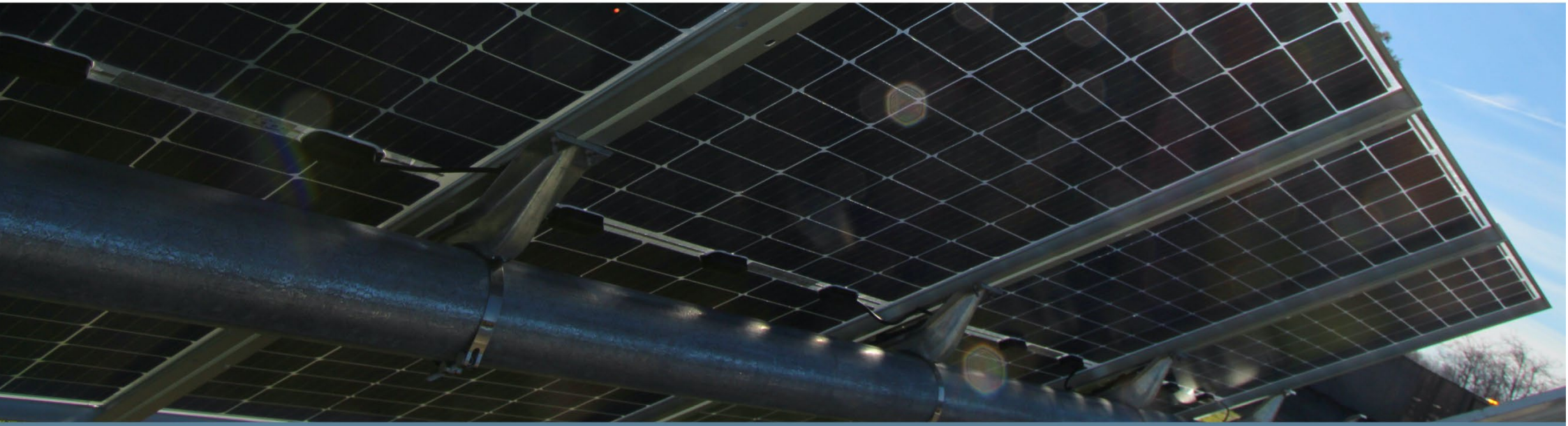
ARBORICULTURAL IMPACT ASSESSMENT

SOUTHLANDS SOLAR FARM AND BATTERY STORAGE
LAND SOUTH OF RUNWELL ROAD (A132), RUNWELL, WICKFORD
P19-AIA OCTOBER 2022



Summary table		
Site Name:	Southlands Solar Farm	
Project reference:	4865	
Site Address:	Land South of Runwell Road (A132), Runwell, Wickford	
Nearest Postcode:	SS11 7QH	
Central Grid reference:	TQ 76495 94589	
Local Planning Authority:	Chelmsford City Council (CCC) - solar farm & cable; and Rochford District Council (RDC) - cable.	
Relevant planning policies:	**CCC Local Plan** 2013-2036. 'S4 - Conserving & Enhancing the Natural Environment', 'DM17 - Trees, Woodland and Landscape Features'. **RDC** local development framework core strategy (adopted version, December 2011), policy ENV1 - protection and enhancement of the natural landscape and habitats and the protection of historical and archaeological sites. RDC local development framework development management plan (adopted 16 December 2014), policy DM1 - design of new developments; policy DM25 - trees and woodlands; policy DM26 - other important landscape features; policy DM27 - species and habitats protection. RDC supplementary planning document (SPD) 7 - design, landscaping and access statements (January 2007).	
Statutory Controls:	**Tree Preservation Order**	**Conservation Area**
	CCC - None; RDC - TBC	CCC - No; RDC - TBC
Soil Type: (Source: BGS online soils map © NERC 2022)	**Superficial/Drift**	**Bedrock**
	Clayey loam to silty loam with limited amount of sandy loam present	London Clay Formation - Clay, silt and sand
Topographical Survey:	Drawing No: TX1402_RAY 3_T (sheets 1 - 6), dated: 15th of August 2022	
Notes:	None	
Report author:	David Holmes *FdSc, MArborA*	
Checked by:	Richard Hyett *MSc, BSc (Hons), MICFor, MArborA*	
Date of issue:	31st of October 2022	

Arboricultural Association
Professional Member
PR01027

Institute of Chartered Foresters
registered

Barton Hyett
Arboricultural Consultants

REPORT CONTENTS:

1. INTRODUCTION

1.1. Barton Hyett Associates Ltd have been instructed to survey trees located at Wickford, Essex ('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 for a solar farm at the site and provide written advice on how they inform feasibility and design options. 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 lies 1.5 miles north-east of the town of Wickford and is made up of agricultural land with field boundaries being defined by a mixture of hedgerows and ditches.

2.2. The survey area measures approximately 68 hectares and is made up of 5 fields used for arable crop production. The site slopes gently down to the south with the approximate height above mean sea level varying between 20m and 10m.

2.3. To the south of the site, the *River Crouch* runs east to west. The A130 dual carriageway runs from north to south at the east of the site. The Crouch Valley Railway line forms a boundary with the south-east corner of the site.

2.4. The surrounding area is agricultural land with occasional farms and outlying dwellings and the village of Battlesbridge is located just under 1 mile to the east of the site. Currently, access to the site is possible from Runwell Road. There is a public footpath crossing the approximate centre of the site, running from east-to-west.

3. TREE SURVEY FINDINGS

3.1. A total of 35 trees, 29 group features and 36 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**).

4. KEY ARBORICULTURAL FEATURES

4.1. At the time of the survey, the UK had experienced a heatwave which gave rise to a phenomenon labelled as false autumn, in which trees displayed early signs of senescing foliage (falling leaves). At the time of writing, the UK Met Office has reported that 2022 was the hottest year since records began. This was evident along highways routes where it supposed that the heat retention of tarmac is greater. For the purpose of this survey, the majority of trees encountered to the internal field boundaries did not display signs of 'false Autumn'.

4.2. I have consulted DEFRA's 'Magic Map' website to check for the presence of ancient woodland (ASNW) which revealed there are no records associated with the site. Consulting the Woodland Trust's 'Ancient Tree Inventory' website did not reveal any records of ancient or veteran trees on this site. A check has been made

	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	**35**	15	19	1	-
Groups	**29**	3	24	2	-
Hedgerows	**36**	-	31	5	-
Total	**100**	**18**	**74**	**8**	**-**

with both relevant LPAs with regards to the protection status of any trees on site (i.e. those protected by Tree Preservation Order). A response from RDC to the enquiry is still awaited.

4.3. The individual trees (T4, T7, T8, T10, T13, T14, T15, T16, T18, T20, T21, T30, T31, T33 and T35) and groups (G10, G28 and G29) have been assigned to Category A (high-quality). These trees and features were found to be good examples of their species with limited obvious defects.

4.4. The offsite horse chestnut T1 shows several radial cracks to scaffold limbs and minor deadwood throughout the crown. Several other chestnuts in the same stand (G2) did not show the same defects. It is recommended that the location and condition be brought to the attention of the local highways authority for them to schedule their own inspection.

5. PROPOSED DEVELOPMENT

5.1. The development proposal is to install a solar farm within the site, along with the associated infrastructure of access tracks, security fencing, CCTV and underground cable connections. The proposed site layout is shown on the proposed site plan, drawing no: RC3-02-P02, Rev. 02, dated: 04/10/2022 (as amended and submitted).

6. IMPACT ASSESSMENT

6.1. The impact assessment considers the effects of any tree 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. Actual and potential impacts can include tree removal to facilitate the development, 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.

<u>Trees to be removed</u>

6.2. To facilitate the layout, 3 sections of hedgerow are proposed to be removed. These removals are summarised by quality category in the table below and shown on the Tree Retention and Removal Plan in **Section 3**.

6.3. In order to provide appropriate site access and facilitate security fencing it will be necessary to remove 3 sections from the moderate-quality hedgerows H2 and H28, along with a section from the low-quality hedgerow H26.

6.4. The removal of a section of H2 is to provide a direct connection between two different areas and avoids the root protection areas (RPAs) of more significant trees; there is an existing track at this point and the removal is to allow reinstatement of this track. The removal of 2 sections from H26 and H28 is to facilitate access and the installation of perimeter security fencing; this will in the long-term prevent 'orphan' sections of hedgerow from being created. In the instance of H26, many of the stems proposed for removal are dead or in decline. The loss of these sections can be mitigated with additional planting elsewhere on-site. The restoration of existing hedgerows would be a suitable opportunity to maintain the integrity of existing features and increase biodiversity.

Impacts on retained trees

6.5. The existing tracks are to be utilised where possible and the traffic during the construction phase of the development will be no more significant than the years of previous agricultural usage. Where the surfacing is to be improved for existing tracks or existing infrequently used tracks which pass through the RPAs of retained trees, no excavations are to take place and the existing levels will be retained as a sub-base with a geotextile separation layer installed prior to installing the wearing-layer. Ground-level changes within the Root Protection Areas (RPAs) of trees are to be avoided.

6.6. The site construction and operation tracks are to be approximately 4m wide consisting of compacted aggregate. The use of limestone for the aggregate is to be avoided; in the mid to longterm, limestone leaching into the soil will restrict the availability of nutrients as the soil chemistry is altered, and this will have a detrimental effect on the vigour of the trees.

6.7. The width of existing tracks should be retained, particularly when running between arboricultural features. Where this is unavoidable and the track width needs to be widened to avoid run-out, the width should be added at the side furthest away from trees if possible, e.g. where a track runs to the eastern side of the woodland, the extra width should be added to the eastern side of the track.

6.8. It was noted that across the majority of the site, where the existing access tracks pass beneath trees, the crown clearance is sufficient for agricultural traffic. It may still be necessary to crown lift trees at some points of access, depending on the type of vehicles coming into the site.

6.9. 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 in relation to the hedgerow is acceptable since this is no more significant than the previous agricultural use of the land.

Conclusion

6.10. 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 draft Tree Retention and Removal and Tree Protection Plan is included in **Section 3**.

7. TREE PROTECTION MEASURES

7.1. The proposed site security fence which is to be erected around the periphery of the site will act as an effective tree protection barrier if erected before any construction works commence on site. This will mitigate the need to install BS5837:2012 fencing along the outer perimeters of the site. However, the perimeter fencing will only protect trees located around the periphery of the site. Trees and hedgerows within the interior of the site could be impacted during the construction phase of the development.

7.2. With this in mind, the high-quality trees T33 and G28 would be located within the site compound. During the construction phase only, temporary protective fencing (HERAS specification fencing, installed as per figure 3 of BS 5837:2012) should be erected around the RPAs of these trees, as shown on the Tree Retention and Removal Plan in **Section 3**.

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 Local Planning Authority.

8.2. Annex B and Table B.1 of BS5837:2012, an informative, advises that Arboricultural Method Statement (AMS) 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 AMS 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 7**.

8.4. A draft, 'Heads of Terms' for an AMS 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.
- Hedgerow section removals x3 - as shown on the Tree Retention and Removal Plan (TRR)
- 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. The loss of trees can be readily mitigated and the retained trees can be adequately protected during construction activities to sustain their health and longevity.

9.2. Many of the hedgerows have small gaps appearing and the opportunity exists to restore these hedgerows with new supplementary planting that would help maintain their integrity and improve their long-term biodiversity value. Where new boundaries are to be defined, such as alongside the retained public footpaths, the establishment of new hedging would be a further opportunity to enhance the landscape.

9.3. The nature of the tree stock across the site could provide a good opportunity for the proposed development to improve the long-term tree cover on the site through appropriate new tree and woodland planting. Suitable planting alongside existing features or establishing new wildlife corridors to link existing ponds or woodland would help with improving biodiversity. Planning large-scale features such as wildlife corridors or shelter belts could also offer a screening of the development from outside the site and better resilience to strong winds, whilst preserving the rural context of the surroundings.

9.4. An AMS and finalised Tree Protection Plan will need to be produced. Where the feasibility of a scheme has been agreed upon by the Local Planning Authority, this detail can be agreed and submitted later as part of a reserved matters application or pre-commencement planning condition (by agreement with the applicant).

David Holmes, *FdSc, MArborA*
Arboriculturist

576000 576250 576500 576750 577000 577250

195000 194750 194500 194250

Label	Description
OOS1	Derelict hedge plot
OOS2	Derelict hedge plot
OOS3	Off-site stand of crack willow which occur to the southern side of The River Crouch, parts of scaffold limbs & foliage span the ditch & overhang the field margin by approx. 2m
OOS4	Offsite oak, approx. dia. of 600mm, at significance distance from survey area
OOS5	Outgrown thorn hedge choked by brambles

Tree Ref	Species	Height (m)	LifeStage	RPA Radius (m)	RPA (m2)
T1	Chestnut (Horse)	16	M	8.4	222
T2	Oak (English)	14	M	14.4	651
T3	Oak (English)	16	M	14.4	651
T4	Oak (English)	16	M	11.8	434
T5	Oak (English)	16	M	13.2	547
T6	Oak (English)	14	EM	7.8	191
T7	Ash (Common)	14	M	13.2	547
T8	Oak (English)	17	M	11.8	434
T9	Oak (English)	14	M	12	452
T10	Oak (English)	17	M	13	528
T11	Oak (English)	10	EM	4.5	65
T12	Oak (English)	17	M	11.8	434
T13	Oak (English)	17	M	10.3	335
T14	Oak (English)	17	M	12	452
T15	Oak (English)	15	M	15	707
T16	Oak (English)	16	M	12	452
T17	Maple (Field)	14	EM	7.3	168
T18	Oak (English)	17	M	13.4	567
T19	Oak (English)	12	M	6.6	137
T20	Oak (English)	17	M	10.8	366
T21	Oak (English)	15	M	12	452
T22	Ash (Common)	18	M	15	707
T23	Ash (Common)	17	M	10.8	366
T24	Willow (Weeping)	15	M	8.4	222
T25	Oak (English)	10	EM	6	113
T26	Ash (Common)	14	EM	8.9	248
T27	Oak (English)	8	SM	3.7	43
T28	Ash (Common)	17	M	12	452
T29	Ash (Common)	16	M	10.8	366
T30	Oak (English)	16	M	9.7	297
T31	Oak (English)	16	M	10.2	327
T32	Oak (English)	12	M	7.7	185
T33	Oak (English)	17	M	13.2	547
T34	Ash (Common)	10	SM	12.8	518
T35	Oak (English)	16	M	12.8	518

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)
- ★ Tree/Group/Hedgerow not on topographical survey. Location given is an estimate

Hedge Ref	Species	Avg. Height (m)	Life Stage	RPA Radius (m)	RPA (m2)
H1	Elm; blackthorn	4.5	EM	1.1	4
H2	Blackthorn	2.5	EM	1	3
H3	Blackthorn; field maple	2.5	EM	1	3
H4	Blackthorn	3	EM	1	3
H5	Blackthorn; hawthorn; oak	4	EM	1.1	4
H6	English oak; crab apple; blackthorn; hawthorn	8	EM	4.7	69
H7	English oak	8	EM	3.6	41
H8	Field maple; ash; English oak; blackthorn; hawthorn;	12	EM	7.2	163
H9	Blackthorn; hawthorn; crab apple	3.5	EM	1	3
H10	Hawthorn	5	EM	1.5	7
H11	Field maple; ash; elm; English oak; blackthorn; elder	5	EM	6	113
H12	Field maple; elm; blackthorn	6	EM	1.1	4
H13	Hawthorn; blackthorn	2	EM	1	3
H14	Hawthorn	2	EM	1	3
H15	Hawthorn; blackthorn; English oak	2	EM	1	3
H16	Hawthorn; blackthorn; English oak	6	EM	1	3
H17	Hawthorn; blackthorn; ash; English oak; elder	1.5	EM	1	3
H18	Hawthorn; blackthorn; English oak	1.5	EM	1	3
H19	Hawthorn; blackthorn	1	EM	1	3
H20	English oak; hawthorn; blackthorn	1.5	EM	1	3
H21	English oak; field maple; hawthorn; blackthorn	3	SM	1.1	4
H22	English oak; elm; crab apple; field maple; hawthorn;	3	SM	1.1	4
H23	Oak	2.5	SM	1.1	4
H24	Hawthorn; blackthorn; field maple; elm	4.5	EM	1.3	5
H25	Oak; field maple; hawthorn; blackthorn	6	EM	1.1	4
H26	Elm	4.5	EM	1.3	5
H27	Blackthorn	4.5	EM	1	3
H28	Blackthorn; elm	6	EM	1.6	8
H29	Blackthorn; hawthorn; crab apple; field maple	4	EM	1.6	8
H30	Hawthorn; blackthorn; elder; oak; ash; crab apple	9	EM	3.6	41
H31	Hawthorn; blackthorn; oak; field maple	3	EM	1	3
H32	Field maple; ash; oak; hawthorn; blackthorn; dogwood	3.5	EM	1.3	5
H33	Field maple; sycamore; cherry; oak; white willow; goat	8	EM	1.6	8
H34	Field maple; sycamore; goat willow; oak; hawthorn;	6	EM	1.5	7
H35	Field maple; ash; hawthorn; blackthorn; dogwood	8	EM	1.3	5
H36	Field maple; sycamore; oak; goat willow; ash;	8	EM	1.6	8
Group Ref	**Species**	**Height Range (m)**	**LifeStage**	**RPA Radius (m)**	**RPA (m2)**
G1	Horse chestnut; field maple; ash; hawthorn; blackthorn	2 - 16	M	7.8	191
G2	Horse chestnut; English oak; ash; hawthorn	2 - 16	M	8.4	222
G3	Horse chestnut; elm; hawthorn; elder	2 - 12	EM	6	113
G4	Hawthorn; ash; elm; oak	3 - 12	EM	6.6	137
G5	Hawthorn	3 - 5	EM	2.2	15
G6	Ash; hawthorn	5 - 8	EM	3.6	41
G7	Ash; English oak	8 - 10	EM	5.3	88
G8	Field maple; ash; hawthorn	5 - 8	EM	3.6	41
G9	English oak; ash; hawthorn	5 - 14	EM	4.4	62
G10	English oak	14	EM	5.8	104
G11	Oak; hawthorn; blackthorn	10 - 12	EM	8.3	215
G12	Elm; hawthorn	6	EM	1.7	9
G13	Oak; ash; hawthorn	4 - 14	EM	4.7	69
G14	English oak; field maple; ash; hawthorn; blackthorn	3 - 16	M	10.8	366
G15	Horse chestnut; field maple; ash; elm; crack willow;	3 - 16	M	7.6	180
G16	English oak; ash; field maple; goat willow; elm; hazel;	2 - 18	M	7.3	168
G17	English oak; hawthorn; blackthorn	2 - 1	EM	6.6	137
G18	English oak; ash; field maple; horse chestnut; goat	2 - 16	M	8.2	209
G19	Ash; English oak; crack willow	17 - 18	M	10.8	366
G20	Elm; blackthorn; elder	5	SM	1.1	4
G21	Goat willow	6	Y	1.3	5
G22	Ash	9 - 10	EM	4.5	65
G23	Field maple; English oak; goat willow; ash; hazel;	3 - 9	SM	3	28
G24	Field maple	8	EM	3.8	46
G25	English oak; field maple	8	EM	6	113
G26	English oak; sycamore	8	EM	5.4	92
G27	English oak; field maple	8	EM	4.8	72
G28	English oak; ash; hawthorn; blackthorn	3 - 16	M	12.1	461
G29	English oak; hawthorn	3 - 17	M	13.2	547

INDEX MAP

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

N
GRID NORTH

0 37.5 75 150 Meters

PROJECT TITLE

Southlands Solar Farm (4865)

DRAWING TITLE

Tree Survey Plan

SCALE				DRAWING NUMBER
Scale: 1:2,000 @ A1				**BHA_4865_01**
DRAWN BY	APPROVED BY	REVISION	SHEET	DATE
TB	**DH**	-	-	**13/09/2022**

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

CLIENT: **Enso Energy Ltd**

Barton Hyett Associates
Arboricultural Consultants

Tel: 01386 576161
Address: Office 5E, Deer Park Business Centre,
Eckington, Pershore, Worcestershire, WR10 3DN

Tree Protection Barrier - Barrier to be erected prior to the commencement of works on site and not to be altered or removed until works are complete (cross check with specific requirements of any relevant planning conditions).

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)
- * Tree/Group/Hedgerow not on topographical survey. Location given is an estimate
- Tree / Hedgerow / Group to be removed

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

Statutory Protection

- Tree Preservation Order (TPO): Trees under statutory protection. No tree works to be undertaken without specific consent or by relevant exception

The site may be within a designated Conservation Area which restricts tree works. Please see attached advice and guidance.

Development / Design Guidance

Recommended Development Area: Area considered appropriate for development in arboricultural terms having considered all arboricultural constraints

Recommended buffer to development: Appropriate offset from development having considered all arboricultural constraints

Photo images: Images of key arboricultural features at the site

Protection Measures

- Tree Protection Barrier
- Secondary Tree Protection Barrier - location to allow works within CEZ (only in accordance with detailed AMS)
- Cellular Confinement System (see AMS report for specification)
- Temporary Ground Protection to BS 5837:2012
- Permanent Ground Protection to BS 5837:2012
- Area of 'No Dig' Construction to BS 5837:2012
- Construction Exclusion Zone (CEZ) - No work to occur within CEZ without prior approval of Project Arboriculturist and/or LPA. All ground levels to be maintained as existing
- All weather information notices to read 'Construction Exclusion Zone - No Entry' A3 in size. To be attached to tree protection barriers at regular intervals
- Target Note

INDEX MAP

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

N
GRID NORTH

0 37.5 75 150 Meters

PROJECT TITLE	Southlands Farm (4865)
DRAWING TITLE	**Tree Retention and Removal Plan**
SCALE	**Scale: 1:2,000 @ A1**
DRAWING NUMBER	**BHA_4865_02**
DRAWN BY	**TB**
APPROVED BY	**DH**
REVISION	**-**
SHEET	**-**
DATE	**01/03/2022**
COORDINATE SYSTEM / DATUM	**British National Grid / Newlyn Datum (AOD)**
CLIENT	**Pegasus Planning Group**
CREDITS	

Barton Hyett Associates
Arboricultural Consultants

Tel: 01386 576161
Address: Office 5E, Deer Park Business Centre, Eckington, Pershore, Worcestershire, WR10 3DN

BS5837:2012 TREE SURVEY SCHEDULE

SOUTHLANDS SOLAR FARM

PROJECT NO: 4865

SURVEYOR: DAVID HOLMES

CLIENT: ENSO ENERGY

SURVEY DATE: 31ST AUGUST TO 2ND SEPTEMBER

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
T1	Chestnut (Horse)	Off	16.0	1	Yes	700	7.0-8.0-9.0-9.0	0.0	0.0	None	M	None	Adjacent to highway; radial cracks to scaffold limbs; minor deadwood throughout crown; tree showing signs of "false autumn" phenomenon that occurred during late summer heatwave of 2022. **Recommend details of location & condition be passed to**	Fair	Fair	10+	B1	8.4	222
T2	Oak (English)	Off	14.0	1	None	1200	7.0-9.0-9.0-9.0	1.0	1.0	W	M	None	Soil heaped-up against north of stem & crown with significant change of levels; loss of vigour with moderate deadwood to north of crown; does not meet veteran tree criteria	Fair	Fair	20+	B1	14.4	651
T3	Oak (English)	Off	16.0	1	None	1200	7.0-8.0-8.0-6.0	1.0	1.0	E	M	None	Loss of vigour with moderate deadwood to west of crown; historic storm damage; does not meet veteran tree criteria	Fair	Fair	20+	B1	14.4	651
T4	Oak (English)	On	16.0	1	None	980	8.5-10.0-10.0-8.5	1.0	4.0	S	M	None	Slightly sparse crown; small heap of debris to north of root-plate	Good	Fair	40+	A1	11.8	434
T5	Oak (English)	On	16.0	1	None	1100	7.0-8.0-8.0-7.5	1.0	3.0	E	M	None	Loss of vigour with moderate deadwood throughout crown; historic damage to stump to south of stem @2m with Chicken O' the Woods fungal fruiting body present; does not meet veteran tree criteria	Fair	Fair	20+	B1	13.2	547
T6	Oak (English)	On	14.0	1	Yes	650	6.0-6.0-6.0-7.0	0.0	2.0	S	EM	None	Main stem splits in two @2m with both scaffold limbs forming a cohesive crown; suppressed by adjacent mature oak	Good	Fair	20+	B1	7.8	191

BS5837:2012 TREE SURVEY SCHEDULE

SOUTHLANDS SOLAR FARM

PROJECT NO: 4865

SURVEYOR: DAVID HOLMES

CLIENT: ENSO ENERGY

SURVEY DATE: 31ST AUGUST TO 2ND SEPTEMBER

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
T7	Ash (Common)	On	14.0	6	None	1100	4.5-5.0-5.0-6.0	0.0	0.0	None	M	None	Multi-stemmed with significant large standing dead stem; form indicates tree was part of an old hedge	Good	Fair	20+	A1	13.2	547
T8	Oak (English)	On	17.0	1	None	980	8.0-8.0-10.0-11.0	1.5	1.5	SW	M	None	Historic storm damage to east of crown @6m; flush-cut pruning wounds to south of main union @4.5m	Good	Fair	40+	A1	11.8	434
T9	Oak (English)	On	14.0	1	None	1000	7.0-8.0-8.0-8.5	1.0	1.5	S	M	None	Loss of vigour with moderate deadwood throughout crown; fissures to main stem; historic storm damage with slow occlusion; visible woodpecker activity; does not meet veteran tree criteria	Fair	Fair	20+	B1	12.0	452
T10	Oak (English)	On	17.0	1	None	1080	9.0-13.0-10.0-9.0	1.5	1.5	S	M	None	Large burr to south of root-collar	Good	Fair	40+	A1	13.0	528
T11	Oak (English)	On	10.0	1	None	380	6.0-6.0-6.0-6.0	1.0	1.0	S	EM	None	Typical for age & species	Good	Fair	20+	B1	4.5	65
T12	Oak (English)	On	17.0	1	None	980	8.5-9.0-10.0-9.0	0.5	2.0	W	M	None	Historic storm damage to scaffold limb @5.5m causing unusual crown formation; vigorous re-gen to inner crown	Good	Fair	40+	B1	11.8	434
T13	Oak (English)	On	17.0	1	None	860	9.0-8.5-9.0-9.0	1.0	1.5	S	M	None	Typical for age & species	Good	Good	40+	A1	10.3	335
T14	Oak (English)	On	17.0	1	Yes	1000	8.0-10.0-8.5-8.0	0.0	1.5	S	M	None	Typical for age & species	Good	Good	40+	A1	12.0	452
T15	Oak (English)	On	15.0	8	None	1270	10.0-9.0-9.0-8.0	2.0	0.0	None	M	None	Multi-stemmed; form indicates tree was part of an old hedge	Good	Fair	40+	A1	15.0	707
T16	Oak (English)	On	16.0	1	Yes	1000	8.5-9.0-10.0-9.0	0.0	1.5	W	M	None	Typical for age & species	Good	Good	40+	A1	12.0	452
T17	Maple (Field)	On	14.0	6	None	610	6.0-6.0-6.0-6.0	0.0	0.0	None	EM	None	Typical for age & species	Good	Fair	20+	B1	7.3	168

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CLIENT: ENSO ENERGY

SURVEY DATE: 31ST AUGUST TO 2ND SEPTEMBER

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
T18	Oak (English)	On	17.0	1	None	1120	9.0-10.0-10.0-11.0	1.0	2.5	SE	M	None	Has appearance of old pollard; stem splits into multiple scaffold limbs @ 5m; moderate deadwood throughout crown; minor deadwood removed & heaped to east & west or root-plate in last 5+ years; damage to north of lower stem & bark missing from root-collar	Good	Fair	40+	A1	13.4	567
T19	Oak (English)	On	12.0	1	Yes	550	6.0-6.0-5.0-6.0	2.5	2.5	SE	M	None	Embedded in hedge; burr to south-west of root-collar; slightly sparse crown; historic storm damage to upper crown	Fair	Fair	20+	B1	6.6	137
T20	Oak (English)	On	17.0	1	None	900	9.0-9.0-10.0-9.0	1.0	2.5	S	M	None	Typical for age & species	Good	Good	40+	A1	10.8	366
T21	Oak (English)	On	15.0	1	None	1000	9.0-8.5-8.0-7.0	1.5	2.0	N	M	None	Historic storm damage resulting in large area of cavitation to lower stem - from ground level to 5m; good vigour throughout a compact crown; minor deadwood; good habitat tree	Good	Fair	20+	A1	12.0	452
T22	Ash (Common)	On	18.0	2	None	1500	8.0-10.0-9.0-8.0	2.0	3.5	S	M	None	Twin-stemmed growing to east of ditch embankment; northern most stem heavily damaged & broken off @12m; large cavity visible to west of stem @5m & visible woodpecker activity; larger southern stem shows historic storm damage & slightly sparse	Fair	Fair	20+	B1	15.0	707

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SOUTHLANDS SOLAR FARM

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SURVEYOR: DAVID HOLMES

CLIENT: ENSO ENERGY

SURVEY DATE: 31ST AUGUST TO 2ND SEPTEMBER

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
T23	Ash (Common)	On	17.0	1	Yes	900	7.0-9.0-7.0-8.0	3.0	3.5	W	M	None	Fungal fruiting bodies to south of stem @2.5m; growing to east of ditch embankment & to north of substantial security gate; scaffold limb to south heavily damaged & broken off @4m; heavily swathed in ivy; minor deadwood throughout crown. Recommend tree be reduced to habitat stem @approx 6m	Fair	Fair	10+	B3	10.8	366
T24	Willow (Weeping)	Off	15.0	1	Yes	700	7.0-7.0-7.0-7.0	0.0	0.0	None	M	None	Off-site tree; cursory inspection from boundary only; appears to have been reduced in the past	Good	Fair	20+	B1	8.4	222
T25	Oak (English)	On	10.0	1	None	500	7.0-8.5-7.0-8.0	0.0	2.5	SE	EM	None	Congested crown with multiple crossing scaffold limbs; adjacent to	Good	Fair	20+	B1	6.0	113
T26	Ash (Common)	Off	14.0	2	Yes	740	8.0-7.0-7.0-7.0	3.0	0.0	None	EM	None	Adjacent to minor road; twin stemmed; slightly sparse crown; stems swathed in ivy	Fair	Fair	20+	B1	8.9	248
T27	Oak (English)	On	8.0	1	None	310	7.0-6.0-7.0-6.0	0.5	1.0	N	SM	None	Typical for age & species	Good	Fair	20+	B1	3.7	43
T28	Ash (Common)	On	17.0	1	Yes	1000	10.0-9.0-8.0-10.0	0.0	0.0	None	M	None	Large scaffold limb failure @3m south directly opposite main union; wound shows exposed heartwood & associated decay; loss of vigour throughout crown; stem occurs to west of ditch	Fair	Fair	20+	B1	12.0	452
T29	Ash (Common)	On	16.0	1	Yes	900	9.0-9.0-9.0-10.0	2.5	3.5	NE	M	None	Large basal cavity to west; main stem swathed in ivy; minor dieback throughout crown; leaf size below average; stem occurs to west of ditch directly north of utilities pipeline which crosses the ditch on a steel & masonry bridge (steel badly corroded)	Fair	Fair	20+	B1	10.8	366

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SURVEYOR: DAVID HOLMES

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SURVEY DATE: 31ST AUGUST TO 2ND SEPTEMBER

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
T30	Oak (English)	On	16.0	1	None	810	10.0-9.0-11.0-10.0	0.0	2.5	N	M	None	Minor dieback throughout crown; Ganoderma bracket to south of root-collar; stem occurs to east of ditch directly opposite area of drainage & concrete reinforcement of road	Fair	Fair	40+	A1	9.7	297
T31	Oak (English)	On	16.0	1	None	850	8.5-9.0-9.0-8.0	2.0	3.5	W	M	None	Historic storm damage with extensive area of decay to north of main stem from ground level to 3m; visible woodpecker activity; good vigour throughout crown; WWII pillbox to east of root-plate	Good	Fair	40+	A1	10.2	327
T32	Oak (English)	On	12.0	2	None	640	7.0-8.0-7.0-7.5	1.0	1.0	E	M	None	Twin-stemmed forming a cohesive crown; both stems swathed in ivy	Good	Fair	20+	B1	7.7	185
T33	Oak (English)	On	17.0	1	None	1100	9.0-10.0-11.0-9.0	0.5	1.0	N	M	None	Large included union failure to east of stem @3m causing a disjointed crown formation; moderate deadwood to east of crown @6m	Good	Fair	40+	A1	13.2	547
T34	Ash (Common)	On	10.0	8	None	1070	6.0-6.0-5.0-6.0	0.0	0.0	None	SM	None	Multi-stemmed; splits & failures to 2x significant stems with associated decay	Fair	Poor	10+	C1	12.8	518
T35	Oak (English)	On	16.0	1	None	1070	8.5-11.0-8.5-9.0	1.5	2.5	E	M	None	Historic storm damage with deadwood & occluding wounds to upper scaffold limbs; WWII pillbox to east of root-plate	Good	Fair	40+	A1	12.8	518

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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)
G1	Horse chestnut; field maple; ash; hawthorn; blackthorn	On	2 - 16	25	None	650	7.0	0.0	M	None	Stand of trees established along route of drainage ditch; thorn occurs as understory	Good	Fair	40+	B2	7.8
G2	Horse chestnut; English oak; ash; hawthorn	Off	2 - 16	15	Yes	700	7.0	0.0	M	None	Adjacent to highway; cursory inspection from site boundary; 3x mature chestnut with other species occurring as understory; chestnut showing signs of "false autumn" phenomenon that occurred during late summer heatwave of 2022	Good	Fair	20+	B2	8.4
G3	Horse chestnut; elm; hawthorn; elder	Off	2 - 12	25	Yes	500	5.0	0.0	EM	None	Adjacent to highway; cursory inspection from site boundary; 1x early-mature chestnut to west of plot with other species occurring as understory; occasional dead elm stems to east of plot	Good	Fair	20+	B2	6.0
G4	Hawthorn; ash; elm; oak	Off	3 - 12	7	None	550	6.0	0.0	EM	None	Multi-stemmed trees on boundary; decayed oak stem to east of group with crown formed by re-gen	Fair	Fair	20+	B2	6.6
G5	Hawthorn	Off	3 - 5	2	None	180	3.0	0.0	EM	None	Multi-stemmed trees on boundary	Fair	Fair	20+	B2	2.2
G6	Ash; hawthorn	Off	5 - 8	8	None	300	5.0	0.0	EM	None	Multi-stemmed trees on boundary	Fair	Fair	20+	B2	3.6
G7	Ash; English oak	On	8 - 10	2	None	440	5.0	0.0	EM	None	Boundary trees	Good	Fair	20+	B2	5.3
G8	Field maple; ash; hawthorn	Off	5 - 8	5	None	300	5.0	0.0	EM	None	Multi-stemmed trees on boundary	Fair	Fair	20+	B2	3.6
G9	English oak; ash; hawthorn	On	5 - 14	6	None	370	6.0	0.0	EM	None	Multi-stemmed trees	Good	Fair	20+	B2	4.4
G10	English oak	On	14	12	None	480	6.0	0.5	EM	None	Stand of early-mature to old boundary	Good	Fair	40+	A2	5.8
G11	Oak; hawthorn; blackthorn	On	10 - 12	3	None	690	6.0	0.0	EM	None	3x oak - 1x early-mature to centre of plot & 2x semi-mature to either side; understory of early-mature thorn	Good	Fair	40+	B2	8.3

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CLIENT: ENSO ENERGY

SURVEY DATE: 31ST AUGUST TO 2ND SEPTEMBER

Barton Hyett Arboricultural Consultants

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)
G12	Elm; hawthorn	On	6	3	None	140	2.0	0.0	EM	None	2x multi-stemmed thorn; elm stem is dead	Fair	Fair	20+	B2	1.7
G13	Oak; ash; hawthorn	On	4 - 14	5	None	390	6.0	0.0	EM	None	Multi-stemmed trees	Good	Fair	20+	B2	4.7
G14	English oak; field maple; ash; hawthorn; blackthorn	On	3 - 16	6	None	900	8.0	0.0	M	None	3x mature oak; 2x semi-mature ash; 1x young maple; thorn occurs as understory	Good	Fair	40+	B2	10.8
G15	Horse chestnut; field maple; ash; elm; crack willow; hawthorn; blackthorn	On	3 - 16	35	None	630	7.0	0.0	M	None	Stand of trees established along route of drainage ditch; thorn & elm occurs as understory	Good	Fair	40+	B2	7.6
G16	English oak; ash; field maple; goat willow; elm; hazel; hawthorn; dogwood; elder	On	2 - 18	50	None	610	7.0	0.0	M	None	Stand of trees established along route of drainage ditch & to the east of mettled surfaced access track; thorn; hazel & elm occurs as understory	Good	Fair	40+	B2	7.3
G17	English oak; hawthorn; blackthorn	On	2 - 1	20	None	550	7.0	0.0	EM	None	Stand of trees established to north of significant drainage ditch; thorn occurs as understory; sample area of group recorded where plot abuts survey area	Good	Fair	40+	B2	6.6
G18	English oak; ash; field maple; horse chestnut; goat willow; crack willow; elm; hawthorn; blackthorn; elder	On	2 - 16	60	None	680	7.0	0.0	M	None	Stand of trees established along route of drainage ditch; thorn & elm occurs as understory	Good	Fair	40+	B2	8.2
G19	Ash; English oak; crack willow	On	17 - 18	3	None	900	8.0	0.0	M	None	3x trees established along route of drainage ditch; ditch looks to have been significantly flooded or excavated; all 3 trees show reduced vigour with slightly sparse crowns	Fair	Fair	20+	B2	10.8
G20	Elm; blackthorn; elder	On	5	8	None	90	2.0	0.0	SM	None	Multi-stemmed trees established along route of drainage ditch; occasional dead elm stems	Fair	Fair	20+	C2	1.1
G21	Goat willow	On	6	3	None	100	1.5	0.0	Y	None	Multi-stemmed trees	Good	Fair	20+	C2	1.3
G22	Ash	On	9 - 10	2	None	380	5.0	0.0	EM	None	Multi-stemmed trees	Good	Fair	20+	B2	4.5

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CLIENT: ENSO ENERGY

SURVEY DATE: 31ST AUGUST TO 2ND SEPTEMBER

Barton Hyett Arboricultural Consultants

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)
G23	Field maple; English oak; goat willow; ash; hazel; hawthorn; blackthorn; elder	Off	3 - 9	100	None	250	5.0	0.0	SM	None	Sporadic group of trees on dual-carriageway embankment (A130)	Good	Fair	20+	B2	3.0
G24	Field maple	On	8	2	None	320	5.0	0.0	EM	None	Multi-stemmed hedgerow trees	Good	Fair	20+	B2	3.8
G25	English oak; field maple	On	8	2	None	500	5.0	0.0	EM	None	Hedgerow trees; multi-stemmed maple; oak shows moderate deadwood within crown	Good	Fair	20+	B2	6.0
G26	English oak; sycamore	On	8	2	None	450	6.0	0.0	EM	None	Hedgerow trees; both multi-stemmed; minor twiggy dieback to sycamore	Good	Fair	20+	B2	5.4
G27	English oak; field maple	On	8	2	Yes	400	5.0	0.0	EM	None	Hedgerow trees; both multi-stemmed	Good	Fair	20+	B2	4.8
G28	English oak; ash; hawthorn; blackthorn	On	3 - 16	7	None	1010	8.0	1.0	M	None	3x mature oak growing around marl-pit; 2x small semi-mature ash with thorn understory; oak to north of group mildly suppressed & shows cavity to limb @4.5m in east of crown	Good	Fair	40+	A2	12.1
G29	English oak; hawthorn	Off	3 - 17	4	None	1100	8.0	1.0	M	None	4x mature oak growing offsite forming a cohesive crown; sporadic / neglected thorn hedge to boundary; southern stem showing bark loss & associated decay; 3rd stem (running north-to-south) has large hung-up limb to east of crown @6.5m	Good	Fair	40+	A2	13.2

HEDGES

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)
H1	Elm; blackthorn	On	4.5	2.5	90	0.0	EM	Outgrown hedgerow; multiple dead elm stems	Fair	Fair	20+	B2	1.1
H2	Blackthorn	On	2.5	2	80	0.0	EM	Maintained by flail	Good	Fair	40+	B2	1.0
H3	Blackthorn; field maple	On	2.5	2	80	0.0	EM	Maintained by flail; sporadic beneath tree canopies	Good	Fair	40+	B2	1.0

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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)
H4	Blackthorn	On	3.0	2.5	80	0.0	EM	Maintained by flail; gap to approx centre which is being colonised by re-gen	Good	Fair	20+	B2	1.0
H5	Blackthorn; hawthorn; oak	On	4.0	3	90	0.0	EM	Maintained by flail	Good	Fair	40+	B2	1.1
H6	English oak; crab apple; blackthorn; hawthorn	On	8.0	5	390	0.5	EM	Lower sides maintained by flail; predominantly oak; with apple & thorn occurring as understory	Good	Fair	40+	B2	4.7
H7	English oak	On	8.0	5	300	0.5	EM	Lower sides maintained by flail	Good	Fair	40+	B2	3.6
H8	Field maple; ash; English oak; blackthorn; hawthorn; elder	On	12.0	7	600	0.5	EM	Lower sides maintained by flail; predominantly oak; with maple & ash; thorn occurs as understory	Good	Fair	40+	B2	7.2
H9	Blackthorn; hawthorn; crab apple	On	3.5	2.5	80	0.0	EM	Maintained by flail	Good	Fair	40+	B2	1.0
H10	Hawthorn	On	5.0	3	120	0.0	EM	Derelict / neglected section of hedge	Fair	Fair	20+	C2	1.5
H11	Field maple; ash; elm; English oak; blackthorn; elder	On	5.0	3	500	0.0	EM	Maintained by flail; 1x oak; 2x maple & 2x ash within hedgerow; sporadic gaps beneath canopy of Cat A oak	Good	Fair	40+	B2	6.0
H12	Field maple; elm; blackthorn	On	6.0	3	90	0.0	EM	Outgrown hedgerow; occasional dead elm stem	Fair	Fair	20+	B2	1.1
H13	Hawthorn; blackthorn	On	2.0	1	80	0.0	EM	Maintained by flail	Good	Fair	40+	B2	1.0
H14	Hawthorn	On	2.0	1	80	0.0	EM	Maintained by flail; remnant section of hedge	Good	Fair	40+	B2	1.0
H15	Hawthorn; blackthorn; English oak	On	2.0	1	80	0.0	EM	Maintained by flail; predominantly thorn; gap to east has been replanted	Good	Fair	40+	B2	1.0
H16	Hawthorn; blackthorn; English oak	On	6.0	5	80	0.0	EM	Outgrown hedgerow to field corner	Good	Fair	40+	B2	1.0
H17	Hawthorn; blackthorn; ash; English oak; elder	On	1.5	1	80	0.0	EM	Maintained by flail; predominantly thorn; sporadic gaps	Fair	Fair	20+	B2	1.0
H18	Hawthorn; blackthorn; English oak	On	1.5	1	80	0.0	EM	Maintained by flail; predominantly thorn; sporadic gaps	Fair	Fair	40+	B2	1.0
H19	Hawthorn; blackthorn	On	1.0	1	80	0.0	EM	Maintained by flail; partially choked by brambles	Fair	Fair	20+	B2	1.0
H20	English oak; hawthorn; blackthorn	On	1.5	1	80	0.0	EM	Maintained by flail	Fair	Fair	40+	B2	1.0
H21	English oak; field maple; hawthorn; blackthorn	On	3.0	2	90	0.0	SM	Maintained by flail; sporadic gaps	Fair	Fair	20+	C2	1.1
H22	English oak; elm; crab apple; field maple; hawthorn; blackthorn	On	3.0	2	90	0.0	SM	Maintained by flail; sporadic gaps	Fair	Fair	20+	C2	1.1

BS5837:2012 TREE SURVEY SCHEDULE

SOUTHLANDS SOLAR FARM

PROJECT NO: 4865

SURVEYOR: DAVID HOLMES

CLIENT: ENSO ENERGY

SURVEY DATE: 31ST AUGUST TO 2ND SEPTEMBER

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)
H23	Oak	On	2.5	2	90	0.0	SM	Maintained by flail; sporadic section of hedge partially choked by brambles	Fair	Fair	10+	C2	1.1
H24	Hawthorn; blackthorn; field maple; elm	On	4.5	6	110	0.0	EM	Maintained by flail; predominantly thorn; occasional dead elm stems	Good	Fair	40+	B2	1.3
H25	Oak; field maple; hawthorn; blackthorn	On	6.0	8	90	0.0	EM	Large thicket to field edge; sample area recorded where plot abuts survey area	Fair	Fair	40+	B2	1.1
H26	Elm	On	4.5	2.5	100	0.0	EM	Maintained by flail; multiple dead stems with limited re-gen	Poor	Fair	20+	C2	1.3
H27	Blackthorn	Off	4.5	4	80	0.0	EM	Outgrown hedgerow	Good	Fair	40+	B2	1.0
H28	Blackthorn; elm	On	6.0	3	130	0.0	EM	Maintained by flail; predominantly elm	Fair	Fair	20+	B2	1.6
H29	Blackthorn; hawthorn; crab apple; field maple	On	4.0	3	130	0.0	EM	Maintained by flail; predominantly thorn; sporadic gaps	Good	Fair	40+	B2	1.6
H30	Hawthorn; blackthorn; elder; oak; ash; crab apple	Off	9.0	6.5	300	0.0	EM	Outgrown hedgerow on railway embankment; predominantly thorn	Good	Fair	40+	B2	3.6
H31	Hawthorn; blackthorn; oak; field maple	On	3.0	2	80	0.0	EM	Predominantly thorn with sporadic patches beneath tree canopies; maintained by flail	Good	Fair	40+	B2	1.0
H32	Field maple; ash; oak; hawthorn; blackthorn; dogwood	On	3.5	3	100	0.0	EM	Boundary hedge maintained by flail	Good	Fair	40+	B2	1.3
H33	Field maple; sycamore; cherry; oak; white willow; goat willow; ash; hawthorn; blackthorn; dogwood	Off	8.0	6.5	130	0.0	EM	Outgrown hedgerow; partially choked by brambles	Good	Fair	40+	B2	1.6
H34	Field maple; sycamore; goat willow; oak; hawthorn; blackthorn; dogwood	On	6.0	6	120	0.0	EM	Outgrown hedge; lower sides flailed for field access	Good	Fair	40+	B2	1.5
H35	Field maple; ash; hawthorn; blackthorn; dogwood	On	8.0	4	110	0.0	EM	Outgrown hedgerow	Good	Fair	40+	B2	1.3
H36	Field maple; sycamore; oak; goat willow; ash; hawthorn; blackthorn; dogwood	On	8.0	5	130	0.0	EM	Outgrown hedgerow	Good	Fair	40+	B2	1.6

SELECT IMAGES FROM THE TREE SURVEY

PROJECT NO: 4865

SOUTHLANDS SOLAR FARM

SURVEYOR: DAVID HOLMES

Barton Hyett
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IMAGE 1: A view looking west at T33 & G28.

IMAGE 2: A view looking east at T12, showing the unusual crown formation.

IMAGE 3: A view looking east at the damage to the central leader of T12, which has lead to the unusual crown formation.

IMAGE 4: A view looking east at G23, with the abutments of Ashdale Bridge being visible to the far right of frame.

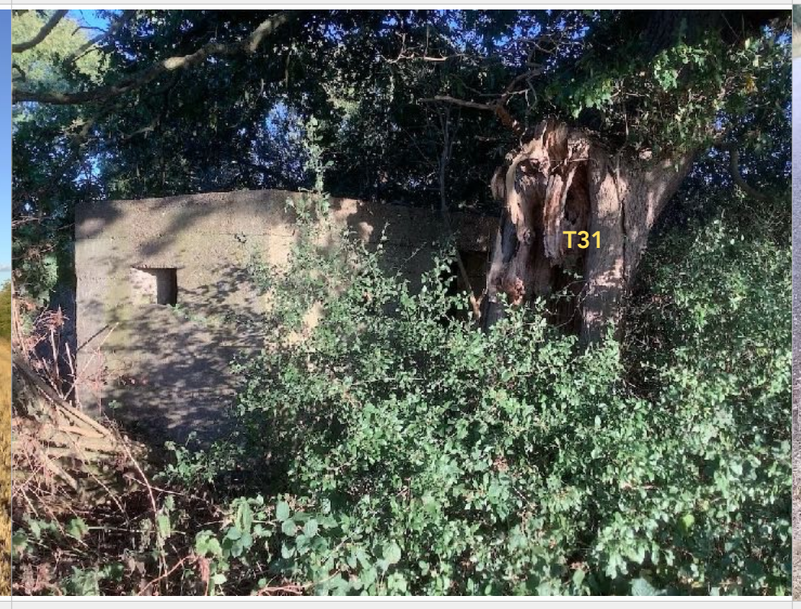

IMAGE 5: A view looking east at T31, showing the cavitation to the main stem. NOTE: WW II pillbox within root-plate.

IMAGE 6: A view looking north at T30 highlighting the fungi fruiting body and showing the tree in relation to the ditch, concrete repairs / gulley opening.

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- 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

The National Planning Policy Framework 2021 (NPPF paragraph 180) states that, when determining planning applications, local planning authorities should apply the following principle:

c) '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.

Other paragraphs of the NPPF 2021 of relevance to this report are:

Paragraph 131: *'Trees make an important contribution to the character and quality of urban environments, and can also help mitigate and adapt to climate change. Planning policies and decisions should ensure that new streets are tree-lined, that opportunities are taken to incorporate trees elsewhere in developments (such as parks and community orchards), that appropriate measures are in place to secure the long-term maintenance of newly-planted trees, and that existing trees are retained wherever possible. Applicants and local planning authorities should work with highways officers and tree officers to ensure that the right trees are planted in the right places, and solutions are found that are compatible with highways standards and the needs of different users.'*

Paragraph 174: *'Planning policies and decisions should contribute to and enhance the natural and local environment by:*
b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland.'

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 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.

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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