


Bubney Solar Farm

ARBORICULTURAL IMPACT ASSESSMENT

On Behalf Of Renewable Connections Developments Limited





ARBORICULTURAL IMPACT ASSESSMENT

Bubney Solar Farm,
Grindley Brook,
Whitchurch

March 2021



Barton Hyett Associates
Arboricultural Consultants

Summary table		
Site Name:	Bubney Solar Farm	
Project reference:	P.4012	
Site Address:	Grindley Brook, Whitchurch	
Nearest Postcode:	SY13 4RG	
Central Grid reference:	SJ 51328 42323	
Local Planning Authority:	Cheshire West and Chester Council	
Relevant planning policies:	Cheshire West and Chester Local Plan (adopted 2019) Policies: ENV3 - Green Infrastructure ENV4 - Biodiversity and Geodiversity	
Statutory Controls:	Tree Preservation Order	Conservation Area
	None	No
Soil Type: (Source: BGS online soils map © NERC 2021)	Superficial/Drift	Bedrock
	Till, Devensian - Diamicton	Wilkesley Halite Member - Halite-stone And Mudstone
Topographical Survey:	Anthony Brookes Surveys Ltd - 661/11559/1F	
Notes:	-	
Report author:	Andrew Cunningham <i>FdSc (Arb), Tech.Cert (AA), MArborA</i>	
Checked by:	Richard Hyett <i>MSc, BSc (Hons), MICFor, MArborA</i>	
Date of issue:	18th March 2021	

REPORT CONTENTS:

SECTION 1:	SUMMARY, SITE DETAILS & SURVEY FINDINGS
SECTION 2:	TREE SURVEY & CONSTRAINTS PLAN
SECTION 3:	COMBINED TREE RETENTION/REMOVAL & PROTECTION PLAN
SECTION 4:	TREE SURVEY SCHEDULE & SITE IMAGES
SECTION 5:	METHODOLOGY
SECTION 6:	DESIGN GUIDANCE AND GENERIC ADVICE
SECTION 7:	PRINCIPLES FOR TREE PROTECTION ON DEVELOPMENT SITES

1. INSTRUCTION

- 1.1. Barton Hyett Associates Ltd have been instructed by Pegasus Environmental on behalf of Renewable Connections Developments to survey trees located at Bubney Farm, Grindley Brook ('the site') in accordance with the recommendations of British Standard 5837:2012 '*Trees in relation to design, demolition and construction - recommendations*'.
- 1.2. The scope of the instruction was to inspect trees relevant to a planning application at the site and provide written advice on how they inform feasibility and design options for the site. The instruction also required an assessment of the potential impact (the arboricultural impact assessment) of the proposed development on the site's arboricultural resource to be undertaken.

2. SITE DESCRIPTION

- 2.1. The site is located on the outskirts of the village of Grindley Brook which is approximately 1.5 miles to the north-west of the market town of Whitchurch, Shropshire.
- 2.2. The site covers 65.2 hectares and consists of large undulating agricultural fields which are contained by managed hedgerows with the occasional mature tree.
- 2.3. The local landscape character is described as rural. Except for the main farmhouse and associated buildings, there are no other dwellings on the site.
- 2.4. Access is from an established tarmac drive which is currently utilised for the existing farm. This navigates from Chester Road (A41) to the north of the site.

3. TREE SURVEY FINDINGS

- 3.1. A total of forty-six trees, groups of trees and 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 Tree Survey and Constraints Plan (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	16	8	8	-	-
Groups	11	6	3	2	-
Hedgerows	19	-	8	11	-
Total	46	14	19	13	-

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

4. KEY ARBORICULTURAL FEATURES

- 4.1. The arboricultural resource within the site is dominated by hedgerows of varying quality. In addition, there are many other mature trees (moderate to high-quality) which are mostly contained within hedgerows and on the field boundaries. These substantial trees (referenced as: T2, T3, T4, T5, T10, T13, T14, T16, G2, G3, G4, G6 and G11) contribute to the overall character of the site.
- 4.2. Other moderate to high-quality individual trees (T6, T7, T8, T9 and T11) are located within the interiors of fields and therefore also more prominent as individual trees within the site and local area.

5. DEVELOPMENT PROPOSAL

- 5.1. Detailed planning consent is sought for the development of a solar farm and associated infrastructure including landscaping. This also includes the cable route to allow the solar farm to be connected to the grid.

6. IMPACT ASSESSMENT

- 6.1. The development proposals do not result in any of the existing trees, groups or hedgerows being removed in their entirety. However, to allow access in to the site the construction of a new internal access track will be required. This will result in the need to remove sections of moderate quality hedgerow (H8) and two low quality hedgerows (H6 and H16). In total, the removals will not exceed 15 linear metres of hedgerow.
- 6.2. These sectional removals are considered minor when viewed in the context of the overall arboricultural resource which will be retained. The proposed losses are therefore not considered to be significant in arboricultural terms.
- 6.3. In addition, the minimal hedgerow loss can be mitigated through the provision of new tree and hedgerow planting as part of the overall landscape strategy for the site.
- 6.4. Although solar farm developments are considered reasonably low impact in nature, there is still potential for damage to occur to retained trees during the construction phase of the project, unless robust tree protection is implemented.
- 6.5. The proposed perimeter security fence for the solar farm will act as an effective tree protection barrier. This will reduce the need to source and install significant linear meterage of temporary tree protection fencing. The perimeter fencing will be similar to deer fencing that will be installed on driven wooden posts with a 2 metre high mesh fence attached. If this fencing is installed ahead of any construction/installation activities commence on site, it will protect much of the arboricultural resource during this installation of the solar farm. The perimeter fence could be rolled out in phases ahead of the main construction/installation.
- 6.6. It should be noted that some trees, hedgerows located within the inner sections of the site will require temporary tree protection barriers for the duration of the construction/installation (e.g T8 and T9). It is proposed that in areas of high volume construction activity or for larger isolated trees fencing in accordance with BS5837:2012 Figure 3 should be installed. In areas where construction activities or construction traffic are less intensive, it is proposed that a lower grade of fencing (such as euro-mesh) is used in certain areas to mark the root protection zones or highlight the presence of hedgerows.

- 6.7. This lower grade fencing is also proposed adjacent to existing concrete access roads in to the site. This is a clearly defined route which should not require construction traffic any deviation from it and therefore not require full BS5837:2012 fencing.
- 6.8. Once the sectional hedgerow removal has been undertaken, it is considered that no further facilitation pruning will be required. If during the construction phase is found that additional tree works are required for access etc, then advice should be obtained by the Project Arboriculturist.
- 6.9. The security fence is shown to pass through the RPAs of Category B group (G11) and Category A tree (T13). As these works just require installing fence posts with a post driver, it is considered that the overall impact to the roots emanating from these trees would be negligible and the long-term impacts acceptable. Should concrete need to be locally utilised (within or close to RPAs) to install the posts, then a membrane (e.g. 1500 gauge DPM) should be used to line the excavation to reduce the chance of 'leaching' to adjacent soils.
- 6.10. There is adequate space within the site to allow the site compound and contractor parking to be situated without impact upon retained trees.
- 6.11. Access tracks will consist of crushed stone laid on a geo-textile membrane where existing tracks do not exist. The location of these have been positioned to avoid RPAs of retained trees which will ensure their successful retention. However, the proposed layout shows that access roads pass through the RPAs of T2, T10 and T15 (moderate to high quality). Within these areas the existing concrete access track will be utilised which is fit for purpose and therefore no impacts upon these trees are anticipated.
- 6.12. The solar farm will connect to the grid via an existing sub-station which is located to the north-east of the site adjacent to the A41. The cable route to connect to the grid does pass a number of moderate to high quality individual trees and groups (G13 - Cat B, T1, G1 and G14 - Cat A) which must be considered during the cable installation. To ensure minimal impact to the roots of these trees, it is proposed that any excavations should be located within the existing access roads and highway to avoid RPAs where possible. This may require moving the cable trench from a soft verge, to the carriageway or even crossing the highway to increase clearance to retained trees. In some instances it may be appropriate to excavate exploratory pits in advance of the works to identify whether roots are present.
- 6.13. If any trees pose a significant constraint which cannot be mitigated through the re-location of the trench, then directional drilling should be considered. It may be appropriate for the Project Arboriculturist to play an active role to advise the route to help avoid unnecessary damage to roots of adjacent trees. The final approach to the grid connection cable installation should be detailed within an approved Arboricultural Method Statement.
- 6.14. Existing ground levels within the site will remain unchanged due to the nature of the development. If during the construction phase it is found that ground levels need to be altered close to retained trees, then advice should be obtained from the Project Arboriculturist.
- 6.15. Foundations are required to install inverter and transformer units. These are all located within the interior of the site and away from existing trees, therefore will have no impact during their installation.

- 6.16. The proposals are 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 draft tree retention and removal and tree protection plan is included in section 3.

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

- 7.1. BS5837:2012 (Figure 1) recommends that detailed/technical design of tree protection and arboricultural methodologies should be resolved and finalised following on from the approval of the feasibility of a scheme by the Local Planning Authority.
- 7.2. 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 planning condition.
- 7.3. 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 7. A draft, 'heads of terms' for an arboricultural method statement is set out below:
 - Project arboriculturist – schedule of monitoring and supervision (as required)
 - Pre- commencement site meeting
 - Hedgerow removals
 - Erection of temporary tree protection barriers
 - Main construction phase - rolling out of perimeter fence in advance of installation
 - Removal of temporary tree protection barriers
 - Final landscaping including tree planting.

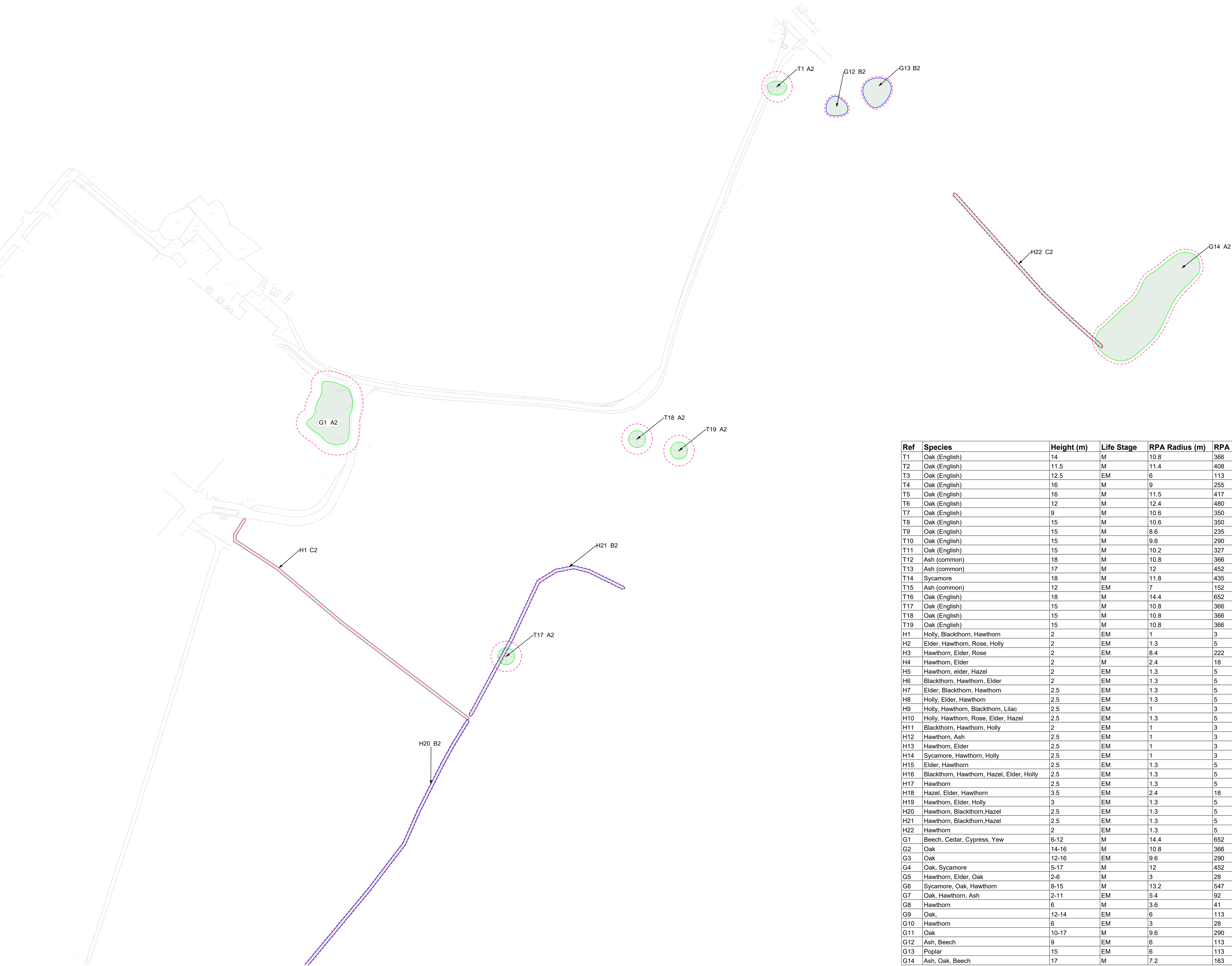
8. RECOMMENDATION AND SUMMARY

- 8.1. Subject to the implementation of the advice contained within this report the proposed development is acceptable from an arboricultural perspective. The minor loss of hedgerow can be readily mitigated through new planting and the retained trees can be adequately protected during construction activities to sustain their health and longevity.



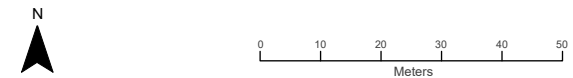
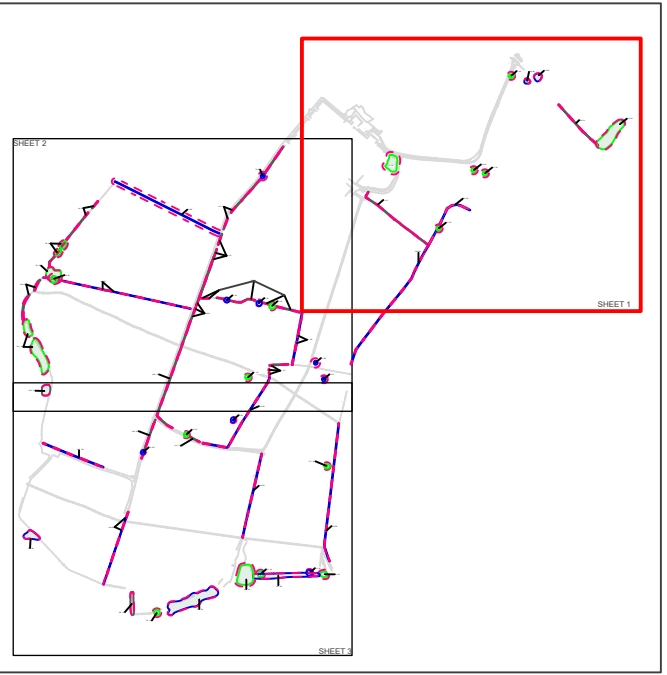
Andrew Cunningham *FdSc (Arb) Tech.Cert (AA), MArborA*
Arboriculturist

TS - 'Section 2'



Ref	Species	Height (m)	Life Stage	RPA Radius (m)	RPA (m2)
T1	Oak (English)	14	M	10.8	366
T2	Oak (English)	11.5	M	11.4	408
T3	Oak (English)	12.5	EM	6	113
T4	Oak (English)	16	M	9	255
T5	Oak (English)	16	M	11.5	417
T6	Oak (English)	12	M	12.4	480
T7	Oak (English)	9	M	10.6	350
T8	Oak (English)	15	M	10.6	350
T9	Oak (English)	15	M	8.6	235
T10	Oak (English)	15	M	9.6	290
T11	Oak (English)	15	M	10.2	327
T12	Ash (common)	18	M	10.8	366
T13	Ash (common)	17	M	12	452
T14	Sycamore	18	M	11.8	435
T15	Ash (common)	12	EM	7	152
T16	Oak (English)	18	M	14.4	652
T17	Oak (English)	15	M	10.8	366
T18	Oak (English)	15	M	10.8	366
T19	Oak (English)	15	M	10.8	366
H1	Holly, Blackthorn, Hawthorn	2	EM	1	3
H2	Elder, Hawthorn, Rose, Holly	2	EM	1.3	5
H3	Hawthorn, Elder, Rose	2	EM	8.4	222
H4	Hawthorn, Elder	2	M	2.4	18
H5	Hawthorn, elder, Hazel	2	EM	1.3	5
H6	Blackthorn, Hawthorn, Elder	2	EM	1.3	5
H7	Elder, Blackthorn, Hawthorn	2.5	EM	1.3	5
H8	Holly, Elder, Hawthorn	2.5	EM	1.3	5
H9	Holly, Hawthorn, Blackthorn, Lilac	2.5	EM	1	3
H10	Holly, Hawthorn, Rose, Elder, Hazel	2.5	EM	1.3	5
H11	Blackthorn, Hawthorn, Holly	2	EM	1	3
H12	Hawthorn, Ash	2.5	EM	1	3
H13	Hawthorn, Elder	2.5	EM	1	3
H14	Sycamore, Hawthorn, Holly	2.5	EM	1	3
H15	Elder, Hawthorn	2.5	EM	1.3	5
H16	Blackthorn, Hawthorn, Hazel, Elder, Holly	2.5	EM	1.3	5
H17	Hawthorn	2.5	EM	1.3	5
H18	Hazel, Elder, Hawthorn	3.5	EM	2.4	18
H19	Hawthorn, Elder, Holly	3	EM	1.3	5
H20	Hawthorn, Blackthorn, Hazel	2.5	EM	1.3	5
H21	Hawthorn, Blackthorn, Hazel	2.5	EM	1.3	5
H22	Hawthorn	2	EM	1.3	5
G1	Beech, Cedar, Cypress, Yew	6-12	M	14.4	652
G2	Oak	14-16	M	10.8	366
G3	Oak	12-16	EM	9.6	290
G4	Oak, Sycamore	5-17	M	12	452
G5	Hawthorn, Elder, Oak	2-6	M	3	28
G6	Sycamore, Oak, Hawthorn	8-15	M	13.2	547
G7	Oak, Hawthorn, Ash	2-11	EM	5.4	92
G8	Hawthorn	6	M	3.6	41
G9	Oak,	12-14	EM	6	113
G10	Hawthorn	6	EM	3	28
G11	Oak	10-17	M	9.6	290
G12	Ash, Beech	9	EM	6	113
G13	Poplar	15	EM	6	113
G14	Ash, Oak, Beech	17	M	7.2	163

- 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/outline of scope (OOS)



PROJECT TITLE
Bubney Solar Farm, Grindley Brook, Whitchurch (P.4012)

DRAWING TITLE
Tree Survey & Constraints Plan

SCALE
1:1250 @ A1

DRAWING NUMBER
BHA_1022_01

DRAWN BY
DV

APPROVED BY
AC

REVISION
A

SHEET
1/3

DATE
12/11/2020

LAYOUT USED WITHIN DRAWING
-

CLIENT
Renewable Connections Developments

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

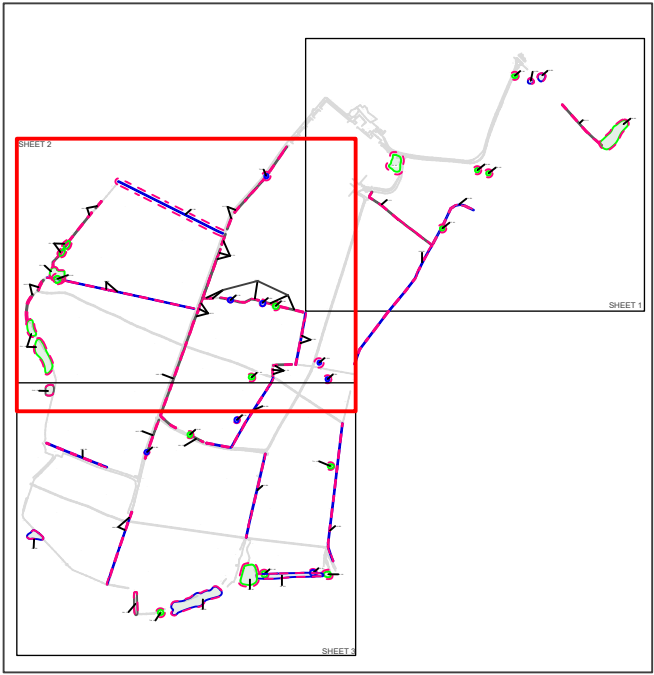
Crown copyright. All rights reserved. 2019 Emappelle Licence number 0100061264.
Ordnance Survey Copyright Licence number 100054267.

Barton Hyett Associates
Arboricultural Consultants

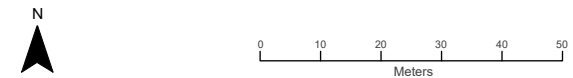
Tel: 01386 578161
Address: Barn 2, Opens Farm, Yarnworth,
Cheltenham, GL54 3QE

TS - 'Section 2'

- 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/offset tree/outline of scope (OOS)



Site Layout @ 1:20,000



PROJECT TITLE
Bubney Solar Farm, Grindley Brook, Whitchurch (P.4012)

DRAWING TITLE
Tree Survey & Constraints Plan

SCALE 1:1250 @ A1		DRAWING NUMBER BHA_1022_01		
DRAWN BY DV	APPROVED BY AC	REVISION A	SHEET 2/3	DATE 12/11/2020

LAYOUT USED WITHIN DRAWING
-

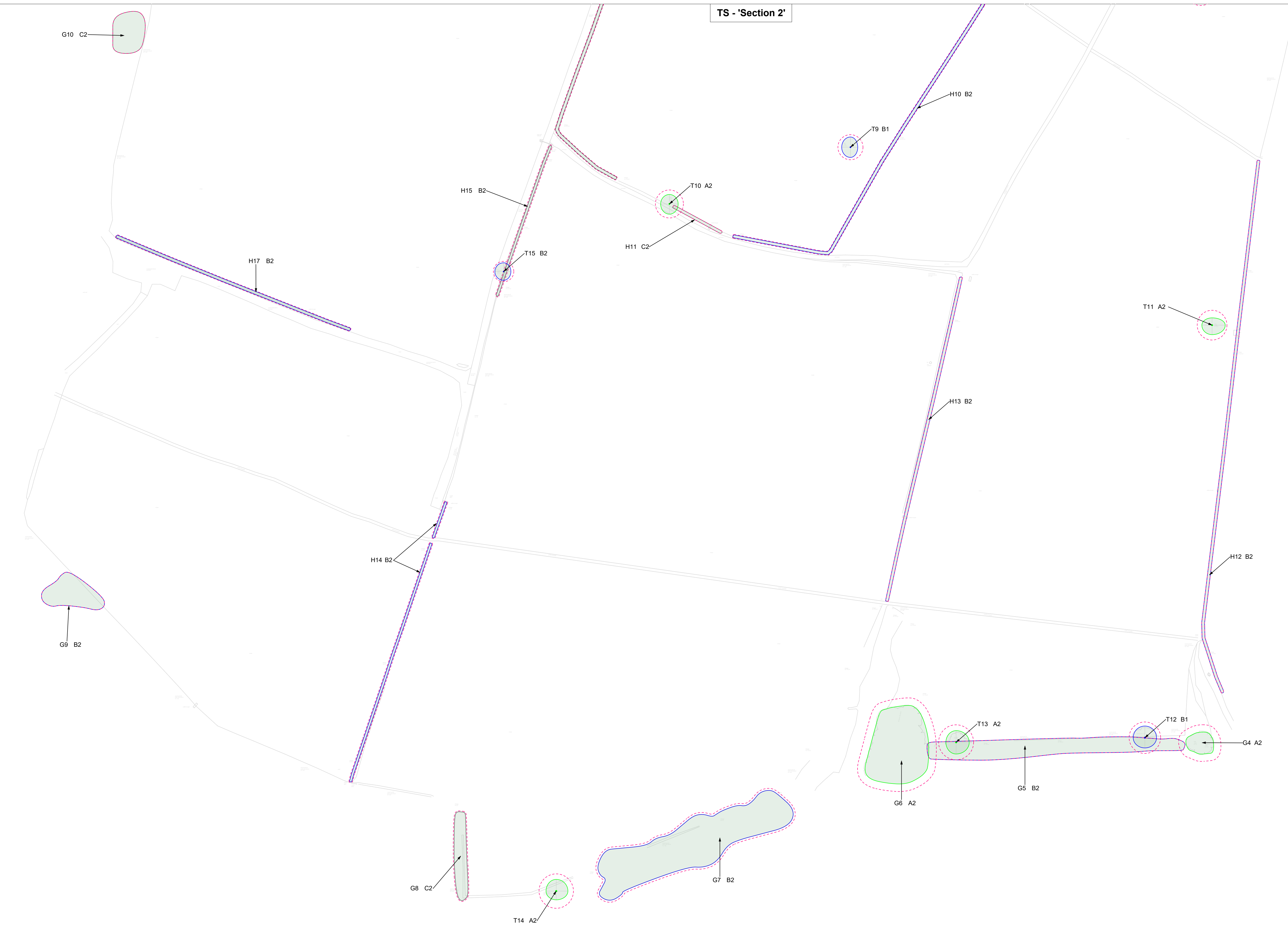
CLIENT
Renewable Connections Developments

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

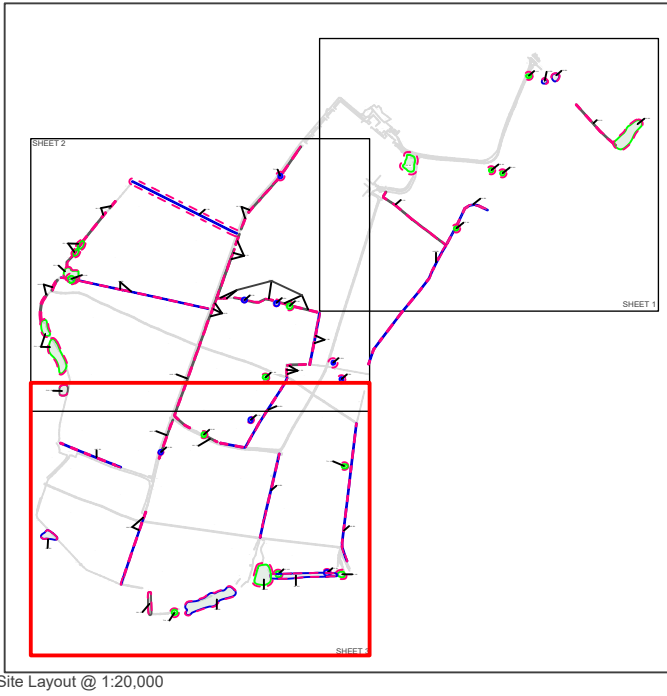
Crown copyright. All rights reserved. 2019 Emapette Licence number 0100061264.
Ordnance Survey Copyright Licence number 100054267.

Barton Hyett Associates
Arboricultural Consultants

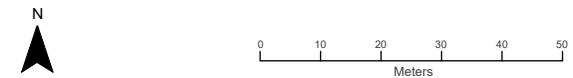
Tel: 01386 578161
Address: Elm 2, Opens Farm, Yarworth,
Cheltenham, GL54 3QE



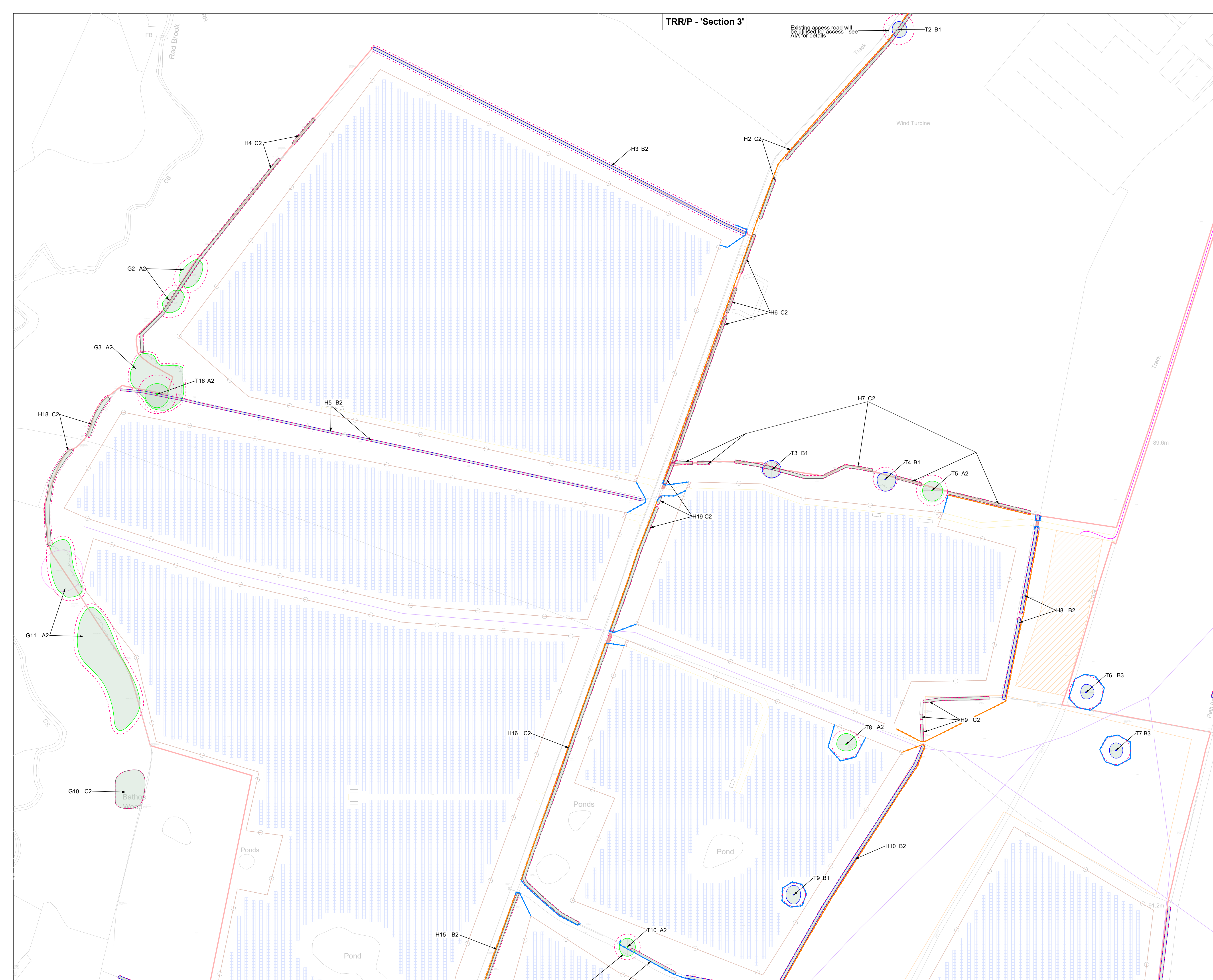
- KEY**
- Category A Tree - High quality (Retention highly desirable)
 - Category A - Hedgerow, Group, Woodland - High quality (Retention highly desirable)
 - Category B Tree - Moderate quality (Retention desirable)
 - Category B - Hedgerow, Group, Woodland - Moderate quality (Retention desirable)
 - 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)



Site Layout @ 1:20,000



PROJECT TITLE				
Bubney Solar Farm, Grindley Brook, Whitchurch (P.4012)				
DRAWING TITLE				
Tree Survey & Constraints Plan				
SCALE		DRAWING NUMBER		
1:1250 @ A1		BHA_1022_01		
DRAWN BY	APPROVED BY	REVISION	SHEET	DATE
DV	AC	A	3/3	12/11/2020
LAYOUT USED WITHIN DRAWING				
-				
CLIENT				
Renewable Connections Developments				
COORDINATE SYSTEM / DATUM				
British National Grid / Newlyn Datum (AOD)				
Crown copyright. All rights reserved. 2019 Emapielle Licence number 0100061264. Ordnance Survey Copyright Licence number 100054267.				



- ## KEY
-  Category A Tree - High quality
(Retention highly desirable)
 -  Category A - Hedgehog, Group, Woodland - High quality
(Retention highly desirable)
 -  Category B Tree - Moderate quality
(Retention desirable)
 -  Category B - Hedgehog, Group, Woodland - Moderate quality
(Retention desirable)
 -  Category C Tree - Low quality
(May be retained but should not constrain development)
 -  Category C - Hedgehog, Group, Woodland - Low quality
(May be retained but should not constrain development)
 -  Category U Tree - Very low quality
(Mostly unsuitable for retention)
 -  Category U - Hedgehog, Group, Woodland - Very low quality
(Mostly unsuitable for retention)
 -  Red 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
 -  Shrink mass/soil profile of scope (OOS)
 -  Tree/ Tree Hedgehog / Group to be removed to allow development to be implemented
 -  Tree Protection Barrier in accordance to BS5857:2012
 -  Secondary Tree Protection Barrier - location to allow works within CEZ only (in accordance with BS5857:2012)



Construction Exclusion Zone(s)

INSTALLING PROTECTION
Protective barriers and ground protection (as approved), must be installed before any materials or machinery are brought onto the site and before the commencement of any demolition, general site clearance, ground or construction works of any description.

RETENTION OF PROTECTION
All protective measures must remain fully intact, vertical (in the case of barriers) and in their approved locations from the outset of the development. They must be maintained, at all times, until all works have been completed on site, including any earthworks and associated soft landscaping works. Any approved phasing of protective measures must be

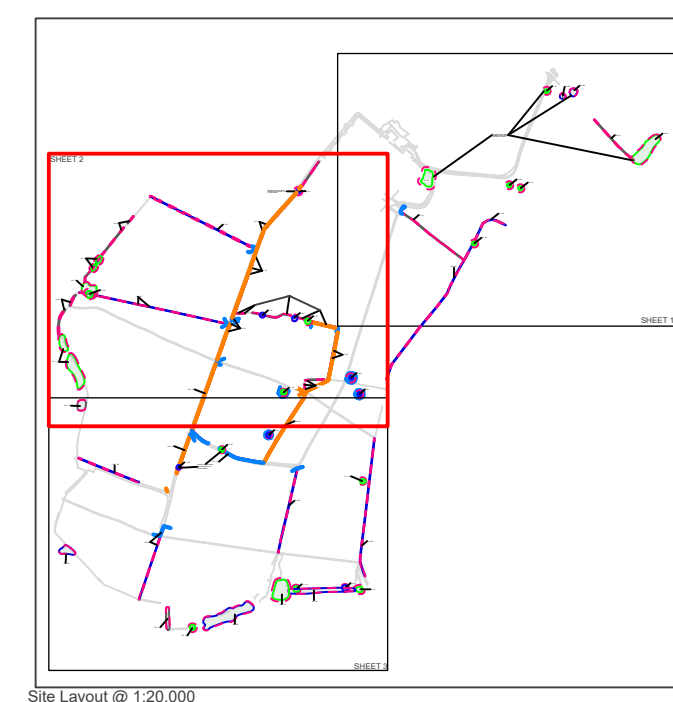
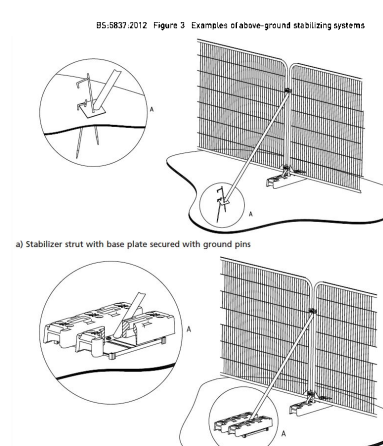
RESTRICTIONS
Construction Exclusion Zone(s) are to remain completely undisturbed for the duration of all development works. No construction activity of any description including but not limited to

- No excavation of any description.
- No storage, disposal of soil, rubble or materials of any other description.
- No alterations to existing levels or ground conditions.

- No herbicide sprays, painting or use of any chemicals or materials in any way or any description.
- No tree works, without the written consent of the Council's Planning service.
- No erection of temporary structures of any description.
- No fires.
- No storage, disposal, handling or use of any chemicals including cement.

- No fixtures or fittings of any description, security lighting, signage etc shall be attached to any part of a tree.
- No fires shall be light within 10 metres of the canopies of any tree or spread of any hedge.

- No chemicals, fuel, liquids/waste residues of any other description to be stored or disposed of within close proximity to or drained towards/into protected areas.



Site Layout @ 1:20,000



PROJECT TITLE	Bubney Solar Farm, Grindley Brook, Whitchurch (P.4012)
---------------	---

DRAWING TITLE

Tree Retention, Removal & Protection Plan

SCALE 1:1250 @ A1		DRAWING NUMBER BHA_1022_02	
DRAWN BY DV	APPROVED BY AC	REVISION A	SHEET 2/3
			DATE 16/03/2021

LAYOUT USED WITHIN DRAWING **RNC002-MASTER XREF**

CLIENT	Renewable Connections Developments
COORDINATE SYSTEM / DATUM	British National Grid / Newlyn Datum (AOD)

Crown copyright. All rights reserved. 2019 Emapsite Licence number 0100061264.
Ordnance Survey Copyright Licence number 100054267.





- ## KEY
-  Category A Tree - High quality
(Retention highly desirable)
 -  Category A - Hedgehog, Group, Woodland - High quality
(Retention highly desirable)
 -  Category B Tree - Moderate quality
(Retention desirable)
 -  Category B - Hedgehog, Group, Woodland - Moderate quality
(Retention desirable)
 -  Category C Tree - Low quality
(May be retained but should not constrain development)
 -  Category C - Hedgehog, Group, Woodland - Low quality
(May be retained but should not constrain development)
 -  Category U Tree - Very low quality
(Mostly unsuitable for retention)
 -  Category U - Hedgehog, Group, Woodland - Very low quality
(Mostly unsuitable for retention)
 -  Red 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
 -  Shrink safe/freeze/total of scope (OOS)
 -  Tree / Hedgehog / Group to be removed to allow development to be implemented
 -  Tree Protection Barrier in accordance to BS5857:2012
 -  Secondary Tree Protection Barrier - location to allow works within CEZ only (in accordance with Schedule A1)



Construction Exclusion Zone(s)

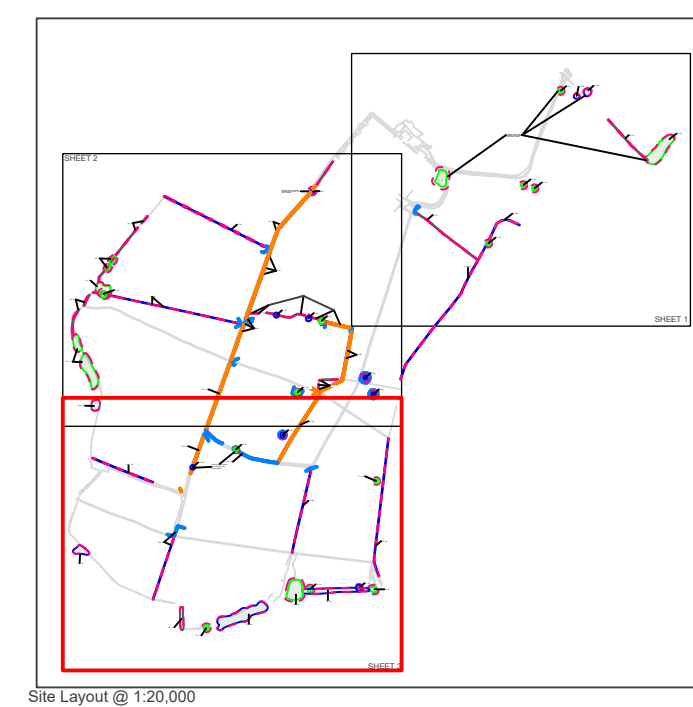
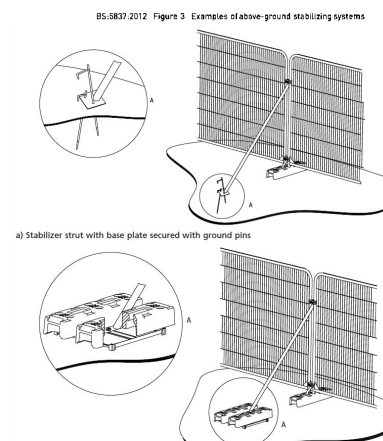
INSTALLING PROTECTION
Protective barriers and ground protection (as approved), must be installed before any materials or machinery are brought onto the site and before the commencement of any demolition, general site clearance, ground or construction works of any description.

RETENTION OF PROTECTION
All protective measures must remain fully intact, vertical (in the case of barriers) and in the specified locations from the outset of the development. They must be maintained, as all times, until all works are completed on site, including any earthworks and associated soil landscaping works. Any approved phasing of protective measures must be fully observed and complied with.

RESTRICTIONS

Construction Exclusion Zone(s) are to remain completely undisturbed for the duration of development works. No construction activity of any description including but not limited to the following must occur within these areas at any time:

- No excavation of any description;
- No stacking of materials or materials of any other description;
- No alterations to existing levels or ground conditions;
- No refuelling, cleaning, parking or use of any tracked or wheeled machinery of any description;
- No tree works, without the written consent of the Council's Planning service;
- No erection of temporary structures of any description;
- No fires;
- No storage disposed handling or use of any chemicals including cement, resins, etc;
- No fumes or fillings of any description, security lighting, signage etc shall be allowed within 10 metres of the Exclusion Zone;
- No fires shall be light within 10 metres of the canopies of any tree or spread of any hedge;
- No chemicals, fuel, liquid/waste residues of any other description to be stored or disposed of within close proximity to or drained towards protected areas;



PROJECT TITLE	Bubney Solar Farm, Grindley Brook, Whitchurch (P.4012)
---------------	---

DRAWING TITLE
Tree Retention, Removal & Protection Plan

SCALE 1:1250 @ A1		DRAWING NUMBER BHA_1022_02		
DRAWN BY DV	APPROVED BY AC	REVISION A	SHEET 3/3	DATE 16/03/2021

LAYOUT USED WITHIN DRAWING **RNC002-MASTER XREF Rev 6**

CLIENT	Renewable Connections Developments
--------	---

Crown copyright. All rights reserved. 2019 Emapsite Licence number 0100081264.
Ordnance Survey Copyright Licence number 100054267.





INDIVIDUAL TREES

Ref	Species	On / off site	Height (m)	No. of Stems	Est diam?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. Canopy Height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Struct. cond.	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²
T1	Oak (English)	On	14.0	1	-	900	4-7-6-7	5.0	6	S	M	None	Mature tree located adjacent to access road, high canopy. Established tarmac access road adjacent.	Good	Good	40+	A2	10.8	366
T2	Oak (English)	On	11.5	1	#	950	6-6-6-5	5.0	3	NW	M	None	Mature tree located adjacent to access road, some retrenchment within canopy, typical hedgerow tree. Existing concrete beam access road within 2m of stem.	Fair	Good	20+	B1	11.4	408
T3	Oak (English)	On	12.5	1	-	500	7-7-6-7	4.5	3	E	EM	None	Early-mature tree located within hedgerow. Typical form, canopy lifted in past.	Good	Good	40+	B1	6.0	113
T4	Oak (English)	On	16.0	1	-	750	5-8-9-6	4.5	3.5	S	M	None	Hedgerow tree, canopy unbalanced and weighted to the south. Deadwood throughout. Some retrenchment. Typical form.	Fair	Good	40+	B1	9.0	255
T5	Oak (English)	On	16.0	1	-	960	7-8-8-7	4.0	3.5	S	M	None	Tree located on boundary. Good form. Minor deadwood throughout.	Good	Good	40+	A2	11.5	417
T6	Oak (English)	Off	12.0	1	-	1030	6-6-5-4	6.0	4	S	M	None	Tree located off-site adjacent to access track. Major retrenchment within canopy, epicormic growth to stem, cavities at base. Some veteran characteristics.	Poor	Fair	20+	B3	12.4	480
T7	Oak (English)	On	9.0	1	-	880	5.5-5-6-5	2.0	2.5	W	M	None	Small mature tree located within interior of field. Plough pan around tree, historic lighting strike to stem with exposed heartwood, minor retrenchment within upper canopy.	Fair	Good	20+	B3	10.6	350
T8	Oak (English)	On	15.0	1	-	880	8-8-5-7	3.0	2.5	E	M	None	Mature tree located within field interior. Good form, plough pan within 3m of stem, minor retrenchment.	Good	Good	40+	A2	10.6	350

Ref	Species	On / off site	Height (m)	No. of Stems	Est diam?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. Canopy Height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Struct. cond.	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²
T9	Oak (English)	On	15.0	1	-	720	7-5-7-6	6.0	5	W	M	None	Tree located within field interior, canopy lifted in past to form high canopy tree. Some retrenchment within canopy.	Good	Good	20+	B1	8.6	235
T10	Oak (English)	On	15.0	1	-	800	6.5-6-7-6	5.0	2.5	S	M	None	Tree located on field boundary. Typical form. Minor Fistulina brackets to stem.	Good	Good	40+	A2	9.6	290
T11	Oak (English)	On	15.0	1	-	850	5-9-6.5-7	5.0	4	S	M	None	Mature tree located within field interior. Good form, plough pan within 3m of stem.	Good	Good	40+	A2	10.2	327
T12	Ash (common)	On	18.0	1	-	900	8-8-7-8	5.0	3	NW	M	None	Mature tree located on boundary, historic limb failure in lower canopy. Substantial tree	Good	Good	20+	B1	10.8	366
T13	Ash (common)	On	17.0	4	-	1000	8-9-8-7	3.0	2	S	M	None	Old pollard now multi-stemmed, good form. Plough line within 3m of stem.	Good	Good	40+	A2	12.0	452
T14	Sycamore	Off	18.0	3	#	980	8-8-6-7	2.5	2.5	W	M	None	Multi-stemmed tree located adjacent to site boundary. Good form. Limited access to base.	Good	Fair	40+	A2	11.8	435
T15	Ash (common)	On	12.0	3	-	580	6-5-6-6	5.0	2.5	S	EM	None	Multi-stemmed tree located adjacent to concrete access road, canopy lifted in past. Typical form.	Good	Fair	20+	B2	7.0	152
T16	Oak (English)	On	18.0	1	-	1200	8-9-10-9	5.0	4.5	SW	M	None	Mature tree located on edge of field. Part of larger group. Good overall form, minor deadwood.	Good	Good	40+	A2	14.4	652
T17	Oak (English)	On	15.0	1	#	900	6-6-6-6	5.0	N/a	N/a	M	None	Mature tree located within hedgerow.	Good	Good	40+	A2	10.8	366
T18	Oak (English)	On	15.0	1	#	900	6-6-6-6	5.0	N/a	N/a	M	None	Mature tree located within open farmland	Good	Good	40+	A2	10.8	366
T19	Oak (English)	On	15.0	1	#	900	-6-6-6	5.0	N/a	N/a	M	None	Mature tree located within open farmland	Good	Good	40+	A2	10.8	366



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. Canopy Height (m)	Life Stage	Special importance	General Observations	Health & vitality	Struct. cond.	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)
G1	Beech, Cedar, Cypress, Yew	On	6-12	5	#	1200.0	7	2.0	M	None	Group of trees located within farmhouse garden. Good form.	Good	Good	40+	A2	14.4
G2	Oak	On	14-16	2	#	900.0	7	3.5	M	None	Two similar sized trees located on site boundary. Typical hedgerow tree form. Limited access to tree stems.	Good	Good	40+	A2	10.8
G3	Oak	On	12-16	4	-	800.0	8	4.0	EM	None	Obvious boundary group. Good collectively, cohesive canopies. Minor deadwood in canopies.	Good	Good	40+	A2	9.6
G4	Oak, Sycamore	Off	5-17	2	#	1000.0	7	2.0	M	None	Obvious group located off-site, Sycamore twin stemmed and mature, suppressed early mature POak contained within. Prominent form.	Good	Good	40+	A2	12.0
G5	Hawthorn, Elder, Oak	Off	2-6	20	#	250	3	1.0	M	None	Area of scrubby trees located off-site. Land drops away to south.	Good	Good	20+	B2	3.0
G6	Sycamore, Oak, Hawthorn	On	8-15	10	#	1100	8	1.0	M	None	Area of trees, cohesive form. Located within hollow. Good collectively form.	Good	Good	40+	A2	13.2
G7	Oak, Hawthorn, Ash	Off	2-11	20	#	450	4	1.0	EM	None	Linear group of off-site trees, land slopes to the south. Good collectively.	Good	Good	40+	B2	5.4
G8	Hawthorn	Off	6	7	#	300	3	1.0	M	None	Linear group of off-site trees. Some in decline with obvious dieback.	Fair	Good	20+	C2	3.6
G9	Oak,	Off	12-14	2	#	500	6	2.0	EM	None	Two tree group located off-site and on slope to south. Good collective form.	Good	Good	40+	B2	6.0
G10	Hawthorn	Off	6	2	#	250	3	1.0	EM	None	Two off-site trees close to site boundary. Typical form.	Good	Good	20+	C2	3.0
G11	Oak	Off	10-17	12	#	800	7	1.0	M	None	Linear group of similar sized trees located on site boundary, some trees overhang site by 6-7m. Limited information on topo.	Good	Good	40+	A2	9.6
G12	Ash, Beech	Off	9	5	#	500	5	2.0	EM	None	offsite group adjacent to highway. Limited access.	Good	Good	20+	B2	6.0
G13	Poplar	Off	15	3	#	500	5	2.0	EM	None	offsite group adjacent to highway. Limited access.	Good	Good	20+	B2	6.0
G14	Ash, Oak, Beech	Off	17	20	#	600	5	1.0	M	None	Linear group offsite trees. Prominent. Limited access.	Good	Good	40+	A2	7.2



HEDGES

Ref	Species	On / off site	Avg. Height (m)	Avg. width (m)	Avg. Stem diam (mm)	Avg. Canopy Height (m)	Life Stage	General Observations	Health & vitality	Struct. cond.	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)
H1	Holly, Blackthorn, Hawthorn	On	2.0	2	75	0.1	EM	Managed hedgerow. Flailed to current dimensions.	Good	Good	10+	C2	1.0
H2	Elder, Hawthorn, Rose, Holly	On	2.0	2	100	0.1	EM	Managed hedgerow flailed to current dimensions, gaps in places but uniform.	Good	Good	20+	C2	1.3
H3	Hawthorn, Elder, Rose	On	2.0	2	200	0.1	EM	Managed hedgerow located adjacent to field boundary. Recently flailed, evidence of historic laying.	Good	Good	20+	B2	2.4
H4	Hawthorn, Elder	On	2.0	2	200	0.2	M	Managed boundary hedgerow, gaps in places. Recently flailed.	Good	Good	20+	C2	2.4
H5	Hawthorn, elder, Hazel	On	2.0	1.5	100	0.2	EM	Managed boundary hedgerow, recently flailed. Dense, good screen.	Good	Good	20+	B2	1.3
H6	Blackthorn, Hawthorn, Elder	On	2.0	2.0	100	0.1	EM	Managed boundary hedgerow, gaps in places.	Good	Good	20+	C2	1.3
H7	Elder, Blackthorn, Hawthorn	On	2.5	2.0	100	0.1	EM	Past managed hedgerow. Grown up in places. Gaps in places.	Good	Good	20+	C2	1.3
H8	Holly, Elder, Hawthorn	On	2.5	2.0	100	0.1	EM	Past managed hedgerow, evidence of past laying. Gaps in places.	Good	Good	20+	B2	1.3
H9	Holly, Hawthorn, Blackthorn, Lilac	On	2.5	2.0	75	0.1	EM	Partially managed hedgerow, gaps in places.	Good	Good	20+	C2	1.0
H10	Holly, Hawthorn, Rose, Elder, Hazel	On	2.5	2.0	100	0.1	EM	Managed hedgerow, spreading form. Mostly continuous.	Good	Good	20+	B2	1.3
H11	Blackthorn, Hawthorn, Holly	On	2.0	2.0	75	0.1	EM	Managed hedgerow, recently flailed.	Good	Good	20+	C2	1.0
H12	Hawthorn, Ash	On	2.5	2.0	75	0.1	EM	Managed boundary hedgerow, mostly continuous form.	Good	Good	20+	B2	1.0
H13	Hawthorn, Elder	On	2.5	2.0	75	0.2	EM	Managed hedgerow, evidence of historic laying. Gaps in places.	Good	Good	20+	B2	1.0
H14	Sycamore, Hawthorn, Holly	On	2.5	1.5	75	0.2	EM	Managed boundary hedgerow. Gaps in places. Evidence of laying.	Good	Good	20+	B2	1.0
H15	Elder, Hawthorn	On	2.5	1.5	100	0.2	EM	Managed hedgerow adjacent to access road. Evidence of past laying.	Good	Good	20+	C2	1.3
H16	Blackthorn, Hawthorn, Hazel, Elder, Holly	On	2.5	2.0	100	0.2	EM	Managed hedgerow adjacent to access road. Mostly continuous form. Laid in past.	Good	Good	20+	C2	1.3
H17	Hawthorn	On	2.5	2.0	100	0.2	EM	Managed boundary hedgerow, gaps in places.	Good	Good	20+	B2	1.3
H18	Hazel, Elder, Hawthorn	On	3.5	3.0	200	0.3	EM	Unmanaged boundary hedgerow, gaps in places, dominated by Hazel.	Good	Good	20+	C2	2.4
H19	Hawthorn, Elder, Holly	On	3.0	2.0	100	0.1	EM	Managed hedgerow adjacent to access road. Mostly continuous in form.	Good	Good	20+	C2	1.3
H20	Hawthorn, Blackthorn,Hazel	On	2.5	2.0	100	0.1	EM	Managed hedgerow. Flailed to current dimensions.	Good	Good	20+	B2	1.3
H21	Hawthorn, Blackthorn,Hazel	On	2.5	2.0	100	0.1	EM	Managed hedgerow. Flailed to current dimensions.	Good	Good	20+	B2	1.3
H22	Hawthorn	Off	2.0	2.0	100	0.1	EM	Managed roadside hedgerow.	Good	Good	20+	C2	1.3



IMAGE 1: Looking south from the entrance of the site off Chester Road (A41). Mature high quality Oak tree T1 located adjacent to existing access drive.



IMAGE 2: Looking west from northern section of the site towards high to moderate quality mature Oak trees T4 and T5. Both were significant arboricultural features.



IMAGE 3: Looking west from the eastern region of the site towards moderate quality Oak tree T9. This tree was located within a field interior and was subject to past canopy lifting.



IMAGE 4: Looking east along southern boundary towards high quality Sycamore tree T14.



IMAGE 5: Looking north-east towards high quality Oak tree T16 which is located on the western boundary and forms part of a larger high quality group G3.



IMAGE 6: Looking north-east along main access road in to the site. Managed hedgerows were mostly located adjacent to this road, however, there were some moderate quality individual trees such as Oak T2.

- 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

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)

T1

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.

T9

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:

T1

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

T1

On new development sites:

T1

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

The National Planning Policy Framework 2019 (NPPF paragraph 175) states that:

'development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused unless there are wholly exceptional reasons, and a suitable compensation strategy exists'.

In this respect the following definitions apply:

'Ancient woodland: An area that has been wooded continuously since at least 1600 AD. It includes ancient semi-natural woodland and plantations on ancient woodland sites (PAWS)', and

'Ancient or veteran tree: A tree which, because of its age, size and condition, is of exceptional biodiversity, cultural or heritage value. All ancient trees are veteran trees. Not all veteran trees are old enough to be ancient, but are old relative to other trees of the same species. Very few trees of any species reach the ancient life-stage.'

Note: Further information from the National Planning Policy Guidance Suite and Standing Advice is provided in the design guidance section.

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 if 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.

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 Planning 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.

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



PEGASUS GROUP BRISTOL

First Floor, South Wing, Equinox North,
Great Park Road, Almondsbury, Bristol, BS32 4QL

E Bristol@pegasusgroup.co.uk

T 01454 625 945

PEGASUSGROUP.CO.UK



Pegasus Group is a trading name of Pegasus Planning Group Limited (07277000) registered in England and Wales
Registered Office: Pegasus House, Querns Business Centre, Whitworth Road, Cirencester, Gloucestershire, GL7 1RT



DESIGN



ENVIRONMENT



PLANNING



ECONOMICS



HERITAGE