Peartree Hill Solar Farm

Outline Landscape and Ecological Management Plan

Revision ~~23~~ (tracked)

Planning Act 2008

Infrastructure Planning

(Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 5(2)(q)

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Contents

1 Introduction

1.1 Introduction and purpose

1.1.1 Peartree Hill Solar Farm (hereafter referred to as the 'Proposed Development') comprises the construction, operational (including maintenance) and decommissioning of a solar photovoltaic ('PV') electricity generating and storage facility with an export capacity of up to 320 megawatts and associated infrastructure, as described within **Environmental Statement (ES) Volume 1, Chapter 3: Proposed Development Description [EN010157/APP/6.1]** and **Schedule 1** of the **Draft Development Consent Order (DCO) [EN010157/APP/3.1]**.

1.1.2 The Proposed Development is located within the 'Order Limits' and encompasses an area of approximately 891 hectares (ha) within East Riding of Yorkshire (the 'Site') as shown on the **Location and Land Area Plan [EN010157/APP/2.1]**. The indicative layout of the Proposed Development during the operation (including maintenance) phase is shown on **ES Volume 3, Figure 3.1: Indicative Operational Layout Plan [EN010157/APP/6.3]**. The proposed mitigation and enhancement measures for the Proposed Development are presented in **Appendix D - Indicative Environmental Masterplan** of the Outline LEMP.

1.1.3 This document provides the Outline Landscape and Ecological Management Plan (Outline LEMP) for the construction and operation (including maintenance) of the Proposed Development and should be read in conjunction with the **Outline Construction Environmental Management Plan (Outline CEMP) [EN010157/APP/7.2]** and the **Outline Operational Environmental Management Plan (Outline OEMP) [EN010157/APP/7.3]**. Decommissioning of the Proposed Development is covered by the **Outline Decommissioning Environmental Management Plan (Outline DEMP) [EN010157/APP/7.4]**. This Outline LEMP includes the provision for the successful establishment and future management of biodiversity and landscaping works. In doing so, it proposes measures to mitigate the effects of the Proposed Development during the operation (including maintenance) phase, to enhance biodiversity and secure compliance with relevant planning policies.

1.1.4 An Environmental Impact Assessment (EIA) has been undertaken for the Proposed Development and an Environmental Statement (ES) has been prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations). In accordance with the requirements of the EIA Regulations, the ES contains the assessment of the likely significant effects on the environment that may be caused during construction,

operation (including maintenance) and decommissioning of the Proposed Development and describes proposed mitigation measures.

1.1.5 A Biodiversity Net Gain assessment (**ES Volume 4, Appendix 7.10: Biodiversity Net Gain Assessment [EN010157/APP/6.4]**) has also been carried out indicating the baseline biodiversity value before development and with the Proposed Development in place. In line with **Appendix D - Indicative Environmental Masterplan**, the Proposed Development would deliver a biodiversity net gain of at least 10%. The Environment Act 2021 requires that habitat creation and enhancement to deliver biodiversity gain need to be managed and maintained for a period of 30 years, which is shorter than the operational life of the Proposed Development, which is 40 years. This Outline LEMP outlines the management and monitoring required to deliver the biodiversity gain outlined in **ES Volume 4, Appendix 7.10: Biodiversity Net Gain Assessment [EN010157/APP/6.4]**. The Landscape and Ecological Management Plan will be reviewed after 30 years to ensure it is fit for purpose for the remaining 10 years of the Proposed Development operation.

1.1.6 RWE Renewables UK Solar and Storage Limited ('the Applicant') has prepared this Outline LEMP from requirements outlined in the ES, as part of an Application for a Development Consent Order (DCO) (the "DCO Application") for the construction and operational (including maintenance) phases of the Proposed Development. It demonstrates the mitigation measures to be secured via the production of a Landscape and Ecological Management Plan, prepared substantially in accordance with this Outline LEMP as set out in **Schedule 2** of the **Draft DCO [EN010157/APP/3.1]** when they will be implemented, as well as setting out the monitoring and recording activities to ensure that these measures are carried out.

1.1.7 The Landscape and Ecological Management Plan will guide the Principal Contractor in relation to the management of the landscape and ecological features within the Proposed Development. The Landscape and Ecological Management Plan will be prepared in consultation with the Environment Agency and agreed with East Riding of Yorkshire Council prior to construction starting.

1.1.8 It is highlighted that the Proposed Development has been designed to respond to its local context. **Volume 5, Design Approach Document [EN010157/APP/5.7]** provides a summary of the approach taken towards design and sets out the project design principles that the Proposed Development will comply with.

1.1.9 A suite of management plans exists to support the delivery of the Proposed Development through construction, operation (including maintenance) and decommissioning. This Outline LEMP should be read in conjunction with the suite of management plans as outlined in **Table 1-1**.

Table 1-~~1~~1: Management Plans

Management Plan	Purpose	Stage	Document reference
Outline CEMP	Sets out how environmental effects would be minimised and mitigated during construction.	Construction	**[EN010157/APP/7.2]**
Outline OEMP	Sets out how potential environmental effects would be minimised and mitigated during operation.	Operation (including maintenance)	**[EN010157/APP/7.3]**
Outline DEMP	Sets out how environmental effects would be minimised during decommissioning .	Decommissioning	**[EN010157/APP/7.4]**
Outline Site Waste Management Plan (Outline SWMP)	Sets out how the Proposed Development would manage waste efficiently including measures to prevent and minimise waste.	Construction	**[EN010157/APP/7.10]**
Outline Soil Management Plan (Outline SMP)	Sets out the overall approach to managing soil resources affected by the Proposed Development.	Construction Operation (including maintenance) Decommissioning	**[EN010157/APP/7.8]**
Outline Construction Traffic Management Plan (Outline CTMP)	Sets out how construction traffic and staff vehicles would be managed during construction.	Construction	**[EN010157/APP/7.7]**

Management Plan	Purpose	Stage	Document reference
Outline Rights of Way and Access Management Plan	Sets out how public rights of ways (PRoW) would be managed to ensure they remain safe to use, and disruption to users of the PRoW is minimised.	Construction Operation (including maintenance) Decommissioning	**[EN010157/APP/7.9]**
Outline Battery Safety Management Plan (Outline BSMP)	Sets out the key measures to minimising the chances of a battery fire event and fire spread in the event of a fire. Sets out the proposed operational response to a fire event.	Construction Operation (including maintenance) Decommissioning	**[EN010157/APP/7.6]**
Archaeological Management Strategy (AMS)	Sets out the management of archaeological remains, both known and currently unknown, during construction.	Construction	**[EN010157/APP/7.11]**

1.1.10 The specification and maintenance schedule presented in this Outline LEMP is provided for planning purposes only to indicate the level of workmanship required. It has not been prepared for contractual purposes and should not be relied upon as the basis for any contractual agreement.

1.2 Landscape context

1.2.1 The circa 891ha Site is located to the east of the town of Beverley, close to the hamlet of Meaux and villages of Routh and Long Riston. Most of the Site is formed of large arable fields, along with some fields of grazed grassland, and relatively

small areas of neutral grassland, broadleaved woodland and scrub. The fields are bordered by a mix of hedgerows, wet ditches and some of the many major, named drains and dikes in the area.

1.2.2 The surrounding area is dominated by agricultural land, farmsteads and minor settlements, with a complex network of interconnecting drains and dikes. The main group of land parcels has few bisecting roads other than Meaux Lane, which cuts through the centre of the area. However, the small easternmost parcel is separated from the rest of the parcels by the A165 road. The River Hull runs close to the south-west corner of the Site, beyond which is the town of Beverley (c.1.3km at its nearest point). The North Sea and the Humber Estuary lie c.10km to the east and south respectively.

1.2.3 The landscape character of the Site is covered in the **ES Volume 2, Chapter 11: Landscape and Visual [EN010157/APP/6.2]**. The proposed landscape typologies and management are intended to build on the existing landscape character wherever possible.

1.3 Ecological context

1.3.1 The full ecological baseline is summarised in ~~Preliminary Ecological Appraisal (PEA) in respect of the Proposed Development was completed in August 2023 and updated in August 2024. Further details can be found in **ES Volume 4, Appendix 7.1: Preliminary Ecological Appraisal Report [EN010157/APP/6.4]**. This section provides a summary of the ecological baseline e~~ **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** and associated appendices and the **Habitats Regulations Assessment - Information to inform Appropriate Assessment [EN010157/APP/5.3]**. The assessment in these documents has identified the following ecological receptors for which mitigation~~within the Order Limits~~ was required:

~~Following the survey work described above and considering the baseline it was clear that three specific ecological features would require mitigation during the operation phase to offset the impacts of the Proposed Development on the following:~~

- ~~Bird species associated with the~~ Humber Estuary Special Protection Area (SPA) and Ramsar site bird species.~~;~~
- Farmland breeding ~~Ground nesting~~ birds.~~; and~~
- Foraging bats; and
- Badgers.

1.3.2 The management objectives within this Outline LEMP build on an understanding of the Site's existing landscape and ecology. In particular, the landscape design

and mitigation proposals within this Outline LEMP, as presented in **Appendix D - Indicative Environmental Masterplan**, and the enhancements outlined in **ES Volume 4, Appendix 7.10: Biodiversity Net Gain Assessment [EN010157/APP/6.4APP-114]** which seek to protect and enhance the valued landscape and ecology present throughout the Site, as well as providing new opportunities for wildlife to thrive, whilst delivering an uplift in biodiversity value.

1.3.3 A summary of the assessment conclusions in the **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** and/or the **Habitats Regulations Assessment - Information to inform Appropriate Assessment [EN010157/APP/5.3APP- 145]** for these receptors are set out below.

~~The management objectives within this Outline LEMP build on an understanding of the Site's existing landscape and ecology. In particular the landscape design and mitigation proposals within this Outline LEMP, as presented in Appendix D - Indicative Environmental Masterplan, and the enhancements outlined in **ES Volume 4, Appendix 7.10: Biodiversity Net Gain Assessment [EN010157/APP/6.4]** which seek to protect and enhance the valued landscape and ecology present throughout the Site, as well as providing new opportunities for wildlife to thrive.~~

~~1.3.1 The land within the Order Limits comprises cropland, modified grassland, other neutral grassland, woodland (and lines of trees), native hedgerows, dense scrub, standing water, rivers and streams with aquatic marginal vegetation and built-up areas and gardens. Habitats and plants within the Order Limits are relatively common and widespread in the surrounding area. However, the network of hedgerows, the rivers, a single pond and woodlands are all considered to be 'Priority Habitat' as listed under Section 41 of the Natural Environment and Rural Communities Act 2006**. [Ref. 1-1]**.~~

~~1.3.2 Habitats within the Order Limits have the potential to support fish, reptiles, breeding and wintering birds, commuting, foraging and roosting bats, water vole (*Arvicola amphibius*), otter (*Lutra lutra*) and badger (*Meles meles*).~~

~~1.3.3 An aquatic walkover was completed in August 2024 (**ES Volume 4, Appendix 7.8: Aquatic Walkover Report [EN010157/APP/6.4]**). The aquatic walkover was completed at all proposed ditch / watercourse crossing or horizontal directional drilling locations. The majority of crossing points were located on ditches deemed to have limited potential for fish.~~

Humber Estuary SPA/Ramsar site bird species

1.3.4 ~~Wintering bird surveys were undertaken between November 2023 and February 2024 (**ES Volume 4, Appendix 7.4: Wintering Bird Survey Report [EN010157/APP/6.4]**). These surveys identified a total of 71 wintering bird~~

species on Site. Based on the species recorded the wintering bird assemblage was assessed as being of district importance.

The Humber Estuary SPA and Ramsar site is designated for supporting internationally important assemblage of waterbirds. It is also used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention **[Ref. 1-29]**) in any season.

The Humber Estuary is also used regularly by 1% or more of Great Britain's populations of Annex I species.

1.3.5 The SPA/Ramsar site lies approximately 8km from the closest point of the Order Limits. Based on the assessments baseline ornithological survey results (see the baseline outlined within **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** and the **Habitats Regulations Assessment - Information to Inform Appropriate Assessment [EN010157/APP/5.3]**), the Proposed Development is deemed to be functionally linked land for the following four Humber Estuary SPA (Natural England Annex B category a species and one Humber Estuary SPA (Natural England Annex B category b species:

- Golden Pplover (*Pluvialis apricaria*).
- Lapwing (*Vanellus vanellus).*
- Mallard (*Anas platyrhynchos*).
- Teal (*Anas crecca*).
- Black-headed gull (*Chroicocephalus ridibundus*).

1.3.6 Therefore, the **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** and the **Habitats Regulations Assessment - Information to Inform Appropriate Assessment [EN010157/APP/5.3])ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** has concluded that mitigation will be required for these species due to the loss of functionally linked land and disturbance/ and displacement.

1.3.4

Farmland breeding birds

1.3.7 Breeding bird surveys were undertaken between 2022 and 2024 inclusive (**ES Volume 4, Appendix 7.3: Breeding Bird Survey Report [EN010157/APP/6.4]**). These surveys identified a total of 51 bird species breeding, or possibly breeding, on Site. Of these 28 were notable species. Based on the species recorded, the farmland breeding bird assemblage was assessed as being of district importance.

~~1.3.5~~1.3.8 ~~The~~ **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** concluded that mitigation will be required for farmland bird species due to loss of habitat, in particular for ground nesting species such as skylark which during the operational phase are likely to be displaced by the erection of solar PV modules on arable and grassland fields used for breeding.

Bats

1.3.9 A suite of bat surveys has been completed. Preliminary Roost Assessments which were completed in June 2023, September 2023 and August 2024. Bat Activity Surveys were completed during June and September 2023 and again in May 2024~~.~~ (**ES Volume 4, Appendix 7.6: Bat Survey Report [EN010157/APP/6.4]**). The number of bat registrations was similar across the Site apart from a couple of bat survey monitoring points which recorded a greater number of registrations. The two areas supporting higher levels of activity were Fields C5 and C6 along Arnold West Carr Drain, and Fields D15 and D17 adjacent to Little Decoy Wood which both appeared to be of greater value to common and widespread foraging bat species.

~~1.3.6~~1.3.10 As outlined in the **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** there is some evidence to suggest that during the operational phase certain species of bats can potentially be displaced by solar PV modules and therefore maintenance of flight corridors by appropriate buffer distances from linear features such as hedgerows and watercourses as well as provision of suitable foraging habitat without solar PV modules will be important. It is considered that the mitigation provided for SPA/Ramsar site bird species and farmland birds will benefit foraging bat species.

Badgers

~~1.3.7 An otter and water vole suitability assessment were completed in August 2024 (**ES Volume 4, Appendix 7.7: Water Vole and Otter Habitat Suitability Report [EN010157/APP/6.4]**). The assessment indicated the rivers and streams supported suitable habitat for both otter and water vole.~~

~~1.3.8~~1.3.11 Badger surveys were undertaken in August 2024 (**ES Volume 4, Appendix 7.2: Badger Survey Report (Confidential) [EN010157/APP/6.4]**). This survey identified 17 setts within the Order Limits. Field margins will remain as open corridors for animals to disperse. Security fencing will be designed and micro-sited to allow access for badger, by ensuring mammal access points are included within the fencing, such as non-buried fencing which will 'rest' on the ground but is flexible to allow badgers to push under the fence at low points to access the setts and enable them to continue to forage under solar PV modules ~~panels~~. Depending on the results of the pre-construction surveys, mammal gates will be installed at appropriate locations along the fence lines to allow badgers and other

small mammals access into fields for foraging. Details of these mammal access points will be provided within the final Landscape and Ecological Management Plan once the results of pre-construction surveys are known.

1.3.9 Following the survey work described above and considering the baseline it was clear that three specific ecological features would require mitigation during the operation phase to offset the impacts of the Proposed Development on the following:

- Bird species associated with the Humber Estuary Special Protection Area (SPA) and Ramsar site;
- Ground nesting birds; and
- Foraging bats

1.3.10 The Humber Estuary SPA and Ramsar site is designated for supporting internationally important assemblage of waterbirds. It is also used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention **[Ref. 1-29]**) in any season.

1.3.11 The Humber Estuary is also used regularly by 1% or more of Great Britain's populations of Annex I species.

1.3.12 The SPA lies approximately 8km from the closest point of the Order Limits. Based on the baseline ornithological survey results (see the baseline outlined in **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** and **Volume 5, Habitats Regulations Assessment - Information to Inform Appropriate Assessment [EN010157/APP/5.3]** the Proposed Development is deemed to be functionally linked land for the following four Humber Estuary SPA (Natural England Annex B category a species and one Humber Estuary SPA (Natural England Annex B category b species:

- Golden Plover (*Pluvialis apricaria*)
- Lapwing (*Vanellus vanellus)*
- Mallard (*Anas platyrhynchos*)
- Teal (*Anas crecca*)
- Black-headed gull (*Chroicocephalus ridibundus*)

1.3.13 Therefore, the **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** has concluded that mitigation will be required for these species due to the loss of functionally linked land and disturbance and displacement.

1.3.14 To calculate the likely area (ha) of mitigation required for wintering bird species a *bird days* calculation has been applied. This is calculated by the mean count for each species and multiplying by the number of days in the survey season., in

this case winter (November to March which is 151 days). Lapwing and Golden Plover were chosen as the key species as the ducks (Mallard and Teal) were mainly recorded within the dykes which will not be directly affected by the Proposed Development. Golden Plover and Lapwing both use similar habitats during the winter months and are often found together so habitat created will be used by both species. However, there will also be some competition between both species so in order to have a sufficient quantum of mitigation to maintain appropriate foraging resources the two species are considered separately.

1.3.15 **Volume 5, Habitats Regulations Assessment - Information to Inform Appropriate Assessment [EN010157/APP/5.3]** gives survey data for Lapwing and Golden Plover for the winters of 2001/22 and 2022/23 both within the order limits and immediately adjacent to it. Summing this and dividing by the number of individual observations gives a mean number of birds sighted over this period – due to the low numbers of birds recorded both winters were included as was the inclusion of bird observations outside the Order Limits, albeit in close proximity (within 1km). This is a more precautionary approach and more representative of the actual number of birds present. The mean for Golden Plover is 184.4 whilst Lapwing is 27.5.

1.3.16 Multiplying by the number of days in the winter season (1st October 2023 to February1st March 2024 is 1512 days) gives a bird day requirement of 28,028.8 for Golden Plover and 4,180 for Lapwing. Evidence in the literature **[Ref. 1-2]**) has reported Golden Plover existing at winter densities in grassland of 1560 bird days per ha and densities for Lapwing of 1,000 per ha. .

Therefore, dividing the number of bird days required by the average density (per ha) that has been recorded in the literature gives a rough estimate of the quantum (ha) of mitigation required. For Golden Plover, this equals 17.96 ha (28028.8 / 1560 = 17.96ha) whilst for Lapwing this equals 4.18 ha (4180/1,000 = 4.18ha). ThereforeAs outlined in this document, a total area of, the 38.42 ha of grassland and wet scrapes will be created in order to mitigate for the loss of functionally linked land for Lapwing and Golden Plover. Therefore, this total area creation outlined in this document will be more than sufficient to mitigate for loss of functionally linked land for Lapwing (requirement 4.18ha) and Golden Plover (17.96ha).

1.3.17 It is proposed that approximately 17.24 ha (Fields E13, and E14 and E613) on the west of the scheme will be grassland creation with wetland scrapes, whilst 21.48 20.66 ha (Field D18) in the centre will be grassland creation. The total hectarage for these areas take into account 0.82 hectares lost due to the permissive path along the northern boundary and includes approximately 2.79 ha of bird scrape. All three areas are surrounded by proposed solar development

on one side only with extensive sightlines across existing arable fields maintaining the open landscape feel that Lapwing and Golden Plover require. The 378.8642 ha of mitigation proposed for wintering Lapwing and Golden Plover will also be suitable for ground nesting birds as the species do not overlap temporally, therefore the mitigation above is also proposed as part of the total quantum of mitigation for ground nesting birds which is discussed below. The areas set aside for mitigation are shown in **Appendix D - Indicative Environmental Masterplan**.

1.3.18 In addition, the Site supports an assemblage of ground nesting birds such as skylark (*Alauda arvensis*) and again the **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** has concluded that mitigation is required.

1.3.19 As such this report details the mitigation proposed, to minimise any impacts on ground nesting bird species.

1.3.20 The Site currently supports an estimated 65 Skylark territories, within an area of approximately 891 ha. This equates to an average density of 0.07 Skylark territories/ha. Whilst the current density of Skylark breeding territories varies between fields, areas used by breeding Skylark will be highly transient between years, so applying an average Skylark territory density across the whole Site is appropriate to inform the quantity of replacement habitat required. Skylark are used as a proxy for all ground nesting species.

1.3.21 As different habitat types typically support different Skylark breeding densities, the quantity of replacement habitat required will be dependent on what that replacement habitat is and how it is managed, as sympathetic management could potentially boost the carrying capacity and the density of nesting Skylarks. Typical Skylark territory densities range from 0.02 territories/ha in intensive grazed pasture to 0.56 territories/ha in organic set-aside, whilst arable farmland typically supports 0.28 territories/ha and coastal saltmarsh 0.7 territories/ha **[Ref. 1-3]**.

1.3.22 To calculate the area of replacement habitat required, the number of replacement territories required is divided by the density of territories per hectare that the replacement habitat aims to support. For example, if all fields within the Site were allocated for solar panels and the proposed realistic target Skylark territory density within the mitigation area(s) was 0.56 territories/ha (based on the maximum territory density on organic set-aside, according to available literature **[Ref. 1-3]**, then c.116 ha of land would be required to deliver mitigation for 65 Skylark territories (65/0.56). It is considered that with suitable mitigation measures a breeding density of 0.56 territories or above per ha will be possible.

1.3.23 For the Proposed Development, fields larger than 2.5 ha in area (as Skylark prefer large open fields the assumption has been made those areas smaller than 2.5 ha are unlikely to be used by nesting birds) have been identified as ecological

mitigation areas in the design. Areas due to be created for wildlife below 2.5ha in area have been identified as ecological enhancement areas.

1.3.24 A total of 116 ha of suitable mitigation area is available for nesting Skylarks and other ground nesting birds in fields almost or larger than 2.5 ha.

1.3.25 The baseline territory density is 0.07 skylark territories per ha. A rough calculation using 0.56 territories/ha as a figure for what additional capacity the enhancement areas might deliver, it is estimated that 116 ha (65/0.56) of land is required to fully mitigate for 65 Skylark territories for the Proposed Development. The 116.2 ha available within the Order Limits will mitigate for the 65 skylark territories whilst additional 9.15 ha of designated ecological enhancement area as well herbal ley underneath the panels will increase invertebrate prey during the breeding season and this coupled with the provision of winter bird seed on 5% of margins will likely increase the carrying capacity of ground nesting birds locally. The areas set aside for mitigation are shown in **Appendix D - Indicative Environmental Masterplan**).

1.3.26 The Site also supports a diverse assemblage of foraging bats, and the mitigation measures outlined for bird species above as well as new landscape (hedgerow and tree belts) will all provide additional foraging for bats. In addition, offsets embedded in the design from existing hedgerows, ditches and other watercourses will protect these important bat foraging corridors.

1.3.27 The management objectives within this Outline LEMP build on an understanding of the Site's existing landscape and ecology. In particular the landscape design and mitigation proposals within this Outline LEMP, as presented in **Appendix D - Indicative Environmental Masterplan**, and the enhancements outlined in **ES Volume 4, Appendix 7.10: Biodiversity Net Gain Assessment [EN010157/APP/6.4]** which seek to protect and enhance the valued landscape and ecology present throughout the Site, as well as providing new opportunities for wildlife to thrive.

2 Overall landscape strategy

2.1 Design vision and principles

2.1.1 The Proposed Development has been designed to avoid or minimise impacts on the landscape and biodiversity, in accordance with the design approach set out in the **Design Approach Document [EN010157/APP/5.7].** The Design Vision is as follows:

"In order to support the urgent need for low-cost decarbonisation of the energy sector the proposed development will seek to maximise energy yield from the site whilst seeking to minimise any adverse effects on the environment and at the same time taking opportunities to deliver significant local benefit.

Good design will influence every decision; conservation and enhancement of the local environment will sit at the core of the design approach. Central to this is responding positively to the baseline landscape and the ecosystem services it provides and developing an understanding of what it is that the local community values. The design principles seek to preserve features of the landscape that contribute to the character and identity of the local area, giving particular consideration to the natural, historic and recreational environment."

2.1.2 A set of tailored project design principles has been developed based on the experience of the design team, and with reference to the Design Principles for National Infrastructure **[Ref. 1-14]** and the East Riding Design Code **[Ref. 1-25]**. The design principles have been established to, avoid, reduce and then mitigate potential and identified environmental impacts where possible. The project design principles also seek to, where appropriate, look at wider ranging enhancements or improvements for local stakeholders.

2.1.3 Under the four themes of Climate, People, Place and Environment the Design Approach Document sets out the project design principles for the Proposed Development. A list of design parameters which underpin the Proposed Development is contained within the **Design Parameters Document [EN010157/APP/5.8]**.

2.1.4 The following section provides a brief overview of the project design principles considered within the design process which are of relevance to the Outline LEMP.

Table 2-1: Overview of the project design principles considered within the design process of the Proposed Development

Theme	Project design principle
1. Climate	1.1 Designed to be **climate resilient** by incorporating, where reasonably practicable, mitigation measures and adaptations that respond to the impacts of climate change.
	1.2 Demonstrating **low carbon approaches** to design, construction and long-term maintenance.
	1.3 Designed to optimise **sustainability** in regard to design, construction and long-term maintenance.
2. People	2.1 Designed to respect the amenity of local residents and communities (giving consideration to environmental impacts including visual, transport, glint and glare, noise etc.).
	2.2 Designed to optimise use and enjoyment of the site and surroundings, promoting active living for existing and future communities and be inclusive.
	2.3 Designed to ensure **effective, appropriate and on-going communication** with the local community.
3. Place	3.1 Designed to consider the **efficient use and multifunctionality** of the land.
	3.2 Designed to champion a **context driven approach**, which positively responds to the local context, including social, economic and environmental priorities.
	3.3 Designed to respond to **local character and distinctiveness**.
	3.4 Designed to secure **effective place-keeping**, by being subject to management arrangements that demonstrate a commitment to effectively implementing, establishing and maintaining features at all stages of the development process.
4. Environment	4.1 Designed to **maximise environmental net gains**.
	4.2 Designed with the intention to **avoid any harmful environmental impacts** as far as possible.
	4.3 Designed to deliver **climate resilient/sustainable water management**, using above ground features to manage flood risk, maintain the natural water cycle and improve water quality within the boundary of the project and at a catchment scale.
	4.4 Designed to deliver **wildlife/biodiversity enhancement.**
	4.5 Designed to **create effective links with existing and planned for ecological features and networks** beyond the boundary of the project.

Ecological design principles

2.1.5 The design of the Proposed Development has been an iterative process involving not only the design principles outlined above, but consultation with key

stakeholders including the Yorkshire Wildlife Trust and the East Riding of Yorkshire Council. The objectives of the ecological mitigation hierarchy (avoid/mitigate/compensate) have been applied and implemented throughout the design process which include:

- Avoidance of direct impacts on nationally designated sites, which has included removal of Land Area A to avoid direct impact on Tophill Low and Leven Canal Site of Specific Scientific Interest (SSSI);
- Avoiding and retaining areas of ancient and non-ancient woodland;
- Minimising impact on priority habitat such as hedgerows and coastal floodplain grazing marsh;
- Minimising impacts on Local Wildlife Sites and mitigating where required;
- A minimum offset of 10m from boundary hedgerows and ditches where reasonably practicable;
- Minimum offset of 15m from ancient woodland where reasonably practicable;
- A minimum offset of 15m from veteran trees. Where it is not possible to retain a 15m offset from veteran trees for any works, tree protection fencing will be installed prior to works commencing and, where relevant, works will be undertaken under arboricultural supervision and 'no dig' construction methods will be used to protect the soil from compaction and minimise root impacts. Further details will be provided in the Arboricultural Method Statement, which will be produced prior to construction of the Proposed Development commencing;
- Mitigating for loss of functionally linked land for wintering birds associated with the Humber Estuary SPA and Ramsar site;
- Mitigating for loss of open ground used by ground nesting bird species; and
- Mitigating potential displacement of foraging bats by continued availability of habitat without solar panels for foraging bats whilst maintaining offsets from existing foraging corridors such as hedgerows, woodland and watercourses.

3 Overall ecology strategy

3.1 Overview

3.1.1 Grassland and wetland scrape habitats will be created prior to construction to mitigate the loss of functionally linked land from the Humber Estuary SPA and Ramsar Site, as well as the loss of suitable ground nesting bird habitats. This would also provide suitable foraging habitat for foraging bats.

3.1.2 There would be temporary habitat loss (agricultural land, small sections of hedgerows and ditches where culverts would be installed) during the anticipated 24-month construction period. This would be associated with construction activities, such as laydown areas, site compounds, haul routes, installation of interconnecting cable routes, and the grid connection cable route. These habitats would be reinstated following completion of the Proposed Development. Such measures will be outlined in the Construction Environmental Management Plan. Measures will be put in place to mitigate the risk of mammal entrapment from open trench cutting, and this risk will be considered within the Riparian Mammal Species Protection Plan, which will be completed as part of the Landscape and Ecological Management Plan.

3.1.3 There would also be long-term habitat change of agricultural land during the 40-year lifetime of the Proposed Development, which will be under the footprint of the solar PV modules and associated above ground infrastructure. Land under and around the margins of the panels will be managed to benefit biodiversity.

3.1.4 With regards to wintering bird species associated with the Humber Estuary SPA and Ramsar Site, the large arable fields within the Proposed Development support transient populations of lapwing and golden plover during the winter months, with the numbers and locations of birds varying considerably based on land use cropping between years, both within the Proposed Development and within the wider environment. Mallard and teal make use of the network of large watercourses and ditches, and black-headed gull are known to make use of the habitats throughout and surrounding the Order Limits for foraging purposes.

3.2 Humber Estuary SPA/Ramsar site bird species

Area of mitigation required

3.2.1 The mitigation areas will be designed to provide suitable habitat for golden plover, lapwing, mallard, teal, and black-headed gull (as identified in Section 1.3).

3.2.2 Following advice from Natural England, a 'bird-days' calculation has been undertaken to quantify the likely area (ha) of mitigation land required. The bird days calculations ~~were~~are based on the numbers of birds recorded during the surveys within and adjacent to Land Areas B to F and the grid connection cable route (refer to Appendix E for full details of the calculation and methodology).

3.2.3 Mallard and teal were mainly recorded within the watercourses and ditches, which would not be directly affected by the Proposed Development, and will further be protected from disturbance by buffers between ditches and the Solar PV modules and black-headed gull were recorded foraging throughout and adjacent to the Order Limits. As such, lapwing and golden plover were chosen as the key species for the bird-days calculations.

~~3.1.5 for golden plover and lapwing, based on the numbers of birds recorded during the surveys within and adjacent to Land Areas B to F and the grid connection cable route (refer to Appendix E for full details of the methodology).~~

3.2.4 The bird-days calculation has determined that the areas required for lapwing and golden plover are approximately 9.58~~7~~ ha and 4.96 ha respectively. Natural England~~E~~ noted that as lapwing have the same habitat requirements as golden plover, there will be competition for the same invertebrate food. Therefore, to provide sufficient mitigation land for both species, a minimum of 14.54~~34~~ ha in total would be required. Note we have re-run the bird days calculation from earlier iterations (revision~~version~~ 2) of the Outline ~~o~~LEMP to incorporate the bird survey ~~work~~ data from the **Grid Connection Cable Route Bird Survey Report [EN010157/APP/8.4]**~~proposed grid connection cable route~~ and also at the request of Natural England~~NE~~ ensuring the provision of mitigation is robust. Although the bird days calculation indicates a slightly lower quantum of required mitigation, the actual amount of mitigation proposed remains the same as 38.~~14~~76 ~~68~~ha.

3.2.5 The following fields totalling 38.~~14~~76 ha have been identified as mitigation areas for lapwing and golden plover:

- Mitigation Area 9 (F~~F~~ield D18~~(~~) – 21.48 ha
- Mitigation Area 11 (Field E6) – 8.6 ~~851~~ha
- Mitigation Area 13 (F~~F~~ields E13/E14) – 8.68 ~~9~~ha

Suitability of mitigation areas

3.2.6 The locations of the mitigation areas have been strategically chosen, based on their proximity to habitats within and adjacent to the Proposed Development where wintering bird species have been previously recorded. For example, Mitigation Area 13 (F~~f~~ields E13/E14) is~~are~~ close to the River Hull, Figham Pasture LWS and Swine Moor Common. Therefore, the mitigation areas provide good

connectivity to habitat within the surrounding landscape known to be used by golden plover, lapwing, teal, mallard and black-headed gull. The mitigation areas are also located on the edge of the Order Limits to minimise their proximity to the solar PV modules.

~~3.1.6~~

~~3.1.7~~3.2.7 Mitigation Areas 9 and 11 (Fields D18 and E6) are currently intensively farmed as arable, and Mitigation Area 13 (Fields E13/E14) is temporary grassland and clover ley. In order to provide habitats suitable to support lapwing and golden plover and increase the carrying capacity of these areas, new wader scrapes with ~~wet~~ neutral grassland are proposed in Mitigation Areas 11 and 13 (Fields E6 and E13/14), and a permanent pasture (flower rich neutral grassland) will be created surrounding the scrapes and within Mitigation Area 9 (Field D18). These habitats will be created sufficiently in advance of construction works to allow establishment prior to the first winter to ensure appropriate habitat is available prior to the beginning of ~~the~~ any construction ~~phase~~activity. As recommended by Natural England, the scrapes would be created at the same time as the ground is prepared to ensure sward establishment. Further details of the proposed habitat creation are provided below and in ~~Refer to s~~Sections 14 and 15 ~~f~~or ~~further details of the proposed habitat creation.~~

~~3.1.8~~3.2.8 Appendix E provides evidence (as requested by Natural England) that the size of the mitigation areas and the anticipated increase in carrying capacity from the proposed habitats to be created, will provide enough invertebrate prey to provide for the combined peaks of both golden plover and lapwing. This includes consideration of the impact of sightlines on carrying capacity, given that areas around the edges of fields close to field boundary features such as hedgerows may be used by lower densities of birds.

Mitigation Area 9 (Field D18)

~~3.1.9~~3.2.9 Mitigation Area 9 (Field D18) was chosen due its large size (21.48ha) which will provide wide open vistas suitable for wintering birds (refer to photographs 1 and 2 below). Its location on the edge of the Order Limits will also minimise proximity to the proposed solar PV modules. As shown on the ~~**Environmental Statement**~~ **ES Volume 3, Figure 3.4: Indicative Environmental Masterplan [APP- 058] ~~ES,: [APP-055]~~** and photographs 3 and 4 below, the proposed solar PV modules are separated from the mitigation area by two existing tall hedgerows with trees~~refer to 3 and 4~~ and would not be visible to birds using the mitigation area. The amount of functionally available 'core habitat' would therefore not be affected by the solar PV modules. The mitigation area is also surrounded by existing farmland fields, farms, and stables and is considered a suitable location, similar to habitats used by golden plover, lapwing, mallard, teal and black-headed gull in the surrounding area.

Photographs 1 and 2: Showing open vistas within Mitigation Area 9 (Field D18)

Photographs 3 and 4: Showing existing hedgerow between Mitigation Area 9 (Field D18) and Field 17, where solar PV modules will be located.

~~mitigation within Land Area D18 is on the edge of the Proposed Development and the only the northern quarter of the mitigation area will be within 150 metres of solar PV modules associated with the Proposed Development and other developments included within **ES Volume 2, Chapter 15: Cumulative Effects [EN010157/APP/6.2.**~~
~~Land Area D18 is partly bordered by land associated with Meaux Abbey to the south which is unlikely to be affected by development within the future and therefore provides long term connected habitat to proposed SPA bird mitigation area as well reducing the risk of disturbance. Two tall existing hedgerows containing trees border the northern boundary of Land Area D18 which will screen the proposed solar PV modules within Land Area D17. Furthermore, as shown within **Outline Landscape and Ecological Management Plan (Outline LEMP) [EN010157/APP/7.5** proposed scrub planting along part of southern boundary of Land Area D17 will provide additional screening~~

Mitigation Area 11 (Field E6)

3.2.10 Mitigation Area 11 (Field E6) is a large field which will provide wide open vistas suitable for wintering birds (refer to photographs 5 and 6 below). Its location on the edge of the Order Limits will also minimise proximity to the proposed solar PV modules. As shown on the **ES Volume 3, Figure 3.4: Indicative Environmental Masterplan [APP- 058]** ~~**Environmental StatementES Volume 3, Figure 3.1: Indicative Operational Layout Plan [APP-055]**~~, the ~~the northern boundary of this~~ mitigation area is ~~in close proximity (within 150 m) to solar PV modules. However, it is~~ separated from the proposed solar array to the north ~~PV modules~~ by an existing hedgerow, which would be gapped up to ensure that the solar PV modules would not be visible to birds using it. T~~and t~~herefore the amount of functionally available 'core habitat' within the mitigation area would not be affected by the solar PV modules. The mitigation area is also surrounded by a Scheduled Monument site (Meaux Duck Decoy) and other ecological mitigation areas for ground nesting birds where no solar PV modules would be located. It is adjacent to Holderness Drain, one of the widest waterbodies within or directly adjacent to the Order Limits. As such, Mitigation Area 11 (Field E6) is considered a suitable location, similar to habitats used by golden plover, ~~and~~ lapwing, mallard, teal and black-headed gull in the surrounding area.

~~Solar PV modules will be within 150 metres of SPA bird mitigation within Land Area E6. However, the only Land Areas associated with the Proposed Development within 150 metres of Land Area E6 which contain solar PV modules will be adjacent to the northern and northeastern boundaries. Land Area E6 will be bordered by ground nesting bird mitigation associated with the Proposed Development to the east. An area of grassland outside the red line boundary borders the southern boundary. Due to the presence of the scheduled monument within the grassland it is unlikely this area will be developed in future and impact the integrity of the SPA bird mitigation. As well the grassland outside the Order Limits a strip of ecological enhancement is located between the solar PV modules within Land Area E9 and Land Area E6. Therefore, no solar PV modules are anticipated within 150 metres of the southern or eastern boundaries.~~

Photograph 5: Mitigation Area 11 (Field E6)

Photograph 6: Mitigation Area 11 (Field E6)

~~As detailed within ES Volume 2, Chapter 15: Cumulative Effects [EN010157/APP/6.2, a solar development associated with planning application 22/03648/STPLF may result in solar PV modules within 150 meters of the western quarter of Land Area E6 if the planning application is approved. However, Holderness Drain separates the solar PV modules and Land Area E6. The section of Holderness Drain adjacent to Land Area E6 is wide and a tall hedgerow is adjacent to the eastern bank which provides sufficient screening~~Mitigation Area 13 (~~f~~FFields E13/14 ~~(Mitigation Area 13)~~

~~3.1.10~~ Mitigation Area 13 (Fields E13/E14) is a large area comprising Fields E13 and 14, providing wide open vistas suitable for wintering birds (refer to photographs 7 and 8). It is also located along the edge of the Order Limits. As shown on the **ES Volume 3, Figure 3.4: Indicative Environmental Masterplan [APP- 058]** and photographs 9 and 10 below, ~~with only a small section in the southeast corner (approximately 100m) in close proximity to solar PV modules (within 150 m). t~~The m~~M~~itigation ~~A~~area is separated from the proposed solar PV modules by an existing road, bounded on both sides by tall hedgerows and a line of established trees. ~~(refer to photographs 9 and 10).~~ As such the solar PV modules would not be visible to birds using the mitigation area and the amount of 'core habitat' available would not be affected. The m~~M~~itigation a~~A~~rea is surrounded by existing arable fields to the west, north, and east, and by an existing farm to the southwest. As such it is considered a suitable location, similar to habitats used by golden plover, lapwing, mallard, teal and black-headed gull in the surrounding area.

Photograph 7: Mitigation Area 13 (Fields E13/14)

Photograph 8: View of Field E13 from the southern boundary.

Photographs 9 and 10: Showing the existing boundary and track separating Mitigation Area 13 (Fields E13/14) from Fields E15 and E17 where solar PV modules will be located.

~~Field E6~~

Habitat creation

3.2.11 An overview of the proposed habitats to be created in Mitigation Areas 9, 11 and 13 is provided below. F~~, with f~~ull details of habitat creation and management are presented in ~~in~~ Sections 14 and 15, which includes consideration of the management regimes recommended by Natural England for scrapes and grassland. The proposed habitats would be suitable for mallard, teal and black-headed gull, lapwing and golden plover.

Wader scrapes and ~~wet~~ neutral grassland

A series of shallow wader scrapes with neutral grassland are proposed to be created in Mitigation Areas 11 (Field E6) and 13 (Field E13/14), the indicative locations of which are shown in **Appendix D - Indicative Environmental**

Masterplan. ~~Field D18 was assessed as unsuitable for scrapes due to XXX its slightly elevated position and lack of suitable water retaining soils.~~

3.2.12 Wader scrapes **[Ref. 1-~~376~~]** ~~—~~are shallow depressions ~~that are~~ created ~~constructed~~ in fields to benefit wildfowl and wading birds. They are designed to hold water during the winter months. The scrapes would be a minimum of 20m^2 in area with an irregular shape and will be designed to fill naturally with rainwater during the winter months and dry slowly during the spring. Depth across the scrapes will be a shallow gradient to a maximum depth of 45cm. The wader scrapes would also be suitable for use by waterfowl and gulls, including mallard, teal and black-headed gull.

3.2.13 An initial review of hydrological and soil information indicates that Mitigation Areas 11 (Field E6) and 13 (Field E13/14) are suitable locations to create scrapes successfully, with the exact locations of the scrapes within Areas 11 (Field E6) and 13 (Field E13/14) to be determined by pre-construction hydrological studies. The Environmental Agency's 'Surface flood map for planning' **[Ref 1-4]** (refer to Plates 1 and 2 below), ~~it~~ shows likely surface water flooding within these mitigation areas, indicating that new scrapes micro-sited in appropriate locations in Fields E6 and E13/E14 would likely hold water during the winter months.

~~Plate 1 Surface water flood mapping Fields E6 and E13/14~~

Plate 11: Surface water flood mapping Mitigation Area 11 (Fields E6). and E13/14

Plate 2: Surface water flood mapping Mitigation Area 13 (Fields E13/14).

3.2.14 In addition, A as detailed within **ES Volume 4, Appendix 10.2: Agricultural Land Classification Report [EN010157/APP/6.4]** the soil within Mitigation Area 11 (Field E6) is an organic clay topsoil over a slowly permeable clay subsoil, therefore likely to be good for water retention. The soil within Mitigation Area 13 (Fields E13/E14) is a medium clay loam topsoil over a slowly permeable clay loam subsoil, which is also likely to be good for water retention. Any land drains found during scrape creation will be removed or broken to assist with water retention. In the event Should Furthermore, if pre-construction hydrological studies indicates the need to line scrapes to ensure they hold water, that scrapes will need to be lined to retain water, this will be done using locally sourced soil with lower permeability to increase water retention land drains are found during the creation of the scrapes they will be appropriately protected and suitable mitigation will be installed to reduce water drainage within the scrape area whilst ensuring the land drain remain functional. Should soil types with greater permeability be discovered during scrape creation, the scrapes will be positioned to avoid these areas.

3.2.15 Mitigation Area 9 (Field D18) was assessed as unsuitable for scrapes due to its slightly elevated position and lack of suitable water retaining soils.

3.2.16 Refer to Section 15 for full details of the creation and management of this habitat type.

Details relating to the creation and management of the scrapes and wet grassland is presented in Section 15, which includes consideration of the management recommended by Natural England including measures to prevent over-vegetation.

Flower rich neutral grassland

3.1.113.2.17 The area around the scrapes in Mitigation Areas 11 (Fields E6), and 13 (Fields E13/14) and Mitigation Area 9 (Field D18) will be sown with a flower rich neutral grassland grassland, which will be managed as permanent pasture to increase foraging resources for wintering birds (Refer to Appendix E). The grassland areas would be suitable for foraging and roosting golden plover, lapwing, mallard, teal and black-headed gull.

3.2.18 Refer to Section 14 for full details of the creation and management of this habitat type.

These will be managed by either taking a late summer hay cut or grazing, with an addition cut if required to ensure a low sward height is present during the winter monrhsmonths. Details relating to the management of the grassland is presented in Section 16.3, which includes consideration of the management regime recommended by Natural England.

3.3 Carrying capacity of SPA bird mitigation asFarmland breeding birds

3.3.1 In addition, theThe Site supports an assemblage of ground nesting birds such as skylark (*Alauda arvensis*) and again the **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]** has concluded that mitigation is required.

3.3.2 The Proposed Development supports a diverse farmland bird assemblage including several ground nesting species such as grey partridge (*Perdix perdix*), yellow wagtail (*Motacilla flava*), lapwing and skylark.

3.3.3 The installation of solar PV modules within open fields is likely to displace and discourage ground nesting birds such as skylark, more so than those other species that typically nest within hedgerows, woodland and scrub, the vast majority of which will be retained by the Proposed Development. Therefore, mitigation will be set aside without panels and will be managed for the benefit of ground nesting birds by sowing to a flower rich neutral grassland and managing by either taking a late summer hay cut or grazing after birds have nested and young have fledged. This mitigation will be fields of 2.0 ha and above as it is considered that ground nesting birds require large open fields and are less likely to use areas smaller than 2.0 ha.

3.3.4 As such this reportOutline LEMP details the mitigation proposed, to minimise any impacts on ground nesting bird species.

3.3.5 The Site currently supports an estimated 65 Skylark territories, within an area of approximately 891 ha. This equates to an average density of 0.07 Skylark territories/ha. Whilst the current density of Skylark breeding territories varies between fields, areas used by breeding Skylark will be highly transient between years, depending on the cropping and management regime, so applying an average Skylark territory density across the whole Site is appropriate to inform the quantity of replacement habitat required. Skylark are used as a proxy for all ground nesting species, they being the most abundant ground nesting species..

3.3.6 As different habitat types typically support different Skylark breeding densities, the quantity of replacement habitat required will be dependent on what that replacement habitat is and how it is managed, as sympathetic management could potentially boost the carrying capacity and the density of nesting Skylarks. Typical

Skylark territory densities range from 0.02 territories/ha in intensive grazed pasture to 0.56 territories/ha in organic set-aside, whilst arable farmland typically supports 0.28 territories/ha and coastal saltmarsh 0.7 territories/ha **[Ref. 1-~~35~~]**.

3.3.7 To calculate the area of replacement habitat required, the number of replacement territories required is divided by the density of territories per hectare that the replacement habitat aims to support. For example, if all fields within the Site were allocated for solar panels and the proposed realistic target Skylark territory density within the mitigation area(s) was 0.56 territories/ha (based on the maximum territory density on organic set-aside, according to available literature **[Ref. 1-~~35~~]**, then c.116 ha of land would be required to deliver mitigation for 65 Skylark territories (65/0.56).

3.3.8 For the Proposed Development, fields larger than 2~~.5 0~~ha in area (as Skylark prefer large open fields the assumption has been made those areas smaller than 2~~.5 0~~ha are unlikely to be used by ground nesting birds) have been identified as ecological mitigation areas in the design. Areas due to be created for wildlife below 2~~.05~~ha in area have been identified as ecological enhancement areas.

3.3.9 ~~A~~Approximately ~~total of~~ 116 ha of suitable mitigation area is available for nesting Skylarks and other ground nesting birds in fields almost or larger than 2~~.0~~ ha. In addition to approximately 116 ha ground nesting bird mitigation, management of the land beneath the solar PV modules, by the creation of flower and legume-rich other neutral grassland, will ensure an abundant supply of insects for ground nesting birds during the breeding season. In addition, some (approximately) 300m of the margins of fields (between the security fence and the field boundary) will be sown with a winter seed mix to provide a seed source for species such as skylark and corn bunting (*Emberiza calandra*) during the winter period. In this manner ground nesting birds have ~~an abundant~~a suitable food supply during both the breeding and non-breeding season which will likely boost the carrying capacity of the land set aside for ground nesting birds.

3.3.10 Furthermore, an additional 9.5 ha of ecological enhancement will be created within the Proposed Development. The areas of ecological enhancement will include habitat such as flower-rich other neutral grassland which will boost invertebrate numbers and provide additional foraging habitat, all of which will boost the carrying capacity of skylarks and other ground nesting birds in the local vicinity. Within the areas proposed as open grassland, a general meadow seed mix will be used, for example Emorsgate EM1 seed mix (or similar).

3.3.11 The baseline territory density is 0.07 skylark territories per ha. ~~–~~A ~~rough~~ calculation using 0.56 territories/ha as a figure for what additional capacity the enhancement areas might deliver, it is estimated that 116 ha (65/0.56) of land is required to fully mitigate for 65 Skylark territories for the Proposed Development. The ~~116.2~~ 116 ha available within the Order Limits will mitigate for the 65 skylark

territories whilst additional 9.15 ha of designated ecological enhancement area as well as herbal ley underneath the solar PV ~~panels~~modules which will increase invertebrate prey during the breeding season and this coupled with the provision of winter bird seed on 5% of margins will likely increase the carrying capacity of ground nesting birds locally.~~-~~ Due to these additional measures to increase local carrying capacity a carrying capacity of 0.56 skylark territories per ha is considered deliverable. The areas set aside for mitigation are shown in **Appendix D - Indicative Environmental Masterplan**).

~~In addition, management of the land beneath the solar PV modules, by the creation of flower and legume-rich other neutral grassland, will ensure an abundant supply of insects for ground nesting birds during the breeding season. In addition, some ([approximately] 300m of the margins of fields (between the security fence and the field boundary) will be sown with a winter seed mix to provide a seed source for species such as skylark and corn bunting (*Emberiza calandra*) during the winter period. In this manner ground nesting birds have an abundant food supply during both the breeding and non-breeding season which will likely boost the carrying capacity of the land set aside for ground nesting birds.~~

~~3.1.12 Finally, an additional~~ ~~9.15ha of ecological enhancement will be created within the Proposed Development. The areas of ecological enhancement will include habitat such as flower-rich other neutral grassland which will boost invertebrate numbers and provide additional foraging habitat, all of which will boost the carrying capacity of skylarks and other ground nesting birds in the local vicinity. Within the areas proposed as open grassland, a general meadow seed mix will be used, for example Emorsgate EM1 seed mix (or similar). The open fields set aside for ground nesting birds are also likely to benefit species such as Lapwing, and Golden Plover during the winter months.~~

~~3.2~~3.4 Bats

~~3.2.1~~3.4.1 The Site also supports a diverse assemblage of foraging bats, and the mitigation measures outlined for bird species above as well as new landscape (hedgerow and tree belts) will all provide additional foraging for bats. In addition, offsets embedded in the design from existing hedgerows, ditches and other watercourses will protect these important bat foraging corridors.

3.4.2 The measures outlined above also ensure there are open grassland areas without panels to give bats alternate foraging habitat. This is coupled with the protection of existing foraging corridors such as watercourses, woodland and hedgerows which are protected by offsets built into the design.

4 Roles and responsibilities

4.1.1 The Applicant has ultimate responsibility, as the undertaker of the Proposed Development, to ensure that the measures secured in the DCO are implemented and maintained. The Applicant may seek to appoint contractors to deliver and/or maintain the Proposed Development and they will also be contractually responsible for ensuring compliance with the DCO.

4.1.2 It is intended that the soft landscape for the initial year after implementation will be maintained by the landscape contractor implementing the soft landscape works. The contract will include a defects liability clause to ensure that replacement planting is carried out and successful establishment achieved.

4.1.3 Following this, the ongoing maintenance and management of the landscape will be overseen by facilities management and their appointed landscape contractor. Once a landscape contractor to undertake the management has been appointed the Landscape and Ecological Management Plan shall be updated (within 4 weeks of appointment) with contact details for the Landscape Contractor/Management Company, and suitably qualified contractors including an Arboriculturist and Ecologist.

4.1.4 The work undertaken, and progress will need to be assessed annually, with a major assessment after the fourth year to allow revision to the existing maintenance and management regime to reflect findings. Maintenance for the following years is to be reviewed at 3-year intervals using the same method to ensure appropriateness of regime. The matrix in **Appendix A** at the end of this report identifies the anticipated work over an extended 40-year period.

4.1.5 This approach will ensure that the quality of the landscape infrastructure created in the early years can be maintained for the benefit of the persons who live near to the Site who interact with it. In addition, it will ensure that the landscape develops to maximise the ecological potential of the proposals.

4.1.6 It is envisaged that the creation of scrapes and sowing of fields to grassland and the sowing of grassland underneath solar panels will be undertaken by the Principal Contractor.

4.1.7 The following roles are identified as relevant to the measures in this document. Additional roles relevant to the wider construction and decommissioning of the Proposed Development are identified in the **Outline CEMP [EN010157/APP/7.2],** and the **Outline DEMP [EN010157/APP/7.4]** respectively.

Table 4-1: Roles and responsibilities

Role	Responsibilities
The Applicant	• adherence to UK and other relevant legislation and guidelines; • supplying data as appropriate to the appointed contractor and relevant stakeholders; • provision of sufficient supervision of implementation and reinstatement; • ensure monitoring of the ecological and landscape restoration works is undertaken and that the Landscape and Ecological Management Plan is reviewed and updated as appropriate; • ensure that monitoring of ecological and landscape restoration works is delivering the expected biodiversity net gain as outlined in **ES Volume 4, Appendix 7.10: Biodiversity Net Gain Assessment [EN010157/APP/6.4]** and habitats are meeting the required condition criteria or if not that remedial action is defined and undertaken; • ensure the monitoring of expected biodiversity gain is made available to East Riding of Yorkshire Council; • liaise with the relevant stakeholders regarding the results of the monitoring and the success of the reinstatement effort; and • ensure the habitat creation and enhancement outlined is delivered and managed for 40 years duration in compliance with the DCO.
Appointed Principal Contractor	• adhere to the requirements of the Landscape and Ecological Management Plan; • adhere to UK and other relevant legislation and guidelines; • appoint suitably qualified ecology and landscape professionals to deliver the Landscape and Ecological Management Plan and produce an appropriately updated Landscape and Ecological Management Plan if and when required; • appoint suitably qualified ecology professionals to undertake appropriate pre-commencement surveys as stated within Environmental Statement to inform appropriate mitigation including Natural England licences;

Role	Responsibilities
	• appoint suitably qualified ecology professionals to produce appropriate species protection plans as stated within the Environmental Statement; • provide all relevant information to the Applicant and their representatives; • provide a detailed programme for the Proposed Development; • diligently execute the works in accordance with approved drawings and specifications; and • ensure the habitat creation and enhancement outlined is implemented, delivered and managed for 40 years duration in compliance with the DCO delivering the expected BNG condition and that a feedback loop is in place for any remedial actions that may be required.
Environmental Clerk of Works Arboriculture Clerk of Works Ecological Clerk of Works	• provide assistance to the appointed contractor, ensuring adherence to UK and other relevant legislation and guidelines including overseeing relevant on-site works; • ensure that monitoring is undertaken and fully documented and reported until the completion of the Proposed Development; and • review and make recommendations regarding appropriate changes to the maintenance, management and monitoring programme within the Landscape and Ecological Management Plan and produce an updated Landscape and Ecological Management Plan as appropriate. • Review pre-commencement survey findings and species protection plans to ensure appropriate mitigation is adhered to; • appropriate toolbox talks to ensure all personnel are informed of environmental hazards and/or constraints; and • undertake watching briefs and pre-commencement checks for protected and notable species.

5 Landscape and ecological proposals

5.1.1 The landscape proposals will focus on the retention, enhancement and/or creation of the following habitat types and features as described in **Table 5-1**, below.

Table 5-1: Landscape and ecological proposals for the Proposed Development

Landscape Typology	**Area/ Length/ No.**	BNG Habitat (*UKHab Code and Habitat Type*)	**Description, Objective and Target Condition**
Retained Landscape			
Hedgerows	33.77km	Native hedgerows *(h2a6 – Other native hedgerow)* Native hedgerows associated with bank or ditch *(h2a6 – Other native hedgerow, 50 ditch)* Native hedgerow with trees *(h2a6 – Other native hedgerow, 11 hedgerow with trees)* Native hedgerow with trees – associated with bank or ditch *(h2a6 – Other native hedgerow, 11 hedgerow with trees* and *50 ditch)* Non-native and ornamental hedgerow *(h2b – Non-native and ornamental hedgerow)* Species-rich native hedgerow – associated with bank or ditch *(h2a5 – Species-rich native hedgerow, 50 ditch)* Species-rich native hedgerow with trees	Objective: To provide a continuity of habitat for existing species within the Site.

Landscape Typology	**Area/ Length/ No.**	BNG Habitat (*UKHab Code and Habitat Type*)	**Description, Objective and Target Condition**
		(h2a5 – Species-rich native hedgerow, 11 hedgerow with trees and *50 ditch)*	
Individual trees	44,400m²	Individual trees – Rural trees *(*Secondary codes: *32 Scattered trees, 201 young trees – planted, 202 young trees – self-set, 203 mature tree* and *204 veteran tree)*	Objective: To provide a continuity of habitat for existing species within the Site.
Woodland	91,700m²	Woodland and forest – Lowland mixed deciduous woodland *(w1f7 Other lowland mixed deciduous woodland)* Woodland and forest – Other coniferous woodland *(w2c Other coniferous woodland)* Woodland and forest – Other woodland; broadleaved *(w1g Other broadleaved woodland)* Woodland and forest – Other woodland; mixed *(w1h Other woodland – mixed)*	Objective: To provide a continuity of habitat for existing species within the Site.
Proposed Tree, Woodland, Scrub and Hedgerow Planting			
Individual Trees	246 no.	Individual trees - Rural Tree *(*Secondary code: *32 scattered trees)*	Objective: To provide opportunity for wildlife foraging and cover, interest and height that will also provide softening and screening to the development.
Mixed Woodland	10,240 m²	Woodland and Forest - Other woodland; mixed *(w1h5 Other woodland – mixed, mainly broadleaved)*	A mixture of broadleaved and possibly coniferous trees in which broadleaved make up over 50% of tree cover.

Landscape Typology	**Area/ Length/ No.**	BNG Habitat (*UKHab Code and Habitat Type*)	**Description, Objective and Target Condition**
			Objective: To provide habitat for birds, bats, invertebrates, amphibians and mammals whilst helping to screen the proposed development once established.
Mixed Native Scrub	18,990m² 34,940 m²	Heathland and Shrub – Hawthorn scrub *(h3f Hawthorn scrub)* Heathland and Shrub – Mixed scrub *(h3h Mixed scrub)*	Dense scrub located alongside woodland areas as a transitionary zone and in areas internally within the Site which are too small to establish woodland. Hawthorn scrub contains a mixture where hawthorn comprises more than 75% of the species mix. The target condition is Moderate. Mixed scrub contains a mixture of species without a single species dominant. Target conditions include Good and Moderate. Objective: To provide habitat for birds, bats, invertebrates, amphibians and reptiles.
Species-rich Native Hedgerow (reinstated)	5.44km	Species-rich native hedgerow *(h2a5 Species-rich native hedgerow)* Species-rich native hedgerow – associated with bank or ditch *(h2a5 – Species-rich native hedgerow, 50 ditch)*	Native hedgerows with ≥ 4 UK native woody species per 30m section of hedgerow. Note: Assumes hedgerow is not alongside a ditch or bank. 'Native species rich hedge' - with no ditch. If next to a ditch BNG code 'native species rich hedgerow associated with ditch'

Landscape Typology	**Area/ Length/ No.**	BNG Habitat (*UKHab Code and Habitat Type*)	**Description, Objective and Target Condition**
		Species-rich native hedgerow associated with bank or ditch *(h2a5 – Species-rich native hedgerow, 50 ditch)* Species-rich native hedgerow with trees *(h2a5 – Species-rich native hedgerow, 11 hedgerow with trees)*	Objective: To provide ecological corridors throughout the Site, providing habitat and foraging opportunities for birds, bats, invertebrates, amphibians, reptiles and mammals.
Species-rich Native Hedgerow (newly created)	19.58km	Species-rich native hedgerow *(h2a5 Species-rich native hedgerow)* Species-rich native hedgerow – associated with bank or ditch *(h2a5 – Species-rich native hedgerow, 50 ditch)* Species-rich native hedgerow associated with bank or ditch *(h2a5 – Species-rich native hedgerow, 50 ditch)* Species-rich native hedgerow with trees *(h2a5 – Species-rich native hedgerow, 11 hedgerow with trees)*	Native hedgerows with ≥ 4 UK native woody species per 30m section of hedgerow. Note: Assumes hedgerow is not alongside a ditch or bank. 'Native species rich hedge' - with no ditch. If next to a ditch BNG code 'native species rich hedgerow associated with ditch' Objective: To provide ecological corridors throughout the Site, providing habitat and foraging opportunities for birds, bats, invertebrates, amphibians, reptiles and mammals.
Traditional Orchards	To be confirmed at detailed design and set out in the Landscape and Ecological Management Plan	Grassland – Traditional orchards *(27 Traditional Orchards)*	Open grown fruit/nut trees (minimum 5no.) within neutral grassland. Objective: To provide habitat, including foraging opportunities for birds, bats,

Landscape Typology	**Area/ Length/ No.**	BNG Habitat (*UKHab Code and Habitat Type*)	**Description, Objective and Target Condition**
			invertebrates and small mammals. To provide a community asset.
Proposed grassland enhancements under and around solar panels (Areas to return to agriculture post-development)			
Initial implementation Legume rich other Neutral Grassland (under solar panels and around margins)	4,301,750m²	Grassland – Other Neutral Grassland *(g3c Other neutral grassland)*	Objective: Ensure design of scheme allows for appropriate agricultural machinery to sow and manage grassland with appropriate width between panels, with turning circles etc. It is to be agreed as to how the modified grassland under the panels will be implemented. This will depend on when the land is secured, when the last crop is removed and how much time will elapse before the solar infrastructure is put in place. The final approach will be agreed as part of the Landscape and Ecological Management Plan but an interim suggested approach of two options is given below: A) Once land is secured and the final crop has been taken, leave vegetation to develop naturally. Immediately before solar infrastructure is due to be installed, spray off with herbicide any remnant crop or weed growth. Install the solar panels. Once panels installed, scarify ground between the panels and sow with a legume rich other neutral grassland mix, then management as outlined below.

Landscape Typology	**Area/ Length/ No.**	BNG Habitat (*UKHab Code and Habitat Type*)	**Description, Objective and Target Condition**
			B) Once land is secured and the final crop has been taken, sow area with a temporary low maintenance fescue grass sward and allow to establish for at least one growing season. Once panels installed scarify the temporary sward between the panels and sow with a legume rich other neutral grassland mix, then management as outlined below. The target condition is 'Poor' for this habitat.
Field Margin – Wild Bird Winter Seed Mix	300m long (12,430m^2)	Cropland – Arable field margins game bird mix *(c1a8 Arable field margins wild bird mix)*	Objective: To provide important food resources for farmland birds, especially in winter and early spring, by maximising the production of small seeds suitable as bird food in either annual or annual/biennial mixtures, while also providing a source of invertebrates for birds in the margins between existing field boundaries and the security fence. It is proposed that only a small fraction (1-5%) of margins are given this treatment. This treatment will need to be repeated every 3-4 years. BNG condition assessments are not applicable to this habitat.

Landscape Typology	**Area/ Length/ No.**	BNG Habitat (*UKHab Code and Habitat Type*)	**Description, Objective and Target Condition**
Field Margins - Legume Rich (Other) Neutral Grassland	70,000 m² 156,200m²	Cropland – Arable field margins – pollen and nectar (*c1a6 Arable field margins – pollen and nectar*) Grassland – Other Neutral Grassland *(g3c Other neutral grassland)*	Grassland located on neutral soils which does not meet the criteria of UKHab Lowland Meadows habitat type, but does meet the criteria of Other Neutral Grassland, as set out in UK Habitat Classification Version 2. The target condition is 'Moderate'. Objective: To provide flower rich (especially legumes) other neutral grassland to benefit pollinators and invertebrates which will provide opportunities for bat and bird species. The legumes will improve soil condition. It is proposed that the majority of margins (95%) receive this treatment sowing with the same seed mix as that used underneath panels.
Proposed Grassland treatments for Mitigation (Areas to be retained for ecological purposes post-development)			
Flower Rich (Other) Neutral Grassland – For breeding and wintering ~~Ground Nesting~~ bBirds	1,075,552~~978,580~~m²	Grassland – Other Neutral Grassland *(g3c Other neutral grassland)*	Grassland located on neutral soils which does not meet the criteria of UKHab Lowland Meadows habitat type, but does meet the criteria of Other Neutral Grassland, as set out in UK Habitat Classification Version 2.0. The target condition is 'Good'. Objective: To provide habitat for ground nesting birds, wintering birds and foraging bats

Landscape Typology	**Area/ Length/ No.**	BNG Habitat (*UKHab Code and Habitat Type*)	**Description, Objective and Target Condition**
			by creating a flower rich grassland supporting diverse insect population.
Neutral Grassland with Scrapes And Grassland creation	Depending on ground conditions where flower-rich (Other) Neutral Grassland is not suitable. To be confirmed at detailed design	Grassland – Other neutral grassland *(g3c Other neutral grassland)*	Grassland located on seasonally wet soils which does not meet the criteria of UKHab Lowland Meadows, Purple-moor grass or rush pasture habitat types, but does meet the criteria of Other Neutral Grassland, as set out in UK Habitat Classification Version 2.0 Objective: To provide habitat, including scrapes, for wintering bird associated with the Humber Estuary SPA/-Ramsar site
Proposed Habitat Features			
Bat Boxes	25 boxes	N/A	Artificial roosts designed to encourage bats into the area. Using a mixture of Schwegler 2F bat boxes, Schwegler 1FF boxes and pole mounted eco-rocket boxes (see **Appendix B**). Objective: To provide roosting opportunities for crevice dwelling species such as pipistrelle species (*Pipistrellus sp.*)
Bird Boxes for a variety of species	30 boxes	N/A	Artificial nest designed to encourage birds into the area. Suitable boxes should be used such as Schwegler 1B bird boxes. Objective: To provide nesting opportunities for local birds.

Landscape Typology	**Area/ Length/ No.**	BNG Habitat (*UKHab Code and Habitat Type*)	**Description, Objective and Target Condition**
Barn Owl Boxes	8 boxes	N/A	Artificial nest designed to encourage barn owls (*Tyto alba*) into the area. Objective: to provide nesting opportunities for barn owl.
Kestrel Boxes	5 boxes	N/A	Artificial nest designed to encourage kestrel (*Falco tinnunculus*) into the area. Objective: to provide nesting opportunities for kestrel.
Tree Sparrow boxes	10 boxes	N/A	Artificial nest designed to encourage tree sparrow (*Passer montanus*) into the area. Objective: to provide nesting opportunities for tree sparrow.
Starling boxes	10 boxes	N/A	Artificial nest designed to encourage starling (*Sturnus vulgaris*) into the area. Objective: to provide nesting opportunities for starling.

6 Landscape implementation and management

6.1 British Standards and published guidance

6.1.1 All tree planting operations are to be in accordance with BS 8545: 2014 Trees: 'From Nursery to Independence in the Landscape - recommendations' **[Ref. 1-6]**.

6.1.2 All planting material is to conform to BS 3936-1:1992 Specification for Nursery stock **[Ref. 1-7].**

6.1.3 All landscape operations are to be in accordance with BS 4428: 1989 Recommendations for general landscape operations **[Ref. 1-8]**.

6.1.4 Native species will be of local provenance, where practicable. Potential suppliers of species to be used as part of the Proposed Development will be included in the Landscape and Ecological Management Plan.

~~6.1.4~~6.1.5 Climate-resilient species will be selected for planting, where possible. Details of species will be included in the Landscape and Ecological Management Plan.

~~6.1.5~~6.1.6 Wildflower seed should be species native to the UK, species appropriate to the location and from a reputable supplier.

~~6.1.6~~6.1.7 Existing trees and hedgerows (including root protection zones / areas) either within, or along the boundary of, the Site will be protected during construction in accordance with 'BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations'. **[Ref. 1-9]**.

~~6.1.7~~6.1.8 In line with recommendations from the UK Government's Tree Health and Plant Biosecurity Expert Taskforce **[Ref. 1-10]** all planting material is to be sourced from reputable nurseries (registered under the Plant Healthy Certification Scheme **[Ref. 1-11]**) in order to avoid the spread of any pest and plant disease which may threaten the health of any proposed or existing planting material. All necessary information with regards to the identity and source of the planting material, from original source, will be obtained from the nursery and made available for inspection on request. Reasonable care has been taken at the time of preparation of the planting design to specify plants which are currently disease free. For further details on notifiable and non-notifiable pests and diseases refer

to the Department for Environment, Food & Rural Affairs (Defra) UK Plant Health Risk Register **[Ref. 1-12]**.

~~6.1.8~~6.1.9 Soil management and storage should follow best practice guidelines; refer to Defra; Construction Code of Practice for the Sustainable Use of Soils on Construction Sites **[Ref. 1-13]**.

~~6.1.9~~6.1.10 Any imported subsoil shall be in accordance with BS 8601:2013 'Specification for subsoil and requirements for use' **[Ref. 1-14], w**ith debris and contamination removed; and stone to be a maximum ring size of 100mm in any dimension.

~~6.1.10~~6.1.11 Any imported topsoil to be in accordance with BS 3882:2015 'Specification for topsoil' **[Ref. 1-15]**.; weed free, fertile medium loam with maximum 20% stone content. Stones to be a maximum ring size of 50mm in any dimension for general tree, shrub and hedge planting and 38mm maximum ring size for grass seed areas.

~~6.1.11~~6.1.12 Planting shall not be undertaken when the ground is waterlogged or frost bound but otherwise shall be undertaken between November and March (as far as reasonably practicable).

6.2 Biodiversity net gain guidance

6.2.1 **ES Volume 4, Appendix 7.10: Biodiversity Net Gain Assessment [ENV010157/APP/6.4]** has assigned all baseline habitat features a value in terms of number of Biodiversity Units based on a number of factors including the ecological condition of each habitat feature. The gain in biodiversity that is predicted to be delivered by the Proposed Development is based on an uplift in the ecological condition of habitat features from the baseline value. The Defra Statutory Biodiversity Metric **[Ref.1-16]** defines a set of criteria for each habitat type that must be achieved in order to achieve the uplift in biodiversity predicted.

6.2.2 Therefore, the ongoing management of habitat features will have regard to the ecological condition criteria to ensure that the anticipated uplift in biodiversity value is achieved, or on track to be achieved over the 30-year period that habitats have to be managed for biodiversity purposes. After 30 years, the management prescriptions will be reviewed to ensure they are still appropriate.

6.3 General management

6.3.1 The tasks set out below will be undertaken across the Order Limits throughout the operational life of the Proposed Development or as required. Maintenance operations will be undertaken in accordance with the prescriptions outlined below

and the schedule presented in **Appendix A** which outlines when management and maintenance operations will be undertaken.

6.3.2 Whilst the aim and objectives of this management plan are set out in some detail with respect to habitat management, opportunities for the creation of additional microhabitats should be taken wherever possible. Deadwood, water-filled cavities, jagged stumps, splits, fungal growths and holes in tree trunks will be retained unless they are creating a safety hazard.

6.3.3 Where necessary, plants will be watered at appropriate times of the day to minimise water evaporation.

6.3.4 Care will be taken to avoid interference with the established levels and contours of the ground, and to avoid damage to footpaths, roads, drains, manholes and existing structures and vegetation. Damage so occasioned will be made good at the earliest opportunity.

6.3.5 It will be the Principal Contractor's responsibility to ensure that all works and operations are carried out in accordance with the Construction Design and Management Regulations 2015 **[Ref. 1-17]**. All work shall be carried out by experienced operatives holding relevant horticultural qualifications and training certificates, or under the supervision on Site of such a person. All works detailed in the following specifications shall be carried out in accordance with good horticultural practice, using materials, plant and machinery appropriate to the task, undertaken in such a manner that avoids damage and/or nuisance to the Site and its surroundings.

Fencing

6.3.6 All security fencing to panel areas to be regularly checked as part of routine maintenance visits to ensure it is safe and fit for purpose and badger access points remain operational.

6.3.7 Fences are to be of a height suitable to exclude deer from solar panel areas, with a suitable mesh size to prevent deer being harmed or becoming trapped. Mammal gates will be installed in suitable locations within the fence lines based on the pre-commencement surveys detailed and secured within the **Outline CEMP [EN010157/APP/7.2]** to allow badgers and other small mammals access to forage under panels. Fencing will not be buried to allow badgers and other small mammals to push underneath enabling them to access the fields with solar PV modules. The design of the Proposed Development includes sufficient offsets between boundary habitats such as hedgerows and watercourses to allow deer and other mammals to continue to move through the landscape.

Lighting

6.3.8 Lighting required for maintenance works during operation (including maintenance) will not be a permanent fixture. Lighting will conform to best practice guidelines with respect to minimising light spill into adjacent habitats and to prevent disturbance to bats and other species during operation. Lighting will be minimised to that required for safe Site operations. Where lighting is required, it will be directed toward the middle of the working area and will utilise directional fittings to minimise outward light spill and glare, preferably at an angle greater than 20 degrees from the horizontal). Where reasonably practicable Infrared sensor triggered security lighting would be used to avoid impacts on bats.

PRoW

6.3.9 During operation (including maintenance) of the Proposed Development, all PRoW within the Order Limits will be maintained to allow unimpeded passage, unless where maintenance temporarily requires otherwise. Any temporary closures or diversions to allow for maintenance activities will be subject to agreement with East Riding of Yorkshire Council. Further information regarding the management of PRoWs is outlined in the **Outline Rights of Way and Access Management Plan [EN010157/APP/7.9]**.

Litter and vandalism

6.3.10 Litter picking will be undertaken as part of regular maintenance visits within the Order Limits. Similarly, damage to signage, interpretation boards, seating and field boundary furniture will also be identified at such visits and replacements implemented as soon as practically possible.

6.3.11 Arisings from management and maintenance operations will be left in safe locations within the Site to naturally decompose and provide habitat for a range of species. Any large, felled branches/logs may be retained on Site at field boundaries as habitat piles.

Watercourses and ponds

6.3.12 There are a number of watercourses within the Order Limits. Watercourses that fall under Environment Agency (main rivers) and Internal Drainage Board ownership will continue to be managed by each respective authority.

6.3.13 Watercourses and ponds will be retained and managed by leaving a 10m offset from the development and allowing vegetation to develop naturally to enhance biodiversity and improve water quality and maintain flows. Grasslands will be diversified and managed to promote biodiversity and improve filtration of runoff. Native scrub and woody vegetation will be left to colonise naturally but monitored such that if it encroaches or shades more than 70% of watercourse or a

waterbody then rotational coppicing will be used to maintain its cover to no more than 70% and ensure permitted access for bodies such as the Environment Agency and Internal Drainage Board is maintained.

6.3.14 Where watercourses are impacted by the construction of a crossing point the affected banks will be re-seeded.

Culvert design

6.3.15 Where practicable box culverts will be used rather than pipe culverts. Pipe culverts will be used within watercourses which infrequently contain water, being dry for the majority of the year.

6.3.16 New culverts excluding those used within watercourses which infrequently contain water will be designed to be as short as possible, with as large a diameter as possible (minimum of 900mm) with a minimum of 600mm of headroom. Culverts will provide as much light penetration as possible at the culvert inlets and outlets to encourage use by water vole and otter. Riparian vegetation planting, if required, will be included at the entry to an exit of culverts to provide cover and transitional light levels for species using these and avoid startling the species (including otter) using these structures.

6.3.17 New culverts excluding those used within watercourses which infrequently contain water will have depressed inverts, natural beds (with 300mm minimum of natural bed material), low-flow channels and sediment baffles to limit sediment loss during surcharging. Pools will be incorporated at culvert outlets to limit scour, dissipate energy and maintain channel stability; these will be of benefit to fish species and in turn otter.

Pollution control

6.3.18 Vehicular access to the Proposed Development would be limited to maintenance activities. Equipment will be provided to contain and clean up any spills of fuel or lubricants as required. Regular inspection of the access tracks would occur to ensure no unacceptable erosion is taking place, with appropriate practicable remedial action taken, should erosion be noted. No vehicle cleaning or refuelling would take place within the Site and drip trays would be placed underneath any stationary maintenance vehicles.

Pesticides, herbicides and fertilisers

6.3.19 All pesticides and herbicides shall be applied according to manufacturer's recommendations and current legislation, including:

- The Food and Environment Protection Act 1985 **[Ref. 1-18]**

- The Control of Pesticides Regulations 1986 **[Ref. 1-19]**
- The Control of Substances Hazardous to Health Regulations 2002 **[Ref. 1-20]**
- The Environment Protection Act 1990 **[Ref. 1-201]**

6.3.20 No pesticides or fertilisers will be used at any time in the species rich grassland area, wildflower offset zone or within 8m of watercourse and waterbodies, unless injurious weeds become a problem in which case spot treatment will be used. Usage on other parts of the Site, where not already specified in this Outline LEMP, will not be permitted.

6.3.21 It is the Principal Contractor's responsibility to ensure that all works are carried out strictly in accordance with the requirements of the foregoing legislation and other relevant Codes of Practice, British Standards, rules, guidelines or directives that relate to the use of hazardous materials. The Principal Contractor will make such notifications as are required under the terms of The Food and Environment Protection Act 1985 **[Ref. 1-18]** and will be responsible for replacing plants killed by inappropriate use of herbicides.

Enabling works

6.3.22 The following principles will be followed:

- The removal of trees and a hedgerows will be required during the construction phase. Where possible and practical, construction access and cabling will use existing field entrances and horizontal directional drilling will install the cables under hedgerows.
- Where vegetation removal/pruning is required for access and/or visibility splays, the works should be limited to that amount required to achieve the appropriate access / visibility required. Pruning of vegetation will be preferred over removal wherever possible.
- Any ground where planting or seeding is proposed that has been used by construction vehicles will require decompaction prior to planting or seeding. In addition, any crop remains of weed growth may require herbicide treatment before sowing.
- The Proposed Development has taken into account the utilities present within the Order Limits. Planting and seeding within these areas will be undertaken in accordance with National Grid guidance (Development near overhead lines, 2008) **[Ref. 1-22]** and will consist of hedgerow and lower growing shrub species maintained to ensure statutory safety clearances. Planting above underground utilities and cables will ensure that seeding and hedgerow planting will be undertaken with suitable

species that will not be a risk to buried services due to root damage or soil shrinkage.

- Additional minor works to trees such as lateral pruning or crown lifting may be undertaken where required prior to construction to avoid damage to trees by construction activities. If this is required these works will be undertaken by a qualified arborist with checks for roosting bats before works commence if a tree has been identified as having bat roost potential.
- Tree protection fencing will be erected before any construction works begin. Such fencing will accord with the principles set out within 'BS5837: Trees in relation to design, demolition and construction' **[Ref. 1-9].** Protection fencing may be erected and dismantled in phases as construction progresses.

Invasive weeds

6.3.23 No invasive plant species have been identified within the Order Limits during the preliminary ecological appraisals or other ecological surveys.

6.3.24 Should invasive weeds (those species registered on the Schedule 9 to the Wildlife and Countryside Act 1981 or the Invasive Alien Species Order 2019) **[Ref. 1-23]** be found on Site or brought to the Site by construction plant, works within the contaminated area must cease immediately, appropriate biosecurity measures implemented to restrict unauthorised access and specialist advice sought to allow for implementation of an invasive weeds management plan. It is not an offence to have invasive species on your land, however it is considered best practice to responsibly manage all areas affected by non-native plants so to avoid their spread into the wild and to avoid detrimental impacts on biodiversity and the environment as well as creating potential constraints to future development.

Coastal floodplain grazing marsh management

6.3.25 Coastal floodplain grazing marsh, a priority habitat, is present at Figham Pastures Local Wildlife Site (LWS). The Proposed Development includes horizontal direction drilling under watercourses present as well as open-cut trench cutting to lay the transmission cable within Figham Pastures LWS. The underlying grassland turf will be replaced within 48 hours of the trench being dug. Details on turf translocation will be included in the Landscape and Ecological Management Plan and the Soil Management Plan, to ensure that the impact is minimal, with the trench width kept to a maximum of 1.5m.

6.4 Landscape management overview

6.4.1 Management objectives are focused on achieving objectives described in the overall vision and facilitated by the maintenance operations.

6.4.2 Maintenance operations are defined as long term cyclical operations over several years to allow successful establishment of the soft landscape areas.

6.4.3 Habitat enhancement and habitat creation measures will need to be managed for a period of 40 years, which is the operational life of the Proposed Development. As explained earlier this exceeds the minimum management period of 30 years to meet BNG requirements.

6.4.4 The ongoing management and monitoring of enhanced and created habitats will be detailed with the Landscape and Ecological Management Plan. The success of the habitats is based on the Defra Statutory Biodiversity Metric Condition Assessment Criteria **[Ref.1-24]**. The resulting anticipated significant on-site gains in biodiversity unit value and associated condition criteria will be required to be delivered by the operator for period of at least 30 years. After 30 years, the Landscape and Ecological Management Plan will be reviewed to ensure habitat management prescriptions are still appropriate for the remainder of the operational phase.

6.4.5 Relevant landowners and appropriate stakeholders will be engaged prior to decommissioning to discuss the options available to retain ecological enhancement and mitigation areas which have been created and managed for the Site.

6.5 Retained trees and hedgerows

6.5.1 Retained non-ancient woodland, hedgerows and individual trees will be protected with a 10m offsets where reasonably practicable. All ancient woodland will be protected with a 15m offsets.

6.6 Management objective for retained trees and hedgerows

6.6.1 It is presumed that the retained woodlands will continue to be managed by the relevant current landowner in the same ways as they have been historically. Retained hedgerows adjacent to Monk Dike will be grown to a maximum height of 4m. All other hedgerows would be grown to a height of 3.5m unless there was a specific operational or safety reason for a section needing to be shorter.

6.6.2 Existing hedges will be managed to maximise biodiversity and the screening of the solar PV development. Where feasible, current flailing practices for hedgerows will be relaxed and the hedge cut or flailed on one side every two to three years, rather than annually. Reinforcement of defunct and gappy hedgerows and the planting of new hedgerows and hedgerow trees will be undertaken within the earliest feasible timescales taking into account needs of construction traffic.

6.7 Maintenance operations for retained trees and hedgerows

Table 7-1: Proposed maintenance of retained trees and hedgerow

Maintenance Operation	Method
Visual inspection of all retained trees and hedgerows and recommendations for any remedial works	A visual inspection of retained trees shall be carried out in the first year and thereafter every 5 years unless advised otherwise by a suitably qualified Arborist. Remedial actions will be implemented as required to remove unacceptable hazards as determined through an on-site risk assessment.
Trees works as directed to BS.3998	All tree works and their management are to be agreed with East Riding of Yorkshire Council. Any specified tree surgery works will be carried out in accordance with BS 3998: 2010 'Recommendations for tree work' [**Ref. 1-25**], Health & Safety legislation and relevant best practice. Prior to the commencement of works, the Principal Contractor shall provide valid proof of the required Public Liability Insurance and a full working method statement and risk assessment. Prior to commencement of works all trees are to be inspected for nesting birds and potential for roosting bats by an approved Ecologist. Where works are to take place during the bird nesting season (March to August) all trees are to be inspected for nesting birds by the Ecologist. Tree Work is to be carried out by an approved member of the Arboricultural Association. Chainsaw work operatives must hold a Certificate of Competence.
Cutting/Pruning	Cutting: Make no cuts of more than 75mm diameter. Cut portions of branches back to lateral or sub lateral buds or branches without leaving stumps.

Maintenance Operation	Method
	Remove whole branches back to the stem or cut lower portions of branches back to lateral or sub lateral buds or branches. Do not leave stumps. Cut vertical branches similarly, with no more slope on the cut surface than is necessary to shed rainwater.
Crown Reduction and Shaping	Cut back selectively to lateral or sub lateral buds or branches to retain flowering branch lines without leaving stumps. Leave trees with a well-balanced natural appearance.
Crown Lifting	Remove branch systems to give clearances as follows – 2400mm above ground level.
Crown Thinning	Removing branches: Remove inward growing, crossing, rubbing, dead and damaged branches. Thinning: Selectively remove approximately 15% of secondary and small live branch growth evenly throughout the crown.
Management of dead/dying trees	Dead or dying trees and felled timber may be used to create habitat log piles to allow them to decay naturally within the woodland providing habitats for insects, newts, and other species.
Management of diseased trees	Diseased trees are to be taken from Site and disposed of. Diseased trees will not be burnt, chipped, or used for ecological purposes on Site.
Hedgerow works	Prior to the commencement of any works hedgerows are to be inspected by a suitably qualified person to ascertain the presence of any protected species. If any such species are found a suitable mitigation strategy must be agreed in advance of any works, with East Riding of Yorkshire Council.
Existing hedgerow trimmed to desired height	Generally existing hedgerows will be allowed to grow to a height of 3.5m. Hedgerows adjacent to Monk Dike will be allowed to grow to a height of 4m. All will be cut on a two- or three-year rotation (different sections of hedgerow being cut each year). Hedgerows will be cut in the months between October and February only.

7 Proposed tree planting

7.1 Individual and hedgerow tree planting

The species outlined in **Table 7-1**, below, will be planted in locations as presented indicatively in **Appendix D - Indicative Environmental Masterplan in**.

Table 7-1: Proposed individual and hedgerow tree species

Small Stature (Up to 8m)			
Botanical name	**Common name**	**Girth (cm)**	**Height**
Crataegus monogyna	Hawthorn	12-14cm	3.4-4m
Malus sylvestris	Crab Apple	12-14cm	3.4-4m
Salix caprea	Goat Willow	12-14cm	3.4-4m
Sorbus aria	Whitebeam	12-14cm	3.4-4m
Medium/Large Stature (Over 8m)			
Botanical name	**Common name**	**Girth (cm)**	**Height**
Acer campestre	Field Maple	12-14cm	3.4-4m
Alnus glutinosa	Alder	12-14cm	3.4-4m
Betula pendula	Silver Birch	12-14cm	3.4-4m
Fagus sylvatica	Common Beech	12-14cm	3.4-4m
Salix fragilis	Crack Willow	12-14cm	3.4-4m
Prunus avium	Wild Cherry	12-14cm	3.4-4m
Quercus robur	Pedunculate Oak	12-14cm	3.4-4m

7.2 Management objective for individual and hedgerow trees

7.2.1 Individual and hedgerow trees are proposed predominantly to the north of solar arrays in solar PV development areas to prevent shadow casting. Trees are not proposed to the south of solar PV development areas prevent shadow casting. These trees will help to screen views of the Proposed Development over the 40-year operational period becoming permanent features in the landscape.

7.2.2 Where individual trees are proposed alongside existing intact hedgerows that do not require supplementary planting or gapping up, trees are to be placed adjacent to the hedge, on the edge of the ecological strip, ensuring no damage to root zone of existing hedgerow shrubs. Planting will be protected by deer fencing (or an equivalent protection measure) for at least the first 5 years to aid successful establishment and prevent browsing.

7.3 Implementation of individual and hedgerow tree planting

Table 7-2: Proposed individual tree and hedgerow planting implementation measures

Implementation	Method
Site visit and Walkover	The Principal Contractor is advised to undertake a Site visit and walkover prior to commencing the work to appraise the Site. This should assist with, amongst other things, determining the feasibility of gapping up, planting new trees in existing hedgerows and identifying damp areas and access requirements.
New trees within existing hedgerows	New trees in existing hedgerows are to be planted at ground level close to or within gaps in the existing hedgerow.
Tree pits	All trees are to be rootballed stock. Trees which have a girth of 16-18cm and above are to be planted in pits of a minimum size of 1500 x 1500 x 900mm depth. Trees which have a girth of 14-16cm and below are to be planted in pits of a minimum size of 1000 x 1000 x 750mm depth. The bottom of pits will be loosened to allow root penetration.
Tree staking and support	Trees which have a girth of 14-16cm and above will be supported by two no. 900mm long 50mm diameter softwood stakes, machine round pointed with a chamfered top, driven 600mm depth with cross bar finished 300mm above ground. Trees will be secured to centre of cross bar using Flat Back Unslotted Block and T260 Buckle Tree Tie by Rubberloc (or equivalent). Trees which have a girth of 12-14cm and below will be supported by one no. 900mm long 50mm diameter softwood stake, machine round pointed with a chamfered top, driven 600mm depth. Trees will be secured to the stake using Flat Back Unslotted Block and T260 Buckle Tree Tie by Rubberloc (or equivalent).
Fertiliser and mulch	Each planting station shall incorporate x2 15g ‘Sierrablen Flora’ slow release fertiliser tablets. Rootballed trees will be topped with 75mm depth of bark mulch covering the extent of the plant pit or 1 m diameter as per the weed free ring around trees.
Watering	All newly planted trees must be watered. A newly planted tree should ideally receive approximately 50 litres of water each week during dry periods throughout May,

Implementation	Method
	June, July and August. Ideally carried out in the morning or evening. If a watering pipe is present, then approximately half of the water should be poured down the pipe and half added to the ground surface around the tree.

7.4 Maintenance operations for individual tree planting

7.4.1 New tree planting will be attended to three times during the growing season (April-September) and once during the dormant season (October-March inclusive). At each visit the operations that are to be carried out are outlined in Table 8-3, below.

Table 7-3: Proposed maintenance of individual tree planting

Maintenance Operation	Detail
Inspection for Litter	Before work commences, all areas shall be inspected for litter, and all debris removed off Site in accordance with paragraphs 6.3.10 and 6.3.11 above.
Monitor and treat pests and diseases including removal of dead, dying and diseased material	Treat as necessary and in accordance with recommendations from suitably qualified Arboricultural consultant
Monitoring and pruning/ remedial surgery (Remove any branches that overhang footpaths, obscure visibility splays, or prevent access for grass cutting)	Any damaged shoots or branches shall be pruned off plants using secateurs, cutting back to above a live, outward-facing bud or shoot.
Monitor, adjust and replace stakes, ties, guards/fence	All staked trees shall be inspected on each maintenance visit and all stakes and ties shall be inspected. Any looseness, constriction or abrasion shall be corrected by adjustment or replacement as required.
Check plant material is firmly planted and firm in as required	All plants shall be checked and firmed up in the ground as necessary.
Water to maintain healthy growth and successful establishment	During the period May to September in the first year after planting, all new staked native trees will be watered on a monthly basis unless the ground is evidently already saturated.

Maintenance Operation	Detail
1m diameter weed free area to be maintained around each tree	A 0.5m diameter weed free area (centred on the tree) shall be maintained around each tree during the first 2 years. Around the new trees, thistle, dock and ragweed will be spot treated with glyphosate during the growing season. Strimmers shall not be used around the base of trees.
Remove any weed growth from shelter guards	Tree guards/shelters shall be lifted as necessary to achieve weed control, and re-firmed in the ground after completion of the work.
Apply fertiliser	Sufficient fertiliser on planting should be specified for the first year. After this time a general fertiliser may be applied. The frequency will depend on the type of fertiliser used but a well-balanced slow release with trace elements once in three years should be sufficient in these soils. Fertilising may cease after 7 years when young trees should have established a good root structure, unless foliage and general condition suggests otherwise.
Replacement tree planting	Any dead/dying/diseased trees shall be removed and replaced within the first 5 years. Replacement planting to be carried out during the next winter visit.
Remove stakes/guys when ready	All stakes, guards and ties shall be removed after 5 years unless required for ongoing protection. On removal of stakes, hole to be backfilled with lightly compacted soil.
Tree works including crown reducing, crown lifting, crown thinning	A tree condition and safety survey will be undertaken every 3 years by a suitably qualified Arboricultural consultant. Any remedial works (e.g. pruning or felling) as recommended by the tree condition and safety survey shall be carried out within the timescales recommended by the consultant.

8 Proposed woodland planting

8.1 Mixed woodland

8.1.1 The species outlined in Table 9-1 below will be planted in locations as presented indicatively in **Appendix D - Indicative Environmental Masterplan**.

Table 8-1: Proposed mixed woodland species

Trees				
%	**Botanical name**	**Common name**	**Root Condition**	**Height**
10	*Acer campestre*	Field Maple	Bare Root (Feathered)	1250-1500mm
5	*Acer campestre*	Field Maple	Bare Root (Standard)	2500-3000mm
10	*Prunus avium*	Wild Cherry	Bare Root (Feathered)	1250-1500mm
10	*Quercus robur*	Pedunculate Oak	Bare Root (Feathered)	1250-1500mm
5	*Quercus robur*	Pedunculate Oak	Bare Root (Standard)	2500-3000mm
Shrubs				
%	**Botanical name**	**Common name**	**Root Condition**	**Height**
10	*Corylus avellana*	Hazel	Bare Root	600-800mm
20	*Crataegus monogyna*	Hawthorn	Bare Root	600-800mm
5	*Ilex aquifolium*	Holly	Bare Root	600-800mm
15	*Prunus spinosa*	Blackthorn	Bare Root	600-800mm
5	*Sambucus nigra*	Elder	Bare Root	600-800mm
5	*Viburnum opulus*	Guelder Rose	Bare Root	600-800mm

8.2 Management objective for woodland

8.2.1 Parcels of new native woodland planting are proposed across the Order Limits to screen views of the Proposed Development, as shown in **Appendix D -Indicative Environmental Masterplan**.

8.2.2 It is recommended that new woodland blocks of planting are protected by deer fencing for at least the first 5 years to aid successful establishment and prevent browsing. Fencing will be managed as outlined earlier in **Section 6.3**.

8.3 Implementation of woodland planting

Table 8-2: Proposed woodland planting implementation

Implementation	Method
Vegetation Clearance	New areas of woodland planting will be cleared of any competing vegetation as necessary before planting.
Planting	All bareroot plants are to be root dipped in Broadleaf Root Dip immediately after lifting at nursery, and retained in polythene bags, secured at the stems until they are ready for planting. Where woodland is planted next to a hard surface/kerb/fence, it should be positioned 1m from the edge. Woodland planting is to be notch planted with native shrubs planted on a 1.5m grid in single species groups of 3 to 9 with native tree species planted on a 3m grid in single species groups of 3 to 7 within this. Planting should be into a moist, friable and not waterlogged soil. Due to the majority of the stock being bare root, planting should be carried out between the months of November and March. On no account are any roots to be left exposed or bent. Care will be taken to ensure that the plant is upright, planted at the original nursery depth and left windfirm on completion.
Protection and staking	Bareroot transplants and small container grown stock will be protected with a 600mm high 'Tubex' tree shelter with a 75mm – 100mm diameter (colour: Green) or equivalent approved. Supported with a previously treated softwood stake 900 x 32 x 32mm treated with water-based preservative driven a minimum of 300mm below ground level.
Under-seeding	Woodland areas are to be under-seeded with a shade tolerant species-rich grassland to increase the biodiversity value but with the area within and immediately adjacent to any guards being kept clear of weed growth.

8.4 Maintenance operations for woodland planting

8.4.1 New woodland planting will be attended to three times during the growing season (April-September inclusive) and once during the dormant season (October-March inclusive). At each visit the following operations are to be carried out in line with the measures identified in Table 9-3 below.

Table 8-3: Proposed maintenance of woodland planting

Maintenance Operation	Detail
Inspection for Litter	Before work commences, all areas shall be inspected for litter, and all debris removed in accordance with paragraphs 6.3.10 and 6.3.11above.
Monitor and treat pests and diseases including removal of dead, dying and diseased material/pruning remedial surgery	Trees and shrubs will be pruned as necessary to remove dead, dying or diseased wood and suckers and to promote healthy growth and natural shape. Pruning will be carried out in accordance with BS 8545:2014 [**Ref. 1-6]** Trees from nursery to independence in the landscape and good horticultural and arboricultural practice. *Pruning Generally* • Timing: Do not prune during the late winter / early spring sap flow period. • Do not prune whips or feathered trees. • Do not damage or tear the stem of branches to be removed. • Keep wounds as small as possible and cut cleanly back to sound wood. • Make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on the cut area. • Prune larger branches using the branch bark ridge as a pruning guide. • Thin, trim and shape each specimen appropriately to species, location, season, and stage of growth, leaving a well-balanced natural appearance. • Use clean, sharp secateurs, hand saws or other appropriate tools. Ragged edges of bark or wood to be trimmed with a sharp knife. • Remove growth encroaching onto grassed areas, paths, roads, signs, sightlines, and road lighting luminaries. • Dead, diseased, or dangerous plants should be treated, lopped and/or felled as necessary. The resultant timber and debris should be made available to create log piles for vertebrates or

Maintenance Operation	Detail
	habitat piles for other species. (Please note any diseased wood should be removed from Site). • General light pruning shall include removal of the oldest, longest, most branched shoots to the base of the plant with secateurs or loppers. Activity should be phased year by year to incrementally achieve the overall effect. Apply this approach to the more vigorous planting at most times of the year to reduce spring pruning load.
Monitor, adjust and replace stakes, ties, guards/fence	Stakes, tubes and ties will be straightened/refixed as necessary.
Check plant material is firmly planted and firm in as required	All plants shall be checked and firmed up in the ground as necessary.
Water to maintain healthy growth and successful establishment	During the period May to September in the first year after planting, all new planting will be watered on a monthly basis unless the ground is evidently already saturated. In subsequent years watering may need to be carried out during periods of drought.
1m diameter weed free area to be maintained around each tree	A 0.5m diameter weed free area (centred on the tree) shall be maintained around each transplant during the first 2 years. Strimmers shall not be used around the base of plants.
Thistle, dock and ragweed to be spot treated with glyphosate/ Spot treat invasive non-native species as necessary	Around the new plants, thistle, dock and ragweed will be spot treated with glyphosate during the growing season.
Remove any weed growth from shelter guards	Tree guards/shelters shall be lifted as necessary to achieve weed control, and re-firmed in the ground after completion of the work.

Maintenance Operation	Detail
Apply fertiliser	Sufficient fertiliser on planting should be specified for the first year. After this time a general fertiliser may be applied. The frequency will depend on the type of fertiliser used but a well-balanced slow release with trace elements once in three years should be sufficient in these soils. Fertilising may cease after 7 years when young trees should have established a good root structure, unless foliage and general condition suggests otherwise.
Replacement whip/transplant/tree planting	Woodland planting shall achieve 90% successful establishment. Any dead/dying/diseased trees shall be removed and replaced within the first 5 years. Replacement planting to be carried out during the next winter visit.
Remove stakes/guys when ready	All stakes, guards and ties shall be removed after 5 years unless required for ongoing protection. On removal of stakes, hole to be backfilled with lightly compacted soil.
Tree works including crown reducing, crown lifting, crown thinning	A tree condition and safety survey will be undertaken in year 4 by a suitably qualified arboricultural consultant. Any remedial works (e.g., pruning or felling) as recommended by the tree condition and safety survey shall be carried out within the timescales recommended by the consultant and before the end of the 5-year establishment period (first 5 years after implementation).
Woodland coppicing and thinning	Tree and shrub planting within woodland structure planting will be thinned out at year 5. This would involve the removal of trees and shrubs up to a maximum of 30%. This should be repeated at year 10 and 15 and then subsequently every 10 years. Existing areas of woodland should be thinned at year 5 and then at 10-year intervals with consideration given to the retention of the existing visual screen. An approved member of the Arboricultural Association or other approved specialist shall carry out thinning operations and surgery to larger trees. Monitoring of trees for disease should lead to infected trees being removed upon confirmation of the presence of disease to protect other trees on Site. Tree remains shall not be left on Site this will

Maintenance Operation	Detail
	reduce the risk of disease spreading. Discovery of any invasive species should lead to their immediate removal. The remains of these species should be removed from the Site. Tree and shrub species such as Corylus avellana, Crataegus monogyna and Prunus spinosa may be selectively coppiced to open the stand and encourage new growth from the base. A 5-year rotation is proposed commencing at the same time as the thinning operations from September to February (reducing to 10 years for existing woodland and for proposed woodland after 15 years). This will create open areas within the planting which will develop into a lower storey of vegetation.

9 Proposed scrub planting

9.1 Mixed native scrub

9.1.1 The species outlined in the table below will be planted in locations as presented indicatively in **Appendix D - Indicative Environmental Masterplan.**

Table 9-1: Proposed mixed native scrub species

Trees				
%	**Botanical name**	**Common name**	**Root Condition**	**Height**
10	*Acer campestre*	Field Maple	Bare Root (Feathered)	1250-1500mm
5	*Malus sylvestris*	Crab Apple	Bare Root (Feathered)	1250-1500mm
5	*Prunus avium*	Wild Cherry	Bare Root (Feathered)	1250-1500mm
Shrubs				
%	**Botanical name**	**Common name**	**Root Condition**	**Height**
15	*Corylus avellana*	Hazel	Bare Root	600-800mm
25	*Crataegus monogyna*	Hawthorn	Bare Root	600-800mm
10	*Ilex aquifolium*	Holly	Bare Root	600-800mm
20	*Prunus spinosa*	Blackthorn	Bare Root	600-800mm
5	*Sambucus nigra*	Elder	Bare Root	600-800mm
5	*Viburnum opulus*	Guelder Rose	Bare Root	600-800mm

9.2 Management objective for scrub

9.2.1 The management objective for scrub is to create a scrub mosaic to maximise biodiversity and help create wildlife linkage within the Order Limits and to provide increased screening of solar PV modules from residential properties and PRoW. Scrub species are to be planted into the same low maintenance grass rich sward used as an establishment crop.

9.2.2 Scrub should be managed with the intention of generally reaching 70% coverage with remaining area retained as grassland.

9.2.3 Grass around the Battery Energy Storage System (BESS) units will be trimmed on a more frequent basis than compared to the other elements of the Proposed Development like the wildflower meadow.

9.3 Implementation of scrub planting

Table 9-2: Proposed scrub planting implementation

Implementation	Method
Vegetation Clearance	New areas of scrub planting will be cleared of any competing vegetation as necessary before planting.
Planting	All bareroot plants are to be root dipped in Broadleaf Root Dip immediately after lifting at nursery, and retained in polythene bags, secured at the stems until they are ready for planting. Where scrub is planted next to a hard surface/kerb/fence, it should be positioned 1m from the edge. Scrub planting is to be notch planted with native shrubs planted on a 1.5m grid in single species groups of 3 to 9 with native tree species planted on a 3m grid in single species groups of 3 to 7 within this. Planting should be into a moist, friable and not waterlogged soil. Due to the majority of the stock being bare root, planting should be carried out between the months of November and March. On no account are any roots to be left exposed or bent. Care will be taken to ensure that the plant is upright, planted at the original nursery depth and left windfirm on completion.
Protection and staking	Bareroot transplants and small container grown stock will be protected with a 600mm high 'Tubex' tree shelter with a 75mm – 100mm diameter (colour: Green) or equivalent approved. Supported with a previously treated softwood stake 900 x 32 x 32mm treated with water-based preservative; driven a minimum of 300mm below ground level.

9.4 Maintenance operations for scrub planting

9.4.1 New scrub planting will be attended to three times during the growing season (April- September) and once during the dormant season (October-March inclusive). At each visit the following operations are to be carried out in line with the measures identified in Table 10-2 below.

Table 9-3: Proposed maintenance of scrub planting

Maintenance Operation	Detail
Inspection for Litter	Before work commences, all areas shall be inspected for litter, and all debris removed off Site in accordance with paragraphs 6.3.10 and 6.3.11 above.
Monitor and treat pests and diseases including removal of dead, dying and diseased material/pruning remedial surgery	Trees and shrubs will be pruned as necessary to remove dead, dying or diseased wood and suckers and to promote healthy growth and natural shape. Pruning will be carried out in accordance with BS 8545:2014 Trees from nursery to independence in the landscape and good horticultural and arboricultural practice [**Ref. 1-6**]. *Pruning Generally* • Timing: Do not prune during the late winter / early spring sap flow period. • Do not prune whips or feathered trees. • Do not damage or tear the stem of branches to be removed. • Keep wounds as small as possible and cut cleanly back to sound wood. • Make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on the cut area. • Prune larger branches using the branch bark ridge as a pruning guide. • Thin, trim and shape each specimen appropriately to species, location, season, and stage of growth, leaving a well-balanced natural appearance. • Use clean, sharp secateurs, hand saws or other appropriate tools. Ragged edges of bark or wood to be trimmed with a sharp knife. • Remove growth encroaching onto grassed areas, paths, roads, signs, sightlines, and road lighting luminaries. • Dead, diseased, or dangerous plants should be treated, lopped and/or felled as necessary. The resultant timber and debris should be made available to create log piles for vertebrates or habitat piles for other species. (Please note any diseased wood should be removed from Site).

Maintenance Operation	Detail
	• General light pruning shall include removal of the oldest, longest, most branched shoots to the base of the plant with secateurs or loppers. Activity should be phased year by year to incrementally achieve the overall effect. Apply this approach to the more vigorous planting at most times of the year to reduce spring pruning load.
Monitor, adjust and replace stakes, ties, guards/fence	Stakes, tubes and ties will be straightened/refixed as necessary.
Check plant material is firmly planted and firm in as required	All plants shall be checked and firmed up in the ground as necessary.
Water to maintain healthy growth and successful establishment	During the period May to September in the first year after planting, all new planting will be watered on a monthly basis unless the ground is evidently already saturated. In subsequent years watering may need to be carried out during periods of drought.
1m diameter weed free area to be maintained around each tree	A 0.5m diameter weed free area (centred on the transplant) shall be maintained around each tree during the first 2 years. Strimmers shall not be used around the base of plants.
Spot treat invasive non-native species as necessary	Around the new plants, thistle, dock and ragweed will be spot treated with glyphosate during the growing season.
Remove any weed growth from shelter guards	Tree guards/shelters shall be lifted as necessary to achieve weed control, and re-firmed in the ground after completion of the work.
Apply fertiliser	Sufficient fertiliser on planting should be specified for the first year. After this time a general fertiliser may be applied. The frequency will depend on the type of fertiliser used but a well-balanced slow release with trace elements once in three years should be sufficient in these soils. Fertilising may cease after 7 years when young trees should have established a good root structure, unless foliage and general condition suggests otherwise.
Replacement whip/transplant/tree planting	Scrub planting shall achieve 90% successful establishment. Any dead/dying/diseased trees shall be removed and replaced within the first 5 years.

Maintenance Operation	Detail
	Replacement planting to be carried out during the next winter visit.
Remove stakes/guys when ready	All stakes, guards and ties shall be removed after 5 years unless required for ongoing protection. On removal of stakes, hole to be backfilled with lightly compacted soil.

10 Proposed native hedgerow planting

10.1 New species rich native hedgerow

10.1.1 The species mix outlined in the table below will be planted in locations as presented indicatively on **Appendix D - Indicative Environmental Masterplan**. The mix is for new hedgerows and also the gapping up of existing hedgerows.

Table 10-1: Proposed species rich native hedgerows

%	Botanical name	Common name	Root Condition	Height
10	*Acer campestre*	Field Maple	Bare Root	600-800mm
10	*Corylus avellana*	Hazel	Bare Root	600-800mm
30	*Crataegus monogyna*	Hawthorn	Bare Root	600-800mm
10	*Ilex aquifolium*	Holly	Bare Root	600-800mm
5	*Malus sylvestris*	Crab Apple	Bare Root	600-800mm
15	*Prunus spinosa*	Blackthorn	Bare Root	600-800mm
5	*Rhamnus frangula*	Alder Buckthorn	Bare Root	600-800mm
5	*Sambucus nigra*	Elder	Bare Root	600-800mm
5	*Viburnum opulus*	Guelder Rose	Bare Root	600-800mm
5	*Ulmus 'New Horizon'*	Elm (disease resistant cultivar)	Bare Root	600-800mm

10.2 Management objective for species rich native hedgerows

10.2.1 The management objective for species rich native hedgerows is to maximise biodiversity and help create wildlife corridors that connect the Order Limits with hedgerows and treelines within the wider landscape. Existing hedgerows are to be retained and enhanced through additional underplanting by infilling gaps to improve species diversity.

10.2.2 All proposed hedgerows are to satisfy the Defra (2024) statutory metric **[Ref. 1-16]** definition of 'species-rich' and consist of at least four woody species per 30m of hedgerow.

10.2.3 Hedgerows should be managed with the intention of generally reaching 3 to 3.5m in height and 2-3m width.

10.3 Implementation of species rich native hedgerow planting

Table 10-2: Proposed species rich native hedgerow implementation

Implementation	Method
Vegetation Clearance	Before planting, ensure that the ground is free of vegetation and weeds; vegetation should be hand-cut if possible, this is generally the least damaging to wildlife, however, herbicides are usually more effective at reducing competition. Their use should be the minimum necessary for effective control.
Planting	All bareroot plants are to be root dipped in Broadleaf Root Dip immediately after lifting at nursery, and retained in polythene bags, secured at the stems until they are ready for planting. Where scrub is planted next to a hard surface/kerb/fence, it should be positioned 1m from the edge. Hedgerow shrubs are to be notch planted in double staggered rows 0.5m apart with 5 plants per linear metre with 0.45m centres in single species groups of 5 to 11. Gapping up of hedgerows is to be undertaken by hand within the rootzone of existing trees. Planting should be into a moist, friable and not waterlogged soil. Due to the majority of the stock being bare root, planting should be carried out between the months of November and March. In open areas the new hedge line is to be broken up by a single pass of a tyne or rotovator to break up the ground to 500mm depth. A trench should then be dug 500mm deep x 500mm wide or shallower and wider if ground water is encountered. On no account are any roots to be left exposed or bent within the trench. Care will be taken to ensure that the plant is upright, planted at the original nursery depth and left windfirm on completion.
Protection and staking	Bareroot transplants and small container grown stock will be protected with a 600mm high 'Tubex' tree shelter with a 75mm – 100mm diameter (colour: Green). Supported with a previously treated softwood stake 900 x 32 x 32mm treated with water-based preservative to driven a minimum of 300mm below ground level.

10.4 Maintenance operations for species rich native hedgerow planting

10.4.1 New hedgerow planting will be attended to three times during the growing season (April- September) and once during the dormant season (October-March inclusive). At each visit the following operations are to be carried out as identified in Table 11-3, below.

Table 10-3: Proposed maintenance of native hedgerow planting

Maintenance Operation	Detail
Inspection for Litter	Before work commences, all areas shall be inspected for litter, and all debris removed off Site in accordance with paragraphs 6.3.10 and 6.3.11 above.
Monitor and treat pests and diseases including removal of dead, dying and diseased material/pruning remedial surgery	Any damaged shoots or branches shall be pruned off plants using secateurs, cutting back to above a live, outward-facing bud or shoot. Generally, the tips of the branches of young plants should be snipped back, by no more than 1cm, in June for the first 5 years to encourage bushy growth.
Monitor, adjust and replace stakes, ties, guards/fence	Stakes, tubes and ties will be straightened/refixed as necessary.
Check plant material is firmly planted and firm in as required	All plants shall be checked and firmed up in the ground as necessary.
Water to maintain healthy growth and successful establishment	During the period May to September in the first year after planting, all new planting will be watered on a monthly basis unless the ground is evidently already saturated. In subsequent years watering may need to be carried out during periods of drought.
1m diameter weed free area to be maintained around each tree	A 0.5m diameter weed free area (centred on the tree) shall be maintained around each transplant during the first 2 years. Strimmers shall not be used around the base of plants.
Spot treat invasive non-native species as necessary	Around the new plants, thistle, dock and ragweed will be spot treated with glyphosate during the growing season.

Maintenance Operation	Detail
Remove any weed growth from shelter guards	Guards/shelters shall be lifted as necessary to achieve weed control, and re-firmed in the ground after completion of the work.
Apply fertiliser	Sufficient fertiliser on planting should be specified for the first year. After this time a general fertiliser may be applied. The frequency will depend on the type of fertiliser used but a well-balanced slow release with trace elements once in three years should be sufficient in these soils. Fertilising may cease after 5 years when young plants should have established a good root structure, unless foliage and general condition suggests otherwise.
Replacement whip/transplant/tree planting	Hedge planting shall achieve 90% successful establishment. Any dead/dying/diseased plants shall be removed and replaced within the first 5 years. Replacement planting to be carried out during the next winter visit.
Remove stakes/guys when ready	All stakes, guards and ties shall be removed after 5 years unless required for ongoing protection. On removal of stakes, hole to be backfilled with lightly compacted soil.
Clipping of hedgerow	The hedgerow should be clipped to the required profile; a trapezium shape broader at the base than at the top. This will allow light to all parts of the plant and avoid a bare base developing and should be done each September. Following year 5 hedgerows are considered established. A cutting regime for established hedgerows is to consist of a cut to one side annually (e.g. front, back or top) on a 3-year cycle. This will maintain vigour and structure as well as provide diverse habitat for wildlife. Cuts shall typically be undertaken as late into the autumn / winter period as possible, in order to ensure that these features provide as much of a food resource as possible for birds. The established the hedge is to be maintained at 3-3.5m high and 2-3m wide.

11 Legume rich other neutral grassland

11.1.1 The legume rich mixture outlined in the table below will be sown in locations as presented indicatively on **Appendix D - Indicative Environmental Masterplan**. Generally, the mixture is to be sown between and underneath the solar panels including (95%) of the margins between the security fence and the existing field boundaries. This is designed to boost insect populations, as foraging for bird and bat species, in particular pollinators whilst also improving soil health long term.

11.1.2 Only source legume rich mixtures which comply with the Countryside Stewardship GS4 **[Ref. 1-26]** will be specified.

11.1.3 If grazing by sheep is not considered an option for management, a mix that does not contain chicory* will be selected. Chicory becomes woody towards late summer, is difficult to dry and can cause damage to bale wrapping material. If grazing is not possible then a cutting regime will be used as outlined within **Table 13-3**.

Table 12-1: Proposed species mixes for legume rich neutral grassland

Latin name	Common name
Achillea millefolium	Yarrow
Cichorium intibus	Perennial Chicory*
Festuca rubra	Strong Creeping Red Fescue
Lolium perenne	Perennial Ryegrass
Lotus corniculatus	Birdsfoot Trefoil
Medicago lupulina	Black Medick
Petroselenium crispum	Sheep's Parsley
Phleum pratense	Timothy
Plantago lanceolata	Ribwort Plantain
Poa pratensis	Smooth Stalked Meadow Grass
Sanguisorba minor	Sheep's Burnet
Schedonorus pratensis (Festuca pratensis)	Meadow Fescue
Trifolium pratense	Red Clover
Vicia sativa	Vetch

11.2 Management objective for legume rich neutral grassland

11.2.1 The mix will be over sown directly under and between the panels once they have been installed. A vigorous sward with abundant legumes and herbs, will provide habitat and food for invertebrates, including crop pollinators, and improve soil structure and water infiltration.

11.2.2 After establishing in the first year following over sowing, a mixture of legumes, herbs and wildflowers will be growing and flowering throughout the spring, summer and early autumn. The exact mechanism for managing the sward has not been determined but is likely to be cutting or grazing or a combination and will be confirmed in the Landscape and Ecological Management Plan. If cutting the sward, it will be left to rest for at least 5 weeks between 1 May and 31 July, so that the majority of flowers are open and available for pollinators. If grazing, a mob grazing approach where each field is grazed by a small number of sheep that are moved regularly (every week) to rest the sward and allow flowering for pollinators may be appropriate.

11.3 Implementation of legume rich neutral grassland

11.3.1 Implementation should be in accordance with Countryside Stewardship GS4: Legume and herb-rich swards guidance.

Table 12-2: Proposed legume rich neutral grassland implementation

Implementation	Method
Ground Preparation	Scarify the existing vegetation or soil surface if surface is bare.
Seeding	Sow from March until August during warm moist conditions; sowing legumes and herbs after August may not allow good enough establishment before the winter. Cultivate and sow to suppliers' recommendations and ensure good seed to soil contact.

11.4 Maintenance operations for legume rich other neutral grassland

11.4.1 Maintenance operations should be in accordance with Countryside Stewardship GS4: Legume and herb-rich swards guidance. **[Ref. 1-26]**

11.4.2 All operations shall be carried out using machinery appropriate to the task, cylinder, rotary or mulch mowers and when weather and ground conditions are suitable. Operations shall be suspended where conditions prevent the use of machinery without damage to the ground surface. Where operations are suspended due to unsuitable conditions additional maintenance visits may be required in order to maintain the sward within acceptable growth limits.

11.4.3 Inspection every three months is advised to check the growth of dominant species and ruderal species. Management of these areas may have to be adapted to allow for less dominant species to predominate.

11.4.4 No fertilisers will be used as this enriches the soil nutrients, allowing grasses to easily outcompete wildflowers and the legumes will do this long term by fixing soil nitrogen. Similarly, the use of chemical pesticides will be avoided as wildflowers are more susceptible than grasses and weeds. Spot-treatment of noxious weeds will be allowed due to their localised nature.

Table 13-3: Proposed maintenance of legume rich other neutral grassland

Maintenance Operation	Detail
Inspection for Litter	Before work commences, all areas shall be inspected for litter, and all debris removed off Site in accordance with paragraphs 6.3.10 and 6.3.11 above.
Water to maintain healthy growth and successful establishment	Newly seeded areas will be watered if drought conditions warrant it during the first 2-3 months to ensure germination and establishment. Once established, watering may need to be carried out during periods of drought.
Maintenance cuts	Following sowing either graze with sheep late each summer (August onwards) with no cutting or grazing between 1 May and 31 July, so that the majority of flowers are open and available for pollinators. Mobile grazing with a low number of stock for a few days and moving stock regularly throughout the growing season would still allow plants to flower and may be more commercially viable. If grazing not possible cut vegetation in late summer. (31 July onwards) each year and remove the arisings.
Weed Control	Thistle, dock and ragweed will be spot treated with glyphosate during the growing season.
Re-sow Failed Areas	Any patches of cropland which have not successfully germinated 6-8 weeks after sowing will be resown. This may by necessity be in the subsequent seeding season. Reinstate areas as required ensuring seed matches existing in species composition and quality. It is considered that with light cutting or grazing a legume rich other neutral grassland will persist but if flowers become scarce consider reseeding over the top perhaps every 10-15 years.

12 Field margin – wild bird winter seed mix

12.1.1 The grassland mixture outlined in the table below will be sown in locations as presented indicatively on **Appendix D -Indicative Environmental Masterplan**. Generally, the mixture will be sown in the margins outside of the security fence between the fence and the solar panels and not within the Biodiversity Mitigation Areas. Only a small number of margins (5%) will be sown and the exact locations will be agreed in the Landscape and Ecological Management Plan.

12.1.2 The wild bird seed mix provides important food resources (small seeds) for farmland birds, especially in autumn and winter. The flowering plants will benefit insects including bumblebees, solitary bees, butterflies and hoverflies.

12.1.3 Only source wild bird mixtures which comply with Countryside Stewardship AB9 **[Ref. 1-27]** with mixes for one and two-year schemes will be specified.

12.1.4 Establish by sowing a seed mix which contains at least 6 seed bearing crops. Seed mixes may contain a maximum of 3 of the following cereal crops - barley, oats, rye, triticale and wheat.

Table 13-1: Proposed species for wild bird winter seed mix

Latin name	Common name
Brassica juncea	Brown Mustard
Brassica oleracea	Kale
Camelina sativa	Gold of Pleasure
Fagopyrum esculentum	Buckwheat
Hordeum vulgare	Winter Barley
Linum usitatissimum	Linseed (Flax)
Lotus corniculatus	Bird's-foot Trefoil
Medicago sativa	Lucerne
Phacelia tanacetifolia	Phacelia
Raphanus sativus	Fodder Radish
Sinapis alba	White Mustard
Trifolium incarnatum	Crimson Clover
Trifolium hybridum	Alsike Clover
Trifolium pratense	Red Clover
Triticum aestivum	Winter Wheat
Vicia sativa	Common Vetch

12.2 Management objective for field margin – wild bird winter seed mix

12.2.1 During the spring or summer, the seed mix, containing at least 6 small seed-bearing crops (not maize), will be established. For 2-year mixes, during the second spring biennial plants, such as kale, will show continued growth and development.

12.2.2 Plants will flower throughout the summer and set seed by autumn which will provide the much-needed supply of small seeds throughout the winter, until at least mid-February.

12.2.3 It is considered that the margins may require resowing every 3-4 years.

12.3 Implementation of field margin – wild bird winter seed mix

12.3.1 Implementation should be in accordance with Countryside Stewardship AB9 Winter bird food **[Ref. 1-27]**.

Table 13-2: Proposed wild bird winter seed mix implementation

Implementation	Method
Vegetation Clearance	Existing vegetation associated with the low maintenance species rich grassland should be fully removed prior to any seeding to minimise impacts from undesired species.
Ground Preparation	Ground preparation will take place in September-October or March-April when ground temperature is above 14ºC. Cultivation along the bases of existing vegetation should take care to not dig too deep to avoid impact on tree roots and advice should be sought from the arboriculture consultant where required. Ground will require rotavating prior to sowing seed. Where weed growth is prevalent, repeated cultivation can be used to exhaust weed plants. Final cultivation with harrow and roller to produce a fairly fine, firm surface suitable for seeding.
Seeding	Seeding will take place in August-September or March-April when there is sufficient warmth and moisture. Sowing to be in accordance with suppliers' recommendations. Wildflower seed is very small so will not germinate if sown too deeply. Broadcast or trickle the seed on top of the seedbed and roll or harrow to help ensure good seed to soil contact.

12.4 Management of field margin – wild bird winter seed mix

12.4.1 Maintenance operations should be in accordance with Countryside Stewardship AB9 Winter bird food guidance **[Ref. 1-27]**.

12.4.2 All operations shall be carried out using machinery appropriate to the task, cylinder, rotary or mulch mowers and when weather and ground conditions are suitable. Operations shall be suspended where conditions prevent the use of machinery without damage to the ground surface. Where operations are suspended due to unsuitable conditions, additional maintenance visits may be required in order to maintain the sward within acceptable growth limits.

12.4.3 Inspection every three months is advised to check the growth of dominant species and ruderal species. Management of these areas may have to be adapted to allow for less dominant species to predominate.

12.4.4 No fertilisers will be used as this enriches the soil nutrients, allowing grasses to easily outcompete wildflowers. Similarly, the use of chemical pesticides will be avoided as wildflowers are more susceptible than grasses and weeds. Spot-treatment of noxious weeds will be allowed due to its localised nature.

Table 13-3: Proposed maintenance of wild bird winter seed mix

Maintenance Operation	Detail
Inspection for Litter	Before work commences, all areas shall be inspected for litter, and all debris removed off Site in accordance with paragraphs 6.3.10 and 6.3.11 above.
Re-establishment of Field Margin – Wild Bird Cropland	Re-establish every 3-4 years to maintain seed production. Keep winter bird food plots until 15 February each year. To minimise the build-up of diseases, pests and weeds over time consider alternating between sowing cereal and brassica-based mixes on non-rotational plots every few years.
Re-sow Failed Areas	Re-sow winter bird plots that fail to establish.

13 Field margin – legume rich grassland

13.1.1 The grassland mixture outlined in the table below will be sown in locations as presented indicatively in **Appendix D - Indicative Environmental Masterplan**. Generally, the mixture will be sown in the margins outside of the security fence and not within the Biodiversity Mitigation and Enhancement Areas.

13.1.2 Only source pollen and nectar mixtures which comply with Countryside Stewardship AB8 [**Ref. 1-28**] with mixes for one and two-year schemes will be used.

Table 14-1: Proposed species for legume rich grassland

Latin name	Common name
Achillea millefolium	Yarrow
Cichorium intibus	Perennial Chicory*
Festuca rubra	Strong Creeping Red Fescue
Lolium perenne	Perennial Ryegrass
Lotus corniculatus	Birdsfoot Trefoil
Medicago lupulina	Black Medick
Petroselenium crispum	Sheep's Parsley
Phleum pratense	Timothy
Plantago lanceolata	Ribwort Plantain
Poa pratensis	Smooth Stalked Meadow Grass
Sanguisorba minor	Sheep's Burnet
Schedonorus pratensis (Festuca pratensis)	Meadow Fescue
Trifolium pratense	Red Clover
Vicia sativa	Vetch

* Chicory excluded if management does not involve grazing

13.2 Management objective for field margin – legume rich grassland

13.2.1 The pollen and nectar mix provides a habitat for invertebrates, including pollinators with a large amount of pollen and nectar rich plants throughout the year.

13.3 Implementation of field margin – legume rich grassland

13.3.1 Implementation should be in accordance with Countryside Stewardship AB8 Flower-rich margins and plots guidance [**Ref. 1.28**].

Table 14-2: Legume rich grassland implementation

Implementation	Method
Ground Preparation	Establish the plot between 1 March and 15 June, but ideally between mid-March and early June during warm and moist conditions. Create a fine and firm seedbed.
Seeding	Seed is to be sown at a depth between 1.5 cm and 2.5 cm.

13.4 Management of field margin – legume rich grassland

13.4.1 Maintenance operations should be in accordance with Countryside Stewardship AB8 Flower-rich margins and plots guidance [**Ref. 1.28**].

13.4.2 All operations shall be carried out using machinery appropriate to the task, cylinder, rotary or mulch mowers and when weather and ground conditions are suitable. Operations shall be suspended where conditions prevent the use of machinery without damage to the ground surface. Where operations are suspended due to unsuitable conditions additional maintenance visits may be required in order to maintain the sward within acceptable growth limits.

13.4.3 Inspection every three months is advised to check the growth of dominant species and ruderal species. Management of these areas may have to be adapted to allow for less dominant species to predominate.

13.4.4 No fertilisers will be used as this enriches the soil nutrients, allowing grasses to easily outcompete wildflowers. Similarly, the use of chemical pesticides will be avoided as wildflowers are more susceptible than grasses and weeds. Spot-treatment of noxious weeds will be allowed due to its localised nature.

Table 14-3: Field Margin - Pollen and Nectar Grassland

Maintenance Operation	Detail
Inspection for Litter	Before work commences, all areas shall be inspected for litter, and all debris removed off Site in accordance with paragraphs 6.3.10 and 6.3.11 above.

Maintenance Operation	Detail
Maintenance topping	Top emerging flowers and weeds at least 3 times in year 1 for spring sowings and at least twice in year 2 for late summer / autumn sowings. Regular topping prevents weeds smothering the slow-growing flowers so that all sown species establish successfully and toppings can be left.
Maintenance cuts	Before the beginning of April each year make sure vegetation is short enough to allow flower species to grow without competition from dominant grasses. Cut and remove summer growth between 15 August and 31 October to help reduce soil fertility and boost flower numbers in subsequent years. Always leave 10% of the area uncut or ungrazed to provide overwinter nesting and safe refuges for pollinators and other invertebrates.
Resow Failed Areas	Any patches of grassland which have not successfully germinated 6-8 weeks after sowing will be resown. This may by necessity be in the subsequent seeding season. Reinstate areas as required ensuring seed matches existing in species composition and quality. It is considered that with light cutting or grazing a legume rich other neutral grassland will persist but if flowers become scarce consider reseeding over the top perhaps every 10-15 years.

14 Flower rich neutral grassland

14.1.1 The grassland mixture outlined in the table below will be sown in locations as presented indicatively on **Appendix D - Indicative Environmental Masterplan**. within the Biodiversity Mitigation Areas and some of the Ecological enhancement Areas.

Table 15-1: Proposed species for flower rich neutral grassland

Wildflowers	
Latin name	**Common name**
Agrimonia eupatoria	Agrimony
Centaurea nigra	Common Knapweed
Chaerophyllum temulum	Rough Chervil
Daucus carota	Wild Carrot
Galium verum	Lady's Bedstraw
Geranium pratense	Meadow Crane's-bill
Lathyrus pratensis	Meadow Vetchling
Leucanthemum vulgare	Oxeye Daisy
Medicago lupulina	Black Medick
Plantago lanceolata	Ribwort Plantain
Plantago media	Hoary Plantain
Poterium sanguisorba ssp sanguisorba	Salad Burnet
Primula veris	Cowslip
Prunella vulgaris	Selfheal
Ranunculus acris	Meadow Buttercup
Rhinanthus minor	Yellow Rattle
Sanguisorba officinalis	Great Burnet
Silene dioica	Red Campion
Taraxacum officinale	Dandelion
Vicia sativa ssp. segetalis	Common Vetch
Grasses	
Latin name	**Common name**
Agrostis capillaris	Common Bent
Cynosurus cristatus	Crested Dogstail
Festuca rubra	Red Fescue
Phleum bertolonii	Smaller Cat's-tail
Poa pratensis	Smooth-stalked Meadow-grass

14.2 Management objective for flower-rich neutral grassland

14.2.1 These are primarily areas set aside for wintering birds (Mitigation Areas 9 (Field D18), 11 (Field E6) and 13 (Fields E13/14)) and ground nesting birds (fields above 2~~.05~~ha) as well as some of the ecological enhancement areas (fields smaller than 2~~.50~~ ha).

14.2.2 The areas of flower-rich neutral grassland within Mitigation Areas 9, 11 and 13 will be managed with the aim of achieving no net loss of mallard, teal, golden plover, lapwing and black-headed gull across the Site, compared to the species populations recorded during the baseline surveys. The no net loss target will take into consideration national trends as a limit of acceptable change.

14.2.3 All areas of flower-rich neutral grassland will be managed with the aim of achieving no net loss of ground nesting birds across the Site, compared to the species recorded during the base line surveys and increasing the local carrying capacity to 0.56 skylark territories per ha. The no net loss target will take into consideration national trends as a limit of acceptable change.

14.2.4 Management of these areas will be undertaken between late August and September to avoid the peak nesting bird season and wintering bird season.

14.2.5 Should monitoring indicate that grass sward height likely to be restricting ground nesting birds utilising grassland during the breeding season then remedial action will occur, this could involve cutting a number of squares 25m^2 within the grassland in early March (ground conditions permitting) to create shorter sward conditions for ground nesting birds. Sward height will also be monitored to ensure that cutting or grazing create a relatively short sward (up to 25cm) during the winter months for foraging lapwing and golden plover.

14.3 Implementation of flower-rich neutral grassland

14.3.1 Implementation should be in accordance with the seed supplier's guidance.

Table 15-2: Flower- rich neutral grassland implementation

Implementation	Method
Ground Preparation	Establish the plot in spring or autumn. Create a fine and firm seedbed.
Seeding	Seed is to be sown at a depth between 1.5 cm and 2.5 cm.

14.4 Management of flower-rich neutral grassland

14.4.1 All operations shall be carried out using machinery appropriate to the task, cylinder, rotary or mulch mowers and when weather and ground conditions are suitable. Operations shall be suspended where conditions prevent the use of machinery without damage to the ground surface. Where operations are suspended due to unsuitable conditions, additional maintenance visits may be required in order to maintain the sward within acceptable growth limits.

14.4.2 Inspection every three months is advised to check the growth of dominant species and ruderal species. Management of these areas may have to be adapted to allow for less dominant species to predominate.

14.4.3 No fertilisers will be used as this enriches the soil nutrients, allowing grasses to easily outcompete wildflowers. Similarly, the use of chemical pesticides will be avoided as wildflowers are more susceptible than grasses and weeds. Spot-treatment of noxious weeds will be allowed due to their localised nature.

Table 15-3: Proposed maintenance of flower rich other neutral grassland

Maintenance Operation	Detail
Inspection for Litter	Before work commences, all areas shall be inspected for litter, and all debris removed off Site in accordance with paragraphs 6.3.10 and 6.3.11 above.
~~Maintenance topping~~	~~Top emerging flowers and weeds at least 3 times in year 1 for spring sowings and at least twice in year 2 for late summer / autumn sowings. Regular topping prevents weeds smothering the slow-growing flowers so that all sown species establish successfully, and toppings can be left.~~
Maintenance cuts or grazing	In order to ensure successful sward establishment, multiple cuts and removal of arising will occur in the first year in order to help the grasses to tiller and to create open, well-lit conditions for seedling establishment. Following the first year, a later hay cut will be undertaken (late August or September) with cuttings removed. Alternatively, appropriate low-density livestock through the summer to maintain a short sward will be undertaken. The area should not be cut or managed between July and middle of August to give the sown species the opportunity to flower, and to avoid nesting birds. The area should not be cut or disturbed between October and March to prevent disturbance to wintering birds.

Maintenance Operation	Detail
	Once flowering is complete the hay cut can commence to around 50 mm height. The hay should be left to dry and shed seed for 1 – 7 days and then removed. ~~Following sowing, cut or graze with sheep late each summer (August onwards) with no cutting or grazing between 1 May and 31 July, so that the majority of flowers are open and available for pollinators.~~ ~~Mob grazing with a low number of stock for a few days and moving stock regularly throughout the growing season would still allow plants to flower and may be more commercially viable.~~ ~~If grazing is not possible mow each year in late July after birds have fledged and remove arisings.~~
Resow Failed Areas	Any patches of grassland which have not successfully germinated 6-8 weeks after sowing will be resown. This may by necessity be in the subsequent seeding season. Reinstate areas as required ensuring seed matches existing in species composition and quality.

15 ~~Wet~~ Flower-rich neutral ~~-~~grassland with scrapes

15.1.1 The grassland mixture outlined in the table below will be sown in locations as presented indicatively in **Appendix D - Indicative Environmental Masterplan**. within the Biodiversity Mitigation and Enhancement Areas.

Table 16-1: Proposed species for flower-rich neutral ~~wet~~ grassland with scrapes

Wildflowers	
Latin name	**Common name**
Achillea millefolium	Yarrow
Agrimonia eupatoria	Agrimony
Angelica sylvestris	Wild Angelica
Betonica officinalis	Betony
Centaurea nigra	Common Knapweed
Filipendula ularia	Meadowsweet
Galium album	Hedge Bedstraw
Galium verum	Lady's Bedstraw
Lathyrus pratensis	Meadow Vetchling
Leontodon hispidus	Rough Hawkbit
Leucanthemum vulgare	Oxeye Daisy
Lotus corniculatus	Bird's-foot Trefoil
Lotus pedunculatus	Greater Bird's-foot Trefoil
Medicago lupulina	Black Medick
Plantago lanceolata	Ribwort Plantain
Primula veris	Cowslip
Prunella vulgaris	Selfheal
Ranunculus acris	Meadow Buttercup
Rhinanthus minor	Yellow Rattle
Rumex acetosa	Common Sorrel
Sanguisorba officinalis	Great Burnet
Silene flos-cuculi	Ragged Robin
Taraxacum officinale	Dandelion
Vicia cracca	Tufted Vetch
Grasses	
Latin name	**Common name**
Agrostis capillaris	Common Bent
Anthoxanthum odoratum	Sweet Vernal-grass
Carex divulsa subsp. divulsa	Grey Sedge
Cynosurus cristatus	Crested Dogstail
Deschampsia cespitosa	Tufted Hair-grass
Festuca rubra	Red Fescue

Hordeum secalinum	Meadow Barley
Phleum bertolonii	Smaller Cat's-tail
Poa trivialis	Rough-stalked Meadow-grass
Schedonorus arundinaceus	Tall Fescue

15.2 Management objective for flower rich neutral ~~wet~~ grassland with scrapes

15.2.1 The scrapes will be fed by rainfall and winter flooding and will remain wetter for longer than the surrounding grassland and dry gradually during spring and early summer. ~~As indicated earlier if hydrological studies indicate scrapes will not hold water for a sufficient period of time (late Autumn into the spring), which is considered unlikely in the low-lying environment, then mitigation would be altered to provide additional flower rich neutral grassland for wintering lapwing and golden plover.~~

15.2.2 These are primarily areas set aside for wintering birds within Mitigation Areas 11 (Field E6) and 13 (Fields E13/14), however as the scrapes are likely to be dry during the spring and summer they also provide suitable habitat for ground nesting birds such as syklark.

15.2.3 The areas of flower-rich neutral grassland with scrapes will be managed with the aim of achieving no net loss of mallard, teal, golden plover, lapwing and black-headed gull across the Site, compared to the species populations recorded during the baseline surveys. The no net loss target will take into consideration national trends as a limit of acceptable change.

15.2.4 All areas of flower-rich neutral grassland with scrapes will be managed with the aim of achieving no net loss of ground nesting birds across the Site, compared to the species populations recorded during the base line surveys and increasing the local carrying capacity to 0.56 skylark territories per ha. The no net loss target will take into consideration national trends as a limit of acceptable change.

15.2.5 Management of these areas will be undertaken between late August and September to avoid the peak nesting bird season and wintering bird season.

Monitoring will ensure the above objectives are being met.

~~15.2.1~~15.2.6

15.3 Implementation of flower-rich neutral ~~wet~~ grassland with scrapes

Table 16-2: Proposed implementation of flower-rich neutral ~~wet~~ grassland with scrapes

Implementation	Method
Good preparation for the seed mixes is essential to successful establishment.	
Vegetation Clearance	Before planting, ensure that the ground is free of vegetation and weeds. All weeds will be removed from the area using repeated cultivation, then ploughed or dug to bury the surface vegetation.
Ground Preparation	Ground preparation will take place in September-October or March-April when ground temperature is above 14ºC. Topsoil shall be cultivated to 300mm depth with a rotovator and then harrowed or raked to produce a medium tilth and rolled to leave a firm level surface.
Scrape Creation	Scrapes will be created prior to seeding of the surrounding area. The scrape itself will not be seeded. The scrapes will be a minimum of 20m^2 in area with an irregular shape and maximum depth of 45 centimetres. The topsoil will be removed to a maximum depth of 60 centimetres and the subsoil compacted to improve water retention. A layer of topsoil approximately 15cm deep will be placed back over the compacted subsoil. The remaining excavated soil will be either spread thinly across the rest of the field or appropriately positioned around the scrape to further retain water. The edges of the scrapes will be of a shallow gradient, to increase the area of muddy edge that will be exposed as the spring progresses and the water level drops. Scrapes will be allowed to naturally fill with water over the winter.
Seeding	If fields are not already grassland, they will be sown to a moderately diverse other neutral grassland using a Emorsgate EM8 (or similar). Seeding will take place in September-October or March-June when ground temperature is above 14ºC. The seed will be surface sown, either by hand or using a machine and then firmed using a roller. Sowing to be in accordance with suppliers' recommendations. For flower-rich neutral ~~species rich wet~~ grassland in frequently/seasonably wet soils, sow when ground is at its driest to allow plants to mature enough to withstand flooding. After sowing the surface will be lightly raked or harrowed to settle the seed in and rolled. People and livestock should be kept off the seeded areas until it has germinated.

Implementation	Method
~~Scrape Creation~~	~~Once wet meadow vegetation has been sown, during spring or early summer excavate scrapes with appropriate excavator.~~ ~~Depth a maximum depth of 45 centimetres. The edges of the scrapes should be of a shallow gradient, to increase the area of muddy edge that will be exposed as the spring progresses and the water level drops.~~ ~~Allow to naturally fill with water over the winter.~~

15.4 Maintenance operations for ~~wet~~flower-rich neutral grassland with scrapes

15.4.1 All operations shall be carried out using machinery appropriate to the task, cylinder, rotary or mulch mowers and when weather and ground conditions are suitable. Operations shall be suspended where conditions prevent the use of machinery without damage to the ground surface. Where operations are suspended due to unsuitable conditions, additional maintenance visits may be required in order to maintain the sward within acceptable growth limits.

15.4.2 Inspection every three months is advised to check the growth of dominant species and ruderal species. Management of these areas may have to be adapted to allow for less dominant species to predominate.

15.4.3 No fertilisers will be used as this enriches the soil nutrients, allowing grasses to easily outcompete wildflowers. Similarly, the use of chemical pesticides will be avoided as wildflowers are more susceptible than grasses and weeds. Spot-treatment of noxious weeds will be allowed due to its localised nature.

Table 16-3: Proposed maintenance of ~~wet~~ flower rich neutral grassland with scrapes

Maintenance Operation	Detail
Inspection for Litter	Before work commences, all areas shall be inspected for litter, and all debris removed off Site in accordance with paragraphs 6.3.10 and 6.3.11 above.
Maintenance cuts	To ensure successful sward establishment, multiple cuts and removal of arising will occur in the first year in order to help the grasses to tiller and to create open, well-lit conditions for seedling establishment.

Maintenance Operation	Detail
	Following the first year, a later hay cut will be undertaken (late August or September) with cuttings removed. Alternatively, appropriate low-density livestock through the summer to maintain a short sward will be undertaken. The area should not be cut or managed between July and middle of August to give the sown species the opportunity to flower, and to avoid nesting birds. Once flowering is complete the hay cut can commence to around 50 mm height. The hay should be left to dry and shed seed for 1 – 7 days and then removed. ~~Within the second year and subsequent years the area can be managed through traditional meadow management.~~ ~~This will include a Summer hay cut in combination with September and Spring mowing.~~ ~~The area should not be cut or managed between July and August to give the sown species the opportunity to flower, and to avoid nesting birds.~~ ~~Once flowering is complete the hay cut can commence to around 50 mm height. The hay should be left to dry and shed seed for 1 – 7 days and then removed.~~ ~~Re-growth can be mown or grazed in late Autumn/Winter, if needed, to maintain the 50 mm length and maintain the short sward through the winter months~~.
Spot treat invasive non-native species as necessary	Within the first year the area should not be weeded and instead left to establish. After the first-year thistle, dock and ragweed will be dug out during the growing season.
Water to maintain healthy growth and successful establishment	Newly seeded areas will be watered as necessary during the first 2-3 months to ensure germination and establishment. Once established watering may need to be carried out during periods of drought.

Maintenance Operation	Detail
Resow Failed Areas	Any patches of grassland which have not successfully germinated 6-8 weeks after sowing will be resown. This may by necessity be in the subsequent seeding season. Ensure seed matches existing in species composition and quality. Establishment on areas prone to flooding may be patchy and take several years to become fully colonised. Re-seed when and where appropriate.
Scrape maintenance	To keep the edges of scrapes open, with no build-up of rushes or rank grassland, it may occasionally be required to cut the vegetated edges. The vegetated edges should be cut no lower than 150mm from ground level using hand tools, if grazing is not possible. Scrapes tend to re-vegetate and in-fill over a period of years. The surface of scrapes will be disturbed every two years or within a shorter period if deemed appropriate, in order to prevent over-vegetation. This will be achieved through use of rotovating or discing machinery, with an open/even finish in the margins. ~~Water levels will therefore be monitored and cattle may also be used outside the nesting bird season at some Sites to keep the scrapes open; if this is not possible vegetation will be cut to now lower than 150mm from ground level using hand tools and~~ Re-excavation will be considered every 10 to 15 years. ~~consideration given to occasional (every 10-15 years) re-excavation.~~ Management practises should be undertaken between late August and September ~~at the appropriate time of year such as early Autumn~~ to prevent disturbance to breeding and wintering birds. Water levels should be allowed to fluctuate as dictated by rainfall and winter flooding.

16 Community accessible land

16.1 Traditional orchards

16.1.1 The use of areas under consideration for community accessible land (see **Appendix D - Indicative Environmental Masterplan**) will be determined at the detailed design stage, but a traditional orchard is proposed, with a mosaic of habitats suited to the Site and the space available. The mosaic of habitats would be important to wildlife and would provide food, shelter and breeding sites for many different species. This area would be accessible to the public and would need to be kept relatively open both visually and physically to ensure it works as a safe space for users.

16.1.2 The traditional orchard would be managed by the Applicant and would include signs to make clear that its use is for the public by permission of the landowner. At the end of the Proposed Development's operation, the area would be returned to the landowner (as set out in the **Outline DEMP [EN010157/APP/7.4]**) in private ownership and the permitted public use would cease.

16.1.3 It is likely to contain elements of woodland, pasture and meadow grassland, ideally bordered by hedgerows, and sometimes contain small areas of scrub. Each individual habitat has value in its own right however, combined together within a traditional orchard setting creates a wildlife haven with a diverse range of plants and a mosaic of habitats that support a range of species on Site.

16.1.4 Apple and pear trees are the best of the orchard trees for humans and for wildlife. However, these combined with a variety of other fruiting trees such as cherries, greengages, quinces and plums would create a more interesting orchard mix for the local community, bringing back some of the forgotten varieties too, offering a good range of fruits to eat and to cook with.- -Where possible, local varieties of fruit trees will be sourced.

Management objective for orchards.

16.1.5 A well-managed established orchard has a mixture of tree ages. Young trees allow plenty of light to reach the grassland and older trees provide shelter and food further adding to the diversity of habitat available for nature. To achieve a varied range of sizes the following rootstock sizes could be considered when planted:

- Rootstock M106 More traditionally orchard size, making 12-14' and the same across. More tolerant of poorish soils.

- Rootstock M26 Is a good compromise between the genuinely dwarfing trees and the larger more vigorous. Growing 10' or so with the same spread.

16.1.6 As the traditional orchard would need to be accessible to the public, some of the habitats that make up a traditional woodland as described above, such as woodland and scrub, and some of the traditional management methods may need to be amended and adapted to suit the Site and its users.

16.1.7 The Community Liaison Group (established for the duration of the construction period as set out in the **Outline CEMP [EN010157/APP/7.2]**) would be consulted on the proposals for the traditional orchard and how it would be managed. Detail on the implementation and management of traditional orchards would be provided in the Landscape and Ecological Management Plan.

16.2 Outdoor classroom

16.2.1 An outdoor classroom located in the community accessible space would entail creation of a log-pile seating area and installation of an information board. Logs would be placed directly onto existing ground surface. The information board shall be on a ground-mounted frame; no supporting posts would be driven into the ground.

16.2.2 The Community Liaison Group (established for the duration of the construction period as set out in the **Outline CEMP [EN010157/APP/7.2]**) would be consulted on the proposals for the outdoor classroom and how it would be managed. Detail on the implementation and management of the outdoor classroom would be provided in the Landscape and Ecological Management Plan.

16.3 Permissive paths

16.3.1 The Proposed Development includes a series of new permissive paths to increase accessibility around the local area and link in with the existing network of public rights of way. This network of new permissive paths would also link in with the areas under consideration for community accessible land, as shown on **Appendix D - Indicative Environmental Masterplan**.

16.3.2 The creation of approximately 12.6km of new permissive paths would provide recreation and amenity benefits. The permissive paths proposed include:

- New permissive path, approximately 476m in length, creating a loop around Field B2, connecting to the existing Riston Footpath No. 2 at the north western and south western points of the field;

- New permissive path, approximately 306m in length, connecting Carr Lane to the existing Riston Footpath No. 2, along the north of Field B8;
- New permissive path circuit, approximately 9.6km in length, around a number of fields in Land Area D and providing a link to the existing Tickton Footpath No. 6. ~~This circuit includes a loop around Field D18 and Field E6, both of which have been set aside for ecological enhancement.~~ The circuit of permissive paths within Land Areas D and E will be made available for horse riding;
- New permissive path, approximately 2.1km in length, running along the eastern boundary of Field F6~~, through the area set aside for ecological enhancement in F9, F10 and F14,~~ connecting with the existing Wawne Footpath No. 1 to the south of Field F16; and
- New permissive path, approximately 290m in length, running along the eastern boundary of Field C8.

16.3.3 The surfacing and waymarking of permissive paths is yet to be determined, but the Applicant would explore options in consultation with the Community Liaison Group to enable accessibility of permissive paths for a variety of users. Further details would be provided in the Landscape and Ecological Management Plan.

17 Enhancement, monitoring and mink control

17.1.1 The Site is assumed to support a population of water vole (*Arvicola amphibius*). The Environmental Statement has not identified any direct impact on water voles, but the scoping response from the Environment Agency, has suggested that monitoring and control of mink (*Neovison vison*) would allow enhancement to the water vole population. Further details are provided within the **Consultation Report appendices [EN010157/APP/5.2]**. Prior to starting the mink control, the Applicant will attempt to consult with the Yorkshire Wildlife Trust to discuss whether the mink control measures within the Land Areas can be coordinated alongside existing mink control projects within the wider catchment.

17.1.2 Mink control will consider methods undertaken by on-going mink control projects such as the Waterlife Recovery Trust mink project and use similar methods if appropriate. Measures may include ~~S~~surveys and trapping using humane specific traps for American mink, ~~(*Neovison vison*) will be~~ undertaken on each suitable watercourse within the Land Areas for the first three years of operation. Any caught mink will be humanely dispatched and information on the caught mink will be sent to the Yorkshire Wildlife Trust. The surveys and trapping will be undertaken by a specialist contractor. Mink control would provide a beneficial long-term impact on many native species in particular water voles.

17.1.3 Note: monitoring and control will be limited to the area within the Order Limits, as areas outside of the Order Limits are not within the control of the Applicant. The Applicant is responsible for ensuring the mink monitoring and trapping is undertaken for the first three years of operation.

18 Proposed habitat features

18.1 Bat boxes

18.1.1 Bat boxes will be installed on suitable retained trees across the Site. This will comprise of 25 boxes using a mixture of Schwegler 2F bat boxes, Schwegler 1FF boxes and pole mounted eco-rocked boxes or similar (see **Appendix B**).

18.2 Installation of bat boxes

18.2.1 Twenty of the twenty five proposed bat boxes will be installed on retained trees, suitable for supporting them, at a height of 3 – 6m. The boxes will need to be installed using a strong aluminium nail of at least 85mm in length. Boxes should be installed on the southern side of the trees, wherever possible, within an open, sunny position. The remaining five bat boxes are pole mounted and should be positioned away from shading, ideally south facing.

18.2.2 The installation of the bat boxes is the responsibility of the Principal Contractor. The monitoring (stated within Table **19-1**) and if required the relocation of the bat boxes is the responsibility of the Applicant.

18.3 Maintenance operations for bat boxes

Table 19-1: Proposed maintenance of bat boxes

Maintenance Operation	Detail
Confirmation of Use	To monitor the efficacy of the bat box installations, it is proposed that bat boxes are monitored during late spring or summer by a bat licenced ecologist annually within the first five years of the Proposed Development to confirm use.
Relocation (if required)	If during the monitoring visits there is no evidence of use by roosting bats, then it is recommended that the location and position of the boxes be re-evaluated, with alternative locations considered.

18.4 Bird boxes

18.4.1 30 bird boxes will be installed on retained trees and within retained woodland. Suitable boxes should be used such as Schwegler 1B bird boxes or similar. In

addition to standard boxes, barn owl boxes should also be installed in order to enhance the Site's opportunities for barn owl (see **Appendix B**).

18.5 Installation of bird boxes

18.5.1 The bird and boxes should be installed at a height of around 3m, in a location out of direct sunlight and in an area of little disturbance. Boxes should be installed with a strong aluminium nail.

18.5.2 Barn owl boxes should be installed at a height of at least 4m, on trees which have an open, countryside, outlook, and close to rough grassland (suitable foraging habitat).

18.5.3 The installation of the bird boxes is the responsibility of the Principal Contractor. The monitoring (stated within **Table 19-2**) and if required the relocation of the bird boxes is the responsibility of the Applicant.

18.6 Maintenance operations for bird boxes

Table 19-2: Proposed maintenance of bird boxes

Maintenance Operation	Detail
Confirmation of Use	To monitor the efficacy of the bird box installations, it is proposed that bird boxes are monitored during late spring or summer by a suitably experienced ecologist or ornithologist annually within the first five years of the Proposed Development to confirm use. Barn owl boxes will need to be checked by a licensed ecologist. To monitor the efficacy of the areas set aside for ground nesting birds, regular monitoring during the operation (including maintenance) phase will occur
Relocation (if required)	Should the bird boxes not have evidence of use by nesting birds after this time, it is recommended that the location of the bird boxes be re-evaluated, and alternative locations be considered.

19 Management plan review and monitoring

19.1 Management plan review

19.1.1 It is proposed that the landscape works will be reviewed at the end of the first 12 months of construction, at the end of the initial five-year aftercare period and then at 10-year intervals during the 40-year operational life of the Proposed Development. The regular habitat reviews will ensure they are still fit for purpose and ensure the BNG commitments are delivered by year 30.

19.1.2 It is anticipated that following the review, any problems or changes that are impacting on the landscape will be accommodated with the agreement of East Riding of Yorkshire Council.

~~19.1.2~~19.1.3 Monitoring results with regards mitigation for wintering bird species will be provided to Natural England. The monitoring methodology is set out below.

19.2 General monitoring

19.2.1 A post-construction monitoring programme will be formalised and agreed as part of the DCO Application and included within the Landscape and Ecological Management Plan. This will include validating the BNG to check the anticipated biodiversity net gain is achieved, in line with **Appendix D - Indicative Environmental Masterplan**. and **ES Volume 4, Appendix 7.10: Biodiversity Net Gain Assessment [EN010157/APP/6.4].** Walkover surveys of the Order Limits will be undertaken between April and June in years 2, 4, 6, 10 and every 5 years post-construction until year 40. The surveys will involve an inspection of the hedgerows, field margins, tree planting and biodiversity mitigation and enhancement areas to ensure that they are being managed accordingly.

19.2.2 Post construction monitoring for birds and bats will be undertaken as outlined within **Table 20-1**.

Monitoring of planting

19.2.3 To ensure reasonable establishment of the newly planted areas within the Order Limits, the areas should be assessed biannually and be maintained for a 5-year period following the completion of the proposed works.

19.2.4 Any areas of newly seeded wildflower meadow, hedgerows, or individual trees found to be damaged, diseased, or dying with in the initial 5-year period will be replaced with like for like planting within the next suitable planting period.

19.2.5 The replacement with like for like planting may be revised if the species of concern are regarded as unsuccessful or commercially unavailable. If such an instance does occur, the species will be replaced with more successful (consultation with a suitably qualified ecologist may be required to determine a suitable replacement species) or readily available species.

19.3 Biodiversity mitigation and enhancement areas monitoring

19.3.1 This section outlines an indicative monitoring strategy and indicative monitoring programme. The final monitoring requirements and programme will be detailed within the Landscape and Ecological Management Plan.

19.3.2 The final monitoring plan will ensure that there are:

- Clear objectives for each element of habitat creation and enhancement outlined above.
- Target/s for each objective, including SPA/Ramsar site bird use targets and habitat targets.
- Details of required management and monitoring (including who is responsible and when it will take place).
- Details of limits of acceptable change.
- Details of remedial actions, where appropriate.

19.3.3 The monitoring of habitat creation mitigation measures will need to include the following:

- Ensure all created habitats meet the habitat condition criteria (as defined by Defra within the guidance for the statutory metric) for the operation (including maintenance) phase (i.e. what condition we have assumed each of the created habitats will achieve). If condition is not on the trajectory to achieve the correct condition, then instigate remedial management.
- Following habitat re-instatement within Figham Pastures LWS, vegetation would be monitored against the National Vegetation Classification baseline to ensure regrowth is comparable with the baseline and that no injurious weeds such as thistles or docks

establish. If injurious weeds become dominant or tufts do not establish, then remedial management would be put in place.

- Ensure the scrapes and grassland created for SPA/Ramsar site bird species meet the design specifications specified in the Landscape and Ecological Management Plan, and if not implement remedial measures to correct.
- Ensure scrapes hold water at least for part of the winter as expected given weather and any flooding.~~, and if hydrological studies indicate scrapes will not hold water consider creating just grassland or arable stubble as foraging for wintering Lapwing and Golden Plover.~~
- Monitor ~~to see if~~Mitigation Areas 9, 11 and 13 and the ditch and dyke network, to confirm whether there is no net loss of SPA/Ramsar site bird species across the Site compared to species population recorded during the baseline surveys. ~~are using the mitigation areas provided, and if duck species are still using the ditch and dyke network.~~The no net loss target will take into consideration national trends as a limit of acceptable change. If the number of birds fall below the baseline conditions when taking into consideration national trends, the Applicant should ensure habitat management is providing the right habitat and conditions as outlined in the Landscape and Ecological Management Plan.
- Monitor sward height of Mitigation Areas 9, 11 and 13 to ensure short sward (up to 25cm) during the winter months.
- Monitor the breeding bird population within the areas set aside for mitigation to identify whether the Proposed Development is maintaining no net loss of breeding bird populations recorded during the baseline surveys and increasing the local carrying capacity to 0.56 skylark territories per ha. ~~a similar diversity of species with a similar number of breeding pairs during the operation (including maintenance) phase as was present during baseline surveys.~~ If the number of birds fall below ~~s well short of~~ the baseline conditions when taking into consideration national trends, the Applicant should ensure habitat management is providing the right habitat and conditions as outlined in the Landscape and Ecological Management Plan. If long sward height considered to be a contributing factor in any loss of breeding bird capacity mow a number of 25m^2 squares in early March (ground conditions permitting) to provide short sward (less than 25cm) at the start of the ground nesting bird breeding season.
- To inform the evidence base for the assessment of future schemes a monitoring programme during the operational phase will look to see if

the flight activity of birds, for example large flocks of wildfowl, appear to alter flight lines or other indicators that glint and glare from the panels appears to be disturbing or otherwise affecting them. This work could also ascertain if large flocks of waterfowl attempt to land within the solar farm having mistaken panels for a large body of water.

19.3.4 It is suggested that the monitoring programme is front loaded to cover the implementation and development phase of habitats and then repeated at regular intervals during the 40 year operational life of the Proposed Development. An indicative programme is given below.

Table 20-1: Indicative monitoring programme

Monitoring activity	Interval and time of year
Undertake a Site visit to ensure scrapes and grassland created for wintering SPA/Ramsar site species meets design criteria set out in Landscape and Ecological Management Plan.	Undertake in the autumn (August – September) before onset of winter to allow for any remedial works before winter (November to March). Once a year for years 1 to 3 and then at 5 yearly intervals subsequently until end of operation (including maintenance) phase.
Undertake wintering bird survey to ascertain if SPA/Ramsar site bird species using mitigation areas described above and over the wider solar farm. Survey results will be compared against the populations recorded during the baseline surveys to assess the effectiveness of the mitigation areas. Target of no net loss of mallard, teal, golden plover, lapwing and black-headed gull taking into consideration national trends as a limit of acceptable change.	Undertake 4 visits (once a month) Nov–March to survey the scrapes and grassland created for SPA/Ramsar site birds and to include the wider solar farm in particular the drains used by mallard and teal and also to see if the areas set aside for ground nesting birds are used by wintering lapwing and golden plover. Once a year for years 1 to 3 and then at 5 yearly intervals subsequently.
Monitor habitat condition of the areas set aside for ground nesting birds to ascertain if created habitat within areas on target to meet the required condition and monitoring establishment against condition criteria.	Botanical survey during the period May–July to ensure habitat condition criteria are being met. Once a year for years 1 to 5 and then at 5 yearly intervals subsequently up to year 30.
Monitor habitat condition of habitat under solar panels and margins to ascertain if created habitat within areas is on target to meet the required	Botanical survey during the period May–July to ensure habitat condition criteria are being met.

Monitoring activity	Interval and time of year
condition and monitoring establishment against condition criteria.	Once a year for years 1 to 5 and then at 5 yearly intervals subsequently up to year 30.
Monitor if glint and glare causing change in bird flight behaviour or any evidence of waterfowl landing within panel areas.	Include within monitoring set out for SPA/Ramsar site bird species above.
Bat activity survey – repeating the static detector survey to ascertain if bat activity levels change between pre-operation and operational stages.	Bat activity using static detectors. Survey one deployment in the Spring/Summer and Autumn. Deployed for 5 consecutive nights within the same or close to the monitoring point locations used during the 2023 and 2024 bat static surveys. Surveys will be undertaken once a year for years 1 to 5 and then at year 10 and 15.
Monitor habitat re-instatement within Figham Pastures LWS against the National Vegetation Classification baseline.	Site visits will compile of one survey per year during years 1, 2 and 3 after construction works within Figham Pastures LWS. The survey will be undertaken during the period May to July to ensure habitat condition criteria are being met.
Monitor effectiveness of ground nesting bird mitigation	Areas set aside for ground nesting birds will be monitored by repeating the breeding bird survey at set intervals (year 1, year 3 and year 5) to assess if ground nesting birds have used the areas set aside. Survey results will be compared against the breeding bird populations recorded during the baseline surveys to assess the effectiveness of the mitigation areas. Target of no net loss of species populations recorded during the baseline surveys and increasing the local carrying capacity to 0.56 skylark territories per ha. The no net loss target will the into consideration national trends as a limit of acceptable change.

~~19.3.5 As above the Biodiversity Mitigation Areas and Enhancement Areas will be monitored during the operation (including maintenance) phase to ensure that they meet or are considered to be progressing towards the habitat condition outlined in the BNG assessment. Areas set aside for ground nesting birds will be monitored by repeating the breeding bird survey at set intervals (year 1, year 3 and year 5) to assess if ground nesting birds have used the areas set aside. Survey results will be compared against the breeding bird populations recorded~~

~~during the baseline surveys to assess the effectiveness of the mitigation areas. Target of no net loss of species populations recorded during the baseline surveys and increasing the local carrying capacity to 0.56 skylark territories per ha. The no net loss target will the into consideration national trends as a limit of acceptable change.~~

19.3.5 The results of SPA/Ramsar habitat and species monitoring surveys including glint and glare will be provided to Natural England and other relevant bodies which will be confirmed within the Landscape and Ecological Management Plan.

19.3.6 The results of the breeding bird monitoring, non-SPA/Ramsar habitat monitoring and bat monitoring surveys will be provided to the East Riding Yorkshire Council and other relevant bodies which will be confirmed within the Landscape and Ecological Management Plan.

Appendix A: Annual maintenance schedule

Maintenance Operation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
General Maintenance												
Litter Removal												
Tidy up areas removing rubbish, litter etc. from planted, grass and hard surface areas	•	•	•	•	•	•	•	•	•	•	•	•
Review of Management Plan												
Monitoring and reporting by Landscape Manager	•	•	•	•	•	•	•	•	•	•	•	•
Annual review of Management Plan												•
Retained Landscape												
Retained Trees and Hedgerows												
Visual inspection of all retained trees and hedgerows and recommendations for any remedial works.	Regular inspection by qualified Arborist to advise on any essential works such as limb reduction, removal or crown reduction. Arborist to advise on timing of inspection and frequency of subsequent inspections.											
Trees works as directed to BS.3998 [**Ref. 1-25**], including cutting/pruning, crown reduction, shaping, lifting and thinning	•	•								•	•	•
Management of dead/dying/diseased Trees	•	•								•	•	•
Hedgerow works (inspection for protected species)	•	•								•	•	•

Maintenance Operation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Existing hedgerow trimmed to desired height	•	•								•	•	•
Individual Tree Planting												
Monitor and treat pests and diseases including removal of dead, dying and diseased material	•	•	•	•	•	•	•	•	•	•	•	•
Monitoring and pruning/ remedial surgery (Remove any branches that overhang footpaths, obscure visibility splays, or prevent access for grass cutting)							•	•	•			
Monitor, adjust and replace stakes, ties, guards/fence		•		•		•		•		•		•
Check plant material is firmly planted and firm in as required	•	•	•	•	•	•	•	•	•	•	•	•
Water to maintain healthy growth and successful establishment				•	•	•	•	•	•			
1m diameter weed free area to be maintained around each tree				•		•			•			•
Remove any weed growth from shelter guards				•		•			•			•
Apply fertiliser				•								
Replacement tree planting	•	•									•	•
Remove stakes/ties when ready	•	•	•	•	•	•	•	•	•	•	•	•
Tree works including crown reducing,	•	•									•	•

Maintenance Operation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
crown lifting, crown thinning												
Woodland Planting												
Monitor and treat pests and diseases including removal of dead, dying and diseased material	•	•	•	•	•	•	•	•	•	•	•	•
Monitoring and pruning/ remedial surgery							•	•	•			
Monitor, adjust and replace stakes, ties, guards/fence		•		•		•		•		•		•
Check plant material is firmly planted and firm in as required	•	•	•	•	•	•	•	•	•	•	•	•
Water to maintain healthy growth and successful establishment				•	•	•	•	•	•			
1m diameter weed free area to be maintained around each plant				•		•			•			•
Spot treat invasive non-native species as necessary				•		•		•				
Remove any weed growth from shelter guards				•		•			•			•
Apply fertiliser				•								
Replacement whip/transplant planting	•	•									•	•
Remove stakes/ties when ready	•	•	•	•	•	•	•	•	•	•	•	•
Tree works including crown reducing, crown lifting, crown thinning	•	•								•	•	•

Maintenance Operation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Woodland coppicing/thinning	•	•									•	•
Scrub Planting												
Monitor and treat pests and diseases including removal of dead, dying and diseased material	•	•	•	•	•	•	•	•	•	•	•	•
Monitoring and pruning/ remedial surgery						•	•	•				
Monitor, adjust and replace stakes, ties, guards/fence		•		•		•		•		•		•
Check plant material is firmly planted and firm in as required	•	•	•	•	•	•	•	•	•	•	•	•
Water to maintain healthy growth and successful establishment				•	•	•	•	•	•			
1m diameter weed free area to be maintained around each plant				•		•			•			•
Spot treat invasive non-native species as necessary				•		•		•				
Remove any weed growth from shelter guards				•		•			•			•
Apply fertiliser				•								
Replacement whip/transplant planting	•	•									•	•
Remove stakes/guards when ready	•	•	•	•	•	•	•	•	•	•	•	•
Native Hedge Planting												
Monitor and treat pests and diseases including removal of	•	•	•	•	•	•	•	•	•	•	•	•

Maintenance Operation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
dead, dying and diseased material												
Monitoring and pruning/ remedial surgery						•	•	•				
Monitor, adjust and replace stakes, ties, guards/fence		•		•		•		•		•		•
Check plant material is firmly planted and firm in as required	•	•	•	•	•	•	•	•	•	•	•	•
Water to maintain healthy growth and successful establishment				•	•	•	•	•	•			
1m diameter weed free area to be maintained around each plant				•		•			•			•
Spot treat invasive non-native species as necessary				•		•		•				
Remove any weed growth from shelter guards				•		•			•			•
Apply fertiliser				•								
Replacement whip/transplant planting	•	•									•	•
Remove stakes/guys when ready	•	•	•	•	•	•	•	•	•	•	•	•
Clipping of Hedgerow					•					•		
Legume Rich Neutral Grassland												
Water to maintain healthy growth and successful establishment				•	•	•	•	•	•			
Maintenance cuts			•	•				•	•			
Weed Control				•	•	•	•	•	•			

Maintenance Operation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Resow Failed Areas			●	●	●	●	●	●				
Field Margin – Wild Bird Winter Seed Mix												
Re-establishment of Field Margin – Wild Bird Cropland			●	●	●	●	●	●				
Resow Failed Areas			●	●	●	●	●	●				
Flower Rich Neutral Grassland												
~~Maintenance topping~~				●	●	●						
Maintenance cuts			●	●				●	●			
Resow Failed Areas			●	●	●	●	●	●				
~~**Wet Grassland with Scrapes**~~ **Flower-Rich Neutral Grassland with Scrapes**												
Maintenance cuts			●			●		●	●		●	
Spot treat invasive nonnative species as necessary				●		●		●				
Water to maintain healthy growth and successful establishment				●	●	●	●	●	●			
Resow Failed Areas			●	●	●	●	●	●				
Scrape maintenance			●			●		●	●		●	
Proposed Habitat Features												
Bird Boxes												
Confirmation of Use					●	●						
Relocation (if required)					●	●						
Bat Boxes												
Confirmation of Use					●	●						
Relocation (if required)					●	●						

Appendix B: Bat and bird box locations

Enhancement	Location – land area	Approx grid reference	Environmental Masterplan Reference
Schwegler 1FF bat box	Line of trees between B3 & B4.	TA 10668 43132	B1
Schwegler 2F bat box	Line of trees between B3 & B4.	TA 10794 43118	B2
Schwegler 1FF bat box	Line of trees between B3 & B4.	TA 10906 43187	B3
Schwegler 1FF bat box	North west corner of C7.	TA 10323 39815	B4
Schwegler 1FF	Southern edge of Little Decoy Wood between D16 and D17.	TA 08970 40705	B5
Schwegler 1FF bat box	Southern edge of Little Decoy Wood between D16 and D17.	TA 08924 40705	B6
Schwegler 1FF bat box	Southern edge of Little Decoy Wood between D16 and D17.	TA 08886 40705	B7
Schwegler 1FF bat box	Southern edge of Little Decoy Wood between D16 and D17.	TA 08851 40705	B8
Schwegler 1FF bat box	Southern edge of Little Decoy Wood between D16 and D17.	TA 08819 40705	B9
Schwegler 2F bat box	Woodland strip along the western boundary of D15.	TA 08375 40671	B10
Schwegler 1FF bat box	Woodland strip along the northern boundary of E3.	TA 08144 40860	B11

Enhancement	Location – land area	Approx grid reference	Environmental Masterplan Reference
Schwegler 2F bat box	Woodland strip along the northern boundary of E4.	TA 07977 40850	B12
Schwegler 2F bat box	Woodland strip along the northern boundary of E5.	TA 07751 40789	B13
Schwegler 2F bat box	Eastern boundary of E11.	TA 08425 39860	B14
Schwegler 2F bat box	Eastern boundary of E11.	TA 08354 39756	B15
Schwegler 1FF bat box	Northern boundary of F9.	TA 09405 38675	B16
Schwegler 2F bat box	Hedgerow with scattered trees between F8 and F14.	TA 09045 38367	B17
Schwegler 1FF bat box	Hedgerow with scattered trees between F14 and F15.	TA 09392 38233	B18
Schwegler 1FF bat box	Western boundary of F17.	TA 09468 38010	B19
Schwegler 1FF bat box	Eastern boundary of F17.	TA 09615 37884	B20
Schwegler 1B bird box	Woodland within the northern end B1.	TA 10662 43655	BD1
Schwegler 1B bird box	Woodland within the northern end B1.	TA 10638 43653	BD2
Schwegler 1B bird box	Woodland within the northern end B1.	TA 10613 43665	BD3
Schwegler 1B bird box	Woodland within the northern end B1.	TA 10583 43670	BD4
Schwegler 1B bird box	Line of trees between B3 & B4.	TA 10668 43132	BD5
Schwegler 1B bird box	Line of trees between B3 & B4.	TA 10722 43133	BD6
Schwegler 1B bird box	Line of trees between B3 & B4	TA 10787 43129	BD7
Schwegler 1B bird box	Line of trees between B3 & B4.	TA 10851 43133	BD8
Schwegler 1B bird box	Line of trees between B8 & C1.	TA 10908 41743	BD9

Enhancement	Location – land area	Approx grid reference	Environmental Masterplan Reference
Schwegler 1B bird box	Line of trees between B8 & C1.	TA 10952 41745	BD10
Schwegler 1B bird box	Woodland within the northern end of D10.	TA 10093 41384	BD11
Schwegler 1B bird box	Woodland within the northern end of D10.	TA 10056 41367	BD12
Schwegler 1B bird box	Woodland within the northern end of D10.	TA 10020 41527	BD13
Schwegler 1B bird box	Woodland within the northern end of D10.	TA 10046 41495	BD14
Schwegler 1B bird box	Woodland within the south western corner of D10.	TA 09717 40709	BD15
Schwegler 1B bird box	Woodland within the south western corner of D10.	TA 09718 40684	BD16
Schwegler 1B bird box	Woodland within the south western corner of D10.	TA 09710 40738	BD17
Schwegler 1B bird box	Woodland along the southern boundary of C4.	TA 11244 40701	BD18
Schwegler 1B bird box	Woodland along the southern boundary of C4.	TA 11201 40681	BD19
Schwegler 1B bird box	Woodland along the eastern boundary of C4.	TA 11182 40723	BD20
Schwegler 1B bird box	Woodland along the eastern boundary of C4.	TA 11164 40778	BD21
Schwegler 1B bird box	Woodland within north western corner of C8.	TA 10866 40011	BD22
Schwegler 1B bird box	Woodland within north western corner of C8.	TA 10851 40021	BD23
Schwegler 1B bird box	Little Decoy Wood between D16 and D17.	TA 08992 40717	BD24

Enhancement	Location – land area	Approx grid reference	Environmental Masterplan Reference
Schwegler 1B bird box	Little Decoy Wood between D16 and D17.	TA 08952 40709	BD25
Schwegler 1B bird box	Little Decoy Wood between D16 and D17.	TA 08907 40733	BD26
Schwegler 1B bird box	Little Decoy Wood between D16 and D17.	TA 08840 40758	BD27
Schwegler 1B bird box	Woodland/scrub at the south western corner of F7.	TA 08850 38553	BD28
Schwegler 1B bird box	Woodland/scrub at the south western corner of F7.	TA 08808 38529	BD29
Schwegler 1B bird box	Woodland/scrub at the south western corner of F7.	TA 08870 38480	BD30
Barn Owl Nest Box – tree mounted	Tree between F8 and F14.	TA 09000 38351	BO1
Barn Owl Nest Box – pole mounted	Between Holderness Drain and F4.	TA 09163 39085	BO2
Barn Owl Nest Box – pole mounted	Adjacent to E9.	TA 08113 40150	BO3
Barn Owl Nest Box – tree mounted	Woodland edge near Little Decoy Far. South western corner of D16.	TA 08542 40622	BO4
Barn Owl Nest Box – tree mounted	Within D18.	TA 09524 40124	BO5
Barn Owl Nest Box – pole mounted	Between Monk Dike and C8.	TA 10724 39855	BO6
Barn Owl Nest Box – tree mounted	Tree line adjacent to B3 and Monk Dike.	TA 10668 43132	BO7
Barn Owl Nest Box – pole mounted	Within E17	TA 07293 39058	BO8
Kestrel box –tree mounted	Northern woodland edge between woodland and area F7.	TA 08901 38538	KB1
Kestel box – tree mounted	Northern boundary of F9/F10.	TA 09427 38674	KB2

Enhancement	Location – land area	Approx grid reference	Environmental Masterplan Reference
Kestel box – tree mounted	Western boundary of D18.	TA 09296 40282	KB3
Kestel box – tree mounted	Southern boundary of Little Decoy Wood. Adjacent to D16.	TA 08955 40701	KB4
Kestel box – tree mounted	Within B8.	TA 10849 42023	KB5
Eco Rocket Bat Box – pole mounted	Within E13.	TA 07011 39823	BD21
Eco Rocket Bat Box – pole mounted	WithinaE13.	TA 07008 39878	B22
Eco Rocket Bat Box – pole mounted	Within E13.	TA 06873 39877	B23
Eco Rocket Bat Box – pole mounted	Within area E6.	TA 07909 40560	B24
Eco Rocket Bat Box – pole mounted	Within area E6.	TA 08111 40495	B25
Tree Sparrow nest boxes	Adjacent to Carr House Farm and B4.	TA 10938 42354	TS1
Tree Sparrow nest box	Adjacent to Carr House Farm and B4.	TA 10954 42351	TS2
Starling nest box	Northern boundary of area E15.	TA 07105 39594	S1
Starling nest box	Northern boundary of area E15.	TA 07067 39589	S2
Tree Sparrow nest box	Woodland opposite Abbey Farm.	TA 09715 40671	TS3
Tree Sparrow nest box	Woodland opposite Abbey Farm.	TA 09724 40719	TS4
Starling nest box	Woodland opposite Abbey Farm.	TA 09705 40679	S3
Starling nest box	Woodland opposite Abbey Farm.	TA 09705 40673	S4
Tree Sparrow nest box	Woodland opposite Meaux Decoy Farm within D16.	TA 08550 40616	TS5
Tree Sparrow nest box	Woodland opposite Meaux Decoy Farm within D16.	TA 08567 40568	TS6
Starling nest box	Woodland opposite Meaux Decoy Farm within D16.	TA 08549 40668	S5

Enhancement	Location – land area	Approx grid reference	Environmental Masterplan Reference
Starling nest box	Woodland opposite Meaux Decoy Farm within D16.	TA 08534 40638	S6
Tree Sparrow nest box	Tree row/hedgerow close to Springdale Farm within E16	TA 07025 39100	TS7
Tree Sparrow nest box	Tree row/hedgerow close to Springdale Farm within E16.	TA 07025 39070	TS8
Starling nest box	Tree row/hedgerow close to Springdale Farm within E16.	TA 07023 39123	S7
Starling nest box	Tree row/hedgerow close to Springdale Farm within E16.	TA 07026 39087	S8
Tree Sparrow nest box	Tree line opposite Wawne Grange, adjacent to F9/F10.	TA 09405 38675	TS9
Tree Sparrow nest box	Tree line opposite Wawne Grange, adjacent to F9/F10.	TA 09453 38675	TS10
Starling nest box	Tree line opposite Wawne Grange, adjacent to F9/F10.	TA 09397 38675	S9
Starling nest box	Tree line opposite Wawne Grange, adjacent to F9/F10.	TA 09441 38674	S10

Appendix C: 40 year landscape maintenance programme

Refer to **Appendix A** for timing/frequency of maintenance operations
The maintenance operations beyond year 30 are subject to review as outlined within **Section 1.1.5**.

Maintenance Operation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-20	Year 21-30	Year 31-40
General Maintenance													*
Litter Removal													
Tidy up areas removing rubbish, litter etc. from planted, grass and hard surface areas	•	•	•	•	•	•	•	•	•	•	•	•	
Review of Management													
Monitoring and reporting by Landscape Manager	•	•	•	•	•	•	•	•	•	•	•	•	
Annual review of management plan	•	•	•	•	•	•	•	•	•	•	•	•	
Retained Landscape													
Retained Trees and Hedgerows													
Visual inspection of all retained trees and hedgerows and recommendations for any remedial works.	•	Regular inspection by qualified Arborist to advise on any essential works such as limb reduction, removal or crown reduction. Arborist to advise on timing of inspection and frequency of subsequent inspections.											
Trees works as directed to BS.3998 **[Ref. 1-25]**, including cutting/pruning, crown reduction,	•												

Maintenance Operation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-20	Year 21-30	Year 31-40
shaping, lifting and thinning													
Management of dead/dying/ diseased trees	•	•	•	•	•	•	•	•	•	•	•	•	
Hedgerow works (inspection for protected species)	•	•	•	•	•	•	•	•	•	•	•	•	
Existing hedgerow trimmed to desired height	•			•			•			•	Every 3rd year	Every 3rd year	
Individual Tree Planting													
Monitor and treat pests and diseases including removal of dead, dying and diseased material			•			•			•		Every 3rd year	Every 3rd year	
Monitoring and pruning/ remedial surgery (Remove any branches that overhang footpaths, obscure visibility splays, or prevent access for grass cutting)			•			•			•		Every 3rd year	Every 3rd year	
Monitor, adjust and replace stakes, ties, guards/fence	•	•	•	•									
Check plant material is firmly planted and firm in as required	•	•	•	•	•								
Water to maintain healthy growth and successful establishment	•	•	•	•	•								
1m diameter weed free area to be	•	•											

Maintenance Operation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-20	Year 21-30	Year 31-40
maintained around each tree													
Remove any weed growth from shelter guards	•	•	•	•	•								
Apply fertiliser	•												
Replacement tree planting	•	•	•	•	•								
Remove stakes/guys/guards					•								
Tree works including crown reducing, crown lifting, crown thinning					•					•	Every 5th year	Every 5th year	
Woodland Planting													
Monitor and treat pests and diseases including removal of dead, dying and diseased material			•			•			•		Every 3rd year	Every 3rd year	
Monitoring and pruning/ remedial surgery (Remove any branches that overhang footpaths, obscure visibility splays, or prevent access for grass cutting)			•			•			•		Every 3rd year	Every 3rd year	
Monitor, adjust and replace stakes, ties, guards/fence	•	•	•	•									
Check plant material is firmly planted and firm in as required	•	•	•	•	•								
Water to maintain healthy growth and	•	•	•	•	•								

Maintenance Operation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-20	Year 21-30	Year 31-40
successful establishment													
1m diameter weed free area to be maintained around each plant	•	•											
Spot treat invasive non-native species as necessary	•	•	•	•	•								
Remove any weed growth from shelter guards	•	•	•	•	•								
Apply fertiliser	•												
Replacement whip/transplant planting	•	•	•	•	•								
Remove stakes/guards					•								
Tree works including crown reducing, crown lifting, crown thinning				•									
Woodland coppicing/thinning					•					•	Every 5th year	Every 5th year	
Scrub Planting													
Monitor and treat pests and diseases including removal of dead, dying and diseased material			•			•			•		Every 3rd year	Every 3rd year	
Monitoring and pruning/ remedial surgery (Remove any branches that overhang footpaths, obscure visibility splays, or			•			•			•		Every 3rd year	Every 3rd year	

Maintenance Operation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-20	Year 21-30	Year 31-40
prevent access for grass cutting)													
Monitor, adjust and replace stakes, ties, guards/fence	•	•	•	•									
Check plant material is firmly planted and firm in as required	•	•	•	•	•								
Water to maintain healthy growth and successful establishment	•	•	•	•	•								
1m diameter weed free area to be maintained around each plant	•	•											
Spot treat invasive non-native species as necessary	•	•	•	•	•								
Remove any weed growth from shelter guards	•	•	•	•	•								
Apply fertiliser	•												
Replacement whip/transplant planting	•	•	•	•	•								
Remove stakes/guards					•								
Native Hedge Planting													
Monitor and treat pests and diseases including removal of dead, dying and diseased material			•			•			•		Every 3rd year	Every 3rd year	
Monitoring and pruning/ remedial surgery			•			•			•		Every 3rd year	Every 3rd year	

Maintenance Operation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-20	Year 21-30	Year 31-40
Monitor, adjust and replace stakes, ties, guards/fence	•	•	•	•									
Check plant material is firmly planted and firm in as required	•	•	•	•	•								
Water to maintain healthy growth and successful establishment	•	•	•	•	•								
1m diameter weed free area to be maintained around each plant	•	•											
Spot treat invasive non-native species as necessary	•	•	•	•	•								
Remove any weed growth from shelter guards	•	•	•	•	•								
Apply fertiliser	•												
Replacement whip/transplant planting	•	•	•	•	•								
Remove stakes/guys when ready					•								
Clipping of Hedgerow					•	•	•	•	•	•	•	•	
Legume Rich Neutral Grassland													
Water to maintain healthy growth and Successful establishment	•												
Maintenance cuts		•	•	•	•	•	•	•	•	•	•	•	
Weed Control		•	•	•	•	•	•	•	•	•	•	•	
Resow Failed Areas		•											
Field Margin – Wild Bird Winter Seed Mix													

Maintenance Operation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-20	Year 21-30	Year 31-40
Re-establishment Of Field Margin – Wild Bird Cropland				●				●			●	●	
Resow Failed Areas		●											
Field Margin – Legume Rich Grassland													
Maintenance topping	●	●											
Maintenance cuts		●	●	●	●	●	●	●	●	●	●	●	
Resow Failed Areas		●											
Flower Rich Other Neutral Grassland													
~~Maintenance topping~~	~~●~~	~~●~~											
Maintenance cuts	●	●	●	●	●	●	●	●	●	●	●	●	
Resow Failed Areas		●											
Neutral ~~Wet~~ Grassland with Scrapes													
Maintenance cuts		●	●	●	●	●	●	●	●	●	●	●	
Spot treat invasive nonnative species as necessary		●	●	●	●	●	●	●	●	●	●	●	
Water to maintain healthy growth and successful establishment	●												
Resow Failed Areas		●											
Scrape maintenance		●	~~●~~	●	~~●~~	●	~~●~~	●	~~●~~	●	~~●~~	●	
Proposed Habitat Features													
Bird Boxes													
Confirmation of Use		●	●	●	●								
Relocation (if required)		●	●	●	●								
Bat Boxes													
Confirmation of Use		●	●	●	●								

Maintenance Operation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-20	Year 21-30	Year 31-40
Relocation (if required)		•	•	•	•								

Appendix D – Indicative Environmental Masterplan

A1

Routh
Tickton
Long Riston
Arnold
Skirlaugh
Thearne
Wawne
Kingswood

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

1km 500m 0 500m 1km

Key

Order Limits

Notes:

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2. Do not scale from this drawing.

Rev	Date	By	Chkd	Appd	Authd
P03	18/08/25	JP	ZF	ZF	ZF
P02	24/06/25	JP	ZF	ZF	ZF
P01	10/02/25	JP	ZF	ZF	ZF

Client: RWE

Designer: RSK

Project Name: Peartree Hill Solar Farm

Drawing Title: Landscape and Ecological Management Plan: Indicative Environmental Masterplan Overview Sheet

Scale at A1: 1:2500

Coordinate System: British National Grid

Status: DCO Application

PINS Number: EN010157/APP/6.3

Rev: P03

Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000

A1

Site Plan: Not to scale

Key

- Order Limits

Existing Features

- Woodland, Trees and Hedgerows to be retained and protected
- Trees and Hedgerows to be removed to allow for construction of Proposed Development
- Public Right of Way
- Watercourses and Waterbodies
- Powerlines and Pylons

Proposed Development Features

- Proposed Solar Panels
- Proposed Internal Tracks
- Proposed Hybrid Pack (Inverters, Converters, BESS Units)
- Proposed Switch Gear/ Spares Container
- Proposed Perimeter Fencing
- Proposed Permissive Path (to be available for pedestrians only)
- Proposed Individual Tree Planting
- Proposed Species-rich Hedgerow Planting
- Proposed Species-rich Infill/Reinstatement Hedgerow Planting
- Proposed Legume Rich Grassland: To establish a sward between the solar panels within the fenced areas (post initial implementation)
- Proposed Field Margin Grassland: To provide habitat and food resources for wildlife. Mixes to be either Wild Bird Winter Seed or Legume Rich Grassland as recommended by Ecologist
- Proposed Flower Rich/Wet Grassland: Within Biodiversity Mitigation & Enhancement Areas. Mixes to be either flower rich grassland or wet grassland as recommended by Ecologist and dependent on site conditions
- Proposed Biodiversity Mitigation Area
- Proposed Biodiversity Enhancement Area
- Proposed bird box location (Refer to Appendix B in the Outline LEMP for box type)
- Proposed barn owl box location (Refer to Appendix B in the Outline LEMP for box type)
- Proposed bat box location (Refer to Appendix B in the Outline LEMP for box type)
- Interconnecting cable routes and grid connection cable route (Habitats to be reinstated following cable installation)

100m 50m 0 50m 100m

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P01	10/02/25	JP	ZF	ZF	ZF

Client: RWE

Designer: RSK

Project Name: Peartree Hill Solar Farm

Drawing Title: Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 1 of 17

Scale at A1: 1:2500

Coordinate System: British National Grid

Status: DCO Application

PINS Number: EN010157/APP/6.3

Rev: P03

Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000

A1

D4
D6
D3
D5
D7
D2
Meaux Lane
BD11
BD12
BD13
BD14

Proposed relaxation of hedge flailing together with hedgerow infill planting where required to provide biodiversity, screening and landscape structure

For continuation see sheet 6
For continuation see sheet 3

Key

Order Limits

Existing Features

Woodland, Trees and Hedgerows to be retained and protected

Trees and Hedgerows to be removed to allow for construction of Proposed Development

Watercourses and Waterbodies

Powerlines and Pylons

Proposed Development Features

Proposed Solar Panels

Proposed Internal Tracks

Proposed Hybrid Pack (Inverters, Converters, BESS Units)

Proposed Switch Gear/ Spares Container

Proposed Perimeter Fencing

Proposed Permissive Path (to be available for pedestrians only)

Proposed Permissive Path (to be available for horse riders and pedestrians)

Proposed Individual Tree Planting

Proposed Species-rich Hedgerow Planting

Proposed Species-rich Infill/Reinstatement Hedgerow Planting

Proposed Legume Rich Grassland:
To establish a sward between the solar panels within the fenced areas (post initial implementation)

Proposed Field Margin Grassland:
To provide habitat and food resources for wildlife. Mixes to be either Wild Bird Winter Seed or Legume Rich Grassland as recommended by Ecologist

Proposed Flower Rich/Wet Grassland:
Within Biodiversity Mitigation & Enhancement Areas. Mixes to be either flower rich grassland or wet grassland as recommended by Ecologist and dependent on site conditions

Proposed Biodiversity Enhancement Area

Proposed bird box location
(Refer to Appendix B in the Outline LEMP for box type)

100m 50m 0 50m 100m

Site Plan: Not to scale

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Client: RWE

Designer: RSK

Project Name: Peartree Hill Solar Farm

Drawing Title: Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 2 of 17

Scale at A1: 1:2500

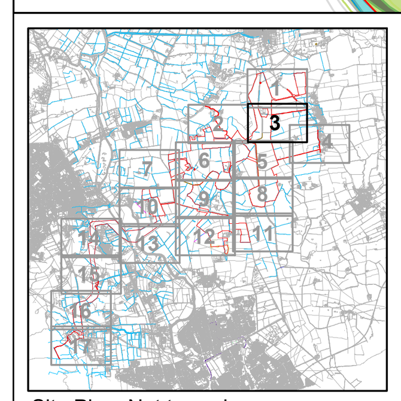
Coordinate System: British National Grid

Status: DCO Application

PINS Number: EN010157/APP/6.3

Rev: P03

Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000



Site Plan: Not to scale

Key

- Order Limits

Existing Features

- Woodland, Trees and Hedgerows to be retained and protected
- Trees and Hedgerows to be removed to allow for construction of Proposed Development
- Public Right of Way
- Watercourses and Waterbodies
- Powerlines and Pylons

Proposed Development Features

- Proposed Solar Panels
- Proposed Internal Tracks
- Proposed Hybrid Pack (Inverters, Converters, BESS Units)
- Proposed Switch Gear/ Spares Container
- Proposed Perimeter Fencing
- Proposed Permissive Path (to be available for pedestrians only)
- Proposed Individual Tree Planting
- Proposed Mixed Scrub Planting
- Proposed Species-rich Hedgerow Planting
- Proposed Species-rich Infill/Reinstatement Hedgerow Planting
- Proposed Legume Rich Grassland: To establish a sward between the solar panels within the fenced areas (post initial implementation)
- Proposed Field Margin Grassland: To provide habitat and food resources for wildlife. Mixes to be either Wild Bird Winter Seed or Legume Rich Grassland as recommended by Ecologist
- Proposed Flower Rich/Wet Grassland: Within Biodiversity Mitigation & Enhancement Areas. Mixes to be either flower rich grassland or wet grassland as recommended by Ecologist and dependent on site conditions
- Proposed Interpretation Board
- Area under consideration for community accessible land
- Proposed Biodiversity Mitigation Area
- Proposed bird box location (Refer to Appendix B in the Outline LEMP for box type)
- Proposed kestrel box location (Refer to Appendix B in the Outline LEMP for box type)
- Interconnecting cable routes and grid connection cable route (Habitats to be reinstated following cable installation)

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100m 50m 0 50m 100m

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P01	10/02/25	JP	ZF	ZF	ZF

Client

RWE

Designer

RSK

Project Name

Peartree Hill Solar Farm

Drawing Title

Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 3 of 17

Scale at A1: 1:2500

Coordinate System: British National Grid

Status: DCO Application

PINS Number: EN010157/APP/6.3

Rev: P03

Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000

A1

For continuation see sheet 3

For continuation see sheet 3

A165

For continuation see sheet 5

Site Plan: Not to scale

Key

Order Limits

Existing Features

Woodland, Trees and Hedgerows to be retained and protected

Trees and Hedgerows to be removed to allow for construction of Proposed Development

Watercourses and Waterbodies

Powerlines and Pylons

Public Right of Way

100m 50m 0 50m 100m

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P01	10/02/25	JP	ZF	ZF	ZF

Client

RWE

Designer

RSK

Project Name

Peartree Hill Solar Farm

Drawing Title

Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 4 of 17

Scale at A1
1:2500

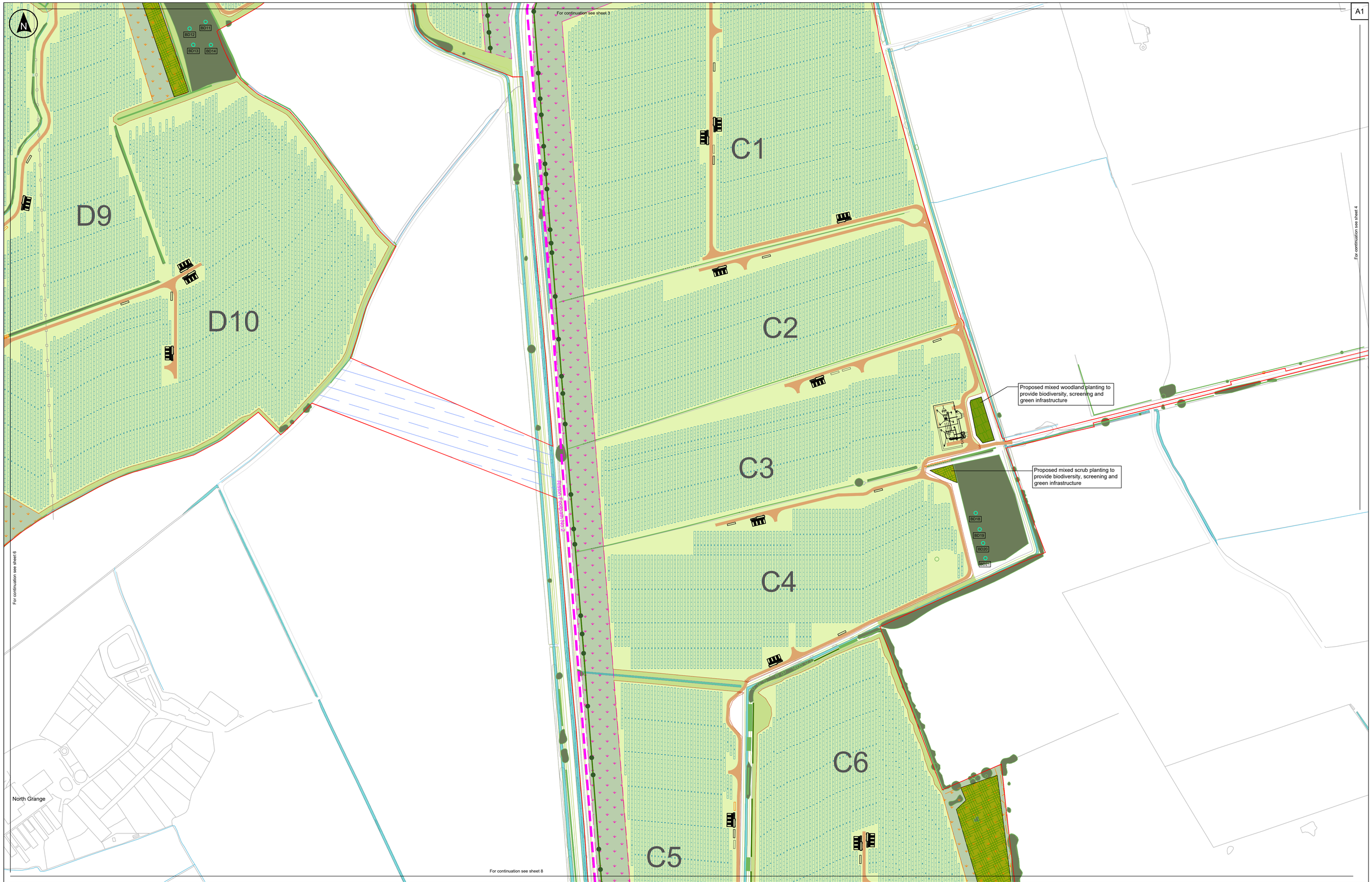
Coordinate System:
British National Grid

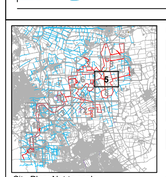
Status
DCO Application

PINS Number
EN010157/APP/6.3

Rev
P03

Drawing Name
0589-SHRSK-XX-XX-DR-L-1000





Site Plan: Not to scale

Key

Order Limits

Existing Features

- Woodland, Trees and Hedgerows to be retained and protected
- Trees and Hedgerows to be removed to allow for construction of Proposed Development
- Public Right of Way
- Watercourses and Waterbodies
- Powerlines and Pylons

Proposed Development Features

- Proposed Solar Panels
- Proposed Internal Tracks
- Proposed Hybrid Pack (Inverters, Converters, BESS Units)
- Proposed Switch Gear/ Spares Container
- Proposed On-site Substation
- Proposed Perimeter Fencing
- Proposed Permissive Path (to be available for pedestrians only)
- Interconnecting cable routes and grid connection cable route (Habitats to be reinstated following cable installation)
- Proposed Individual Tree Planting
- Proposed Mixed Woodland Planting
- Proposed Mixed Scrub Planting
- Proposed Species-rich Hedgerow Planting
- Proposed Species-rich Infill/ Reinstatement Hedgerow Planting
- Proposed Legume Rich Grassland: To establish a sward between the solar panels within the fenced areas (post initial implementation)
- Proposed Field Margin Grassland: To provide habitat and food resources for wildlife. Mixes to be either Wild Bird Winter Seed or Legume Rich Grassland as recommended by Ecologist
- Proposed Flower Rich/Wet Grassland: Within Biodiversity Mitigation & Enhancement Areas. Mixes to be either flower rich grassland or wet grassland as recommended by Ecologist and dependent on site conditions
- Proposed Biodiversity Mitigation Area
- Proposed Biodiversity Enhancement Area
- Proposed bird box location (Refer to Appendix B in the Outline LEMP for box type)
- Interconnecting cable routes and grid connection cable route (Habitats to be reinstated following cable installation)

100m 50m 0 50m 100m

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P01	10/02/25	JP	ZF	ZF	ZF

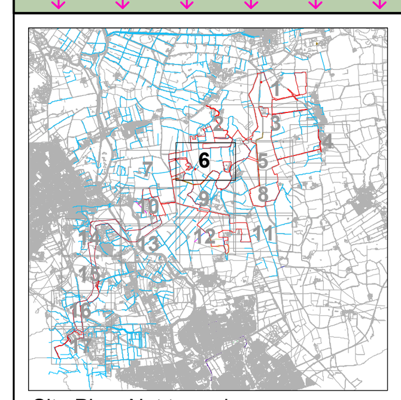
Client: RWE

Designer: RSK

Project Name: Peartree Hill Solar Farm

Drawing Title: Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 5 of 17

Scale at A1	Coordinate System:
1:2500	British National Grid
Status	
DCO Application	
PINS Number	Rev
EN010157/APP/6.3	P03
Drawing Name	
0589-SHRSK-XX-XX-DR-L-1000	


Site Plan: Not to scale

Key

Order Limits

Existing Features

- Woodland, Trees and Hedgerows to be retained and protected
- Trees and Hedgerows to be removed to allow for construction of Proposed Development
- Public Right of Way
- Watercourses and Waterbodies
- Powerlines and Pylons

Proposed Development Features

- Proposed Solar Panels
- Proposed Internal Tracks
- Proposed Hybrid Pack (Inverters, Converters, BESS Units)
- Proposed Switch Gear/ Spares Container
- Proposed On-site Substation
- Proposed Perimeter Fencing
- Proposed Permissive Path (to be available for horse riders and pedestrians)
- Proposed Individual Tree Planting
- Proposed Mixed Scrub Planting
- Proposed Species-rich Hedgerow Planting
- Proposed Species-rich Infill/ Reinstatement Hedgerow Planting
- Proposed Legume Rich Grassland: To establish a sward between the solar panels within the fenced areas (post initial implementation)
- Proposed Field Margin Grassland: To provide habitat and food resources for wildlife. Mixes to be either Wild Bird Winter Seed or Legume Rich Grassland as recommended by Ecologist
- Proposed Flower Rich/Wet Grassland: Within Biodiversity Mitigation & Enhancement Areas. Mixes to be either flower rich grassland or wet grassland as recommended by Ecologist and dependent on site conditions
- Proposed Biodiversity Mitigation Area
- Proposed Biodiversity Enhancement Area
- Proposed Interpretation Board
- Proposed Scrape (indicative extent)
- Interconnecting cable routes and grid connection cable route (Habitats to be reinstated following cable installation)
- Proposed bird box location (Refer to Appendix B in the Outline LEMP for box type)
- Proposed kestrel box location (Refer to Appendix B in the Outline LEMP for box type)
- Proposed barn owl box location (Refer to Appendix B in the Outline LEMP for box type)
- Proposed bat box location (Refer to Appendix B in the Outline LEMP for box type)

Notes:

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2. Do not scale from this drawing.

100m 50m 0 50m 100m

Rev	Date	By	Chkd	Appd	Authd
P03	18/08/25	JP	ZF	ZF	ZF
P02	24/06/25	JP	ZF	ZF	ZF
P01	10/02/25	JP	ZF	ZF	ZF

Client: RWE

Designer: RSK

Project Name: Peartree Hill Solar Farm

Drawing Title: Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 6 of 17

Scale at A1: 1:2500

Coordinate System: British National Grid

Status: DCO Application

PINS Number: EN010157/APP/6.3

Rev: P03

Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000

A1

E1

E5

E6

E9

Tickton Footpath No.6

Proposed permissive route to provide multiple circular routes for walkers and horseriders and a connection to North Carr Lane together with biodiversity and screening with new hedgerow and species rich grassland margins

Proposed heritage trail following route of proposed permissive path north of Meaux Duck Decoy Scheduled Monument

Proposed scrape creation comprising of shallow depressions that hold water in the winter months to benefit wildfowl and wading birds. The fields within which the scrapes are situated will also benefit ground nesting birds and provide a source of insects for foraging bats.

Scheduled Monument

Carr House Farm

For continuation see sheet 10

For continuation see sheet 6

For continuation see sheet 10

B12 B13 B24 B25 B03

Site Plan: Not to scale

Key

Order Limits

Existing Features

- Woodland, Trees and Hedgerows to be retained and protected
- Trees and Hedgerows to be removed to allow for construction of Proposed Development
- Public Right of Way
- Watercourses and Waterbodies
- Powerlines and Pylons

Proposed Development Features

- Proposed Solar Panels
- Proposed Internal Tracks
- Proposed Hybrid Pack (Inverters, Converters, BESS Units)
- Proposed Switch Gear/ Spares Container
- Proposed Perimeter Fencing
- Proposed Permissive Path (to be available for horse riders and pedestrians)
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- Proposed Flower Rich/Wet Grassland: Within Biodiversity Mitigation & Enhancement Areas. Mixes to be either flower rich grassland or wet grassland as recommended by Ecologist and dependent on site conditions
- Proposed Interpretation Board
- Proposed Biodiversity Mitigation Area
- Proposed Scrape (indicative extent)
- Proposed bat box location (Refer to Appendix B in the Outline LEMP for box type)
- Proposed kestrel box location (Refer to Appendix B in the Outline LEMP for box type)

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100m 50m 0 50m 100m

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P01	10/02/25	JP	ZF	ZF	ZF

Client: RWE

Designer: RSK

Project Name: Peartree Hill Solar Farm

Drawing Title: Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 7 of 17

Scale at A1: 1:2500

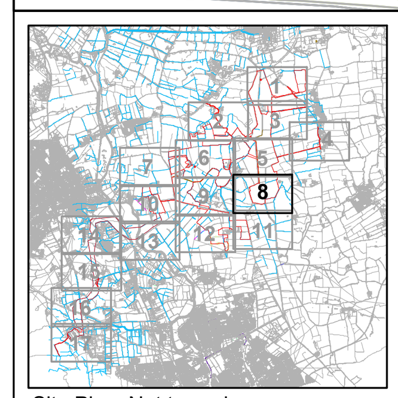
Coordinate System: British National Grid

Status: DCO Application

PINS Number: EN010157/APP/6.3

Rev: P03

Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000


Site Plan: Not to scale

Key

Order Limits

Existing Features

Woodland, Trees and Hedgerows to be retained and protected

Trees and Hedgerows to be removed to allow for construction of Proposed Development

Public Right of Way

Watercourses and Waterbodies

Powerlines and Pylons

Proposed Development Features

Proposed Solar Panels

Proposed Internal Tracks

Proposed Hybrid Pack (Inverters, Converters, BESS Units)

Proposed Switch Gear/ Spares Container

Proposed Perimeter Fencing

Proposed Permissive Path (to be available for pedestrians only)

Proposed Individual Tree Planting

Proposed Mixed Woodland Planting

Proposed Mixed Scrub Planting

Proposed Species-rich Hedgerow Planting

Proposed Species-rich Infill/ Reinstatement Hedgerow Planting

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Proposed Biodiversity Mitigation Area

Proposed Biodiversity Enhancement Area

Area under consideration for community accessible land (Refer to the Outline Landscape and Ecological Management Plan [EN010157/APP/7.5] for more information)

Proposed Interpretation Board

Proposed bird box location (Refer to Appendix B in the Outline LEMP for box type)

Proposed barn owl box location (Refer to Appendix B in the Outline LEMP for box type)

Proposed bat box location (Refer to Appendix B in the Outline LEMP for box type)

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100m 50m 0 50m 100m

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P01	10/02/25	JP	ZF	ZF	ZF

Client: RWE

Designer: RSK

Project Name: Peartree Hill Solar Farm

Drawing Title: Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 8 of 17

Scale at A1: 1:2500

Coordinate System: British National Grid

Status: DCO Application

PINS Number: EN010157/APP/6.3

Rev: P03

Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000

A1

For continuation see sheet 6

E9

E10

E11

E12

B14

B15

B05

B62

Proposed permissive route to provide multiple circular routes for walkers and horseriders and a connection to Meaux Lane together with biodiversity and screening with new hedgerow and species rich grassland margins

Proposed relaxation of hedge flailing together with hedgerow infill planting where required to provide biodiversity, screening and landscape structure

Proposed relaxation of hedge flailing together with hedgerow infill planting where required to provide biodiversity, screening and landscape structure

Crown Farm

Bridge Farm

Stud Fa

For continuation see sheet 10

For continuation see sheet 8

For continuation see sheet 12

Key

Order Limits

Existing Features

Woodland, Trees and Hedgerows to be retained and protected

Trees and Hedgerows to be removed to allow for construction of Proposed Development

Public Right of Way

Watercourses and Waterbodies

Powerlines and Pylons

Proposed Development Features

Proposed Solar Panels

Proposed Internal Tracks

Proposed Hybrid Pack (Inverters, Converters, BESS Units)

Proposed Switch Gear/ Spares Container

Proposed Perimeter Fencing

Proposed Permissive Path (to be available for horse riders and pedestrians)

Interconnecting cable routes and grid connection cable route (Habitats to be reinstated following cable installation)

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Proposed Mixed Woodland Planting

Proposed Mixed Scrub Planting

Proposed Species-rich Hedgerow Planting

Proposed Species-rich Infill/ Reinstatement Hedgerow Planting

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Proposed Biodiversity Mitigation Area

Proposed Biodiversity Enhancement Area

Proposed barn owl box location (Refer to Appendix B in the Outline LEMP for box type)

Proposed bat box location (Refer to Appendix B in the Outline LEMP for box type)

100m 50m 0 50m 100m

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Site Plan: Not to scale

Rev	Date	By	Chkd	Appd	Authd
P03	18/08/25	JP	ZF	ZF	ZF
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P01	10/02/25	JP	ZF	ZF	ZF

Client: RWE

Designer: RSK

Project Name: Peartree Hill Solar Farm

Drawing Title: Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 9 of 17

Scale at A1: 1:2500

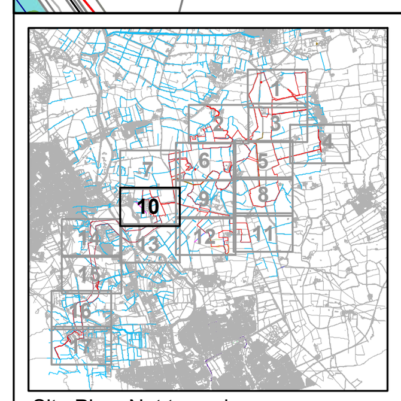
Coordinate System: British National Grid

Status: DCO Application

PINS Number: EN010157/APP/6.3

Rev: P03

Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000



Key

Symbol	Description
	Order Limits

Existing Features

- Woodland, Trees and Hedgerows to be retained and protected
- Trees and Hedgerows to be removed to allow for construction of Proposed Development
- Public Right of Way
- Watercourses and Waterbodies
- Powerlines and Pylons

Proposed Development Features

- Proposed Solar Panels
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100m 50m 0 50m 100m

Rev	Date	By	Chkd	Appd	Authd
P03	18/08/25	JP	ZF	ZF	ZF
P02	24/06/25	JP	ZF	ZF	ZF
P01	10/02/25	JP	ZF	ZF	ZF

Client: RWE

Designer: RSK

Project Name: Peartree Hill Solar Farm

Drawing Title: Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 10 of 17

Scale at A1: 1:2500

Coordinate System: British National Grid

Status: DCO Application

PINS Number: EN010157/APP/6.3

Rev: P03

Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000

For continuation see sheet 8

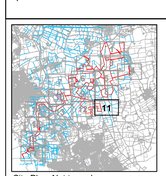
For continuation see sheet 12

F11

F12

F13

Existing landowner track



Site Plan: Not to scale

Key

Order Limits

Existing Features

Woodland, Trees and Hedgerows to be retained and protected

Trees and Hedgerows to be removed to allow for construction of Proposed Development
Public Right of Way

Existing Landowner Tracks

Watercourses and Waterbodies

Powerlines and Pylons

Proposed Development Features

Proposed Solar Panels

Proposed Internal Tracks

Proposed Hybrid Pack (Inverters, Converters, BESS Units)

Proposed Switch Gear/ Spares Container

Proposed Perimeter Fencing

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Proposed Flower Rich/Wet Grassland:
Within Biodiversity Mitigation & Enhancement Areas. Mixes to be either flower rich grassland or wet grassland as recommended by Ecologist and dependent on site conditions

Proposed Biodiversity Mitigation Area

100m 50m 0 50m 100m

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P03	18/08/25	JP	ZF	ZF	ZF
P02	24/06/25	JP	ZF	ZF	ZF
P01	10/02/25	JP	ZF	ZF	ZF

Client: RWE

Designer: RSK

Project Name: Peartree Hill Solar Farm

Drawing Title: Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 11 of 17

Scale at A1: 1:2500

Coordinate System: British National Grid

Status: DCO Application

PINS Number: EN010157/APP/6.3

Rev: P03

Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000

Site Plan: Not to scale

Key

Order Limits

Existing Features

Woodland, Trees and Hedgerows to be retained and protected

Trees and Hedgerows to be removed to allow for construction of Proposed Development

Public Right of Way

Existing Landowner Tracks

Watercourses and Waterbodies

Powerlines and Pylons

Proposed Development Features

Proposed Solar Panels

Proposed Internal Tracks

Proposed Hybrid Pack (Inverters, Converters, BESS Units)

Proposed Switch Gear/ Spares Container

Proposed Perimeter Fencing

Proposed Permissive Path (to be available for pedestrians only)

Proposed Individual Tree Planting

Proposed Mixed Scrub Planting

Proposed Species-rich Hedgerow Planting

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Proposed Flower Rich/Wet Grassland: Within Biodiversity Mitigation & Enhancement Areas. Mixes to be either flower rich grassland or wet grassland as recommended by Ecologist and dependent on site conditions

Area under consideration for community accessible land (Refer to the Outline Landscape and Ecological Management Plan [EN010157/APP/7.5] for more information)

Proposed Biodiversity Mitigation Area

Proposed Biodiversity Enhancement Area

Proposed bird box location (Refer to Appendix B in the Outline LEMP for box type)

Proposed barn owl box location (Refer to Appendix B in the Outline LEMP for box type)

Proposed kestrel box location (Refer to Appendix B in the Outline LEMP for box type)

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100m 50m 0 50m 100m

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P03	18/08/25	JP	ZF	ZF	ZF
P02	24/06/25	JP	ZF	ZF	ZF
P01	10/02/25	JP	ZF	ZF	ZF

Client

RWE

Designer

RSK

Project Name

Peartree Hill Solar Farm

Drawing Title

Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 12 of 17

Scale at A1: 1:2500

Coordinate System: British National Grid

Status: DCO Application

PINS Number: EN010157/APP/6.3

Rev: P03

Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000

A1

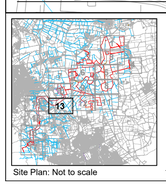
For continuation see sheet 10

For continuation see sheet 12

For continuation see sheet 14

For continuation see sheet 15

For continuation see sheet 3



Site Plan: Not to scale

Key

Order Limits

Existing Features

Woodland, Trees and Hedgerows to be retained and protected

Trees and Hedgerows to be removed to allow for construction of Proposed Development

Public Right of Way

Watercourses and Waterbodies

Powerlines and Pylons

Proposed Development Features

Interconnecting cable routes and grid connection cable route (Habitats to be reinstated following cable installation)

100m 50m 0 50m 100m

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Client

RWE

Designer

RSK

Project Name

Peartree Hill Solar Farm

Drawing Title

Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 13 of 17

Scale at A1

1:2500

Coordinate System:

British National Grid

Status

DCO Application

PINS Number

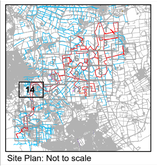
EN010157/APP/6.3

Rev

P02

Drawing Name

0589-SHRSK-XX-XX-DR-L-1000



Site Plan: Not to scale

Key

Order Limits

Existing Features

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Powerlines and Pylons

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100m 50m 0 50m 100m

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Client

RWE

Designer

RSK

Project Name

Peartree Hill Solar Farm

Drawing Title

Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 14 of 17

Scale at A1

1:2500

Coordinate System:

British National Grid

Status

DCO Application

PINS Number

EN010157/APP/6.3

Rev

P02

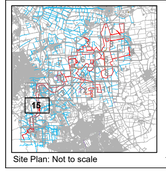
Drawing Name

0589-SHRSK-XX-XX-DR-L-1000

For continuation see sheet 14

A1

For continuation see sheet 16



Site Plan: Not to scale

Key

Order Limits

Existing Features

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Trees and Hedgerows to be removed to allow for construction of Proposed Development

Public Right of Way

Watercourses and Waterbodies

Powerlines and Pylons

Proposed Development Features

Interconnecting cable routes and grid connection cable route (Habitats to be reinstated following cable installation)

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100m 50m 0 50m 100m

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P02	24/06/25	JP	ZF	ZF	ZF
P01	10/02/25	JP	ZF	ZF	ZF

Client

RWE

Designer

RSK

Project Name

Peartree Hill Solar Farm

Drawing Title

Landscape and Ecological Management Plan: Indicative Environmental Masterplan
Sheet 15 of 17

Scale at A1
1:2500

Coordinate System:
British National Grid

Status
DCO Application

PINS Number
EN010157/APP/6.3

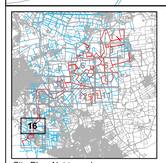
Rev
P02

Drawing Name
0589-SHRSK-XX-XX-DR-L-1000

For continuation see sheet 15

A1

For continuation see sheet 17



Site Plan: Not to scale

Key

Order Limits

Existing Features

Woodland, Trees and Hedgerows to be retained and protected

Trees and Hedgerows to be removed to allow for construction of Proposed Development

Public Right of Way

Watercourses and Waterbodies

Powerlines and Pylons

Proposed Development Features

Interconnecting cable routes and grid connection cable route (Habitats to be reinstated following cable installation)

100m 50m 0 50m 100m

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Rev	Date	By	Chkd	Appd	Authd
P02	24/06/25	JP	ZF	ZF	ZF
P01	10/02/25	JP	ZF	ZF	ZF

Client: RWE

Designer: RSK

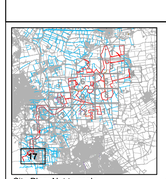
Project Name: Peartree Hill Solar Farm

Drawing Title: Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 16 of 17

Scale at A1: 1:2500	Coordinate System: British National Grid
Status: DCO Application	
PINS Number: EN010157/APP/6.3	Rev: P02
Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000	

A1

For continuation see sheet 16



Site Plan: Not to scale

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Order Limits

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Watercourses and Waterbodies

Powerlines and Pylons

Proposed Development Features

Interconnecting cable routes and grid connection cable route (Habitats to be reinstated following cable installation)

100m 50m 0 50m 100m

Notes:

1. Drawing is indicative only and not for construction.
2. This drawing depicts the anticipated layout of the Proposed Development, exact details concerning the layout and dimensions of the Proposed Development will be determined and designed at detailed design stage in line with the provisions of the DCO Application (Refer to document EN010157/APP/6.3).
2. Do not scale from this drawing.

Rev	Date	By	Chkd	Appd	Authd
P02	24/06/25	JP	ZF	ZF	ZF
P01	10/02/25	JP	ZF	ZF	ZF

Client

RWE

Designer

RSK

Project Name

Peartree Hill Solar Farm

Drawing Title

Landscape and Ecological Management Plan: Indicative Environmental Masterplan Sheet 17 of 17

Scale at A1: 1:2500

Coordinate System: British National Grid

Status: DCO Application

PINS Number: EN010157/APP/6.3

Rev: P02

Drawing Name: 0589-SHRSK-XX-XX-DR-L-1000

Appendix E: Bird-days Calculations

19.3.7 Natural England suggested a 'bird-days' approach to describe bird-use of the Order Limits and surroundings and to demonstrate that the mitigation land being provided is sufficient to support the bird-use. Following the calculation of bird-days (using the non-breeding bird data from the 2021/2022, 2022/23, 2023/24 and 2024/25 surveys~~)~~, as presented within **ES Volume 4, Appendix 7.3: Breeding Bird Survey Report [EN010157/APP/6.4]**; **ES Volume 4, Appendix 7.4: Wintering Bird Survey Report [EN010157/APP/6.4]**; **ES Volume 4, Appendix 7.5: Ornithological Survey Report [EN010157/APP/6.4]**; **ES Volume 4, Appendix 7.9: Passage Bird Survey Report [EN010157/APP/6.4]**; and **Grid Connection Cable Route Bird Survey Report [EN010157/APP/8.4]**), ~~,~~ the area of mitigation land required to support this number of bird-days has been calculated.

19.3.8 Mallard and teal were mainly recorded within ~~the~~ watercourses and ditches, which would not be directly affected by the Proposed Development (with watercourse and ditches protected by buffers), and black-headed gull were recorded foraging throughout and adjacent to the Order Limits. As such, lapwing and golden plover were chosen as the key species for the bird-days calculations. Notwithstanding this, the mitigation proposed (see earlier in this Outline ~~o~~LEMP) would also provide suitable habitat for mallard, teal and black headed gull.

19.3.9 All observations of golden plover and lapwing within and adjacent to Land Areas B to F and within and adjacent to the grid connection cable route are provided in Tables 5-2, 5-3, 5-5, 5-6 and 5-17 of the **Habitats Regulations Assessment – Information to Inform the Appropriate Assessment [EN010157/APP/5.3]**. For clarity, the total counts of birds recorded within or adjacent to the survey areas (i.e. not flying over) per month are shown in the calculation tables below.

19.3.10 To describe bird-use, and therefore the average use of the Order Limits and adjacent land during the non-breeding season, the 'inter-annual' mean of the 'intra-annual' mean of monthly counts for each survey year has been calculated, as set out below.

1) Intra-annual mean (within year mean) for each of the four survey years = sum of the total number of individuals recorded during a survey year, divided by the maximum number of months the species has been recorded (see Table E1 below).

2) Inter-annual mean (between year mean) = sum of annual means divided by the number of survey years (four).

19.3.11 Metrics were calculated using the January to March period for golden plover, as non-breeding golden plover were not recorded outside this period in any of the four survey years. Metrics for lapwing were based on the November to March period, because non-breeding lapwing were recorded during those months only.

19.3.12 Seasonal bird-days were calculated by multiplying the inter-annual mean for each species by the number of days in the month over which they had been recorded.

- Golden plover: (January to March) 90 days
- Lapwing: (November to March) 151 days

19.3.13 This provides a measure of the utilisation of the Order Limits and a basis on which to establish an appropriate mitigation area to manage for the benefit of golden plover and lapwing.

Golden plover

Table E1: Total number of golden plover in the survey months in which they were recorded, in each survey year. Grey shading indicates months where surveys were not undertaken.

Survey Yr.	Survey Month			Intra-year mean	Inter-year mean
	Jan.	Feb.	Mar.		
2021/22	46	860	62[1]	322.67	86
2022/23	2			0.67	
2023/24			14		7.00
2024/25			41		13.67

Bird-days

90 days (January to March) X 86 (inter-year mean) = **7,740 bird-days**

Mitigation area

19.3.14 Gillings et al. (2007) **[Ref. 1-29]** reported golden plover densities of 1,560 bird-days per hectare (ha) from mixed arable farmland. In line with the approach agreed with NE on the Cleve Hill Solar Farm Development Consent Order [Ref. 1-30], these figures have been used in the calculation below as a worst-case, acknowledging that the habitats to be created (wader scrapes with neutral grassland, and flower rich neutral permanent grassland) will support a higher

[1] 62 birds recorded within the grid connection cable route during the breeding bird survey in March 2022.

biomass of invertebrate prey than arable farmland (further information regarding carrying capacity is provided below).

7,740 bird-days / 1,560 = **4.96 ha**

Lapwing

Table E2: Total number of lapwing in the survey months in which they were recorded, in each survey year. Grey shading indicates months where surveys were not undertaken.

Survey Yr.	Survey Month					Intra-year mean	Inter-year mean
	Nov.	Dec.	Jan.	Feb.	Mar.		
2021/22	-	50	66	82	53[2]	62.75	630.45
2022/23	-	18	254	37	12	80.25	
2023/24	- 30	57		131	9	45.4	
2024/25	- 12			303	12	65.4	

Bird-days

151 days (November to March) X 63.45 (inter-year mean) = **9,580.95 bird-days**

Mitigation area

19.3.15 Gillings et al. (2007) **[Ref. 1-29]** reported lapwing densities of 1,000 bird-days per hectare (ha) from mixed arable farmland. This figure has been used in the calculation below as a worst-case, acknowledging that the habitats to be created (wader scrapes with neutral grassland, and flower rich neutral permanent grassland) will support a higher biomass of invertebrate prey than arable farmland (further information regarding carrying capacity is provided below).

9,580.95 bird-days / 1,000 = **9.58 ha**

Golden plover and lapwing mitigation area

19.3.16 Natural England noted that as lapwing have the same habitat requirements as golden plover, there will be competition for the same invertebrate food. As such

[2] Includes 28 birds recorded within the grid connection cable route during the breeding bird survey in March 2022.

although there is a requirement to provide sufficient mitigation land for both species i.e. a minimum of 14.54 ~~4.14~~ ha in total (9.58 ~~18~~ ha plus 4.96 ha) would be required.

19.3.17 The area of mitigation land to be created and managed is set out in the table below.

Table E3: Summary of Mitigation Areas.

Mitigation Area	Size (ha)	Habitats to be created
Mitigation Area 9 (Field D18)	21.48	Flower rich neutral grassland
Mitigation Area 11 (Field~~s~~ E6)	8.6	Wader scrapes with neutral grassland, surrounded by flower rich neutral grassland
Mitigation Area 13 (Fields E13/E14)~~)~~	8.68	Water scrapes with neutral grassland, surrounded by flower rich neutral grassland

Carrying capacity

The Humber estuary SPA/Ramsar site qualifying bird species such lapwing and golden plover were recorded sporadically and in small numbers during the bird surveys, with distribution linked to crop rotations and land usage rather than being focused on specific hotspots.

19.3.18 Natural England have requested further justification that a combined area of 38.34~~X~~ ha flower rich neutral grassland and scrapes with neutral grassland will produce enough invertebrate prey to provide for the combined peaks of both golden plover and lapwing. They have requested that consideration is also given to the impact of sightlines on carrying capacity, given that areas around the edges of fields close to field boundary features such as hedgerows may be used by lower densities of birds, than the areas towards the middle of the fields. Further information on the likely changes in carrying capacity within the mitigation areas in relation to proposed habitat creation and management is provided below.

Scrapes

19.3.19 Scrapes can be very important feeding sites for the chicks and adults of farmland waders, as their gently-sloping edges support large numbers of invertebrates **[Ref.1-35]**. For example, a study within nine grazed neutral grassland sites in eastern England **[Ref. 1-32]** found that installation of shallow wet features provided valuable foraging areas for lapwing chicks. The wet features were also found to support more than twice the biomass of surface-active invertebrates and a greater abundance of aerial invertebrates than grazing marsh. A Swedish study of newly created wetlands in agricultural land, also found that wetland creation

increased aquatic macroinvertebrate diversity in agricultural landscapes **[Ref.1-333X]**.

19.3.6 As noted in Section 3, the habitats within the mitigation areas are currently intensively managed agricultural fields, with one being improved grassland. The addition of scrapes within Mitigation Areas 11 (Fields E6) and Mitigation Area 13 (Fields E13/14) will improve soil moisture and expose soft substrates which support higher densities of soil invertebrates and earthworms. This will enhance the availability and accessibility of food resources for birds, increasing the suitability and therefore the carrying capacity of the fields for wintering lapwing and golden plover, as well as teal, mallard and black-headed gull.

19.3.20 In addition, scrapes will provide open undisturbed areas with good visibility (which are preferred by waders and waterfowl), especially in wet or frozen conditions when other fields in the area may be less suitable.

Flower rich neutral grassland

19.3.21 Golden plover and lapwing both feed on invertebrates found in vegetation and just below the soil surface (e.g. earthworms, beetles etc.). A review by Gillings and Fuller **[Ref. 1-2934]** as part of a review of winter ecology of golden plovers and lapwing, in relation to survey methods noted the following:

- Prey availability is probably higher in vegetated fields than bare till because the vegetation insulates the soil surface and creates a suitable microclimate for soil invertebrates which would otherwise be buried deeper below ground especially during the winter months.
- Soil protected by a dense layer of insulating vegetation may remain unfrozen during periods of ground frost and thus render soil invertebrates relatively more surface-active and relatively more available to plovers foraging on grassland than those foraging on cultivated land.
- Earthworms are a common dietary component for golden plover and lapwing and for whose abundance can be estimated. Permanent pastures are richest in earthworms, with less in winter cereals and the least in row crops.
- In grassland, worm biomass increases as a function of the time since last ploughing, hence permanent pastures attain a higher biomass of earthworms than temporary grasslands.
- Plover distribution is positively correlated both with the biomass of earthworms and with field age.

- Grassland feeding habitat has the potential to support a food biomass density about three-fold greater than arable, however this biomass level takes several years to be realised.

19.3.22 The review by Gillings and Fuller **[Ref. ~~X~~1-34291-~~2~~]** also considered how lapwing and golden plover used habitats dependant on management. The review found that usage was greater in fields which had been mown, and that unmown fields were virtually avoided. In addition, grazing may benefit foraging plovers through 'dunging'. Not only does dung harbour its own invertebrate fauna but soil productivity may be increased as grazing animals convert unavailable nutrients into simpler nutrients which soil invertebrates can readily assimilate. Although, heavy grazing may reduce invertebrate density and diversity.

19.3.23 Evidence suggests that in the Lower Derwent Valley, North Yorkshire, lapwings generally preferred short swards and avoided swards more than 10 cm tall. This is reflected by Scottish Government supporting guidance for wader grazed grassland **[Ref.1-~~6~~35]** which notes that short-grazed areas (less than 10 centimetres) provide easy access to food and open terrain to enable vigilance against predators. Patchy swards which vary in height (created by grazing), provide suitable feeding and nesting habitat.

19.3.24 Based on the evidence above, it is considered reasonable to assume that an increased carrying capacity compared to the existing intensively farmed arable agricultural fields can be achieved through the creation of scrapes with neutral grassland and permanent flower rich neutral grassland, with appropriate management to maximise food resources available.

Sightlines

Scottish Government supporting guidance for wader grazed grassland **[Ref.1-~~6~~31]** states that r~~R~~esearch has shown that waders avoid nesting and feeding in areas close to tall trees and hedgerows~~s~~. As such the areas around the hedgerows and trees within the Mitigation Areas may support lower densities of foraging birds. However, given that the Mitigation Areas provide a greater area than required (based on bird numbers and usage), and that the habitat creation and management will increase carrying capacity, the Mitigation Areas are still considered to provide sufficient functionally available 'core habitat' for golden plover, lapwing, mallard, teal and black-headed gull.

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