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St Asaph Flood Risk Management Strategy

Bat Roost Potential Survey Report

July 2015



A GALLIFORD TRY,
BLACK & VEATCH
JOINT VENTURE

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BAT ROOST POTENTIAL REPORT**CONTENTS**

1.	INTRODUCTION	1
1.1	Background.....	1
1.2	Site Context and Scope	1
1.3	Legislative Framework	1
2.	METHODOLOGY	3
2.1	Desk Study.....	3
2.2	Bat Roost Potential Field Survey	3
2.3	Survey Limitations	4
3.	RESULTS	5
3.1	Desk Study.....	5
3.2	Bat Roost Potential Field Survey	5
4.	DISCUSSION AND RECOMMENDATIONS	9
4.1	Discussion.....	9
4.2	Recommendations	10
5.	REFERENCES	11
	APPENDICES	12
	APPENDIX A: TREES PLANNED FOR FELLING/LOPPING WITHIN THE SURVEY AREA	13
	APPENDIX B: BAT ROOST POTENTIAL OF TREES	21

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1. INTRODUCTION

1.1 Background

Natural Resources Wales (NRW) are undertaking a flood risk management appraisal study for St Asaph, North Wales. The city was subject to severe flooding from the River Elwy during November 2012 with some 300 properties and businesses directly affected. A key objective for the study is to deliver a flood risk management scheme to provide a present day 1 in 200 annual chance of flood protection to the town. A Preliminary Ecological Appraisal (GBV, 2014) assessed the survey area and stated '*any Bat Roost Potential (BRP) trees proposed to be felled or lopped will require further survey work to be undertaken in relation to roosting bats*'. Planning permission for the Scheme is anticipated to be sought in late summer, 2016.

There exists the potential for an accelerated programme and planning application for part of the Scheme (Spring Garden Bridge to the northern end of the survey area adjoining the caravan park). This would involve the construction of a new abutments and the replacement of Spring Garden Bridge with a new bridge.

1.2 Site Context and Scope

The site is situated in the city of St Asaph, North Wales, grid reference SJ 03397 76181, and runs along the River Elwy, which provides a mature and continuous band of semi-natural woodland and shrub layer. The site runs through the conurbation of St Asaph with residential properties surrounding the site towards the centre and south. The land at the northern end of the site is located within a pastoral landscape.

The River Elwy corridor provides a mature, extensive and continuous band of semi-natural woodland, running water and shrub-layer which is likely to support a high volume of invertebrate prey items for bats. The river corridor is also well connected to the adjacent field boundary network, allowing commuting and dispersal across the wider landscape.

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

The objectives of the surveys were to establish which trees that are planned to be felled or lopped have bat roost potential. This would allow an assessment of potential impacts to be made, along with proposals for further survey recommendations. Individual trees subject to felling or lopping are shown on an annotated diagram in Appendix A

1.3 Legislative Framework

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

The relevant sections of this legislation make it an offence to:

- Deliberately kill, injure or capture bats;
- Intentionally, deliberately or recklessly disturb roosting bats or obstruct access to their roosts. Disturbance includes in particular any activity that is likely to impair

their ability to survive, breed or reproduce, or to rear or nurture young or to hibernate or to affect significantly the local distribution or abundance of the species to which they belong; and

- Damage or destroy bat roosts (including if bats are absent).

Offences under this legislation carry a maximum penalty of imprisonment for up to six months and/or a fine not exceeding Level 5 on the standard scale, or both (currently up to £5,000).

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

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

Biodiversity Action Plans

In addition to species protected by law, other species have been identified within Section 42 (Wales) of the NERC Act 2006, as requiring conservation action as Species and Habitats of Principal Importance for the conservation of biodiversity in Wales. These are species previously listed on the UK Biodiversity Action Plan (UK BAP). This Act also confers a biodiversity duty on public bodies, such as planning authorities, to ensure that biodiversity is integrated within all relevant policies and decisions made.

The following priority bat species of relevance to the St Asaph Scheme are represented within Section 42:

- Noctule bat;
- Soprano pipistrelle bat; and
- Brown long-eared bat.

The local BAP for Denbighshire [July 2015] contains an action plan for bats.

2. METHODOLOGY

2.1 Desk Study

A desk study was undertaken for the St Asaph Scheme as part of the Preliminary Ecological Assessment (GBV, 2014) and data has been used as part of this report.

Data was sought to identify any nature conservation sites and/or any relevant protected or notable species records within 2km of the site.

The following sources of information were utilised:

- NRW Protected Sites Map (<http://www.ccg.gov.uk/interactive-maps/protected-sites-map.aspx>)
- NBN Gateway (<https://data.nbn.org.uk/>)
- Ordnance Survey website (<http://www.getamap.ordnancesurvey.co.uk/>)
- Wales Biodiversity Partnership (<http://www.biodiversitywales.org.uk/>)

A data enquiry was also made to NRW, for any records of bats.

2.2 Bat Roost Potential Field Survey

The bat survey was undertaken according to standard best practice survey guidelines, which include: The Bat Mitigation Guidelines (2004); The Bat Workers Manual (2004); and The Bat Conservation Trust, Bat Surveys: Good Practice Guidelines (2012).

A bat roost potential survey was undertaken on 29th June and 1st July 2015. Galliford Try, Black & Veatch (GBV) Senior Ecologist Matt Rung carried out inspections of trees which were considered likely to be directly or indirectly affected by the Scheme proposals (see **Figure 1**).

Given the anticipated impacts of the Scheme on trees the bat roost potential survey area included terrestrial habitats associated with the River Elwy with the potential to support a bat roost (e.g. trees) (refer to **Figure 1**).

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

- Actual bat presence (live or dead);
- Accumulation of bat droppings;
- Feeding remains (e.g. butterfly wings);
- Smear or scratch marks around roost entrance holes;
- Urine staining; and
- Chattering noises coming from a roost (in warm weather conditions).

Trees

Surveyors recorded a general description of each group of tree (e.g. tree species, age, description of features, etc).

Groups of trees identified during the survey were labelled using the following numbering system 'G1', 'G2', 'G3'. Individual trees of interest were labelled using the numerical value system '1', '2' etc.

Bat Roost Potential Assessment

Upon completion of the inspections, each tree/group of trees was categorised according to its potential to support roosting bats (termed its 'bat roost potential'). The categories used are: 'Confirmed', 'High', 'Medium', 'Low' and 'Negligible' potential for use by bats. See Table 1 for descriptions of these categories (based on Mitchell-Jones et al, 2004 and BCT 2012).

The value of the surrounding habitat for foraging and commuting bats was also quantified on a continuum from low to high in accordance with the BCT Survey Guidelines (2012) and used to inform the overall bat roost potential scoring.

Table 1: Bat Roost Potential Assessment Scorings

Value	Description
Confirmed	Confirmed signs of bat presence/occupation (droppings, oily staining around entry points, food remnants, odour, scratching) and actual bat presence.
High	Features present with a high potential to support roosting bats. These include holes/gaps on a tree with enveloping ivy within a woodland setting.
Moderate	Some features of a high potential trees, but with few access points into the tree, or located in sub-optimal habitat.
Low	No obvious access into trees, cavities and crevices that may be shallow in nature or within a sub-optimal habitat.
Negligible	Tree in good condition, with no holes/fissures or breaks. Located in sub-optimal habitat (i.e. in an urban area).

2.3 Survey Limitations

There were no limitations to this survey.

3. RESULTS

3.1 Desk Study

Designated Sites

There are three Local Wildlife Sites (LWS) located within 1km of the survey area. These are:

- Afon Clwyd and floodplain LWS; designated for its importance as a habitat corridor and for its lowland dry acid grassland and lowland calcareous grassland habitats. Located ~400m east of the northern end of the survey area;
- Mount Road Churchyard, St Asaph LWS; located ~200m east of the riparian corridor in the centre of St Asaph;
- Coed Fron and Eryl Hall Wood LWS.

These sites are not designated for bats.

NBN Records

Several bat species were recorded within the same 10km grid square as the survey area within the last 10 years. These were:

- Serotine;
- Daubenton's;
- Whiskered / Brandt's;
- Natterer's;
- Noctule;
- Common pipistrelle;
- Soprano pipistrelle;
- Brown long-eared; and
- Lesser horseshoe.

NRW Records

NRW have provided records for the following species within 1km of the scheme:

- Common pipistrelle;
- Myotis sp.;
- Brown long-eared bat; and
- Whiskered bat.

3.2 Bat Roost Potential Field Survey

The survey identified a number of trees that were considered to have some potential to be affected by the Schemes proposals (either directly or indirectly) (refer to Appendix A for details of the bat roost potential results). These were as follows:

- 10 groups of trees; and
- 88 trees.

Two trees supported bat boxes confirmed roosts were recorded along the River Elwy corridor at SJ 03570 74165 within bat boxes which contained staining and scratch marks and are therefore considered as a confirmed roost; several additional bat boxes were recorded from this area but no evidence of bat roosting was observed.

No other trees were assessed as having a 'confirmed' bat roost potential i.e. no signs of bat presence (e.g. droppings, urine staining, feeding remains, or actual bats) were recorded at this time.

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

Table 1: Bat Roost Potential Assessment Scorings

Bat Roost Potential	Tree groups	Trees
Confirmed	0	0
High	0	3
Moderate	0	24
Low	4	19
Negligible	6	42
Inaccessible	0	0
TOTAL	10	88

Three trees were noted to have a high bat roost potential. These were:

Tree 1: This ash tree (*Fraxinus excelsior*) contained three holes on north side 6m from ground, two fissures on main trunk 3m from ground and a downward leaning holes on south side. This tree is planned to be felled as part of the Scheme proposals and is located at the southern end of the survey area.

Tree 217: This black poplar (*Populus nigra*) contained two south facing cavities 5m from the ground. Ivy covering was dense over much of the tree and there were some missing limbs. The tree is due to be lopped and is located to the centre of the survey area on the west side of the River Elwy.

Tree 186: This ash tree contained south facing hole on the main trunk which was 10cm in diameter. A fissure was also present along main trunk that is not exposed and located 3-

5m from the ground. This tree is planned to be lopped as part of the Scheme proposals and is located to the centre of the survey area.

Twenty four trees planned to be felled or lopped were assessed as having moderate roost potential. Specific details for each tree can be found in Appendix B. These trees were:

Tree 4: An ash tree located to the south of the survey area. Contained a hollow in main trunk (1m in length, 5-10cm in width). This tree is planned to be felled as part of the Scheme proposals.

Tree 24: A lime tree (*Tilia x europaea*) located to the southern end of the survey area. Contained two shallow, unexposed north facing cavities present on main trunk 3-4m from ground. This tree is planned to be felled as part of the Scheme proposals.

Tree 35: An ash tree located at the southern end of the survey area. Contained ivy which covered much of the tree and had two bird boxes attached to main trunk. Bird boxes were old and had gaps at the bottom and hold some roost potential. This tree is planned to be lopped as part of the Scheme proposals.

Tree 66: A dead alder (*Alnus glutinosa*) tree located at the southern end of the survey area. Growing to 6m with a north-facing woodpecker hole 5m from the ground. No staining/scratching present but has potential to hold a roost. This tree is planned to be felled as part of the Scheme proposals.

Tree 68: An ash tree located at the southern end of the survey area. Tree entirely covered with ivy but no other features of interest for bats observed. This tree is planned to be lopped as part of the Scheme proposals.

Tree 71: A sycamore (*Acer pseudoplatanus*) tree located at the southern end of the survey area. Tree entirely covered with ivy which obscured view of main trunk but no other features of interest for bats observed. This tree is planned to be lopped as part of the Scheme proposals.

Tree 157: A sycamore located to the centre of the survey area. Ivy densely covering much of lower and middle parts of trunk and some major limbs. No obvious cavities/fissures but potential does exist for a roost to be present. This tree is planned to be lopped as part of the Scheme proposals.

Tree 602: A sycamore located towards the centre of the survey area. Ivy completely covers the main trunk and some major limbs. This tree is planned to be felled as part of the Scheme proposals.

Tree 607: A willow (*Salix sp.*) located towards the centre of the survey area. Split on major limb and south facing. Ivy densely covers main trunk. This tree is planned to be lopped as part of the Scheme proposals.

Poplar: A poplar tree (*Populus sp*) located to the centre of the survey area. Ivy covered and dense in places. Main trunk grows straight and is in good condition but owing to the width of the tree at breast height the tree has the potential to hold a roost. This tree is planned to be felled as part of the Scheme proposals.

Tree 503: An ash tree located to the north of the survey areas. Ivy clad throughout and dense so has the potential to hold a roost. This tree is planned to be felled as part of the Scheme proposals.

Tree 468: A crack willow (*Salix fragilis*) located to the north of the survey area. Dense ivy growth observed throughout and gaps between bark and trunk (2-5cm). This tree is planned to be lopped as part of the Scheme proposals.

Tree 465: A crack willow located to the north of the survey area. Major split from trunk to major limb which is north facing and about 1m long. This tree is planned to be lopped as part of the Scheme proposals.

Tree 356: An alder tree located to the north of the survey area. Ivy cladding is dense and covers much of the tree with the tree being wide enough to hold a roost. This tree is planned to be felled as part of the Scheme proposals or potentially as part of the Spring Garden Bridge development.

Trees 349/350/351: Alder trees located to the north of the survey area. Ivy present with some potential to hold a small/individual roost. Trees appear in good condition. These trees are planned to be felled as part of the Scheme proposals.

Hawthorn (*Crataegus monogyna*) 1 and 2: Hawthorn trees located towards the centre of the survey area. Trees are densely covered with ivy with one containing several fissures (partly exposed). This tree is planned to be felled as part of the Scheme proposals.

Tree 254: An ash tree located to the centre of the survey area. Ivy covered to halfway (dense) with some cracks and loose bark. Missing limbs present but cuts are clean with only shallow holes. This tree is planned to be felled as part of the Scheme proposals.

Tree 234: A dead alder tree located to the centre of the survey area. Small north facing holes present but couldn't see how deep these were from the ground. Ivy densely covering. This tree is planned to be lopped as part of the Scheme proposals.

Tree 200: An ash tree located to the centre of the survey area. Ivy covering is dense and covers the main trunk with tree being wide enough to support a bat roost. This tree is planned to be lopped as part of the Scheme proposals.

Tree 190: An ash tree located to the centre of the survey area. Ivy covering is dense and covers the main trunk with tree being wide enough to support a bat roost. This tree is planned to be lopped as part of the Scheme proposals.

All remaining trees that are planned to be felled or lopped within the survey area were considered to have a low or negligible bat roost potential.

Potential foraging and commuting habitats for bats exist across the survey area and these include the River Elwy and woodland fringing the river, which have a very high value for foraging and commuting bats. Trees surveyed as part of the bat roost potential surveys are all located within or close to the River Elwy corridor, with the exception of the Trees 1-10, and therefore considered to be within the very high value area.

Trees 1-10 are located at the southern end of the survey area and are surrounded by improved and semi-improved grassland, residential areas and a road. This area is considered to offer low-moderate value foraging and commuting habitat.

Incidental observations of confirmed roosts were recorded but were located outside of the survey area and are not planned to be felled or lopped as part of the Scheme proposals. The nearest trees planned to be felled/lopped to the confirmed roosts are located 40m to the west (42, 51, 52, 53 54) and separated by the River Elwy. These trees have negligible bat roost potential.

4. DISCUSSION AND RECOMMENDATIONS

4.1 Discussion

The bat roost potential survey identified ten tree groups and 88 trees within the survey area. None of these trees was assessed as having a confirmed (i.e. signs of bat presence) bat roost, but three trees (1, 186, 217) had a high bat roost potential at the time of survey. Moderate bat roost potential was attributed to 24 trees. These are further discussed below.

High Potential

Three trees with high roost potential were recorded during the surveys. These trees are planned to be either felled or lopped as part of the Scheme proposals. Bats therefore have the potential to be negatively impacted by the Scheme proposals and further targeted surveys are recommended and outlined below in order to ascertain presence/likely absence.

Moderate Potential

Twenty four trees with moderate roost potential were recorded during the surveys. All trees are planned to be either felled or lopped as part of the Scheme proposals. Bats therefore have the potential to be negatively impacted by the Scheme proposals and further targeted surveys are recommended and outlined below in order to ascertain presence/likely absence.

It has been identified that the survey area supports high value foraging and commuting habitats, specifically, broadleaved semi-natural woodland, broadleaved scattered trees and the River Elwy. Removal of trees as part of the Scheme proposals will not sever any commuting routes although there is potential for minor disturbance and habitat loss (in the form of trees). Therefore commuting and foraging bats have the potential to be impacted by the removal of trees as part of the Scheme proposals. Recommendations for offset measures with regards to replacing trees are discussed further below.

Planning permission for the Scheme is likely to be sought in late-summer 2016 with the potential for a separate planning application for Spring Garden Bridge to be sought also by summer 2016; this has the potential to impact all trees outlined above. In relation to the Spring Garden Bridge development (outline in the Section 1.1) only one tree with moderate roost potential was highlighted within this area that has the potential to be impacted (either high or moderate roost potential). This was Tree 356 which had a moderate roost potential and is described in Section 3.2. Further recommendations are made in relation to Spring Garden Bridge in the Recommendations section below. The bridge structure is well maintained and has negligible roost potential.

4.2 Recommendations

The following recommendations are made in respect of bats for the proposed St Asaph Scheme. Please note that any revision to the Scheme design relating to tree or works proposals following issue of this report, may necessitate revision of these recommendations.

Option 1 (Assumes that only one planning application is sought for the entire Scheme) - Bat activity surveys (dusk emergence / dawn re-entry) should be undertaken to determine the bat status of the trees. This would likely consist of three dusk/dawn surveys conducted on each tree with high potential (three trees). For trees with moderate potential (24 trees in total) this would likely consist of one dusk and one dawn survey conducted on each tree between May and August in accordance with current best practice (Hundt, 2012). If trees are located adjacent to each other (e.g. Hawthorn 1 and 2) then dusk and dawn surveys for both trees could be done concurrently. Furthermore, if only minor lopping is required on trees of moderate potential then the potential exists for lopping works to be conducted on this type of tree using Reasonable Avoidance Measures; this can only be determined at the detailed design stage but has the potential to reduce the survey load.

Option 2 (if the Spring Garden Bridge planning application is submitted prior to May 2016 and separate to the rest of the Scheme) – Bat activity surveys (one dusk emergence / dawn re-entry) should be undertaken on Tree 356 in August 2015.

Following this, bat activity surveys (dusk emergence / dawn re-entry) should be undertaken to determine the bat status of the remaining trees. This would likely consist of three dusk/dawn surveys conducted on each tree with high potential (three trees). For trees with moderate potential (23 trees in total) this would likely consist of one dusk and one dawn survey conducted on each tree between May and August in accordance with current best practice (Hundt, 2012). If trees are located adjacent to each other (e.g. Hawthorn 1 and 2) then dusk and dawn surveys for both trees could be done concurrently. Furthermore, if only minor lopping is required on trees of moderate potential then the potential exists for lopping works to be conducted on this type of tree using Reasonable Avoidance Measures; this can only be determined at the detailed design stage but has the potential to reduce the survey load.

Following these surveys recommendations would be made as to whether the trees can be clear felled/lopped without the presence of a bat-licensed ecologist or whether reasonable avoidance measures should be implemented (e.g. section felling with the assistance of a bat licensed ecologist and/or a licence is required (see below).

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

Offset Measures. As trees are planned to be removed as part of the Scheme it is recommended that any loss or damage to features during the Scheme are offset e.g. bat boxes, new planting.

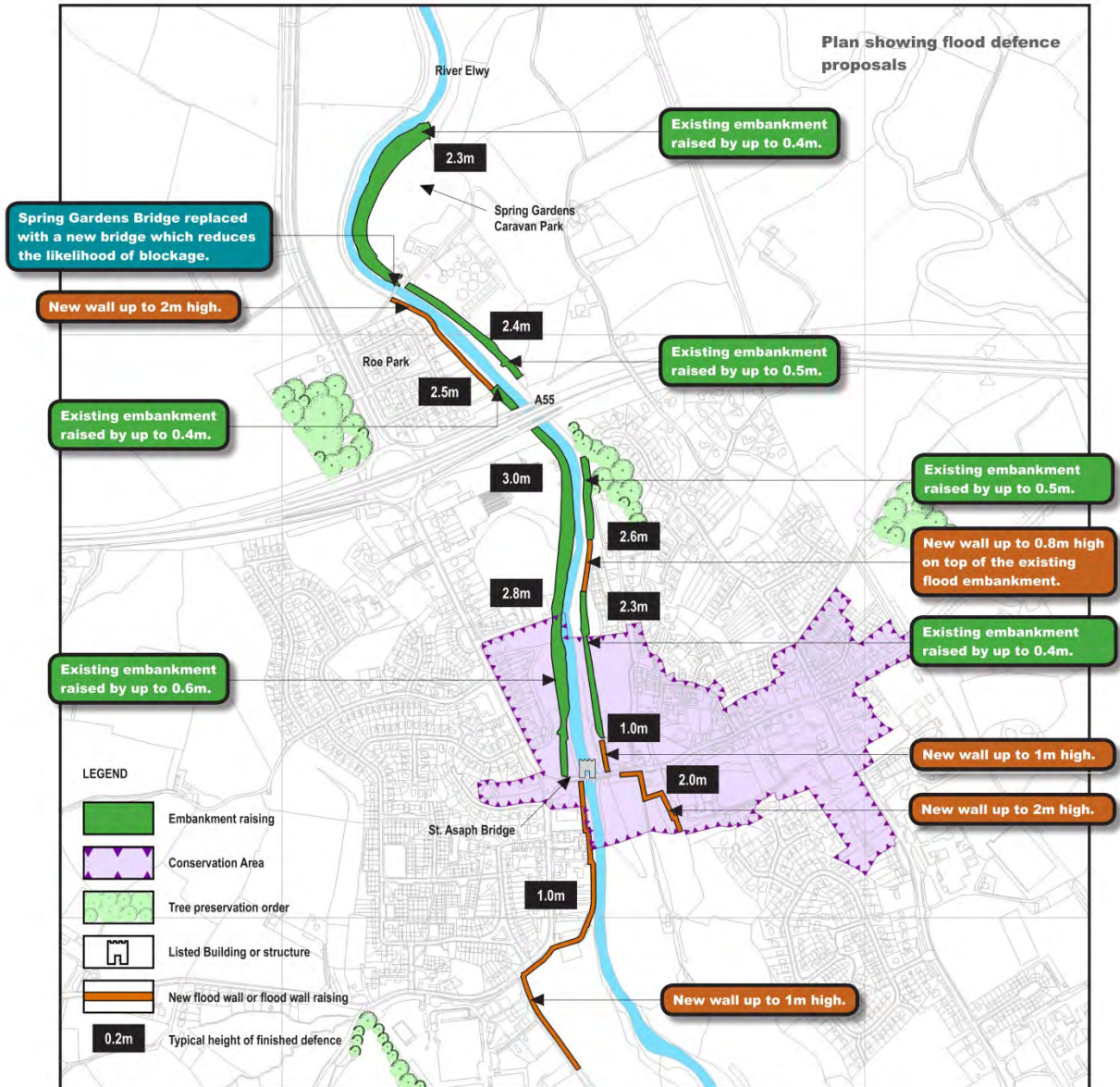
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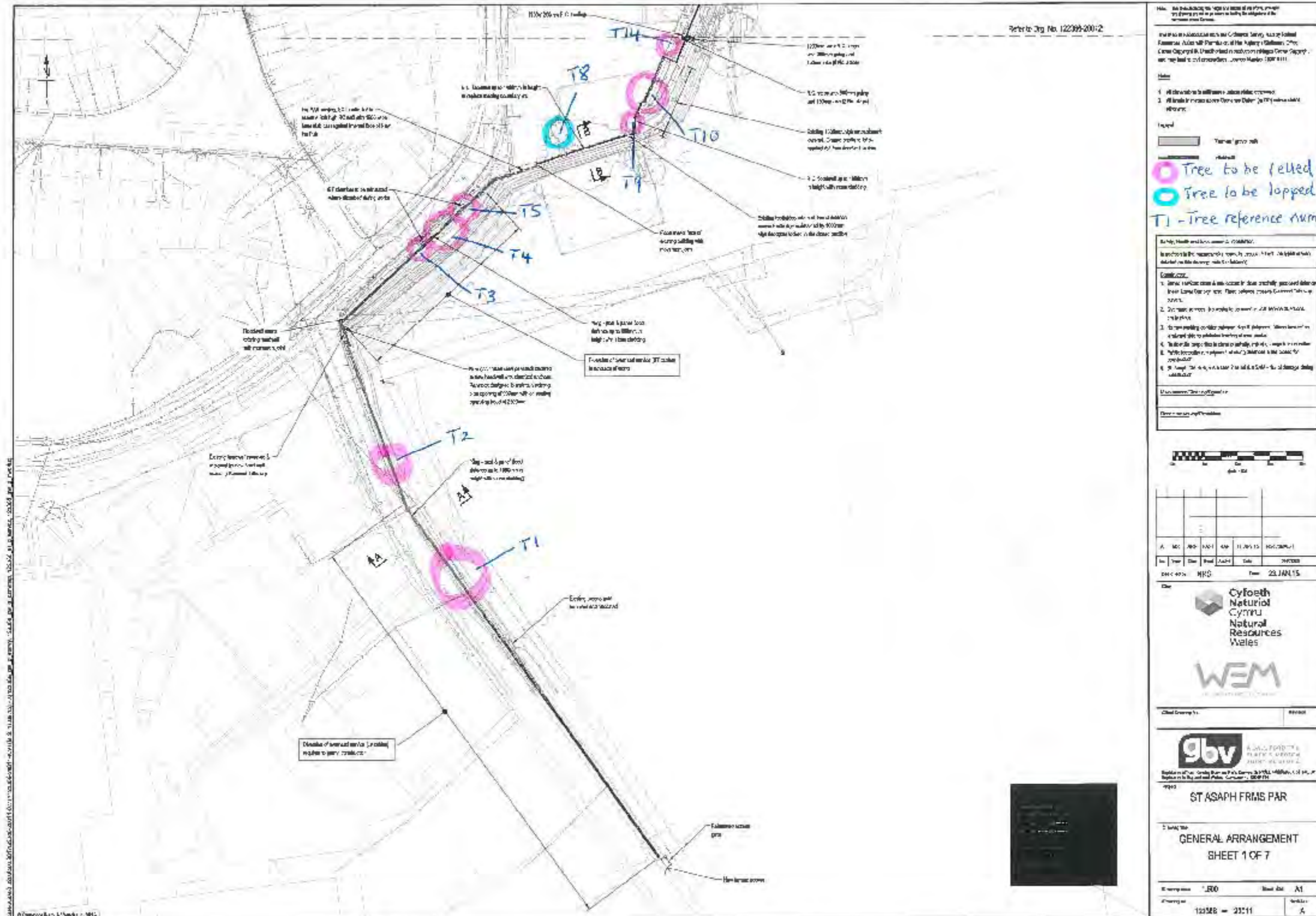
Mitchell-Jones, A.J, & McLeish, A.P. Ed., (2004) Bat Workers' Manual.

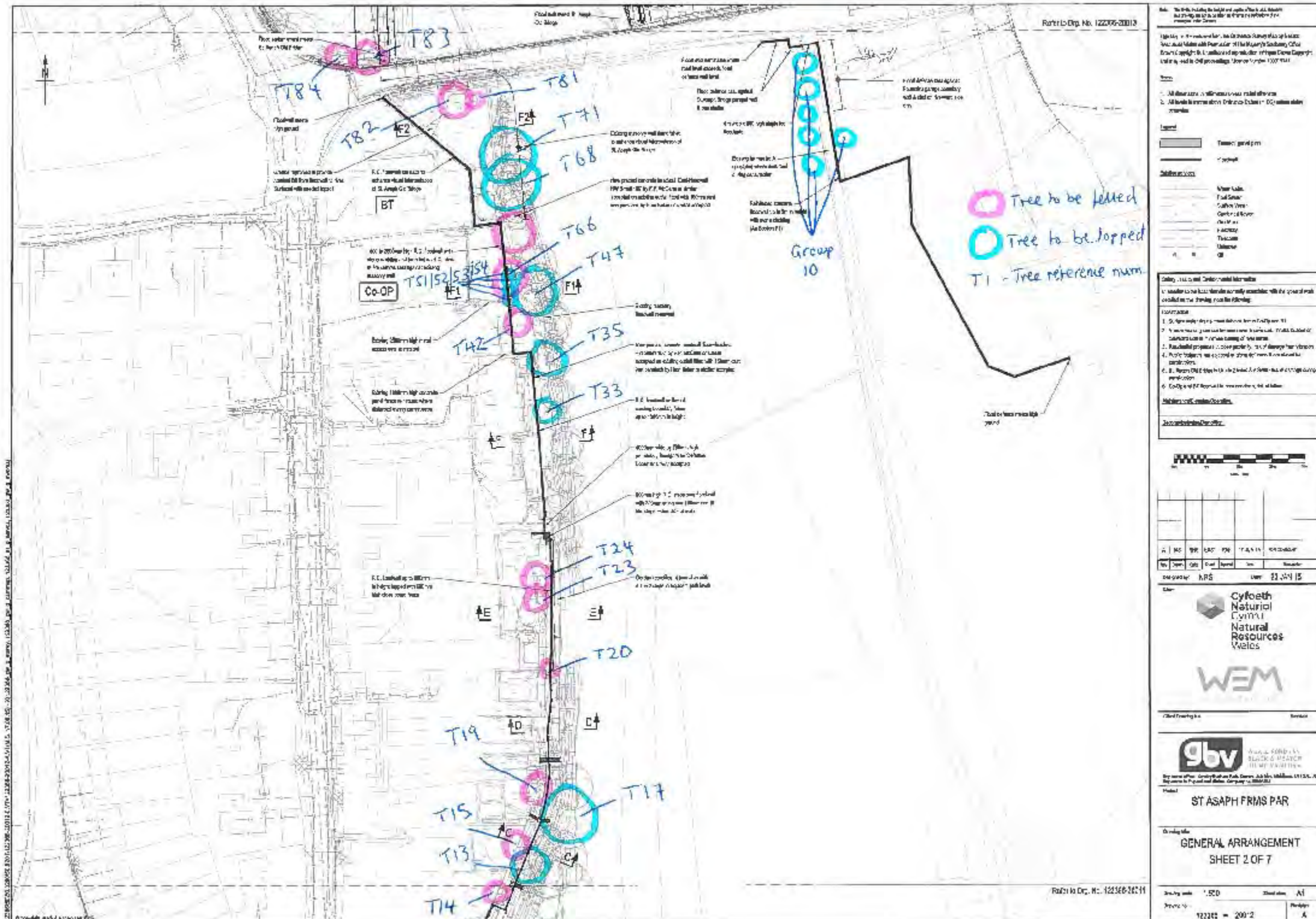
Figure 1 – Scheme Overview Plan

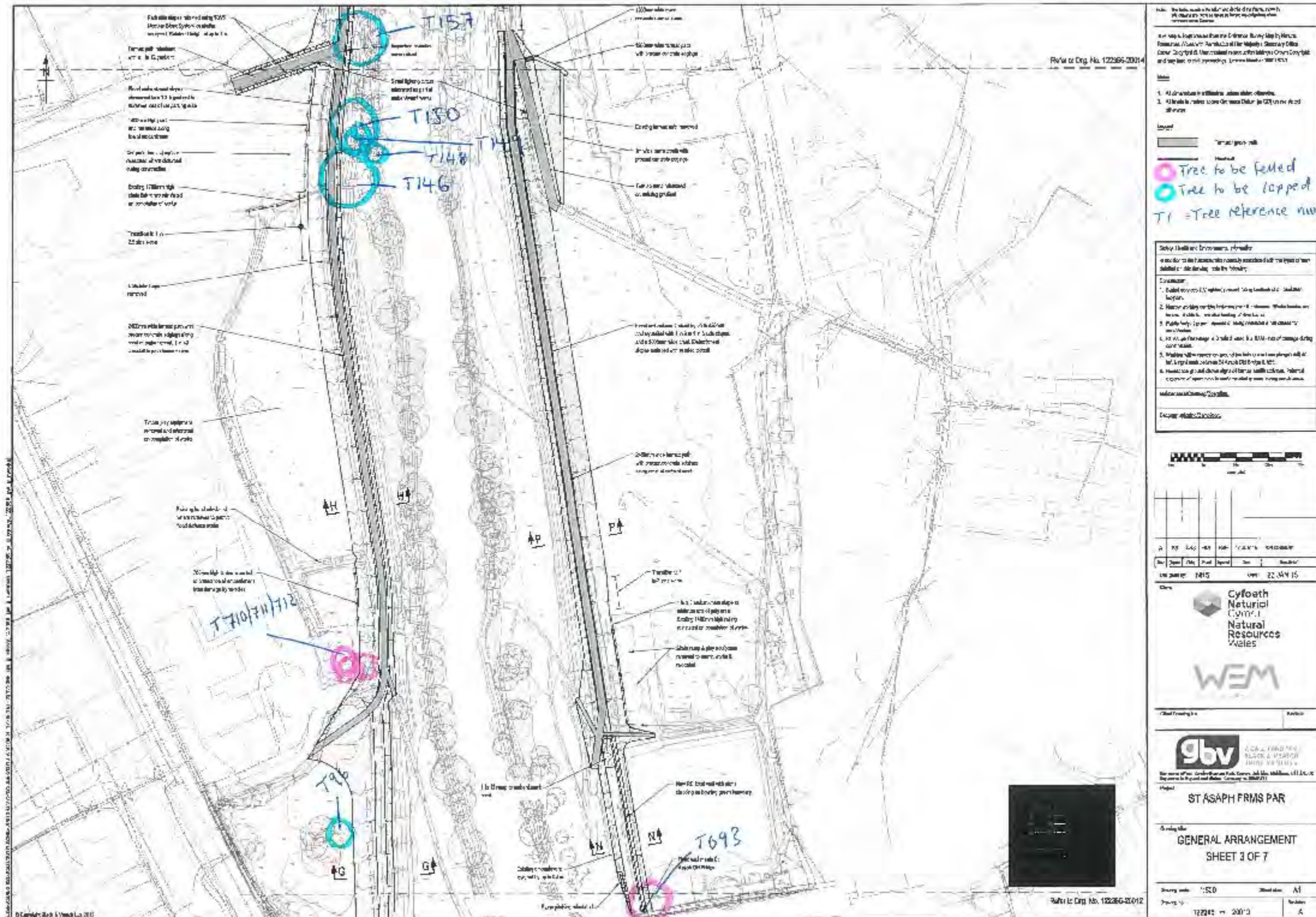


APPENDICES

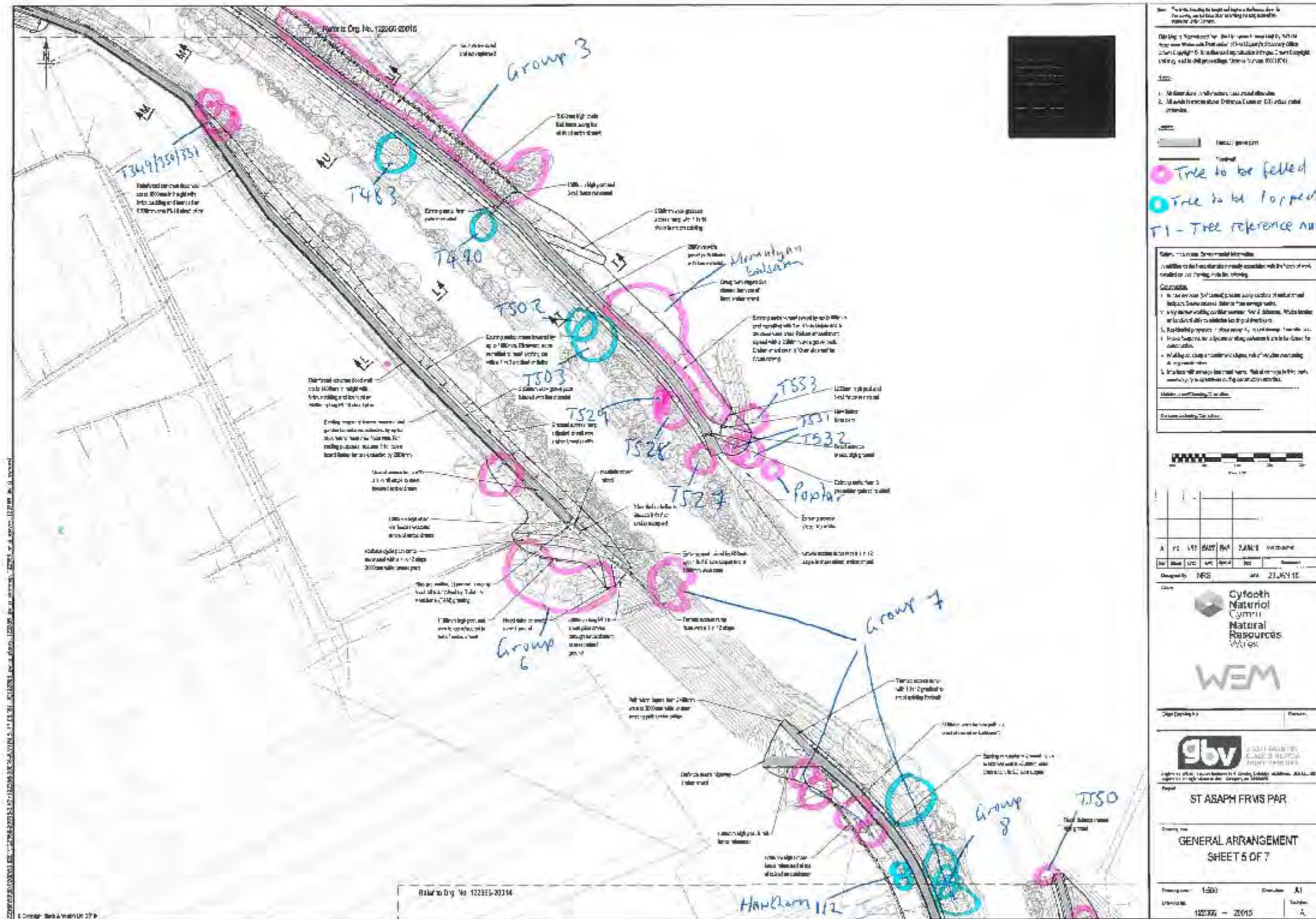
APPENDIX A: TREES PLANNED FOR FELLING/LOPPING WITHIN THE SURVEY AREA

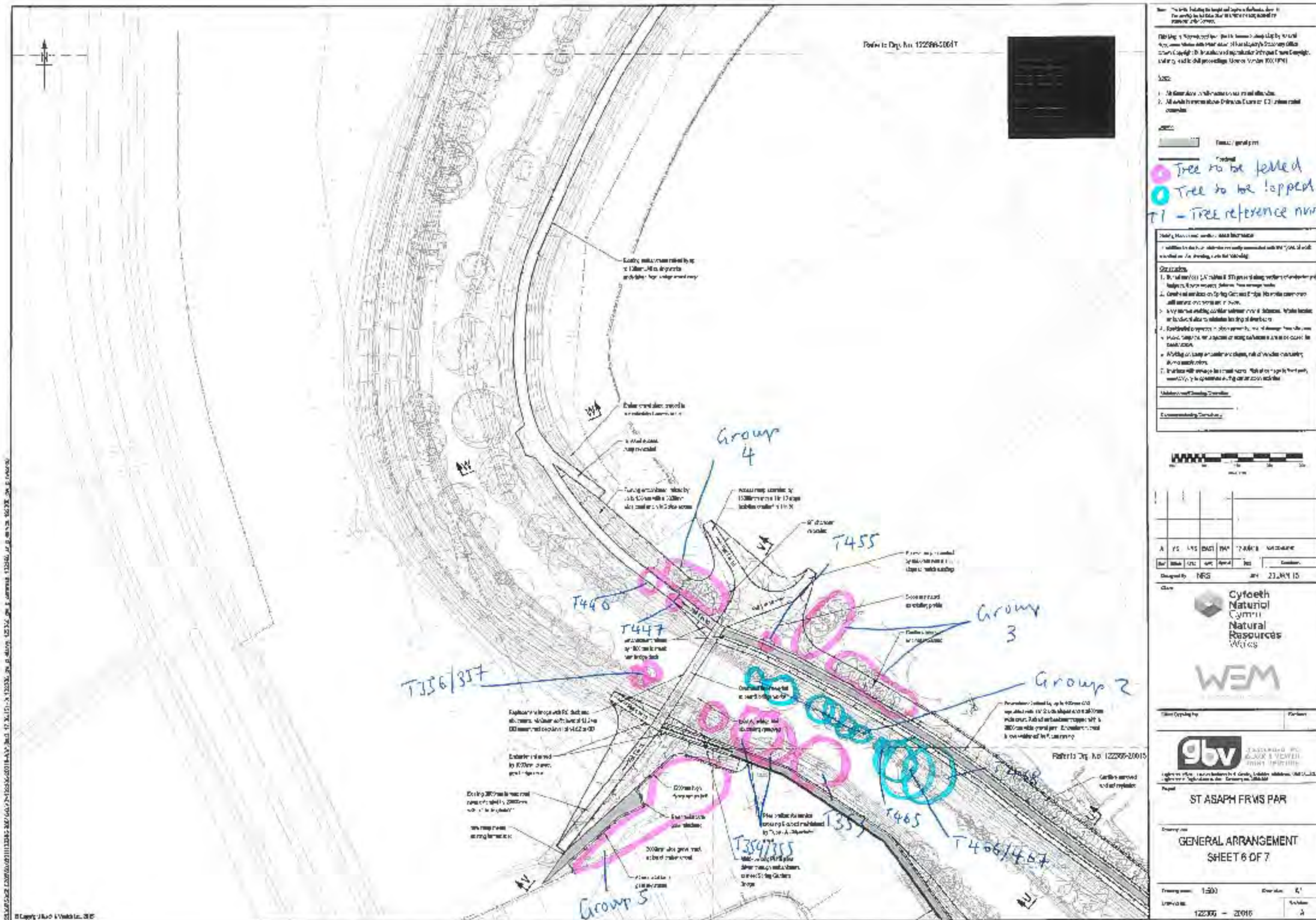


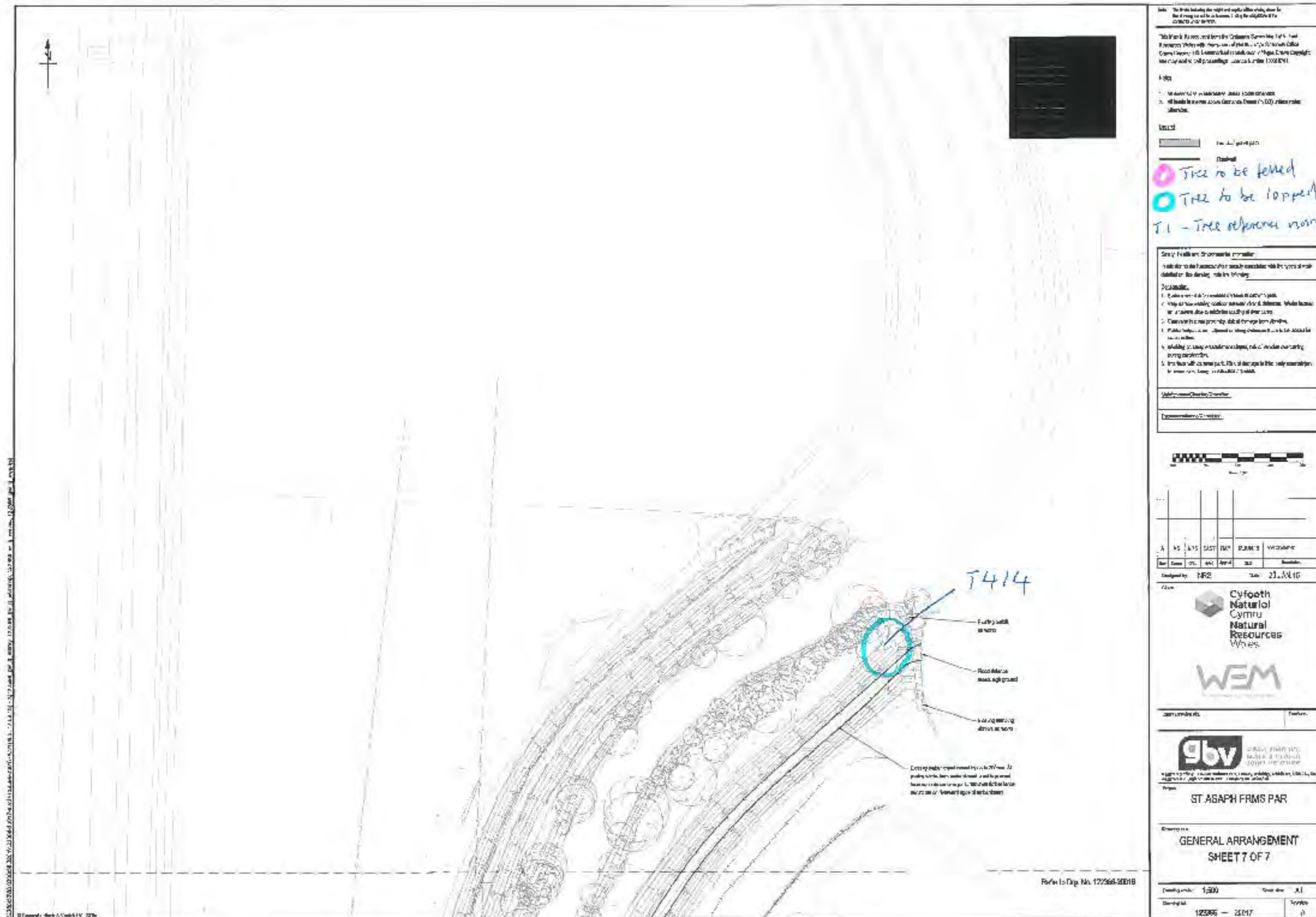












APPENDIX B: BAT ROOST POTENTIAL OF TREES

Sheet No: 1		Recorder (initials): MR/HB			Date: 29-6-15			Site Location: St Asaph, River Elwy.											
Weather: Cloud cover 1/8, light wind, no rain, 25°C					Description of Feature							Description of Feature	Roost Potential					Other	
Tree number / ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ SM/ S)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other	Bats/evidence present Describe	Confirmed	High	Medium	Low	Negligible	Other	
1	Ash	1.5	12	M	X		X		X			Three holes on north side 6m from ground; two fissures on main trunk 3m from ground. Downward leaning holes on south side		X					
2	Ash	0.5	8	M					X			Small amounts of ivy on lower trunk but sparsely growing.						X	
3	Ash	0.3 - 0.5	8	M								No features						X	
4	Ash	1	12	M			X		X			Hollow in main trunk (1m in length, 5-10cm in width)			X				
5	Ash	0.2 - 0.3	7	SM								No features						X	
8/9/10	Ash/Maple/Elder	0.5-1	5-8	SM/M					X			Ivy cladding sparse around trunk					X		
81	Silver birch	0.5	10	M					X			Ivy cladding dense throughout the tree but main trunk is narrow and unlikely to support a roost					X		Cat 2
82	Silver birch	0.5	10	M					X			Ivy sparsely covering main trunk						X	



Sheet No: 1	Recorder (initials): MR/HB		Date: 29-6-15		Site Location: St Asaph, River Elwy.													
Weather: Cloud cover 1/8, light wind, no rain, 25°C					Description of Feature							Bats/evidence present Describe	Roost Potential					Other
Tree number / ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ SM/ S)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other		Confirmed	High	Medium	Low	Negligible	
13/15/16/19	Ash, walnut	0.3	4-8	SM								No features					X	
20	Walnut	0.2	6	SM								No features					X	
24	Lime	0.3-0.5	6-8	M			X					Two shallow, north facing cavities present on main trunk 3-4m from ground			X			
23	Rowan	0.3	6	SM							X	No features					X	
33	Ash	0.3	8	SM								No features					X	
35	Ash	1	12	M					X		X	Ivy covered tree with two bird boxes attached to main trunk. Bird boxes are old and have gaps at the bottom and hold some roost potential			X			
42	Sycamore	0.5-0.8	10	M					X			Ivy covers the main trunk sparsely and does not offer roosting potential					X	
51/52/53	2x hawthorn and 1 sycamore	0.3-0.8	5-10m	M					X			No features					X	
54	Alder	0.8	12	M					X			Ivy cover is prevalent but sparse on main trunk and large, main limb. Not suitable for roosting bats					X	

Sheet No: 1	Recorder (initials): MR/HB		Date: 29-6-15		Site Location: St Asaph, River Elwy.														
Weather: Cloud cover 1/8, light wind, no rain, 25°C					Description of Feature							Bats/evidence present Describe	Roost Potential					Other	
Tree number / ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ SM/ S)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other		Confirmed	High	Medium	Low	Negligible		
66	Alder	0.4-0.8	8-12	OM				X				A dead alder tree growing to 6m with a north-facing woodpecker hole 5m from the ground. No staining/scratching present but has potential to hold a roost			X				
68	Ash	0.6-0.8	10	M					X			Tree entirely covered with ivy but no other features of interest for bats observed			X				
71	Sycamore	0.6-0.8	10	M					X			Tree entirely covered with ivy which obscured view of main trunk but no other features of interest for bats observed			X				
83-84	Larch/Scots pine	0.4-0.7	8-10	M					X			Trees containing one main trunk which was observable with some dead ivy on both but no roosting potential observed						X	
96	Scots Pine	0.3	8	SM							X	No features						X	
711-712	Larch	0.3-0.5	10	M					X			Trees in good condition for only small amounts of ivy on main trunk						X	
710	Larch	0.6	10	M		X			X			Ivy clad in lower half of tree with some broken limbs but these are shallow. Loose bark present but superficial				X			

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Tree number / ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ SM/ S)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other		Confirmed	High	Medium	Low	Negligible		
146	Sycamore	0.8	10	M									Main trunk splits into two sections from ground. Some missing limbs but these are shallow and exposed					X	
148/149/150	Sycamore	0.3-0.6	10	M					X				Multi-stemmed sycamore trees with trunks containing some ivy but trees too narrow to hold a roost				X		
157	Sycamore	1	12	M					X				Ivy densely covering much of lower and middle parts of trunk and some major limbs. No obvious cavities/fissures but potential does exist for a roost to be present			X			
577	Crack Willow	1	12	M									Multi-stemmed with a lean towards the river. No features observed					X	
Group 1 (585-599)	Sycamore/Ash/Oak	0.6-1	8-12	M					X				Trees in good condition with some ivy covering but not enough to hold a roost					X	
600	Sycamore	1	12	M		X			X				Main trunk is split into two sections. Ivy loosely covered most of the tree but trunk was visible. Ivy offered no roost potential. Loose bark present but superficial				X		
601	Sycamore	0.4-0.8	8-10	M					X				Ivy growth present on main trunk but not dense enough to hold a roost					X	

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602	Sycamore	0.6-0.8	10	M					X			Ivy completely covers the main trunk and some major limbs			X			
607	Willow	0.8	12	M	X				X			Split on major limb and south facing. Ivy densely covers main trunk			X			
604-608	Alder	0.6	10-12	M					X			Some ivy cladding but not dense				X		
550	Sycamore	0.3-0.4	10	SM/M								No features					X	
532	Ash	0.5	2	Dead	X							Large split from tree falling. The split is upward leaning and exposed and close to the ground so offers negligible roost potential					X	
531	Crack willow	0.5-0.8	8	M					X			Tree leans away from the river and is sparsely covered with ivy but generally in good condition.				X		
Poplar	Poplar	1	10-12	M					X			Ivy covered and dense in places. Main trunk grows straight and is in good condition			X			Cat 2
527	Elm	0.6	10	M					X			Sparse ivy covering with tree in good condition					X	

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Tree number / ref	Tree species	DBH (m)	Height (m)	Age (OM / M/ SM/ S)	Split	Loose bark	Trunk cavity	Branch cavity	Ivy	Callus rolls	Other		Confirmed	High	Medium	Low	Negligible	
528	Sycamore	0.8	10	M					X			Sparse ivy covering with tree in good condition					X	
529	Alder	0.5	8	M	X				X			Split in main stem where wood is rotten but this is upward facing and exposed approximately 1m from the ground. Ivy covering is sparse/moderate				X		
530	Alder	0.5	8	M					X			Sparse ivy covering with tree in good condition					X	
503	Ash	1	8	M					X			Ivy clad throughout and dense so has the potential to hold a roost			X			
502	Elm	0.5-0.7	10-12	M					X			Some moderate ivy covering but tree is in good condition with no obvious features observed				X		
468	Crack willow	1	10	Dead		X						Dense ivy growth throughout and gaps between bark and trunk (2-5cm)			X			
466/467	Crack willow	1	12	M					X			Ivy grows halfway up the trees and cover is sparse/moderate. Trees in good condition				X		
465	Crack willow	1	10	M					X			Major split from trunk to major limb which is north facing and about 1m long			X			

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Group 2 (456-464)	Sycamore/Ash	0.3-0.6	10-12	M					X			Trees in good condition with small amounts of ivy present				X		
Group 3	Leylandii	0.3-0.6	12	M					X			Row of leylandii; some are multi-stemmed. Some sparse/moderate ivy growth is present but trees are in good condition				X		Associated with bridge development
455	Ash	0.3	6-8	SM								Tree in good condition					X	
414	Crack willow	0.5	10-12	M		X						Some missing minor limbs but these are shallow grooves and are exposed. Loose bark present on main trunk and some major limbs but are shallow				X		
446	Alder	0.3	8	M								No features					X	Associated with bridge development
Group 4 434-458 (excluding 446/447)	Alder/beechn/ash/sycamore	0.3	8	M								No features					X	Trees 448-454 associated with bridge development
447	Walnut	0.2	6	SM								No features					X	Associated with bridge development

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356	Alder	0.3	10	M					X			Ivy cladding is dense and covers much of the tree			X				Associated with bridge development
357	Alder	0.3	10	M					X			Ivy cladding present but only occurs on lower part of the tree				X			Associated with bridge development
Group 5	Horse Chestnut/Leylandii/Alder/Hawthorn	0.1-0.3	4-8	SM/M		X	X		X			Some loose bark present on trees and small holes but these are shallow and have negligible potential to support bats. Ivy growth is present but sparse				X			Associated with bridge development
353/354/355	Crack willow	0.6-0.8	14	M								Good condition and multi-stemmed tree with no features present that could be used as a bat roost					X		Associated with bridge development
349/350/351	Alder	0.3-0.5	10	M					X			Ivy present with some potential to hold a small/individual roost. Tree appears in good condition			X				
Group 6	Cherry species	0.1-0.3	8	SM								No features					X		
Group 7 (247-280)	Sycamore	0.3	8-10	M					X			Some sparse ivy coverage on main trunk					X		
273-276	Ash/Maple	0.3-0.6	8-10	M					X			Some sparse ivy covering but tree is in good condition with no obvious features that could be used as a bat roost					X		

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Hawthorn 1 and 2	Hawthorn	0.3-0.5	8	M	X				X			Trees are densely covered with ivy with 276 containing several fissures (partly exposed)			X			
Group 8 (255-261)	Alder/Sycamore	0.3	10-12	M					X			Multi-stemmed tree with some ivy cladding but this is sparse/moderate with no features that could be used by bats as roost					X	
716	Grey willow	0.3	6	SM					X			Sparse ivy cladding					X	
254	Ash	1	14	M		X			X			Ivy covered to hallway (dense) with some cracks and loose bark. Missing limbs present but cuts are clean with only shallow holes			X			
217	Black poplar	180	15	M	X		X		X			Two south facing cavities 5m from the ground. Ivy dense throughout and some missing limbs		X				
234	Alder	0.6	19	OM	X		X		X			Small north facing holes present but couldn't see how deep these were from the ground. Ivy densely covering			X			
200	Ash	1	12	M					X			Ivy covering is dense and covers the main trunk			X			
190	Ash	0.8	12	M					X			Ivy covering is dense and covers the main trunk			X			

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186	Ash	1	12	M	X			X	X			Tree hole is south facing and 10cm in diameter. Fissure present along main trunk that is not exposed		X				
Group 9 (175-272)	Alder/Maple/Willow	0.2-0.5	10	M					X			Ivy present but trunks are either too narrow to support a bat roost or ivy coverage is sparse and trees were in good condition with no features present				X		
172	Ash	0.3	10	SM								No features					X	
173	Sycamore	0.5	10	SM								No features					X	
693	Scots pine	0.8-1	10-12	M								No features					X	
Group 10	Sycamore and elm	0.3-0.5	6-10	SM/M								No features					X	
483	Sycamore	0.9	12-14	M								No features					X	

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490	Goat willow	0.3-0.5	8	M								No features					X	

