TAIYO
POWER AND STORAGE

Parc Solar Caenewydd, Swansea

ARBORICULTURAL IMPACT ASSESSMENT

Development of National Significance in the Renewable Energy Sector
Full Re-Consultation before Applying for Planning Permission

On behalf of **Taiyo Power & Storage Limited**

October 2023 | P21-2998

ARBORICULTURAL IMPACT ASSESSMENT

Parc Solar Caenewydd,
Gowerton

October 2023

Barton Hyett Associates
Arboricultural Consultants

Summary table		
Site Name:	Parc Solar Caenewydd	
Project reference:	4439	
Site Address:	Land fronting the A484 and Swansea Road (B4560) at Gowerton, Swansea	
Nearest Postcode:	SA4 4LN	
Central Grid reference:	SS 60031 97078	
Local Planning Authority:	City and County of Swansea	
Relevant planning policies:	Swansea local development plan (LDP); trees, hedgerows and woodland supplementary planning guidance (SPG); biodiversity and development supplementary planning guidance (SPG)	
Statutory Controls:	**Tree Preservation Order**	**Conservation Area**
	Yes, G47 (TPO No: 206)	None
Soil Type: (Source: BGS online soils map © NERC 2023)	**Superficial/Drift**	**Bedrock**
	Till, Devensian - Diamicton	Grovesend Formation - Mudstone, siltstone and sandstone
Topographical Survey:	N/A	
Notes:	Ancient woodland present within and adjacent to the site Sporadic clusters of Japanese knotweed across the site.	
Report author:	David Holmes *FdSc, MArborA*	
Checked by:	Richard Hyett *MSc, BSc (Hons), MICFor, MArborA*	
Date of issue:	21 May 2023	
Revision A:	09 October 2023 - updated layout for re-consultation	

Arboricultural ASSOCIATION Professional Member

PR01027

Institute of Chartered Foresters registered

Barton Hyett Arboricultural Consultants

REPORT CONTENTS:

1. INTRODUCTION

1.1. Barton Hyett Associates Ltd has been appointed by Taiyo Power Storage Limited (herein referred to as "the Applicant") to undertake a tree survey in accordance with the recommendations of British Standard 5837:2012 '*Trees in relation to design, demolition and construction - recommendations*', for a proposed utility-scale solar and battery storage facility on land fronting the A484 and Swansea Road (B4560) at Gowerton, Swansea (herein referred to as 'the site'). The development is called 'Parc Solar Caenewydd'.

1.2. This assessment considers the impact on the Arboricultural resource of the site.

1.3. The scope of the instruction was to inspect trees relevant to a Development of National Significance (DNS) application for a solar farm at the site and provide written advice on how they inform feasibility and design options for the site. The Arboricultural Impact Assessment (AIA) will form part of the suite of documents submitted to Planning and Environment Decisions Wales (PEDW).

1.4. NB: *This AIA is being published to accompany a second phase of statutory pre-application consultation carried out under Articles 8 and 9 of the Development of National Significance (Procedure) (Wales) Order 2016. The first phase of statutory consultation was carried out between June and August 2023. The applicant is now undertaking a full re-consultation in light of the changes introduced to the planning application boundary and development description.*

2. SITE DESCRIPTION

2.1. The site is made up of agricultural land used for growing crops and grazing cattle with field boundaries defined by a mixture of hedgerows, fences and ditches. Field gates allow vehicular access throughout the site. The redline area of the main site and survey area measures approximately 80 hectares in size. The cable routes equates to approximately an additional 3 hectares.

2.2. At the approximate centre of the site is the farmyard, complete with a residential dwelling and out-buildings.

2.3. The city of Swansea lies to the south-east of the site, approximately 4.25 miles away. The town of Llanelli is located approximately 6.15 miles west-north-west of the site.

2.4. To the north of the site is the A484 highway (field number 16 located north of the road) and to the far south of the site runs the *Gors-fawr Brook*. The *Afon Lian* River runs east-west through the lower half of the site.

2.5. The surrounding area is largely agricultural land with areas of woodland, several commercial and industrial sites and outlying rural dwellings. The site slopes southwards and undulates throughout, with the approximate height above sea level varying between 41m at the north to 15m at the south.

2.6. The site is currently accessed by an unnamed road, which leads into the site from the A484. The lane enters the farmyard at its eastern side.

2.7. Several footpaths pass through the site, with kissing gates present to contain livestock. The site is crossed by several overhead power lines.

3. TREE SURVEY FINDINGS

3.1. A total of 48 trees, 113 groups of trees and 68 hedgerows were surveyed. These are summarised in terms of their quality in accordance with the recommendations of BS5837 below, and shown in more detail on the plan in **Section 2** and within the Tree Survey Schedule (**Section 3**).

	Total	A - High quality trees whose retention is most desirable.	B - Moderate quality trees whose retention is desirable.	C - Low quality trees which could be retained but should not significantly constrain the proposal.	U - Very poor quality trees that should be removed unless they have high conservation value.
Trees	**62**	3	47	12	-
Groups	**140**	2	116	22	-
Hedgerows	**74**	-	65	9	-
Woodland	**1**	1	-	-	
Total	**277**	**6**	**228**	**43**	**-**

Table 1: Summary of arboricultural features of each BS5837 quality category

4. KEY ARBORICULTURAL FEATURES

4.1. There are no veteran or ancient trees located within the site. The most significant features within the site are the groups G1, G2, G33, G35, G46 (offsite), G52 and G67. The latter 2 groups, along with T28, have been recorded as category A with the other groups being category B.

4.2. The moderate quality category B group G47 flanks the northern bank of the *Gors-fawr Brook* water course and is protected by a Tree Preservation Order (TPO), order No: 206. The TPO is a legal mechanism used to preserve trees for amenity value or environmental reasons. The group is at the edge of the extent of the survey area and is remote from the proposed development.

4.3. One high quality category A group, G106 and two moderate quality category B groups, G43 and G105, are listed as designated Ancient Semi-Natural Woodland (ASNW) on the '*2021 Ancient Woodland Inventory*' hosted by Natural Resources Wales (NRW). Two moderate quality category B groups, G33 and G35 and one low quality category C group (G34) are listed as Restored Ancient Woodland (RAW), on the '*2017 National Forestry Inventory'*, again hosted by NRW.

4.4. The majority of features internal to the site are hedgerows which are either maintained by flail or outgrown.

5. PROPOSED DEVELOPMENT

5.1. The proposed development comprises of a renewable energy scheme and the main element of the proposal is the construction, operation, maintenance and decommissioning of a ground mounted solar farm. The solar farm will include a battery storage facility. The scheme will also require a cable route to connect to the grid. The scheme will have an operational lifespan of 40 years, after which the development will be decommissioned, and the site returned to agricultural use.

6. IMPACT ASSESSMENT

6.1. The AIA considers the effects of any tree and hedgerow loss required to implement the proposed development as well as any reasonably foreseeable potentially damaging activities proposed in the vicinity of retained trees. This is undertaken with reference to BS5837:2012 and considering the nature of the proposed development. Impacts can include tree removal to facilitate design, soil compaction in close proximity to trees and direct impact damage to the canopy and roots of retained trees from construction activities. A summary of anticipated impacts resulting from the proposed development is provided below.

6.2. In response to the arboricultural constraints (e.g. the presence of high and moderate-quality trees and tree groups) the proposed development has been designed in order that Root Protection Areas (RPAs) can be largely avoided. Wherever possible, the existing farm access tracks and gaps in hedgerows have been utilised for the routing of the construction and maintenance tracks and for the perimeter/security fencing where practical. On the basis that the construction process is carried out appropriately, the proposed development can be implemented without significant direct impacts on these important trees.

<u>Tree / hedgerow removals</u>:

6.3. The proposed solar farm development will not require the complete removal of any significant trees of tree groups.

6.4. Within the main part of the site, the need for significant hedgerow removal has been avoided through the proposed layout responding to the arboricultural constraints that have been identified. For example the proposed access tracks making use of existing tracks and openings in hedgerows. The security fence routing has been planned to avoid the removal of hedgerows where possible. Hedgerows and some small low quality groups have not had temporary protective fencing specified due to the small RPA.

6.5. However, within the centre of the site the complete removal of two hedgerows is anticipated to be required. In addition, some isolated sections of hedgerow removal across the site will also be required. The anticipated hedgerow removal is summarise below. The summary provides the hedgerow reference, BS5837:2012 quality category, length of removal (full or partial and linear metres) and the reason for the removal.

- H14 - B2 - partial - 10m - Security fences
- H17 - B2 - part 2m - Security fence
- H21 - B2 - part 2m - Security fence
- H23 - C2 - part 2m - Security fence
- H28 - B2 - 5m wide cable connection (50m long)
- H38 - B2 - partial 2m - Security fence
- H43 - B2 - partial 2m - Security fence
- H45 - B2 - partial 2m - Security fence
- H48 - B2 - partial 3m - Security fence
- H51 - B2 - partial 2m - Access track
- H52 - B2 - remove 50m - Access track
- H53 - B2 remove 50m - Access Track
- H58 - B2 - partial - 15m - Access track
- H59 - B2 - partial - 9m - Security fence
- Total = circa 200 linear metres

6.6. With local adjustments, it would be possible to move the site perimeter security fence line in order to minimise the number of stems to be removed, convenient gaps should be exploited. It is recommended that as the fence is to pass through the hedge, strainer posts are installed at a distance of 3m on either side of the hedgerow, with a 6m fencing panel being affixed to these posts in order to minimise ground disturbance and make the panels easier to install.

6.7. In addition, the partial removal of two tree groups is anticipated to be required in order to accommodate the swept path of the access to the substation and battery compound. These are summarised below:

- G1 - B2 - small section at southern end - Access track (swept path)
- G1 - B2 - 5m wide section - cable connection

<u>Impacts on retained trees</u>:

6.8. The proposed layout in relation to the retained trees is shown in the Tree Retention and Removal Plan in **Section 2**. The proposed access tracks onto the site will make use of existing access, in particular, the tracks passing adjacent to trees and hedgerows. The existing tracks have been used by agricultural machinery for many decades. However, the low branches above some sections of proposed access route will need to be crown-lifted to provide in the region of 5m of ground clearance. At present clearance along the routes is sufficient and it is recommended that the levels of the tracks be retained. If the surface is to be improved this should be done by adding a top-dressing and retaining the existing materials as a sub-base.

6.9. The layout of solar panels and security fencing to the north & west of G33 and G35, the Restored Ancient Woodland (RAW), is presently shown to be within the Ancient Woodland Buffer. The layout of panels and fencing should be reconfigured to avoid the buffer At the north of G33, the fencing should be moved to the topside of G27 to ensure sufficient clearance.

6.10. The security fencing will pass beneath the moderate quality trees T28, T38 and T46. In the case of T28 and T38, a crown lift to allow the fencing beneath is feasible provided that the works be carried out in accordance with BS 3998:2010. The fencing proposed beneath T46 should be locally adjusted to move eastwards and avoid a development clash.

6.11. There are instances across the site where the existing track is routed parallel, and closely alongside hedgerows. Where this is the case, the close proximity of the tracks is acceptable since this is no more significant than the previous agricultural use of the land.

6.12. A new track is proposed to provide access to the northernmost parcel of the site. This track leads from the existing roundabout at the junction of the A484 and the B4560. The track passes between G105 and G106 (both areas of Ancient Woodland), however the new track follows the line of the well established existing track between the two areas of woodland. Despite the presence of the existing track, it will still be necessary to take precautions when upgrading the track to ensure the woodlands are not adversely impacted. Despite the track upgrade being feasible in the arboricultural terms this matter will require further design and assessment at the detailed design stage.

6.13. Service and connecting cable runs within the site interior should be designed to avoid the RPAs of retained trees. An assessment of the site layout indicates this will be possible. Should services need to be installed near, or within RPAs, the project arboriculturist should be consulted and an appropriate installation method statement prepared.

6.14. No ground-level changes, foundations or underground utilities are proposed within the root protection areas of retained trees.

6.15. Adding new planting to the existing arboricultural resource will be beneficial to enhancing the biodiversity of the site. There exists the opportunity to enhance the existing hedgerows with supplementary planting to fill in gaps brought about by undesirable species colonising the plots, such as bramble or elder.

6.16. Biodiversity Enhancement Areas (BEA) have been designated to the edges of the site. A landscape strategy plan and a biodiversity management plan have been prepared to specify mitigation planting.

Anticipated Arboricultural Impacts - Cable Connection Routes

6.17. Two cabling routes are currently proposed, the first to connect to the existing pylon located off Ystrad Road. In addition, a second point of connection option is being introduced to the scheme and this is located to the north off Carmarthen Road. The proposal is to route the cable trench along the existing local highway (namely Swansea Road, Carmarthen Road, Ystrad Road and Denver Road).

6.18. It may be necessary to install the cable close to and occasionally within the RPAs of significant trees and tree groups. Both routes, are feasible from an arboricultural point of view since there would be little to no tree removal.

6.19. Guidance is set out within the National Joint Utilities Group (NJUG) Volume 4 (Section 4) - How To Avoid Damage To Trees which details acceptable working methods relating to '*excavations or other works occurring within the Prohibited zone or Precautionary Zone*'.

6.20. Section 4.1 reinforces the role of the project arboriculturist and the requirement for arboricultural supervision to be necessary when working within RPAs: '*Wherever trees are present, precautions should be taken to minimise damage to their root systems. As the shape of the root system is unpredictable, there should be control and supervision of any works, particularly if this involves excavating through the surface to 600mm, where the majority of roots develop*'.

6.21. The preferred approach is to avoid RPAs through the realignment of apparatus. '*Whenever possible apparatus should always be diverted or re-aligned outside the Prohibited or Precautionary Zones. Under no circumstances can machinery be used to excavate open trenches within the Prohibited Zone*'.

6.22. If, due to the constraints of the site, the two proposed indicative cable routes as identified in the Tree Protection Plan (**Section 2**) is not achievable the preferred solution is to use trench-less techniques such as directional drilling. NJUG states that where necessary 'trench-less techniques should be used. The launch and receiver pits should be located outside the Prohibited or Precautionary Zones (as defined within the NJUG guidance). In order to avoid damage to roots by percussive boring techniques, it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the equipment with materials other than water (e.g. oil, bentonite, etc.) must not be used when working within the Prohibited Zone.

6.23. As trench-less techniques may not be practical for sections of installation that are less than circa 50m in length, it is likely that the installation will utilise open trench excavation that will work around the RPAs of individual trees, where this is deemed to be a practical solution.

6.24. There are also certain factors that will have historically abated the growth of tree roots beneath the highway, such as the previous installation of services/apparatus which may have already severed tree roots and the presence of a drainage ditch or steep embankment at the highway edge.

6.25. The working methods, as set out above, will therefore need to be applied to the installation of the cable connection within the highway. If excavation is required to be carried out within RPAs, a schedule of arboricultural monitoring will need to be agreed with the project arboriculturist.

Summary

6.26. The proposal is feasible from an arboricultural perspective, and if carefully implemented according to an approved arboricultural method statement there would be no or only a low potential negative impact on the retained trees. A combined Tree Retention and Removal and Tree Protection Plan are included in **Section 2**.

7. TREE PROTECTION MEASURES

7.1. To define the solar compound and the periphery of the site, it is proposed that security fencing (2 - 2.5m high deer fence) be erected to run outside the RPA of existing arboricultural features. This fence will act as an effective tree protection barrier if erected before any construction works commence on site and mitigate the need to install temporary BS5837:2012 fencing along the outer perimeters of the site.

7.2. However, trees within the interior of the site could be impacted during the construction phase of the development and some will require protection. Temporary protective fencing is proposed around the moderate-quality trees G3, G4, T25, T28, T30, T39, T47, T48, G102, G112 and the low-quality group G79. The type of fencing should be HERAS type, erected as per figure 3 within BS 5837:2012.

7.3. Given the previous long-standing agricultural use of this site, additional temporary protective fencing for the hedgerows or remnant individual thorn is not recommended during the development phase.

8. HEADS OF TERMS FOR AN ARBORICULTURAL METHOD STATEMENT (AMS)

8.1. BS5837:2012 (Figure 1) recommends that detailed/technical design of tree protection and arboricultural methodologies should be resolved and finalised following the approval of the feasibility of a scheme by the Welsh Ministers.

8.2. Annex B and Table B.1 of BS5837:2012, an informative, advises that Arboricultural method Statement Heads of Terms are a sufficient level of information in order to deliver tree-related information into the planning system. The table also advises that a detailed Arboricultural Method Statement might reasonably be required as a 'reserved matter' or planning condition.

8.3. In relation to the site, it is anticipated that arboricultural working methods are likely to be quite straightforward. A brief summary of the principles of tree protection on development sites is included in **Section 6**.

8.4. A draft, 'Heads of Terms' for an Arboricultural Method Statement is set out below:

- Project arboriculturist – schedule of monitoring and supervision to be agreed with the applicant and LPA
- Pre-commencement site meeting - to be attended by the project arboriculturist, client, site manager and other relevant parties. Project arboriculturist to ensure that all parties have copies of the tree protection plan and this report
- Facilitation pruning
- Erection of tree protection barriers as per the Tree Protection Plan (TPP)
- Site preparation and ground works - no access for any machinery within the fenced tree protection areas.
- Main construction phase - all tree protection measures shall remain in situ and intact for the duration of the construction phase
- Removal of tree protection barriers - only to occur following approval of site conditions by the project arboriculturist
- Final landscaping including tree planting

9. CONCLUSIONS AND RECOMMENDATIONS

9.1. Subject to the implementation of the advice contained within this report the proposed development is acceptable from an arboricultural perspective. All retained trees can be adequately protected during construction activities to sustain their health and longevity.

9.2. The proposed new tree planting will enhance the existing tree stock and help further improve the habitat value of the site.

9.3. An Arboricultural Method Statement and finalised Tree Protection Plan will need to be produced. Where the feasibility of a scheme has been agreed upon by the Welsh Ministers, this detail can be agreed and submitted later as part of a pre-commencement planning condition (by agreement with the applicant).

9.4. On the basis that the construction process is carried out appropriately, the proposed development can be implemented without significant impact on the site's arboricultural resources. In conclusion, the proposals are acceptable from an arboricultural perspective, subject to the implementation of the advice and recommendations set out in this report.

David Holmes, *FdSc MArborA*
Arboriculturist

TRR&P - 'Section 3'

BS:5837:2012 Figure 3 Examples of above-ground stabilizing systems

a) Stabilizer strut with base plate secured with ground pins

b) Stabilizer strut mounted on block tray

For more details refer to BS:5837:2012 *'Trees in relation to design, demolition and construction - Recommendations'* p.21

KEY

- Category A Tree - High quality (Retention highly desirable)
- Category A - Hedgerow, Group, Woodland - High quality (Retention highly desirable)
- Category B Tree - Moderate quality (Retention desirable)
- Category B - Hedgerow, Group, Woodland - Moderate quality (Retention desirable)
- Category C Tree - Low quality (May be retained but should not constrain development)
- Category C - Hedgerow, Group, Woodland - Low quality (May be retained but should not constrain development)
- Category U Tree - Very low quality (Mostly unsuitable for retention)
- Category U - Hedgerow, Group, Woodland - Very low quality (Mostly unsuitable for retention)
- Root Protection Area (RPA) - Layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and soil volume to maintain the tree's viability
- Shrub mass/offsite tree/out of scope (OOS)

Ancient Tree / Woodland or Veteran Trees

- Ancient tree/woodland or Veteran tree: Important trees that require special consideration
- Ancient tree/woodland or Veteran tree buffer: As per published standing advice from Natural England and the Forestry Commission

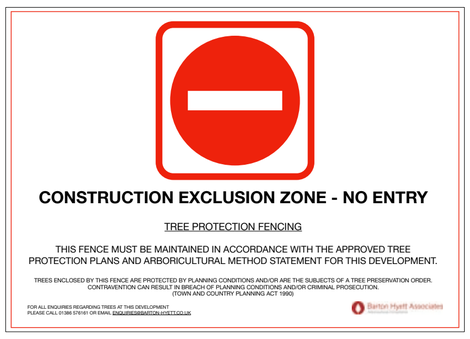
- Tree / Hedgerow / Group to be removed

Protection Measures

- Tree Protection Barrier installed according the the specification of Figure 3 of BS5837: 2012.

N
GRID NORTH

1 0 10 20 30 40 50
Metres



Note: The original of this drawing was produced in colour – a monochrome copy should not be relied upon. This drawing should be interpreted with reference to the accompanying tree schedule and written advice

PROJECT TITLE

Parc Solar Caenewydd, Swansea

DRAWING TITLE

Tree Retention/Removal & Protection Plan

SCALE	DRAWING NUMBER
1:2000 @ A1	BHA_4439_02

DRAWN BY	APPROVED BY	REVISION	SHEET	DATE
AD	DH	B	1/3	09/10/2023

LAYOUT USED WITHIN DRAWING **Pre-app Formal consultation layout - 29.09.23**

CLIENT **Low Carbon Alliance**

COORDINATE SYSTEM / DATUM **British National Grid / Newlyn Datum (AOD)**

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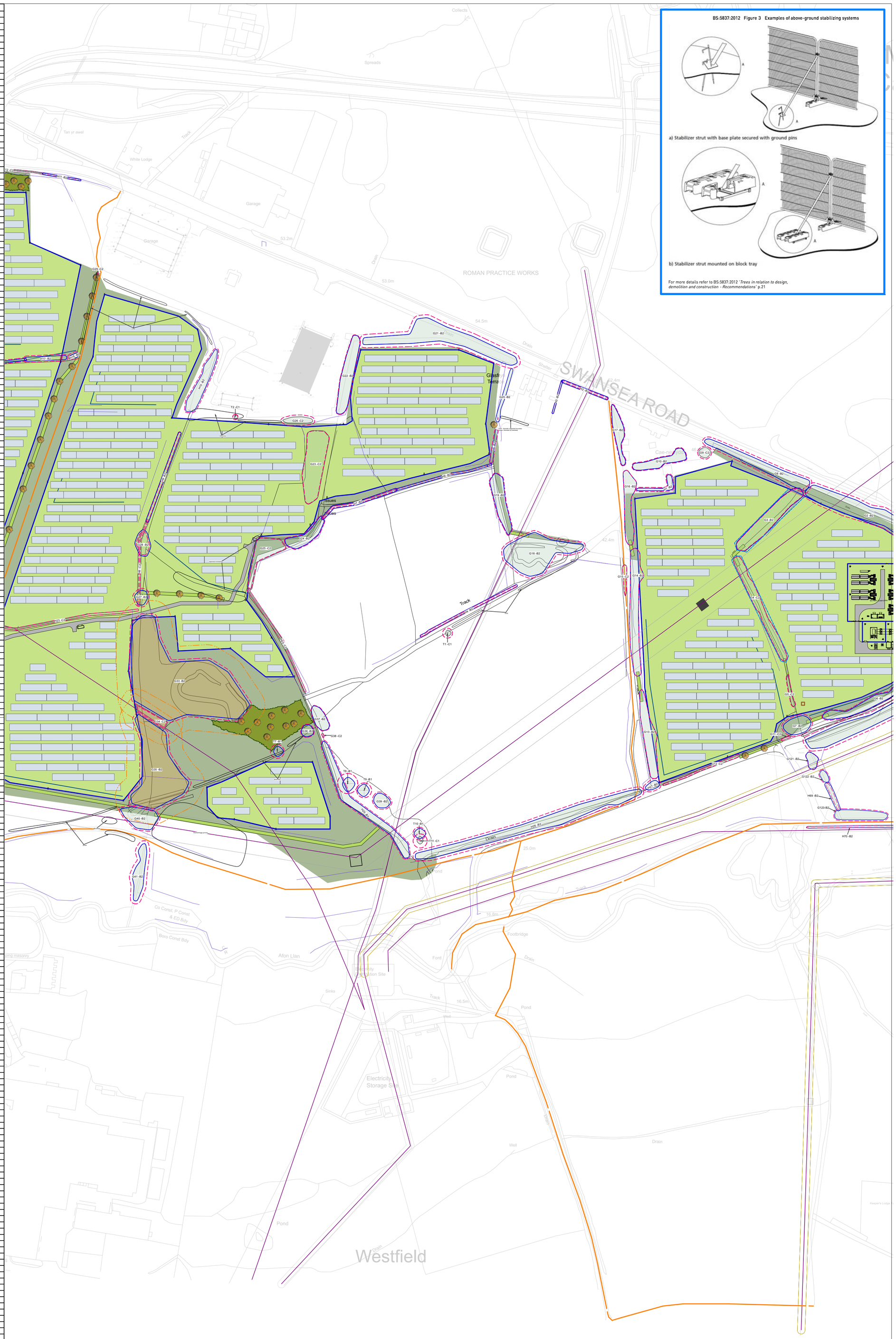
Ref	Species	Height (m)	Life Stage	RPA Radius (m)	RPA (m2)
T1	Willow (Goat)	5	SM	4.8	72
T2	Ash (Common)	4.5	Y	2.6	22
T3	Ash (Common)	8	EM	4.8	72
T4	Oak (English)	12	EM	4.4	62
T5	Oak (English)	9	EM	5.4	92
T6	Oak (English)	9	EM	4.8	72
T7	Oak (English)	8	EM	6.7	142
T8	Oak (English)	11	M	9.8	304
T9	Oak (English)	9	EM	7.2	163
T10	Oak (English)	8	EM	6.1	118
T11	Oak (English)	8	EM	6.8	147
T12	Oak (English)	10	M	9.4	275
T13	Oak (English)	11	M	8.4	222
T14	Willow (Goat)	5	EM	5.2	84
T15	Willow (Goat)	5	EM	4.1	52
T16	Alder (Common)	10	EM	5.5	96
T17	Alder (Common)	10	EM	4.4	62
T18	Alder (Common)	11	EM	4.8	72
T19	Willow (Goat)	12	EM	5.9	109
T20	Willow (Goat)	12	EM	4.2	55
T21	Oak (English)	8	EM	4.3	59
T22	Oak (English)	10	EM	5.8	104
T23	Oak (English)	12	EM	7.9	197
T24	Oak (English)	7	EM	5.4	92
T25	Oak (English)	10	EM	6.6	137
T26	Oak (English)	8	EM	7	152
T27	Oak (English)	8	EM	5.5	96
T28	Willow (Goat)	6	EM	13.2	547
T29	Hawthorn	4.5	SM	2	13
T30	Alder (Common)	11	M	7.2	163
T31	Hawthorn	3	SM	1.7	9
T32	Willow (Goat)	6	Y	1.8	10
T33	Cypress (Lawson)	7	EM	4.7	69
T34	Pear	9	M	5.9	109
T35	Larch (Common)	8	EM	3.2	33
T36	Hawthorn	6	M	4.8	72
T37	Elder	2	SM	3.8	46
T38	Aspen	9	EM	4.7	69
T39	Oak (English)	2.5	EM	3.6	41
T40	Cherry (Wild)	6.5	EM	3.3	35
T41	Oak (English)	7	SM	3	28
T42	Elm (English)	10	EM	5.6	100
T43	Willow (Crack)	9	EM	4.8	72
T44	Oak (English)	7	SM	3.3	35
T45	Chestnut (Horse)	10	EM	4.5	65
T46	Elm (English)	16	EM	1	3
T47	Ash (Common)	14	EM	8.5	228
T48	Oak (English)	12	EM	7.6	180
G1	Oak; birch; holly; gorse; hazel; hawthorn; goat willow	3-10	EM	6.6	-
G2	Oak; goat willow; holly; hazel; hawthorn	3-12	M	7.4	-
G3	Goat willow; oak; blackthorn; holly; hazel; birch; hawthorn	3-10	EM	3.6	-
G4	Goat willow; oak; hazel; honeysuckle; holly; hawthorn	03-06	SM	2.2	-
G5	Goat willow	2.5	Y	1.6	-
G6	Birch; goat willow; hawthorn; oak; gorse; hazel	3-12	EM	4.8	-
G7	Oak	14	EM	7	-
G8	Oak; goat willow; holly; hazel; hawthorn	3-8	EM	6	-
G9	Ash; goat willow; hawthorn; horse chestnut	5	SM	3.8	-
G10	Oak; walnut; goat willow; yew	5-14	EM	5.6	-
G11	Hawthorn	2	Y	1	-
G12	Oak; gorse; alder	2	Y	0.6	-
G13	Alder; oak; goat willow; birch; hawthorn	03-06	SM	2.4	-
G14	Alder; oak; goat willow; birch; hawthorn; holly; gorse; elder	03-06	SM	2.4	-
G15	Hawthorn; hazel; gorse; goat willow; oak	5	SM	2.2	-
G16	Ash; elder; holly; hazel; oak; hawthorn; goat willow; privet; dogrose	03-06	SM	2.6	-
G17	Ash; oak; holly; hawthorn	10	EM	6	-
G18	Oak; birch; hazel; hawthorn; goat willow	3-12	EM	7.9	-
G19	Birch; ash; hawthorn; holly; oak; goat willow	02-08	SM	3.1	-
G20	Oak; hawthorn; goat willow; hazel	6	EM	2	-
G21	Oak; hazel; holly; goat willow; birch	03-12	M	7	-
G22	Oak; hazel; goat willow	13	EM	6.4	-
G23	Goat willow	3	Y	0.6	-
G24	Alder; birch; oak; goat willow	10	EM	4.7	-
G25	Goat willow; birch; hazel; oak; alder; hawthorn; holly	4.5	Y	1.3	-
G26	Elder; goat willow; hawthorn	7	EM	4.9	-
G27	Oak; goat willow; birch; holly	05-10	EM	5.8	-
G28	Ash	14	M	6.7	-
G29	Hawthorn oak	4	Y	2.4	-
G30	Elm	13	SM	5.6	-
G31	Elm	11	SM	5.4	-
G32	Oak	9	SM	3.7	-
G33	Goat willow; oak; birch; holly; hazel; alder; elder	3-16	M	7.6	-
G34	Goat willow	4.5	SM	1.1	-
G35	Goat willow; oak; birch; holly; hazel; alder; elder	3-16	M	7.8	-
G36	Oak; birch	8-12	EM	6.7	-
G37	Oak; birch; rowan; hawthorn	3-12	EM	4.9	-
G38	Oak; birch; hawthorn; goat willow	3-13	EM	6	-
G39	Oak	10	EM	6.8	-
G40	Birch; oak; hazel; holly; gorse	3-10	EM	6.5	-
G41	Oak; birch; goat willow; holly; hawthorn	4-10	EM	7.4	-
G42	Oak; birch; ash	12	EM	7.3	-
G43	Oak; birch; ash; alder; hazel; gorse; holly	02-12	EM	7	-
G44	Hazel; oak	6	EM	2.5	-
G45	Oak; birch; hazel; blackthorn; hawthorn; gorse; rowan; holly	02-11	EM	7.4	-
G46	Oak; goat willow; hawthorn; gorse; hazel; birch	12	EM	6.6	-
G47	Alder; hazel; oak; gorse; holly; hawthorn	02-12	EM	6.6	-
G48	Oak; birch; hawthorn	02-14	EM	8.3	-
G49	Alder; goat willow; holly; ash; hawthorn; hazel	04-12	EM	4.9	-
G50	Alder; hazel; ash; sycamore	04-12	EM	4.7	-
G51	Alder; hawthorn	04-10	EM	5	-
G52	Oak; alder; hazel; holly; hawthorn; goat willow	02-12	M	9.4	-
G53	Hazel	3.5	SM	1	-
G54	Alder; oak; ash; hazel; elder	04-12	EM	4.8	-
G55	Alder; ash; hawthorn; goat willow	8	EM	2.9	-
G56	Alder; goat willow; gorse	5	Y	1.1	-
G57	Alder; hawthorn	10	EM	3.5	-
G58	Alder	10	EM	4.9	-
G59	Alder; ash; hawthorn; goat willow	10	EM	3.7	-
G60	Alder; hawthorn	12	EM	4.3	-
G61	Alder; sycamore; goat willow; birch; hawthorn	12	EM	4.1	-
G62	Alder; ash; hazel; goat willow; hawthorn	1	EM	4.2	-
G63	Alder; hawthorn; goat willow; birch; hazel	12	EM	4.3	-
G64	Alder; ash; hawthorn	10	EM	4.1	-
G65	Oak; hazel; hawthorn; goat willow	05-Jun	EM	7.2	-
G67	Oak; alder	11	EM	7.6	-
G68	Alder; blackthorn	12	EM	4.2	-
G69	Alder; hazel; goat willow	12	EM	5.6	-
G70	Alder; hawthorn; blackthorn; goat willow	12	EM	5.3	-
G71	Alder; goat willow; hazel; ash	11	EM	3	-
G72	Alder; hawthorn; goat willow	11	EM	4.3	-
G73	Alder; hawthorn; goat willow	11	EM	3.9	-
G74	Alder; hazel; goat willow	12	EM	5.5	-
G75	Alder; sycamore	11	EM	4.3	-
G76	Oak; lime	10	EM	3.1	-
G77	Oak; lime	11	EM	5.5	-
G78	Oak; birch	10	EM	5.3	-
G79	Oak; ash	11	EM	4.2	-
G80	Alder; goat willow; oak; hazel	11	EM	5.4	-
G81	Alder; hazel; hawthorn	11	EM	4.8	-
G82	Goat willow; oak	10	EM	4.5	-
G83	Elm; blackthorn; elder	15	SM	4.5	-
G84	Elder; ash	7.5	Y	1.8	-
G85	Apple	6	EM	2.3	-
G86	Sycamore	13	EM	6.6	-
G87	Cherry	9	EM	4.5	-
G88	Cherry	6.5	EM	3.6	-
G89	Norway maple	7	SM	2.6	-
G90	Hawthorn; oak; gorse.	4.5	SM	1	-
G91	Norway maple	8	SM	2.6	-
G92	Alder	14	EM	4.4	-
G93	Alder; hazel; hawthorn; holly; oak	10	EM	3.6	-
G94	Holly; goat willow; hawthorn; alder	7	EM	2.8	-
G95	Corsican pine; oak; birch; holly; dogwood	10	SM	3.8	-
G96	Alder	9	SM	2.6	-
G97	Goat willow; oak; hazel; birch.	8	M	4.4	-
G98	Oak; goat willow	7	EM	2.4	-
G99	Goat willow; alder; oak	4	Y	1	-
G100	Leylandii; white poplar.	6	EM	2.4	-
G101	Hazel; alder; hawthorn; oak	4	EM	3.2	-
G102	Oak; alder	12	M	6	-
G103	Goat willow	4	SM	1.5	-
G104	Goat willow; alder; oak; hawthorn; holly; gorse	10	SM	4.1	-
G105	Oak; alder; birch; holly; gorse; hawthorn; white willow; goat willow; hazel	14	EM	5.8	-
G106	Oak; alder; goat willow hawthorn; hazel; holly; birch	14	M	6	-
G107	Holly	7	SM	2.6	-
G108	Hazel; holly; sycamore ash	9	EM	5	-
G109	Hawthorn; bay	3.5	SM	1.3	-
G110	Hazel; goat willow; hawthorn; blackthorn; privet; elder; sycamore.	9	SM	2.4	-
G111	Goat willow	5	Y	1.1	-
G112	Oak	12	EM	4.4	-
G113	Ash	9	SM	2.4	-
H1	Cypress; oak; hawthorn; goat willow	14	EM	3	-
H2	Hawthorn; holly; hazel	1.5	EM	0.8	-
H3	Privet	2.5	EM	0.8	-
H4	Blackthorn; hazel; oak	4	EM	0.8	-
H5	Hazel; oak	3.5	EM	1.8	-
H6	Oak; goat willow; hawthorn; hazel	3.5	EM	0.8	-
H7	Oak; goat willow; alder	5	EM	0.8	-
H8	Goat willow; birch; hazel; oak; hawthorn; holly	2	EM	0.6	-
H9	Goat willow; birch; hazel; oak; blackthorn; hawthorn; holly	3.5	EM	1.1	-
H10	Ash; blackthorn; hazel; hawthorn; birch	8	EM	3.1	-
H11	Blackthorn; hawthorn	2	EM	0.6	-
H12	Blackthorn; hawthorn	1.5	EM	0.6	-
H13	Blackthorn; hawthorn; hazel; oak; goat willow; gorse	2.5	M	1.3	-
H14	Hazel; holly; hawthorn; blackthorn	3	M	0.8	-
H15	Hazel; holly; crab apple; oak; hawthorn; blackthorn; goat willow	3.5	M	1.8	-
H16	Oak; holly; gorse; hazel; hawthorn; birch; goat willow	2.5	EM	1.8	-
H17	Oak; holly; hawthorn	6.5	EM	3.2	-
H18	Oak; goat willow; hazel; holly; hawthorn	4	EM	3	-
H19	Goat willow; blackthorn	1.5	SM	0.6	-
H20	Goat willow	2	Y	0	-
H21	Goat willow; blackthorn; alder	2	Y	0.6	-
H22	Goat willow; gorse; hawthorn	2.5	Y	0.6	-
H23	Gorse; oak; goat willow	1.5	Y	0	-
H24	Goat willow	1.5	Y	0	-
H25	Oak; birch; goat willow; hazel	8	EM	3.2	-
H26	Oak; birch; hazel; hawthorn; goat willow; gorse	7	EM	4.5	-
H27	Oak; goat willow	7	EM	4.1	-
H28	Oak; birch; hazel; holly; hawthorn; goat willow; gorse	19	EM	4.7	-
H29	Hazel; holly; goat willow; birch; oak; hawthorn	6	EM	2.3	-
H30	Hazel; elder	3	EM	0.6	-
H31	Hazel; hawthorn; blackthorn; oak	3.5	EM	1	-
H32	Alder; willow	3	EM	0.8	-
H33	Alder; willow; ash; sycamore	3.5	EM	0.8	-
H34	Willow	3	EM	0.8	-
H35	Willow	3	EM	0.8	-
H36	Hazel; hawthorn; blackthorn	3.5	EM	1	-
H37	Hawthorn; hazel; holly	3	EM	1	-
H38	Hawthorn; hazel	2	EM	0.8	-
H39	Hawthorn; hazel; alder; oak; goat willow	2	EM	0.8	-
H40	Goat willow	2.5	EM	0.8	-
H41	Blackthorn	2	EM	0.6	-
H42	Hazel	2.5	EM	0.8	-
H43	Alder; willow; hazel; hawthorn; blackthorn	3	EM	2	-
H44	Blackthorn; birch; hazel; willow	2.5	EM	0.8	-
H45	Oak; ash; field maple; blackthorn; hawthorn; hazel; goat willow;	2	EM	1.3	-
H46	Hazel; hawthorn; willow	2.5	EM	0.6	-
H47	Blackthorn; hazel; oak; hawthorn; holly	2	EM	1	-
H48	Holly; elder; hazel; goat willow	2	EM	1	-
H49	Hawthorn; oak; holly; hazel; ash; elder	2	EM	1	-
H50	Hawthorn; blackthorn; oak; holly; gorse; goat willow; field maple	2	EM	1	-
H51	Hawthorn	2	EM	1	-
H52	Hawthorn; hazel; field maple	2	EM	1	-
H53	Hawthorn; hazel; field maple; blackthorn; elder; holly	2	EM	1	-
H54	Oak; ash; field maple; blackthorn; hawthorn; hazel; goat willow;	2.5	EM	1.8	-
H55	Blackthorn	3	EM	0.6	-
H56	Hawthorn; dogwood; oak; holly; elder	4.5	SM	1.6	-
H57	Rose hips	1.5	EM	0	-
H58	Hazel; hawthorn; ash	3	EM	2	-
H59	Hawthorn; elder; oak	2.5	M	1.3	-
H60	Hawthorn; elder; gorse; oak	4	EM	1.1	-
H61	Hawthorn; dogwood	1	SM	0.8	-
H62	Hawthorn; elder; gorse; oak	2.5	EM	1.1	-
H63	Hawthorn	3.5	SM	1.1	-
H64	Holly; lonicera; hawthorn privet.	2	SM	1.1	-
H65	Cypress	7	SM	2.4	-
H66	Cypress	3	SM	1.5	-
H67	Privet; hazel; hawthorn; holly.	1.5	SM	1	-
H68	Hawthorn; oak; holly; gorse; cotoneaster.	5	EM	1.8	-



TRR&P - 'Section 3'

KEY

- Category A Tree - High quality (Retention highly desirable)
- Category A - Hedgerow, Group, Woodland - High quality (Retention highly desirable)
- Category B Tree - Moderate quality (Retention desirable)
- Category B - Hedgerow, Group, Woodland - Moderate quality (Retention desirable)
- Category C Tree - Low quality (May be retained but should not constrain development)
- Category C - Hedgerow, Group, Woodland - Low quality (May be retained but should not constrain development)
- Category U Tree - Very low quality (Mostly unsuitable for retention)
- Category U - Hedgerow, Group, Woodland - Very low quality (Mostly unsuitable for retention)
- Root Protection Area (RPA) - Layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and soil volume to maintain the tree's viability
- Shrub mass/offsite tree/out of scope (OOS)

Ancient Tree / Woodland or Veteran Trees

- Ancient tree/woodland or Veteran tree: Important trees that require special consideration
- Ancient tree/woodland or Veteran tree buffer: As per published standing advice from Natural England and the Forestry Commission
- Tree / Hedgerow / Group to be removed

Protection Measures

- Tree Protection Barrier installed according the the specification of Figure 3 of BS5837: 2012.

N
GRID NORTH

Meters

CONSTRUCTION EXCLUSION ZONE - NO ENTRY

TREE PROTECTION FENCING

THIS FENCE MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED TREE PROTECTION PLANS AND ARBORICULTURAL METHOD STATEMENT FOR THIS DEVELOPMENT.

TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A TREE PRESERVATION ORDER. CONTRAVENTION CAN RESULT IN BREACH OF PLANNING CONDITIONS AND/OR CRIMINAL PROSECUTION. (TOWN AND COUNTRY PLANNING ACT 1990)

FOR ALL ENQUIRES REGARDING TREES AT THIS DEVELOPMENT PLEASE CALL 01386 576161 OR EMAIL ENQUIRIES@BARTON-HYETT.CO.UK

Barton Hyett Associates Arboricultural Consultants

Note: The original of this drawing was produced in colour – a monochrome copy should not be relied upon. This drawing should be interpreted with reference to the accompanying tree schedule and written advice

PROJECT TITLE

Parc Solar Caenewydd, Swansea

DRAWING TITLE

Tree Retention/Removal & Protection Plan

SCALE			DRAWING NUMBER	
1:2000 @ A1			BHA_4439_02	
DRAWN BY	APPROVED BY	REVISION	SHEET	DATE
AD	DH	B	2/2	09/10/2023

LAYOUT USED WITHIN DRAWING **Pre-app formal consultation layout - 29.09.23**

CLIENT **Low Carbon Alliance**

COORDINATE SYSTEM / DATUM **British National Grid / Newlyn Datum (AOD)**

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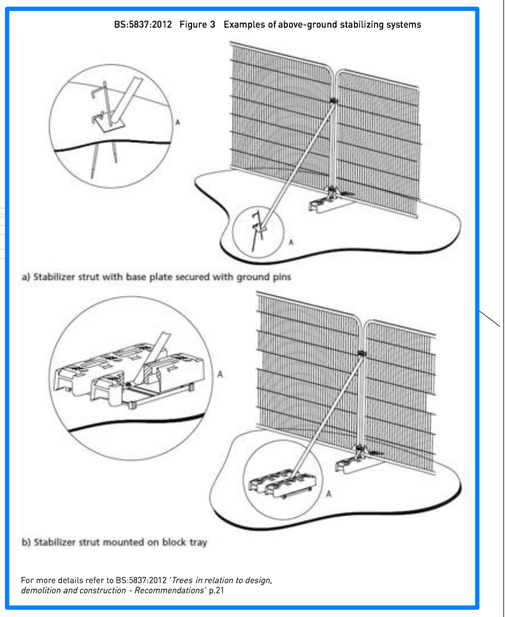

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N
GRID NORTH

0 10 20 30 40 50
Meters

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Parc Solar Caenewydd, Swansea

DRAWING TITLE
Tree Retention/Removal & Protection Plan

SCALE		DRAWING NUMBER
1:2000	@ A1	BHA_4439_02

DRAWN BY	APPROVED BY	REVISION	SHEET	DATE
AD	DH	B	3/3	04/04/2023

LAYOUT USED WITHIN DRAWING **Pre-app Formal Consultation Layout - 29.09.23**

CLIENT **Low Carbon Alliance**

COORDINATE SYSTEM / DATUM **British National Grid / Newlyn Datum (AOD)**

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Address: Suite 5E, Deer Park Hall Business Centre, Eckington, Pershore, WR10 3DN

BS5837:2012 TREE SURVEY SCHEDULE

PARC SOLAR CAENEWYDD

PROJECT NO: 4439

SURVEYOR: DH/LF

CLIENT: TAIYO POWER AND STORAGE LTD

SURVEY DATE: 6-7-8/12/2021

Barton Hyett
Arboricultural Consultants

INDIVIDUAL TREES

Ref	Species	On/off site	Top Height (m)	No. of Stems	Est diam?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. low crown height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²	TPO?
T1	Willow (Goat)	On	5	7	Yes	400	3-3-3-2	n/a	n/a	n/a	SM	None	Typical for species	Fair	Fair	10+	C1	4.8	72	-
T2	Ash (Common)	Off	4.5	2	Yes	220	2-2-2-1	1.0	0	S	Y	None	Self seeded on boundary	Fair	Fair	10+	C1	2.6	22	-
T3	Ash (Common)	On	8	1	Yes	400	5-5-6-5	4.0	1	S	EM	None	Short extension growth throughout crown - possible Inonotus hispidus; ivy cover to main stem & scaffold limb; minor storm damage to lower crown @ 2.5m	Fair	Fair	20+	B1	4.8	72	-
T4	Oak (English)	On	12	1	-	370	5-5-5-4	3.0	2	S	EM	None	Typical for species	Fair	Fair	20+	B1	4.4	62	-
T5	Oak (English)	On	9	1	-	450	5-5-4-5	3.5	3.5	W	EM	None	Typical for species; holly growing within root plate	Fair	Fair	20+	B1	5.4	92	-
T6	Oak (English)	On	9	1	-	400	5-7-6-4	3.0	3.5	S	EM	None	Typical for species	Fair	Fair	20+	B1	4.8	72	-
T7	Oak (English)	On	8	4	Yes	560	5-6-5-3	0.3	n/a	n/a	EM	None	Typical for species	Good	Fair	20+	B1	6.7	142	-
T8	Oak (English)	On	11	1	-	820	6-7-8-5	1.5	2	S	M	None	Typical for species; water logged ground	Good	Fair	20+	B1	9.8	304	-
T9	Oak (English)	On	9	1	-	600	6-5-6-6	1.0	2.5	W	EM	None	Typical for species; water logged ground	Good	Fair	20+	B1	7.2	163	-
T10	Oak (English)	On	8	1	-	510	5-6-5-5	1.5	2.5	N	EM	None	Typical for species; water logged ground	Good	Fair	20+	B1	6.1	118	-
T11	Oak (English)	On	8	1	-	570	4-3-3-3	2.5	2.5	N	EM	None	Dead standing tree; good habitat	Poor	Fair	10+	C1	6.8	147	-
T12	Oak (English)	On	10	2	Yes	780	8-6-7-7	1.5	0.25	N	M	None	Typical for species; on adjacent site	Good	Fair	20+	B1	9.4	275	-
T13	Oak (English)	On	11	1	Yes	700	6-8-6-4	1.5	n/a	n/a	M	None	Windswept form to east; main stem & scaffold limbs heavily swathed in ivy	Good	Fair	20+	B1	8.4	222	-
T14	Willow (Goat)	On	5	3	-	430	3-3-3-2	n/a	n/a	n/a	EM	None	Typical for species	Good	Fair	20+	B1	5.2	84	-
T15	Willow (Goat)	On	5	6	-	340	2-3-3-2	n/a	n/a	n/a	EM	None	Typical for species	Good	Fair	20+	B1	4.1	52	-
T16	Alder (Common)	On	10	2	-	460	2-5-5-4	1.5	1.5	S	EM	None	Typical for species	Good	Fair	20+	B1	5.5	96	-

BS5837:2012 TREE SURVEY SCHEDULE

PARC SOLAR CAENEWYDD

PROJECT NO: 4439

SURVEYOR: DH/LF

CLIENT: TAIYO POWER AND STORAGE LTD

SURVEY DATE: 6-7-8/12/2021

Barton Hyett Arboricultural Consultants

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T17	Alder (Common)	On	10	1	-	370	2-4-3-3	1.5	1.5	NE	EM	None	Typical for species	Good	Fair	20+	B1	4.4	62	-
T18	Alder (Common)	On	11	1	Yes	400	2-1-2-2	n/a	n/a	n/a	EM	None	Heavily swathed in ivy	Fair	Fair	10+	C1	4.8	72	-
T19	Willow (Goat)	On	12	3	Yes	490	3-3-3-3	1.5	n/a	n/a	EM	None	Typical for species	Good	Fair	20+	B1	5.9	109	-
T20	Willow (Goat)	On	12	1	Yes	350	3-3-2-3	1.5	n/a	n/a	EM	None	Typical for species	Good	Fair	20+	B1	4.2	55	-
T21	Oak (English)	On	8	1	-	360	2-5-6-5	1.5	1.5	W	EM	None	Crown flailed to north to clear hedge	Good	Fair	20+	B1	4.3	59	-
T22	Oak (English)	On	10	1	-	480	6-6-6-4	1.5	2.5	SW	EM	None	Typical for species	Good	Fair	20+	B1	5.8	104	-
T23	Oak (English)	On	12	1	-	660	6-6-5-5	1.5	2.5	SE	EM	None	Typical for species	Good	Fair	20+	B1	7.9	197	-
T24	Oak (English)	On	7	1	Yes	450	4-5-5-4	1.5	1	S	EM	None	Heavily swathed in ivy; directly beneath 275kv overhead power lines	Good	Fair	20+	B1	5.4	92	-
T25	Oak (English)	On	10	1	Yes	550	6-6-6-6	3	2.5	N	EM	None	Broken stems to lower crown leaving pegs	Good	Fair	20+	B1	6.6	137	-
T26	Oak (English)	On	8	2	-	580	3-4-5-7	4	0.5	W	EM	None	Horizontal stem has hazard beam fracture and wildlife value.	Good	Good	40+	B1	7	152	-
T27	Oak (English)	On	8	1	-	460	1-4-3-5	2.5	2	W	EM	None	Side of tree to north has been flailed.	Good	Good	40+	B1	5.5	96	-
T28	Willow (Goat)	Off	6	6	Yes	1100	5-5-5-5	1.5	n/a	n/a	EM	None	Offsite within treatment works	Good	Fair	20+	B1	13.2	547	-
T29	Hawthorn	On	4.5	5	Yes	170	2-1-2-2	1	n/a	n/a	SM	None	Growing amongst fence.	Good	Fair	10+	C1	2	13	-
T30	Alder (Common)	On	11	4	Yes	600	7-6-6-6	3	2	N	M	None	Styrene but squat tree. Ivy covering scaffold limbs.	Good	Good	40+	B1	7.2	163	
T31	Hawthorn	On	3	2	-	140	2-2-2-2	1	n/a	n/a	SM	None	Typical for species.	Good	Good	40+	C1	1.7	9	
T32	Willow (Goat)	On	6	1	Yes	150	1-1-1-2	1	n/a	n/a	Y	None	Self seeded to rear of barn	Fair	Fair	10+	C1	1.8	10	
T33	Cypress (Lawson)	On	7	1	-	390	2-2-3-2	1.5	n/a	n/a	EM	None	Within garden to rear of dwelling	Good	Fair	10+	C1	4.7	69	
T34	Pear	On	9	1	None	490	5-4-4-3	1.5	2.5	E	M	None	Within garden to rear of dwelling; girdled by washing line	Good	Fair	20+	B1	5.9	109	
T35	Larch (Common)	On	8	1	-	270	2-2-1-5	1.5	1.5	W	EM	None	Within garden to rear of dwelling; girdled by washing line	Good	Fair	20+	B1	3.2	33	-

BS5837:2012 TREE SURVEY SCHEDULE

PARC SOLAR CAENEWYDD

PROJECT NO: 4439

SURVEYOR: DH/LF

CLIENT: TAIYO POWER AND STORAGE LTD

SURVEY DATE: 6-7-8/12/2021

Barton Hyett
Arboricultural Consultants

Ref	Species	On/off site	Top Height (m)	No. of Stems	Est diam?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. low crown height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²	TPO?
T36	Hawthorn	On	6	7	-	400	3-3-3-3	0.25	n/a	n/a	M	None	Within garden to rear of dwelling; remnant part of old hedge	Good	Fair	20+	B1	4.8	72	-
T37	Elder	On	2	10	-	320	1-1-1-1	n/a	n/a	n/a	SM	None	Typical for species	Fair	Fair	10+	C1	3.8	46	-
T38	Aspen	On	9	1	-	390	4-7-6-4	1.5	2	N	EM	None	Typical for species	Good	Fair	20+	B1	4.7	69	-
T39	Oak (English)	On	2.5	1	Yes	300	5-0-4-1	0	0.5	S	EM	None	Flailed on sides and top	Fair	Good	20+	B1	3.6	41	-
T40	Cherry (Wild)	On	6.5	1	Yes	280	5-5-2-3	4	1.5	W	EM	None	Typical for species	Good	Good	20+	B1	3.3	35	-
T41	Oak (English)	Off	7	1	Yes	250	3-4-2-2	3	2	W	SM	None	Typical for species. Probably maintained by highways.	Good	Good	40+	B1	3	28	-
T42	Elm (English)	Off	10	3	-	470	5-5-4-2	6	4	S	EM	None	Large healthy specimen for species. Crown lifted and cut back from neighbouring property.	Good	Good	10+	B1	5.6	100	-
T43	Willow (Crack)	On	9	1	Yes	400	7-6-4-4	3	2	S	EM	None	Typical for species	Good	Good	20+	B1	4.8	72	-
T44	Oak (English)	Off	7	1	Yes	280	3-3-2-2	3	3	NE	SM	None	Previously poorly pruned from property.	Fair	Good	40+	B1	3.3	35	-
T45	Chestnut (Horse)	Off	10	1	Yes	380	3-2-3-3	3	3	SE	EM	None	Topped at 7 m.	Good	Fair	20+	C1	4.5	65	-
T46	Elm (English)	On	16	2	None-	80	7-74-5-5	5	3	W	EM	None	Large old specimen for species. Balanced crown and nice form no sign of elm bark beetle.	Good	Good	20+	A1	1	3	-
T47	Ash (Common)	On	14	2	Yes	710	6-7-7-6	4.5	5	NW	EM	None	Heavily swathed in ivy	Good	Fair	20+	B1	8.5	228	-
T48	Oak (English)	On	12	1	-	630	6-7-6-6	1.5	2.5	W	EM	None	Lower stem swathed in ivy	Good	Fair	20+	B1	7.6	180	-
T49	Sycamore	On	14.0	1	Yes	550	6.0-5.0-6.0-5.5	1.5	0.0	NW	M	None	Growing from embankment directly 2m south of bridge; loss of main leader; crown overhangs bridge by approx. 1.5m with 2m of headroom	Good	Fair	20+	B1	6.6	137	-
T50	Hawthorn	On	9.0	2	Yes	340	3.0-2.0-5.0-5.0	2.5	0.0	S	M	None	Growing from embankment directly south of bridge; crown overhangs bridge by approx. 2m with 2.5m of headroom	Fair	Fair	20+	B1	4.1	52	-

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Barton Hyett
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Ref	Species	On/off site	Top Height (m)	No. of Stems	Est diam?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. low crown height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²	TPO?
T51	Sycamore	On	16.0	3	Yes	870	7.0-7.0-7.0-7.0	2.0	0.0	-	M	None	3x stems grown closely forming a cohesive & wide spreading crown; 2x stems to east showing basal bark damage with hollowing & decay	Good	Fair	10+	C1	10.4	342	-
T52	Oak (English)	On	14.0	1	None	630	7.0-7.0-6.0-7.0	1.5	2.0	E	M	None	Growing to south embankment of old tramway; loss of main leader resulting in low spreading crown	Good	Fair	40+	B1	7.6	180	-
T53	Sycamore	Off	14.0	1	Yes	500	3.0-5.0-4.0-3.0	1.5	1.0	S	EM	None	Growing from offsite embankment; heavily cut back for clearance above gateway	Good	Fair	20+	B1	6.0	113	-
T54	Ash (Common)	Off	12.0	2	Yes	500	5.0-5.0-6.0-6.0	1.5	0.0	N	EM	None	Growing from offsite embankment	Good	Fair	20+	B1	6.0	113	-
T55	Oak (English)	On	16.0	3	None	940	8.0-8.0-7.0-7.0	2.0	0.0	-	M	None	Growing from embankment of old boundary; 3x close grown stems forming a cohesive crown; 1st stem dia. est. @0.5m	Good	Fair	40+	A1	11.3	400	-
T56	Alder (Common)	On	16.0	3	None	780	7.0-5.0-8.0-5.0	2.0	0.0	-	M	None	3x close grown stems forming a cohesive crown	Good	Fair	20+	B1	9.4	275	-
T57	Oak (English)	On	15.0	1	Yes	700	7.0-6.0-8.0-6.0	2.0	3.0	N	M	None	Growing from embankment of old boundary; loss of main leader from 3m resulting in 3x scaffold limbs which form a cohesive crown	Good	Fair	40+	B1	8.4	222	
T58	Willow (Goat)	On	14.0	3	Yes	690	7.0-6.0-6.0-6.0	2.0	0.0	-	M	None	Typical for age & species	Good	Fair	20+	B1	8.3	215	
T59	Willow (Goat)	On	8.0	2	Yes	250	4.0-4.0-4.0-4.0	0.5	0.0	-	SM	None	Typical for age & species	Good	Fair	10+	C1	3.0	28	
T60	Oak (English)	Off	16.0	1	None	750	8.0-9.0-8.0-7.0	1.5	3.0	N	M	None	Growing on off-site embankment; non-progressive lean to east	Good	Fair	40+	A1	9.0	254	
T61	Ash (Common)	Off	16.0	2	None	790	6.0-8.0-8.0-8.0	1.5	0.0	-	M	None	Growing on off-site embankment; lower stem swathed in ivy	Fair	Fair	20+	B1	9.5	282	

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T62	Ash (Common)	Off	19.0	1	None	1000	10.0-9.0-9.0-9.0	2.0	5.5	N	M	None	Growing on off-site embankment; lower stem swathed in ivy; northern section of crown overhangs site by approx. 10m with headroom of 2 - 2.5m; pruning rounds to north @5m leaving peg; small to moderate deadwood throughout crown	Good	Fair	20+	B1	12.0	452	

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Barton Hyett Arboricultural Consultants

GROUPS OF TREES

Ref	Species	On/off site	Height range (m)	No. of trees	Est diam?	Max stem diam (mm)	Av. Crown radius (m)	Avg. low crown height (m)	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	TPO?
G1	Oak; birch; holly; gorse; hazel; hawthorn; goat willow	On	3-10	70	Yes	550	4.5	2.5	EM	None	Predominately oak with other species occurring as understory; water course running southwards through group	Good	Fair	40+	B2	6.6	-
G2	Oak; goat willow; holly; hazel; hawthorn	On	3-12	60	-	620	5	2.5	M	None	Predominately mature oak with other species occurring as early mature understory; drainage ditch running through group; 275kv power lines pass over group; adjacent to highway	Good	Fair	20+	B2	7.4	-
G3	Goat willow; oak; blackthorn; holly; hazel; birch; hawthorn	On	3-0	50	-	300	4	1.5	EM	None	Outgrown hedge on boundary	Good	Fair	20+	B2	3.6	-
G4	Goat willow; oak; hazel; honeysuckle; holly; hawthorn	On	3-6	40	-	180	2.5	1	SM	None	Outgrown hedge on boundary; predominantly willow; 275kv power lines pass over group	Fair	Fair	20+	C2	2.2	-
G5	Goat willow	On	2.5	8	-	130	1	0.25	Y	None	Sporadic self seeded willow within bramble hedge	Fair	Fair	10+	C2	1.6	-
G6	Birch; goat willow; hawthorn; oak; gorse; hazel	On	3-12	40	Yes	400	4	3	EM	None	Predominately birch & willow; on disused railway banking	Good	Fair	20+	B2	4.8	-
G7	Oak	On	14	4	-	580	5.5	4	EM	None	Ivy to main stems	Good	Fair	20+	B2	7	-
G8	Oak; goat willow; holly; hazel; hawthorn	On	3-8	70	-	500	4	2.5	EM	None	Predominately oak & willow with other species occurring as understory; drainage ditch running through group; adjacent to highway	Good	Fair	20+	B2	6	-
G9	Ash; goat willow; hawthorn; horse chestnut	Off	5	11	Yes	320	2.5	1.5	SM	None	Offsite group	Fair	Fair	10+	C2	3.8	-
G10	Oak; walnut; goat willow; yew	Off	5-14	20	Yes	470	5	3	EM	None	Offsite group	Good	Fair	20+	B2	5.6	-
G11	Hawthorn	On	2	2	-	80	1	0	Y	None	Sporadic self seeded thorn within bramble hedge	Fair	Fair	10+	C2	1	-
G12	Oak; gorse; alder	On	2	6	-	50	1	0	Y	None	Sporadic self seeded young trees within bramble hedge; gorse self seeding to south & colonising access track	Fair	Fair	10+	C2	0.6	-
G13	Alder; oak; goat willow; birch; hawthorn	On	3-6	30	-	200	2.5	1	SM	None	Outgrown hedge on boundary; predominantly willow; 275kv power lines pass to north of group	Fair	Fair	20+	B2	2.4	-

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Ref	Species	On/off site	Height range (m)	No. of trees	Est diam?	Max stem diam (mm)	Av. Crown radius (m)	Avg. low crown height (m)	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	TPO?
G14	Alder; oak; goat willow; birch; hawthorn; holly; gorse; elder	On	3-6	30	-	200	2.5	1	SM	None	Outgrown hedge on boundary; predominantly willow; 275kv power lines pass to south of group; failed willow stems to west in field	Fair	Fair	20+	B2	2.4	-
G15	Hawthorn; hazel; gorse; goat willow; oak	On	5	12	-	180	2.5	0.5	SM	None	Sporadic self seeded in-field group	Good	Fair	10+	C2	2.2	-
G16	Ash; elder; holly; hazel; oak; hawthorn; goat willow; privet; dogrose	On	3-6	50	-	220	2.5	1	SM	None	Outgrown hedge on boundary; predominantly willow; ash stems failed westwards into field	Fair	Fair	20+	B2	2.6	-
G17	Ash; oak; holly; hawthorn	Off	10	12	Yes	500	5.5	2.5	EM	None	Offsite group	Good	Fair	20+	B2	6	-
G18	Oak; birch; hazel; hawthorn; goat willow	On	3-12	30	-	660	6	2	EM	None	Predominantly oak group around mound; storm damage to trees at north of group	Good	Fair	20+	B2	7.9	-
G19	Birch; ash; hawthorn; holly; oak; goat willow	On	2-8	20	-	260	2.5	1	SM	None	Sporadic outgrown hedge	Good	Fair	20+	B2	3.1	-
G20	Oak; hawthorn; goat willow; hazel	On	6	14	Yes	170	4	1	EM	None	Sporadic group	Good	Fair	20+	B2	2	-
G21	Oak; hazel; holly; goat willow; birch	On	3-12	80	-	580	4	1	M	None	Mature oak with other species occurring as early mature understory; drainage ditch running through group; adjacent to highway	Good	Fair	20+	B2	7	-
G22	Oak; hazel; goat willow	On	13	17	Yes	530	6	2	EM	None	On banking with adjacent site; derelict fencing would suggest trees are on site	Good	Fair	20+	B2	6.4	-
G23	Goat willow	On	3	40	-	50	1	0	Y	None	Sporadic self seeded thicket; choked with brambles to north	Fair	Fair	10+	C2	0.6	-
G24	Alder; birch; oak; goat willow	On	10	12	Yes	390	4	3	EM	None	Boundary group	Good	Fair	20+	B2	4.7	-
G25	Goat willow; birch; hazel; oak; alder; hawthorn; holly	On	4.5	35	Yes	110	2	0	Y	None	Flailed in past; JKW within group	Fair	Fair	10+	C2	1.3	-
G26	Elder; goat willow; hawthorn	On	7	5	Yes	410	3	1.5	EM	None	On banking with adjacent site; derelict fencing would suggest trees are on site; storm damage throughout	Good	Fair	20+	C2	4.9	-
G27	Oak; goat willow; birch; holly	On	5-10	6	Yes	480	4	4	EM	None	Group within hedge	Good	Fair	20+	B2	5.8	-
G28	Ash	On	14	5	-	560	8	4	M	None	Group within hedge	Good	Fair	20+	B2	6.7	-
G29	Hawthorn oak	On	4	2	Yes	200	2.5	2	Y	None	At edge of footpath kissing gate	Good	Fair	10+	C2	2.4	-
G30	Elm	On	13	6	-	470	4.5	3.5	SM	None	Stand of trees adjacent to farm entrance	Good	Good	20+	B2	5.6	-

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G31	Elm	On	11	7	-	450	4	3	SM	None	Stand of trees adjacent to pond & pole mounted electrical transformer; 1x stem topped possibly for previous overhead cable run	Good	Fair	20+	B2	5.4	-
G32	Oak	On	9	2	-	310	3.5	2	SM	None	Typical for species	Good	Fair	20+	B2	3.7	-
G33	Goat willow; oak; birch; holly; hazel; alder; elder	On	3-16	150	-	630	5.5	1	M	Ancient Woodland	Predominantly oak & birch; established around old workings; JKW to north of group; badger sett within approx centre of group; limited understory	Good	Fair	40+	B2	7.6	-
G34	Goat willow	On	4.5	8	-	90	2	0	SM	Ancient Woodland	Self seeded regrowth beneath line clearance	Good	Fair	10+	C2	1.1	-
G35	Goat willow; oak; birch; holly; hazel; alder; elder	On	3-16	80	-	650	5.5	1	M	Ancient Woodland	Predominantly oak & birch; established around old workings; spoil tipped to north west corner raising ground levels	Good	Fair	40+	B2	7.8	-
G36	Oak; birch	On	8-12	2	-	560	6	0.25	EM	None	Birch mildly suppressed by oak	Good	Fair	20+	B2	6.7	-
G37	Oak; birch; rowan; hawthorn	On	3-12	11	-	410	4.5	1	EM	None	Adjacent to drainage ditch	Good	Fair	20+	B2	4.9	-
G38	Oak; birch; hawthorn; goat willow	On	3-13	10	Yes	500	5.5	1	EM	None	Adjacent to highway; most significant trees are 1x birch & 1x oak to east east of group	Good	Fair	20+	B2	6	-
G39	Oak	On	10	2	-	570	5.5	2	EM	None	Water logged ground	Good	Fair	20+	B2	6.8	-
G40	Birch; oak; hazel; holly; gorse	On	3-10	12	-	540	5	1	EM	None	Predominantly oak & birch; established around old workings; small pond formed to south of group close to footpath	Good	Fair	20+	B2	6.5	-
G41	Oak; birch; goat willow; holly; hawthorn	On	4-10	25	-	620	4.5	3.5	EM	None	4x oak & 2x birch (early mature); understory formed of willow birch & holly which is maintained by flail; appears to be remnant of hedge	Good	Fair	20+	B2	7.4	-
G42	Oak; birch; ash	On	12	17	-	610	5.5	1	EM	None	Predominantly birch; water logged ground	Good	Fair	20+	B2	7.3	-
G43	Oak; birch; ash; alder; hazel; gorse; holly	On	2-12	70	-	580	6	1	EM	Ancient Woodland	Established around old workings	Good	Fair	20+	B2	7	-
G44	Hazel; oak	On	6	7	-	210	4.5	1	EM	None	6x hazel & 1x oak; spoil heaped around stems	Good	Fair	20+	B2	2.5	-
G45	Oak; birch; hazel; blackthorn; hawthorn; gorse; rowan; holly	On	2-11	50	-	620	4	1	EM	None	Watercourse runs through group	Good	Fair	20+	B2	7.4	-

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G46	Oak; goat willow; hawthorn; gorse; hazel; birch	Off	12	250	Yes	550	6	1	EM	None	On adjacent site behind palisade fence	Good	Fair	40+	B2	6.6	-
G47	Alder; hazel; oak; gorse; holly; hawthorn	Off	2-12	100	Yes	550	4.5	1	EM	None	Watercourse runs through group	Good	Fair	20+	B2	6.6	YES
G48	Oak; birch; hawthorn	On	2-14	40	-	690	4.5	1	EM	None	Oak with birch; thorn occurs as understory/ neglected hedge	Good	Fair	20+	B2	8.3	-
G49	Alder; goat willow; holly; ash; hawthorn; hazel	On	4-12	40	-	410	5	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	4.9	-
G50	Alder; hazel; ash; sycamore	On	4-12	40	-	390	4.5	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	4.7	-
G51	Alder; hawthorn	On	4-10	40	-	420	4.5	1	EM	None	Adjacent to watercourse; compartment contains young self seeded trees to the south west corner	Good	Fair	20+	B2	5	-
G52	Oak; alder; hazel; holly; hawthorn; goat willow	On	2-12	60	-	780	5.5	1	M	None	Established around old workings & disused railway; watercourse runs through group	Good	Fair	20+	A2	9.4	-
G53	Hazel	On	3.5	20	-	80	1	0	SM	None	Self seeded regrowth beneath line clearance	Good	Fair	10+	C2	1	-
G54	Alder; oak; ash; hazel; elder	Off	4-12	40	Yes	400	4	1	EM	None	Adjacent to watercourse; to rear of dwellings	Good	Fair	20+	B2	4.8	-
G55	Alder; ash; hawthorn; goat willow	On	8	7	-	240	2.5	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	2.9	-
G56	Alder; goat willow; gorse	On	5	12	Yes	90	1	0	Y	None	Self seeded trees around drain; heavily choked by brambles	Good	Fair	10+	C2	1.1	-
G57	Alder; hawthorn	On	10	11	-	290	3.5	1	EM	None	Adjacent to watercourse; 1x dead stem to east	Good	Fair	20+	B2	3.5	-
G58	Alder	On	10	2	Yes	408	3	1	EM	None	Adjacent to watercourse; both trees in decline	Fair	Fair	10+	C2	4.9	-
G59	Alder; ash; hawthorn; goat willow	On	10	6	-	310	3.5	1	EM	None	Adjacent to watercourse; ash showing signs in crown of dieback	Good	Fair	20+	B2	3.7	-
G60	Alder; hawthorn	On	12	15	-	360	3.5	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	4.3	-
G61	Alder; sycamore; goat willow; birch; hawthorn	On	12	20	-	340	4	1	EM	None	Adjacent to watercourse; 1x multi stemmed willow & 1x alder (from opposite bank) has failed southwards into field	Good	Fair	20+	B2	4.1	-
G62	Alder; ash; hazel; goat willow; hawthorn	On	1	20	-	350	4	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	4.2	-
G63	Alder; hawthorn; goat willow; birch; hazel	On	12	25	-	360	4	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	4.3	-

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Ref	Species	On/off site	Height range (m)	No. of trees	Est diam?	Max stem diam (mm)	Av. Crown radius (m)	Avg. low crown height (m)	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	TPO?
G64	Alder; ash; hawthorn	On	10	12	-	340	4.5	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	4.1	-
G65	Oak; hazel; hawthorn; goat willow	On	05-Jun	10	-	600	3.5	1	EM	None	3x early mature oak with have been reduced to clear 275kv overhead power lines; all other species occur as understory/neglected hedge	Good	Fair	20+	B2	7.2	-
G66	Oak	On	10	3	-	610	6	1.5	EM	None	Typical for species	Good	Fair	20+	B2	7.3	-
G67	Oak; alder	On	11	2	-	630	6	1.5	EM	None	Adjacent to boggy ground; small formed to south	Good	Fair	20+	B2	7.6	-
G68	Alder; blackthorn	On	12	6	-	350	4	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	4.2	-
G69	Alder; hazel; goat willow	On	12	25	-	470	4.5	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	5.6	-
G70	Alder; hawthorn; blackthorn; goat willow	On	12	12	-	440	4.5	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	5.3	-
G71	Alder; goat willow; hazel; ash	On	11	5	Yes	250	4	1	EM	None	Adjacent to watercourse; restricted access due to brambles	Good	Fair	20+	B2	3	-
G72	Alder; hawthorn; goat willow	On	11	7	-	360	4.5	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	4.3	-
G73	Alder; hawthorn; goat willow	On	11	4	-	330	4	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	3.9	-
G74	Alder; hazel; goat willow	On	12	15	-	460	4	1	EM	None	Adjacent to watercourse	Good	Fair	20+	B2	5.5	-
G75	Alder; sycamore	On	11	4	-	360	4	1	EM	None	Adjacent to watercourse; 2x dead alder stems	Good	Fair	20+	B2	4.3	-
G76	Oak; lime	On	10	2	-	260	3	1	EM	None	Pn entrenched bank between 2 drainage ditches	Good	Fair	20+	B2	3.1	-
G77	Oak; lime	On	11	2	-	460	5	1.5	EM	None	On entrenched bank between 2 drainage ditches	Good	Fair	20+	B2	5.5	-
G78	Oak; birch	On	10	7	-	440	5	1.5	EM	None	Sporadic group; on entrenched bank between 2 drainage ditches	Good	Fair	20+	B2	5.3	-
G79	Oak; ash	On	11	6	Yes	350	5	2	EM	None	Dieback within crowns of ash stems; if ash are removed the single oak would likely succumb to wind throw	Fair	Fair	10+	C2	4.2	-
G80	Alder; goat willow; oak; hazel	On	11	80	Yes	450	4	1	EM	None	Group established as screen for treatment works	Good	Fair	20+	B2	5.4	-
G81	Alder; hazel; hawthorn	Off	11	35	Yes	400	4	1	EM	None	Offsite group within treatment works	Good	Fair	20+	B2	4.8	-

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G82	Goat willow; oak	On	10	7	-	380	5	3	EM	None	One oak in group has uprooted.	Good	Good	40+	B2	4.5	-
G83	Elm; blackthorn; elder	On	15	25	-	380	3	2	SM	None	Elm make up the taller trees on bank with blackthorn and elder understory.	Good	Good	20+	B2	4.5	-
G84	Elder; ash	On	7.5	10	Yes	150	1	0	Y	None	Self seeded trees to rear of barn	Fair	Fair	10+	C2	1.8	-
G85	Apple	On	6	8	-	190	3	1.5	EM	None	Orchard to rear of dwelling	Good	Good	20+	B2	2.3	-
G86	Sycamore	On	13	2	Yes	550	4.5	1.5	EM	None	Within garden of dwelling	Good	Good	20+	B2	6.6	-
G87	Cherry	Off	9	2	Yes	380	3.5	3	EM	None	Probably maintained by highways.	Good	Good	20+	B1	4.5	-
G88	Cherry	Off	6.5	3	Yes	300	3	3	EM	None	Probably maintained by highways.	Good	Good	20+	B2	3.6	-
G89	Norway maple	On	7	5	Yes	220	3	3	SM	None	Row of trees planted along highway.	Good	Good	40+	B2	2.6	-
G90	Hawthorn; oak; gorse.	On	4.5	20	Yes	80	1.5	1	SM	None	Scrub like shrubs on bank to road	Good	Good	20+	B2	1	-
G91	Norway maple	On	8	5	Yes	220	3	3	SM	None	Row of trees planted along highway.	Good	Good	40+	B2	2.6	-
G92	Alder	On	14	4	Yes	370	4.5	3	EM	None	Typical for species.	Good	Good	20+	B2	4.4	-
G93	Alder; hazel; hawthorn; holly; oak	On	10	20	-	300	3	2	EM	None	Watercourse running through group.	Good	Good	40+	B2	3.6	-
G94	Holly; goat willow; hawthorn; alder	On	7	15	-	230	2	1	EM	None	Cluster of trees around watercourse.	Fair	Fair	20+	B2	2.8	-
G95	Corsican pine; oak; birch; holly; dogwood	On	10	27	Yes	320	4	2	SM	None	A row of trees planted along highway.	Good	Good	40+	B2	3.8	-
G96	Alder	On	9	3	Yes	220	2	3	SM	None	Typical for species	Good	Good	40+	B2	2.6	-
G97	Goat willow; oak; hazel; birch.	On	8	20	Yes	370	5	2	M	None	Larger willows with oak and hazel understory.	Good	Good	40+	B2	4.4	-
G98	Oak; goat willow	On	7	6	-	200	2.5	2	EM	None	Outside of boundary fence.	Good	Good	20+	B2	2.4	-
G99	Goat willow; alder; oak	On	4	12	-	80	1	1	Y	None	Scrubby trees and bramble growing amongst fence line.	Good	Fair	<10	C2	1	-
G100	Leylandii; white poplar.	Off	6	20	Yes	200	2.5	0.5	EM	None	Topped to give clearance to overhead cables.	Good	Good	10+	B2	2.4	-
G101	Hazel; alder; hawthorn; oak	On	4	15	-	270	2	2	EM	None	Flailed at 2 m.	Fair	Fair	20+	B2	3.2	-
G102	Oak; alder	On	12	2	Yes	500	4	2	M	None	Oak suppressing alder which has storm damage.	Good	Good	40+	B1	6	-

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G103	Goat willow	On	4	10	-	120	2	0.5	SM	None	Growing amongst and along side fence. Previously coppiced.	Fair	Fair	10+	C1	1.5	-
G104	Goat willow; alder; oak; hawthorn; holly; gorse	On	10	60	Yes	340	3	3	SM	None	Mixed group with water course partially running through. Semi maintained hawthorn hedge roadside.	Good	Good	40+	B2	4.1	-
G105	Oak; alder; birch; holly; gorse; hawthorn; white willow; goat willow; hazel	On	14	150	-	480	4	3	EM	Ancient Woodland	Field boundary trees with watercourse running through. Trees to south probably maintained by highways. Oak willow and oak make up larger trees with the other species as understory.	Good	Good	20+	B2	5.8	-
G106	Oak; alder; goat willow hawthorn; hazel; holly; birch	On	14	80	-	500	4.5	3	M	Ancient Woodland	Some larger oak and alder to east. Watercourse running through at top of group.	Good	Good	40+	A2	6	-
G107	Holly	On	7	6	Yes	220	2	1	SM	None	Typical for species	Good	Good	20+	B2	2.6	-
G108	Hazel; holly; sycamore ash	On	9	7	Yes	420	3	1	EM	None	Mix of on and off site trees. Ash tree topped.	Fair	Good	20+	B2	5	-
G109	Hawthorn; bay	On	3.5	3	Yes	100	2	0	SM	None	Self seeded in field corner	Good	Fair	10+	C1	1.3	-
G110	Hazel; goat willow; hawthorn; blackthorn; privet; elder; sycamore.	Off	9	15	Yes	200	2.5	2	SM	None	Field margin/ scrub trees and trees that back onto parking lots.	Fair	Good	20+	B2	2.4	-
G111	Goat willow	On	5	2	-	90	1	0.25	Y	None	Self seeded & preventing usage of gate	Good	Fair	10+	C2	1.1	-
G112	Oak	On	12	2	-	370	5.5	2	EM	None	Ivy cover to main stems & to scaffold limbs of tree to north	Good	Fair	20+	B2	4.4	-
G113	Ash	On	9	6	Yes	200	3	2	SM	None	Most trees have some advanced crown dieback.	Poor	Poor	10+	C2	2.4	-
G114	Oak; ash; goat willow; hazel	On	8 - 16	25	None	470	6.0	2.5	M	None	Stand of predominantly oak with hazel; occasional willow & ash; established to south embankment of what appears to be an old tramway	Good	Fair	40+	B2	5.6	-
G115	Alder	On	16	8	None	520	5.0	1.0	M	None	Multi-stemmed trees adjacent to water course	Good	Fair	20+	B2	6.2	-
G116	Alder; hazel	On	8 - 16	2	None	550	6.0	1.0	M	None	Multi-stemmed trees adjacent to water course; 2x hazel & 2x alder; low crown clearance above tramway (1m); 1x alder stem failed to east with limb hung-up in trees on opposite side of water course	Good	Fair	20+	B2	6.6	-

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G117	Oak; alder; hazel; hawthorn	On	8 - 13	8	None	410	6.0	1.0	EM	None	Stand of predominantly alder; oak with hazel; established to south embankment of water course; low crown clearance above tramway	Good	Fair	20+	B2	4.9	-
G118	Oak; ash	On	14 - 17	3	None	560	7.0	2.5	M	None	Stand of 2x oak with 1x ash between; established to south bank of what appears to be an old tramway	Good	Fair	40+	B2	6.7	-
G119	Oak	On	12 - 16	3	None	800	8.0	2.0	M	None	Stand of 2x sub-dominant oak being laterally suppressed by 1x mature oak between; established to south bank of what appears to be an old tramway; central oak has delaminated limb to east of crown @2 - 3.5m. Recommend limb be pruned back to main stem	Good	Fair	40+	B2	9.6	-
G120	Oak; ash	On	15	2	None	580	6.5	1.5	M	None	1x oak with 1x ash - the latter is an old coppice stool with old bole & crown formed by semi-mature re-gen; established to north bank of what appears to be an old tramway	Good	Fair	20+	B2	7.0	-
G121	Oak	On	10 - 14	2	Yes	550	6.0	1.5	EM	None	Established on derelict hedge line; pruned to south for overhead power lines	Good	Fair	20+	B2	6.6	-
G122	Oak	On	11	2	Yes	350	5.0	2.0	EM	None	Established on derelict hedge line	Good	Fair	20+	B2	4.2	-
G123	Oak; birch; goat willow; hazel	On	6 - 14	14	Yes	500	6.0	3.5	EM	None	Stand of predominantly oak & birch with hazel; occasional willow established to north embankment of track	Good	Fair	20+	B2	6.0	-
G124	Alder; birch; oak; goat willow; hazel	On	4 - 16	30	Yes	550	6.0	0.0	M	None	Stand off trees adjacent to water course; predominantly alder; birch & oak; willow & hazel occur as understory	Good	Fair	20+	B2	6.6	-
G125	Alder; elm	On	10	8	Yes	90	2.5	3.0	SM	None	Stand of alder; minimal overhang above track	Good	Fair	20+	B2	1.1	-
G126	Ash; elm; hazel	On	4 - 15	10	Yes	450	6.0	0.0	EM	None	Stand off trees adjacent to water course	Good	Fair	20+	B2	5.4	-
G127	Oak; birch; goat willow; holly	On	6 - 14	40	Yes	400	4.0	0.0	EM	None	Stand of trees along boundary; headroom to south of track approx. 3.5m	Good	Fair	20+	B2	4.8	-
G128	Alder; birch	On	6 - 12	6	Yes	300	3.0	0.0	EM	None	Stand of trees establishing within large swathe of brambles	Good	Fair	20+	B2	3.6	-
G129	Alder; oak	On	7 - 15	5	Yes	450	6.0	2.0	EM	None	3x oak & 2x alder forming a cohesive crown (1x oak stem is semi-mature)	Good	Fair	20+	B2	5.4	-
G130	Oak	On	8	3	Yes	300	4.0	1.0	SM	None	3x oak forming a cohesive crown; middle stem laterally suppressed by outer stems	Good	Fair	20+	B2	3.6	-

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G131	Oak	On	7 - 8	2	Yes	300	4.0	1.5	SM	None	2x oak forming a cohesive crown; co-dominant tree to west laterally suppressing adjacent tree	Good	Fair	20+	B2	3.6	-
G132	Elm; oak; hazel	On	4 - 16	40	Yes	500	7.0	0.0	M	None	Stand of trees on field boundary	Good	Good	20+	B2	6.0	-
G133	Goat willow; birch	On	2 - 6	15	Yes	90	1.5	0.0	Y	None	Sporadically group of self-seeded trees	Good	Fair	10+	C2	1.1	-
G134	Oak; birch; holly; hazel	On	4 - 13	25	Yes	450	7.0	0.0	M	None	Stand of trees on field boundary	Good	Good	20+	B2	5.4	-
G135	Alder; sycamore; hawthorn	On	12	3	Yes	350	5.0	0.0	M	None	Close grown multi-stemmed trees forming a cohesive crown	Good	Fair	20+	B2	4.2	-
G136	Alder; elder	On	12	2	Yes	350	5.0	0.0	M	None	Close grown multi-stemmed trees forming a cohesive crown	Good	Fair	20	B2	4.2	-
G137	Alder; oak; hazel	On	12	5	Yes	350	4.0	0.0	M	None	Close grown multi-stemmed trees; predominantly alder	Good	Fair	20	B2	4.2	-
G138	Alder; ash; goat willow; hazel	On	2 - 15	15	Yes	350	4.0	0.0	M	None	Close grown multi-stemmed trees	Good	Fair	20	B2	4.2	-
G139	Oak; ash; holly; hazel	Off	2 - 16	12	Yes	400	6.0	1.5	M	None	Trees established on off-site embankment	Good	Fair	20	B2	4.8	-
G140	Elm; ash; holly; hazel	Off	2 - 16	35	Yes	450	6.0	1.0	M	None	Trees established off-site to rear of commercial building; 3x stems topped @5m beneath pylon	Good	Fair	20	B2	5.4	-

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HEDGES

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H1	Cypress; oak; hawthorn; goat willow	Off	14	4.5	250	0.5	EM	Predominantly cypress with other species occurring as self seeded understory	Good	Good	20+	B2	3
H2	Hawthorn; holly; hazel	On	1.5	3	60	0.0	EM	Maintained by flail; colonised by brambles to west	Good	Fair	20+	B2	0.8
H3	Privet	On	2.5	1.5	60	0.0	EM	Maintained by flail; outgrown stems to north	Good	Fair	20+	B2	0.8
H4	Blackthorn; hazel; oak	On	4	2.5	60	0.0	EM	Unmaintained hedge; predominantly thorn; sporadic gaps to west	Good	Fair	20+	B2	0.8
H5	Hazel; oak	On	3.5	2.5	150	0.0	EM	Predominantly hazel; 2x topped oak at north of hedge	Good	Fair	20+	B2	1.8
H6	Oak; goat willow; hawthorn; hazel	On	3.5	2	60	0	EM	Maintained by flail	Good	Fair	20+	B2	0.8
H7	Oak; goat willow; alder	On	5	3	70	0	EM	Unmaintained hedge	Good	Fair	20+	B2	0.8
H8	Goat willow; birch; hazel; oak; hawthorn; holly	On	2	3	40	0	EM	Sporadic gaps throughout; JKW within group	Fair	Fair	10+	C2	0.6
H9	Goat willow; birch; hazel; oak; blackthorn; hawthorn; holly	On	3.5	3	90	0	EM	Maintained by flail	Good	Fair	20+	B2	1.1
H10	Ash; blackthorn; hazel; hawthorn; birch	On	8	4	260	0	EM	5x multi stemmed ash; 1x birch within unmaintained hedge (tree height approx 8m; hedge height approx 4m)	Good	Fair	20+	B2	3.1
H11	Blackthorn; hawthorn	Off	2	1.5	50	0	EM	Maintained by flail; bramble ingress	Good	Fair	20+	B2	0.6
H12	Blackthorn; hawthorn	On	1.5	1	50	0	EM	Layed hedge; choked with brambles	Fair	Fair	10+	C2	0.6
H13	Blackthorn; hawthorn; hazel; oak; goat willow; gorse	On	2.5	1.5	100	0	M	Maintained by flail	Good	Good	40+	B2	1.3
H14	Hazel; holly; hawthorn; blackthorn	On	3	2.5	60	0	M	Maintained by flail	Good	Good	40+	B2	0.8
H15	Hazel; holly; crab apple; oak; hawthorn; blackthorn; goat willow	On	3.5	2.5	150	0	M	Maintained by flail	Good	Fair	40+	B2	1.8
H16	Oak; holly; gorse; hazel; hawthorn; birch; goat willow	On	2.5	2	150	0	EM	Maintained by flail; sporadic gaps	Good	Fair	20+	B2	1.8
H17	Oak; holly; hawthorn	On	6.5	4	270	0.25	EM	Sides maintained by flail & top growth left unchecked	Good	Fair	20+	B2	3.2

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H18	Oak; goat willow; hazel; holly; hawthorn	On	4	3	250	0	EM	Outgrown hedge	Good	Fair	20+	B2	3
H19	Goat willow; blackthorn	On	1.5	2	50	0	SM	Maintained by flail	Good	Fair	20+	B2	0.6
H20	Goat willow	On	2	2	30	0	Y	Consistent feature of self seeded willow forming cohesive crown	Fair	Fair	10+	C2	0
H21	Goat willow; blackthorn; alder	On	2	2	40	0	Y	Maintained by flail	Fair	Fair	20+	B2	0.6
H22	Goat willow; gorse; hawthorn	On	2.5	2	40	0	Y	Maintained by flail	Good	Fair	20+	B2	0.6
H23	Gorse; oak; goat willow	On	1.5	2	30	0	Y	Maintained by flail; sporadic hedge predominantly of gorse; choked by brambles	Fair	Fair	10+	C2	0
H24	Goat willow	On	1.5	2	30	0	Y	Maintained by flail	Good	Fair	10+	C2	0
H25	Oak; birch; goat willow; hazel	On	8	4.5	270	0	EM	Outgrown hedge; both 11kv & 275kv power lines pass above	Good	Fair	20+	B2	3.2
H26	Oak; birch; hazel; hawthorn; goat willow; gorse	On	7	4.5	380	1	EM	Outgrown hedge	Good	Fair	40+	B2	4.5
H27	Oak; goat willow	On	7	4.5	340	1.5	EM	Outgrown hedge	Good	Fair	20+	B2	4.1
H28	Oak; birch; hazel; holly; hawthorn; goat willow; gorse	On	19	4.5	390	1	EM	Outgrown hedge	Good	Fair	40+	B2	4.7
H29	Hazel; holly; goat willow; birch; oak; hawthorn	On	6	4.5	190	1	EM	Outgrown hedge; maintained by flail	Good	Fair	40+	B2	2.3
H30	Hazel; elder	On	3	2	40	0	EM	Maintained by flail	Good	Fair	20+	B2	0.6
H31	Hazel; hawthorn; blackthorn; oak	On	3.5	2	80	0	EM	Maintained by flail	Good	Fair	40+	B2	1
H32	Alder; willow	On	3	2	70	0	EM	Maintained by flail; 2x willow to west of group retained as hedgerow trees (approx 7m in height)	Good	Fair	20+	B2	0.8
H33	Alder; willow; ash; sycamore	On	3.5	2.5	70	0	EM	Maintained by flail; JKW present	Good	Fair	20+	B2	0.8
H34	Willow	On	3	2	60	0	EM	Maintained by flail; JKW present	Good	Fair	20+	B2	0.8
H35	Willow	On	3	2	60	0	EM	Maintained by flail; JKW present	Good	Fair	20+	B2	0.8
H36	Hazel; hawthorn; blackthorn	On	3.5	2	80	0	EM	Maintained by flail	Good	Fair	40+	B2	1
H37	Hawthorn; hazel; holly	On	3	2	80	0	EM	Maintained by flail	Good	Fair	40+	B2	1
H38	Hawthorn; hazel	On	2	1.5	60	0	EM	Maintained by flail	Good	Fair	40+	B2	0.8

BS5837:2012 TREE SURVEY SCHEDULE

PARC SOLAR CAENEWYDD

PROJECT NO: 4439

SURVEYOR: DH/LF

CLIENT: TAIYO POWER AND STORAGE LTD

SURVEY DATE: 6-7-8/12/2021

Barton Hyett
Arboricultural Consultants

Ref	Species	On/off site	Av. Height (m)	Av. width (m)	Av. Stem diam (mm)	Avg. low crown height (m)	Life Stage	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)
H39	Hawthorn; hazel; alder; oak; goat willow	On	2	2	70	0	EM	Maintained by flail; sporadic gaps; partly choked by brambles	Good	Fair	20+	B2	0.8
H40	Goat willow	On	2.5	2	60	0	EM	Outgrown hedge; partly maintained by flail	Good	Fair	20+	B2	0.8
H41	Blackthorn	On	2	3	40	0	EM	Thicket; maintained by flail	Good	Fair	20+	B2	0.6
H42	Hazel	On	2.5	2	60	0	EM	Maintained by flail	Good	Fair	20+	B2	0.8
H43	Alder; willow; hazel; hawthorn; blackthorn	On	3	2.5	170	0.25	EM	Stems growing adjacent to watercourse; topped @ 1.5m with regrowth maintained by flail	Good	Fair	20+	B2	2
H44	Blackthorn; birch; hazel; willow	On	2.5	1.5	60	0	EM	Maintained by flail	Good	Fair	40+	B2	0.8
H45	Oak; ash; field maple; blackthorn; hawthorn; hazel; goat willow;	On	2	1.5	100	0	EM	Flailed hedgerow.	Good	Good	20+	B2	1.3
H46	Hazel; hawthorn; willow	On	2.5	1.5	50	0	EM	Maintained by flail	Good	Fair	40+	B2	0.6
H47	Blackthorn; hazel; oak; hawthorn; holly	On	2	1.5	80	0	EM	Maintained by flail	Good	Fair	40+	B2	1
H48	Holly; elder; hazel; goat willow	On	2	1.5	80	0	EM	Maintained by flail; heavily choked by brambles	Fair	Fair	20+	B2	1
H49	Hawthorn; oak; holly; hazel; ash; elder	On	2	1.5	80	0	EM	Maintained by flail	Good	Fair	40+	B2	1
H50	Hawthorn; blackthorn; oak; holly; gorse; goat willow; field maple	On	2	1.5	80	0	EM	Maintained by flail; sporadic gaps	Good	Fair	20+	B2	1
H51	Hawthorn	On	2	1.5	80	0	EM	Maintained by flail; sporadic gaps/choked with brambles	Good	Fair	20+	B2	1
H52	Hawthorn; hazel; field maple	On	2	1.5	80	0	EM	Maintained by flail	Good	Fair	40+	B2	1
H53	Hawthorn; hazel; field maple; blackthorn; elder; holly	On	2	1.5	80	0	EM	Maintained by flail	Good	Fair	40+	B2	1
H54	Oak; ash; field maple; blackthorn; hawthorn; hazel; goat willow;	On	2.5	2	150	0	EM	Flailed hedgerow. Some gaps in the middle.	Good	Good	20+	B2	1.8
H55	Blackthorn	Off	3	3	50	0	EM	Offsite thicket; partly maintained by flail	Good	Fair	20+	B2	0.6
H56	Hawthorn; dogwood; oak; holly; elder	On	4.5	3	130	1	SM	Unmaintained hedgerow	Good	Fair	20+	B2	1.6

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Ref	Species	On/off site	Av. Height (m)	Av. width (m)	Av. Stem diam (mm)	Avg. low crown height (m)	Life Stage	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)
H57	Rose hips	On	1.5	1	30	0	EM	Established hedge; partially colonised by brambles	Good	Fair	10+	C2	0
H58	Hazel; hawthorn; ash	On	3	2	160	0	EM	Partially flailed field side.	Good	Good	20+	B2	2
H59	Hawthorn; elder; oak	On	2.5	2	100	0	M	Flailed hedgerow; some gaps in the middle.	Good	Good	40+	B2	1.3
H60	Hawthorn; elder; gorse; oak	On	4	3.5	90	0.5	EM	Unmaintained hedgerow.	Good	Fair	20+	B2	1.1
H61	Hawthorn; dogwood	On	1	1	60	0	SM	Over run with brambles and other weeds. Deadwood.	Poor	Poor	10+	C2	0.8
H62	Hawthorn; elder; gorse; oak	On	2.5	3.5	90	0	EM	Generally flailed at 2.5 m but some parts not reached by flail and reach 5 m.	Good	Fair	20+	B2	1.1
H63	Hawthorn	On	3.5	2	90	0	SM	Semi maintained hedgerow	Good	Good	20+	B2	1.1
H64	Holly; lonicera; hawthorn privet.	On	2	1.5	90	0	SM	Broken hedge maintained by flail backing on to residential gardens.	Fair	Fair	20+	B2	1.1
H65	Cypress	Off	7	2.5	200	1	SM	Typical for species.	Good	Good	20+	B2	2.4
H66	Cypress	Off	3	2	120	0	SM	Trees of various heights making up residential hedge.	Fair	Good	20+	C2	1.5
H67	Privet; hazel; hawthorn; holly.	On	1.5	1	80	0	SM	Semi maintained with flail.	Fair	Fair	20+	B2	1
H68	Hawthorn; oak; holly; gorse; cotoneaster.	On	5	4	150	1	EM	Hawthorn hedge borders road; vegetation protrudes into field at points of self set scrubby vegetation. Unmaintained.	Good	Good	20+	B2	1.8
H69	Birch; goat willow	On	4.5	2.0	60	0.0	EM	Unmaintained hedge.	Good	Fair	20+	B2	0.8
H70	Hazel; goat willow	On	3.0	2.5	60	0.0	EM	Unmaintained hedge	Good	Fair	20+	B2	0.8
H71	Elm; ash; oak; hawthorn; hazel	On	9.0	3.5	200	3.5	EM	Hedge maintained in past; establishing elm (x4) stems & oak stem (x1) along hedge line; approx. 3.5m headroom above track	Good	Fair	20+	B2	2.4
H72	Elm; blackthorn; hazel	On	8.0	3.0	180	0.0	EM	Hedge maintained in past; establishing elm (x4) stems along hedge line; approx. no overhang above track	Good	Fair	20+	B2	2.2
H73	Oak; elm; alder; hawthorn; holly	On	8.0	3.0	280	0.0	EM	West side flailed for clearance above track; establishing stems along hedge line	Good	Fair	20+	B2	3.3
H74	Alder; goat willow	On	8.0	3.0	150	0.0	EM	Partially maintained hedge; predominantly flailed willow with establishing alder	Good	Fair	10+	C2	1.8

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PARC SOLAR CAENEWYDD

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WOODLANDS

Ref	Species	On/off site	Height range (m)	No. of trees	Est diam?	Max stem diam (mm)	Av. Crown radius (m)	Avg. low crown height (m)	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	TPO?
W1	Oak; alder; ash; aspen; goat willow; hazel; holly	On	1 - 16	50	Yes	500	7.0	1.0	EM	None	Sample area recorded where feature abuts survey site; predominantly oak & alder with limited hazel & holly understory	Good	Fair	40+	A2	6.0	-

IMAGE 1: A view looking east at G1.

IMAGE 2: A view looking north-west at G30.

IMAGE 3: A view looking west along H26.

IMAGE 4: A view looking north-west at G33.

IMAGE 5: A view looking west along G48.

IMAGE 6: A view looking west along the Afon Lian, with T17 in the centre.

- The tree survey was carried out with reference to the methodology set out in BS5837:2012 'Trees in relation to design, demolition and construction – Recommendations'.
- Trees were surveyed individually or as groups where it was considered that they had grown together to form cohesive arboricultural features either aerodynamically (trees that provide companion shelter), visually (e.g. avenues or screens) or culturally (including for biodiversity). However, where it was considered that there was an arboricultural need to differentiate between attributes trees within groups and / or woodlands were also surveyed as individuals.
- The full tree survey findings are recorded in the following tree survey schedule.
- Within the tree survey schedule, each surveyed TREE (T), GROUP (G), HEDGEROW (H), WOODLAND (W) or SHRUB MASS on or adjacent to the site is given a reference number which refers to its position on the tree survey and constraints plan.
- TREE SPECIES are listed by common name.

The **DIMENSIONS** taken are:

- STEM-No. Indicates the number of main stems (i.e. whether the trunk divides at or below 1.5m; (Used in the calculation of RPA.) "m-s" = Multi-stemmed.
- STEM DIAMETER (measured in millimetres), obtained from the girth measured at approx. 1.5m. For trees with 2 to 5 sub-stems a notional figure is derived from the sum of their cross-sectional areas. For multi-stemmed trees, the notional diameter may be estimated on the basis of the average stem size x the number of stems. (A notional diameter may be estimated where measurement is not possible.)
- HEIGHT (measured in metres), recorded to the nearest half metre for dimensions up to 10m and to the nearest whole metre for dimensions over 10m.
- The CROWN SPREAD, taken at the four cardinal points to derive an accurate representation of the tree crown, recorded up to the nearest half metre for dimensions up to 10m and to up the nearest whole metre for dimensions over 10m.
- CROWN CLEARANCES are expressed both as existing height above ground level of first significant branch along with its direction of growth (e.g. 2.5m-N), and also in terms of the overall crown e.g. the average height of the crown above ground level. Measurements are recorded to the nearest half metre for dimensions up to 10m and to the nearest whole metre for dimensions over 10m.
- ESTIMATES. Where any measurement has had to be estimated, due to inaccessibility for example, this is indicated by a "#" suffix to the measurement as shown in the tree survey schedule.

LIFE STAGE is defined as follows:

Y Young: Normally stake dependent, establishing trees. Should be growing fast, usually primarily increasing in height more than spread but as yet making limited impact upon the landscape.

SM Semi-mature: Established young trees, normally of good vigour and still increasing in height but beginning to spread laterally. Beginning to make an impact upon the local landscape and environment. Semi-Mature (still capable of being transplanted without preparation, up to 30cm girth and not yet sexually mature).

EM Early-mature: Not yet having reached 75% of expected mature size. Established young trees, normally of good vigour and still increasing in height but beginning to spread laterally. Beginning to make an impact upon the local landscape and environment.

M Mature: Well-established trees, still growing with some vigour but tending to fill out and increase spread. Bark may be beginning to crack and fissure. In the middle half of their safe, useful life expectancies.

LM Late-Mature: In full maturity but possibly beyond mature and in a state of natural decline). Still retaining some vigour but any growth is slowing.

A Ancient: A tree that has passed beyond maturity and is old/aged compared with other trees of the same species. Typically having a very wide trunk and a small canopy.

PHYSIOLOGICAL CONDITION (HEALTH & VITALITY):

Essentially a snapshot of the general health of the tree based upon its general appearance, it's apparent vigour and the presence or absence of symptoms associated with poor health, physiological stress etc. (Fungal infections may be recorded here but decay giving rise to structural weakness would be recorded under 'Structural Condition' – see next parameter):

Good: No significant health issues.
Fair: Indications of slight stress or minor disease (e.g. the presence of minor dieback/deadwood or of epicormic shoot growth).
Poor: Significant stress or disease noted; larger areas of dieback than above.
Dead: (or Moribund).

STRUCTURAL CONDITION:

Defects affecting the structural stability of the tree including decay, significant dead wood, root-plate instability or significant damage to structural roots, weak forks (e.g. those where bark is included between the members) etc. Classified as:

Good: No obvious structural defects: basically sound.
Fair: Minor, potential or incipient defects.
Poor: Significant defect(s) likely to lead to actual failure in the medium to long-term.
Dead: (or Moribund).

ESTIMATED REMAINING CONTRIBUTION:

An estimate of the length of time in years that a tree might be expected to continue to make a useful contribution to the locality at an acceptable level of risk (based on an assumption of continued routine maintenance):

- Less than 10 years
- 10+ years
- 20+ years
- 40+ years

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SPECIAL IMPORTANCE:

Trees that are particularly notable as high value trees such as ancient trees/woodland or veteran trees. Such trees may be regarded as the principal arboricultural features of a site and pose a significant constraint to potential development.

An *ancient* tree is one that has passed beyond maturity and is very old compared with other trees of the same species. Very few trees reach the ancient life-stage.

Veteran trees are often very old but not necessarily so; they may be regarded as 'survivors' that have developed some of the characteristic features of an ancient tree but have not necessarily lived as long. All ancient trees are veterans but not all veteran trees are ancient.

An ancient woodland is an area that has been wooded continuously since at least 1600 AD. It includes ancient semi-natural woodland (ASNW), plantations on ancient woodland sites (PAWS) and ancient replanted woodland (ARW)

QUALITY CATEGORY:

Trees are classed as category U, A, B or C, based on criteria given in BS5837:2012; summary definitions as follows (see BS5837 for further details). Categories A, B and C are further characterised by the use of sub-categories, which attempt to identify what aspect of the tree is the main source of its perceived value, These are:

(1) arboricultural qualities
(2) landscape qualities, and
(3) cultural, historic or ecological/conservation qualities.

Examples of these qualities for each of the three categories are given below, although these are indicative only.

Note: This is NOT a health and safety classification; the classification does not take into account any requirement for remedial tree care or ongoing maintenance apart from that which may affect the trees' general suitability for retention.

CATEGORY A: HIGH QUALITY:

Trees or groups whose retention should be given a particularly high priority within the design process. Normally with an expected useful life expectancy of at least 40 years.

A1: Notably fine specimens; rare or unusual specimens; essential component trees within groups, semi-formal or formal plantings (e.g. dominant trees within an avenue etc.).
A2: Trees, groups or woodlands of particular visual importance as landscape features.
A3: Trees, groups or woodlands of particular significance by virtue of their conservation, historical, commemorative or other value (e.g. veteran trees or wood pasture.)

CATEGORY B: MODERATE QUALITY:

Trees or groups of some importance with a likely useful life expectancy in excess of 20 years. Their retention would be desirable; selective removal of certain individuals may be acceptable but only after full consideration of all alternative courses of action.

B1: Fair quality but not exceptional; good specimens showing some impairment (e.g. remediable defects, minor storm damage or poor past management.)
B2: Acceptable trees situated such as to have little visual impact within the wider locality. Also numbers of trees, perhaps in groups or woodlands, whose value as landscape features is greater collectively than would warrant as individuals (such that the selective removal of an individual would not impact greatly upon the trees' overall, collective value).
B3: Trees, groups or woodlands with clearly identifiable conservation or other cultural benefits.

CATEGORY C: LOW QUALITY:

Trees or groups of rather low quality, although potentially capable of retention for at least approx. 10 years. Also small trees with stems below 15cm diameter.

Potentially retainable, but not of sufficient value to be regarded as a significant planning constraint.

C1: Unremarkable trees of very limited merit or of significantly impaired condition.
C2: Trees offering only low or short-term landscape benefits; also secondary specimens within groups or woodlands whose loss would not significantly diminish their landscape value.
C3: Trees with extremely limited conservation or other cultural benefit.

CATEGORY U:

Trees likely to prove to be unsuitable for retention for longer than 10 years should any significant increase in site usage arise as a result of development.

E.g. dead or moribund trees; those at risk of collapse or in terminal decline; trees that will be left unstable by other essential works such as the removal of nearby category U trees; trees infected by pathogens that could materially affect other trees; low quality trees that are suppressing better specimens.

(Category U trees may have conservation values that it might be desirable to preserve. This category may also include trees that should be removed irrespective of any development proposals.)

ROOT PROTECTION AREA (RPA):

These are normally represented as a circle centred on the base of each tree stem with a radius of 12 times stem diameter, measured at 1.5m above ground level. The shape of the RPA may be altered where site conditions dictate that there are sound reasons to do so.

VETERAN OR ANCIENT TREE BUFFER (VTB/ATB)

In line with the Standing Advice produced by the Forestry Commission and Natural England this is a buffer zone (in metres) around an ancient or veteran tree that should be at least 15 times larger than the diameter of the tree. The buffer zone should be 5m from the edge of the tree's canopy if that area is larger than 15 times the tree's stem diameter.

ANCIENT WOODLAND BUFFER (FOR ASNW, PAWS OR ARW)

In line with the Standing Advice produced by the Forestry Commission and Natural England this is a buffer zone of at least 15 metres to avoid root damage. Where assessment shows other impacts are likely to extend beyond this distance, a larger buffer zone may be required.

THE IMPORTANCE OF TREES

Wider benefits:

There is a growing body of evidence that trees bring a wide range of benefits to the places people live.

Some *Economic* benefits of trees include:

- Trees can increase property values
- As trees grow larger, the lift they give to property values grows proportionately
- They can improve the environmental performance of buildings by reducing heating and cooling costs, thereby cutting bills
- Mature landscapes with trees can be worth more as development sites
- Trees create a positive perception of a place for potential property buyers
- Urban trees improve the health of local populations, reducing healthcare costs

Some *Social* benefits of trees include:

- Trees help create a sense of place and local identity
- They benefit communities by increasing pride in the local area
- They can create focal points and landmarks
- They have a positive impact on people's physical and mental health
- They can have a positive impact on crime reduction

Some *Environmental* benefits of trees include:

- Urban trees reduce the 'urban heat island effect' of localised temperature extremes
- They provide shade, making streets and buildings cooler in summer
- They help remove dust and particulates from the air
- They help to reduce traffic noise by absorbing and deflecting sound
- They help to reduce wind speeds
- By providing food and shelter for wildlife they help increase biodiversity
- They can reduce the effects of flash flooding by slowing the rate at which rainfall reaches the ground
- They can help remediate contaminated soil

On new development sites:

Trees bring many benefits to new development. Where retained successfully they can form important and sustainable elements of green infrastructure, contribute to urban cooling and reduce energy demands in buildings. Their importance is acknowledged in relation to adaptation to the effects of climate change. Other benefits brought by trees include:

- increasing property values;
- visual amenity
- softening, complementing and adding maturity to built form
- displaying seasonal change
- increasing wildlife opportunities in built-up areas
- contributing to screening and shade
- reducing wind speed and turbulence

NATIONAL PLANNING POLICY

Paragraph 6.4.26 of the Planning Policy Wales - Edition 11 (PPW) states in relation to Ancient Woodland:

'Ancient woodland and semi-natural woodlands and individual ancient, veteran and heritage trees are irreplaceable natural resources, and have significant landscape, biodiversity and cultural value. Such trees and woodlands should be afforded protection from development which would result in their loss or deterioration unless there are significant and clearly defined public benefits; this protection should prevent potentially damaging operations and their unnecessary loss. In the case of a site recorded on the Ancient Woodland Inventory, authorities should consider the advice of NRW. Planning authorities should also have regard to the Ancient Tree Inventory'.

The PPW goes on to state:

'The protection and planting of trees and hedgerows should be delivered, where appropriate, through locally specific strategies and policies'.

STATUTORY CONTROLS

Statutory tree protection

Works to trees which are covered by Tree Preservation Orders (TPOs) or are within a Conservation Area (CA) require permission or consent from the Local Planning Authority. Where information is available on

any Statutory designations such as this they are identified within the summary table in Section 1 and on the Tree Survey and Constraints Plan at Section 2.

Notwithstanding specific exceptions and in general terms, a TPO prevents the cutting down, uprooting, topping, lopping, wilful damage or wilful destruction of protected trees or woodlands without the prior written consent of the LPA.

Penalties for contravention of a TPO tend to reflect the extent of damage caused but can, in the event of a tree being destroyed, result in a fine of up to £20,000 if convicted in a Magistrates' Court, or an unlimited fine is the matter is determined by the Crown Court.

Similarly, and again notwithstanding specific exceptions, it is an offence to carry out any works to a tree in a Conservation Area with a trunk diameter greater than 75mm diameter at 1.5 height without having first provided the LPA with 6 weeks written notification of intent to carry out the works.

On many non-residential sites (excluding specific exemptions) there is also a statutory restriction relating to tree felling that relates to quantities of timber that can be removed within set time periods. In basic terms, it is an offence to remove more than 5 cubic metres of timber in any one calendar quarter without having first obtained a felling licence from the Forestry Commission.

Any proposed tree works that are planned to be carried out on site must be carried out in accordance with the statutory controls outlined. Therefore, we recommend that a further check is made with the LPA before any tree works are carried out.

Statutory Wildlife Protection

Although preliminary visual checks from ground level of likely wildlife habitats are made at the time of surveying, detailed ecological assessments of wildlife habitats are not made by the arboriculturist and fall outside of the scope for this report.

Trees which contain holes, splits, cracks and cavities could potentially provide a habitat for protected species such as bats in addition to birds and small mammals. It is advised that in some instances specialist ecological advice may be required. This may result in tree works being carried out following a detailed climbing inspection to the tree to ensure that protected species or their nests/roosts are not disturbed. If any are found, the site manager, site owner or consulting arboriculturist should be informed and appropriate action taken as recommended by the appointed Ecologist or the relevant Statutory Nature Conservation Organisation (SNCO): Natural England, Scottish Natural Heritage or Natural Resources Wales.

It is advised that tree/hedgerow works are carried out with the understanding that birds will generally nest in trees, hedges and shrubs between March and August. This time period only provides an indication of likely nesting times and as such diligence is required when undertaking tree works at all times.

Irrespective of the time of year and other than any actions approved under General Licence, it is an offence to intentionally kill, injure or take any wild bird or to intentionally take, damage or destroy the nest or eggs of any wild bird. Ideally, tree operations should be avoided during the likely bird nesting period. However, any tree works should always only be carried out following a preliminary visual check of the vegetation.

For information, the Wildlife and Countryside Act 1981 (as amended), The Countryside and Rights of Way Act 2000 (as amended) and the Conservation of Habitat and Species Regulations 2010, form the basis of the statutory legislation for flora and fauna in England and Wales. A different legislative framework applies in Scotland and Northern Ireland.
Any proposed tree works that are planned to be carried out on site must be carried out in accordance with any relevant statutory controls, outlined above.

DESIGN GUIDANCE

Approach

The approach adopts the guidelines set out in the British Standard BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations. The process is broken down to coordinate with the key elements within both the RIBA Plan of Work (2013) and British Standard 5837:2012 as set out in the table below:

Information Stage	RIBA Stage	BS5837:2012
Stage A – Tree Survey	2: Concept	4: Feasibility
Stage B – Arboricultural Impact Assessment	3: Developed design	5: Proposals
Stage C – Arboricultural Method Statement	4: Technical design	6: Technical Design
Stage D – Arboricultural Site Supervision	5: Construction	7: Demolition and construction

A hierarchical approach is adopted in order to achieve optimum use of the site and location of built structures. This is set out below:

Avoid

The starting point of Site layout design should be to avoid the RPA of retained trees and provide suitable clearance from above ground constraints [tree canopies]. Where possible building lines should be at least 2m outside the RPA to provide working space for construction. However, protection measures can be taken if such clearance is not achievable.

Mitigate

Where intrusion within the RPA is unavoidable then its impact on the tree can be mitigated by specialist measures:

Foundations that avoid trenching e.g. screw piles, suspended floor slabs or casting at ground level for lightweight structures such as bin and cycle stores.

Limited use may be made for parking, drives or hard surfaces within the root protection areas, subject to advice from a qualified arboriculturist. Cellular confinement systems that enable hard surfaces to be built above existing soil levels are acceptable methods subject to site-specific soil conditions.

Service runs that cannot be routed outside the RPA(s) can be installed by, for example, thrust boring, directional drilling, air excavation or hand digging. These operations often require supervision by the project arboriculturist.

Compensate

Replacement planting can ensure the continuity of tree cover where tree removal is unavoidable or desirable. Off-site provision may be considered in some circumstances but this will require negotiation with the local planning authority.

Considerations:

For proposed residential developments, consideration must be given to numerous factors future tree growth and orientation.

Tree constraints

Root Protection Areas:

With reference to BS5837:2012, a root protection area (RPA) is defined as "a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure should be treated as a priority". "**The default position [when considering design layout in relation to RPAs] should be that structures are located outside the RPAs of trees to be retained**".

BS5837:2012 states (4.6.2) that, "where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced." The BS goes on to state that, "modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution," and that any deviation from the original circular plot should take into account:

- Morphology and disposition of roots;
- topography and drainage;
- soil type and structure;
- the likely tolerance of the tree to root damage/disturbance.

Additional buffer zones beyond the RPA:

The following text is taken from the Standing Advice produced by the Forestry Commission and Natural England as included in the National Planing Policy Guidance:

'A buffer zone's purpose is to protect ancient woodland and individual ancient or veteran trees. The size and type of buffer zone should vary depending on the scale, type and impact of the development'.

Ancient woodland buffer:

'For ancient woodlands, you should have a buffer zone of at least 15 metres to avoid root damage. Where assessment shows other impacts are likely to extend beyond this distance, you're likely to need a larger buffer zone. For example, the effect of air pollution from development that results in a significant increase in traffic'.

Ancient and veteran tree buffer:

'A buffer zone around an ancient or veteran tree should be at least 15 times larger than the diameter of the tree. The buffer zone should be 5m from the edge of the tree's canopy if that area is larger than 15 times the tree's diameter'.

Above ground:

Above ground constraints posed by trees describe the capacity for trees to have an overbearing or dominating effect on new developments; usually post occupancy. Typical above ground constraints include a number or combination of inconveniences including shading, branch spread, movement of trees during strong winds and so on. If not adequately considered, above ground constraints can lead to repeated requests to fell or heavily prune retained and protected trees.

Shade:

Adverse shading and blocked views from windows raise concerns for incoming residents, which may lead to pressure to fell or remove trees in the future. Wherever possible it is advisable to arrange fenestration away from tree canopies to lessen the conflict, or increase window size to accommodate ambient light.
Conversely, appropriate designed development can use existing or new trees to create necessary and welcome shade and screening.
As part of the adopted approach the above considerations and constraints are assessed cumulatively in order to provide clear and site-specific advice on the areas of a site most suitable for the location of development.

Dependent on the site and nature of the proposed development, the Tree Survey and Constraints Plans may show the following:

Recommended Developable area - an advisory area defined in order to minimise arboricultural impacts using standard approaches to construction. Restricting proposed development to this area will limit the risk of harm to retained trees and of the Local Planning Authority objecting to the proposed development. It may be possible to propose development outside of this area but specific 'low impact' construction techniques may be needed recommended.

Recommended Buffer to development - similar to the Recommend Developable Area but defined as a line marking a suitable buffer to retained trees. More commonly used on large sites or sites where the presence of trees is localised.

Tree Opportunities

Depending on the scale of developments existing trees can often provide opportunities to enhance the existing arboricultural resource of a site by bringing it into good management or by putting in place remedial measures e.g. soil amelioration.

Appropriately designed new tree planting is extremely important in maintaining healthy and sustainable tree populations. For the reasons highlighted, new trees can bring many benefits to new developments. It is critical to the establishment of new tree planting that the locations, species and specification of new trees is appropriate. Subsequently the sourcing of high-quality stock, suitable planting and the provision of post planting maintenance are essential to allow new trees to establish and to allow them to mature.

Barton Hyett
Arboricultural Consultants

HOW TREE DAMAGE CAN OCCUR

Above the ground

Damage can occur as a result of knocks and scuffs, breakages of branches and/or tree trunks. This is often but not always associated with machine operations, groundworks excavations, tele handlers, high sided vehicles and crane use. Other forms of above ground damage include fixings to trunk and unauthorised cutting back of branches. Wounds will harm a tree's health and shorten its life by letting in disease-causing organisms.

Below the ground

It is often not appreciated that the majority of most tree roots are generally located within the top 600mm of the ground. On this basis it needs to be understood that damage to roots can occur in three ways:

- Root severance can occur as a result of, for example, soil stripping during site clearance or excavations.
- Root dieback and death can result from compaction of the soil. Compaction can occur as a result of vehicle weight, weight of stored materials or increased pedestrian access. Compaction crushes out soil pore space and prevents tree respiration from occurring (respiration requires gas exchange between the ground and the atmosphere). Compacted soil is denser and therefore inhibits/prevents any further new root growth.
- Pollution of the soil with chemicals such as oil or cement washings can destroy the soil environment, making it inhospitable for the tree cause causing it stress.

The effects of these impacts can be disfiguring to a tree's appearance and also weaken a tree making it more liable to attack by pest and diseases. In addition, root damage or death results in corresponding decline above the ground with dieback occurring within the tree crown.

The effects of damage to trees generally take some time to become fully apparent. In many cases, damaged trees decline slowly after the completion of a new development, until they eventually need to be removed due to ill health.

Tree protection barriers and load distributing 'no-dig' paths are specified in order to prevent soil compaction from taking place.

GENERAL SITE RULES FOR TREE PROTECTION

Do not independently carry out any activity that is at odds with the site scheme of tree protection. This is contained within an approved Arboricultural Method Statement (AMS) and accompanying Tree Protection Plan.

In simple terms: do not carry out any work within any Construction Exclusion Zone (CEZ) without prior liaison with the Project Arboriculturist and written authorisation from the Local Planning Authority.

Within the CEZ:

- No mixing of cement
- No soil/turf stripping, raising/lowering of ground levels (unless advised), deposit or excavation of soil or rubble
- No excavations for services or installation of services
- No storage of materials, machinery fuel, chemicals or other materials of any other description
- No parking/use of tracked or wheeled machinery
- No siting of temporary structures including hard standing areas, portaloos, site huts
- No lighting of fires or disposal of liquids
- Fires on site should be avoided if possible. Where they are unavoidable, they must not be lit in a position where heat could damage foliage or branches. Fires must be a minimum of 20m from the trunk of any retained tree or the centre line of any hedgerow to be retained
- No signs, cables, fixtures or fittings of any other description shall be attached to any part of a retained tree