SOLAR FARM, PELHAM STOCKING, ESSEX: BIODIVERSITY NET GAIN ASSESSMENT

ECO02096-R-01a

Pelham Solar Farm BNG assessment
1
15 June 2022

[redacted]

Quality Management

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1 INTRODUCTION

Purpose and scope of this report

1.1 RPS was commissioned by Berden Solar Limited to undertake a Biodiversity Net Gain (BNG) assessment of a proposed solar farm at Pelham Stocking, Essex ('the site').

1.2 An Ecological Appraisal for the site was undertaken by Cherryfield Ecology (Cherryfield Ecology, 2022), based on surveys undertaken in 2019, 2020 and 2022.

1.3 This report provides:

- Assessment of baseline ecological value and ecological value of the application site post-development;
- A summary of habitat enhancement and creation proposals; and
- Results of the overall net gain assessment.

Biodiversity Net Gain definition and methods

1.4 Biodiversity Net Gain is defined in Baker *et al* (2019)[1] as:

"Development that leaves biodiversity in a better state than before"

1.5 The requirement for developments to seek to achieve BNG arises from the National Planning Policy Framework (NPPF, 2021), which states in Para. 174 that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by … minimising impacts on and providing net gains for biodiversity."

1.6 An accepted method of assessing BNG is through the use of biodiversity calculators to assess the biodiversity value of habitats pre- and post-development based on habitat type, distinctiveness and condition.

1.7 A biodiversity index is derived for the baseline and for the proposed development, and BNG is considered to be achieved where an increase in value is delivered (on or offsite), and where habitats of a higher value are not replaced exclusively with habitats of a lower value.

1.8 This assessment was undertaken using the Defra biodiversity metric version 3.0 which was made available in July 2021. The metric and associated documents were downloaded from [redacted]

Baseline habitats

1.9 The Phase 1 habitat survey map used to assess the baseline is provided in Figure 1 (redrawn using shapefiles provided by Cherryfield Ecology. Refer to Cherryfield (2022) for full survey information.

Baker, J., Hoskin, R. & Butterworth, T. (2019). *Biodiversity Net Gain – good practice principles for development.* Ciria, London.

Proposed habitats

1.10 The full landscaping proposal drawing for the site is provided in Appendix A. A plan showing habitat areas used for the BNG assessment based on the landscaping proposals is provided in Figure 2 (redrawn from Appendix A).

Assumptions

1.11 The Cherryfield ecological appraisal does not contain sufficient information to make an assessment of habitat condition for those habitats that require condition assessment for BNG purposes (woodland, scrub, tall ruderal field margins and hedges). For the purposes of this assessment it has therefore been assumed that all habitats for which a condition assessment is required are in moderate condition.

1.12 Based on the information provided, the dry ditches on site are not considered to meet the requirement for inclusion in a separate 'rivers and streams' BNG assessment as they are not likely to hold water for more than 40% of the year.

1.13 A Landscape & Ecological Management Plan (LEMP) for the site is has been produced (Sightline Landscape, 2022). The LEMP contains objectives, strategies and management tasks for retained and created habitats but does not set out targets for assessing habitat condition as defined by the Defra BNG metric. In the absence of such targets, it has been assumed that all retained habitats will be maintained in moderate condition (with the exception of one hedgerow that is enhanced from poor to good condition by planting up gaps), and that all new habitats will also be maintained in moderate condition also. The condition criteria for habitat condition assessment for BNG purposes are set out in Section 3 of this report. It is recommended that condition assessment is included as part of the monitoring regime for the site post-construction, in order to assess whether the habitat management regime is achieving habitat condition required to generate the BNG as calculated in this report, and that the management regimes are adjusted in future iterations of the LEMP as necessary.

1.14 It is considered that the above represents a reasonable set of assumptions to make an initial assessment of BNG for the Pelham Solar project.

Figure 1. Phase 1 survey map

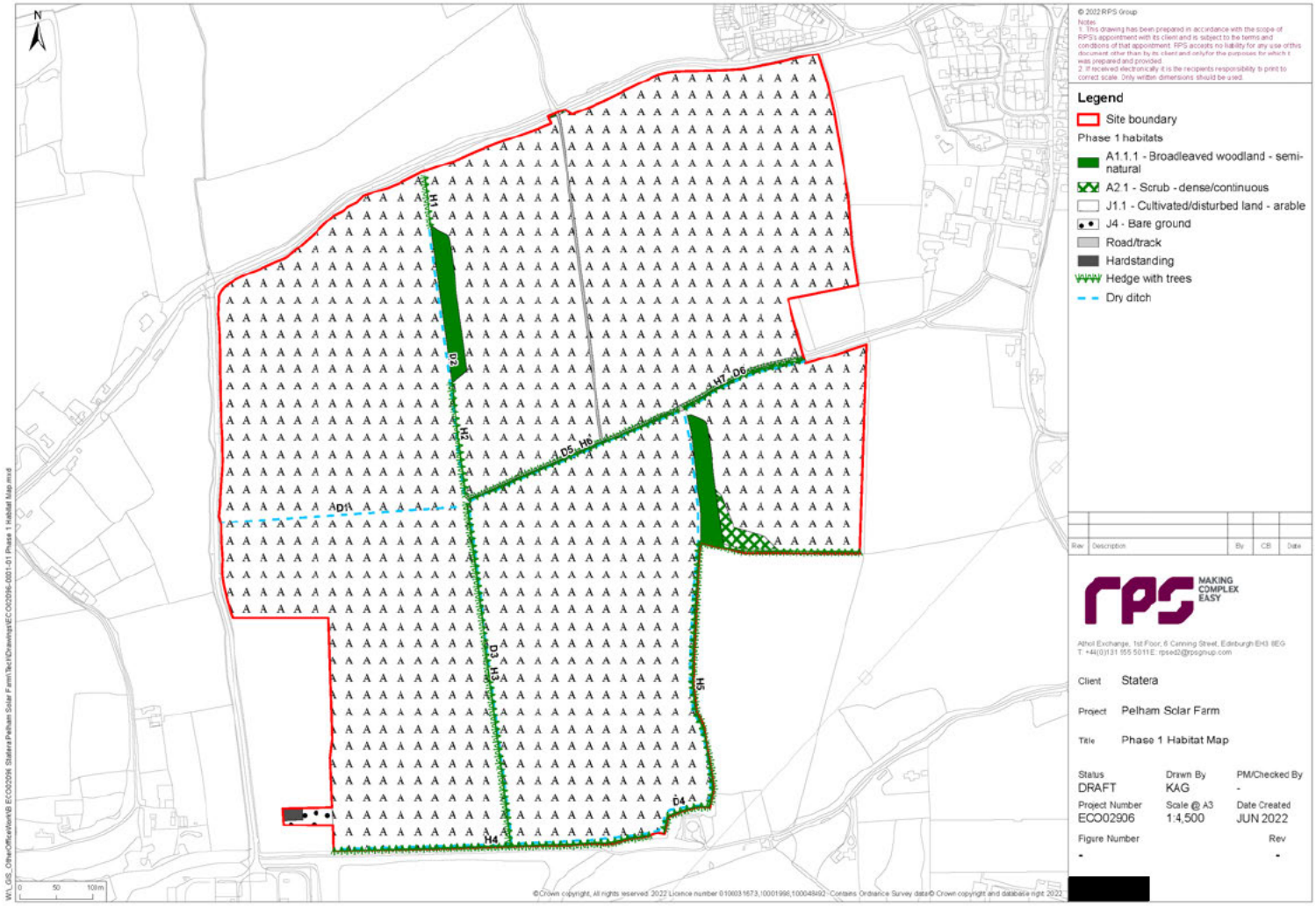
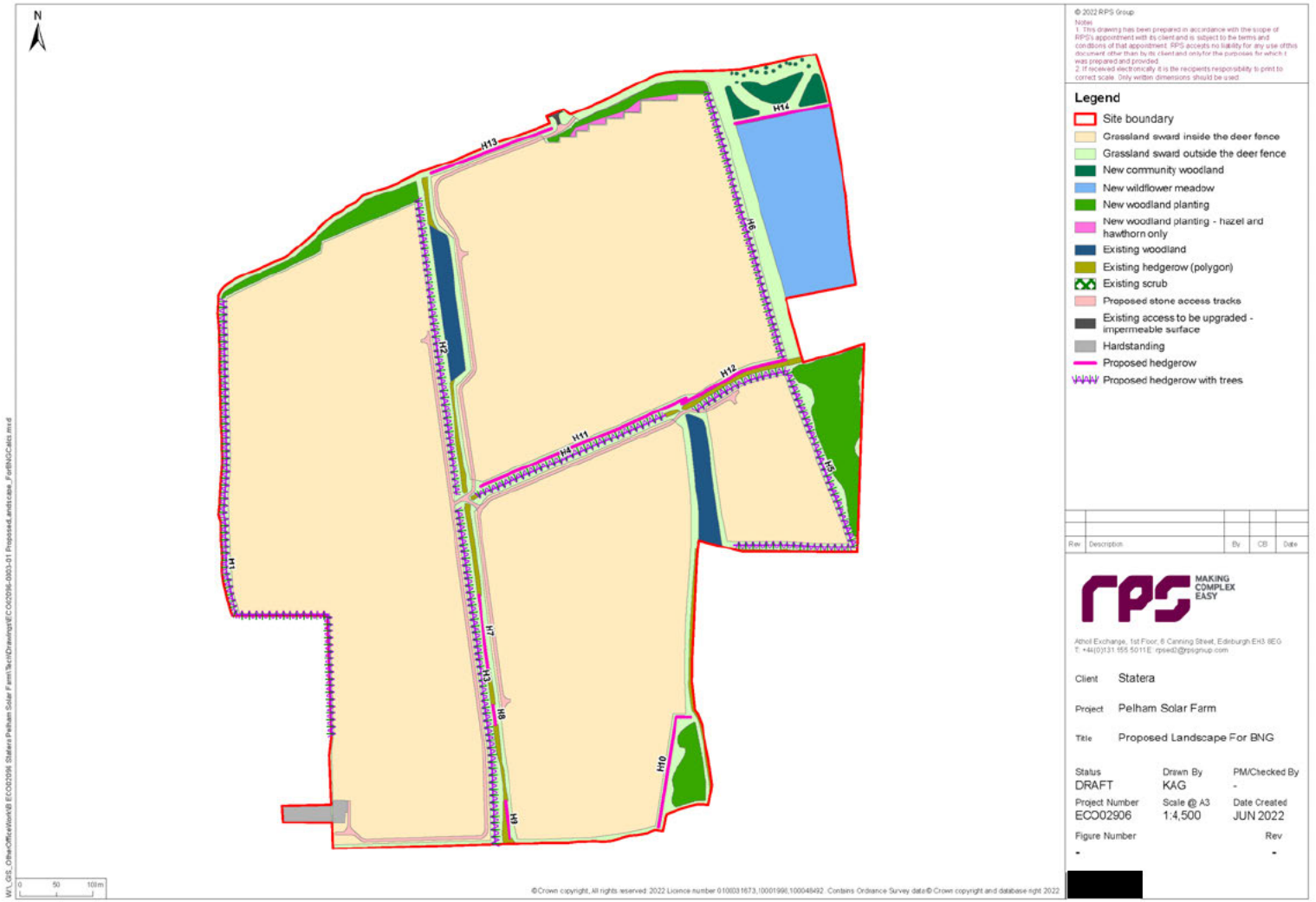


Figure 2. Habitat proposals within application red line



2 BIODIVERSITY NET GAIN ASSESSMENT

2.1 The baseline for assessment of BNG used the Phase 1 habitat map for the Site produced for the Ecological Appraisal (Figure 1 and Cherryfield Ecology, 2022). Refer to this report for details of the baseline habitats present on site.

2.2 Habitats on the proposed development site are taken from the proposals submitted with the outline planning application (Figure 2 and Appendix A).

2.3 Numbers in the tables in this section are copied from those generated by the Defra metric. Note that the spreadsheet rounds figures of credits to 2 decimal places which occasionally generates apparent minor discrepancies due to rounding errors when numbers are placed into tables.

Habitats

2.4 The extent, distinctiveness and condition of the baseline habitats on site are summarised in Table 2.1.

2.5 Areas of enhanced and new habitats proposed for the Site post-redevelopment and the biodiversity value as derived from the Defra calculation tool are provided in Table 2.2.

2.6 The assessment estimates the baseline value of the site at 156.29 units, of which 144.97 units are lost and 11.32 units retained.

2.7 Habitat creation proposed for the site provides 274.50 units.

2.8 Post-development units on site are therefore **11.32 + 274.50** = **285.82 units**. This is a net change of +**129.53 habitat biodiversity units**, which is a gain of **82.87%**.

Table 2.1: Baseline assessment of biodiversity value

Habitat type	Area (ha)	Distinctiveness score		Condition score		Strategic significance score		Value (biodiversity units)[1]	Area of habitat retained	Area of habitat enhanced	Baseline value of retained habitats	Baseline value of enhanced habitats	Area of habitat lost (ha)	Value of habitats lost
Lowland mixed deciduous woodland (two small copses)	0.941	High	6	Moderate	2	Low	1	11.29	0.941		11.29	0.00	0.00	0.00
Mixed (dense) scrub	0.409	Medium	4	Moderate	2	Low	1	3.27	0.004		0.03	0.00	0.41	3.24
Artificial unvegetated, unsealed surface (farm tracks)	0.292	V.Low	0	N/A	0	Low	1	0.00			0.00	0.00	0.29	0.00
Bare ground	0.122	Low	2	Moderate	2	Low	1	0.49			0.00	0.00	0.12	0.49
Arable fields	69.367	Low	2	N/a	1	Low	1	138.73			0.00	0.00	69.37	138.73
Developed land; sealed surface (hard standing)	0.045	V.Low	0	N/A	0	Low	1	0.00			0.00	0.00	0.05	0.00
Ruderal/Ephemeral (set-aside tall ruderal strips adjacent to retained hedgerows & ditches)	0.627	Low	2	Moderate	2	Low	1	2.51			0.00	0.00	0.63	2.51
Total	**71.80**							**156.29**	**0.95**	**0**	**11.32**	**0.00**	**70.86**	**144.97**

1: Calculated as: area x distinctiveness x condition x strategic significance

Table 2.2: Assessment of biodiversity value of post-construction habitat creation

Proposed habitat	Area (ha)	Distinctiveness score		Condition score		Time to target condition (years)	Temporal multiplier	Difficulty of creation	Difficulty multiplier	Habitat units delivered[1]
Modified grassland (grassland under panels inside deer fence, sown with solar farm grassland mix)	55.067	Low	2	Moderate	2	4	0.867	Low	1	**191.01**
Developed land; sealed surface (estimated area of total landtake for panel supports)	0.002	V.Low	0	N/A	0	0	1.000	Medium	0.67	**0.00**
Other neutral grassland (meadow grassland sown outside of deer fencing)	8.031	Medium	4	Moderate	2	5	0.837	Low	1	**53.76**
Other woodland; broadleaved (Community woodland area)	0.431	Medium	4	Moderate	2	15	0.586	Low	1	**2.02**
Lowland mixed deciduous woodland (other new woodland planting)	2.409	High	6	Moderate	2	30+	0.320	High	0.33	**3.05**
Mixed scrub (planting of hazel & hawthorn scrub near panels)	0.092	Medium	4	Moderate	2	5	0.837	Low	1	**0.62**
Artificial unvegetated, unsealed surface (stone access tracks)	0.996	V.Low	0	N/A	0	0	1.000	Low	1	**0.00**
Developed land; sealed surface (hardstanding – upgraded farm access track)	0.013	V.Low	0	N/A	0	0	1.000	Medium	0.67	**0.00**
Developed land; sealed surface (hard standing and solar farm infrastructure)	0.227	V.Low	0	N/A	0	0	1.000	Medium	0.67	**0.00**
Other neutral grassland (area of wildflower meadow planting)	2.983	Medium	4	Moderate	2	5	0.837	Low	1	**19.97**
Other neutral grassland (grassland outside deer fence adjacent to retained hedges/ditches)	0.607	Medium	4	Moderate	2	5	0.837	Low	1	**4.06**
Total habitat creation	**70.86**									**274.50**

1: Calculated as: area x distinctiveness x condition x time x difficulty)

Hedgerows

2.9 Hedgerows present within the site are summarised in Table 2.3. New and enhanced hedgerows proposed for the site are provided in Table 2.4 and Table 2.5.

2.10 The existing value of hedgerow habitat is **24.72** units, all of which are retained. Enhancement of one length of hedge (via planting up existing gaps) with baseline value of 1.09 units delivers a total of 1.97 units which is an additional net **0.88** units gain.

2.11 The value of new hedgerows is **30.36** units.

2.12 Post-development hedgerow units on site are therefore **24.72 + 0.88 + 30.36** = **55.97 units**. This is a net change of +**31.23 hedgerow biodiversity units**, which is a gain of **126.39%**.

Table 2.3: Baseline assessment of hedgerows

Hedgerow no. (Fig 1)	Hedgerow type	Length (km)	Distinctiveness score		Condition score		Strategic significance score		Value (hedgerow units)	Length retained	Length enhanced	Baseline value of retained hedgerows	Baseline value of enhanced hedgerows	Length lost	Value of length lost
1	Native Hedgerow with trees	0.067	Medium	4	Moderate	2	Low	1	0.54	0.067		0.54	0.00		
2	Native Hedgerow with trees - Associated with bank or ditch	0.157	High	6	Moderate	2	Low	1	1.88	0.157		1.88	0.00		
3	Native Hedgerow with trees - Associated with bank or ditch	0.479	High	6	Poor	1	Low	1	2.87	0.297	0.182	1.78	1.09		
4	Native Hedgerow with trees - Associated with bank or ditch	0.44	High	6	Moderate	2	Low	1	5.28	0.44		5.28	0.00		
5	Native Hedgerow with trees - Associated with bank or ditch	0.684	High	6	Moderate	2	Low	1	8.21	0.684		8.21	0.00		
6	Native Hedgerow with trees - Associated with bank or ditch	0.315	High	6	Moderate	2	Low	1	3.78	0.315		3.78	0.00		
7	Native Hedgerow with trees - Associated with bank or ditch	0.18	High	6	Moderate	2	Low	1	2.16	0.18		2.16	0.00		
	Total	**2.32**							**24.72**	**2.14**	**0.182**	**23.63**	**1.09**	**0**	**0**

Table 2.4: Assessment of biodiversity value of post-construction hedgerow creation

Hedgerow no. (Fig 2)	Proposed habitat	Length (km)	Distinctiveness score		Condition score		Time to target condition (years)	Temporal multiplier	Difficulty of creation	Difficulty multiplier	Hedgerow units delivered
1	Native Species Rich Hedgerow with trees	0.734	High	6	Moderate	2	10	0.700	Low	1	6.17
2	Native Species Rich Hedgerow with trees	0.414	High	6	Moderate	2	10	0.700	Low	1	3.48
3	Native Species Rich Hedgerow with trees	0.467	High	6	Moderate	2	10	0.700	Low	1	3.92
4	Native Species Rich Hedgerow with trees	0.284	High	6	Moderate	2	10	0.700	Low	1	2.39
5	Native Species Rich Hedgerow with trees	0.57	High	6	Moderate	2	10	0.700	Low	1	4.79
6	Native Species Rich Hedgerow with trees	0.381	High	6	Moderate	2	10	0.700	Low	1	3.20
10	Native Species Rich Hedgerow	0.176	Medium	4	Moderate	2	5	0.837	Low	1	1.18
11	Native Species Rich Hedgerow	0.312	Medium	4	Moderate	2	5	0.837	Low	1	2.09
12	Native Species Rich Hedgerow	0.157	Medium	4	Moderate	2	5	0.837	Low	1	1.05
13	Native Species Rich Hedgerow	0.179	Medium	4	Moderate	2	5	0.837	Low	1	1.20
14	Native Species Rich Hedgerow	0.134	Medium	4	Moderate	2	5	0.837	Low	1	0.90
	Total	**0.23**									**30.36**

Table 2.5: Assessment of biodiversity value of hedgerow enhancement

Hedgerow no.	Hedgerow type	Condition change	Length (km)	Distinctiveness	Score	Condition	Score	Strategic significance	Score	Standard Time to target condition/years	Time to target multiplier	Difficulty	Difficulty multiplier	Hedge units delivered
3 (Fig 1) 7-9 (Fig 2)	Native Hedgerow with trees - Associated with bank or ditch	Poor - Moderate	0.182	High	6	Moderate	2	Low	1	6	0.08	Low	1	1.97
Net Gain[1]														**0.88**

1: Net gain is value of hedge units delivered minus baseline value of enhanced hedgerow from Table 3.3.

3 PROPOSED HABITATS – TARGET CONDITION

3.1 As discussed in Section 1, the LEMP does not set out habitat condition targets for created and retained habitats, and this assessment has been undertaken on the assumption that it will be possible to achieve 'moderate' condition for all habitats.

3.2 This section sets out the criteria for achieving habitat condition as defined by the Defra 3.1 biodiversity metric guidance.

Modified grassland

3.3 Grassland inside the deer fence will be sown with a 'solar farm permanent Solar Park Permanent Grassland – Low Maintenance seedmix. These seedmixes typically contain up to 9 grass species and no flowering plants, and as such this grassland would be defined as 'modified grassland' for BNG purposes.

3.4 To achieve moderate condition, this habitat needs to achieve between 4-5 of the 7 criteria listed in Table 3.1, of which criterion 1 is essential.

Table 3.1. Habitat condition criteria for modified grassland

Criterion no.	Criterion
1	There must be 6-8 species per m2.
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.
4	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.
5	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens).
6	Cover of bracken less than 20%.
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981).

Other neutral grassland

3.5 Grassland outside the deer fence and in a separate area of meadow grassland (Figure 2 and Appendix A) will be sown with a Chalk & Limestone Soil Mixture. Although this is a grassland seedmix suitable for calcareous soils it is considered that it is unlikely to develop into full calcareous grassland given that it is being established on agricultural soils and therefore it has been defined as 'other neutral grassland' for the purposes of this assessment.

3.6 To achieve moderate condition, this habitat needs to achieve between 3-4 of the criteria listed in Table 3.2, of which criterion 1 is essential.

Table 3.2. Habitat condition criteria for other neutral grassland

Criterion no.	Criterion
1	The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type. Wildflowers, sedges and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward.
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.
3	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.
4	Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%.
5	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of species indicative of sub-optimal condition1 and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.
6	There are greater than 9 species per metre squared. NB - This criterion is essential for achieving good condition (non-acid grassland types only).

Woodland

3.7 To achieve moderate condition, this habitat needs to achieve a score of 26-32 from the criteria summarised in Table 3.3.

Table 3.3. Habitat condition criteria for woodland

Indicator		Good (3 points)	Moderate (2 points)	Poor (1 point)
1	Age distribution of trees	Three age classes present	Two age classes present	One age class present
2	Wild, domestic and feral herbivore damage	No significant browsing damage evident in woodland	Evidence of significant browsing pressure is present in 40% or less of whole woodland	Evidence of significant browsing pressure is present in 40% or more of whole woodland
3	Invasive plant species	No invasive species present in woodland	Rhododendron or laurel not present, other invasive species < 10% cover	Rhododendron or laurel present, or other invasive species > 10% cover
4	Number of native tree species	Five or more native tree or shrub species found across woodland parcel	Three to four native tree or shrub species found across woodland parcel	None to two native tree or shrub species across woodland parcel
5	Cover of native tree and shrub species	> 80% of canopy trees and >80% of understory shrubs are native	50-80% of canopy trees and 50-80% of understory shrubs are native	< 50% of canopy trees and <50% of understory shrubs are native
6	Open space within woodland	10 – 20% of woodland has areas of temporary open space, unless woodland is <10ha in which case lower threshold of 10% does not apply	21- 40% of woodland has areas of temporary open space	More than 40% of woodland has areas of temporary open space
7	Woodland regeneration	All three classes present in woodland; trees 4-7cm dbh, saplings and seedlings or advanced coppice regrowth	One or two classes only present in woodland	No classes or coppice regrowth present in woodland
8	Tree health	Tree mortality less than 10%, no pests or diseases and no crown dieback	11% to 25% mortality and/or crown dieback or low risk pest or disease present	Greater than 25% tree mortality and or any high

Indicator		Good (3 points)	Moderate (2 points)	Poor (1 point)
				risk pest or disease present
9	Vegetation and ground flora	Ancient woodland flora indicators present	Recognisable NVC plant community present	No recognisable NVC community
10	Woodland vertical structure[6]	Three or more storeys across all survey plots or a complex woodland	Two storeys across all survey plots	One or less storey across all survey plots
11	Veteran trees[7]	Two or more veteran trees per hectare	One veteran tree per hectare	No veteran trees present in woodland
12	Amount of deadwood	50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	Between 25% and 50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	Less than 25% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps
13	Woodland disturbance[8]	No nutrient enrichment or damaged ground evident	Less than 1 hectare in total of nutrient enrichment across woodland area and/or less than 20% of woodland area has damaged ground	More than 1 hectare of nutrient enrichment and/or more than 20% of woodland area has damaged ground

Scrub

3.8 To achieve moderate condition, this habitat needs to meet 3-4 of the criteria summarised in Table 3.4.

Table 3.4. Habitat condition criteria for scrub

Criterion no.	Criterion
1	Habitat is representative of UKHab description (where in its natural range). There are at least three woody species, with no one species comprising more than 75% of the cover (except common juniper, sea buckthorn or box, which can be up to 100% cover).
2	There is a good age range – all of the following are present: seedlings, young shrubs and mature shrubs.
3	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and species indicative of sub-optimal condition make up less than 5% of ground cover.
4	The scrub has a well-developed edge with scattered scrub and tall grassland and/or herbs present between the scrub and adjacent habitat(s).
5	There are clearings, glades or rides present within the scrub, providing sheltered edges.

Hedgerows

3.9 To achieve moderate condition, hedgerows must fail no more than 5 in total of the criteria in Table 3.5 and must not fail both criteria in more than one functional group.

Table 3.5. Habitat condition criteria for hedgerows

Attributes and functional groupings (A, B, C, D & E)		Criteria (the minimum requirements for 'favourable condition'	Description
A1.	Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees. Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice). A newly planted hedgerow does not pass this criterion (unless it is > 1.5 m height).
A2.	Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (e.g. blackthorn suckers) are only included in the width estimate when they >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice[4]).
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	This is the vertical gappiness of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length and No canopy gaps >5 m	This is the horizontal gappiness of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall gappiness, but are not subject to the >5 m criterion (as this is the typical size of a gate).

Attributes and functional groupings (A, B, C, D & E)		Criteria (the minimum requirements for 'favourable condition'	Description
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: - measured from outer edge of hedgerow, and - is present on one side of the hedge (at least)	This is the level of disturbance (excluding wildlife disturbance) at the base of the hedge. Undisturbed ground should be present for at least 90% of the hedgerow length, greater than 1m in width and must be present along at least one side of the hedge. This criterion recognises the value of the hedge base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc. can limit available habitat niches.
C2.	Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	The indicator species used are nettles (Urtica spp.), cleavers (Galium aparine) and docks (Rumex spp.). Their presence, either singly or together, should not exceed the 20% cover threshold.
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Neophytes are plants that have naturalised in the UK since AD 1500. For information on neophytes see the JNCC website and for information on invasive non-native species see the GB Non-Native Secretariat website.
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (e.g. excessive hedge cutting).
For hedgerows with trees only			
E1.	Tree age	At least one mature tree per 30m stretch of hedgerow. A mature tree is one that is at least 2/3 expected fully mature height for the species.	This criterion addresses if there are sufficient mature trees (within the scope of planning timescales) which are of higher value to biodiversity.
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.

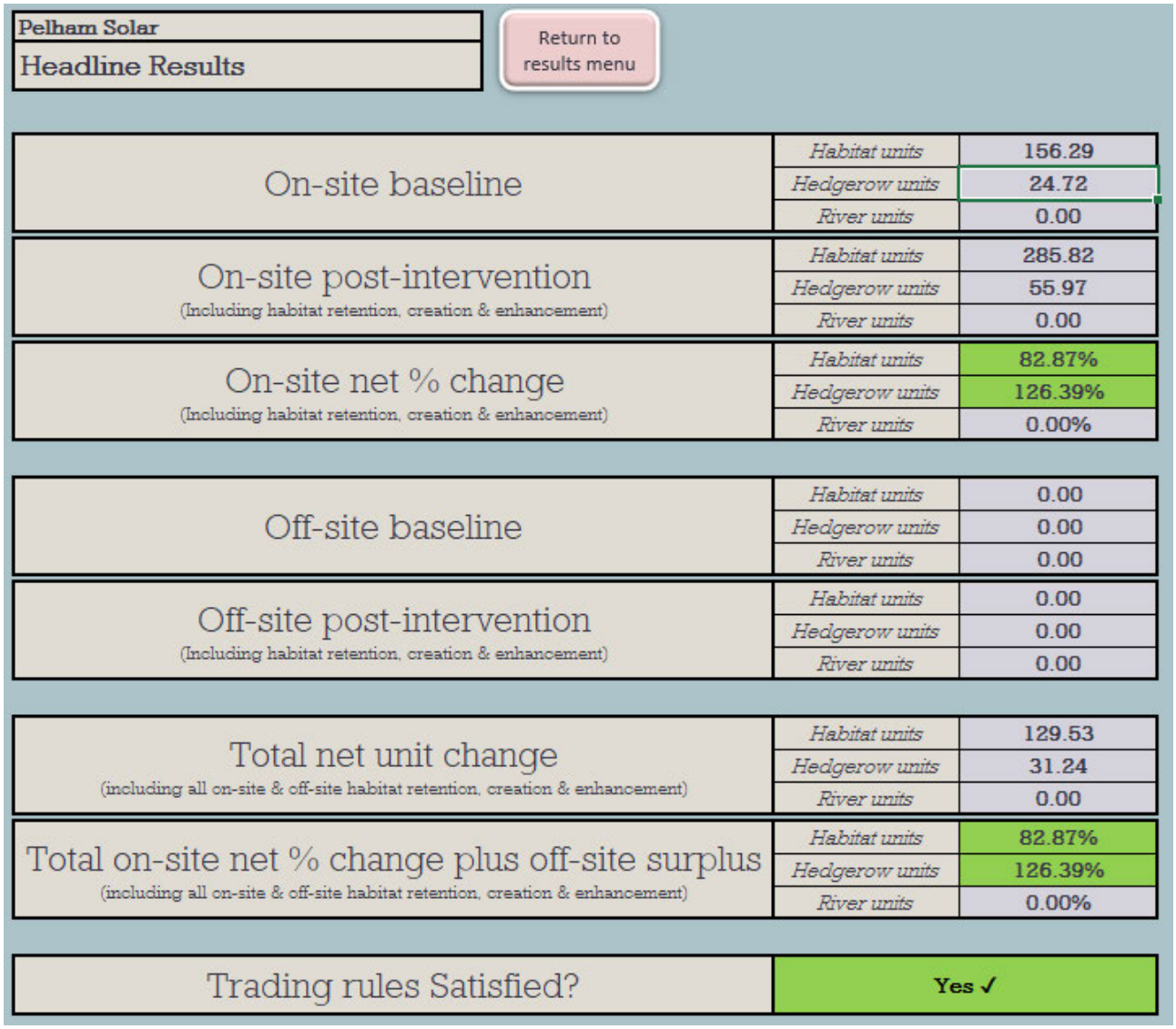
4 SUMMARY

4.1 The assessment above indicates that the development proposals provide the following:

- Area-based habitats: A net gain of 82.87%
- Hedgerows: A net gain of 126.39%

4.2 All three assessed habitat types therefore provide an enhancement significantly of above the target of 10% net gain as set out in the Environment Act 2021 assuming that moderate condition can be achieved for created habitats.

4.3 A summary screenshot from the calculator tool is provided below.



Pelham Solar

Headline Results

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On-site baseline	*Habitat units*	156.29
	Hedgerow units	24.72
	River units	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	285.82
	Hedgerow units	55.97
	River units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	82.87%
	Hedgerow units	126.39%
	River units	0.00%
Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	129.53
	Hedgerow units	31.24
	River units	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	82.87%
	Hedgerow units	126.39%
	River units	0.00%
Trading rules Satisfied?	Yes ✓	

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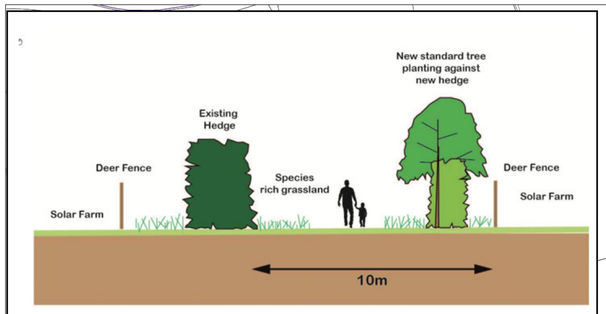
Sightline Landscape (2022). Pelham Solar Farm: Landscape and Ecological Management Plan. Sightline Landscape, Bath.

APPENDIX A: DEVELOPMENT SITE PROPOSALS



TYPICAL SECTION ACROSS A PUBLIC RIGHT OF WAY PASSING THROUGH THE PROPOSED SOLAR FARM

SWARD ESTABLISHMENT

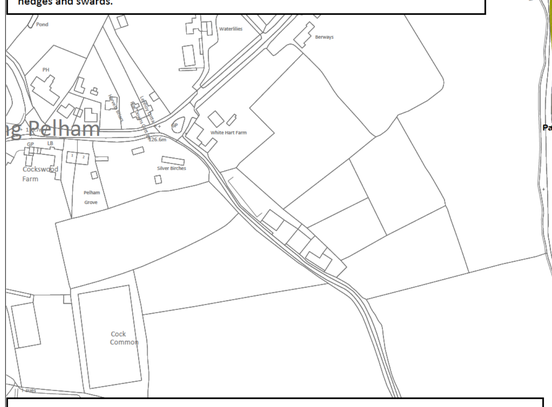
The sward inside the deer fence is to be sown with a Solar Park Permanent Grassland – Low Maintenance (Ref: MIXSPPG) at a rate of 25 Kg per hectare, available from Cotswold Grass Seeds Direct (https://www.cotswoldseeds.com) or similar mix from another supplier to approval.

The woodland areas are to be sown with PlAB1 The Operation Pollinator Mix (Just Legumes) Ref: MIXOPANTS at a rate of 12.5 Kg per hectare, available from Cotswold Grass Seeds Direct or another supplier of a similar product to approval.

All areas outside the deer fence but within the Site are to be sown with: Chalk & Limestone Soil Mixture (Ref: Ref: MIXCHA) at a rate of 25 Kg per hectare available from Cotswold Grass Seeds Direct or another supplier of a similar product to approval.

ESTABLISHMENT AND MAINTENANCE

The contractor shall follow the tasks set out in the Landscape and Ecological Management Plan (Sightline Landscape 2022) for the establishment and maintenance of the trees, woodland, hedges and swards.

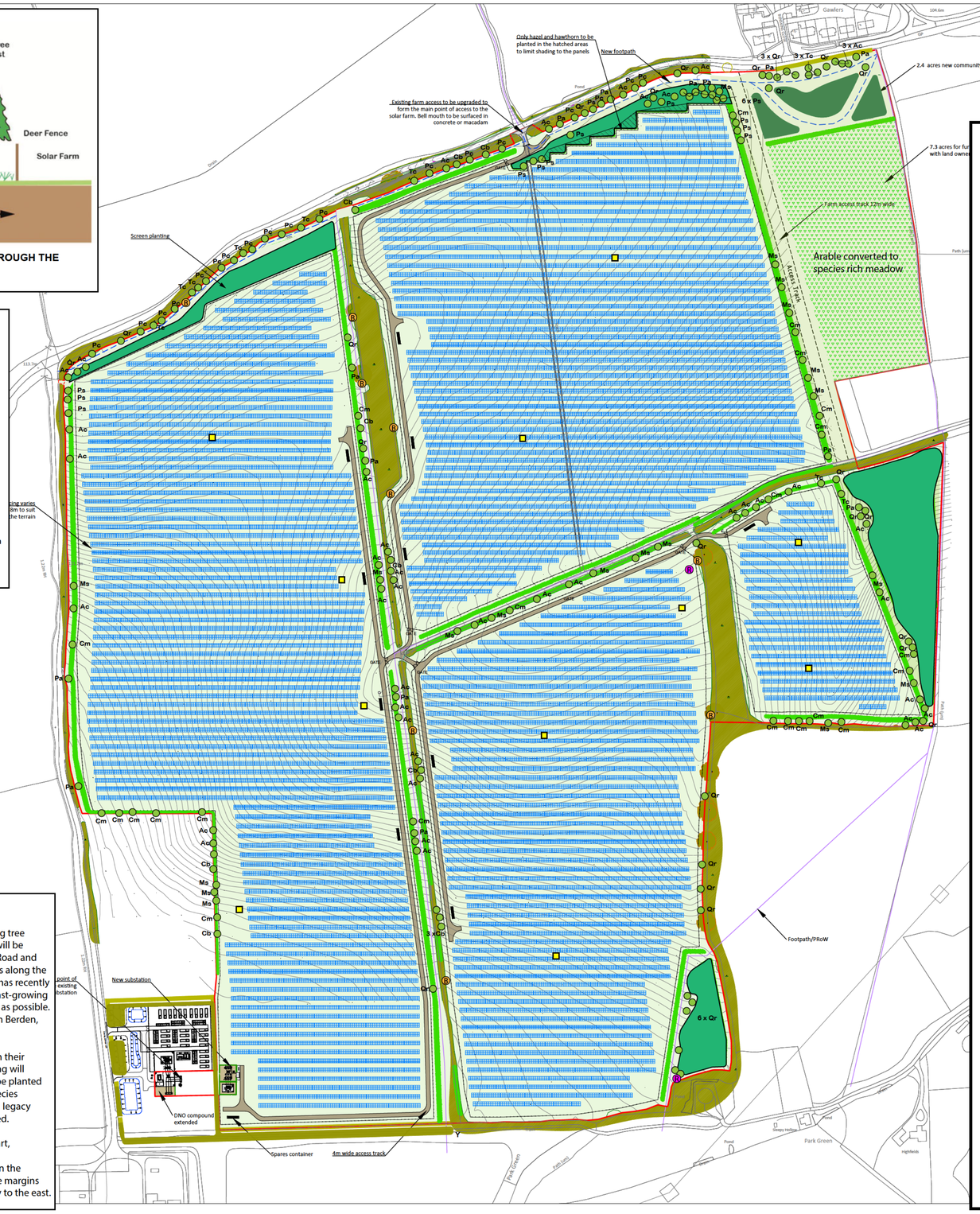


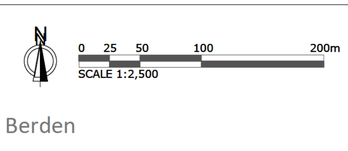
LANDSCAPE STRATEGY

Visual analysis indicates that the proposed solar farm will be well screened by existing tree and hedge cover which lies to the south and west. The more open areas to the east will be screened by hedge and tree planting. The most significant views will be from Ginns Road and higher ground further north. For this reason, it is proposed to plant woodland buffers along the northern edge to augment the existing roadside tree cover and a new hedge which has recently been planted by the landowner. As well as the woodland planting some individual fast-growing trees have been specified to ensure the views from the north are screened as rapidly as possible. Blocks of woodland planting alomng the eastern edge will screen the solar farm from Berden, nearby footpaths and in long distant views from high ground to the east.

The public rights of way which will pass through the solar farm will be maintained on their current alignment, set within 10 m wide corridors, within which native hedge planting will screen the solar farm from view when in leaf (see inset above). Tall stature trees will be planted where space and shading issues allow, while on other boundaries smaller stature species such as hawthorn and field maple will be planted. The proposed planting will leave a legacy of tree and hedge cover across the Site once the solar farm has been decommissioned.

The slight north facing slope means that the panels will be spaces sufficiently far apart, which combined with the short solar farm grass mix, will provide good nesting opportunities for skylark nesting. The grass sward will also allow sheep grazing within the solar farm if appropriate/practical. Species rich grassland will be specified around the margins and 2.7 hectares of permanent meadow will be established on land outside the array to the east.





PLANTING SCHEDULES AND SPECIFICATIONS

WOODLAND PLANTING

Latin Name	English Name	Size	Specification	%
Acer campestre	Field Maple	60 - 80 cm high	Bare root	10
Acer campestre	Field Maple	1.2 - 1.5 m high	Bare root feathered tree	5
Carpinus betulus	Hornbeam	0.9 - 1.5 m high	Bare root feathered tree	4
Carpinus betulus	Hornbeam	60 - 80 cm transplant	Bare root 1+1	7
Corylus avellana	Hazel	60 - 80 cm high	Bare root 1+1	25
Crataegus monogyna	Hawthorn	45 - 60 cm high	Bare root 1+1	17
Malus sylvestris	Crab apple	60 - 80 cm transplant	Bare root transplant 1+1	4
Prunus avium	Cherry	0.9 - 1.2 m high	Bare root feathered tree	4
Prunus avium	Cherry	60 - 80 cm transplant	Bare root 1+1	5
Quercus robur	Oak	0.9 - 1.2 m high	Bare root feathered tree	2
Quercus robur	Oak	45 - 60 cm transplant	Bare root 1+1	*8*
Tilia cordata	**Small leaved lime**	**0.9 - 1.2m high**	**Bare root feathered tree**	**4**
Tilia cordata	Small leaved lime	60- 80 cm transplant	Bare root 1+1	5
				100

HEDGE PLANTING

Latin Name	English Name	Size	Specification	%
Acer campestre	Field maple	60 - 80 cm high	Bare root 1+1	30
Crataegus monogyna	Hawthorn	45 - 60 cm high	Bare root 1+1	25
Carpinus betulus	Hornbeam	60 - 80 cm high	Bare root 1+1	13
Cornus sanquinea	Dog wood	60 - 80 cm high	Bare root 1+1	7
Corylus avellana	Hazel	60 - 80 cm high	Bare root 1+1	12
Lonicera periclymenum	Honeysuckle	60 - 90cm high	2 litre container grown	1
Ilex aquifolium	Holly	20- 40 cm high	2 litre Container grown	2
Rosa canina	Dog Rose	60 - 80 cm high	Bare root 1+1	5
Viburnum opulus	Guelder Rose	60 - 80 cm high	Bare root 1+1	5
				100

INDIVIDUAL TREE PLANTING

Latin name	English Name	Size	Specification	Code
Acer campestre	Field Maple	Standard Tree	8 - 10 cm girth 2.5 - 3.0m high	Ac
Crataegus monogyna	Hawthorn	Standard Tree	8 - 10 cm girth 2.5 - 3.0m high	Cm
Carpinus betulus	Hornbeam	Standard Tree	8 - 10 cm girth 2.5 - 3.0m high	Cb
Malus sylvestris	Crab apple	Standard Tree	8 - 10 cm girth 2.5 - 3.0m high	Ms
Prunus avium	Cherry	Standard Tree	8 - 10 cm girth 2.5 - 3.0m high	Pa
Populus canadensis 'Robusta'	Poplar	Standard Tree	2.5 - 3.0 m high feathered tree	Pc
Quercus robur	Oak	Standard Tree	8 - 10 cm girth 2.5 - 3.0m high	Qr
Tilia cordata	Small leaved lime	Standard Tree	8 - 10 cm girth 2.5 - 3.0m high	Tc
Pinus nigra	Scots Pine	Specimen	1.25 - 1.5 m high container grown	Ps

EXISTING VEGETATION

Any necessary works being undertaken within close proximity to the retained tree and hedgerows should be carried out in accordance with BS 3998:2010 Tree work and Recommendations, BS 5837:2012 Trees in Relation to Design Demolition and Construction and NJUG 4 Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees and in consultation with the Tree Protection Plan for the Site. Tree and hedgerow protection measures shall be put in place prior to the start of the main construction works.

PREPARATION

On completion of the construction of the solar farm infrastructure all deleterious construction materials and waste products shall be removed from site. Liaise with the main contractor operator on health and safety requirements, particularly in relation to any excavations near buried electrical cables.

Make good any damaged/disturbed areas by infilling with topsoil previously stripped from hardstanding areas within the site, grading out and cultivating to marry in with existing levels. Areas to be planted shall have a minimum depth of 350 mm topsoil. If less than this, make up the deficit with topsoil from the site strip. By mechanical means, relieve any compaction or areas of poor drainage arising from the construction works

PROPOSED PLANTING

Planting to be supplied in accordance with BS 3936-1:1992 Nursery Stock. specification for trees and shrubs, BS 3936-4:2007 Nursery Stock, BS 8545:2014 Trees: from nursery to independence in the landscape. All landscaping works to be in accordance with BS4428:1989 "General Landscaping Works." All planting should be UK grown and, where possible, sourced from local provenance certified stock. Planting to take place during the months of November to March, preferably before January and at a time when the soil is not frozen or waterlogged.

Trees and hedges will be planted into arable farmed soil. Transplants to be notch planted and trees to be pit planted with the pit being the depth of the rootball and 20% wider than the rootball. Backfill with existing site soil.

WOODLAND PLANTING

Transplants and feathered trees for the woodland area shall be planted in a loose grid at 2.25m centres. Species shall be randomly mixed and feathered trees and transplants to be evenly distributed across the woodland area. Transplants to be protected with biodegradable, staked deer shelters Feathered trees are to be fixed to a 50 mm dia. stake, driven in until firm. Once the woodland has been planted it is to be sown with a legume rich seed mix designed for pollinators, such as AB1 The Operation Pollinator Mix (Just Legumes) Ref: mixopants available from Cotswolds Grass Seeds Direct or another supplier to approval.

HEDGE PLANTING

Hedges are to comprise three staggered rows of plants. The first row is to be planted 2.5 m from the deer fence and the rows are to be 400mm apart with plants within rows at 600 mm centres. Species are to be randomly mixed along the lengths. Protect transplants with spiral rabbit guards and a cane.

INDIVIDUAL TREE PLANTING

Trees are to be planted in the positions shown with the specific species as indicated on the plan. Trees are to be double staked either side of the rootball with a looped webbing with spacers between the stakes and tree. Stakes to be driven in until firm and typically 0.9 – 1.2 metres above ground.

Site boundary
Proposed solar panels
Public Right of Way
2m high post and wire deer fence
Grass, sheep grazing sward inside the deer fencing, wildflower elsewhere.
Existing woodland and hedges
New hedges
Proposed stone access tracks
Transformer substation (10 no. total)
New woodland planting, see Schedule and specification).
New community woodland
New wildflower meadow
New permissive footpath
Area of woodland on the northern edge where only hazel and hawthorn to be planted to prevent shading to panels

Qr Individual standard trees (See Schedule for tree species codes)
Indicative skylark nesting sites (shown at 7m x 7m but in reality the gaps between the panels in most areas is sufficient to provide opportunities for nesting).
R 1.5 x 1.5 x 0.75 m high pile of dead wood from the site to enhance the habitat for reptiles and invertebrates
B A bird box is to be installed at these locations. The exact position to be determined by an ecologist.

Revision	Date	Comment

ON BEHALF
Pelham Solar Ltd

PROJECT
Proposed Solar Farm, Stocking Pelham, Essex

DATE 20th May 2022
SCALE 1 : 2,500 @ A1
DWG No 375_PP_04
APPROVED CMcD

TITLE
Planting Plan