ARBORICULTURAL IMPACT ASSESSMENT

BURSTEAD SOLAR FARM AND BATTERY STORAGE ‘FREE GO’

LAND SOUTH AND EAST OF GREAT BURSTEAD, BILLERICAY, ESSEX

NOVEMBER 2023

ARBORICULTURAL IMPACT ASSESSMENT

Burstead Solar Farm

'Free Go'

November 2023

Barton Hyett Associates

Arboricultural Consultants

Summary table		
Site Name:	Burstead Solar Farm 'Free Go'	
Project reference:	4606	
Site Address:	Land south and east of Great Burstead, Billericay, Essex	
Nearest Postcode:	CM11 2UD	
Central Grid reference:	TQ 68860 92097	
Local Planning Authority:	Basildon Borough Council & Rochford District Council	
Relevant planning policies:	Basildon Borough Local Plan - Rochford District Council. Current development plan forms the Core Strategy adopted 2011 and Development Management Plan adopted 2014. Current development plan forms the saved policies of the 1998 Local Plan.	
Statutory Controls:	Tree Preservation Order	Conservation Area
	Ecological Assessment Report, by avian ecology notes: No TPOs "Woodland Trust Ancient Tree Inventory identified no notable trees within the Site, however, three notable trees were located approximately 130m northwest of the western Site land parcel	While outside of the site the Great Burstead CA lies to the north of the western parcel.
Soil Type: (Source: BGS online soils map © NERC 2021)	Superficial/Drift	Bedrock
	None recorded	London Clay Formation - Clay, Silt And Sand
Topographical Survey:	Gurnards-Farm_UAV-TOPO_Linework-MAIN_OSGB36(15)_Rev1_2021-10-31	
Site Layout:	Rev 8	
Report author:	Ian Howell *BA (Hons), Cert Arb L4 (ABC), TechArborA*	
Checked by:	Richard Hyett MSc, BSc (Hons), MICFor, MArborA	
Date of issue:	20.11.2023	

Arboricultural Association Technician Member

TE6738

Institute of Chartered Foresters registered

Barton Hyett Arboricultural Consultants

REPORT CONTENTS:

1. INTRODUCTION

1.1. Barton Hyett Associates Ltd have been instructed by Enso Green Holdings J Limited to survey trees located at Burstead Solar Farm ('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 detailed 'Free Go' planning application at the site and provide written advice on how they inform feasibility and design options for the site following a previous refusal. 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 to the south and east of Billericay, Great Burstead. The site consists of a number irregularly shaped agricultural fields that, at the time of survey, were being used for arable crop production.

2.2. The site is rural in nature but has residential areas close by to the north and east in its western parcel. Within the western parcel, there are public rights of way (PRoWs) that cross the site from all directions and in the eastern parcel, a PRoW spans the length of the eastern boundary before crossing through the site.

2.3. The site broadly has a fall from north to south. Vehicle access into the western parcel is currently gained via the existing farm track that runs west from the A4129 Southend Road. Access into the eastern parcel is currently gained from the existing access road off Granites Chase that serves the industrial units. New access tracks are proposed for eastern parcels.

2.4. The tree and hedgerow cover of the site is fairly typical for the area, with medium to large field boundary trees located within hedgerows and occasional tree groups/woodland blocks within fields and along highway boundaries.

3. TREE SURVEY FINDINGS

3.1. A total of 144 trees, groups of trees and hedgerows were originally surveyed. The Proposed Development area has since been reduced and the 53 trees, groups of trees and hedgerows that remain within the bounds of the development 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	**41**	4	32	4	1
Groups	**8**	-	8	-	-
Hedgerows	**4**	-	-	4	-
Total	**53**	**4**	**40**	**8**	**1**

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

4. KEY ARBORICULTURAL FEATURES

4.1. As can be seen from the summary table, the majority of the arboricultural resource at the site is considered to be of moderate or high quality and therefore desirable, and highly desirable for retention.

4.2. There are four high-quality (BS5837:2012 Category A) trees at the site. Three are mature English oak trees (T72, T74, T96) which are all located within hedgerows or tree groups at the site boundaries. A mature and prominent crack willow tree (T89) is located in a more central location within hedgerow H20.

4.3. The high-quality trees T74 and T96 have been assigned the BS5837:2012 sub-category 3 due to their heritage and conservation value. Typically these trees are of notable maturity and have significant habitat potential due to the presence of niche habitat features e.g. large diameter branch tear outs/stubs and associated hollowing with significant amounts of deadwood habitat present within the main stem or tree crown. A number of moderate (BS5837:2012 Category B) and sometimes low category BS5837:2012 Category C) trees across the site have also been assigned BS5837:2012 sub-category 3 where this is considered relevant.

4.4. Some mature tree groups also bound the site and form prominent linear tree features. G22 is a prominent tree group for the western parcel of the site, containing many early mature to mature common ash, English oak and willow.

4.5. G15 and G16 form a prominent linear tree feature at the north and north-east site boundary. There is an informal footpath that runs through the centre of the tree groups. Early-mature to mature English oak trees are dominant within the group canopy.

5. PROPOSED DEVELOPMENT

5.1. The development proposal is for:

"Installation of a solar farm and battery storage facility with associated infrastructure (Free Go)"

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.

6.2. The proposed solar farm development will not require the removal of any significant trees, groups or hedgerows.

6.3. Within the main part of the site, the need for any hedgerow removal has been avoided through the proposed layout responding to the arboricultural constraints that have been identified.

6.4. In my opinion, the Proposed Development is feasible from an arboricultural perspective and if carefully implemented there would be a very low potential for negative impact on the retained trees.

7. TREE PROTECTION MEASURES

7.1. The proposed site security fence (standard deer fence on timber posts), which is to be erected around the periphery of the site and along internal field boundaries, 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. Trees and hedgerows contained within the interior of the site that are not protected by the security fence and could be impacted during the construction phase of the development will require some protection. See the Combined Tree Retention/Removal and Protection 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 on from 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 Heads of Terms are a sufficient level of information in order to deliver tree-related information into the planning system. The table also advises that a detailed Arboricultural Method Statement might reasonably be required as a 'reserved matter' or planning condition.

8.3. In relation to the site, it is anticipated that arboricultural working methods are to be very straightforward, given that the overwhelming majority of the site's arboricultural resource is to be adequately protected by the site security fencing. 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 Arboricultural Method Statement is set out below:

- Project arboriculturist – devise a schedule of monitoring and supervision as required
- Pre-commencement site meeting and main contractor briefing
- Erection of perimeter security fence and temporary tree protection barriers - including phased roll out and sign-off
- Main construction phase
- Removal of temporary tree protection barriers - subject to approval of site conditions
- Implementation of proposed soft landscaping
- Final completion

9. CONCLUSIONS AND RECOMMENDATIONS

9.1. The Proposed Development has been designed in response to the arboricultural considerations identified within the tree survey. The Proposed Development will therefore not require the complete removal of any trees or hedgerows.

9.2. The proposed layout respects the RPAs of retained trees, and the retained trees can be adequately protected during the construction process in order to sustain their health and longevity.

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

Ian Howell
Arboriculturist

Barton Hyett Associates
Arboricultural Consultants

Barton Hyett Associates
Arboricultural Consultants

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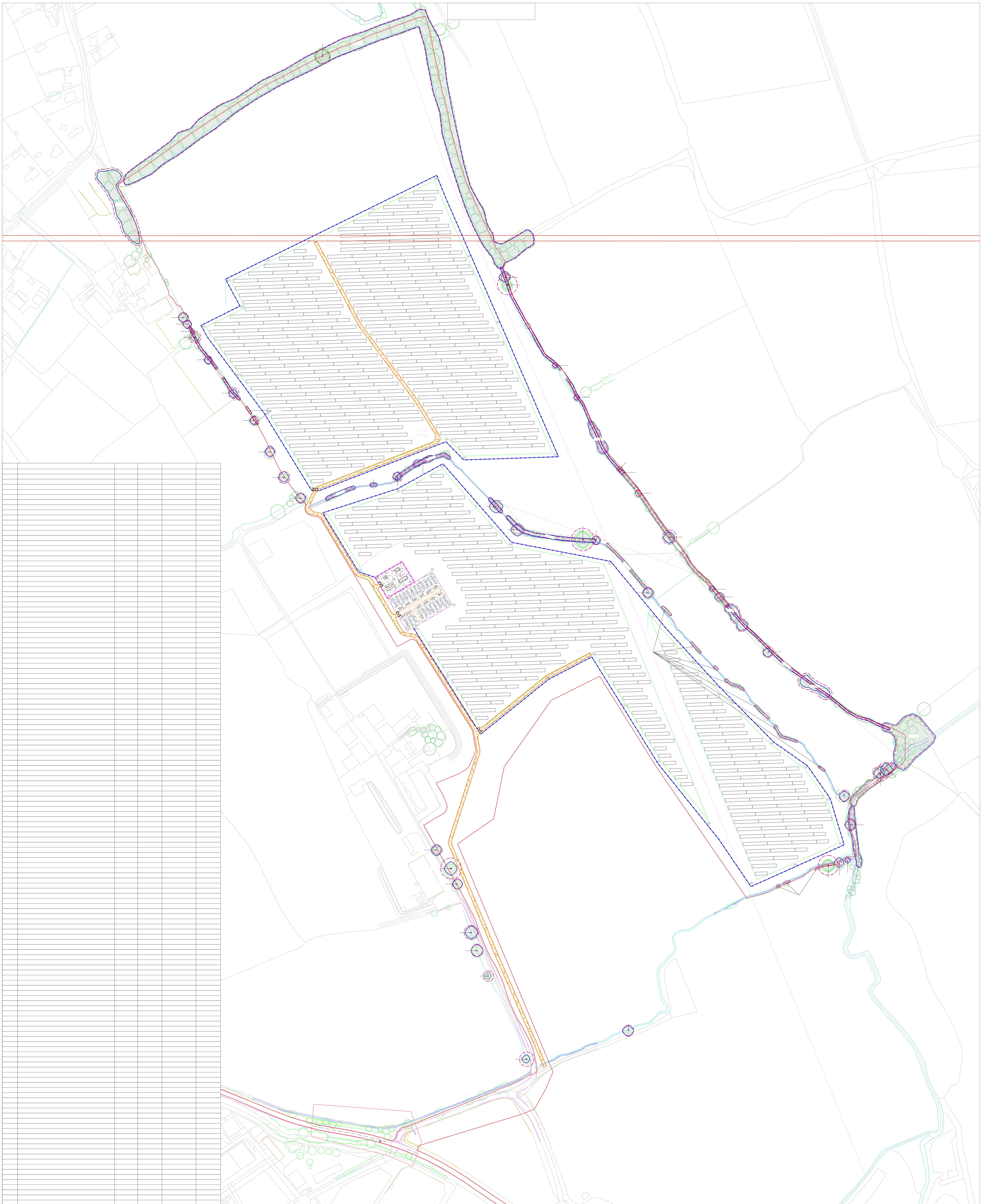

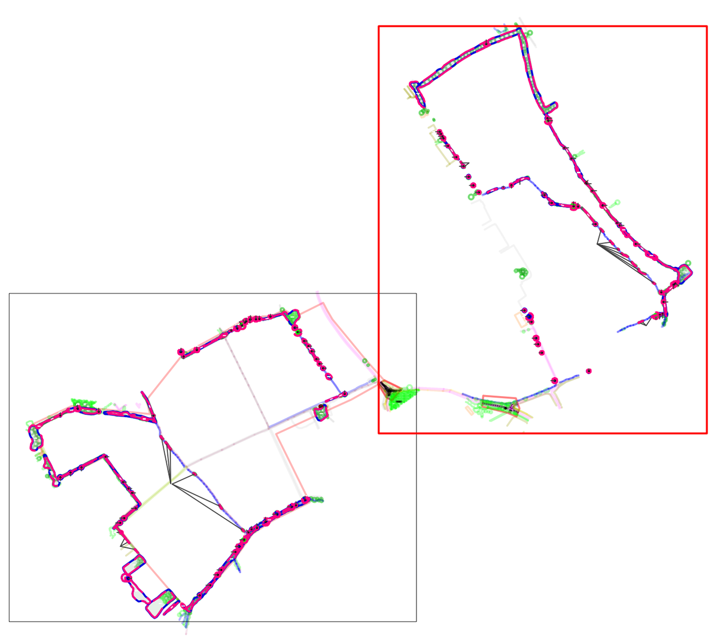

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BS5837:2012 TREE SURVEY SCHEDULE

BURSTEAD SOLAR FARM

PROJECT NO: 4606

SURVEYOR: IAN HOWELL

CLIENT: ENSO

SURVEY DATE: 19 & 20/11/2021

Barton Hyett Arboricultural Consultants

INDIVIDUAL TREES

Ref	Species	On/ off site	Top Height (m)	No. of Stems	Est diam ?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. low crown height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²	Located within the final site boundary?
T1	Ash (Common)	Off	10.0	1	Yes	780	6-6-6-6	4.0	4.0	W	M	None	Mature tree located north of a ditch. Hollowed stem, good habitat tree	Good	Fair	40+	B3	9.4	275.0	No
T2	Oak (English)	Off	8.0	1	Yes	300	5-5-5-5	2.0	1.0	W	SM	None	Establishing oak located within the hedgerow	Good	Good	40+	B1	3.6	41.0	No
T3	Oak (English)	Off	12.0	1	Yes	900	8-8-8-8	4.0	3.0	W	M	None	Mature oak of good form and condition with large diameter branch stubs and hollowing within main stem	Good	Good	40+	B3	10.8	366.0	No
T4	Poplar (Hybrid black)	Off	12.0	1	Yes	300	5-5-5-5	4.0	3.0	-	SM	None	Establishing tree located within the hedgerow, significant future growth potential	Good	Good	40+	C1	3.6	41.0	No
T5	Willow (Goat)	Off	10.0	6	Yes	490	6-6-6-5	4.0	0.5	-	M	None	Located east of the ditch, multi stemmed tree located within the hedgerow	Good	Fair	40+	C1	5.9	109.0	No
T6	Oak (English)	Off	12.0	1	Yes	950	6-6-8-8	4.0	3.0	W	M	None	Mature oak, set back from the site boundary, large diameter hollowing main stem	Good	Good	40+	B3	11.4	408.0	No
T7	Chestnut (Horse)	Off	9.0	2	Yes	320	6-4-5-4	3.0	0.5	S	EM	None	Establishing tree located within the hedgerow	Good	Good	40+	B1	3.8	46.0	No
T8	Oak (English)	Off	13.0	1	Yes	400	9-9-10-9	3.0	3.0	E	EM	None	Tree of good form and condition located within the hedgerow/ golf course	Good	Good	40+	B1	4.8	72.0	No
T9	Oak (English)	Off	10.0	1	Yes	370.0	8-8-8-8	3.0	3.0	-	EM	None	Tree of good form and condition located within the hedgerow/ golf course	Good	Good	40+	B1	4.4	62.0	No
T10	Oak (English)	Off	10.0	1	Yes	400.0	8-8-8-8	3.0	3.0	-	EM	None	Tree of good form and condition located within the hedgerow/ golf course	Good	Good	40+	B1	4.8	72.0	No

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Ref	Species	On/ off site	Top Height (m)	No. of Stems	Est diam ?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. low crown height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²	Located within the final site boundary?
T11	Oak (English)	Off	8.0	1	Yes	220.0	5-5-5-4	3.0	3.0	W	SM	None	Establishing tree of good form and condition located within the hedgerow	Good	Good	40+	B1	2.6	22.0	No
T12	Oak (English)	Off	10.0	1	Yes	260.0	6-6-6-6	3.0	3.0	W	SM	None	Establishing tree of good form and condition located within the hedgerow	Good	Good	40+	B1	3.1	31.0	No
T13	Oak (English)	Off	8.0	1	Yes	250.0	5-5-5-5	3.0	3.0	N	SM	None	Establishing tree of good form and condition located on the golf course side of the hedgerow	Good	Good	40+	B1	3.0	28.0	No
T14	Oak (English)	Off	10.0	1	Yes	380.0	6-5-5-6	3.0	2.0	N	EM	None	Tree of good form and condition located within the hedgerow/ golf course	Good	Good	40+	B1	4.5	65.0	No
T15	Oak (English)	Off	8.0	1	Yes	250.0	5-5-5-5	3.0	3.0	W	SM	None	Establishing tree of good form and condition located on the golf course side of the hedgerow	Good	Good	40+	B1	3.0	28.0	No
T16	Oak (English)	Off	13.0	1	Yes	650	8-10-9-10	3.0	3.0	E	M	None	Tree of good form and condition located within the hedgerow/ golf course	Good	Good	40+	B1	7.8	191.0	No
T17	Oak (English)	Off	14.0	1	Yes	550.0	8-8-8-9	3.0	3.0	-	M	None	Tree of good form and condition located within the hedgerow/ golf course	Good	Good	40+	B1	6.6	137.0	No
T18	Willow (Goat)	Off	10.0	2	Yes	430.0	5-5-6-5	4.0	0.5	-	EM	None	Located at the site boundary, east of a wire fence	Good	Fair	40+	C1	5.2	84.0	No
T19	Oak (English)	Off	16.0	1	Yes	1000.0	7-9-8-8	5.0	5.0	-	M	None	Mature oak, ivy on main stem, significant deadwood habitat throughout crown	Fair	Fair	40+	B3	12.0	452.0	No
T20	Ash (Common)	Off	17.0	1	Yes	400.0	9-8-6-8	4.0	4.0	N	EM	None	Located amongst the tree group at the site boundary. Overhanging the site by up to 8m	Good	Fair	40+	B2	4.8	72.0	No

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T21	Oak (English)	Off	16.0	1	Yes	420.0	7-8-8-7	4.0	4.0	E	EM	None	Located within the tree group at the site boundary,south of the stream	Good	Good	40+	B2	5.0	80.0	No
T22	Ash (Common)	Off	16.0	1	Yes	750.0	9-9-6-9	3.0	1.0	N	M	None	Located amongst the tree group at the site boundary. Overhanging the site by up to 8m	Good	Fair	40+	B2	9.0	254.0	No
T23	Ash (Common)	Off	16.0	6	Yes	490.0	7-7-8-8	3.0	1.0	-	M	None	Located amongst the tree group at the site boundary. Overhanging the site by up to 7m	Good	Fair	40+	B2	5.9	109.0	No
T24	Ash (Common)	Off	16.0	1	Yes	580.0	8-8-7-8	3.0	1.0	W	M	None	Located amongst the tree group at the site boundary. Overhanging the site by up to 7m	Good	Fair	40+	B2	7.0	152.0	No
T25	Ash (Common)	Off	10.0	1	Yes	900.0	7-7-4-5	3.0	0.5	-	LM	None	Located amongst the tree group at the site boundary. Overhanging the site by up to 7m. Large diameter hollowed stem with regrowth at the base. Good habitat tree	Good	Fair	40+	B3	10.8	366.0	No
T26	Oak (English)	Off	17.0	1	Yes	1100.0	5-8-9-8	4.0	3.0	-	M	None	Mature oak with a large stem diameter. Of lapsed pollard form. A prominent tree adjacent to the footpath and stream	Good	Good	40+	A3	13.2	547.0	No
T27	Oak (English)	Off	10.0	1	Yes	280.0	5-5-5-5	2.0	3.0	W	SM	None	Located within the tree group at the site boundary	Good	Good	40+	B2	3.3	35.0	No
T28	Ash (Common)	Off	10.0	1	Yes	300.0	6-6-6-6	3.0	3.0	-	SM	None	Located within the tree group at the site boundary	Good	Good	40+	B2	3.6	41.0	No
T29	Oak (English)	Off	15.0	1	Yes	400.0	7-8-8-7	4.0	4.0	E	EM	None	Located within the tree group at the site boundary,south of the stream	Good	Good	40+	B2	4.8	72.0	No

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T30	Willow (Crack)	Off	15.0	1	Yes	1500.0	9-9-9-9	4.0	3.0	-	LM	None	Located within the tree group at the site boundary. Prominent and mature tree with a large stem diameter	Good	Good	40+	B3	15.0	707.0	No
T31	Willow (Crack)	Off	15.0	1	Yes	1000.0	11-9-8-8	3.0	1.0	N	M	None	Located within the tree group at the site boundary. Prominent and mature tree with a large stem diameter. Pronounced stem lean to the north. Overhanging the site by up to 10m	Good	Good	40+	B2	12.0	452.0	No
T32	Willow (Crack)	Off	16.0	1	Yes	980.0	8-8-8-9	3.0	3.0	SW	M	None	Located within the tree group at the site boundary. Prominent and mature tree with a large stem diameter. Overhanging the site by up to 8m	Good	Good	40+	B2	11.8	434.0	No
T33	Ash (Common)	Off	14.0	2	Yes	360.0	7-6-7-7	3.0	0.5	-	EM	None	Located within the tree group at the site boundary. Ivy throughout crown	Good	Fair	40+	B2	4.3	59.0	No
T34	Willow (Crack)	Off	16.0	1	Yes	1000.0	10-10-8-9	4.0	3.0	NE	M	None	Located within the tree group at the site boundary. Prominent and mature tree with a large stem diameter. Overhanging the site by up to 10m	Good	Good	40+	B2	12.0	452.0	No
T35	Willow (Crack)	Off	10.0	2	Yes	380.0	5-6-6-6	2.0	1.0	SE	SM	None	Tree in acute decline, unsuitable for long term retention	Poor	Poor	<10	U	4.5	65.0	No
T36	Oak (English)	Off	14.0	1	Yes	500.0	7-8-8-9	2.0	2.0	S	EM	None	Tree of good form and condition located adjacent to an existing hard surfaced track	Good	Good	40+	B1	6.0	113.0	No
T37	Oak (English)	Off	14.0	1	Yes	550.0	7-8-8-8	3.0	2.0	NE	EM	None	Tree of good form and condition located east of the ditch at the field edge	Good	Good	40+	B1	6.6	137.0	No

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T38	Oak (English)	Off	13.0	1	Yes	580.0	7-6-6-6	3.0	2.0	E	EM	None	Tree of good form and condition located east of the ditch at the field edge	Good	Good	40+	B1	7.0	152.0	No
T39	Oak (English)	Off	4.5	1	Yes	580.0	3-3-3-3	2.0	2.0	E	M	None	Hollowed and burnt out stem with regrowth. located east of the ditch at the field edge. Good habitat tree	Good	Good	40+	B3	7.0	152.0	No
T40	Oak (English)	Off	15.0	1	Yes	550.0	8-8-8-8	4.0	3.0	N	EM	None	Tree of good form and condition located east of the ditch at the field edge	Good	Good	40+	B1	6.6	137.0	No
T41	Oak (English)	Off	12.0	1	Yes	520.0	6-7-6-6	4.0	3.0	N	EM	None	Tree of good form and condition located east of the ditch at the field edge	Good	Good	40+	B1	6.2	122.0	No
T42	Oak (English)	Off	13.0	1	Yes	540.0	7-7-7-7	4.0	3.0	-	EM	None	Tree of good form and condition located east of the ditch at the field edge	Good	Good	40+	B1	6.5	132.0	No
T43	Oak (English)	Off	10.0	1	Yes	1200.0	6-7-7-4	3.0	3.0	-	LM	None	Mature oak with a large stem diameter diameter and numerous veteran features such as large diameter deadwood, large diameter branch stubs, hollowing in stems, retrenched crown	Good	Good	40+	A3	14.4	651.0	No
T44	Oak (English)	Off	17.0	1	Yes	820.0	7-8-9-8	4.0	3.0	-	M	None	Tree of good form and condition, ivy throughout crown	Good	Good	40+	B1	9.8	304.0	No
T45	Oak (English)	Off	12.0	1	Yes	600.0	7-7-7-7	2.0	2.0	-	EM	None	Tree of good form and condition, located within the hedgerow and north of the site boundary	Good	Good	40+	B1	7.2	163.0	No
T46	Ash (Common)	Off	13.0	2	Yes	600.0	6-7-7-7	4.0	3.0	SE	M	None	Located within the hedgerow, slightly reduced vitality, woodpecker holes in stems and deadwood habitat in crown make this a good habitat tree	Fair	Fair	20+	C3	7.2	163.0	No

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Ref	Species	On/ off site	Top Height (m)	No. of Stems	Est diam ?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. low crown height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²	Located within the final site boundary?
T47	Oak (English)	Off	4.0	1	Yes	800.0	3-3-3-3	1.0	2.0	-	M	None	Hollowed out stem (large diameter) with regrowth. Good habitat tree	Good	Good	40+	B3	9.6	290.0	No
T48	Ash (Common)	Off	13.0	1	Yes	450.0	6-6-6-6	4.0	3.0	E	EM	None	Located within the hedgerow, slightly reduced vitality, woodpecker holes in stems and deadwood habitat in crown make this a good habit tree	Fair	Fair	20+	C3	5.4	92.0	No
T49	Oak (English)	Off	4.5	1	Yes	800.0	2-3-4-3	1.0	2.0	-	M	None	Hollowed out stem (large diameter) with regrowth. Good habitat tree	Good	Good	40+	B3	9.6	290.0	No
T50	Oak (English)	Off	12.0	1	Yes	850.0	6-5-6-7	4.0	4.0	W	M	None	Dead tree with significant habitat value	Poor	Poor	<10	C3	10.2	327.0	No
T51	Oak (English)	Off	6.5	1	Yes	280.0	4-3-4-4	2.0	2.0	-	SM	None	Establishing tree located within the hedgerow	Good	Good	40+	B1	3.3	35.0	No
T52	Oak (English)	Off	15.0	1	Yes	1300.0	8-7-3-5	1.0	2.0	W	LM	None	Located within the hedgerow, ivy throughout crown, large stem diameter and good deadwood habitat in upper crown	Good	Good	40+	A3	15.0	707.0	No
T53	Oak (English)	Off	16.0	1	Yes	950.0	8-9-6-7	5.0	3.5	N	LM	None	Located within the hedgerow, large stem diameter, reduced vitality. Large diameter deadwood throughout crown	Fair	Fair	20+	B3	11.4	408.0	No
T54	Oak (English)	Off	6.5	1	Yes	220.0	4-4-4-4	2.0	2.0	-	SM	None	Establishing tree located within the hedgerow	Good	Good	40+	B1	2.6	22.0	No
T55	Oak (English)	On	11.0	1	Yes	580.0	6-7-8-8	4.5	3.5	S	EM	None	Located adjacent to the access road, north of the ditch. Likely to require some minor crown raising	Good	Good	40+	B1	7.0	152.0	Yes
T56	Oak (English)	On	10.0	1	Yes	800.0	6-4-5-6	4.0	3.0	-	M	None	Located west of the drainage ditch and existing hard surfaced access road, dead wood habitat in upper crown	Fair	Good	40+	B3	9.6	290.0	Yes

BS5837:2012 TREE SURVEY SCHEDULE

BURSTEAD SOLAR FARM

PROJECT NO: 4606

SURVEYOR: IAN HOWELL

CLIENT: ENSO

SURVEY DATE: 19 & 20/11/2021

Barton Hyett Arboricultural Consultants

Ref	Species	On/ off site	Top Height (m)	No. of Stems	Est diam ?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. low crown height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²	Located within the final site boundary?
T57	Oak (English)	On	10.0	1	Yes	580.0	5-4-4-5	5.0	4.0	-	EM	None	Located west of the drainage ditch and existing hard surfaced access road, dead wood habitat in upper crown , significantly reduced vitality	Fair	Good	20+	C3	7.0	152.0	Yes
T58	Oak (English)	On	16.0	1	Yes	650.0	9-8-8-8	4.0	3.0	-	EM	None	Located west of the drainage ditch and existing hard surfaced access road. Tree of good form and condition	Fair	Good	40+	B1	7.8	191.0	Yes
T59	Oak (English)	On	16.0	1	Yes	780.0	9-9-8-8	4.0	3.0	-	EM	None	Located west of the drainage ditch and existing hard surfaced access road. Tree of good form and condition	Fair	Good	40+	B1	9.4	275.0	Yes
T60	Oak (English)	On	15.0	1	Yes	550.0	7-7-7-6	5.0	5.0	S	EM	None	Located east of the drainage ditch and existing hard surfaced access road. Tree of good form and condition	Fair	Good	40+	B1	6.6	137.0	Yes
T61	Oak (English)	On	15.0	1	Yes	1160.0	9-8-9-9	5.0	6.0	-	M	None	Located east of the drainage ditch and existing hard surfaced access road. Mature tree, with a large diameter hollowed stem	Good	Good	40+	B3	13.9	609.0	Yes
T62	Ash (Common)	On	17.0	1	Yes	450.0	7-7-7-7	5.0	6.0	-	EM	None	Located east of the drainage ditch and existing hard surfaced access road.	Good	Good	40+	B1	5.4	92.0	Yes
T63	Oak (English)	On	13.0	1	Yes	550.0	7-6-6-7	5.0	3.0	-	EM	None	Located north of the drainage ditch and existing compacted earth access track. Sufficient ground clearance for high vehicles	Good	Good	40+	B1	6.6	137.0	Yes
T64	Oak (English)	Off	12.0	1	Yes	650.0	8-6-6-7	5.0	2.0	W	EM	None	Located west of the drainage ditch, tree of good form and condition	Good	Good	40+	B1	7.8	191.0	Yes

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T65	Oak (English)	Off	13.0	1	Yes	450.0	8-6-7-7	4.0	2.0	W	EM	None	Located west of the drainage ditch, tree of good form and condition	Good	Good	40+	B1	5.4	92.0	Yes
T66	Oak (English)	Off	9.0	1	Yes	400.0	6-5-6-6	4.0	2.0	W	SM	None	Located west of the drainage ditch, tree of good form and condition	Good	Good	40+	B1	4.8	72.0	Yes
T66	Oak (English)	Off	9.0	1	Yes	600.0	5-5-6-6	4.0	2.0	-	EM	None	Located west of the drainage ditch, off Pollarded form	Good	Good	40+	B3	7.2	163.0	Yes
T67	Oak (English)	Off	9.0	1	Yes	400.0	5-4-6-6	4.0	2.0	W	SM	None	Located west of the drainage ditch, ivy throughout crown	Good	Good	40+	B1	4.8	72.0	Yes
T68	Willow (Crack)	Off	13.0	1	Yes	650.0	6-6-6-6	4.0	2.0	-	SM	None	Located west of the drainage ditch, tree partially collapsed (decayed main stem)	Good	Fair	40+	C3	7.8	191.0	Yes
T69	Maple (Field)	Off	7.0	1	Yes	200.0	4-4-3-2	4.0	2.0	-	SM	None	Located west of the drainage ditch	Good	Fair	40+	C2	2.4	18.0	Yes
T70	Oak (English)	Off	10.0	1	Yes	450.0	5-5-6-6	4.0	2.0	W	EM	None	Located west of the drainage ditch	Good	Good	40+	B2	5.4	92.0	Yes
T71	Oak (English)	Off	14.0	1	Yes	550.0	7-6-6-7	4.0	2.0	W	EM	None	Located west of the drainage ditch	Good	Good	40+	B2	6.6	137.0	Yes
T72	Oak (English)	On	18.0	1	Yes	780.0	9-10-11-11	4.0	4.0	E	M	None	Prominent tree within the linear tree feature. Ditch in-between tree and site, overhanging the site by up to 5m	Good	Good	40+	A1	9.4	275.0	Yes
T73	Oak (English)	Off	12.0	1	Yes	450.0	8-7-6-8	4.0	3.0	S	EM	None	Located east of the drainage ditch	Good	Good	40+	B1	5.4	92.0	Yes
T74	Oak (English)	Off	10.0	1	Yes	1100.0	5-6-6-7	4.0	3.0	-	LM	None	Located east of the drainage ditch. Large diameter hollowed stem	Good	Good	40+	A3	13.2	547.0	Yes
T75	Oak (English)	Off	6.5	1	Yes	220.0	4-4-4-3	3.0	2.0	S	Y	None	Establishing tree located at the field edge	Good	Good	40+	B1	2.6	22.0	Yes
T76	Oak (English)	Off	8.0	1	Yes	230.0	4-4-4-4	3.0	2.0	NE	Y	None	Establishing tree located at the field edge	Good	Good	40+	B1	2.8	24.0	Yes
T77	Oak (English)	Off	8.0	1	Yes	200.0	3-3-3-3	3.0	2.0	-	Y	None	Establishing tree located at the field edge	Good	Good	40+	B1	2.4	18.0	Yes

BS5837:2012 TREE SURVEY SCHEDULE

BURSTEAD SOLAR FARM

PROJECT NO: 4606

SURVEYOR: IAN HOWELL

CLIENT: ENSO

SURVEY DATE: 19 & 20/11/2021

Barton Hyett Arboricultural Consultants

Ref	Species	On/ off site	Top Height (m)	No. of Stems	Est diam ?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. low crown height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²	Located within the final site boundary?
T78	Elm (English)	On	10.0	1	Yes	250.0	4-4-3-4	5.0	3.0	N	SM	None	Dead elm stems	None	None	None	U	3.0	28.0	Yes
T79	Elm (English)	On	10.0	3	Yes	320.0	5-4-5-4	4.0	1.0	-	SM	None	Elm stems of an age where there are likely to succumb to DED	Good	Fair	<10	C2	3.8	46.0	Yes
T80	Oak (English)	Off	14.0	1	Yes	780.0	7-7-8-8	4.0	4.0	W	EM	None	Located east of the drainage ditch. Overhanging the site by up to 8m	Good	Good	40+	B1	9.4	275.0	Yes
T81	Oak (English)	Off	8.0	1	Yes	260.0	4-4-3-4	3.0	2.0	N	Y	None	Establishing tree located at the field edge	Good	Good	40+	B1	3.1	31.0	Yes
T82	Elm (English)	Off	13.0	1	Yes	300.0	6-6-6-7	4.0	3.0	E	SM	None	Establishing tree located at the field edge. Showing good resilience to DED	Good	Good	40+	B1	3.6	41.0	Yes
T83	Oak (English)	Off	15.0	1	Yes	600.0	5-5-7-7	5.0	2.0	NE	EM	None	Located at the field edge	Good	Good	40+	B1	7.2	163.0	Yes
T84	Willow (Crack)	Off	20.0	1	Yes	850.0	9-5-6-9	5.0	2.0	N	M	None	Located at the field edge, ivy throughout crown, forming a cohesive canopy with neighbouring tree	Good	Good	40+	B2	10.2	327.0	Yes
T85	Willow (Crack)	Off	20.0	1	Yes	850.0	9-9-7-7	5.0	2.0	SW	M	None	Located at the field edge, ivy throughout crown, forming a cohesive canopy with neighbouring tree	Good	Good	40+	B2	10.2	327.0	Yes
T86	Oak (English)	On	16.0	1		580.0	6-7-8-6	4.0	3.0	S	EM	None	Tree of good form and condition located at the field edge	Good	Good	40+	B1	7.0	152.0	Yes
T87	Oak (English)	On	12.0	1	Yes	480.0	7-7-7-7	4.0	3.0	NE	EM	None	Tree of good form and condition located west of the ditch	Good	Good	40+	B1	5.8	104.0	Yes
T88	Oak (English)	On	12.0	1	Yes	490.0	6-5-5-6	4.0	3.0	W	EM	None	Slightly reduced vitality, located west of the ditch	Good	Good	40+	B1	5.9	109.0	Yes
T89	Willow (Crack)	On	21.0	1	Yes	1300.0	10-11-11-10	3.0	3.0	S	M	None	Mature and prominent tree with a large stem diameter. Of good form and condition	Good	Good	40+	A1	15.0	707.0	Yes

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Ref	Species	On/ off site	Top Height (m)	No. of Stems	Est diam ?	Calc. / Actual Stem Dia. (mm)	Crown radii (m) N-E-S-W	Avg. low crown height (m)	1st branch ht (m)	1st branch dir.	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	RPA m²	Located within the final site boundary?
T90	Oak (English)	On	16.0	1	Yes	500.0	8-9-8-9	4.0	3.0	N	EM	None	Tree of good form and condition located south of the ditch	Good	Good	40+	B1	6.0	113.0	Yes
T91	Oak (English)	On	9.0	2	Yes	280.0	8-9-8-9	2.0	1.0	S	SM	None	Establishing oak located west of the ditch	Good	Good	40+	B1	3.3	35.0	Yes
T92	Oak (English)	On	10.0	1	Yes	550.0	6-5-5-6	2.0	3.0	S	EM	None	Stunted oak, deadwood in upper crown	Good	Good	40+	B1	6.6	137.0	Yes
T93	Ash (Common)	On	9.0	6	Yes	610.0	8-6-8-8	1.0	1.0	-	M	None	Mature hedgerow coppice	Good	Fair	40+	B1	7.3	168.0	Yes
T94	Oak (English)	Off	6.0	1	Yes	180.0	4-4-4-4	0.5	0.5	-	Y	None	Establishing tree located south of the ditch and site boundary	Good	Good	40+	B1	2.2	15.0	Yes
T95	Oak (English)	Off	11.0	1	Yes	250.0	7-6-6-6	1.5	1.5	N	SM	None	Establishing tree located south of the ditch and site boundary	Good	Good	40+	B1	3.0	28.0	Yes
T96	Oak (English)	Off	13.0	1	Yes	1100.0	7-8-8-7	3.0	3.0	W	M	None	Mature oak with a large diameter hollowed stem, located south of the ditch and site boundary	Good	Good	40+	A3	13.2	547.0	Yes

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)	Located within the final site boundary?
G1	Goat willow, English oak	Off	6-8	4	Yes	280.0	5.0	2.0	SM	None	Establishing trees located within the hedgerow	Good	Good	40+	C2	3.3	No
G2	Goat willow, field maple	Off	6-8	3	Yes	325.0	5.0	2.0	SM	None	Establishing trees located within the hedgerow	Good	Good	40+	C2	3.9	No
G3	English oak, field maple, goat willow	Off	8-10	3	Yes	480.0	6.0	1.0	EM	None	Establishing trees located within the hedgerow, located beyond the ditch at the site boundary	Good	Fair	40+	B2	5.8	No
G4	Common ash	Off	8-12	3	Yes	350.0	5.0	2.0	EM	None	SM to EM ash located within the hedgerow	Good	Fair	40+	C2	4.2	No

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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)	Located within the final site boundary?
G5	English oak, Scots pine, field maple, hawthorn	Off	5-20	25	Yes	800	8.0	4.0	M	None	Offsite tree group bounding the site. Overhanging the site boundary by up to 9m. Understorey trees provide reasonably good screening	Good	Good	40+	B2	9.6	No
G6	English oak, field maple, hawthorn, Leyland Cypress	Off	5-18	20	Yes	650	8.0	4.0	M	None	Offsite tree group bounding the site. Overhanging the site boundary by up to 6m. Understorey trees provide reasonably good screening	Good	Good	40+	B2	7.8	No
G7	English oak, blackthorn, hawthorn	Off	5-8	100	Yes	180	4.0	0.5	Y	None	Establishing plantation of predominantly young oak. Located within neighbouring private land	Good	Good	40+	B2	2.2	No
G8	English oak, field maple, hawthorn	Off	5-18	100	Yes	650	8.0	4.0	M	None	Offsite tree group bounding the site. Overhanging the site boundary by up to 7m Understorey trees provide reasonably good screening	Good	Good	40+	B2	7.8	No
G9	Goat willow, blackthorn, hawthorn	Off	4-7	150	Yes	180	4.0	0.5	Y	None	Establishing scrub, dominated by goat willow. Located within neighbouring private land	Good	Good	40+	B2	2.2	No
G10	English oak, silver birch	Off	6-9	4	Yes	280	2.0	0.5	SM	None	Establishing trees located at the site boundary within a neighbouring private garden	Good	Good	40+	B2	3.3	No
G11	Hawthorn blackthorn, field maple, English oak	Off	5-12	100	Yes	400	6.0	0.5	SM	None	Linear tree feature at the site boundary, located on the banks of a stream. Dominated by hawthorn and establishing young oak, understorey trees provide reasonable screening. More mature/significant trees have been plotted as individual trees	Good	Fair	40+	B2	4.8	No
G12	English oak, crack willow, hawthorn, blackthorn	Off	5-11	20	Yes	450	5.0	1.0	SM	None	Trees located around an agricultural pond and set back from the site boundary, some willow are in poor condition	Good	Good	40+	B2	5.4	No
G13	Crack willow	Off	13-16	2	Yes	680	6.0	4.0	M	None	Two willow forming a cohesive canopy. Located east of a ditch at the field edge	Good	Fair	40+	B3	8.2	No

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Ref	Species	On/off site	Height range (m)	No. of trees	Est diam?	Max stem diam (mm)	Av. Crown radius (m)	Avg. low crown height (m)	Life Stage	Special importance	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	Located within the final site boundary?
G14	English oak, goat willow, hawthorn, blackthorn	Off	4-15	30	Yes	500	5.0	0.5	SM	None	Copse of trees, predominantly oak, located east of the ditch at the field edge	Good	Good	40+	**B2**	6.0	No
G15	English oak	Off	10-15	10	Yes	800	7.0	4.0	EM	None	Linear tree feature separated from the site by an existing hard surfaced access road	Good	Good	40+	**B2**	9.6	Yes
G16	English oak	On	5-17	250	Yes	650	7.0	3.0	EM	None	Linear tree feature at the site boundary. SM to EM oak with an understorey of blackthorn and hawthorn with a footpath running west to east through the centre of the group. Reasonable screening from the site is provided by the thorn trees at the site edge	Good	Good	40+	**B2**	7.8	Yes
G17	English oak	Off	8-13	5	Yes	450	7.0	4.0	EM	None	Establishing oak at the site boundary forming a largely cohesive canopy. Ditch inbetween site and trees	Good	Good	40+	**B2**	5.4	Yes
G18	English oak	On	8-13	3	Yes	800	8.0	4.0	M	None	Mature oak at the site boundary forming a largely cohesive canopy. Deadwood habitat throughout canopy	Good	Good	40+	**B3**	9.6	Yes
G19	English oak	On	12-15	3	Yes	900	8.0	4.0	M	None	Mature oak at the site boundary forming a largely cohesive canopy. Deadwood habitat throughout canopy	Good	Good	40+	**B3**	10.8	Yes
G20	Common ash, English oak, field maple, blackthorn	On	8-15	50	Yes	450	7.0	2.0	SM	None	SM to EM trees forming a copse at the southern boundary, overhanging the site by up to 8m	Good	Good	40+	**B2**	5.4	Yes
G21	English oak	On	8-12	3	Yes	450	7.0	4.0	EM	None	Establishing oak on the southern bank of the ditch	Good	Good	40+	**B2**	5.4	Yes
G22	Common ash, hawthorn, blackthorn, field maple, English oak	Off	5-15	150	Yes	400	6.0	0.5	SM	None	Linear tree feature at the site boundary, located on the banks of a stream. Dominated by ash, understorey trees provide reasonable screening. More mature/significant trees have been plotted as individual trees	Good	Fair	40+	**B2**	4.8	Yes

BS5837:2012 TREE SURVEY SCHEDULE

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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)	Included within the final site boundary?
H1	Blackthorn, hawthorn, field maple, goat willow	Off	5	5	150	0.2	M	Dense and unmaintaned hedgerow, some individual oak, goat willow and field maple establishing along its length	Good	Fair	40+	B2	1.8	No
H2	Hawthorn	Off	5	3	80	0.2	EM	Dense hedgerow, good screening, unmaintaned accross the top	Good	Good	40+	B2	1	No
H3	Hawthorn, blackthorn	Off	4	4	100	0.1	EM	Remnant hedgerow or self sewn trees located on the banks of a deep ditch	Good	Fair	40+	C2	1.3	No
H4	Hawthorn, blackthorn, goat willow, field maple	Off	6	8	150	0.2	M	Dense and unmaintaned hedgerow/scrub. Located beyond the ditch at the site boundary. Good screening for the site, area of approx 10-15m has been cleared recently	Good	Fair	40+	B 2	1.8	No
H5	Hawthorn, blackthorn, English elm	Off	5	5	150	0.1	M	Outgrown and unmaintaned hedgerow, some gaps along the length where elm have succumbed to DED	Fair	Fair	20+	C2	1.8	No
H6	Hawthorn, blackthorn, field maple	Off	5	5	150	0.2	M	Dense and mature hedgerow, flailed con the site site, unmaintaned across the top. Good screening for the site	Good	Good	40+	B2	1.8	No
H7	Blackthorn, field maple, English elm	Off	3	2	80	0.2	Y	Informal hedgerow/young self sewn trees	Good	Fair	40+	C2	1	No
H8	Hawthorn, English oak, blackthorn	Off	5	4	100	0.2	Y	Offsite hedgerow within a neighbouring private garden	Good	Good	40+	B 2	1.3	No
H9	Blackthorn, hawthorn	Off	2	2	80	0.2	SM	Short section of dense and well maintained hedgerow	Good	Good	40+	B2	1	No
H10	Hawthorn	Off	5	4	150	0.3	EM	Remnant hedgerow trees	Fair	Fair	20+	C 2	1.8	No
H11	Hawthorn, goat willow, field maple	Off	4	4.5	140	0.2	EM	Section of dense and unmaintaned hedgerow	Good	Fair	40+	B2	1.7	No
H12	Hawthorn, blackthorn	Off	3	4	80	0.2	EM	Unmaintaned hedgerow, reasonably dense, some gaps along its length	Good	Fair	40+	B2	1	No
H13	Hawthorn, blackthorn	Off	3	3	80	0.2	SM	Two short sections/remnants of a hedgerow	Good	Fair	40+	C2	1	No

BS5837:2012 TREE SURVEY SCHEDULE

BURSTEAD SOLAR FARM

PROJECT NO: 4606

SURVEYOR: IAN HOWELL

CLIENT: ENSO

SURVEY DATE: 19 & 20/11/2021

Barton Hyett Arboricultural Consultants

Ref	Species	On/off site	Av. Height (m)	Av. width (m)	Av. Stem diam (mm)	Avg. low crown height (m)	Life Stage	General Observations	Health & vitality	Structural condition	Estimated Remaining Contribution (Years)	BS5837 Category	RPA Radius (m)	Included within the final site boundary?
H14	Hawthorn, blackthorn, field maple	Off	3	3	80	0.2	EM	Dense and unmaintaned hedgerow, providing some screening for the site	Good	Fair	40+	B2	1	Yes
H15	Blackthorn, hawthorn	Off	3.5	3	80	0.2	M	Hedgerow located east of the ditch and likely offsite, generally dense and providing good screening. Slightly thinner in its northern sectiom	Fair	Good	40+	B2	1	Yes
H16	Blackthorn, hawthorn	Off	5	5	100	0.2	SM	Hedgerow located at the site boundary, dominated by elm, al large percentage of which have died or are in decline due to DED	Poor	Poor	<10	C2	1.3	Yes
H17	Blackthorn, hawthorn	Off	3.5	3	80	0.2	EM	Unmaintaned but reasonably dense hedgerow	Good	Fair	40+	B2	1	Yes
H18	Blackthorn, hawthorn, willow, field maple	On	5	6	150	0.2	M	Located north and south of an agricultural pond. Some trees are partially collapsed, dense ivy throughout, dead ash stem	Fair	Fair	20+	C 2	1.8	Yes
H19	Blackthorn, hawthorn, elm, elder	On	3.5	3	100	0.1	EM	Remnant sections of hedgerow/self sewn trees located on the banks of a ditch	Fair	Fair	20+	C2	1.3	Yes
H20	Blackthorn, hawthorn, goat willow, dogwood	On	4	5	150	0.1	M	Unmaintaned but dense hedgerow	Good	Good	20+	B2	1.8	Yes
H21	Blackthorn, hawthorn	On	4	5	100	0.1	M	Unmaintaned but dense hedgerow, gaps along its length	Good	Good	20+	B2	1.3	Yes
H22	Hawthorn, blackthorn, field maple	On	5	6	150	0.2	M	Mature and outgrown hedgerow	Good	Good	40+	B 2	1.8	Yes
H23	Blackthorn	On	3	2	80	0.2	SM	Remnant of a hedgerow/self sewn trees	Good	Fair	20+	C2	1	Yes

IMAGE 1: Photoview of G5, a prominent tree group at the site boundary contains many mature English oak trees.

IMAGE 2: Photoview looking west along the northern edge of G22. A prominent linear tree feature at the southern boundary.

IMAGE 3: A prominent and mature English oak tree adjacent to the footway/ footbridge and stream at the southern boundary.

IMAGE 4: Mature English oak with significant habitat potential located within the hedgerow.

IMAGE 5: English oak trees located parallel to the existing hard surfaced track to the south of the industrial units.

IMAGE 6: Prominent linear tree feature forming the north and north-east boundary to the eastern parcel of the site.

- 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)

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 Planing Policy Guidance:

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

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

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

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

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

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

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

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

Tree Opportunities

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

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

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