font-size: small; margin-top: 10px;">NOTE: <i>Category U trees can have existing or potential conservation value which might be desirable to preserve; see section 4.7.5</i></p>			<b>DARK RED</b>
<b>TREES TO BE CONSIDERED FOR RETENTION</b>				
<b>Category and Definition</b>	<b>Criteria Subcategories</b>			<b>Identification on Plan</b>
	<b>1, Mainly arboricultural values</b>	<b>2. Mainly landscape values</b>	<b>3. Mainly cultural values, including conservation</b>	
<b>Category A</b> <b>Trees of high quality:</b> with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species especially if rare or unusual, or essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and or landscape features	Trees, groups or woodlands of significant conservation, historical commemorative or other value (e.g. veteran trees or wood-pastures)	<b>LIGHT GREEN</b>
<b>Category B</b> <b>Those of moderate quality:</b> with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider area	Trees with clearly identifiable conservation or other cultural benefits	<b>MID BLUE</b>
<b>Category C</b> <b>Those of low quality</b> with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in the higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit.	Trees with no material conservation or other cultural value	<b>GREY</b>

## Appendix IV Tree Protective Fence Detail.



Appendix V: Tree Protection Notices

 <p><b>PROTECTIVE FENCING. THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.</b></p>	 <p><b>TREE PROTECTION AREA KEEP OUT !</b> <small>(TOWN &amp; COUNTRY PLANNING ACT 1990) TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A TREE PRESERVATION ORDER. CONTRAVENTION OF A TREE PRESERVATION ORDER MAY LEAD TO CRIMINAL PROSECUTION</small> <b>ANY INCURSION INTO THE PROTECTED AREA MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY</b></p>
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Appendix VI – List of Common and Botanical Names

<b>Common Name</b>	<b><i>Scientific Name</i></b>
Alder	<i>Alnus glutinosa</i>
Ash	<i>Fraxinus excelsior</i>
Beech	<i>Fagus sylvatica</i>
Blackthorn	<i>Prunus spinosa</i>
Birch (downy)(silver)	<i>Betula (pubescens)(pendula)</i>
Bird cherry	<i>Prunus padus</i>
Corsican Pine	<i>Pinus nigra</i>
Elder	<i>Sambucus nigra</i>
English oak	<i>Quercus robur</i>
Goat Willow	<i>Salix cupra</i>
Grey Poplar	<i>Populus canescens</i>
Guilder rose	<i>Viburnum opulus</i>
Hawthorn	<i>Cretagus monogyna</i>
Hazel	<i>Corylus avellana</i>
Holly	<i>Ilex aquifolium</i>
Horse chestnut	<i>Aesculus hippocastanum</i>
Laurel (Cherry)	<i>Prunus Laurocerasus</i>
Leyland cypress	<i>X Cupressocyparis leylandii</i>
Lime	<i>Tilia cordata</i>
Monkey Puzzle	<i>Araucaria araucana</i>
Purple plum	<i>Prunus cerasifera</i>
Rowan	<i>Sorbus aucuparia</i>
Scots pine	<i>Pinus sylvestrus</i>
Sessile Oak	<i>Quercus petraea</i>

Sitka spruce	<i>Picea stichensis</i>
Sweet chestnut	<i>Castanea sativa</i>
Sycamore	<i>Acer pseudoplatanus</i>
Wild cherry	<i>Prunus avium</i>
Wych Elm	<i>Ulmus Glabra</i>
Yew	<i>Taxus baccata</i>

## TREE ROOT PROTECTION DURING CONSTRUCTION PROJECTS

The Department for Communities and Local Government's guide "Tree Roots in the Built Environment" states that "ground protection should be installed before any materials or machinery is brought onto the site"(Section 9.3.3.2)

It has been shown that "the major contribution to soil compaction from vehicle movements comes from the first passes of vehicles over the ground" (Section 4.2.3)

Thus it is essential that ground protection is specified and installed from day one of construction projects.

Failure to protect the ground from compaction will lead to reduced water and oxygen infiltration to the tree roots, and can ultimately lead to the decline of the tree.

### The use of GROUND-GUARDS for tree root protection

The **Ground-Guards** temporary roadway system is frequently used on construction sites to protect the ground from erosion and damage by construction vehicles. **Ground-Guards** are usually installed as a roadway consisting of a parallel track of 2.4m x 1.2m panels with a 1.2m space in between. Where a temporary roadway must pass near to trees, the following extra precautions must be taken in order to provide cushioning for the ground under the tree canopy:

1. Edge rails of 200 x 50mm sawn timber should be installed where the trackway will pass under the tree canopy. These should be staked on either side of the trackway using 50 x 50x 500mm timber stakes at 1.5m spacings.
2. A layer of geotextile membrane should be laid to cover at least the area under the tree canopy, and preferably under the whole of the trackway.
3. A pad of Ground Guards, three boards wide should be laid on top of the geotextile membrane, between the timber rails.
4. A 150mm deep layer of wood chippings should be laid.
5. The twin trackway can then be laid so that it rises over the wood chippings as it passes under the tree canopy. Extra Ground-Guard boards should be installed in the gap between the twin trackway at this point to retain the wood chips in place.

## Ground-Guards

Tel: 0113 267 6000

Fax: 0113 267 2222

Email: [info@greentek.org.uk](mailto:info@greentek.org.uk)



Ground protection is essential to maintain the health of tree roots on construction sites.



Ground-Guard trackways should have additional cushioning installed where they pass near to trees.



200X50 timber rails

50X50X500 timber stakes

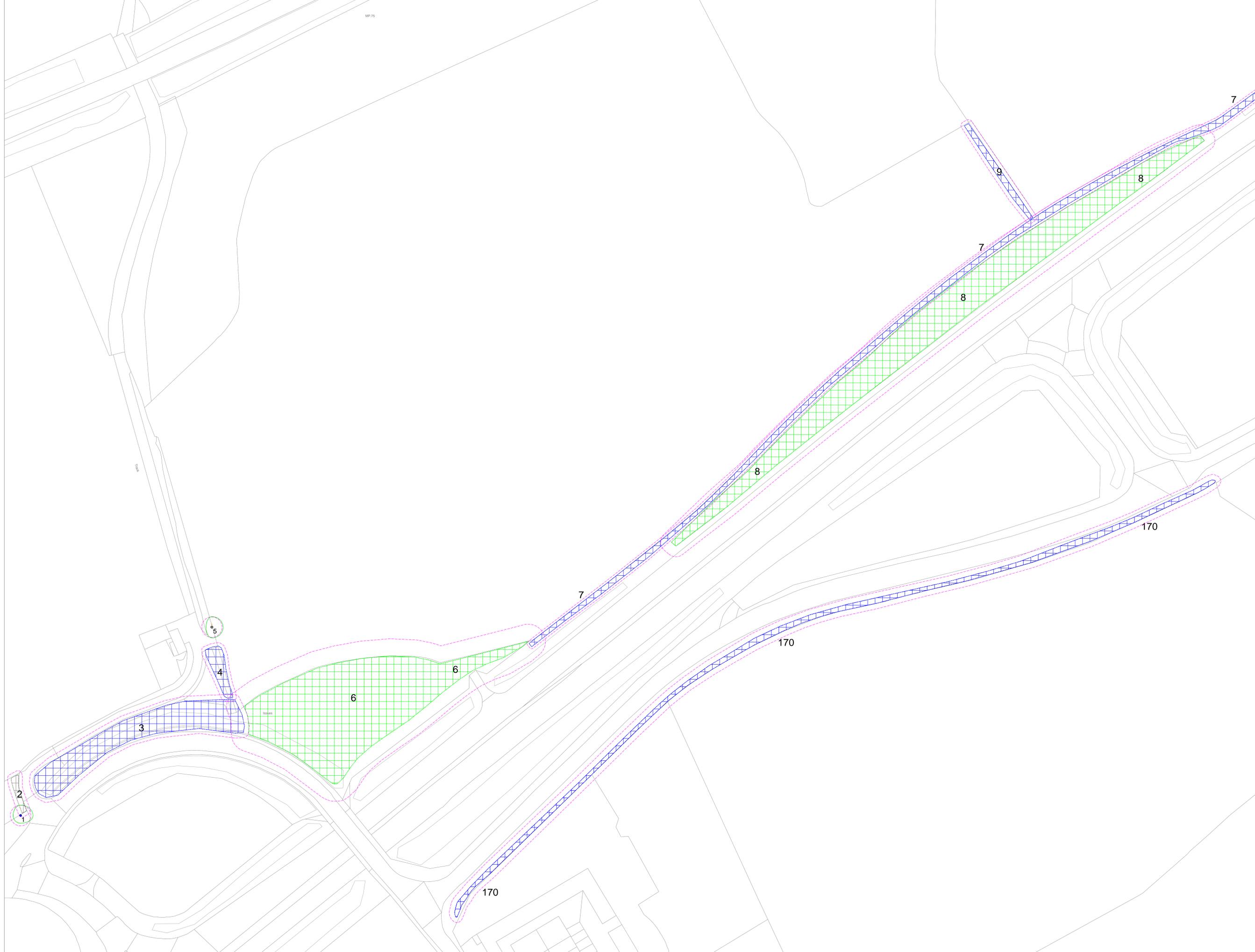
Geotextile Membrane

Base layer of Ground-Guards

Wood Chippings

Ground-Guard Trackway

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MP 75

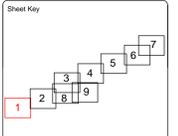
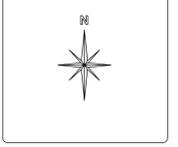
Notes  
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 Depictions of tree canopies are based on measurements taken to four cardinal compass points.  
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**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

**BSS837:2012 Tree Categories**

-  **Category A**  
Tree of high quality with an estimated remaining life expectancy of at least 40 years.
-  **Category B**  
Tree of medium quality with an estimated remaining life expectancy of at least 20 years.
-  **Category C**  
Tree of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 100 mm.
-  **Category D**  
Trees in such a condition that they cannot be retained for the remainder of their lives in the context of the current land use for longer than 10 years.
-  **Tree**  
Showing canopy extent, category colour, ID number, RPS, crown and ground projection area showing location of first significant branch.



**Mynydd Timber Services Ltd**  
 18 Tan y Bwlch,  
 Mynydd Llandegai, LL57 4DX.  
 Office: 01248 601032  
 jpasweeny@yahoo.com

<b>Client</b>	YGC		
<b>Project</b>	A55 Tai'r Meibion to Abergwyngregyn		
<b>Drawing Title</b>	Tree Constraints Plan - Sheet 1		
<b>Scale</b>	<b>Date</b>	<b>DB</b>	<b>CS</b>
1:500 (A4)	Sept 15	CS	JS
<b>Drawing Number</b>	<b>Rev</b>		
5055_BS5837_3	3		

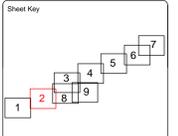
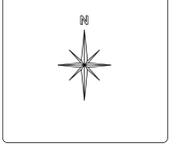


Notes  
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 Depictions of tree canopies are based on measurements taken to four cardinal compass points.  
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Designed by: **Myndd Timber Services Ltd**  
 Created: **18/09/2015**  
 Checked: **18/09/2015**  
 Drawn: **18/09/2015**  
 Project: **AS5 Tai'r Mebion to Abergywynyregyn**  
 Client: **YGC**  
 Scale: **1:500 (A4)**  
 Date: **15/09/2015**  
 DB: **CS**  
 CB: **JS**  
 Drawing Number: **5055\_BS5837\_3**  
 Rev: **3**

**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

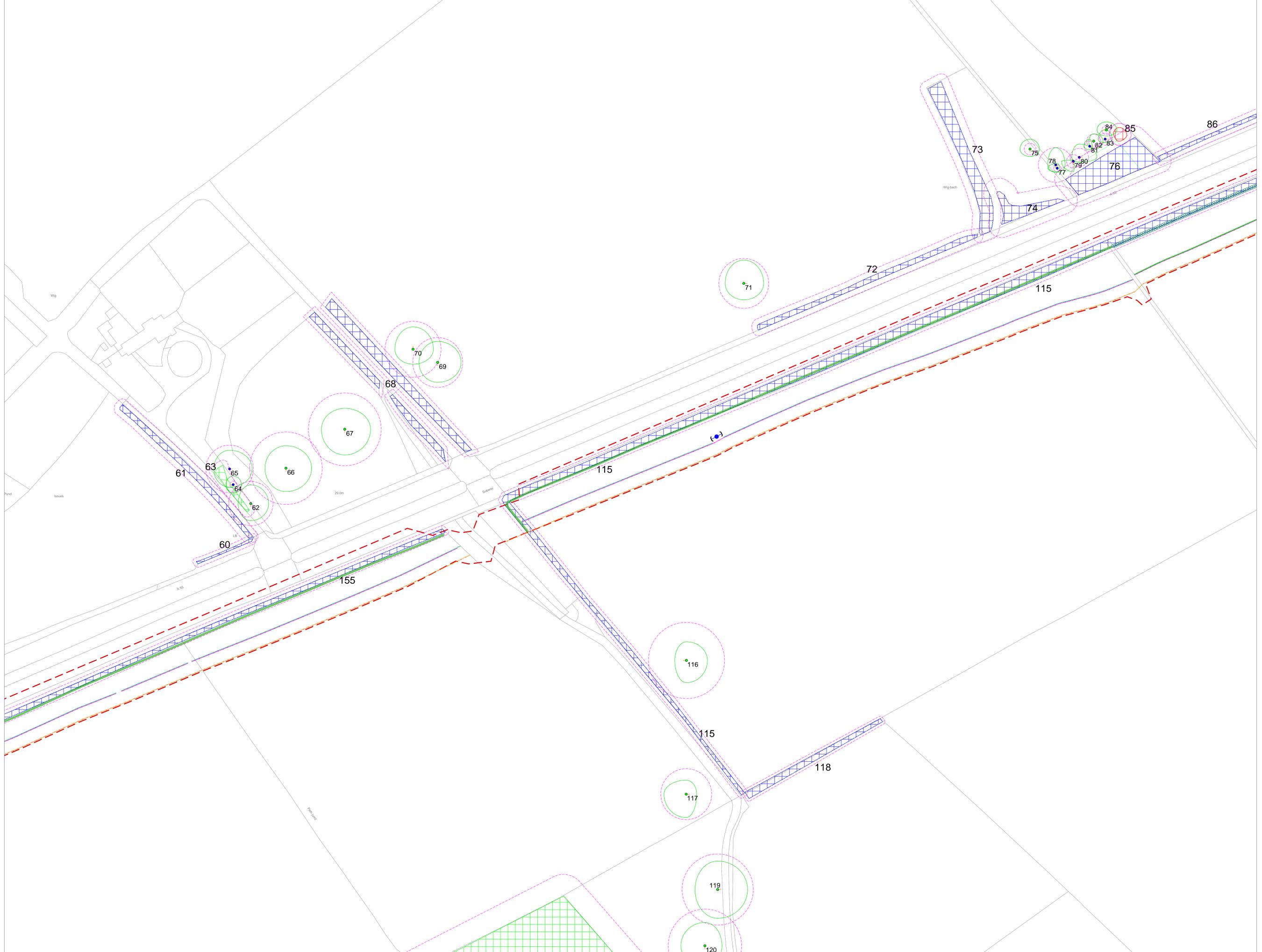
- BSS5837:2012 Tree Categories**
- Category A:** Trees of high quality with an estimated remaining life expectancy of at least 40 years.
  - Category B:** Trees of medium quality with an estimated remaining life expectancy of at least 20 years.
  - Category C:** Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 100 mm.
  - Category D:** Trees in such a condition that they cannot realistically be retained as long term trees in the context of the current land use for longer than 10 years.
  - Tree:** Showing canopy extent, category colour, ID number, RPS code and optional indicator arrow showing direction of tree significant branch.



**Myndd Timber Services Ltd**  
 18 Tan y Bwlch,  
 Myndd Llandegai, LL57 4DX.  
 Office: 01248 601032  
 jpasweeny@yahoo.com

Client	YGC		
Project	AS5 Tai'r Mebion to Abergywynyregyn		
Drawing Title	Tree Constraints Plan - Sheet 2		
Scale	Date	DB	CB
1:500 (A4)	15/09/2015	CS	JS
Drawing Number	Rev		
5055_BS5837_3	3		





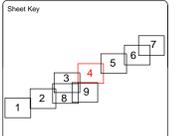
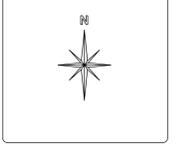
Notes  
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Designed by: Alan J. King, Director, gtd  
 Created: Thomas Jones at Mynnydd  
 Client: Mynnydd y Gwynn  
 Map prepared by: Alan J. King at Mynnydd  
 15/09/2015 10:00:00 AM  
 Report done by: Thomas Jones  
 Checked by: Alan J. King  
 Approved by: Alan J. King  
 Drawn by: Alan J. King  
 Date: 15/09/2015  
 Scale: 1:500  
 Drawing Number: 5055\_BS5837\_3

**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

**BSS5837:2012 Tree Categories**

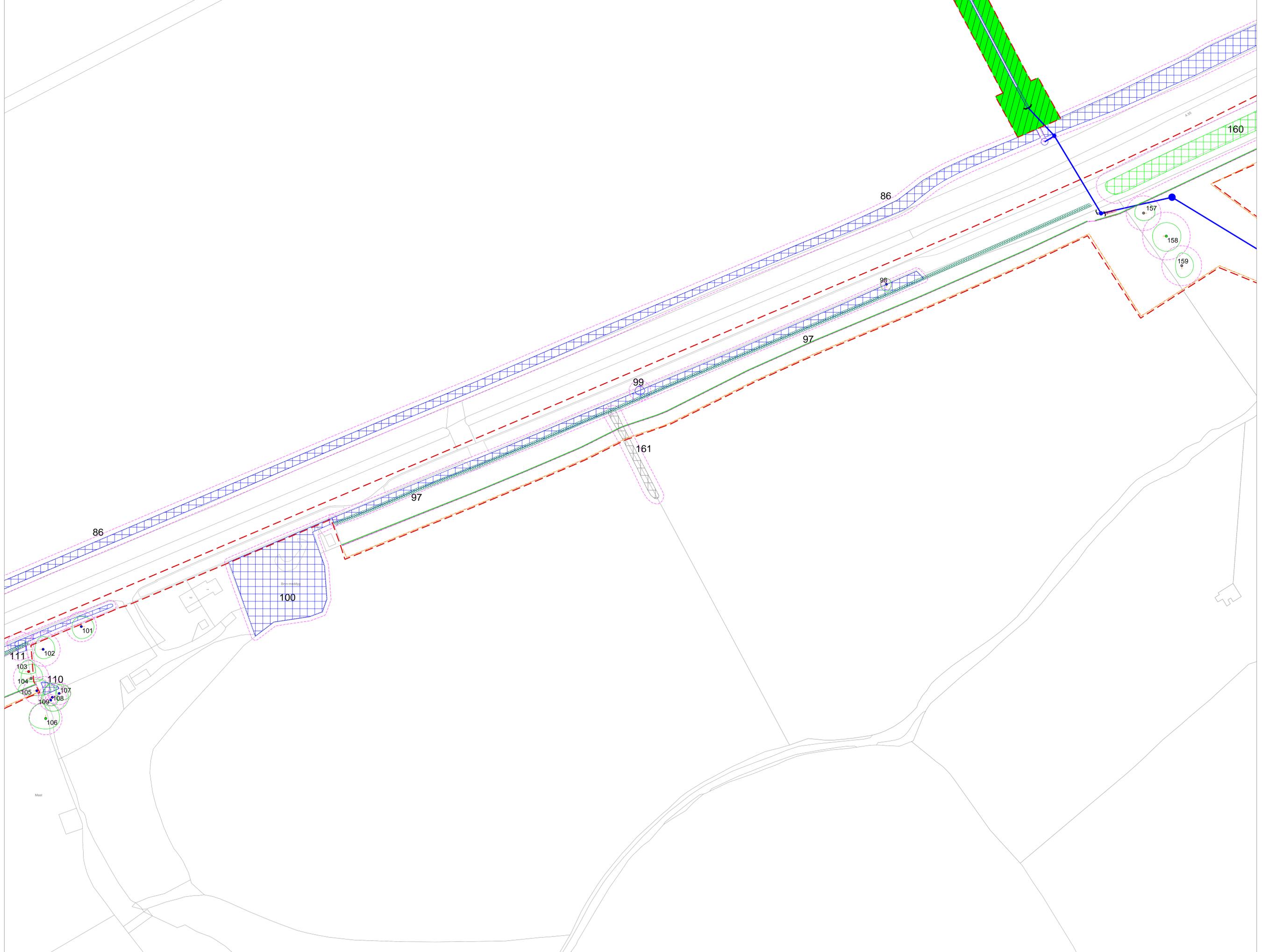
- Category A**  
 Trees of high quality with an estimated remaining life expectancy of at least 40 years.
- Category B**  
 Trees of medium quality with an estimated remaining life expectancy of at least 20 years.
- Category C**  
 Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 100 mm.
- Category D**  
 Trees in such a condition that they cannot be expected to remain as long trees in the context of the current land use for longer than 10 years.
- Category E**  
 Trees showing canopy stress, category colour, ID number, RPS code and proposed retention status showing location of first significant branch.



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 Mynnydd Llandegai, LL57 4DX.  
 Office: 01248 601032  
 jpasweeny@yahoo.com

Client	YGC		
Project	A55 Tai'r Meibion to Abergwyngregyn		
Drawing Title	Tree Constraints Plan - Sheet 4		
Scale	Date	DB	CB
1:500 (A4)	Sept 15	CS	JS
Drawing Number	Rev		
5055_BS5837_3	3		





Notes  
 To be used in conjunction with the tree data schedule which accompanies this drawing.  
 Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements.  
 Depictions of tree canopies are based on measurements taken to four cardinal compass points.  
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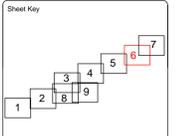
Site plan prepared by Mynydd Timber Services Ltd.  
 Client: Mynydd Timber Services Ltd.  
 Map prepared for the purpose of the site plan.  
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**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

**BSS837:2012 Tree Categories**

- Category A** Trees of high quality with an estimated remaining life expectancy of at least 40 years.
- Category B** Trees of medium quality with an estimated remaining life expectancy of at least 20 years.
- Category C** Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 100 mm.
- Category D** Trees in such a condition that they cannot realistically be retained as long trees in the context of the current land use for longer than 10 years.

**Tree** Showing canopy extent, category colour, ID number, RPS circle and proposed retention area showing location of first significant branch.

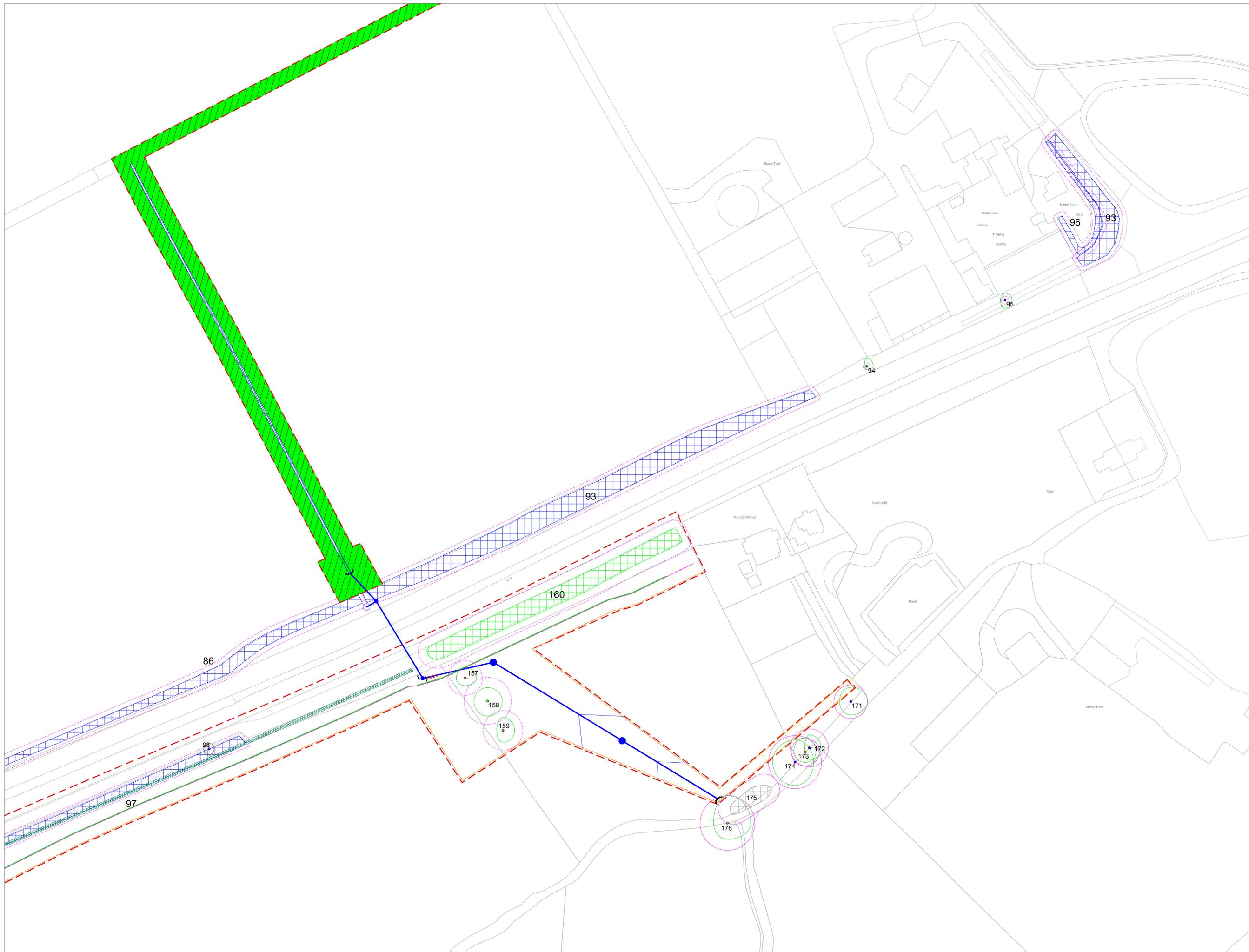


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 jpasweeny@yahoo.com

<b>Client</b>	YGC		
<b>Project</b>	A55 Tai'r Meibion to Abergywyngregyn		
<b>Drawing Title</b>	Tree Constraints Plan - Sheet 6		
<b>Scale</b>	<b>Date</b>	<b>DB</b>	<b>CS</b>
1:500 (A4)	Sept 15	CS	JS
<b>Drawing Number</b>	<b>Rev</b>		
5055_BS5837_3	3		

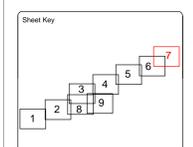
Notes  
 To be used in conjunction with the tree data schedule which accompanies this drawing.  
 Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements.  
 Depictions of tree canopies are based on measurements taken to four cardinal compass points.  
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**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

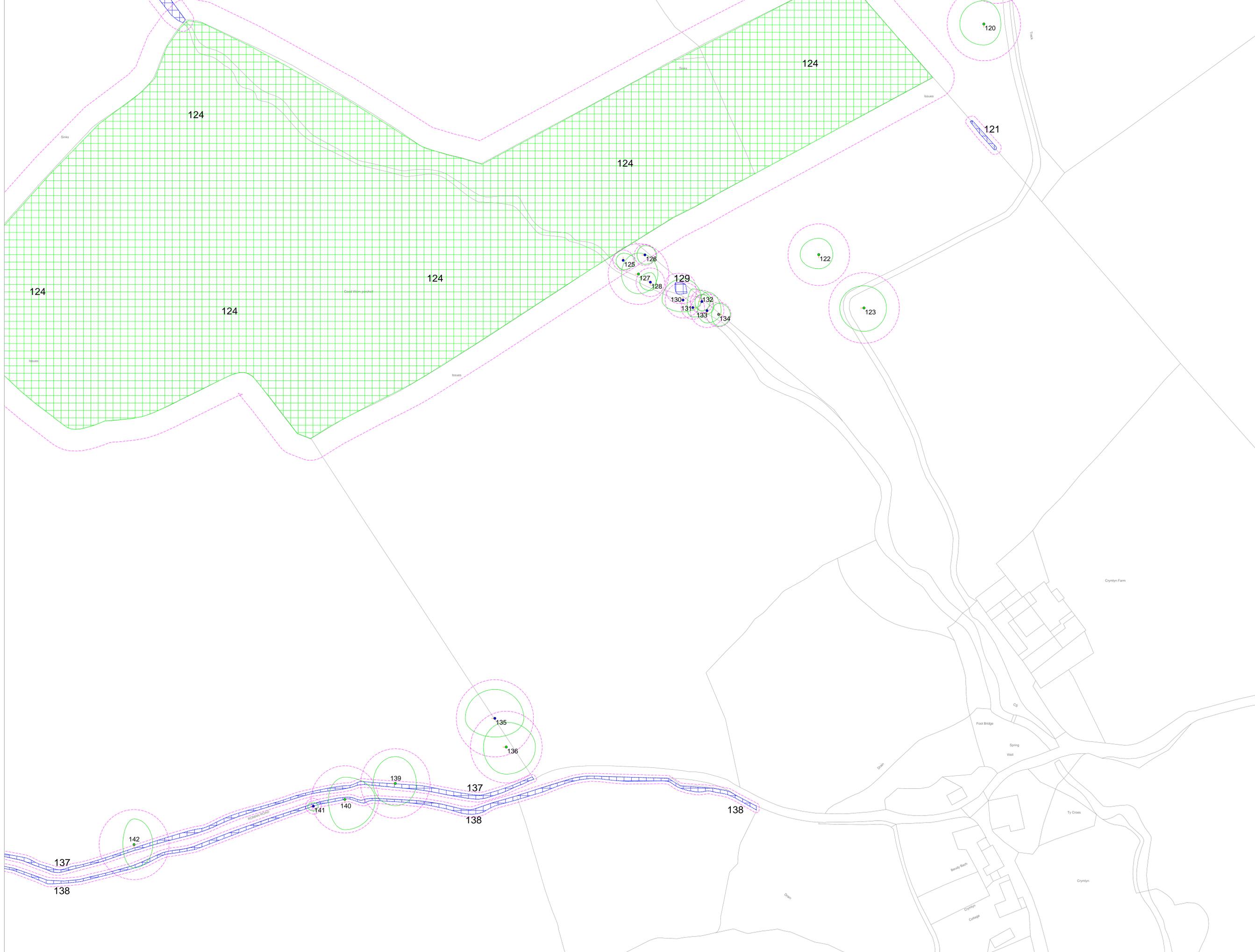
- BSS837:2012 Tree Categories**
-  **Category A** Trees of high quality with an estimated remaining life expectancy of at least 40 years.
  -  **Category B** Trees of medium quality with an estimated remaining life expectancy of at least 20 years.
  -  **Category C** Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.
  -  **Category D** Trees in such a condition that they cannot realistically be retained as long trees in the context of the current land use for longer than 10 years.
  -  **Tree** Existing canopy extent, category colour, ID number, RHS code and proposed retention status showing location of first significant branch.



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 18 Tan y Bwlch,  
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 jpasweeny@yahoo.com

<b>Client</b>	YGC		
<b>Project</b>	A55 Tai'r Meibion to Abergefnwyregyn		
<b>Drawing Title</b>	Tree Constraints Plan - Sheet 7		
<b>Scale</b>	<b>Date</b>	<b>DB</b>	<b>CS</b>
1:500 (A4)	Sept 15	CS	JS
<b>Drawing Number</b>	<b>Rev</b>		
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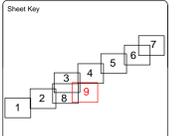
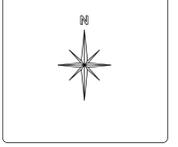


Notes  
 To be used in conjunction with the tree data schedule which accompanies this drawing.  
 Do not scale off drawing - refer to the tree data schedule for accurate client supplied measurements.  
 Depictions of tree canopies are based on measurements taken to four cardinal compass points.  
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 18 Tan y Bwlch,  
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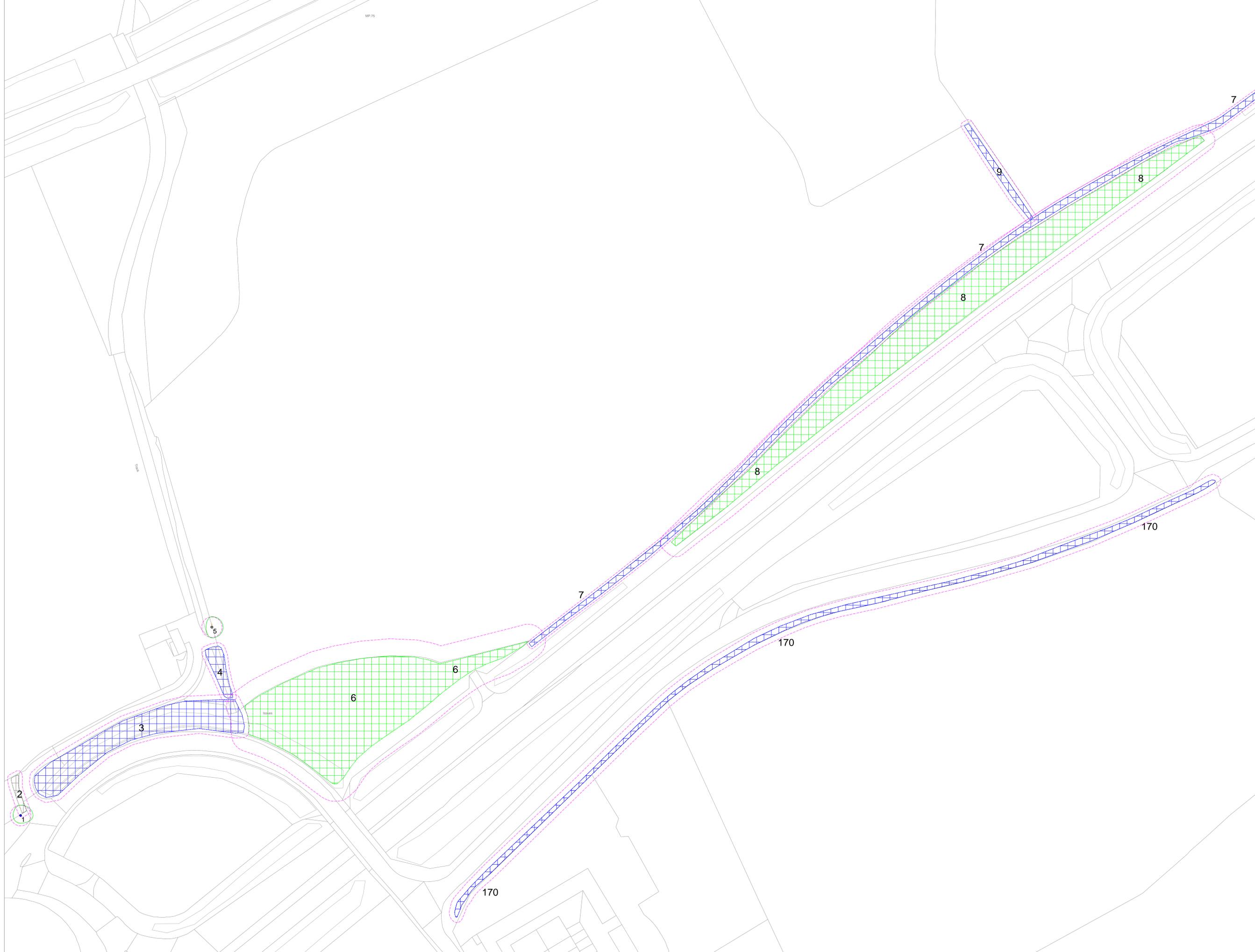
**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

- BSS837:2012 Tree Categories**
- Category A**  
 Trees of high quality with an estimated remaining life expectancy of at least 40 years.
  - Category B**  
 Trees of medium quality with an estimated remaining life expectancy of at least 20 years.
  - Category C**  
 Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 100 mm.
  - Category D**  
 Trees in such a condition that they cannot realistically be retained as long trees in the context of the current land use for longer than 10 years.
  - Tree**  
 Existing canopy extent, category colour, ID number, RPS code and proposed retention status showing location of first significant branch.



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Client	YGC		
Project	A55 Tai'r Meibion to Abergefyngregyn		
Drawing Title	Tree Constraints Plan - Sheet 9		
Scale	Date	DB	CB
1:500 (A4)	Sept 15	CS	JS
Drawing Number	Rev		
5055_BS5837_3	3		



MP.75

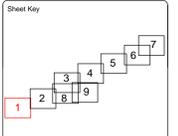
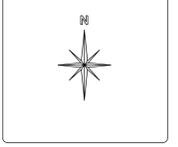
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**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

**BSS837:2012 Tree Categories**

-  **Category A**  
Tree of high quality with an estimated remaining life expectancy of at least 40 years.
-  **Category B**  
Tree of moderate quality with an estimated remaining life expectancy of at least 20 years.
-  **Category C**  
Tree of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 100 mm.
-  **Category D**  
Trees in such a condition that they cannot realistically be retained as long term trees in the context of the current land use for longer than 10 years.
-  **Tree**  
Showing canopy extent, category colour, ID number, RPS, crown and ground projection area showing location of first significant branch.



**Mynydd Timber Services Ltd**  
 18 Tan y Bwlch,  
 Mynydd Llandegai, LL57 4DX.  
 Office: 01248 601032  
 jpasweeny@yahoo.com

Client	YGC		
Project	A55 Tai'r Meibion to Abergwyngregyn		
Drawing Title	Tree Constraints Plan - Sheet 1		
Scale	Date	DB	CB
1:500 (A4)	Sept 15	CS	JS
Drawing Number	Rev		
5055_BS5837_3	3		



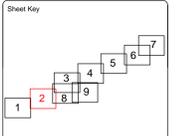
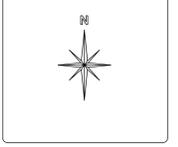
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Designed by: Alan J. O'Connell  
 Checked by: Alan J. O'Connell  
 Drawn by: Alan J. O'Connell  
 Date: 15/09/2015  
 Project: A55 Tai'r Meibion to Abergefnwy  
 Client: YGC  
 Scale: 1:500  
 Date: 15/09/2015  
 Drawn by: Alan J. O'Connell  
 Checked by: Alan J. O'Connell  
 Date: 15/09/2015

**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

**BSS837:2012 Tree Categories**

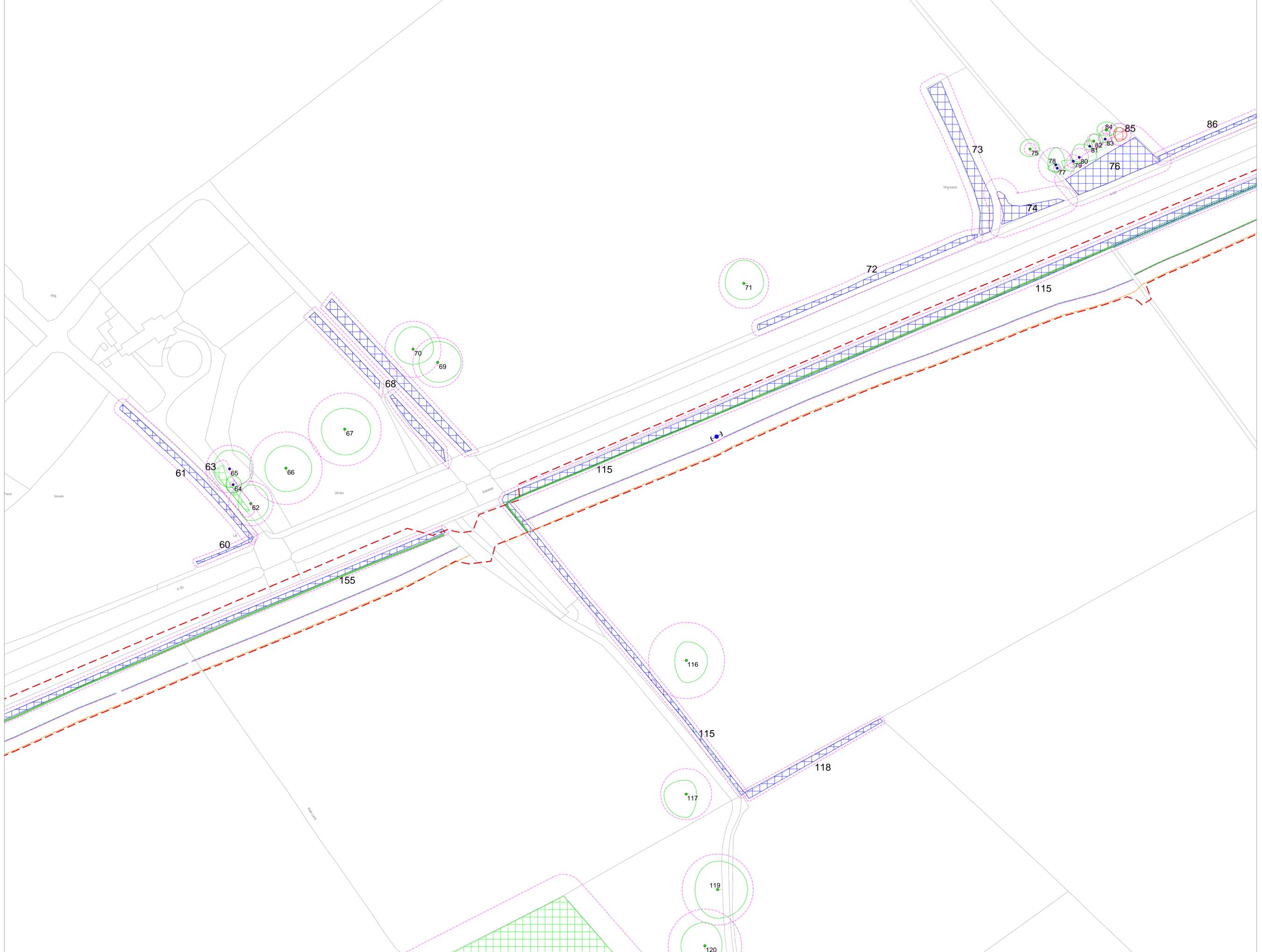
- Category A**  
 Trees of high quality with an estimated remaining life expectancy of at least 40 years.
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 Trees of medium quality with an estimated remaining life expectancy of at least 20 years.
- Category C**  
 Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 100 mm.
- Category D**  
 Trees in such a condition that they cannot realistically be retained as long term trees in the context of the current land use for longer than 10 years.
- Tree**  
 Existing canopy extent, category colour, ID number, RPS code and proposed retention status showing location of first significant branch.



**Mynydd Timber Services Ltd**  
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Client	YGC		
Project	A55 Tai'r Meibion to Abergefnwy		
Drawing Title	Tree Constraints Plan - Sheet 2		
Scale	Date	DB	CB
1:500 (A4)	Sept 15	CS	JS
Drawing Number	Rev		
5055_BS5837_3	3		





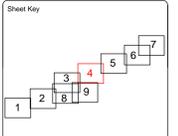
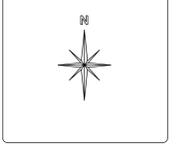
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**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

**BSS837:2012 Tree Categories**

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 Trees of high quality with an estimated remaining life expectancy of at least 40 years.
- Category B**  
 Trees of medium quality with an estimated remaining life expectancy of at least 20 years.
- Category C**  
 Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 100 mm.
- Category D**  
 Trees in such a condition that they cannot realistically be expected to bring trees to the control of the current land use for longer than 10 years.
- Tree**  
 Existing canopy extent, category colour, ID number, RPS code and proposed retention status showing location of first significant branch.

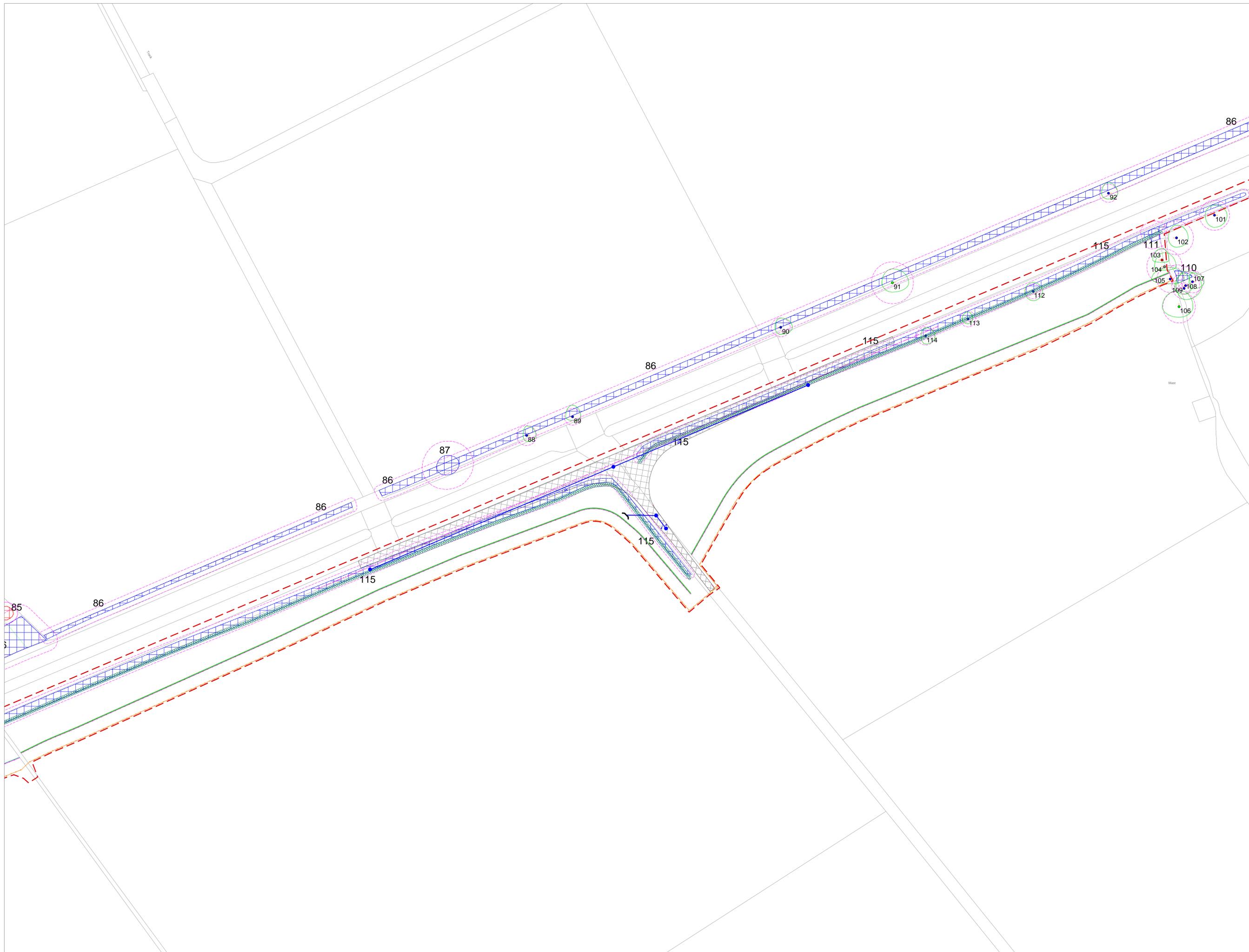


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Client	YGC		
Project	A55 Tai'r Meibion to Abergywyngregyn		
Drawing Title	Tree Constraints Plan - Sheet 4		
Scale	Date	DB	CB
1:500 (A4)	Sept 15	CS	JS
Drawing Number	Rev		
5055_BS5837_3	3		

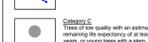
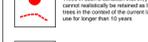
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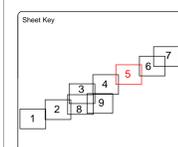
Submitted to: **YGC**  
 Prepared by: **Mynydd Timber Services Ltd**  
 Date: **15 Sept 2015**  
 Scale: **1:500**  
 Drawing No: **5055\_BS5837\_3**



**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

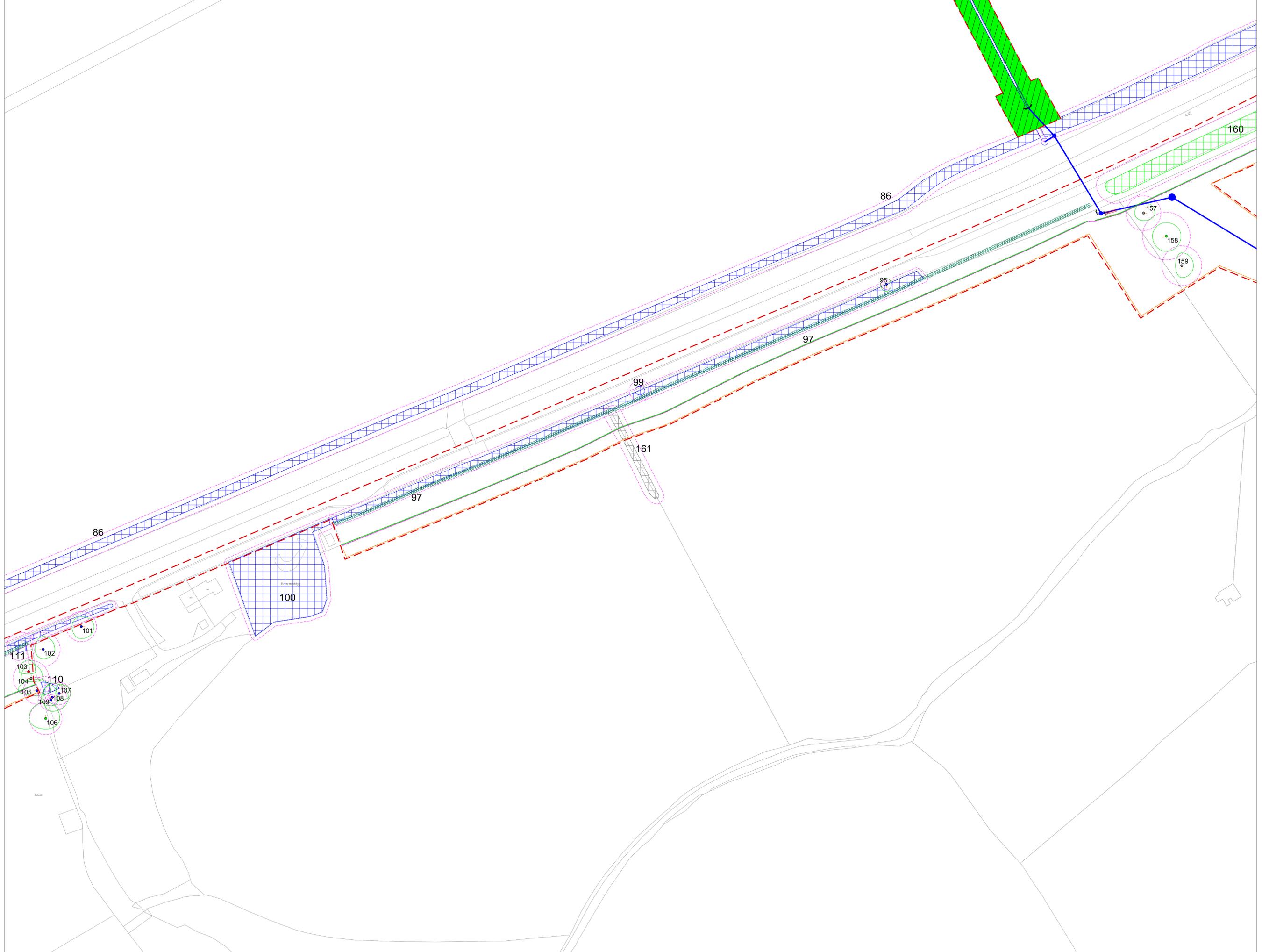
**BSS5837:2012 Tree Categories**

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 Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
- Category C**  
 Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 100 mm.
- Category D**  
 Trees in such a condition that they cannot realistically be retained as long trees in the context of the current land use for longer than 10 years.
- Tree**  
 Existing canopy extent, category colour, ID number, RPS code and proposed retention status showing location of first significant branch.



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Client	YGC		
Project	A55 Tai'r Meibion to Abergefnwy		
Drawing Title	Tree Constraints Plan - Sheet 5		
Scale	Date	DB	CB
1:500 (A4)	Sept 15	CS	JS
Drawing Number	Rev		
5055_BS5837_3	3		



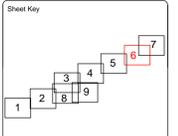
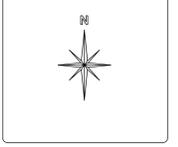
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 Cinger Drawings: 10002087 - 2015

**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

**BSS837:2012 Tree Categories**

-  **Category A**  
Tree of high quality with an estimated remaining life expectancy of at least 40 years.
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-  **Category C**  
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-  **Category D**  
Trees in such a condition that they cannot realistically be retained as long trees in the context of the current land use for longer than 10 years.
-  **Tree**  
Showing canopy extent, category colour, ID number, RPS circle and proposed retention status showing location of first significant branch.

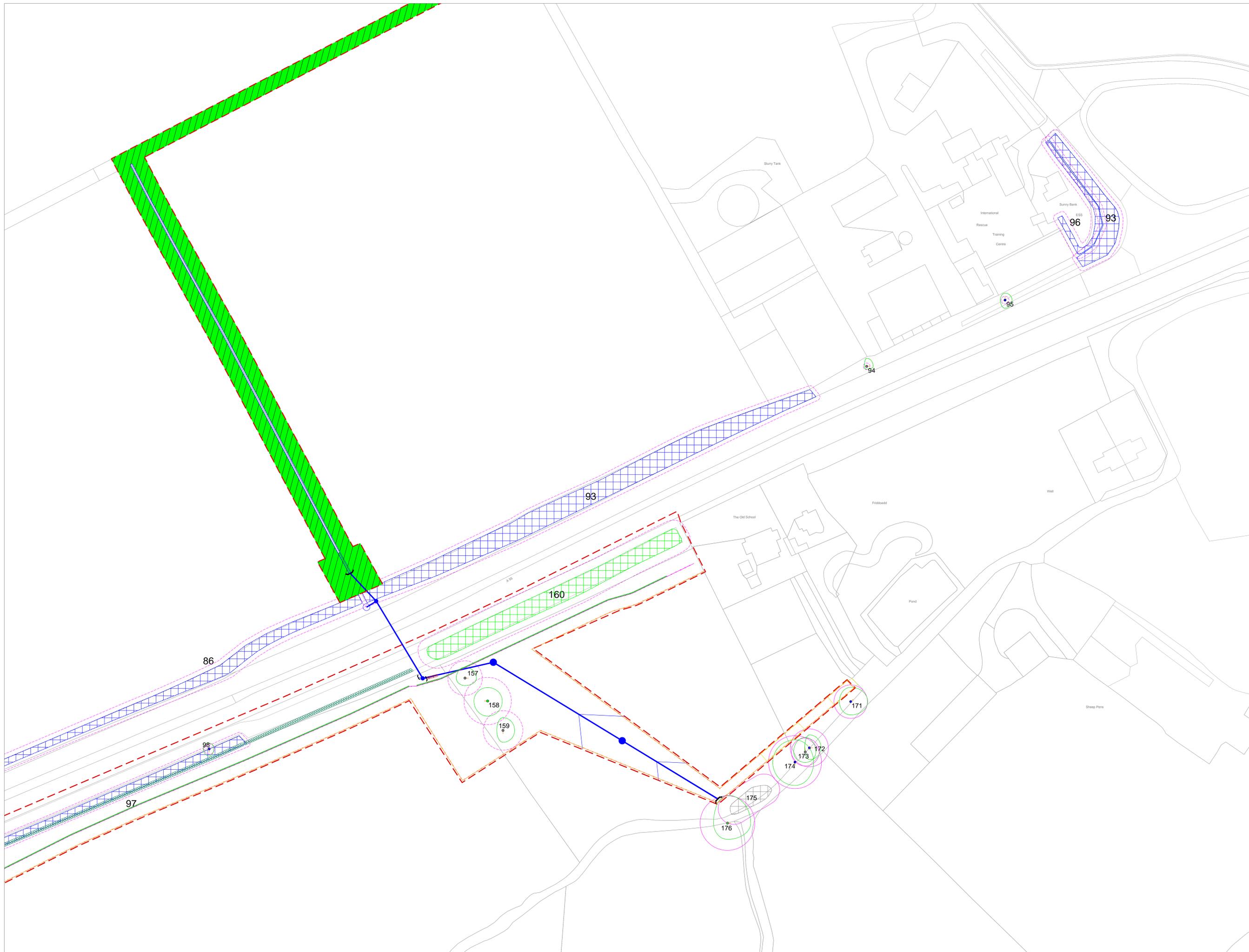


**Mynydd Timber Services Ltd**  
 18 Tan y Bwlch,  
 Mynydd Llandegai, LL57 4DX.  
 Office: 01248 601032  
 jpasweeny@yahoo.com

<b>Client</b>	YGC		
<b>Project</b>	A55 Tai'r Meibion to Abergywynyregyn		
<b>Drawing Title</b>	Tree Constraints Plan - Sheet 6		
<b>Scale</b>	<b>Date</b>	<b>DB</b>	<b>CS</b>
1:500 (A4)	Sept 15	CS	JS
<b>Drawing Number</b>	<b>Rev</b>		
5055_BS5837_3	3		

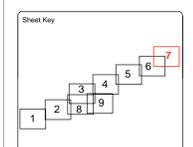
Notes  
 To be used in conjunction with the tree data schedule which accompanies this drawing.  
 Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements.  
 Depictions of tree canopies are based on measurements taken to four cardinal compass points.  
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Surveyed in May 2015 using a total station and GPS. Data collected by Glynis Jones. Map prepared by Glynis Jones. Report done for the Client. Survey mapping with the permission of the Controller of the Majesty's Stationery Office. Unauthorised reproduction of this document is prohibited and may be liable to prosecution if it infringes copyright. Copyright © 2015 Glynis Jones.



**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

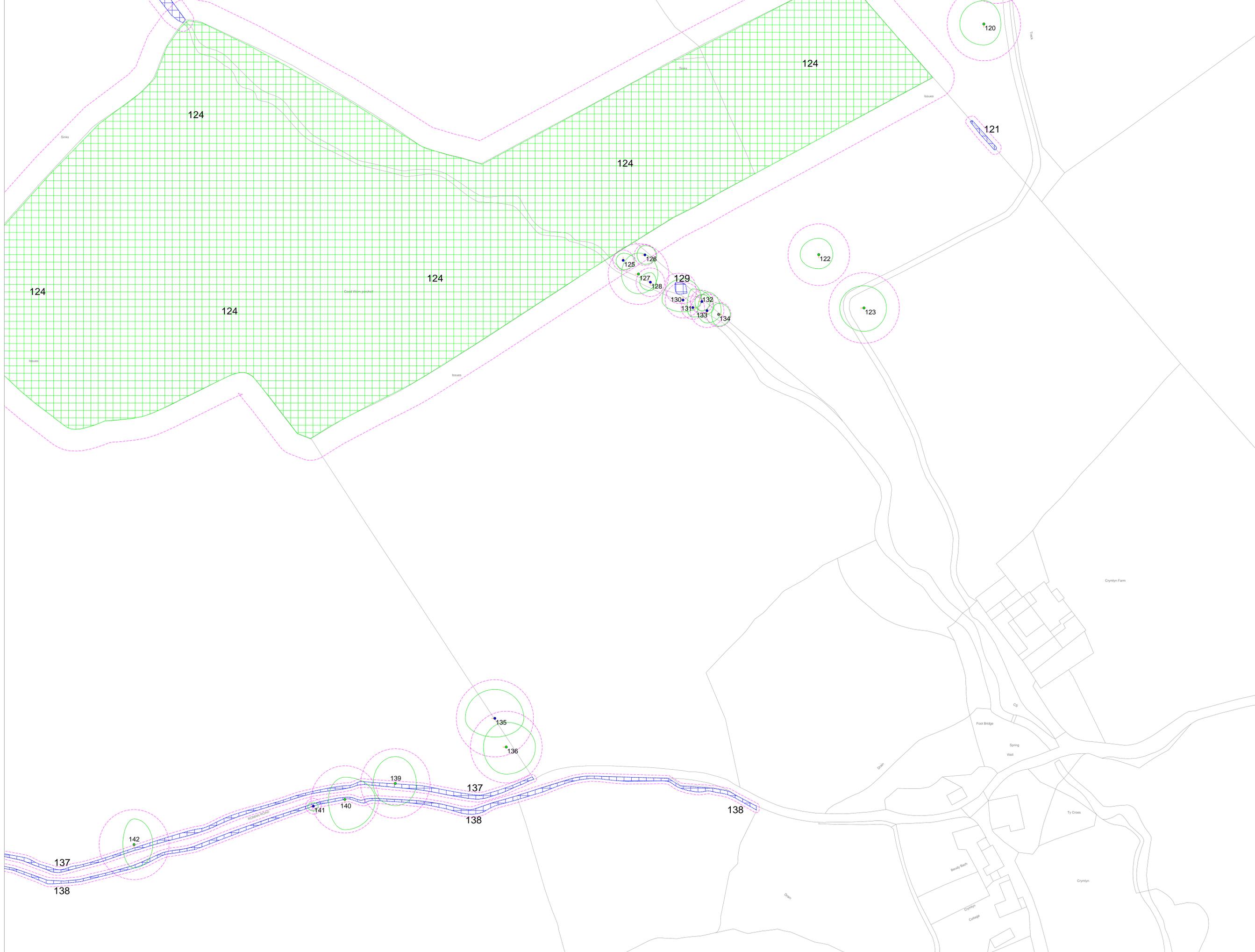
- BSS837:2012 Tree Categories**
-  **Category A** Trees of high quality with an estimated remaining life expectancy of at least 40 years.
  -  **Category B** Trees of medium quality with an estimated remaining life expectancy of at least 20 years.
  -  **Category C** Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.
  -  **Category D** Trees in such a condition that they cannot realistically be retained as long trees in the context of the current land use for longer than 10 years.
  -  **Tree** Showing canopy extent, category colour, ID number, RPS code and proposed retention status showing location of first significant branch.



**Mynydd Timber Services Ltd**  
 18 Tan y Bwlch,  
 Mynydd Llandegai, LL57 4DX.  
 Office: 01248 601032  
 jpasweeny@yahoo.com

<b>Client</b>	YGC		
<b>Project</b>	A55 Tai'r Meibion to Abergefnwyregyn		
<b>Drawing Title</b>	Tree Constraints Plan - Sheet 7		
<b>Scale</b>	<b>Date</b>	<b>DB</b>	<b>CS</b>
1:500 (A4)	Sept 15	CS	JS
<b>Drawing Number</b>	<b>Rev</b>		
5055_BS5837_3	3		





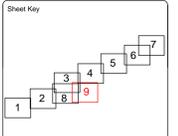
Notes  
 To be used in conjunction with the tree data schedule which accompanies this drawing.  
 Do not scale off drawing - refer to the tree data schedule for accurate client supplied measurements.  
 Depictions of tree canopies are based on measurements taken to four cardinal compass points.  
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Site plan prepared by:  
 Mynydd Timber Services Ltd  
 18 Tan y Bwlch,  
 Mynydd Llandegai, LL57 4DX.  
 Office: 01248 601032  
 jpasweeny@yahoo.com

**Tree Constraints Plan showing existing layout against tree categories and root protection zones.**

**BSS837:2012 Tree Categories**

- Category A** Trees of high quality with an estimated remaining life expectancy of at least 40 years.
- Category B** Trees of medium quality with an estimated remaining life expectancy of at least 20 years.
- Category C** Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 100 mm.
- Category D** Trees in such a condition that they cannot realistically be retained as long trees in the context of the current land use for longer than 10 years.
- Tree** Existing canopy extent, category colour, ID number, RPS code and proposed retention status showing location of first significant branch.



**Mynydd Timber Services Ltd**  
 18 Tan y Bwlch,  
 Mynydd Llandegai, LL57 4DX.  
 Office: 01248 601032  
 jpasweeny@yahoo.com

Client	YGC		
Project	A55 Tai'r Meibion to Abergefyngregyn		
Drawing Title	Tree Constraints Plan - Sheet 9		
Scale	Date	DB	CB
1:500 (A4)	Sept 15	CS	JS
Drawing Number	Rev	3	
5055_BS5837_3			



# A55(T) ABERGWYNGREGYN TO TAI'R MEIBION IMPROVEMENT

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PHASE 1 HABITAT SURVEY  
APRIL 2016

CPF: 5055  
Client: Welsh Government

## Document Control Sheet

<b>Document Author:</b>	Christian Middle MCIEEM
<b>Project Manager:</b>	Dave Meller

### Revision History

Date	Version No.	Summary of Changes
02/06/2016	0.01	1st Issue

### Approvals

Approved by	Signature	Date	Version
Nancy Wilkinson		02/06/2016	0.01

### Distribution

Name	Title	Date	Version

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**Appendix I: Phase 1 Habitat Survey Plan**

**Appendix II: Site Photographs**

**References**

# A55(T) Abergwyngregyn to Tai'r Meibion Improvement Phase 1 Habitat Survey

April 20<sup>th</sup> & 21<sup>st</sup> 2016

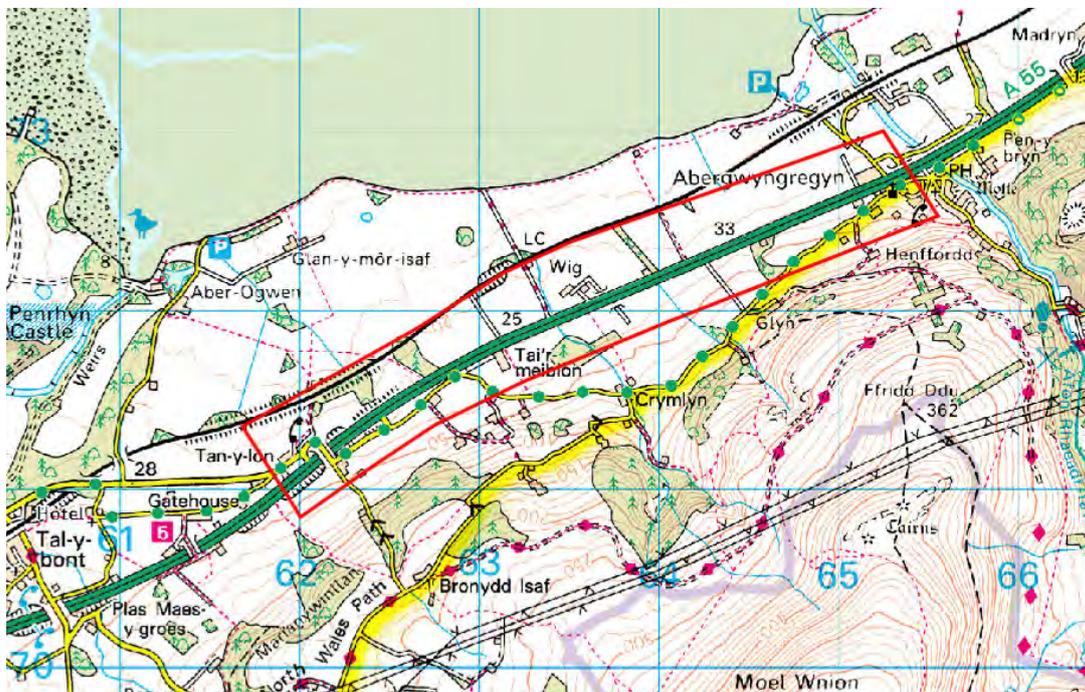
## 1.0 Introduction

A phase 1 habitat survey was undertaken by YGC ecologist Christian Middle MCIEEM (full member of the Chartered Institute of Ecology and Environmental Management) on 20<sup>th</sup> and 21<sup>st</sup> April 2016 as part of the field work surveys to inform the Environmental Impact Assessment (EIA) for the proposed A55(T) Abergwyngregyn to Tai'r Meibion Improvement.

The survey area is comprised of areas of land both to the north and south of the A55(T) in Gwynedd between Talybont to the west and Abergwyngregyn to the east, NGR SH 62024 72766 to SH 65267 72766 (see Figure 1).

The purpose of the survey was to identify any changes in the habitat types and land use adjacent to the A55(T) Abergwyngregyn to Tai'r Meibion Improvement proposal and to update the previous Phase 1 survey undertaken in approximately 2003. This report does not however, provide advice on any further ecological survey work required for example protected species surveys, as a suite of surveys for bats, otter and badger have been previously undertaken in 2015 with ongoing bat activity surveys continuing throughout the 2016 bat survey season.

An ecological survey scoping document sent to Welsh Government, NMWTRA and Gwynedd Council in April 2015 stated that Water Vole, Dormouse and Great Crested Newt surveys have been scoped out of the 2015 surveys on the basis of negative results during the previous surveys and lack of previous records for these species within the vicinity.



**Figure 1:** Location of A55(T) Abergwyngregyn to Tai'r Meibion Improvement Phase 1 Habitat Survey Area (shown by bold red line).

## **2.0 Methodology**

A phase 1 habitat survey of the site was undertaken on the 20<sup>th</sup> and 21<sup>st</sup> April 2016 by a MCIEEM ecologist to update the previous Phase 1 Habitat survey that was last undertaken in approximately 2003. The habitat types present and the current land use surrounding the proposal were identified and mapped within the survey area. The phase 1 survey plan is provided in Appendix I: Phase 1 Survey Plan.

With respect to legally protected species, specific surveys for bats, otter and badger have been undertaken previously during 2015 with ongoing bat activity surveys throughout the 2016 bat survey season.

In accordance with the guidelines of the Chartered Institute of Ecology and Environmental Management (CIEEM) evidence of any invasive species found during the course of the survey has been highlighted in this report.

## **3.0 Limitations to the Survey**

Ecological surveys are limited by factors which affect the presence of plants and animals, such as the time/season of year and the migration patterns and behaviour of animals. Consequently, the ecological survey of this site has not produced a complete list of plants. However, it is considered that the results of the ecological survey undertaken have allowed for the identification of the habitats on site and for the potential presence of invasive species.

The weather conditions on the days preceding the survey and the days that the site was visited to undertake the survey did not pose any limitations.

Access to areas of extremely dense vegetation in parts of the site and beyond the survey area was not possible due to the density of the vegetation and the existing boundaries of the survey area.

## **4.0 Phase 1 Habitat Descriptions**

### **4.1 Broadleaved Semi-natural Woodland (A.1.1.1), Scrub (A.2.1) and Broad-leaved Scattered Trees (A.3.1)**

The vegetated boundaries to both the north and south of the A55(T) are dominated by pruned and maintained hawthorn dominated hedgerows with a low number of immature and semi-mature ash, sycamore and blackthorn growing within them. In some areas only fence lines are present in the absence of vegetation.

Pockets of mature and semi-mature broadleaved woodland dominated by ash, sycamore and sessile and pendunculate oak providing suitable habitat for badgers and a variety of breeding birds and bat species are present throughout the survey area to both the north and south of the A55(T), generally with sparse understoreys and in some cases dominated by *Rhododendron ponticum* (a Schedule 9 invasive plant species).

Tall herb vegetation and bracken with extensive areas of bramble scrub and with ancient woodland indicators such as dog's mercury, bluebell and ramsons are present in some areas of mature woodland.

Scattered mature trees generally dominated by oaks, providing suitable habitat for roosting and foraging bats as well as breeding birds and invertebrates, are also present to both the north and south of the A55(T) within generally heavily grazed and improved fields.

Areas of scrub dominated by bramble and hawthorn with blackthorn are also present adjacent to boundaries and within the small pockets of woodland. Mixed broadleaved and coniferous woodland is also present in limited areas on both sides of the A55(T).

Immature, semi-mature and mature trees dominated by hawthorn, ash and sycamore are also present within the boundaries leading away from and connected to the boundaries of the A55(T). Other species of tree present within the survey area include horse chestnut, sweet chestnut, wayfaring tree, small-leaved lime, beech, elder, alder, English elm and holly.

The areas of mature broadleaved woodland and scrub provide suitable habitat for a variety of protected species such as bats, otter, badger, reptiles and invertebrate species.

#### **4.2 Improved Grassland (B.4)**

The majority of the habitat within the survey area to both the north and south of the A55(T) is considered to be improved neutral grassland dominated by perennial rye grass. Improved fields are heavily grazed, predominantly by sheep but with cattle stock grazing the north eastern section of the survey area.

#### **4.3 Neutral Semi-improved Grassland (B.2.2)**

A very small area of semi-improved neutral grassland (intensely grazed by sheep) dominated by a variety of grasses including common bent, crested dogs tail and yorkshire fog is present in the south eastern section of the survey area. However, the diversity of the semi-improved grassland is considered to be low due to intensive grazing.

Small areas of wet grassland dominated by soft rush are present to both the north and south of the A55(T) but are not considered to be comprised of lowland coastal grazing marsh or rush pasture.

#### **4.5 Bracken (C.1)**

Areas of bracken are frequent throughout the survey area, located predominantly within the small areas of woodland and scrub scattered throughout the survey area.

#### **4.6 Running Water (G.2)**

The Afon Wig main river flows south to north through the survey area and under the A55(T). Several other smaller and unnamed watercourses also flow south to north through the survey area and under the A55(T). All watercourses are currently culverted under the A55(T).

The watercourses provide low quality suitable habitat for otters and fish species to the north of the A55(T) as the movement of these species is restricted to the habitat south of the A55(T) due to the design of the culverts under the road.

#### **4.7 Boundaries (J.2)**

##### **4.7.1 Native Species Rich Hedgerows (J.2.1.1)**

The only species rich hedgerows within the survey area are located adjacent to both sides of the Henffordd road and are comprised of old intact cloddiau with very well established mature hedgerow vegetation on top of them and infrequent mature trees set within or directly adjacent to the hedgerows. These are likely to be an important foraging, commuting and breeding resource for a variety of species including bat, reptiles, breeding birds and invertebrates (see Appendix II: Site Photographs).

The hedgerow and clawdd vegetation is dominated by woody species such as hazel, elder, hawthorn, blackthorn, ash, sycamore, holly, oak and a variety of wildflowers including bluebell, red campion, wall pennywort, common dog violet, wood sorrel, wood sage, wood avens, primrose, lesser stitchwort, garlic mustard, field bindweed, European gorse and herb robert.

##### **4.7.2 Species Poor Hedgerows (J.2.1.2)**

The majority of the hedgerows within the survey area to both the north and south of the A55(T) are comprised of species poor hedgerows dominated by hawthorn and with limited other species that include ash, blackthorn and sycamore (see Appendix II: Site Photographs).

All hedgerows contain integrated fence lines within them.

A Phase 1 Habitat Plan is provided in Appendix I, together with a list of the plant species that were recorded during the course of the survey.

## **5.0 Protected Species**

### **5.1 Bats**

Previous general bat activity surveys have been undertaken in 2015 by Ecological Design Consultants (EDC), the results of which are detailed in the 'Bat Surveys; A55, Abergwyngregyn to Tai'r Meibion Improvement' report.

Targeted bat activity surveys at the locations of the Tai'r Meibion and Wig Farm Underpasses have been undertaken by YGC in 2015 and are ongoing throughout the bat survey season of 2016. The results of the 2015 surveys are detailed in the 'A55(T) Underpasses Bat Activity Report 2015'.

### **5.2 Otter**

Previous survey for otter has been undertaken by YGC in 2015, the results of which are detailed in the 'A55(T) Abergwyngregyn to Tai'r Meibion Otter and Badger Survey May 2015'.

### **5.3 Badger**

Previous survey for badger has been undertaken by YGC in 2015, the results of which are detailed in the 'A55(T) Abergwyngregyn to Tai'r Meibion Otter and Badger Survey May 2015'.

### **5.4 Reptiles**

No specific reptile surveys have been undertaken within the survey area to date due to health and safety restrictions associated with the A55(T) road verge which would necessitate a lane closure in order to facilitate the setting up and completion of the survey.

However, the habitat of the hedgerow and scrub lined habitat of the A55(T) verges is considered to provide medium suitable habitat for the more common species of reptile including slow worm and potentially common lizard.

The habitat provided by the old clawdd wall habitat directly adjacent to and bordering the Henffordd road is considered to provide medium to high suitability for the more common reptile species including slow worm, common lizard and potentially grass snake and adder.

However, all boundary habitats including hedgerows, scrub lined fences and cloddiau are considered likely to provide suitable habitat for the more common species of reptiles.

### **5.5 Breeding Birds**

The areas of hedgerow, woodland and scrub habitats are considered suitable for a variety of breeding birds.

A breeding bird survey is currently being undertaken by EDC during the 2016 survey season.

### **5.6 Invertebrates**

The areas of wet and semi-improved grassland, woodland and scrub and the boundary habitats present are considered to be reasonably good quality habitat for various invertebrate species such as butterflies. Butterfly species recorded during the course of the survey include, peacock, orange tip, speckled wood, comma, small white and small tortoiseshell.

## **6.0 Invasive Plant Species**

The Schedule 9 invasive plant species *Rhododendron ponticum* is present in large stands and scattered individuals throughout some areas of the site and is the dominant understory vegetation in several of the broadleaved woodland areas to the north and south of the A55(T) (see Appendix I: Phase 1 Survey Plan and see Section 9.0 Recommendations for Further Work).

The Schedule 9 invasive plant species Japanese Knotweed (*Fallopia japonica*) is also present within one broadleaved woodland area to the northwest of the survey area and A55(T) (see Appendix I: Phase 1 Survey Plan and see Section 9.0 Recommendations for Further Work).

## **7.0 Gwynedd BAP Species and Habitats**

All Local Authorities are obliged to consider the species and habitats listed in the Local Biodiversity Action Plan. The following species and habitats are listed as priority species and habitats in the Gwynedd Local Biodiversity Action Plan (LBAP) and are, or are potentially, present within the survey area and will contribute to informing the ecological scoping process for the EIA.

### **Gwynedd LBAP Species recorded within the survey area**

Bats  
Otter  
Newts  
Bumblebees  
Bluebell

### **Gwynedd LBAP Species potentially present within the survey area**

Polecat  
Brown hare  
Barn owl  
Dragonfly / Damselfly species  
Lapwing  
Farmland birds  
Green woodpecker  
Lampreys  
Salmonids

### **Gwynedd LBAP Habitats recorded within the survey area**

Wet woodland  
Scrub woodlands  
Lowland meadows & pasture  
Hedgerows  
Transport Corridors  
Buildings  
Gardens  
River Corridors  
Lakes, ponds & ditches

## **8.0 NERC Act Section 42 Species and Habitats**

All public bodies in Wales, including Welsh Government and Gwynedd Council as scheme stakeholders, have a duty to '*have regard for*' the species and habitats listed under Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006. As such the following such habitats and species are present, or are considered to be potentially present, within the survey area and will contribute to informing the ecological scoping process for the EIA).

### **NERC Section 42 Species recorded within the survey area**

Bat species  
Otter

### **NERC Section 42 Species potentially present within the survey area**

West European hedgehog  
Brown hare  
Polecat  
Common cuckoo  
Kestrel  
House sparrow  
Dunnoek  
Common bullfinch  
Common starling  
Song thrush  
Northern lapwing  
European eel

River lamprey  
Brown / Sea trout  
Slow-worm  
Common toad  
Common lizard  
Grass snake  
Large garden bumblebee

#### **NERC Section 42 Habitats recorded within the survey area**

Wet woodland  
Lowland mixed deciduous woodland  
Hedgerows  
Lowland meadows  
Rivers  
Open mosaic habitats on previously developed land

### **9.0 Recommendations for Further Survey Work**

#### **9.1 Bats**

The bat activity surveys at the locations of the Tai'r Meibion and Wig Farm Underpasses are continuing throughout the 2016 bat survey season with a total of three dusk and/or pre-dawn surveys proposed in May, July and September 2016.

#### **9.2 Otter**

No further survey is recommended for otter as survey for the species has been undertaken in 2015.

#### **9.3 Badger**

No further survey is recommended for badger as survey for the species has been undertaken in 2015.

#### **9.4 Reptiles**

No specific reptile surveys have been undertaken within the survey area to date due to health and safety restrictions associated with the A55(T) road verge which would necessitate a lane closure in order to facilitate the setting up and completion of the survey.

#### **9.5 Breeding Birds**

A breeding bird survey is currently being undertaken by EDC during the 2016 survey season.

#### **9.6 Vegetation**

##### **9.6.1 Hedgerows**

Species rich hedgerows and cloddiau form the boundaries of the Henffordd old road that runs from Talybont to Abergwyngregyn to the south of the A55(T). This meets the criteria for an 'important hedgerow' under the Hedgerow Regulations 1997 but it has been confirmed that a hedgerow removal licence would not be required to remove this hedgerow as the proposed works are being consented under other legislation. It is recommended that this hedgerow is translocated rather than replanted if possible.

##### **9.6.2 Invasive Plant Species**

Japanese Knotweed and *Rhododendron ponticum* are listed in Schedule 9, Part II of the Wildlife and Countryside Act 1981 (as amended). Under the Wildlife & Countryside Act 1981 (as amended) it is an offence "to plant or otherwise encourage" the growth of these plants in the wild. This could include cutting the plant or roots and disturbing surrounding soil if not correctly managed. Any contaminated soil or plant material that is discarded should be dealt with accordingly. It is possible also to treat these plants on site if given an appropriate timescale and methodology, which should be approved by NRW. Ideally a chemical treatment would be the best option to treat these invasive species.

A watching brief for the removal of these plants is recommended. Disposal to a licensed waste facility is necessary.

## 10.0 Protected Sites

The nearest protected sites to the proposal are the Traeth Lafan Site of Special Scientific Interest (SSSI) and Special Protected Area (SPA) and Menai Strait and Conwy Bay Special Area of Conservation (SAC) located approximately 589m to the north. Eryri SSSI and SAC located approximately 642m to the south and Coedydd Aber SSSI located approximately 656m to the southeast, see Figure 2.



**Figure 2:** Locations of the nearest protected sites in relation to the A55(T) Abergwyngregyn to Tai'r Meibion Improvement. Traeth Lafan SSSI and SPA and the Menai Strait and Conwy Bay SAC are shown in red to the north. Eryri SSSI and SAC and the Coedydd Aber SSSI are shown in brown to the east and southeast.

## Phase 1 Habitat Survey Plant Species List

The plant species list below was compiled during the course of the phase 1 habitat survey and was produced in order to help determine the habitat types present within the survey area; it is not intended to be an exhaustive or complete list of all the plant species present within the survey area.

Alder	( <i>Alnus glutinosa</i> )
Ash	( <i>Fraxinus excelsior</i> )
Autumn Hawkbit	( <i>Scorzoneroides autumnalis</i> )
Beech	( <i>Fagus sylvatica</i> )
Birch, Silver	( <i>Betula pubescens</i> )
Bird Cherry	( <i>Prunus padus</i> )
Bittercress species	( <i>Cardamine species</i> )
Blackthorn	( <i>Prunus spinosa</i> )
Bluebell	( <i>Hyacinthoides non-scripta</i> )
Bramble	( <i>Rubus fruticosus</i> )
Broadleaved Dock	( <i>Rumex obtusiflorus</i> )
Broadleaved Plantain	( <i>Plantago major</i> )
Buddleja	( <i>Buddleja davidii</i> )
Burdock	( <i>Arctium lappa</i> )
Bittersweet	( <i>Solanum dulcamara</i> )
Bracken	( <i>Pteridium aquilinum</i> )
Bugle	( <i>Ajuga reptans</i> )
Cleavers	( <i>Galium aparine</i> )
Cocks Foot	( <i>Dactylis glomerata</i> )
Coltsfoot	( <i>Tussilago farfara</i> )
Comfrey	( <i>Symphytum officinale</i> )
Common Sorrel	( <i>Rumex acetosa</i> )
Cow Parsley	( <i>Anthriscus sylvestris</i> )
Crack Willow	( <i>Salix fragilis</i> )
Creeping Buttercup	( <i>Ranunculus repens</i> )
Creeping Thistle	( <i>Cirsium arvense</i> )
Common Bent	( <i>Agrostis capillaris</i> )
Common Chickweed	( <i>Stellaria media</i> )
Common Dog Violet	( <i>Viola riviniana</i> )
Common Mouse Ear	( <i>Cerastium fontanum</i> )
Common Nettle	( <i>Urtica dioica</i> )
Common Ragwort	( <i>Senecio jacobaea</i> )
Common Knapweed	( <i>Centaurea nigra</i> )
Common Ragwort	( <i>Senecio jacobaea</i> )
Crested Dogs Tail	( <i>Cynosurus cristatus</i> )
Daisy	( <i>Bellis perenis</i> )
Dandelion	( <i>Taraxacum officinale</i> )
Dogs Mercury	( <i>Mercurialis perennis</i> )
Dog Rose	( <i>Rosa canina</i> )
Elder	( <i>Sambucas nigra</i> )
Enchanters Night shade	( )
English Elm	( <i>Ulmus procera</i> )
European Gorse	( <i>Ulex europaeus</i> )
Eyebright	( <i>Euphrasia officinalis</i> )
Field Bindweed	( <i>Convolvulus arvensis</i> )
Field Horsetail	( <i>Equisetum species</i> )
Foxglove	( <i>Digitalis pupurea</i> )
Garlic Mustard	( <i>Alliaria petiolata</i> )
Germander Speedwell	( <i>Veronica chamaedrys</i> )
Goat Willow	( <i>Salix caprea</i> )
Greater Stitchwort	( <i>Stellaria holostea</i> )
Grey Willow	( <i>Salix cinerea</i> )
Harts Tongue Fern	( <i>Asplenium scolopendrium</i> )

Hawkbit species	( <i>Leontodon species</i> )
Hawthorn	( <i>Crataegus monogyna</i> )
Hazel	( <i>Corylus avellana</i> )
Hawthorn	( <i>Crataegus monogyna</i> )
Hedge Woundwort	( <i>Stachys sylvatica</i> )
Herb Robert	( <i>Geranium robertianum</i> )
Hogweed	( <i>Heracleum sphondylium</i> )
Holly	( <i>Ilex aquifolium</i> )
Honeysuckle	( <i>Lonicera periclymenum</i> )
Horse Chestnut	( <i>Aesculus hippocastanum</i> )
Ivy	( <i>Hedera helix</i> )
Japanese Knotweed	( <i>Fallopia japonica</i> )
Ladies Smock	( <i>Cardamine pratensis</i> )
Lesser Celandine	( <i>Ranunculus ficaria</i> )
Lichen species	
Lords and Ladies	( <i>Arum maculatum</i> )
Marsh Marigold	( <i>Caltha palustris</i> )
Marsh Thistle	( <i>Cirsium palustre</i> )
Meadow Buttercup	( <i>Ranunculus acris</i> )
Meadowsweet	( <i>Filipendula ulmaria</i> )
Oak, Pendunculate	( <i>Quercus robur</i> )
Oak, Sessile	( <i>Quercus petraea</i> )
Perennial Rye Grass	( <i>Lolium perenne</i> )
Pineapple Weed	( <i>Matricaria discoidea</i> )
Primrose	( <i>Primula vulgaris</i> )
Privet	( <i>Ligustrum species</i> )
Rosebay Willowherb	( <i>Epilobium angustifolium</i> )
Rose of Sharon	( <i>Hibiscus syriacus</i> )
Rough Meadow Grass	( <i>Poa trivialis</i> )
Ramsons	( <i>Allium ursinum</i> )
Red Champion	( <i>Silene dioica</i> )
Rhododendron ponticum	( <i>Rhododendron ponticum</i> )
Ribwort Plantain	( <i>Plantago lanceolata</i> )
Sea Buckthorn	( )
Scarlet Pimpernel	( <i>Anagallis arvensis</i> )
Silver Birch	( <i>Betula pubescens</i> )
Spear Thistle	( <i>Cirsium vulgare</i> )
Soft Rush	( <i>Juncus effusus</i> )
Silverweed	( <i>Potentilla anserina</i> )
St. John's wort	( <i>Hypericum perforatum</i> )
Sweet Chestnut	( <i>Castanea sativa</i> )
Sweet Vernal Grass	( <i>Anthoxanthum odoratum</i> )
Sycamore	( <i>Acer pseudoplatanus</i> )
Ivy Leaved Toadflax	( <i>Linaria vulgaris</i> )
Tormentil	( <i>Potentilla erecta</i> )
Umbellifer species	
Water Mint	( <i>Mentha aquatica</i> )
Wayfaring Tree	( <i>Viburnum lantana</i> )
White Clover	( <i>Trifolium repens</i> )
Wood Sage	( <i>Teucrium scorodonia</i> )
Wood Avens	( <i>Geum urbanum</i> )
Yarrow	( <i>Achillea millefolium</i> )
Yellow Flag Iris	( <i>Iris pseudacorus</i> )
Yorkshire Fog	( <i>Holcus lanatus</i> )
Yew	( <i>Taxus baccata</i> )

## **Appendix I**

### **Aerial Photographic Phase 1 Survey Plan**

#### **Key**

I – Improved Grassland

SI – Semi – Improved Grassland

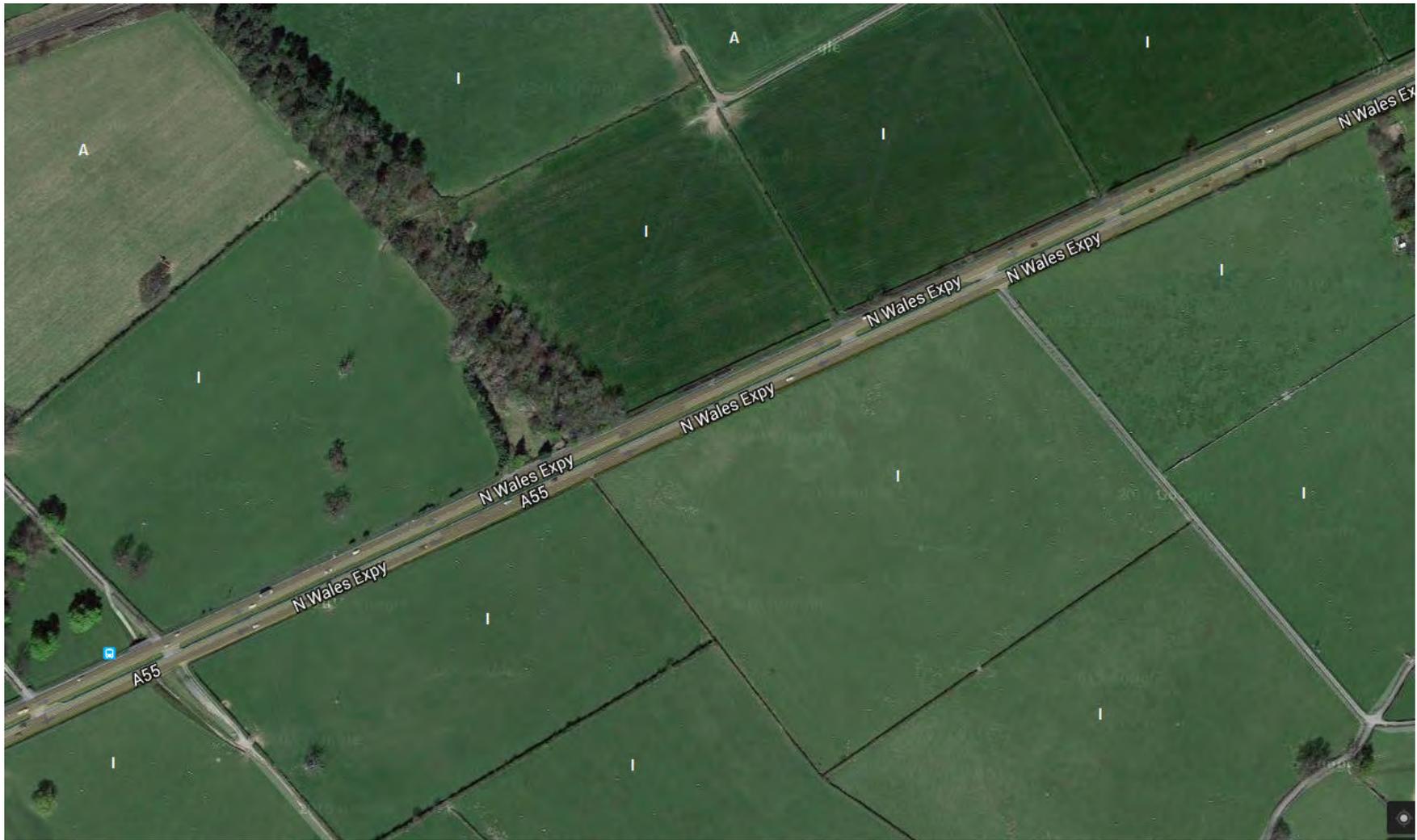














Encroaching  
Sea Buckthorn  
within A55 verge

International Rescue  
Training Centre Wales

Station Rd

N Wales Expy

A55

N Wales Expy

N Wales Expy

Jones H Glyn

## Appendix II

### Site Photographs



**Photograph 1:** View looking west along north boundary of A55(T) near Abergwynnregyn west bound junction.



**Photograph 2:** View looking west along north boundary of A55(T).



**Photograph 3:** View looking west along north boundary of A55(T).



**Photograph 4:** View looking west along north boundary of A55(T).



**Photograph 5:** View looking west along north boundary of A55(T) at location of former Wig Bach property.



**Photograph 6:** View looking west along north boundary of A55(T).



**Photograph 7:** View looking west along north boundary of A55(T).



**Photograph 8:** View looking west along north boundary of A55(T) at Wig Farm Underpass.



**Photograph 9:** View looking west along north boundary of A55(T).



**Photograph 10:** View looking west along north boundary of A55(T) at Tai'r Meibion Farm Underpass .



**Photograph 11:** View looking west along north boundary of A55(T).



**Photograph 12:** View looking west along north boundary of A55(T).



**Photograph 13:** View looking west along north boundary of A55(T).



**Photograph 14:** View looking east along north boundary of A55(T) at Talybont eastbound junction.



**Photograph 15:** View looking west along route of A55(T) including eastbound Talybont junction to north in right of photograph.



**Photograph 16:** View looking east along south boundary of A55(T).



**Photograph 17:** View looking east along south boundary of A55(T).



**Photograph 18:** View looking east along south boundary of A55(T) at entrance to Tai'r Meibion Farm.



**Photograph 19:** View looking east along south boundary of A55(T) at Tai'r Meibion Farm Underpass.



**Photograph 20:** View looking east along south boundary of A55(T).



**Photograph 21:** View looking east along south boundary of A55(T) showing Bryn Meddyg properties.



**Photograph 22:** View looking east along south boundary of A55(T).



**Photograph 23:** View looking east along south boundary of A55(T) near Abergwyngregyn west bound junction.



**Photograph 24:** View looking east along route of Henffordd.



**Photograph 25:** View looking east along route of Henffordd.



**Photograph 26:** View looking east along route of Henffordd.



**Photograph 27:** View looking east along route of Henffordd.



**Photograph 28:** View looking east along route of Henffordd.



**Photograph 29:** View looking east along route of Henffordd.



**Photograph 30:** View looking east along route of Henffordd



**Photograph 31:** View looking east along route of Henffordd.



**Photograph 32:** View looking east along route of Henffordd.



**Photograph 33:** View looking east along route of Henffordd.



**Photograph 34:** View looking east along route of Henffordd.

## References

Highways Agency. 2009. ***Design Manual for Roads and Bridges (DMRB)***.

Institute of Environmental Assessment. 1995. ***Guidelines for Baseline Ecological Assessment***.

Landmap. 2001. CCW Website.

Nature Conservancy Council. 1990. ***Handbook for Phase 1 Habitat Survey***.

**A55(T) Chester to Bangor Trunk Road: Abergwyngregyn to Tai'r Meibion Improvement****Environmental Assessment Species Survey (Extended) for Roman (Henffordd) Road and A55(T) Access Road, Gwynedd.**

**Site:** Roman (Henffordd) Road  
Abergwyngregyn  
Gwynedd  
(SH 628716 – SH 636715)

**Client:** Environment Directorate  
Gwynedd Consultancy  
Council Offices  
Shire Hall Street  
Caernarfon  
LL55 1SH

**Job No.:** 0435

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**1.0 INTRODUCTION****1.1 Aim**

Following changes to the proposed, published scheme we were instructed by the client to undertake a protected species survey and Phase I Habitat survey along Roman (Henffordd) Road and the verge of the feeder road on the southern side of the A55(T) between Tan yr Allt cottages and Tan y Lon. The survey is an extension of the previous surveys undertaken for the proposed, published scheme. The aim of the survey was to determine the presence / absence of protected species and to attempt to classify and evaluate the habitat within the survey area. From the results of the survey potential impacts caused by the changes to the proposed scheme could be highlighted and subsequent mitigation proposals drawn up. The survey was undertaken on the 3 November 2008

**1.2 Survey Area**

The area surveyed was approximately 300 metres of Roman (Henffordd) Road including the new proposed route of the field crossing and approximately 800m of the verge of the A55 feeder roads and the Tal y Bont overbridge crossing. The survey area is shown in Figure 1.

**1.3 Existing Data**

- Nesting birds are recorded within the 2008 breeding bird survey.
- Badger is recorded locally.
- Bats are recorded locally but details are unavailable of any known roosts in the immediate vicinity.

#### 1.4 Site Description

The section of Roman (Henffordd) Road surveyed gently climbs from west to east and is bordered on both sides by improved grassland grazed by sheep. The road is approximately 3 metres wide and has a metalled surface, though grass grows in the centre of the road suggesting it carries little traffic. The boundaries of the road are formed by a combination of stone-built banks to about 50cm in height and above these are mature, managed hedgerows approximately 2 metres tall. A single narrow, shallow drain runs from the south under the road approximately midway along the survey section. The field section records improved grazing pasture running north - south from the road. The field boundaries are formed from slate and wire.

The feeder road verge consists of a narrow grass verge between the road edge and a mix of stone walls and hedgerows. The hedgerow and scrub growth is a recent planting formed during the previous construction of the A55 T

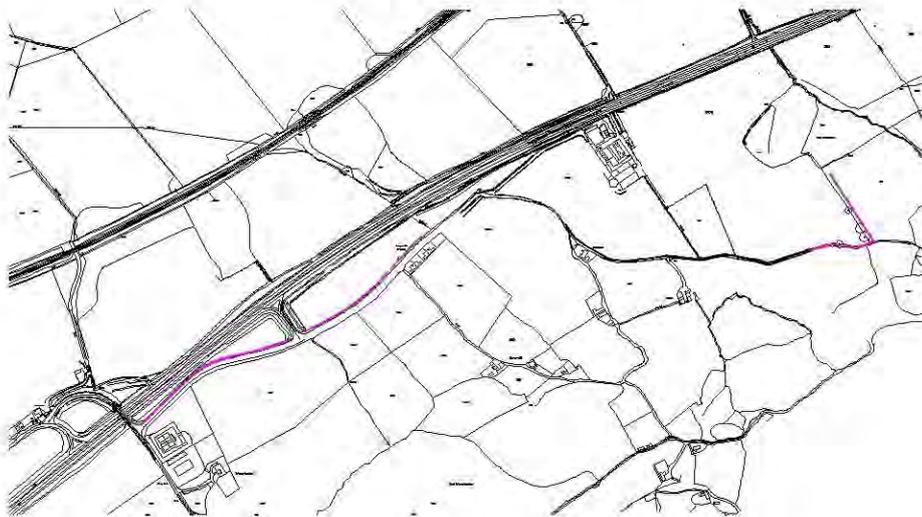


Figure 1:

## 2.0 METHODOLOGIES

### 2.1 **Badger *Meles meles***

Walk over survey to record setts, pathways, latrines, foraging activity and associated feeding habitat. Emphasis was placed on identifying any pathways or

access points across the road used by this species. These were then followed to record any further evidence of badger activity.

**2.2 Water vole *Arvicola terrestris***

Walk over survey to record linear and static water bodies and terrestrial habitat capable of supporting populations of this species. Any suitable water bodies identified were subjected to terrestrial searches for burrows, feeding remains and latrines.

**2.3 Otter *Lutra lutra***

Walk over survey to record linear and static water bodies and terrestrial habitat capable of supporting populations of this species. Any suitable water bodies identified were subjected to terrestrial searches for holts, spraints, footprints, feeding remains and slipways.

**2.4 Common dormouse *Muscardinus avellanarius***

Walk over survey to assess habitat suitability and to record potential resting places and foraging activity / opportunities within the survey area.

**2.5 Bats *Chiroptera***

Walk over survey to record buildings and trees that could provide potential roost sites, and an assessment of foraging opportunities and linear corridors provided by the habitat inside the survey area.

**2.6 Great crested newt *Triturus cristatus***

Walk over survey to record water bodies and suitable terrestrial habitat.

**2.7 Reptiles *Sauria / Serpentes***

Walk over survey to assess habitat suitability and to record potential resting places and foraging opportunities provided within the survey area.

**2.8 Birds *Aves***

Walk over survey to record evidence of 2008 nesting activity and to identify habitat potential for nesting and foraging.

**2.9 Phase I Habitat Survey**

Walk over survey to classify habitats encountered within the survey area following the methodology set out in JNCC's Handbook and to record individual plant species where possible.

### **3.0 RESULTS**

The results of this survey are to be referenced with the previous reports of the area.

#### **3.1 Badger**

No evidence of badger activity was recorded within the survey area. The habitat does provide suitable foraging opportunities for this species in the open fields and along the boundary hedgerows.

#### **3.2 Water vole**

No evidence of this species was recorded. No suitable habitat identified within the survey area.

#### **3.3 Otter**

No evidence of this species was recorded. No suitable habitat identified within the survey area.

#### **3.4 Common dormouse**

No evidence of this species was recorded. Habitats are fragmented within the survey area.

#### **3.5 Bats**

The survey area along the upper section of Roman (Henffordd) Road and the field crossing recorded a single oak on the northern verge of the road way, two mature oaks within the adjacent field to the west of the proposed track alignment and a single ash tree adjacent to the boundary fence line. The oaks and the ash recorded suitable cavities that present roosting opportunities for bats. The hedgerows along Roman (Henffordd) Road and the feeder roads offer linear corridors and areas of foraging habitat.

#### **3.6 Great crested newt**

No water bodies capable of supporting this species were recorded within 250m of the survey area.

#### **3.7 Reptiles**

The survey area provides low-grade habitat for reptiles as previously recorded.

#### **3.8 Birds**

Foraging for birds is provided by the hedges and to an extent, particularly for wintering birds, by the open grazing land. With regard to nesting sites for birds, the only areas that could potentially be affected by the proposed road widening are the hedges along Roman (Henffordd) Road, and the recorded trees at the

eastern end of the survey. However, as previously recorded, the hedges, when viewed in conjunction with the surrounding land, only offer suitable nesting habitat for a fairly limited number of species. Refer to previous surveys for suggested and recorded nesting species.

### 3.9 **Phase I Habitat Survey**

This is as previously recorded for the upper Roman (Henffordd) Road and the field crossing. The dominant Phase I habitat classification for the survey area was improved grassland (B4).

The boundary hedge to the northern edge of the road in the upper section of Roman (Henffordd) Road is as previously recorded. Seasonal limitations apply for the extended survey.

The survey adjacent to the feeder road to the A55 T recorded grass verges and species poor hedgerows. The verge and hedgerow are relatively recent plantings formed during the construction of the A55 T.

## 4.0 **POTENTIAL IMPACTS**

### 4.1 **Badger**

None.

### 4.2 **Water vole**

None.

### 4.3 **Otter**

None.

### 4.4 **Common dormouse**

None.

### 4.5 **Bats**

The survey recorded the potential for bats roosting in cavities in mature trees towards the eastern extent of the survey area, along Roman (Henffordd) Road. The proposed road widening within the extended survey area, will directly impact and result in the loss of one of the mature oak trees within the hedgerow. The other trees recorded in the survey, having a potential for use, are located outside of the road alignment. However the relative position of the road could be within the crown of the trees, which may indirectly affect the root system.

### 4.6 **Great crested newt**

None.

#### 4.7 **Reptiles**

None.

#### 4.8 **Birds**

The clearance of the northern boundary hedge along Roman (Henffordd) Road and the single mature tree identified for felling within the extended survey area will see the removal of both foraging and nesting habitat for birds. However, the impact will not be severe provided that the hedge on the southern boundary of the road remains intact. If works on the road are to occur during the bird nesting season (typically from mid-March to early-August in the U.K.) then disturbance of nesting birds in the remaining hedge and trees will have an impact on breeding success.

#### 4.9 **Hedge removal**

The actual process of the removal of the hedge on the northern boundary of Roman (Henffordd) Road will have a major impact on the flora, as all species present will be destroyed. The hedge is historic, mature and species rich providing both foraging opportunities and refuge for all species of fauna (both invertebrates and vertebrates) in the vicinity. However, the majority of the fauna is mobile and will be able to relocate to and exploit the adjacent hedgerow 3m to the south that will remain unaffected by the proposed scheme.

### 5.0 **MITIGATION PROPOSALS**

#### 5.1 **Bats**

Any tree works proposed will require felling in section with a licensed bat worker present to check cavities prior to felling and sections as they are felled. Any torpid bats discovered will have to be translocated to a suitable shelter provided by a bat box positioned nearby. Loss of potential roosting sites in tree cavities can be mitigated for by the provision of bat boxes in nearby trees that should be erected prior to any felling operations. The alignment of the agricultural access track in respect of the other trees recorded should be such that it is outside of the crown structure as a minimum requirement. It is advised that an arboricultural report is commissioned to establish any impacts caused by the proposed agricultural access track.

(\*Also refer to para.5.3 Hedge removal)

#### 5.2 **Nesting birds**

All vegetation clearance, including tree works, must be timed outside of the nesting season (refer to para.4.8) to avoid destruction of active nests. However, certain species such as mistle thrush, robin and song thrush may begin nesting in February so a check for nests should be made immediately prior to daily clearance operations. Should an active nest be discovered during works then an

exclusion perimeter or “no-go area” of 15m radius from the nest should be set up. The provision of small-hole nest boxes in nearby trees prior to felling operations will mitigate for any nesting cavities lost as a result of the scheme.  
(\*Also refer to para.5.3 Hedge removal)

### 5.3 **Hedge removal**

The removed hedge and associated clawdd feature below it should be re-created along the newly formed northern boundary of the widened Roman (Henffordd) Road as part of the mitigation for the proposed scheme. The new boundary line should attempt to mimic as closely as possible the section of hedge removed.

The base of the boundary line should be formed by a clawdd of approximately 50cm height into which a hedge formed by all the species removed from the original hedge should be planted. With the initial structure of the hedge line in place natural colonisation from herb-layer species growing in the opposite hedge will in time enrich the species diversity of the new hedge.

\* The new hedge will also restore any linear corridors lost to fauna thus reducing fragmentation of habitat. It will also reform a linear navigation feature that may be used by bats in the area, and provide nesting sites and foraging opportunities for birds, invertebrates and small mammals.

## 6.0 **CONCLUSIONS**

No evidence of statutorily protected species was recorded during the survey and thus the impact from the proposed road-widening of Roman (Henffordd) Road, the agricultural access track and the footway along the feeder road is deemed to be low.

As with previous surveys the greatest impact is the removal of the historic hedge that forms the northern boundary of Roman (Henffordd) Road. This feature recorded the wider biodiversity value locally, providing foraging and cover for the local fauna. However, provided that the southern boundary hedge of Roman (Henffordd) Road remains unaffected by the scheme, the initial impact will be restricted to the physical removal of the northern hedge and its loss of flora. This loss will immediately remove nesting sites for birds and foraging habitat for invertebrates and vertebrates alike but these are mobile and can migrate to the unaffected hedge line along Roman (Henffordd) Road. The construction of a new clawdd and the replanting of hedge and herb species on the newly formed northern boundary of Roman (Henffordd) road can mitigate this loss.

## 7.0 **LIMITATIONS**

### 7.1 **Mammals**

Many mammal species (badger, water vole and otter) become less active during the winter months, and others (common dormouse and bats) will hibernate. However, in November, for all species except bats, one would expect to find some evidence of recent activity to confirm presence. Evidence for presence of bat species could not be achieved and thus the survey was limited to identifying potential roost sites without actually inspecting them.

## 7.2 **Herpetofauna**

At the time of survey all species of reptile and amphibian would have been dormant for the winter months so actual observation was impossible. However, the lack of any suitable breeding pools for great crested newt can confirm the absence of this species. Reptiles on the other hand can only be confirmed through observation and, as this was impossible, conclusions for this report have been drawn from the suitability of the habitat presented inside the survey area matched against individual species requirements.

## 7.3 **Birds**

During November no bird species are nesting and some species that may use the site may be migratory and so evidence of breeding activity could not be recorded. Consequently the results presented in this report had to be drawn from evidence of the 2008 breeding bird survey and from knowledge of breeding habitat requirements for individual species matched against that found within the survey area.

## 7.4 **Vegetation**

Seasonal conditions again posed limitations. It was impossible to record all species present as a result of subterranean winter dormancy in certain species.

Tim Hodnett.  
November 2008

## **PROTECTED SPECIES SURVEY**

**Site:** A55  
Abergwyngregyn  
Gwynedd

**Client:** Environment Directorate  
Gwynedd Consultancy  
Council Offices  
Shire Hall Street  
Caernarfon  
LL55 1SH

---

### **1.0 INTRODUCTION**

#### **1.1 Aim**

We were instructed by the client to undertake a protected species survey and Phase I Habitat survey along the area of land highlighted in the attached plan. The aim of the survey was to determine presence / absence of protected species and to attempt to classify and evaluate the habitat within the survey area. From the results of the survey potential impacts caused by the proposed road-widening scheme could be highlighted and subsequent mitigation proposals drawn up.

#### **1.2 Survey Area**

The area surveyed was divided into two distinct areas:

*Area 1* – land adjacent to the northern (eastbound lane) boundary of the A55 running from west to east from SH 620712 to SH 632718.

*Area 2* – land approximately 350m south of the A55 running from west to east from SH 633715 to SH 638719.

The survey area is shown in Figure 1.

#### **1.3 Existing Data**

Nesting birds are recorded but no details of red-list species available.

Badger is recorded locally.

Bats are recorded locally but details are unavailable of any known roosts in the immediate vicinity.

#### **1.4 Site Description**

*Area 1* – the land surveyed gently climbs from west to east through improved grassland grazed by sheep following an existing farm track which is bordered to

the south by a continuous managed hawthorn *Crataegus monogyna* hedgerow and sheep netting separating it from the A55 embankment. The embankment is approximately 5m wide and has scrub growth for its full length and there is a small mixed-species plantation of trees at its western end. The survey section is intersected at 3 points by streams flowing from south to north. These are highlighted on the survey plan. The third (easternmost) stream flows through a mature plantation of Corsican pine *Pinus nigra* immediately north and adjacent to the existing farm track.

*Area 2* – this section runs through improved pastoral land grazed by sheep and in the main follows an existing farm track. The line of survey crosses several field boundaries and a stream halfway along its length that flows south to north into an area of mature woodland. The banks of this stream are lined by mature alders *Alnus glutinosa* and several other mature field trees (oak *Quercus robur* and ash *Fraxinus excelsior*) are present along the length of the survey section.

## **2.0 METHODOLOGIES**

### **2.1 *Badger Meles meles***

Walk over survey to record setts, pathways, latrines, foraging activity and associated feeding habitat. Emphasis was placed on identifying any pathways or access points across the road used by this species. These were then followed to record any further evidence of badger activity.

### **2.2 *Water vole Arvicola terrestris***

Walk over survey to record linear and static water bodies and terrestrial habitat capable of supporting populations of this species. Any suitable water bodies identified were subjected to terrestrial searches for burrows, feeding remains and latrines.

### **2.3 *Otter Lutra lutra***

Walk over survey to record linear and static water bodies and terrestrial habitat capable of supporting populations of this species. Any suitable water bodies identified were subjected to terrestrial searches for holts, spraints, footprints, feeding remains and slipways.

### **2.4 *Common dormouse Muscardinus avellanarius***

Walk over survey to assess habitat suitability and to record potential resting places and foraging activity / opportunities within the survey area.

### **2.5 *Bats Chiroptera***

Walk over survey to record buildings and trees that could provide potential roost sites, and an assessment of foraging opportunities provided by the habitat inside the survey area.

### **2.6 *Great crested newt Triturus cristatus***

Walk over survey to record water bodies and suitable terrestrial habitat.

2.7 **Reptiles Sauria / Serpentes**  
Walk over survey to assess habitat suitability and to record potential resting places and foraging opportunities provided within the survey area.

2.8 **Birds Aves**  
Walk over survey to record evidence of 2006 nesting activity and to identify habitat potential for nesting and foraging.

2.9 **Phase I Habitat Survey**  
Walk over survey to classify habitats encountered within the survey area following the methodology set out in JNCC's Handbook and to record individual plant species where possible.

### 3.0 **RESULTS**

#### 3.1 **Badger**

*Area 1* – signs of badger activity were recorded along the full length of survey area. The animals appear to be using the A55 embankment as a foraging corridor from which they enter the fields by squeezing under the stock fencing. A large sett was recorded [REDACTED] of the survey area. The sett stretched almost 100m [REDACTED] and comprised of 33 entrance holes with a minimum of 30 of these being active. A large latrine was also recorded at the edge of the sett area.

*Area 2* – No evidence of badger activity was recorded. The habitat does, however, provide suitable foraging opportunities for this species in the open fields and within the adjacent woodland.

#### 3.2 **Water vole**

The streams recorded in the survey areas were generally shallow, steep-sided and had little vegetation cover. These habitat conditions are typically unsuitable for water voles and no evidence of this species was recorded

#### 3.3 **Otter**

No evidence of this species was recorded.

#### 3.4 **Common dormouse**

No evidence of common dormouse was recorded.

#### 3.5 **Bats**

*Area 1* – No potential roost sites were identified.

*Area 2* - several mature oaks, alders and ash with suitable cavities were recorded that present roosting opportunities for bats (see target notes on Figure 1). The field boundary hedgerows, stream and adjacent woodland provide foraging opportunities.

#### 3.6 **Great crested newt**

No water bodies capable of supporting this species were recorded within 250m of the survey area.

### 3.7 Reptiles

The survey area provides low-grade habitat for reptiles and no evidence was recorded

### 3.8 Birds

Foraging ground for birds is provided predominantly by the hedges and by the open grazing land. Nesting sites are also provided by the hedgerows, the scrub and the woodland recorded in the survey areas. Further nesting sites are provided in the branches and within cavities of the mature field trees. Following the assessment of the habitat, a list of potential breeding species and their typical nest site is presented in Table 1:

**Table 1:** Potential breeding bird species

<b>Common Name</b>	<b>Scientific Name</b>	<b>Nest Site</b>
Blackbird	<i>Turdus merula</i>	Small open nest in hedge
Blue tit	<i>Parus caeruleus</i>	Concealed nest in small tree cavity
Buzzard	<i>Buteo buteo</i>	Large open nest in tree
Carrion crow	<i>Corvus corone</i>	Large open nest in tree
Chaffinch	<i>Fringilla coelebs</i>	Small open nest in hedge
Coal tit	<i>Parus ater</i>	Concealed nest in small tree cavity
Dunnock	<i>Prunella modularis</i>	Small open nest in hedge
Great tit	<i>Parus major</i>	Concealed nest in small tree cavity
Jackdaw	<i>Corvus monedula</i>	Concealed nest in larger tree cavity
Little owl	<i>Athene noctua</i>	Concealed nest in larger tree cavity
Long-tailed tit	<i>Aegithalos caudatus</i>	Small open nest in hedge
Magpie	<i>Pica pica</i>	Large open nest in tree
Mistle thrush	<i>Turdus viscivorus</i>	Small open nest in tree
Nuthatch	<i>Sitta europaea</i>	Concealed nest in small tree cavity
Pied wagtail	<i>Motacilla alba</i>	Small concealed nest in river bank
Grey wagtail	<i>Motacilla cinerea</i>	Small concealed nest in river bank
Raven	<i>Corvus corax</i>	Large open nest in tree
Robin	<i>Erithacus rubecula</i>	Small concealed nest in bank
<b>Song thrush</b>	<i>Turdus philomelos</i>	Small open nest in hedge
Wren	<i>Troglodytes troglodytes</i>	Small open nest in hedge

(\*Bold type indicates a red-list species of high conservation concern)

### 3.9 Phase I Habitat Survey

*Area 1* – The dominant Phase I habitat classification for the survey area was improved grassland (B4). Generally the habitat was species poor, dominated by a single grass species, and had been heavily grazed by sheep right up to the base of the boundary features. The boundary hedge was solely comprised of hawthorn *Crataegus monogyna*. The Phase 1 survey map for the survey area is given in Figure 1 in the Appendix of this report.

*Area 2* – classified as improved grassland with additional species recorded along the boundary features. Again, the habitat was species poor, dominated by a single grass species, and had been heavily grazed by sheep right up to the base of the boundary features.

## **4.0 POTENTIAL IMPACTS**

### **4.1 Badger**

[REDACTED] The use of heavy machinery is not permitted within 30m of an active badger sett unless licensed. [REDACTED]

[REDACTED]. The proposed works will cause disruption to the pathways used by the badgers in [REDACTED] and consequently affect the foraging opportunities available to them within their territory. This disruption could force the clan to roam into neighbouring territories bringing them into violent conflict with badgers from other clans.

### **4.2 Water vole**

None expected.

### **4.3 Otter**

None expected.

### **4.4 Common dormouse**

None expected.

### **4.5 Bats**

The planned scheme will not affect any roosts that may occur in local buildings. However, the potential for bats roosting in cavities in mature trees Area 2 of the survey is a possibility and consequently there may be an impact.

### **4.6 Great crested newt**

None expected.

### **4.7 Reptiles**

None expected.

### **4.8 Birds**

The clearance of sections of hedgerow, and any mature trees identified for felling will see the some loss of both foraging and nesting habitat for birds. However, the impact will not be severe provided that works on the road do not occur during the bird-nesting season (typically from mid-March to early-August in the U.K.).

## **5.0 MITIGATION PROPOSALS**

### **5.1 Badger**

[REDACTED] it is prudent to apply to DEFRA for a license to carry out works under the supervision of a suitably experienced consultant ecologist. Guidelines published by Countryside Council for Wales (CCW) state that a license to disturb badgers must be obtained from DEFRA if any heavy machinery (generally tracked

vehicles) is to be operated within 30 metres of a sett entrance; if any lighter machinery (generally wheeled vehicles), particularly for any digging operation, within 20 metres of the sett entrance, and light work such as hand digging or scrub clearance within 10 metres of a sett entrance. During and on completion of works, all efforts must be made to allow badgers access to their traditional foraging pathways along the A55 embankment and beyond

Reports of road kills for this species along the A55(T) is very low, which considering the size and activity levels recorded immediately adjacent to the road is quite remarkable. Part of the road widening scheme includes works to the existing culverts, it is suggested that where feasible badger underpasses should be placed adjacent to these as safe access points to the land to the south of the carriageway.

## 5.2 **Bats**

Any tree works proposed will require felling in section with a licensed bat worker present to check cavities prior to felling and sections as they are felled. Any bats discovered will require moving to shelter provided by a bat box positioned nearby. Loss of potential roosting sites in tree cavities can be mitigated for by the provision of bat boxes in nearby trees that should be erected prior to any felling operations.

(\*Also refer to para.5.3 Hedge removal)

## 5.2 **Nesting birds**

All vegetation clearance including tree works must be timed outside of the nesting season (refer to para.4.8) to avoid destruction of active nests. However, certain species such as mistle thrush, robin and song thrush may begin nesting in late-February so a check for nests should be made immediately prior to daily clearance operations. Should an active nest be discovered during works then an exclusion perimeter or “no-go area” of 15m radius from the nest should be set up. The provision of small-hole nest boxes in nearby trees prior to felling operations will mitigate for any nesting cavities lost as a result of the scheme.

## 6.0 **CONCLUSIONS**

The habitat quality of the survey areas was generally poor, comprising in the main of heavily grazed improved grassland of little merit to native wildlife. However, key features were identified within and adjacent to the survey area that would be impacted upon by the proposed works.

The most important of these is an extensive badger sett [REDACTED] [REDACTED] Although the sett is possibly just outside the limits set out by CCWs badger guidelines for unlicensed works with heavy machinery, the case is certainly borderline and it is advised that a license from DEFRA is acquired prior to the start of any works.

Other features include the presence of mature trees with cavities that provide possible roosts for bats and nesting sites for birds. These were, however, few in number.

## **7.0**      **LIMITATIONS**

The greatest limitation to the survey was the seasonal timing. The limitations are presented below:

### **7.1**      **Mammals**

Many mammal species (badger, water vole and otter) become less active during the winter months, and others (common dormouse and bats) will hibernate. However, in Winter, for all species except bats, one would expect to find some evidence of recent activity to confirm presence. Evidence for presence of bat species could not be achieved and thus the survey was limited to identifying potential roost sites without actually inspecting them.

### **7.2**      **Herpetofauna**

At the time of survey all species of reptile and amphibian would have been dormant for the winter months so actual observation was impossible. However, the lack of any suitable breeding pools for great crested newt can confirm the absence of this species. Reptiles on the other hand can only be confirmed through observation and as this was impossible, thus conclusions for this report have been drawn from the suitability of the habitat presented inside the survey area matched against individual species requirements.

### **7.3**      **Birds**

During Winter no bird species are nesting and some species that may use the site may be migratory and so evidence of breeding activity could not be recorded. Consequently the results presented in this report had to be drawn from evidence of 2006 nesting activity (in the form of old nests found) and from knowledge of breeding habitat requirements for individual species matched against that found within the survey area.

### **7.4**      **Vegetation**

Seasonal conditions again posed limitations. It was impossible to record all species present as a result of subterranean Winter dormancy in certain species.

**A.D.C.**

February 2007

**APPENDIX**

**Figure 1:** Phase 1 Habitat Survey Plan-north west

**Figure 2:** Phase 1 Habitat Survey Plan-north east

**Figure 3:** Phase 1 Habitat Survey Plan-south east

**Environmental Assessment Species Survey Henffordd Road, Gwynedd.**

**Site:** Henffordd Road  
Abergwynnregyn  
Gwynedd  
(SH 628716 – SH 636715)

**Client:** Environment Directorate  
Gwynedd Consultancy  
Council Offices  
Shire Hall Street  
Caernarfon  
LL55 1SH

**Job No.:** 0435

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**1.0 INTRODUCTION****1.1 Aim**

We were instructed by the client to undertake a protected species survey and Phase I Habitat survey along Henffordd Road. The aim of the survey was to determine presence / absence of protected species and to attempt to classify and evaluate the habitat within the survey area. From the results of the survey potential impacts caused by the proposed road-widening scheme could be highlighted and subsequent mitigation proposals drawn up.

**1.2 Survey Area**

The area surveyed was approximately 800 metres of Henffordd Road running west to east from NGR: SH 628716 – SH 636715. The survey included the boundary features and land 5 metres to the north of the road boundary. The survey area is shown in Figure 1.

**1.3 Existing Data**

- Nesting birds are recorded but no details of red-list species available.
- Badger is recorded locally.
- Bats are recorded locally but details are unavailable of any known roosts in the immediate vicinity.

## 1.4 **Site Description**

The section of Henffordd Road surveyed gently climbs from west to east and is bordered on both sides by improved grassland grazed by sheep. The road is approximately 3 metres wide and has a metalled surface though grass grows in the centre of the road suggesting it carries little traffic. The boundaries of the road are formed by a combination of stone-built banks to about 50cm in height and above these mature, managed hedgerows approximately 2 metres tall. A single narrow, shallow drain runs from the south under the road approximately midway along the survey section.

## 2.0 **METHODOLOGIES**

### 2.1 **Badger** *Meles meles*

Walk over survey to record setts, pathways, latrines, foraging activity and associated feeding habitat. Emphasis was placed on identifying any pathways or access points across the road used by this species. These were then followed to record any further evidence of badger activity.

### 2.2 **Water vole** *Arvicola terrestris*

Walk over survey to record linear and static water bodies and terrestrial habitat capable of supporting populations of this species. Any suitable water bodies identified were subjected to terrestrial searches for burrows, feeding remains and latrines.

### 2.3 **Otter** *Lutra lutra*

Walk over survey to record linear and static water bodies and terrestrial habitat capable of supporting populations of this species. Any suitable water bodies identified were subjected to terrestrial searches for holts, spraints, footprints, feeding remains and slipways.

### 2.4 **Common dormouse** *Muscardinus avellanarius*

Walk over survey to assess habitat suitability and to record potential resting places and foraging activity / opportunities within the survey area.

### 2.5 **Bats** *Chiroptera*

Walk over survey to record buildings and trees that could provide potential roost sites, and an assessment of foraging opportunities and linear corridors provided by the habitat inside the survey area.

### 2.6 **Great crested newt** *Triturus cristatus*

Walk over survey to record water bodies and suitable terrestrial habitat.

## 2.7 **Reptiles** *Sauria / Serpentes*

Walk over survey to assess habitat suitability and to record potential resting places and foraging opportunities provided within the survey area.

## 2.8 **Birds** *Aves*

Walk over survey to record evidence of 2006 nesting activity and to identify habitat potential for nesting and foraging.

## 2.9 **Phase I Habitat Survey**

Walk over survey to classify habitats encountered within the survey area following the methodology set out in JNCC's Handbook and to record individual plant species where possible.

# 3.0 **RESULTS**

## 3.1 **Badger**

No evidence of badger activity was recorded within the survey area. The habitat does provide suitable foraging opportunities for this species in the open fields and along the boundary hedgerows. Pathways and faeces were recorded for red fox *Vulpes vulpes*; and pathways and burrows were recorded for rabbit *Oryctolagus cuniculus*.

## 3.2 **Water vole**

The only water body within the survey area is the drain referred to in the introduction of this report (par. 1.4). This drain is less than 1m wide, has shallow banks and carries little water. Consequently it is unsuitable for water voles and no evidence of this species was recorded

## 3.3 **Otter**

The water body referred to in 3.2 was also unsuitable for otter and no evidence of this species was recorded.

## 3.4 **Common dormouse**

No evidence of common dormouse was recorded. The rich flora found in the hedges along Henffordd Road provides ample cover and sufficient suitable food plants for foraging to support this species. However, the isolation of these hedgerows from nearby woodland would record a low probability of supporting a population.

### 3.5 Bats

There are 2 domestic dwellings immediately to the south of Henffordd Road, and several mature oaks *Quercus robur* with suitable cavities towards the eastern end of the survey area that present roosting opportunities for bats. The hedgerows along the road and the field boundaries offer linear corridors. Both the hedgerow to the road and the woodland approximately 250m to the north of the survey area, provide foraging habitat.

### 3.6 Great crested newt

No water bodies capable of supporting this species were recorded within 250m of the survey area.

### 3.7 Reptiles

The survey area provides low-grade habitat for reptiles. The only suitable vegetation for foraging and cover is provided in the hedgerows along Henffordd Road. The northern boundary hedge along the road receives little solar exposure and thus offers very few opportunities for reptiles to thermo-regulate. The adjacent land is heavily grazed by sheep and thus offers no foraging habitat or refuge.

### 3.8 Birds

Foraging for birds is provided by the hedges and to an extent, particularly for wintering birds, by the open grazing land. With regard to nesting sites for birds, the only areas that could potentially be affected by the proposed road widening are the hedges along Henffordd Road, and oak trees towards the eastern end of the survey area. However, the hedges, when viewed in conjunction with the surrounding land, only offer suitable nesting habitat for a fairly limited number of species. The discovery of only one recently used nest of chaffinch *Fringilla coelebs* supported this assessment of the habitat. Further nesting sites are provided in the branches and within cavities of the larger oaks at the eastern end of the survey area. Following the assessment of the habitat, a list of potential breeding species and their typical nest site is presented in Table 1:

**Table 1:** Potential breeding bird species

Common Name	Scientific Name	Nest Site
Blackbird	<i>Turdus merula</i>	Small open nest in hedge
Blue tit	<i>Parus caeruleus</i>	Concealed nest in small tree cavity
Buzzard	<i>Buteo buteo</i>	Large open nest in tree
Carrion crow	<i>Corvus corone</i>	Large open nest in tree
Chaffinch	<i>Fringilla coelebs</i>	Small open nest in hedge
Coal tit	<i>Parus ater</i>	Concealed nest in small tree cavity
Dunnock	<i>Prunella modularis</i>	Small open nest in hedge
Great tit	<i>Parus major</i>	Concealed nest in small tree cavity
Jackdaw	<i>Corvus monedula</i>	Concealed nest in larger tree cavity
Little owl	<i>Athene noctua</i>	Concealed nest in larger tree cavity
Long-tailed tit	<i>Aegithalos caudatus</i>	Small open nest in hedge

Magpie	<i>Pica pica</i>	Large open nest in tree
Mistle thrush	<i>Turdus viscivorus</i>	Small open nest in tree
Nuthatch	<i>Sitta europaea</i>	Concealed nest in small tree cavity
Pied wagtail	<i>Motacilla alba</i>	Small concealed nest in roadside bank
Raven	<i>Corvus corax</i>	Large open nest in tree
Robin	<i>Erithacus rubecula</i>	Small concealed nest in roadside bank
<b>Song thrush</b>	<i>Turdus philomelos</i>	Small open nest in hedge
Wren	<i>Troglodytes troglodytes</i>	Small open nest in hedge

(\*Bold type indicates a red-list species of high conservation concern)

### 3.9 Phase I Habitat Survey

The dominant Phase I habitat classification for the survey area was improved grassland (B4) as this habitat forms the entire 5m x 800m strip immediately north of the boundary of Henffordd Road. This parcel of land was species poor, dominated by a single grass species, and had been heavily grazed by sheep right up to the base of the boundary hedge with the road.

The boundary hedge itself was species rich and was judged to be historical, in sections recording 4+ species per 30m stretch. Species dominating the hedge were blackthorn *Prunus spinosa* and hawthorn *Crataegus monogyna*. The northern side of the hedge as already mentioned had been grazed right up to the base by sheep. However, the southern side of the hedge on the actual roadside displayed a rich mix of flora at its base. The nature of the hedge with its stone baking in parts, supports several fern species, and due to its north facing aspect and naturally damp conditions several species associated with marshland.

Target notes (each with an 8 figure NGR) for the survey include the following:

- SH6348 7151 – mature *Quercus robur*
- SH6358 7152 – mature *Quercus robur*

A full list of species recorded along the hedgerow is given in Table 2. The Phase I map for the survey area is given in Figure 1 in the Appendix of this report.

**Table 2:** Flora recorded along the northern boundary hedge of Henffordd Road

Common Name	Scientific Name
Ash	<i>Fraxinus excelsior</i>
Blackthorn	<i>Prunus spinosa</i>
Black Spleenwort	<i>Asplenium adiantum-nigrum</i>
Bramble	<i>Rubus fruticosus</i>
Broad-leaved Dock	<i>Rumex obtusifolius</i>
Bush Vetch	<i>Vicia sepium</i>
Common Mallow	<i>Malva sylvestris</i>
Common Polypody	<i>Polypodium vulgare</i>
Foxglove	<i>Digitalis purpurea</i>
Greater Stitchwort	<i>Stellaria holostea</i>
Ground Ivy	<i>Glechoma hederacea</i>
Hart's Tongue	<i>Asplenium scolopendrium</i>
Hawthorn	<i>Crataegus monogyna</i>

Hazel	<i>Corylus avellana</i>
Hedge Woundwort	<i>Stachys sylvatica</i>
Herb Robert	<i>Geranium robertianum</i>
Ivy	<i>Hedera helix</i>
Lady Fern	<i>Athyrium filix-femina</i>
Pedunculate Oak	<i>Quercus robur</i>
Pennywort	<i>Hydrocotyle vulgaris</i>
Perrenial Sow-thistle	<i>Sonchus arvensis</i>
Red Campion	<i>Silene dioica</i>
Sheep's Sorrel	<i>Rumex acetosella</i>
Slender Thistle	<i>Carduus tenuiflorus</i>
Spear Thistle	<i>Cirsium vulgare</i>
Stinging Nettle	<i>Urtica dioica</i>
Sycamore	<i>Acer pseudoplatanus</i>
Turkey oak	<i>Quercus cerris</i>
Wild Angelica	<i>Angelica sylvestris</i>
Wild Carrot	<i>Daucus carota</i>
Wild Strawberry	<i>Fragaria vesca</i>
Yarrow	<i>Achillea millefolium</i>

#### **4.0 POTENTIAL IMPACTS**

##### **4.1 Badger**

None.

##### **4.2 Water vole**

None.

##### **4.3 Otter**

None.

##### **4.4 Common dormouse**

None.

##### **4.5 Bats**

The planned scheme will not affect any roosts that may occur in local buildings. However, the potential for bats roosting in cavities in mature trees towards the eastern extent of the survey area is a possibility and consequently there may be an impact. The loss of only the northern boundary hedge of Henffordd Road will have little impact on foraging opportunities while the southern hedge remains intact.

#### 4.6 **Great crested newt**

None.

#### 4.7 **Reptiles**

None.

#### 4.8 **Birds**

The clearance of the northern boundary hedge and any mature trees identified for felling will see the removal of both foraging and nesting habitat for birds. However, the impact will not be severe provided that the hedge on the southern boundary of the road remains intact. If works on the road are to occur during the bird nesting season (typically from mid-March to early-August in the U.K.) then disturbance of nesting birds in the remaining hedge and trees will have an impact on breeding success.

#### 4.9 **Hedge removal**

The actual process of the removal of the hedge on the northern boundary of Henffordd Road will have a major impact on the flora, as all species present will be destroyed. The hedge is historic, mature and species rich providing both foraging opportunities and refuge for all species of fauna (both invertebrates and vertebrates) in the vicinity. However, the majority of the fauna is mobile and will be able to relocate to and exploit the adjacent hedgerow 3m away that will remain unaffected by the proposed scheme.

### 5.0 **MITIGATION PROPOSALS**

#### 5.1 **Bats**

Any tree works proposed will require felling in section with a licensed bat worker present to check cavities prior to felling and sections as they are felled. Any torpid bats discovered will have to be translocated to a suitable shelter provided by a bat box positioned nearby. Loss of potential roosting sites in tree cavities can be mitigated for by the provision of bat boxes in nearby trees that should be erected prior to any felling operations.

(\*Also refer to para.5.3 Hedge removal)

#### 5.2 **Nesting birds**

All vegetation clearance including tree works must be timed outside of the nesting season (refer to para.4.8) to avoid destruction of active nests. However, certain species such as mistle thrush, robin and song thrush may begin nesting in February so a check for nests should be made immediately prior to daily clearance operations. Should an active nest be discovered during works then an exclusion perimeter or "no-go area" of 15m radius from the nest should be set up.

The provision of small-hole nest boxes in nearby trees prior to felling operations will mitigate for any nesting cavities lost as a result of the scheme.  
(\*Also refer to para.5.3 Hedge removal)

### 5.3 **Hedge removal**

The removed hedge and associated clawdd feature below it should be re-created along the newly formed northern boundary of the widened Henffordd Road as part of the mitigation for the proposed scheme. The new boundary line should attempt to mimic as closely as possible the section of hedge removed.

The base of the boundary line should be formed by a clawdd of approximately 50cm tall into which a hedge formed by all the species removed from the original hedge should be planted. With the initial structure of the hedge line in place natural colonisation from herb-layer species growing in the opposite hedge will in time enrich the species diversity of the new hedge.

\* The new hedge will also restore any linear corridors lost to fauna thus reducing fragmentation of habitat. It will also reform a linear navigation feature that may be used by bats in the area, and provide nesting sites and foraging opportunities for bird, invertebrates and small mammals.

## 6.0 **CONCLUSIONS**

No evidence of statutorily protected species was recorded during the survey and thus the impact upon from the proposed road-widening scheme at Henffordd Road is deemed to be very low.

The major issue is the removal of the historic hedge that forms the northern boundary of the road. This is the richest habitat recorded in the survey area and therefore supports a higher level of biodiversity than the surrounding land, providing foraging and cover for the local fauna. However, provided that the southern boundary hedge of Henffordd Road remains unaffected by the scheme, the initial impact will be restricted to the physical removal of the opposite hedge and its loss of flora. This loss will immediately remove nesting sites for birds and foraging habitat for invertebrates and vertebrates alike but these are mobile and can migrate to the unaffected hedge line along Henffordd Road. The construction of a new clawdd and the replanting of a hedge and herb species on the newly formed northern boundary of the road can mitigate this loss.

## 7.0 **LIMITATIONS**

The greatest limitation to the survey was the seasonal timing. The limitations are presented below:

### 7.1 **Mammals**

Many mammal species (badger, water vole and otter) become less active during the winter months, and others (common dormouse and bats) will hibernate. However, in November, for all species except bats, one would expect to find some evidence of recent activity to confirm presence. Evidence for presence of bat species could not be achieved and thus the survey was limited to identifying potential roost sites without actually inspecting them.

### 7.2 **Herpetofauna**

At the time of survey all species of reptile and amphibian would have been dormant for the winter months so actual observation was impossible. However, the lack of any suitable breeding pools for great crested newt can confirm the absence of this species. Reptiles on the other hand can only be confirmed through observation and as this was impossible, thus conclusions for this report have been drawn from the suitability of the habitat presented inside the survey area matched against individual species requirements.

### 7.3 **Birds**

During November no bird species are nesting and some species that may use the site may be migratory and so evidence of breeding activity could not be recorded. Consequently the results presented in this report had to be drawn from evidence of 2006 nesting activity (in the form of old nests found) and from knowledge of breeding habitat requirements for individual species matched against that found within the survey area.

### 7.4 **Vegetation**

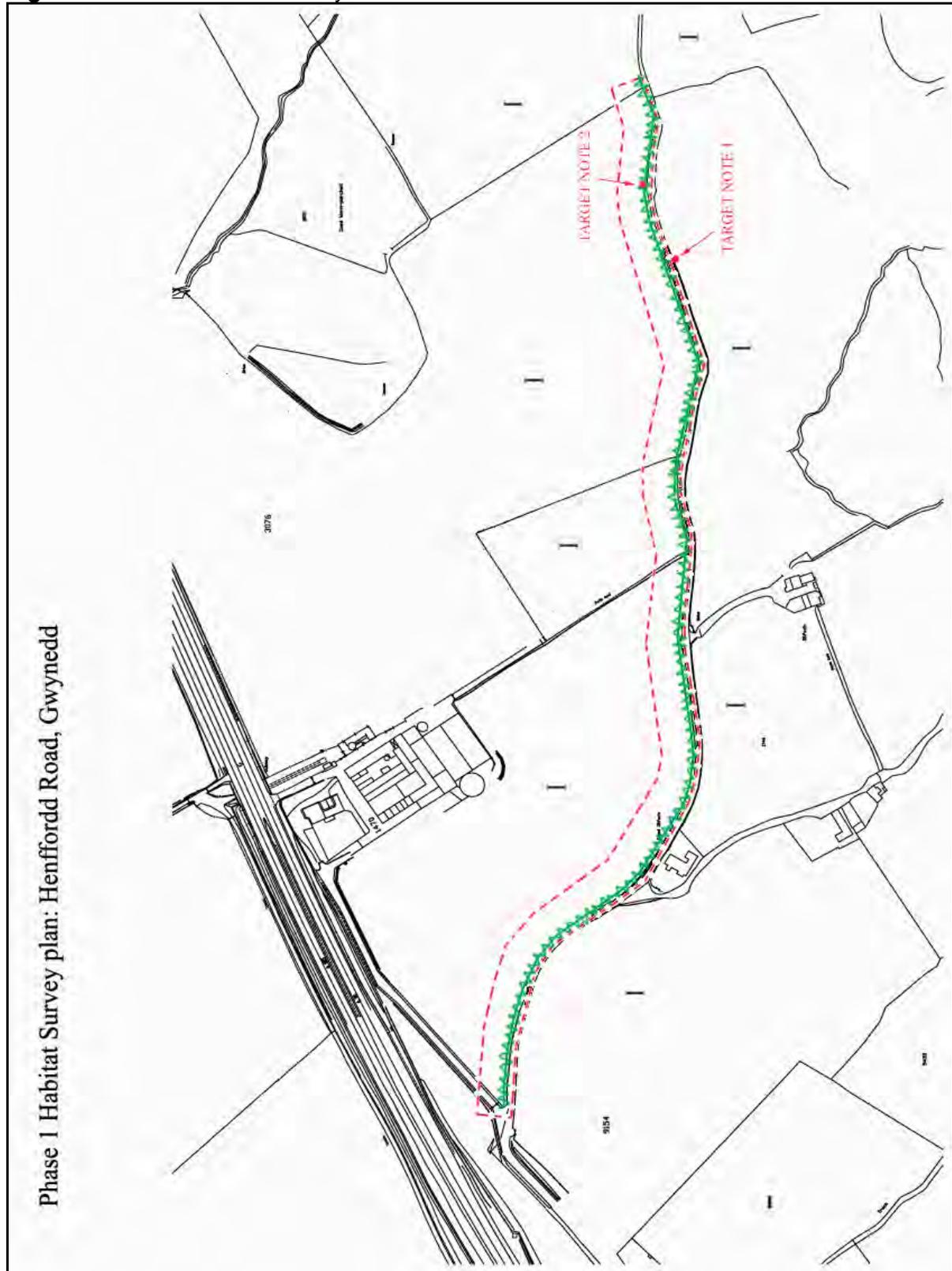
Seasonal conditions again posed limitations. It was impossible to record all species present as a result of subterranean winter dormancy in certain species.

**A.D.C.**

November 2006

**APPENDIX**

**Figure 1: Phase I Habitat Survey Plan**



**ENVIRONMENTAL IMPACT - A55 (T) Tai'r Meibion to Abergwyngregyn**

**Site:** Land Adjacent to A55 (T)  
Tai'r Meibion to Abergwyngregyn  
Gwynedd

**Client:** Rhydian Roberts  
Environment Directorate  
Gwynedd Consultancy  
Council Offices  
Caernarfon  
Gwynedd  
LL55 1SH

**Job No.:** 0359

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**SPECIES SURVEYS**

**1.0 INTRODUCTION**

- 1.1 Proposed Scheme
- 1.2 Existing Data
- 1.3 Survey Areas

**2.0 METHODOLOGIES**

**3.0 RESULTS**

- 3.1 Survey Area North
- 3.2 Survey Area South
- 3.3 Species Results

**4.0 MITIGATION RECOMMENDATIONS**

**5.0 CONCLUSION**

**6.0 APPENDIXES**

- 6.1 Incidental Species

**1.0 INTRODUCTION**

## Follow up Ecological Survey - A55 (T) Tai'r Meibion to Abergwyngregyn

### 1.1 Proposed Scheme:-

Proposals have been put forward for the widening of a section of the A55 (T) road, which at present does not meet the highway standards for this class of road. The proposed scheme is approximately 2 km in length and runs from Abergwyngregyn in the west to farm Tai'r Meibion to the east. Prior to development of the scheme full ecological assessments have been commissioned to ascertain potential impacts on the existing habitats and associated flora and fauna species. The surveys are to include all protected species together with the biodiversity species as identified in the Highways TREBAP.

### 1.2 Existing Data.

Initial surveys had been commissioned in September 2001 and specific species surveys were undertaken 2002 to 2003. The results of the surveys are as laid out in the document Ecology and Nature Conservation (baseline Conditions) as prepared by Casella. This report uses this survey as a baseline for a follow up survey to identify seasonal and true time variations on the initial findings. The survey concentrates on fauna, as these are the elements that can vary with time.

### 1.3 Survey Areas

The survey areas will be reported on as follows: -

- i). The land to the north of the A55 (T), (area A) an area approx. 2 km in length and approx. 350 m wide, with its northern boundary denoted by the railway.
- ii). The land to the south of the A55 (T), (area B) an area of land approx. 2 km in length and varying in width from 300 to 500 m in width, with its southern boundary denoted by the 'C' class road which runs from Abergwyngregyn to Tai'r Meibion.

## 2.0 METHODOLOGIES.

### 2.1.1 The Great Crested Newt *Triturus cristatus*

Walk over surveys to establish position and potential water bodies suitable for breeding, assessment of terrestrial habitat.

### 2.1.2 Water Vole *Arvicola territories*

Walk over surveys to establish position and potential linear and static water bodies and associated terrestrial habitat. Terrestrial searches within highlighted areas for burrows, feeding stations and latrines.

### 2.1.3 Otter *Lutra lutra*

Walk over surveys to establish position and potential linear and static water bodies and associated terrestrial habitat. Terrestrial searches within highlighted areas for holts, prints, spraints and feeding debris.

### 2.1.4 Badger *Meles meles*

Walk over surveys to identify sets, pathways, latrines and associated feeding habitat.

## Follow up Ecological Survey - A55 (T) Tai'r Meibion to Abergwyngregyn

### 2.1.5 Bats *Chiroptera*

Walk over surveys to establish potential roost sites and foraging habitats.

### 2.1.6 Barn Owl *Tyto alba*

Walk over surveys to establish potential roost sites and foraging habitats.

### 2.1.7 Reptiles

Walk over surveys to establish potential refuges and foraging habitats.

### 2.1.8 Dormouse *Muscardinus avellanarius*.

Walk over surveys to establish potential habitats and possible nest and feeding remains.

### 2.1.9 Incidental Species

General survey of working areas and logging of sightings, evidence of presence and anecdotal records.

## 3.0 RESULTS.

### 3.1 Survey Area A.

This area is located to the northern side of the A55 (T) road, the area is made up of managed enclosed improved grazing pasture. The enclosures are formed from both clawdd and hedgerow features, stock fencing and ditches. The area is generally open and flat, with few notable features. Three areas of tree plantings are located within this area, a small block of mature trees around Wig farm, a linear belt of mixed woodland running north south between the road and the railway adjacent to Wig Bach and a small block of Corsican pines to the north east of Wig Bach adjacent to the railway. The land is heavily grazed by sheep and cattle with no visible headland. The extent of the grazing has left a very short sward offering no cover for small mammals, reptiles or amphibians. Two water bodies are located within this area, a redundant millpond at Wig and a small wetland area to the western boundary of the survey area. The road verges, rail line and the clawdd and hedgerows offer the more diverse habitats but are limited to their extents. Several ditches run parallel to the field enclosures, however these features have been grazed and puddled offering poor marginal aquatic habitats.

### 3.2 Survey Area B.

This area is located to the southern side of the A55 (T) road. Similar to area A the area is made up of primarily managed enclosed improved grassland. The fields adjacent to the road are on a similar elevation to that of the road, but the southern side of the survey area rises to the base of Moel Wnion. This area offers slightly greater habitat diversity with slightly smaller enclosures, larger expanses of mixed woodland and wider linear features. A single medium sized woodland block is located to the east of Tai'r Meibion and south of Crymlyn Farm. The main block of woodland is of mixed species plantings of approximately 40 years. A finger of

## Follow up Ecological Survey - A55 (T) Tai'r Meibion to Abergwyngregyn

woodland extends to the east of the main block which is a relatively recent planting approximately 20 years. Both areas have areas of clear understore and dense scrub growth. The Afon Wig flows from Crymlyn farm down and through the main woodland block before crossing the main road via a culvert and down to the sea. Two other areas of woodland are recorded within this survey area, a small plantation adjacent to the 'C' Class road opposite Plas Nant and a block of woodland, Coed Bryn-meddyg above Bryn-meddyg cottages on the A55 (T). This woodland is of mixed species with a varying understore. The streams and rivers to this southern side are faster flowing on steeper inclines with boulder bases and embankments.

### 3.3 Species Results

#### 3.3.1 The Great Crested Newt *Triturus cristatus*

##### Area A

The initial report highlights the wetland area adjacent to Afon Wig and the Mill pond at Wig. The wetland area had a low potential for breeding amphibians being limited in size with a strong flow across the area. The mill pond however had a greater potential for breeding amphibians. No signs of activity was recorded at the time of the survey but this would be associated to the time of year of the survey, but the surveyor would suggest that this site has a small potential for breeding amphibians. The water bodies are limited within the area and would tend to concentrate to the areas of water that do exist, though they may be deemed generally poor.

##### Area B

This area recorded a small area of standing water adjacent to the eastern end of the main woodland block to the north east of Crymlyn Farm. Similar to area A standing water is limited within the area and would tend to attract any breeding amphibians to these sites.

#### 3.3.2 Water Vole *Arvicola terrestris*

##### Area A

This area records several watercourses and ditches, the main watercourse being the Afon Wig. This stream is fast flowing with deep cut banks, but the intensive grazing to the stream margins offers poor quality foraging habitat for this species. Similarly the ditches are heavily grazed and puddled by stock. No evidence of use by water voles was recorded from either burrows, latrines or feeding stations. The only recorded evidence of use was by bank vole, but this was also limited by the intensive grazing.

##### Area B.

Similarly to area A most of the watercourses are fed from the hillside to the south and run down towards the sea. These watercourses are similar to those recorded within area A, but with faster flowing water. The main woodland block did record areas of wetland and reasonable foraging habitat but no evidence of use by water vole was recorded. This area did record use by bank vole.



## Follow up Ecological Survey - A55 (T) Tai'r Meibion to Abergwyngregyn

### Area B

No evidence of use is available for this area.

### 3.3.7 Reptiles

#### Area A

The area generally offers good quality refuges within the cloddiau and hedgerows, suitable for reptiles. It is suggested that the general area could support both slow worm, common lizard and possibly grass snake to the wetland areas, although this felt to be low. It is suggested that the adder would be limited to the upper areas of hillside.

#### Area B

This area has a similar potential for reptiles within the field enclosures specifically with the south facing cloddiau for common lizard. Similarly the woodland edges and the small open glades could support slow worm.

### 3.3.8 Dormouse *Muscardinus avellanarius*.

#### Area A-B

The area was surveyed for suitable habitats for this species, it was concluded that the woodland was likely to be too fragmented for this species, although the field boundaries did offer tenuous links to other areas. Very little hazel stock was recorded within the survey areas, but this is not a modern day defining method for this species as recent tube surveys and observations have recorded this species in more diverse habitats. The main consideration for long-term sustainability being fragmented habitats.

### 3.3.9 Incidental Species

#### Area A

This area recorded evidence of use by the following species: -

Buzzard - Feeding perch and pellets within the Corsican pine block adjacent to the railway.

Weasel - Anecdotal record for the farm area of Wig.

Tawny Owl - Anecdotal record for the woodland block to the area of Wig  
Area B

Fox - Fox castings within the main woodland block, fox skull within the field to east of the main woodland block.

## 4.0 MITIGATION RECOMMENDATIONS

### 4.1.1 The Great Crested Newt *Triturus cristatus*

Based on the survey results we suggest that there is a potential for amphibians within the two ponds as described, but it cannot be confirmed that GCN's are present in the area as no other base line data is available. The ponds in question are a reasonable distance from the proposed works with no direct linear corridors from the sites to the roadway. However, we recommend that consultations are undertaken with CCW in respect to their advice regarding further survey requirements in this case.

### 4.1.2 Water Vole *Arvicola terrestris*

The surveys revealed no evidence of presence for this species within the watercourses surveyed. The present condition of the bank side vegetation to the water courses is very poor and would suggest that a management agreement be developed with the local landowners, e.g. secondary fencing to allow more substantial vegetation growth which will allow a more diverse water corridor to develop.

### 4.1.3 Otter *Lutra lutra*

The survey revealed no evidence of presence for this species, but it is feasible that Otters are active locally, based on the recorded road kill for this species. It is recommended that the two road access tunnels and culverts are widened to allow for habitat corridors to be developed to the tunnels and otter shelves introduced to the culverts to improve the foraging migration routes.

### 4.1.4 Badger *Meles meles*

The survey recorded limited activity to the survey area. No activity was recorded within the immediate road corridor or to the northern survey area. It is therefore suggested that the present activity is concentrated to the southern side of the road. There is a potential for the clan to increase in size or split into two. This would increase the demand on habitat in the longer term. It is therefore suggested that a badger tunnel is considered near [REDACTED]. The recommendations for the otters in regard to the road tunnels and culverts can be developed to be acceptable for use by badgers.

### 4.1.5 Bats *Chiroptera*

No precise data is available for bat roosts or bat flight paths within the area and the follow up survey did not cover this aspect in depth. It is recommended that if any tree stock which is deemed suitable for use by bats is to be removed during the works that more in depth surveys are undertaken and a full mitigation package is put forward at that time. There has been concern with the impact on bats crossing major roads especially with reference to Lesser Horseshoe bats and Whiskered bats. The surveys carried out and the habitats available would suggest a low potential for Lesser horseshoe bats to be present within the area. The existing dual carriage way would have already raised an issue with bats crossing the road. The proposed increase in width of the road will have a minimal impact to that which is already present. The two existing farm access tracks gain access under the road via tunnels, it is suggested that the hedgerows are improved to either side of these tracks and

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lead directly to the buttress walls. At present these tracks connect to the main road at road level, it is suggested that at these connection points the hedgerows are omitted so as the under ground corridors are more favorable for bats and offer greater protection for small flying insects.

### 4.1.6 Barn Owl *Tyto alba*

Only anecdotal evidence is available for this species with no recent sightings being recorded. Unless the grazing is reduced in intensity or wider field margins are developed it is suggested that the area would have difficulty in sustaining a breeding pair within the vicinity. The improvement of the foraging habitat to the immediate verges of the highway to improve the foraging habitat for this species would not be desirable as it would attract individuals into possible conflict with traffic and have a negative outcome for this species.

### 4.1.7 Reptiles

The survey did highlight several areas which could support, primarily common lizard and slow worm. The prime areas are the cloddiau and hedgerows. It is recommended that any removal of these features within the work corridor should be cleared and secured prior to works being carried out. Any disturbed or removed areas should be mitigated for with similar replacement structures.

### 4.1.8 Dormouse *Muscardinus avellanarius*.

The survey did not record any signs of activity for this species. The woodland habitats are fragmented and it is suggested that they are not large enough to sustain a breeding population. The area of the proposed works will be limited to the road corridor with no immediate impact on the woodland areas. Some hedgerows will be lost, but it is assumed these areas of loss will be mitigated for the scheme landscape proposals.

### 3.3.9 Incidental Species

Note: At the time of the survey several bird species were recorded prospecting for nest sites, it is therefore recommended that more in depth surveys are undertaken if the proposed works are to be undertaken between March and September.

## 5.0 CONCLUSION

The follow up survey did not reveal any great variations to those recorded within the initial survey. The areas of variation were the increase in Badger activity, the anecdotal records for Barn Owl, the potential for the water bodies to support small populations of amphibians and the potential presence of reptiles. It is felt that most of the proposed works will have a minimal impact on the species and habitats as recorded. It enforces the requirement of good practice with regard to sustainability and the development and management of diverse habitats. Assuming the recommendations are considered and implemented within the scheme it is in our view that the conservation status for the area can be maintained.

Tim Hodnett, Richard Castell,  
March 2005

## **6.0 APPENDIXES**

### **6.1 INCIDENTAL SPECIES**

#### **Bird**

Pied Wagtail  
Meadow Pipit  
Grey Wagtail  
Nuthatch  
Fieldfare  
Song Thrush  
Blackbird  
Robin  
Chaffinch  
Jackdaw  
Magpie  
Common Crow  
Rook  
Curlew  
House Sparrow  
Starling  
Herring Gull  
Lesser Black Back Gull

#### **Third Party**

Barn Owl  
Tawny Owl  
Buzzard

#### **Mammals**

Weasel  
Grey Squirrel  
Rabbit  
Fox  
Bank Vole  
Rat