Peartree Hill Solar Farm

Design Approach Document
Revision 2

Planning Act 2008

Infrastructure Planning

(Applications: Prescribed Forms

and Procedure) Regulations 2009 –

Regulation 5(2)(q)

Application Document Ref: EN010157/APP/5.7

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Contents

Acronyms

Acronym	Description
AOD	Above ordnance datum
AC	Alternating current
ALC	Agricultural Land Classification
BESS	Battery Energy Storage System
BMV	Best and Most Versatile
BNG	Biodiversity Net Gain
CEMP	Construction Environmental Management Plan
CNP	Critical national priority
CTMP	Construction Traffic Management Plan
DAD	Design Approach Document
DC	Direct current
DCO	Development Consent Order
Draft DCO	Draft Development Consent Order
DEMP	Decommissioning Environmental Management Plan
EIA	Environmental Impact Assessment
ERLP	East Riding Local Plan
ES	Environmental Statement
ERYC	East Riding of Yorkshire Council
FRA	Flood Risk Assessment
GHG	Greenhouse gas
HDD	Horizontal Directional Drilling
HGV	Heavy goods vehicle
kV	Kilovolts
LCA	Landscape Character Area
LCT	Landscape Character Type
LEMP	Landscape and Ecological Management Plan
MVA	Megavolt-amperes
MW	Megawatts
NCA	National Character Area
NETS	National Electricity Transmission System
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NIC	National Infrastructure Commission
NTS	Non-Technical Summary
OEMP	Operational Environmental Management Plan
PA 2008	Planning Act 2008
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate

PRoW	Public Rights of Way
PV	Photo voltaic
SoS	Secretary of State for the Department for Energy Security and Net Zero
SSSI	Sites of Special Scientific Interest

Glossary

Term or Abbreviation	Definition
Applicant	The organisation submitting the Development Consent Order Application (in the case of Peartree Hill Solar Farm, RWE Renewables UK Solar and Storage Ltd).
Battery Energy Storage System	This comprises batteries and associated enclosures, monitoring systems, air conditioning, electrical cables and fire safety infrastructure. This equipment allows for the storage, importation and exportation of energy to the National Grid. Battery Energy Storage System units will form one element of hybrid packs, along with inverters, transformers and DC-DC converters.
Best and most versatile agricultural land	Defined as Grades 1, 2 and 3a in the Agricultural Land Classification by the National Planning Policy Framework and Planning Practice Guidance. This is the land which is determined to be most flexible, productive, and efficient in response to inputs and which can best deliver future crops for food and non-food uses such as biomass, fibres, and pharmaceuticals. Grades 3b, 4, and 5 are used to classify land that is of moderate quality to very poor quality.
Biodiversity	The biological diversity of the earth's living resources. The total range of variability among systems and organisms at the following levels of organisation: bioregional, landscape, ecosystem, habitats, communities, species, populations, individuals, genes, and the structural and functional relationships within and between these different levels.
Biodiversity Net Gain	An approach to development that leaves biodiversity in a better state than before.
Climate change	Large scale, long term shift in the Earth's weather patterns or average temperature.
Construction compound	A secure area from which construction activities are managed and resourced, including but not limited to temporary offices, workshops, parking and storage. For the Proposed Development, these are divided into main compounds and satellite compounds.
National Grid Creyke Beck Substation	The existing National Grid substation located near Cottingham that will facilitate the export and import of electricity from the Proposed Development to the National Grid.

DC-DC converter	Device that stabilises the voltage from the solar PV modules to the batteries. They will form one element of hybrid packs, along with inverters, Battery Energy Storage System units, transformers.
Decommissioning	The process of shutting down, and where relevant, removing the infrastructure comprised in the Proposed Development when it is no longer required once it has reached end of life.
Development Consent Order	A Statutory Instrument made by the Secretary of State pursuant to the Planning Act 2008.
Development Consent Order Application	The application for a Development Consent Order that is submitted by the Applicant to the Secretary of State for the Department for Energy Security and Net Zero.
Development Consent Order Requirement	The conditions which govern how the Proposed Development is to be delivered. These form part of the Schedule of Requirements which forms part of the Draft Development Consent Order.
Draft Development Consent Order	A Development Consent Order is a Statutory Instrument made by the Secretary of State pursuant to the Planning Act 2008. A draft version of the Development Consent Order is submitted in support of the Development Consent Order Application.
Embedded (primary) mitigation	Modifications to the location or design of the Proposed Development made during the pre-application phase that are an inherent part of the design of the Proposed Development and do not require additional action to be taken.
Enhancement	Measures to improve the environment, such as landscape resource and the visual amenity of the Proposed Development and its wider setting, over and above its baseline condition.
Environmental Impact Assessment Regulations	For the purpose of the Development Consent Order Application, the Environmental Impact Assessment Regulations are the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
Environmental Impact Assessment	A systematic means of assessing the significance of effects from the Proposed Development, undertaken in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
Environmental Statement	A statement prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 that includes the

	information that is reasonably required to assess the likely effects of a development and which the Applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile.
Examining Authority	Planning Inspector(s) responsible for conducting the examination and recommending a decision on a Development Consent Order Application to the Secretary of State.
Field (e.g. Field B1)	Each Land Area is made up of a number of fields which have been assigned a unique reference code, for example Field B1 (in Land Area B).
Flood map for planning	Defines Flood Zones based on annual probability of flooding from fluvial and tidal sources to inform development planning and flood risk assessment, with a Nationally consistent delineation of 'high', 'medium' and 'low' flood risk.
Flood Risk Assessment	A document that reviews a development in its proposal form to assess it against the risk of flooding, whether that be from groundwater, river (fluvial), surface water (pluvial), estuary/coastal (tidal), or from sewer sources.
Flood zones	Zones based on the annual probability of flooding from fluvial and tidal sources, as defined in the Flood Map for Planning. Areas are categorised into one of the following: Flood Zone 1, Flood Zone 2, Flood Zone 3a or Flood Zone 3b.
Flood Zone 1	Land assessed as having less than a 1 in 1,000 (0.1%) annual probability of flooding from rivers or the sea in any year.
Flood Zone 2	Land assessed as having between a 1 in 100 (1%) and 1 in 1000 (0.1%) annual probability of flooding from rivers, or between a 1 in 200 (0.5%) and 1 in 1,000 (0.1%) annual probability of flooding from the sea in any year.
Flood Zone 3a	Land assessed as having a 1 in 100 (1%) or greater annual probability of flooding from rivers or a 1 in 200 (0.5%) or greater annual probability of flooding from the sea in any year.
Flood Zone 3b	Land where water has to flow or be stored in times of flood.
Glare	A continuous source of bright light typically received by static receptors or from large reflective surfaces.

Glint	A momentary flash of bright light typically received by moving receptors or from moving reflectors.
Greenhouse gas	Gases that absorb and emit reflected solar radiation which result in the warming of the Earth's atmosphere. It is absorbed and emitted at specific wavelengths within the spectrum of infrared radiation emitted by the earth's surface, the atmosphere, and clouds. The six main greenhouse gases whose emissions are human caused are: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbon, and sulphur hexafluoride. In combination, these greenhouse gas emissions are commonly expressed in terms of 'carbon dioxide equivalents' (CO_2e) according to their relative global warming potential. For this reason, the shorthand 'carbon' may be used to refer to greenhouse gases.
Grid connection	The export and import of electricity from the Proposed Development to or from the National Grid Creyke Beck Substation.
Grid connection cable route	The proposed corridor in which 132kV cabling will be laid to connect the solar PV development (from Land Area E) to National Grid Creyke Beck Substation.
Groundwater	Groundwater is the store of water present beneath Earth's surface in rock and soil pore spaces and in the fractures of rock formations.
Habitat	The environment in which populations or individual species live or grow.
Heavy Goods Vehicle	Vehicles with 3 axles (articulated) or 4 or more axles (rigid and articulated).
Heritage	The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.
Heritage asset	A building, monument, site, place, area, or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage assets include designated heritage assets and non-designated heritage assets.
Horizontal Directional Drilling	Low impact trenchless method of installing underground cables.
Hybrid Pack	An arrangement of four Battery Energy Storage System units, one inverter (including transformer) and four DC-DC converters.
Inverter	Inverters convert the direct current (DC) electricity collected by the solar PV modules into alternating current

	(AC), which allows the electricity generated to be exported to the National Grid. Battery Energy Storage System also use inverters to convert between DC and AC. The batteries function in DC and electricity must be converted to/from AC to pass into or from the grid.
Land Areas (B to F)	The Proposed Development comprises several areas of land connected by underground cables (the interconnecting cable routes). The Land Areas are identified as follows (note, there is no Land Area A): • Land Area B: Land north-west of Long Riston; • Land Area C: Land west of Arnold; • Land Area D: Land south of the A1035; • Land Area E: Land east of Weel; and • Land Area F: Land north of Wawne.
Land use	The purpose for which land is used, based on broad categories of functional land cover, such as urban and infrastructure use and the different types of agricultural and forestry.
Landscape	An area, as perceived by people, the character of which is a result of the action and interaction of natural and/or human factors.
Landscape and Visual Impact Assessment	A tool used to identify and assess the likely significant effect of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenity.
Landscape character	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another.
Listed building	A building which is considered to be of special architectural or historic interest and listed in accordance with the Planning (Listed Buildings and Conservation Areas) Act 1990.
Local Development Plan	The set of documents and plans that sets out the Local Planning Authority's policies and proposals for the development and use of land in their area.
Local Wildlife Site	A site of local importance that has been identified and selected for its wildlife value.
Local Planning Authority	The function of a local authority that is empowered by law to exercise statutory town planning functions for a particular area of the UK.
Main compound	Designated area within a construction site that serves as the central hub for managing and supporting construction activities, containing staff welfare facilities

	and storage areas materials, plant and equipment. Four main compounds are expected to be located across the Site and would each have a footprint of up to 6,000m^2.
Mitigation hierarchy	The mitigation hierarchy is a structured approach to managing environmental impacts in an Environmental Impact Assessment. It involves a sequence of actions to avoid, minimise, restore, and, as a last resort, offset negative environmental effects. This approach prioritises prevention and reduction of harm before considering compensation.
Mounting structure	Metal structure onto which the solar PV modules are mounted.
National Planning Policy Framework	The document that sets out the UK Government's planning policies for England and how these are expected to be applied. The National Planning Policy Framework was last revised in December 2024.
National Policy Statement	Policy designated under the Planning Act 2008 concerning the planning and consenting of Nationally Significant Infrastructure Projects in the UK. Where applicable, they form the primary policy framework for the consenting of Nationally Significant Infrastructure Projects.
Nationally Significant Infrastructure Project	Projects which fall under one of the categories in Part 3 of the Planning Act 2008.
Non-statutory consultation	Consultation with stakeholders on the Proposed Development which occurred in addition to the statutory consultation.
On-site substation	The Proposed Development includes two on-site substations, which would receive the electricity from the solar PV modules and hybrid packs and step up the voltage from 33 kV to 132 kV ready to be exported to the National Grid Creyke Beck Substation via 132 kV underground cable. The substations would house electrical equipment such as transformers, switchgear and metering equipment. The two on-site substations are labelled Project Substation West and Project Substation East.
Order Limits	The boundary of the Site, i.e. the maximum extent of land potentially required temporarily and/or permanently for the construction, operation and decommissioning of the Proposed Development.

Outline Construction Environmental Management Plan	A document that details management methods to ensures that the Proposed Development will mitigate its potential impacts on the environment during construction.
Outline Construction Traffic Management Plan	A document that proposes measures to control the delivery of materials and staff onto the Site during the construction phase in the interests of safety and efficiency and also to mitigate effects on the local highway network.
Outline Decommissioning Environmental Management Plan	A document that details management methods to ensure that the Proposed Development will mitigate its potential impacts on the environment during decommissioning.
Outline Landscape and Ecological Management Plan	A document that sets out the principles for how the land will be managed throughout the operation (including maintenance) phase, following the completion of the construction phase.
Outline Operational Environmental Management Plan	A document that sets out the principles and key measures that will be employed during the operation (including maintenance) phase of the Proposed Development to control and minimise the impacts on the environment, including best practice guidelines on waste and water management.
Outline Rights of Way and Access Management Plan	A document that sets out the principles and measures that will be employed to manage public rights of way and permissive paths during the construction, operation (including maintenance) and decommissioning of the Proposed Development.
Outline Site Waste Management Plan	A document that sets out principles and measures for implementing, monitoring, and managing waste.
Outline Soil Management Plan	A document that sets out measures for soil management and follow the principles of best practice to maintain the physical properties of the soil
Parameter	A limit or boundary which defines the maximum or minimum height/width/length/depth of infrastructure, which will be shown on parameter plans and secured through the Development Consent Order.
Permissive path	A route for users on foot or with a horse, depending on what has been agreed to, that a private landowner has voluntarily opened up to the public, to enable them to cross his or her land. It does not constitute a public right of way.

Planning Act 2008 (PA 2008)	Primary legislation outlining the consent regime for major infrastructure projects in the fields of energy, transport, water, wastewater, and waste.
Planning Inspectorate	The Government agency responsible for administering applications for development consent under the Planning Act 2008 on behalf of the relevant Secretary of State.
Pollution	The introduction of harmful materials into an environment.
Public Rights of Way	Rights across land exercisable by the public at all times.
Preliminary Environmental Information Report	A document that is prepared to inform statutory consultation by enabling interested parties to develop an informed view of the likely significant environmental effects of the Proposed Development as understood at that point in time, based on available environmental baseline information and design information.
Project Substation East	The on-site substation located in Land Area C.
Project Substation West	The on-site substation in Land Area E.
Rochdale envelope	An acknowledged way of dealing with an application where details of a project have not been fully resolved by the time the application is submitted. The term is used to describe those elements of a scheme that have not yet been finalised, but can be accommodated within certain parameters allowing the likely significant effects of a project to be presented in the Environmental Statement as a reasonable worst case. It also provides the opportunity to assess aspects of a development where the detailed design is to be developed post grant of a Development Consent Order and approved by the Local Planning Authority under a Development Consent Order Requirement.
Satellite compound	Supplementary compound within the construction area, used to support the main compounds. These would have an area of up to 3,000m^2.
Secretary of State	In the case of the Proposed Development, this refers to the Secretary of State for Energy Security and Net Zero.
Setting	The surroundings within which a heritage asset is experienced and any element, which contributes to the understanding of its significance.
Significance	A measure of the importance of an effect defined by significance criteria specific to the environmental aspect.

Significant effects	It is a requirement of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 to determine the likely significant effects of development on the environment. The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and sensitivity of the receptor) that should be attached to the impact described. Whether an effect should be considered significant or not is not absolute and requires the application of professional judgement.
Solar photovoltaic (PV) modules	Panels comprised of photovoltaic cells beneath a layer of toughened glass that convert sunlight into electrical current.
String inverter	Types of inverter that are mounted underneath the solar PV modules.
Switchgear	Combination of electrical disconnect switches, fuses or circuit breakers to control, protect and isolate electrical equipment.
Transformer	A static piece of apparatus with two or more windings which, by electromagnetic induction, transforms a system of alternating voltage and current into another system of voltage and current usually of different values and at the same frequency for the purpose of transmitting electrical power.
Visual amenity	Overall enjoyment of a particular area, surroundings, or views in terms of people's activities - living, recreating, travelling through, visiting, or working.
Visual effect	An effect on specific views and on the general visual amenity experienced by people.

Executive Summary

This Design Approach Document has been prepared in support of an application for a Development Consent Order for the construction, operation (including maintenance) and decommissioning of Peartree Hill Solar Farm (the 'Proposed Development'). The Proposed Development consists of a solar photovoltaic array electricity generating facility and Battery Energy Storage System including solar photovoltaic modules and mounting structures, on-site supporting equipment including inverters, transformers and switchgears, two on-site substations and underground cabling to connect to the National Grid Creyke Beck Substation, associated infrastructure including fencing, drainage and storage containers and biodiversity and landscaping enhancement measures, together with temporary development during the construction phase.

The Proposed Development is a Nationally Significant Infrastructure Project under Section 14(1)(a) and Sections 15(1) and (2) of the Planning Act 2008 as it comprises a generating station in England with a capacity exceeding 50 megawatts. It therefore requires a Development Consent Order from the Secretary of State for the Department for Energy Security and Net Zero.

This Design Approach Document has been prepared on behalf of RWE Renewables UK Solar and Storage Ltd to support the Development Consent Order Application. The Design Approach Document sets out the vision, context and design response for the Proposed Development and should be read in conjunction with the other documents submitted with the Development Consent Order Application. The Design Approach Document details the consideration given to policy, the existing context and the necessary safety requirements when designing a solar farm.

1 Introduction

1.1 Purpose of this document

1.1.1 This Design Approach Document (DAD) has been prepared on behalf of RWE Renewables UK Solar and Storage Ltd (the 'Applicant') in support of an application for a Development Consent Order (DCO) (the 'DCO Application') made to the Secretary of State for the Department for Energy Security and Net Zero ('SoS'), pursuant to the Planning Act 2008 (PA 2008) **[Ref. 1]**. The DCO Application is for a Nationally Significant Infrastructure Project (NSIP) for the installation of a solar photovoltaic (PV) array electricity generating facility, Battery Energy Storage System (BESS) and associated infrastructure (the 'Proposed Development') which would allow for the generation and export of electricity. The **Location and Land Area Plan [EN010157/APP/2.1]** shows the Order Limits (the 'Order Limits') for the Proposed Development, which is approximately 891 hectares of land located within the council area of East Riding of Yorkshire Council ('ERYC').

1.1.2 The Proposed Development includes infrastructure capable of generating more than 50 megawatts (MW) of renewable energy which is to connect to the National Electricity Transmission System (NETS) at National Grid's Creyke Beck Substation.

1.1.3 The purpose of the DAD is to set out the vision, context and design response for the Proposed Development. The preparation of the DAD has been informed by the 'Nationally Significant Infrastructure Projects: Advice on Good Design' **[Ref. 2]**, the relevant National Policy Statements (NPS) **[Ref. 3, 4 and 5]**, the National Infrastructure Commission (NIC) Principles of Good Design **[Ref. 6]** and the draft East Riding of Yorkshire Design Code **[Ref. 7]**.

1.1.4 The DAD outlines the design vision and project design principles which have informed the design of the Proposed Development, as well as the **Design Parameters Document [EN010157/APP/5.8]** which sets out parameters and principles with which the Proposed Development is required to comply**.**

1.1.5 The DAD is intended to be read alongside and supplement other DCO Application documents, namely:

- **Consultation Report [EN010157/APP/5.1];**
- **Planning Statement [EN010157/APP/5.5];**
- **Design Parameters Document [EN010157/APP/5.8];**

- **Environmental Statement (ES) Volume 2, Chapters 6-15 [EN010157/APP/6.2];**
- **ES Volume 3, Figure 7.1: Designated sites and ecological mitigation and enhancement areas [EN010157/APP/6.3]; and,**
- **Outline Landscape and Ecological Management Plan (LEMP) [EN010157/APP/7.5].**

1.2 Structure of this document

1.2.1 This DAD is organised into chapters, in so far as is possible in a logical and chronological order, detailing the consideration given to policy, the existing context and the necessary safety requirements when designing a solar farm.

1.2.2 A short summary of what can be found in each chapter is provided below:

- **Chapter 1 Introduction -** provides an introduction to the DAD, its purpose and how it interacts with the wider application.
- **Chapter 2 The Proposed Development -** provides a summary of the description and the components which make up the Proposed Development.
- **Chapter 3 The Design Vision -** outlines the vision that the Applicant has developed in collaboration with stakeholders as well as the resulting project design principles.
- **Chapter 4 Design Context -** summarises the relevant national and local policy requirements for achieving 'good design'.
- **Chapter 5 Location Context -** provides a summarised description of the existing landscape, referring to landscape and visual, cultural heritage, biodiversity and land use.
- **Chapter 6 Evolution of the Design -** provides an account of how the design of the Proposed Development has evolved since conceptualisation until DCO submission.
- **Chapter 7 The Design Response -** provides an account of how the design of the Proposed Development has responded to the design context and the location context, detailing the remaining landscape and visual effects.
- **Chapter 8 Conclusion -** sets out the conclusions of this DAD, and how the Applicant has sought to design the Proposed Development in a sympathetic way.

1.3 Pre-Application Engagement and Consultation

1.3.1 The development of the design of the Proposed Development has included extensive engagement and consultation with local landowners, business owners, residents and statutory stakeholders and regulators.

1.3.2 The PA 2008 **[Ref. 1]** requires applicants for DCOs to carry out formal (statutory) pre-application consultation on their proposals. To satisfy the requirements on consultation that must be undertaken as set out in the PA 2008 and related regulations, the Applicant has adopted a three-stage approach to pre-application consultation.

1.3.3 A non-statutory consultation (Stage 1) was carried out between Monday 9 October 2023 and Monday 6 November 2023, and statutory consultation (Stage 2) in compliance with Sections 42 and 47 of the PA 2008 **[Ref 1]** was undertaken between Wednesday 15 May 2024 to Wednesday 26 June 2024, supported by a Preliminary Environmental Information Report (PEIR). Following ongoing design development and environmental assessments, a number of revisions to the draft Order Limits, which required additional land for construction or operation of the Proposed Development were identified. A targeted consultation (Stage 3) took place between Tuesday 8 October and Friday 8 November 2024 to consult on these changes.

1.3.4 In addition to the three-stage approach outlined above, the Applicant has undertaken extensive engagement with ERYC, statutory prescribed persons, relevant statutory undertakers, those with an interest in the land, as well as those who may be affected by the Proposed Development throughout the development of the Proposed Development. This ongoing engagement with the ERYC has comprised of regular meetings where updates have been provided on the Proposed Development, including the development of the design, and technical meetings with the ERYC's relevant technical specialists.

1.3.5 The Applicant has had regard to all feedback it has received through consultation and engagement when refining the Proposed Development.

1.3.6 For a detailed account of the consultation and engagement undertaken during the pre-application period, please see the **Consultation Report [EN010157/APP/5.1]**.

2 The Proposed Development

2.1 Project Description

2.1.1 This section provides an overview description of the Proposed Development, including the components of the Proposed Development, alongside the proposed construction, operation (including maintenance) and decommissioning activities. The full description is contained within **ES Volume 1, Chapter 3: Proposed Development Description [EN010157/APP/6.1].**

2.2 Project Components

2.2.1 The principal components of the Proposed Development include:

- Solar PV modules and associated mounting structures (groupings of solar PV modules are referred to as 'arrays');
- On-site supporting equipment including inverters, transformers, direct current (DC)-DC converters and switchgear;
- A BESS including batteries and associated enclosures, monitoring systems, air conditioning, electrical cables and fire safety infrastructure;
- Two on-site 132 kV substations, including transformers, switchgear, circuit breakers, control equipment buildings, control functions, material storage, parking, as well as wider monitoring and maintenance equipment;
- Low voltage and 33 kV interconnecting cabling within and between the Land Areas to connect the solar PV modules together and to transmit electricity from the solar PV modules and BESS to one of the two on-site 132 kV substations;
- 132 kV underground cables (two 132 kV export cables) connecting the on-site substations to the National Grid Creyke Beck Substation;
- Works at the National Grid Creyke Beck Substation to facilitate the connection of the 132 kV underground cabling into the substation;
- Associated infrastructure including access tracks, parking, security measures, gates and fencing, lighting, drainage infrastructure, storage containers, earthworks, surface water management, maintenance and welfare facilities, security cabins and any other works identified as necessary to enable the development;
- Highways works to facilitate access for construction vehicles, comprising passing places where necessary to ensure that heavy goods vehicles (HGVs)

can be safely accommodated amongst existing traffic, new or improved site accesses and visibility splays;

- A series of new permissive paths connecting to the existing public right of way network;
- Environmental mitigation and enhancement measures, including landscaping, habitat management, biodiversity enhancement and amenity improvements; and,
- Temporary development during the construction phase of the Proposed Development including construction compounds, parking and laydown areas.

The Proposed Development includes environmental mitigation and enhancement measures to avoid or reduce adverse impacts on the surrounding environment and nearby communities. These are illustrated on the **Outline LEMP [EN010157/APP/7.5]**.

3 The Design Vision

3.1 Introduction

3.1.1 As described in the **Statement of Need** at Appendix 3 of the **Planning Statement [EN010157/APP/5.5]** and chapter 4 of this DAD, large scale solar generation is expected to make an important contribution to achieving the Government's objectives for the UKs energy supply. As summarised in the Overarching National Policy Statement for Energy (NPS EN-1) **[Ref. 3]**, paragraph 3.2.1, these objectives include ensuring that the supply of energy always remains secure, reliable, affordable, and enables the UK to transition to a low carbon economy in order to meet its carbon emission reduction commitments.

3.1.2 To support this objective, the Applicant's vision for the Proposed Development is to deliver a project that will seek to maximise energy yield whilst seeking to minimise any adverse effects on the environment and at the same time taking opportunities to deliver significant local benefit.

3.1.3 Good design influenced every decision, and conservation and enhancement of the local environment sits 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 project 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.

3.2 Design Principles

3.2.1 The NIC provide expert impartial advice to Government on major infrastructure projects. The NIC's Design Group has identified four principles to guide the planning and delivery of major infrastructure projects being:

- **Climate** – Mitigate greenhouse gas emissions and adapt to climate change;
- **People** – Reflect what society wants and share benefits widely;
- **Places** – Provide a sense of identity and improve our environment; and
- **Value** – Achieve multiple benefits and solve problems well.

3.2.2 The NIC define the role of principles as "reminders to the delivery organisation, a steer in the right direction, and a means of restoring focus to the big picture… Design Principles should be a point of departure, setting out a common understanding of the issues to be addressed" **[Ref. 8]**.

3.2.3 The Proposed Development has adopted the NIC Design Principles of climate, people, place and value to guide the design of the Proposed Development. These NIC Design Principles have been used to frame a set of specific project design principles which ensure the Proposed Development fits sensitively into the local context, mitigates environmental effects, respects local communities and conserves the environment where possible.

3.3 Project Design Principles

3.3.1 A set of tailored project design principles have been developed based on the project experience of the design team, and with reference to the NIC Design Principles **[Ref. 6]** and the draft East Riding Design Code **[Ref. 7]**. These principles have been established to, avoid reduce, and then mitigate potential and identified environmental impacts where possible. The project design principes also seek to, where appropriate, look at wider ranging enhancements or improvements for local stakeholders.

3.3.2 The project design principles at the core of the design for the Proposed Development are set out in **Table 1** below:

Table 1 Proposed project design principles

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 and noise).
	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.

3.3.3 The design development of the Proposed Development, and how the project design principles have influenced the design response are set out in chapter 7 of this DAD as well as in the **Outline LEMP [EN010157/APP/7.5]** insofar as they have been considered within the design process as relevant to the Outline LEMP.

4 Design Context

4.1 Introduction

4.1.1 This chapter provides a summary of the planning policy documents and guidance considered to be relevant and important to the good design of the Proposed Development.

4.1.2 It provides an overview of the design requirements established by the relevant NPSs, and the NICs Principles of Good Design.

4.2 Overarching National Policy Statement for Energy (NPS EN-1)

4.2.1 The Proposed Development has been designed in accordance with NPS EN-1 **[Ref 3]** and the requirements set out regarding good design. NPS EN-1 was published in November 2023 and designated in January 2024, as an update to the previous suite of energy NPSs designated in 2011.

4.2.2 NPS EN-1 introduces the critical national priority (CNP) for low carbon infrastructure. Set out in section 4.2 of NPS EN-1, the CNP explicitly identifies the need for nationally significant low carbon infrastructure to meet Government decarbonisation targets and achieve net zero ambitions. Paragraph 4.2.5 of NPS EN-1 confirms that solar photovoltaic generation is a form of CNP infrastructure.

4.2.3 Paragraph 4.2.6 of NPS EN-1 goes on to state that substantial weight should be given to the overarching need case for CNP infrastructure, as a starting point for determination of energy infrastructure applications. It is clarified in paragraphs 4.2.7 to 4.2.9 of NPS EN-that the needs case is to be considered taking into account the impacts of the Proposed Development and the application of the mitigation hierarchy, however the CNP policy will influence how residual impacts are considered in the overall planning balance. NPS EN-1 is referring here to the policy position that for CNP infrastructure, residual impacts remaining after application of the mitigation hierarchy are unlikely to outweigh the urgent need for the Proposed Development. Exceptions to this relate to a limited, specified set of unacceptable risks presented by residual impacts. An assessment of the overall planning balance of the Proposed Development is provided in section 9 of the **Planning Statement [EN010157/APP/5.5].**

4.2.4 Section 4.7 of NPS EN-1 establishes the need for “good design" in energy infrastructure, identifying in paragraphs 4.7.1 to 4.7.4 of NPS EN-1 that implementing good design can:

- Create high quality, inclusive design which is also fit for purpose and sustainable;
- Create sustainable infrastructure which is sensitive to place;
- Be a means through which many NPS policy objectives can be met; and
- Mitigate adverse effects of a project.

4.2.5 Paragraph 4.1.5 of NPS EN-1 defines the 'mitigation hierarchy' as measures to "avoid, reduce, mitigate or compensate for any adverse impacts", and clarifies at 4.3.8 of NPS EN-1 that references to 'impacts' within the NPS should be taken to mean 'likely significant impacts'. Paragraph 4.2.11 of NPS EN-1 indicates that the mitigation hierarchy must be applied to projects and that residual impacts should only be those which "cannot be avoided, reduced or mitigated".

4.2.6 Applicants are encouraged to embed good design within a project from the outset, with paragraph 4.7.5 of NPS EN-1 referring to the use of "design principles" to be established to guide the project from conception to operation. Paragraph 4.7.7 of NPS EN-1 requires that applicants demonstrate in their DCO Application how the design process was conducted and evolved, and why a favoured choice was selected where different designs were considered.

4.2.7 Paragraphs 4.7.6 and 4.7.10 to 4.7.12 of NPS EN-1 recognise the role of functionality and operational requirements in designing new energy infrastructure, in which the scope of the design approach may be constrained or limited in some respects due to the need for a functional, safe and secure development. However, the benefits of ensuring both functionality and aesthetics are highlighted with regard to ensuring a proposal is sensitive to its location, contributes to the quality of an area where possible and remains durable and adaptable.

4.2.8 Paragraph 5.10.19 of NPS EN-1 outlines that applicants should consider landscape and visual matters in the early stages of siting and design, where site choices and design principles are being established. By considering landscape and visual matters early in the process, the applicant can demonstrate in the ES how negative effects have been minimised and opportunities for creating positive benefits or enhancement have been recognised and incorporated into the design, delivery and operation of the scheme.

4.2.9 Paragraph 5.11.23 of NPS EN-1 goes on to state that although in the case of most energy infrastructure there may be little that can be done to mitigate the direct effects of an energy project on the existing use of the proposed site applicants should nevertheless seek to minimise these effects and the effects on existing or planned uses near the site by the application of good design principles, including the layout of the project and the protection of soils during construction.

4.3 National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) and National Policy Statement for Electricity Networks Infrastructure (NPS EN-5)

4.3.1 NPS EN-3 **[Ref 4]** and NPS EN-5 **[Ref 5]** set out technology-specific policy, relating to solar infrastructure and electricity networks infrastructure respectively. They make reference to the overarching principles of good design as set out in NPS EN-1, with the concept underpinning the approach outlined in many policy topics across the NPS suite.

4.3.2 NPS EN-3 identifies in section 2.3 that a number of factors may influence site selection and design, recognising that most renewable energy resources can only be developed where that resource exists and is economically feasible. Paragraphs 2.10.19 to 2.10.26 of NPS EN-3 identifies how irradiance, topography and grid connection are key factors for solar farm siting and commercial viability, noting the need to consider cumulative effects where there may be other energy generating stations in proximity. The site selection process for the Proposed Development was informed by section 2.10 of NPS EN-3 and is described in the **Site Selection Assessment** at Appendix 2 of the **Planning Statement [EN010157/APP/5.5].**

4.3.3 Paragraph 2.10.59 to 2.10.64 of NPS EN-3 outlines technical considerations for the layout design and appearance of solar farms. Paragraph 2.10.59 of NPS EN-3 states that applicants should consider the criteria for good design set out in EN-1 Section 4.7 at an early stage when developing projects. Paragraph 2.10.61 of NPS EN-3 outlines that for a solar farm to generate electricity efficiently the panel array spacing should seek to maximise the potential power output of the site. The type, spacing and aspect of panel arrays will depend on the physical characteristics of the site such as site elevation. Paragraph 2.10.62 of NPS EN-3 goes on to state that applicants may favour a south facing arrangement of panels to maximise output although other orientations may be chosen. Paragraphs 2.10.63 and 2.10.64 of NPS EN-3 also consider the cabling required for solar farms to connect the electrical assets of the site, such as from the substation to the panel arrays or storage facilities.

4.3.4 Paragraph 2.2.7 of NPS EN-5 notes that it is not necessarily always the case that the cable route should be the most direct, as there will be other factors including engineering and environmental aspects that would be important in determining a feasible route. Paragraph 2.2.1 to 2.2.6 of NPS EN-5 states that siting is not always within the control of the applicant and is determined by the location of new generating stations and system capacity, but that applicants do have control over

the routing and site selection. Locational constraints do not exempt candidates from balancing site selection or good design considerations. Paragraphs 2.2.8 to 2.2.9 of NPS EN-5 state that the flexibility of locating substations should allow the Applicant to consider local characteristics and screening and other mitigation options. The cable route selection process for the Proposed Development was informed by NPS-EN-5 and is described in the **Site Selection Assessment** at Appendix 2 of the **Planning Statement [EN010157/APP/5.5]**.

4.4 Local policies on good design

4.4.1 The East Riding Local Plan (ERLP) 2012 – 2029 **[Ref. 9]**, which was adopted in April 2016, contains strategic policies that refer to the need for good design in new development.

4.4.2 Policy ENV1: 'Integrating high quality design' states that development will be supported where it achieves a high quality of design that optimises the potential of the site and contributes to a sense of place. This policy also states that: 'Where possible, the design of development that maximises the use of decentralised and renewable or very low carbon technologies will be supported.'

4.4.3 Policy ENV2: 'Promoting a high quality landscape' requires that all development proposals are sensitively integrated into the existing landscape, demonstrate an understanding of the intrinsic qualities of the landscape setting and, where possible, seek to make the most of the opportunities to protect and enhance landscape characteristics and features.

4.4.4 The design of the Proposed Development has sought to respond to the local planning policies. The project design principles were developed at an early stage and have guided the design response to the local context to develop a good design that balances the need to maximise renewable energy generation from the Proposed Development. Details of the Proposed Development's accordance with Local Planning Policy are detailed in Table 5 of the **Policy Accordance Tables** at Appendix 1 of the **Planning Statement [EN010157/APP/5.5]**.

4.5 The Mitigation Hierarchy

4.5.1 The design process has incorporated a practical hierarchy of mitigation with the purpose of identifying how potential impacts can be avoided, reduced or mitigated where possible. The first option would be to avoid the impacts at source, which would involve removing the feature or re-siting it to an area where it would have no or reduced effects. In some instances, where it is not possible to avoid impacts altogether the potential to reduce impacts has been explored.

4.5.2 It is acknowledged that not all impacts will be able to be avoided and in some cases even reduced. The Proposed Development has therefore also considered mitigation to offset adverse effects on the environment. Where the Applicant considers that opportunities for environmental enhancement exist, these are detailed within **ES Volume 2, Chapters 6 to 15 [EN010157/APP/6.2]** and section 7 of this document.

4.5.3 Mitigation measures proposed to prevent, reduce or offset likely adverse effects have been identified and developed as part of the iterative design process. The primary mitigation measures have been embedded into the Proposed Development design and are referred to as embedded mitigation. Where avoidance of an impact through embedded mitigation is not possible, or is only partly effective, further 'essential mitigation' is considered. Further details of embedded mitigation measures are provided in **ES Volume 1, Chapter 3: Proposed Development Description [EN010157/APP/6.1].**

4.5.4 The **Outline LEMP [EN010157/APP/7.5]** sets out how the Proposed Development will include recreation and amenity improvements. These will be designed to retain and enhance recreational connectivity across the Proposed Development.

4.6 Applying 'good design'

4.6.1 An appraisal of how the Proposed Development is in compliance with relevant planning policy relating to good design is provided in the **Policy Accordance Tables** at Appendix 1 of the **Planning Statement [EN010157/APP/5.5]**.

4.6.2 The remainder of this DAD demonstrates how the Proposed Development has taken into account the criteria of NPS EN-1, NPS EN-3 and NPS EN-5 in relation to good design. It sets out the local context in which the Proposed Development is situated and outlines the design response to that context in seeking to mitigate adverse impacts and integrate good design principles. Recognising the constraints presented by some infrastructure, it also identifies how technical considerations have in some instances limited design choices.

4.6.3 This DAD is supported by the **Site Selection Assessment** at Appendix 2 of the **Planning Statement [EN010157/APP/5.5]** and **ES Volume 1, Chapter 4: Alternatives and Design Iteration [EN010157/APP/6.1]**. These documents provide a description of the site selection process, consideration of alternatives and design development. These documents demonstrate that good design principles have been incorporated into the approach to the Proposed Development since inception, with early site selection seeking to balance operational and functional needs with the intention to avoid, where possible, sensitive environments and constraints. The iterative approach to design has

sought to ensure that changes could be made in response to assessment and feedback in order to better fit the proposals into the existing context, avoid or reduce adverse effects and deliver enhancement where feasible.

4.6.4 As set out in the Mitigation Hierarchy (section 4.5 of this DAD), throughout the design process, changes have been made and implemented into the design of the Proposed Development to avoid or reduce adverse environmental effects and to make the Proposed Development fit better into the wider landscape. To secure the delivery of good design, should development consent be granted, a list of design parameters which underpin the Proposed Development is contained within the **Design Parameters Document [EN010157/APP/5.8]**. These parameters would be required to be retained in the future detailed design and would be secured pursuant to a requirement of the **Draft Development Consent Order (DCO) [EN010157/APP/3.1]**.

4.6.5 Taking into account the points summarised above, it is concluded in the **Planning Statement [EN010157/APP/5.5]** that the Proposed Development is in compliance with policy relating to good design. Please refer to the Planning Statement, including Appendix 1, for further detail on the policy appraisal.

5 Location Context

5.1.1 The Order Limits comprise of approximately 891 hectares of land located within the administrative boundary of East Riding of Yorkshire, presented in **ES Volume 3, Figure 1.1: Order Limits and Administrative Boundaries [EN010157/APP/6.3]**. The Order Limits are the anticipated maximum area of land that would be required to facilitate the construction, operation (including maintenance) and decommissioning of the Proposed Development pursuant to the DCO.

5.1.2 The Proposed Development is located north of the city of Hull and east of the town of Beverley, between the villages of Tickton, Routh, Leven, Long Riston, Arnold, Wawne, Woodmansey and Weel.

5.1.3 The Proposed Development is made up of five Land Areas, interconnecting underground cables between Land Areas, 132 kV underground cable route to National Grid Creyke Beck Substation, and sections of highway land. These are presented on **ES Volume 3, Figure 1.2: Land Areas and Cable Routes Plan with Field Numbering System [EN010157/APP/6.3]**. The five Land Areas include:

- **Land Area B**: This area comprises two separate sections. One lies west of the A165 and is bounded to the north by the A1035, to the west by Meaux and Routh East Drain, to the east by an unnamed ditch, and to the south by Land Area C. Monk Dike runs through the centre of this section. The other smaller section of Land Area B lies east of the A165 and north of Long Riston and is bounded by agricultural fields and ditches.
- **Land Area C**: This area lies adjacent to the southern boundary of Land Area B. It is bounded to the west by Arnold West Carr Drain/Arnold and Riston Drain and to the south by Kidhill Lane. Along the eastern boundary are ditches and agricultural land.
- **Land Area D**: This area is located in the centre of the overall Order Limits. It is adjacent to Land Area E, which lies to the south-west. The area is bounded by various drains and ditches and crosses Meaux Lane. On the eastern border is Cote Wood Local Wildlife Site and semi-natural ancient woodland. Meaux Abbey Scheduled Monument lies to the south.
- **Land Area E**: This area comprises three separate sections. The westernmost of these, located approximately 300 m east of Weel at the closest point, lies either side of Carr Lane and is bounded by ditches and agricultural land. The largest section of Land Area E is primarily bounded to the west and south by Holderness Drain, to the east by Meaux West ditch, and to the north-east by

Land Area D. To the north is agricultural land, within which is Meaux duck decoy Scheduled Monument. Beyond this is the third section of Land Area E, which is divided in two by a strip of woodland. Meaux Abbey Scheduled Monument lies to the south-east of Land Area E.

- **Land Area F**: This is the southernmost area, lying approximately 730 m north-east of Wawne at the closest point. It is largely bounded to the north and east by Holderness Drain. In other directions are agricultural fields. To the north, beyond Holderness Drain, is Meaux Abbey Scheduled Monument. Meaux Road runs north to south through this Land Area.

5.1.4 More detail on the location of the Proposed Development is provided in **ES Volume 1, Chapter 2: Location of the Proposed Development [EN010157/APP/6.1]**.

5.2 Landscape and Visual

5.2.1 The Order Limits have been selected and designed to avoid any statutory landscape designations. The nearest National Landscapes (previously known as Areas of Outstanding Natural Beauty) to the Proposed Development are the Lincolnshire Wolds and Howardian Hills National Landscapes, both of which are over 30 km from the Order Limits.

5.2.2 Nationally, the Proposed Development is located within the centre of a National Character Area (NCA) 40 Holderness. At a district level, the East Riding of Yorkshire Landscape Character Assessment **[Ref 10]** identifies Landscape Character Types (LCTs) and Landscape Character Areas (LCAs). The LCAs within the Order Limits are presented in **ES Volume 3, Figure 11.4: Landscape Character [EN010157/APP/6.3]**.

5.2.3 All of Land Areas B-F are located within LCT 19: Open Farmland and specifically LCA 19D: Central Holderness Open Farmland, with the exception of Fields E13-E17 which are located within LCT 18: Low Lying Drained Farmland and specifically LCA 18A: River Hull Corridor. To the south-west of Land Areas B-F the grid connection cable route passes through LCA 18A: River Hull Corridor; LCA 18F: Figham and Swine Moor Common and LCA 16F: Beverley Parks Farmland. The grid connection cable route stops on the boundary of LCA 17B: North Cottingham Farmland.

5.2.4 The local landscape is flat, ranging between 1 metre above ordnance datum (mAOD) and 12 mAOD, but small localised undulations can appear noticeable in the wider level landscape. A series of ditches and dykes form a key characteristic of the landscape and the River Hull runs to the west of the Order Limits. The River

Hull and some dykes are enclosed by flood embankments, which are often the highest point in the local landscape and provide a visual barrier, as well as a higher vantage point for views across the landscape.

5.2.5 The landscape is open with wide views of exposed arable farmland and the sky. There are no identified vistas, focal points or prominent horizons, as referenced in the ERLP **[Ref. 9]** or East Riding of Yorkshire Landscape Character Assessment **[Ref. 10]**, upon which these views focus. The relatively flat landscape means there can often be long-distance views around the Proposed Development, but also that fairly low-level planting, such as hedgerows, can foreshorten views and provide significant screening.

5.2.6 The River Hull is a key feature of the landscape and separates the large town of Beverley to the west of the river from the agricultural landscape to the east. The river is also a noticeable visual barrier with the embankments visible as ridges in the wider landscape.

5.2.7 The A1035 is a prominent feature which cuts through the agricultural landscape in the vicinity of the Order Limits. The road is extremely busy and removes all tranquillity from the area. In addition, the roadside vegetation on both sides of the A1035 creates a prominent visual barrier in the landscape.

5.2.8 The 12 wind turbines at Hall Farm Wind Farm, and individual turbines elsewhere within the vicinity of the Order Limits, are prominent vertical features in the landscape.

5.2.9 For more information, please refer to **ES Volume 2, Chapter 11: Landscape and Visual [EN010157/APP/6.2]**.

5.3 Cultural Heritage

5.3.1 There are no known designated heritage assets within the Order Limits.. However, there are a number of Scheduled Monuments, Grade II Registered Parks and Gardens, Conservation Areas and Listed Buildings (Grade I, II and II*) within 5 km of the Order Limits.

5.3.2 The following heritage assets are located within 5 km of the Order Limits.

- 35 Scheduled Monuments. Three of the Scheduled Monuments (Hayholme moated site (NHLE 1008043), Baynard Castle (NHLE 1019823) and Haltemprice Augustinian Priory (NHLE 1019825)) are on the Heritage at Risk Register;
- Two Grade II Registered Parks and Gardens. One of the Registered Parks and Gardens (Thwaite Hall, NHLE 1000137) is on the Heritage at Risk Register;

- 14 Grade I Listed Buildings;
- 51 Grade II* Listed Buildings;
- 573 Grade II Listed Buildings; and
- 26 Conservation Areas. One of the Conservation Areas (Beverley Road, Hull) is on the Heritage at Risk Register

5.3.3 There are no Registered Battlefields or World Heritage Sites within 5km of the Order Limits.

5.3.4 More detailed information regarding cultural heritage is provided within **ES, Volume 2, Chapter 9: Cultural Heritage [EN010157/APP/6.2]**.

5.3.5 During operation the siting of solar PV modules within the Order Limits has the potential to result in a change to the setting of surrounding designated and non-designated assets. However, the key elements of the asset's values, derived from their surviving historic fabric and form, and from where they are experienced, would be preserved. Mitigation measures have been embedded into the design and layout to reduce any potential effects and include the retention of existing vegetation screening and the inclusion of open space to preserve the asset's immediate settings.

5.3.6 The Proposed Development has been designed sensitively taking into account known heritage assets, their status and settings. The Proposed Development and associated works have been sited to minimise any impact on the setting of the previously mentioned assets. Therefore the Proposed Development would not result in any significant effects on designated heritage assets and would minimise to a negligible level any other harms to the identified heritage assets or their settings.

5.3.7 For further information, see **ES Volume 2, Chapter 9: Cultural Heritage [EN010157/APP/6.2]**.

5.4 Ecology and Biodiversity

5.4.1 There are no statutory ecological designations within the Order Limits however there are a number of internationally and nationally statutorily designated sites as well as non-statutorily designated sites within the surrounding area. These include five international statutory designations covering three sites within 10 km of the Order Limits, two statutory nationally designated sites within 2 km of the Order Limits. A portion of the Order Limits, associated with the cable route corridor includes part of Figham Pastures Local Wildlife Site which is a non-statutory designated site. In addition, there are six other non-statutory designated

sites (Local Wildlife Sites) within 1 km of the Order Limits, including Cote Wood Local Wildlife Site, which borders Land Area D.

5.4.2 There is one area of ancient semi-natural woodland within 1 km of the Order Limits, Cote Wood Local Wildlife Site, which is adjacent to Fields D11 and D17, though on the other side of a ditch.

5.4.3 In addition, there are areas of priority deciduous woodland (in the central and western sections of the Order Limits) and areas of floodplain grazing marsh (to the south-west of the Order Limits).

5.4.4 More detailed information regarding biodiversity is provided within **ES Volume 2, Chapter 7: Biodiversity [EN010157/APP/6.2]**.

5.5 Land Use

5.5.1 Public Rights of Way (PRoW) run through the Proposed Development and throughout the surrounding area, providing recreation opportunities for walkers and local people. Not all of the PRoW which intersect with the Proposed Development are considered to be impacted by it.

5.5.2 The local area to the Order Limits predominately consists of agricultural fields (mostly arable with some grassland) interspersed with hedgerows, ditches, small woodland blocks and farm access tracks. The hedgerows within the Order Limits range from dense tall vegetation to sporadic shrubs and trees present. The fields are bordered by a mix of hedgerows, wet ditches and some of the many major named drains and dykes in the area including Monk Dike and Holderness Drain.

5.5.3 The Applicant took into account the agricultural land classification (ALC) and type when identifying the Order Limits and the solar PV development within it. This was initially based on the publicly available national level data and field surveys, alongside initial conversations with the landowners regarding the quality and viability of the land for agriculture.

5.5.4 A detailed survey for agricultural land quality has subsequently been undertaken and presented in the ES which confirms the majority of the land within the Order Limits is classified as grade 3b, which is not considered best and most versatile. Further information on ALC is provided in **ES Volume 2, Chapter 10: Land, Soil and Groundwater [EN010157/APP/6.2]**.

5.5.5 More detailed information regarding geology is provided within **ES, Volume 2, Chapter 10: Land, Soil and Groundwater [EN010157/APP/6.2]**.

5.6 Water Resources

5.6.1 The land within the Order Limits is located in predominantly low-lying land, which relies on a network of drainage systems including ditches, culverts and pumping stations and is located within the area administered by the Beverley and North Holderness Internal Drainage Board.

5.6.2 The Order Limits are predominantly located in Flood Zones 2 and 3, albeit benefitting from the presence of flood defences including the River Hull Tidal Surge Barrier. Flood Zone 3 indicates an area that has a high probability of flooding, defined as a 1% or greater annual probability of river or sea flooding. Flood Zone 2 is defined as having between a 0.1% and 1% annual probability of river or sea flooding. More detailed information regarding water resources is provided within **ES Volume 4, Appendix 5.6: Flood Risk Assessment [EN010157/APP/6.4]**.

6 Evolution of the Design

6.1 Initial site selection

6.1.1 The initial step in the evolution of the design of the Proposed Development was the selection of the land plots within Order Limits. The Applicant undertook a three-stage site selection process to identify the location of the Proposed Development which is outlined within **Site Selection Assessment** at Appendix 2 of the **Planning Statement [EN010157/APP/5.5]**. The Site Selection Assessment outlines three fundamental attributes for large scale solar farms, which form the site selection principles for the Proposed Development. These attributes are:

- Existence of sufficient land to deliver the project and meet the scale of the Proposed Developments aims;
- Availability and capacity of a suitable point of connection to the NETS; and

6.1.2 Solar irradiation levels to support the Proposed Development's potential to produce and efficient and economic energy yield.

6.1.3 The **Site Selection Assessment** at Appendix 2 of the **Planning Statement [EN010157/APP/5.5]** was informed by the factors influencing site selection and design outlined in Section 2.10 of NPS EN-3 **[Ref. 4]**. An overview of these factors and how they informed the Site Selection Assessment is as follows:

- **Irradiance and site topography** – preference was given to sites with a south facing aspect and flatter topography;
- **Network connection** – the site selection focused on the area around the National Grid Creyke Beck Substation where there was available connection with preference given to sites in close proximity to the point of connection;
- **Proximity of site to dwellings** – the site selection sought to avoid sites in close proximity to residential dwellings or where it would not be possible to appropriately mitigate visual amenity and glint and glare;
- **Agricultural land classification and land type** – the site selection sought to minimise the impact on best and most versatile agricultural land (land classified as Grade 3a and above);
- **Accessibility** – the site selection considered the suitability of the access routes to the proposed sites, during construction, operation (including maintenance) and decommissioning;

6.1.4 The Site Selection Assessment also had regard to several environmental and spatial considerations, including:

- **Designated international and national ecological and geological sites** – the site selection considered the proximity to nationally recognised designations such as Sites of Special Scientific Interest (SSSI), National Nature Reserves, National Parks, the Broads, Registered Parks and Gardens and World Heritage Sites. The site selection process has sought to avoid these areas;
- **Nationally designated landscapes** - the site selection considered the proximity to nationally designated landscapes. The site selection process has sought to avoid these areas;
- **Scheduled Monuments and conservation areas** - the site selection considered the proximity to Scheduled Monuments and conservation areas. The site selection process has sought to avoid sites which contain scheduled monuments;
- **Proximity to human receptors** - consideration was given to the proximity of nearby sensitive human receptors which include residential dwellings, and populated areas/villages; and
- **Flooding** - the site selection process considered areas of lower flood risk.

6.2 Design iteration

6.2.1 The location, design and layout of the Proposed Development has formed part of an iterative process which has been informed and shaped by the ongoing environmental assessment process, site selection assessment and taking into consideration the project design principles and ongoing engagement and consultation with stakeholders and consultees.

6.2.2 **ES Volume 1, Chapter 4: Alternatives and Design Iteration [EN010157/APP/6.1]** explains the legal and policy background of the consideration of alternatives and background to the design development of the Order Limits. The Chapter covers the evolution of the design of the Proposed Development from the identification of the Order Limits through to the design of the Proposed Development submitted for the DCO Application

6.2.3 The design parameters of the DCO Application will maintain a degree of flexibility under the Rochdale Envelope to allow for the latest solar technology to be utilised at the time of construction; further information can be found in **ES Volume 1, Chapter 3: Proposed Development Description [EN010157/APP/6.1]**.

6.2.4 Throughout the design process, the primary options under consideration have been a fixed panel or tracking panel system and the need to preserve a flexibility of choice remains in terms of the DCO Application. Therefore, each environmental factor assessment presented in this ES assesses the worst-case scenario in terms of fixed or tracker panels, the choice of which is clearly stated within each of the environmental factor assessment chapters **ES Volume 2, Chapters 6 to 15 [EN010157/APP/6.2]**.

Status of current design

6.2.5 The layout and extents of the Proposed Development has been through three stages of design iterations.

6.2.6 The first stage of design (Stage 1) was held prior to the public launch of the Proposed Development for non-statutory consultation and is presented in **ES Volume 3, Figure 4.1: Stage 1 Layout Masterplan [EN010157/APP/6.3]**.

6.2.7 The second stage of design (Stage 2) relates to the design that was presented within the PEIR and informed statutory consultation and is shown on **ES Volume 3, Figure 4.2: Stage 2 Layout Masterplan [EN010157/APP/6.3]**.

6.2.8 The third stage of design (Stage 3) is the design presented in support of the DCO Application, as shown in **ES Volume 3, Figure 3.4: Indicative Environmental Masterplan [EN010157/APP/6.3]**.

6.2.9 The design of the Proposed Development has been informed by consultation feedback, the emerging results from further environmental surveys, targeted engagement with statutory consultees and stakeholders and further internal technical design workshops.

6.2.10 Additionally, the Applicant recognises that there are still refinements and matters of detailed design that will be subject to further engagement and consultation with statutory bodies and local authorities. This commitment to detailed design is secured via a requirement of the **Draft DCO [EN010157/APP/3.1]**.

7 The Design Response

7.1.1 This chapter focuses on the design response relating to the landscape and environmental design, and the technical infrastructure components which have been wholly or partly driven in response to the requirements of 'good design' and the existing location context.

7.1.2 It is not intended that this chapter provides a design rationale for all elements of the Proposed Development, such as those that are constrained by safety requirements, manufacturing capabilities or industry standards and/or were not influenced by the requirements of 'good design' and the existing location context.

7.1.3 The design parameters for the individual and specific elements of the components which make up the Proposed Development are outlined in, and controlled by, the **Design Parameters Document [EN010157/APP/5.8]**.

7.2 Technical infrastructure

Solar PV modules

7.2.1 The extent of solar PV modules within the identified 'panel areas' has been driven by a number of offsets and buffers which were applied to the design as standard. These included:

- Minimum of 10 m offset from all existing trees/woodland and boundary hedgerows, where reasonably practicable.
- Minimum of 15 m offset from ancient woodland and veteran trees, where reasonably practicable.
- Minimum of 50 m offset from residential properties.
- Minimum of 10 m offset from all watercourses, ditches and ponds, other than locations where temporary span bridges are required to be installed or where existing crossing points or culverts require upgrading.
- Minimum of 50 m offset from all barns suitable to support nesting pairs of barn owls.
- Minimum of 10 m offset from all public rights of way, including new planting where reasonably practicable.

7.2.2 These buffers and offsets are secured within the **Outline Construction Environmental Management Plan (CEMP) [EN010157/APP/7.2]** and **Outline Decommissioning Environmental Management Plan (DEMP) [EN010157/APP/7.4]**.

7.2.3 In addition, the extent and location of solar PV modules within the identified 'panel areas' has been driven by an iterative design process. Throughout this process the Applicant has carefully considered the areas suitable for the location of the solar PV Development to ensure that the design of the Proposed Development submitted for the DCO Application meets the requirements for 'good design'.

7.2.4 During Stages 1, 2 and 3 of the design process, the design team identified fields that were considered unsuitable for accommodating solar PV development and were therefore discounted for this use. The reasoning for discounting these fields during Stages 1, 2 and 3 is detailed within **Tables 2, 3** and **4** below.

Table 2: Reasons for discounting fields from solar PV development at Stage 1

Location	Reason for discounting
Fields A1, A2 and A4 (Land Area A)	Solar PV development was discounted from the western extent of Fields A1 and A2 and to the north of Field A4 due to the proximity to the River Hull.
Fields E6, E7 and E9 (Land Area E)	Solar PV development was discounted on Field E6 and the northern extends of Fields E7 and E9 due to the proximity to the Meaux duck decoy Scheduled Monument.
Field F17 (Land Area F)	Solar PV development was discounted on land to the south of Field F17 due to proximity to residential developments and a public right of way.

Table 3: Reasons for discounting fields from solar PV development at Stage 2

Location	Reason for discounting
Fields A4 and A6 (Land Area A)	Solar PV development was further pulled back in the north of this Land Area, in Fields A4 and A6, to provide a buffer between residential properties and the Proposed Development.
Fields A7 and A8 (Land Area A)	Areas of solar PV development in Fields A7 and A8 were removed to minimise potential impacts on identified below-ground archaeology.
Field B2 (Land Area B)	Field B2 to the north of this Land Area was discounted from solar PV development to provide a mitigation area for ground nesting birds.
Field B3 (Land Area B)	Field B3 was discounted from solar PV development to minimise potential impacts on identified below-ground archaeology.

Location	Reason for discounting
Field B4 and B8 (Land Area B)	Areas of solar PV development in the south of this Land Area, in Fields B4 and B8, was discounted in order to minimise potential visual impacts on nearby properties and potential impacts on identified below-ground archaeology.
Field C8 (Land Area C)	Solar PV development in Field C8 was discounted in order to provide a buffer between nearby public rights of way (particularly public right of way Riston No. 2 to the west and the Proposed Development).
Fields C6 and C9 (Land Area C)	Solar PV development on the edge of Fields C6 and C9 was further set back to minimise potential visual impacts on nearby properties.
Field D16 (Land Area D)	Solar PV development in Field D16 was set back to minimise potential visual and amenity impacts on the property at the southern edge of the field.
Field D18 (Land Area D)	Solar PV development was discounted in Field D18 to minimise potential impacts to the setting of the Meaux Deserted Medieval Village and potential visual impacts on nearby properties.
Fields E13 and E14 (Land Area E)	Solar PV development was discounted in Fields E13 and E14 to minimise potential impacts on nearby properties.
Field E16 (Land Area E)	Solar PV development was further set back in Field E16 to minimise potential visual and amenity impacts on the property at the southern edge of the field.
Fields F6, F9, F10 and F11 (Land Area F)	Solar PV development was discounted in Fields F9 and F10 and partially removed from Fields F6 and F11 to minimise potential impacts on identified below-ground archaeology.
Fields F1, F4, F5, F6 (Land Area F)	Solar PV development was discounted from northern sections of Fields F1 and F4-F6 to minimise potential impacts to the setting of the Meaux Abbey.
Tickton Bridleway No.5	Solar PV development on either side of the Tickton Bridleway No. 5 was further set back to minimise potential impacts on users.

Table 4: Reasons for discounting fields from solar PV development at Stage 3

Location	Reason for discounting
Land Area A and Cable A-B	Land Area A has been removed from the Order Limits following feedback on ecological receptors risk in the area from statutory parties and the community, as well as the results of flooding and transport assessments.

7.2.5 It should be noted that at Stages 1 and 2, the areas discounted from solar PV development were retained within the Proposed Development for potential mitigation, enhancement or retained agricultural use, as shown in **ES Volume 3, Figure 3.4: Indicative Environmental Masterplan [EN010157/APP/6.3]**.

7.2.6 The solar PV modules would be installed as fixed arrays or as tracking arrays (which adjust the position of the solar PV modules to track the sun throughout the day). Flexibility is sought within this DCO Application to deliver either of these technology options.

7.2.7 The maximum height of the solar PV modules for both fixed and tracker arrays will be 3 m. The height of the solar PV modules for the tracker array would vary throughout the day. The maximum height of the solar PV modules was reduced from 3.5 m following responses to statutory consultation which raised concerns regarding the height of the solar PV modules.

7.2.8 The solar PV modules would be separated with a minimum row separation space of 4 m for both the fixed or tracking array options. For fixed array there will be a distance between 4 m to 12 m between the rows and for the tracking array there will be a distance between 4 m to 6 m between the rows. The spacing between the rows would vary across the Land Areas to minimise effects of overshadowing and to ensure optimal efficiency.

7.2.9 As such, the DCO Application has sought to retain a level of flexibility so that technological advances between the time of submission and the installation of the panels, should the Proposed Development be granted development consent, can be considered. This flexibility, and the parameters of that flexibility, are detailed in the **Design Parameters Document [EN010157/APP/5.8]**.

On-site supporting equipment

7.2.10 A range of equipment is required to support the solar PV modules to convert the electrical power generated, manage this power and export power onto the national grid. The electrical output from the solar PV modules would be exported by low voltage cabling to shipping container style storage units, which would contain an inverter, transformer and BESS. Details of the function of each of these elements is provided within **ES Volume 1, Chapter 3: Proposed Development Description [EN010157/APP/6.1]**.

7.2.11 To facilitate ‘good design’ the majority of the BESS, inverters and DC-DC converters would likely be arranged together, known as ‘hybrid packs’. Each hybrid pack would comprise four BESS units, one inverter and four DC-DC

converters arranged as shown in the **Indicative Layouts and Cross Section Plans [EN010157/APP/2.10]** that comprises a footprint of 13 m by 22 m with a height of 3.5 m. There will also be stand-alone switchgear containers spread across the Land Areas.

7.2.12 The design and specification of the on-site supporting equipment is subject to a number of key standards, guidelines and principals which have been established as part of the wider solar industry and associated development requirements. The **Outline Battery Safety Management Plan [EN010157/APP/7.6]** sets out the approach to be taken to manage the safety of the BESS in accordance with regulatory requirements, guidance, and good industry practice. The Outline Battery Safety Management Plan will address aspects such as safe design, construction, operation, and disposal and the strategy for firefighting and emergency planning.

7.2.13 The Proposed Development would utilise up to seven switchgears to control, protect and isolate electrical currents and equipment. Switchgears allow parts of the solar PV system to be de-energised safely, allowing routine maintenance or faults to be identified and work undertaken. It is anticipated that the switchgears would be housed in shipping-style containers.

7.2.14 There will be up to 40 weather masts across the Order Limits, with each standing up to 5 m in height.

7.2.15 The distribution of the on-site supporting equipment across the Order Limits has been designed in such a way that it is compliant with the industry safety requirements. The design also aims to ensure that there is limited other environmental effects (in line with NPS EN-1 and the ability of good design to mitigate adverse effects) by taking into account the following:

- Proximity and visual impact on residential settlements;
- Impacts on nearby environmental features;
- Located outside of Flood Zones 2 or 3; and
- Proximity and location of public rights of way.

7.2.16 Similarly to the solar PV modules, the Proposed Development has sought to retain a level of flexibility so that technological advances can be considered. This flexibility, and the parameters of that flexibility, are detailed in the **Design Parameters Document [EN010157/APP/5.8]**.

7.2.17 Therefore, it is anticipated that there will be limited environmental impacts arising from the on-site infrastructure and BESS. A detailed account of the landscape and environmental design for the Proposed Development can be found in section 7.3 of this DAD.

On-site substations

7.2.18 The two on-site substations would receive the electricity from the solar PV modules and hybrid packs and step up the voltage from 33 kV to 132 kV ready to be exported to the National Grid Creyke Beck Substation via the 132 kV cables.

7.2.19 The on-site substations would house electrical equipment such as transformers, switchgear and metering equipment. Each substation will also contain a switchroom building and storage unit.

7.2.20 The on-site substations would be sized as 180 megavolt-amperes (MVA). The substation compounds would be up to 60 m in length and 110 m in width. The equipment within the substations would have a maximum height of 15 m (this would only relate to a communications tower, with the maximum height of the other equipment within the substation being up to 7 m).

7.2.21 At Design Stage 1, the location of the on-site substations were informed by the following factors:

- Proximity and visual impact on residential settlements;
- Impacts on nearby environmental features;
- Located outside of Flood Zones 2 or 3; and
- Proximity and location of public rights of way.

7.2.22 As part of Design Stage 1, it was determined that the two on-site substations would not be located within 250 m of residential properties or designated environmental features. It was further determined that the proposed locations of these would be informed by further environmental assessment and technical requirements.

7.2.23 The locations of the on-site substations were further refined at Design Stage 2, following additional assessment work. As shown in **ES Volume 3, Figure 4.2: Stage 2 Layout Masterplan [EN010157/APP/6.3]**, the two on-site substations were proposed to be located within Field C3 and Field E8 and identified as Project Substation East (Land Area C) and Project Substation West (Land Area E). The siting of these were influenced by flood breach modelling and existing woodland within the Proposed Development area, taking advantage of the existing screening from the surrounding area.

7.2.24 The indicative location of the Project Substation East, located in Field C3, was amended slightly within the same field for Design Stage 3. This was to ensure that the infrastructure was outside of an area of flood risk posed by the Arnold and Riston Drain. This also provided an opportunity for additional screening to be implemented to the east of the substation.

7.2.25 The location of the two on-site substations are shown on **ES Volume 3, Figure 3.1: Indicative Operational Layout Plan [EN010157/APP/6.3]**.

Cabling

7.2.26 Cables would be required to connect the solar PV modules to the on-site transformers, switchgear, and BESS, as well as from the Land Areas to the two on-site substations, and onwards to the National Grid Creyke Beck Substation.

Interconnecting cables

7.2.27 Low voltage cabling within the Land Areas required to connect solar PV modules to the combiner boxes would be installed above ground and fixed to the mounting structure of the modules, with a small section placed underground where it leaves the modules and connects to the hybrid packs.

7.2.28 Higher voltage cables (33 kV) are required to connect the hybrid packs and switchgears, and to connect the switchgears to the two on-site substations. These cables would be buried underground.

7.2.29 Data cables (typically fibre optic) would be installed, typically alongside electrical cables in order to allow for monitoring during operation and maintenance, such as the collection of solar data from devices known as pyranometers.

Grid connection cable to National Grid Creyke Beck Substation

7.2.30 The Proposed Development would connect to the National Grid Creyke Beck Substation, located approximately 5.6 km south-west of the southern extent of the Land Areas by underground cabling.

7.2.31 Whilst Design Stages 1 and 2 presented a number of options for the cable route corridor to connecting the Proposed Development to the existing National Grid Creyke Beck Substation, only one cable route corridor has been taken forward in support of the DCO Application.

7.2.32 The cable route corridor submitted for the DCO Application runs south-west from Fields E16 and E17 in Land Area E to the north of Woodmansey and then south to the National Grid Creyke Beck Substation, as shown in **ES Volume 3, Figure 3.1: Indicative Operational Layout Plan [EN010157/APP/6.3]**.

7.2.33 The cable route corridor included within the DCO Application has been designed to remove the full highway option, previously included at Design Stage 1, and a refinement of other options, including reduced corridor widths in a number of

areas. The route has been designed to avoid residential properties and gardens and has been informed by environmental assessments and engagement with relevant landowners and stakeholders.

7.2.34 A more comprehensive description of the cable route options considered between the Proposed Development and the National Grid Creyke Beck Substation, and the reasons for discounting each, is presented in the **Site Selection Assessment** at Appendix 2 of the **Planning Statement [EN010157/APP/5.5]**.

7.2.35 For the installation of both types of cable, cable ploughing will be utilised where ground conditions and other site factors allow however, for the purposes of the Environmental Impact Assessment (EIA), it has been assumed that open cut trenching will take place as a worst-case scenario. The underground cabling would be located in existing gaps in hedgerows wherever practicable. In instances where open cut or cable plough cannot be used, for example when crossing a public road or large drainage ditch, alternative methods, such as horizontal directional drilling (HDD), would be used. The areas potentially requiring HDD are identified in **ES Volume 3, Figure 3.3 Indicative HDD Crossing Points [EN010157/APP/6.3]**.

Fencing

7.2.36 Primarily required for safety and security purposes, the Applicant has proposed a perimeter security fence to be installed to safely enclose the operational areas of the Proposed Development. As shown in the **Location and Land Area Plan [EN010157/APP/2.1]**.

7.2.37 The operational areas of the Proposed Development would be fenced using either a wire mesh or deer-proof fencing, which is formed of wooden or metal posts and wire mesh, up to 2 m in height. The fence would be designed in such a way to allow small animals to pass through the Proposed Development and would also be gated to allow access to and from the Proposed Development.

7.2.38 Palisade security fencing would be installed around the perimeter of the on-site substation compounds. Palisade security fencing is made of steel rails attached to horizontal-running rails, connected to vertical steel joints. It is anticipated that the fencing would be up to 2.4 m in height.

7.2.39 Mitigation area fencing would be installed to separate paths from mitigation areas, where necessary, in order to prevent disturbance by path users (including dogs) on the bird species for which the mitigation areas are intended. The fence would comprise post and wire stock proof fencing measuring up to 1 m in height. The fence would be designed in such a way to allow small animals to pass underneath

and, where necessary, would be gated to allow access to mitigation areas for habitat management purposes.

Security

7.2.40 Pole-mounted, infrared security detection cameras would be mounted on poles of a maximum of 3 m in height located within the perimeter fence. It is anticipated that these cameras would have motion detection technology for recording and would be pointed directly within the Proposed Development and away from any land outside of the Proposed Development.

7.2.41 Infrared sensor triggered security lighting would be required around key electrical infrastructure. No areas of the Proposed Development would be continuously lit. The lighting design would seek to limit any impact on sensitive receptors.

7.3 Landscape and environmental design

7.3.1 The landscape and environmental design of the Proposed Development has been guided by the project design principles. The project design principles have been separated into four themes which relate to Climate, People, Place and Environment. These themes tie in with the proposed Management Objectives as described within the **Outline LEMP [EN010157/APP/7.5]**. They are not mutually exclusive, indeed there is strong evidence that access to quality green space and the natural environment can result in improvements to health and wellbeing of people. Hence there is some overlap within the four themes as they are set out below, as, wherever possible, improvements in one theme can have a commensurate positive effect to another.

Climate

7.3.2 The Proposed Development has been designed to be climate resilient by incorporating, where reasonably practicable, mitigation measures and adaptations that respond to the impacts of climate change.

7.3.3 Flood risk modelling has been undertaken to consider climate change and ensure that sensitive infrastructure has been located taking this into account, as detailed with **ES Volume 4, Appendix 5.6: Flood Risk Assessment [EN010157/APP/6.4]**. The layout of the Proposed Development has been designed so that water sensitive infrastructure (substations, inverters and switch gear) are located outside the design event flood extents as detailed within Appendix E of **ES Volume 4, Appendix 5.6: Flood Risk Assessment [EN010157/APP/6.4]**.

7.3.4 Landscape species selection has sought to incorporate native species that are suitable for the local climate both now and in the future wherever possible. Details of the species selection are provided within the **Outline LEMP [EN010157/APP/7.5]**.

People

7.3.5 The Proposed Development has been designed to respect the amenity of local residents and communities by giving consideration to environmental impacts. Landscape Architects were involved in the high-level design of the Proposed Development from an early stage, and this included field surveys around the Order Limits to identify sensitive receptors including those residents most likely to be impacted by the Proposed Development. Fields were identified as being highly likely to create high level effects on residents and recommendations made for some fields to be removed from the solar PV development or to host biodiversity and mitigation measures only. Other fields were identified where an offset within the field, or new mitigation planting would reduce potential impacts on local residents.

7.3.6 The two on-site substations have been located as far from residential receptors as practicably possible, within the confines of engineering and technical requirements. In addition, both on-site substations have been located adjacent to existing woodland blocks within the Order Limits which would both screen and backcloth the new infrastructure, reducing the potential visual impacts of the on-site substations on the local community.

7.3.7 The Proposed Development has been designed to ensure existing access and local amenity areas are safeguarded. In addition, a series of permissive paths have been included within the proposals which increase accessibility around the local area and link in with the existing network of public rights of way.

7.3.8 The creation of approximately 11.8 km of new permissive paths will provide recreation and amenity benefits. The permissive paths proposed include:

- New permissive path, approximately 492 m 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 367 m in length, connecting Carr Lane to the existing Riston Footpath No. 2, along the north of Field B8;
- New permissive path circuit, approximately 8.4 km in length, around a number of fields in Land Area D and providing a link to the existing Tickton Footpath No. 6. The circuit of permissive paths within Land Areas D and E will be made available for horse riding;

- New permissive path, approximately 2.2 km in length, running along the eastern boundary of Field F6, through Fields F9, F10, F14 and F16, connecting with the existing Wawne Footpath No. 1 to the south of Field F16; and
- New Permissive path, approximately 318 m in length, running along the eastern boundary of Field C8.

7.3.9 **ES Volume 3, Figure 3.1: Indicative Operational Layout Plan [EN010157/APP/6.3]** illustrates the new permissive paths. Details of how the public rights of way and permissive paths will be managed to ensure users safety is provided in the **Outline Rights of Way and Access Management Plan [EN010157/APP/7.9]**.

Place

7.3.10 The Proposed Development has been designed to preserve and where possible enhance local landscape features and give consideration to providing greater access to enable their appreciation, according with NPS EN-1's requirement for infrastructure to be sensitive to place.

7.3.11 The design has ensured the retention of mature woodland and trees and a minimal impact on existing hedgerows. Existing field patterns, landform and landscape characteristics would be largely unaffected by the design, with the impacts largely localised on the host fields.

Environment

7.3.12 The layout of the Proposed Development has been designed in a manner which maximises the opportunities around enhancing and conserving biodiversity and geological conservation interests. This includes the retention of strategic areas within the Order Limits, which will be managed as suitable habitat for ground nesting birds and secured through the **Outline LEMP [EN010157/APP/7.5]**.

7.3.13 The design incorporates a minimum offset of 10 m between solar array and boundary hedgerows, and 15 m for ancient woodland and veteran trees, to ensure there is a sufficient distance between the infrastructure and the field boundary to allow habitat connectivity and biodiversity and landscape improvements as detailed in the **Outline LEMP [EN010157/APP/7.5]**.

7.3.14 The Proposed Development design would include landscaping, habitat management and biodiversity enhancement, which would be refined as the design progresses. Indicative areas for planting and for environmental mitigation and enhancement are shown on **ES Volume 3, Figure 3.4: Indicative Environmental Masterplan [EN010157/APP/6.3]** and would be secured by the

Outline LEMP [EN010157/APP/7.5] and the **Outline Operational Environmental Management Plan (OEMP) [EN010157/APP/7.3]**.

7.3.15 The existing hedgerows, woodland and field margins are proposed to be retained as part of the Proposed Development, with the exception of gaps required for new access points, visibility at vehicle turning points and for the installation of cabling as shown in the **Tree Preservation Order and Hedgerow Plans [EN010157/APP/2.8]**. Existing agricultural tracks and field margins would be used for access points where reasonably practicable and, if required, the width of any new gaps would be kept to a minimum, as detailed in and secured by the **Outline CEMP [EN010157/APP/7.2]** and the **Outline DEMP [EN010157/APP/7.4]**.

7.3.16 Landscaping, including new hedgerow and tree planting is proposed to avoid or minimise significant environmental effects. The total length of new hedgerow and structural woodland/scrub planting proposed within the Order Limits as a whole (19.58 km and 17,833m² respectively) would far exceed the amount removed during construction. Details of the proposed hedgerows and habitat creation are provided in the **ES Volume 3, Figure 3.4: Indicative Environmental Masterplan [EN010157/APP/6.3].** In addition, as detailed in the **Outline LEMP [EN010157/APP/7.5]**, field margins and the fields hosting solar PV modules would be seeded with wildflower rich grassland maintaining a vegetative ground cover throughout the Proposed Development.

7.3.17 In addition, the Proposed Development will provide further habitat creation, including through new bird and bat boxes, as detailed in the **Outline LEMP [EN0101/APP/7.5]**.

7.3.18 As a result of these measures, the Proposed Development is expected to achieve at least a 10% net gain in area habitats, hedgerows and watercourses, as detailed within **ES Volume 4, Appendix 7.10: Biodiversity Net Gain Assessment [EN010157/APP/6.4]**.

7.3.19 Appropriate management and monitoring of created and improved habitats would be required for a period of 30 years (Biodiversity Net Gain requirement) to ensure successful establishment and condition. The habitat management and monitoring regime will be detailed in the **Outline LEMP [EN010157/APP/7.5]** and **Outline OEMP [EN010157/APP/7.3]**. This includes management of wintering and ground nesting bird mitigation areas, hedgerows, grassland, field margins, watercourses and treatments under solar panels.

7.3.20 The Proposed Development corresponds with the approach to good design as set out in NPS EN-1 **[Ref 3]** through sustainable design and meeting other NPS policy objectives, and with the NIC's 'places' Good Design Principle **[Ref 6]** by

making a positive contribution to ecology. It has sought to retain existing trees and hedgerows wherever reasonably possible to maintain the landscape fabric of the Order Limits and aid the development's assimilation into its surroundings.

7.4 Design response outcomes

Embedded Mitigation

7.4.1 The design response has resulted in embedded mitigation measures incorporated into the design. Embedded mitigation is reported in the topic specific chapters at **ES Volume 2, Chapters 6-15 [EN010157/APP/6.2]**.

7.4.2 The embedded measures are a fundamental part of the Proposed Development and the assessment of residual effects relies on the embedded mitigation measures being enacted.

7.4.3 The design process has been informed by a desktop review of plans, maps, aerial photography, policy documents and published baseline assessments; as well as a site visits and design review workshops. The process identified several mitigation measures to be embedded in the Proposed Development design.

7.4.4 Typical sections through the Proposed Development to illustrate the positive impacts of embedded mitigation as part of the design response is shown in **Figure 1** below.

Enhancement

7.4.5 In addition to the embedded mitigation proposed, the design of the Proposed Development has identified opportunities for enhancement which are detailed within the **ES Volume 2, Chapters 6-15 [EN010157/APP/6.2]**.

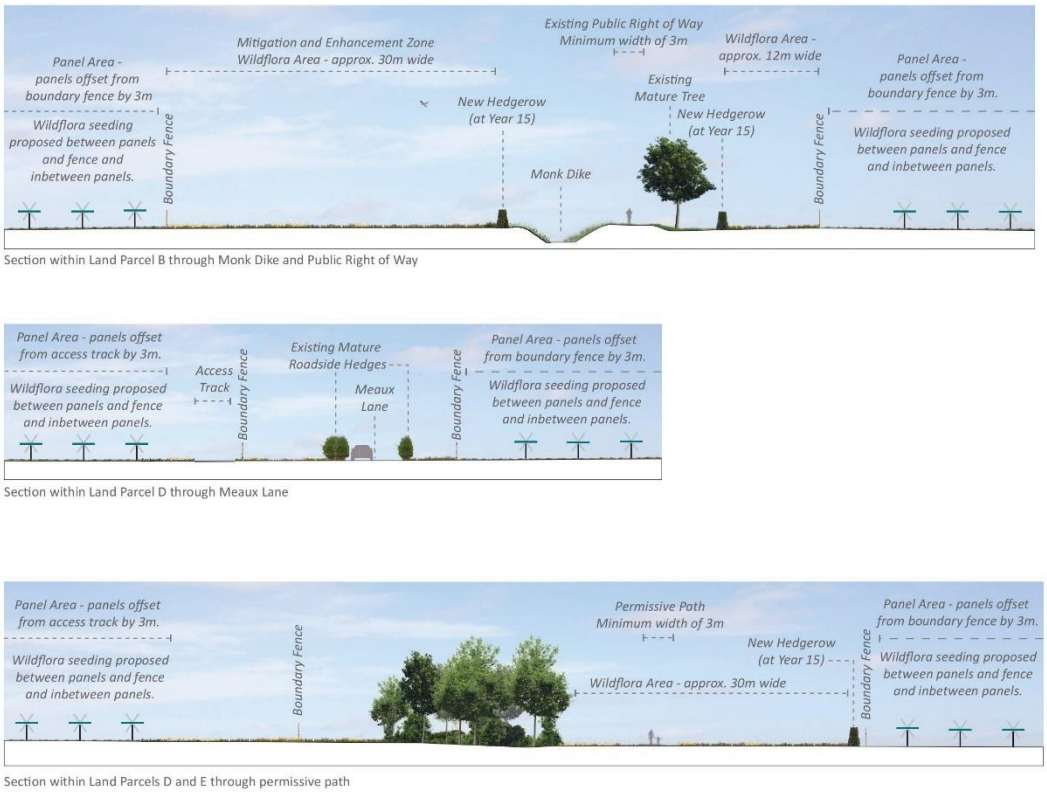

Figure 1 Typical Sections of the Proposed Development

8 Conclusion

8.1.1 This DAD provides a rationale and explanation for the Applicant's design process for the Proposed Development, including how it has taken into account and considered the surrounding landscape and site context, and the requirements for 'good design' as outlined in the relevant NPSs.

8.1.2 By necessity, elements of the Proposed Development have been designed in such a way to ensure that safety and viability are at the forefront. The Applicant has committed to developing a design which not only provides a safe and reliable source of renewable energy generation, but one that is in keeping with the local landscape and ensures that local communities and visitors alike can continue to access and enjoy the natural landscape and environment around them.

8.1.3 Mitigation and enhancement have been at the heart of the design process for the Proposed Development, by placing embedded mitigation at the forefront. This means that rather than simply providing mitigation for the effects arising from the proposals, the Applicant has ensured that their design has sought to avoid, reduce and mitigate effects where possible to do so and include the measures as part of the Applicant's standard design.

8.1.4 The delivery of the Proposed Development would align with legislation, policy and strategic priorities relating to decarbonisation, energy security, and energy affordability. In doing so, it establishes the evidenced need for the principle of the Proposed Development which is outlined within the **Statement of Need** at Appendix 3 of the **Planning Statement [EN010157/APP/5.5]**.

8.1.5 The Proposed Development would have the capacity to generate up to 320 MW of electricity thereby responding to the urgent need for new renewable energy infrastructure that is established through:

- national legislative commitments;
- national policy;
- local planning policy and climate emergency declarations;
- national energy strategy; and,
- energy market demand and security concerns.

8.1.6 Alongside an established needs case, the Proposed Development would provide a series of wider benefits, both locally and nationally, as identified within the **Planning Statement [EN010157/APP/5.5]**.

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