RWE

Peartree Hill Solar Farm

Design Parameters Document Revision 3

Planning Act 2008

Infrastructure Planning

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

Application Document Ref: EN010157/APP/5.8

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Contents

1 Introduction

1.1.1 This Design Parameters document 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 (the 'SoS') for the Department for Energy Security and Net Zero, pursuant to the Planning Act 2008 (PA 2008).

1.1.2 The DCO Application would provide consent for the Applicant to construct, operate (including maintain) and decommission Peartree Hill Solar Farm, 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 up to 320 MW 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 893 hectares of land located within the administrative area of East Riding of Yorkshire Council (ERYC) (the 'Host Authority').

1.1.3 The Proposed Development is a Nationally Significant Infrastructure Project as it includes infrastructure capable of generating more than 50 megawatts (MW) of renewable energy which is to connect to the National Electricity Transmission System at National Grid's Creyke Beck Substation.

1.1.4 This document will become a certified document through the DCO should it be granted consent. Under Schedule 2 (Requirements) to the DCO it places a duty on the Applicant to ensure that the detailed design and associated infrastructure is delivered in accordance with the parameters outlined in the table below and subsequently secured by this document.

1.1.5 This document should be read alongside the **Draft Development Consent Order [EN010157/APP/3.1]**, the **Design Approach Document [EN010157/APP/5.7],** which sets out the main design principles and design process undertaken for the Proposed Development, and the **Environmental Statement (ES) Volume 1, Chapter 3: Proposed Development Description [EN010157/APP/6.1].**

1.1.6 The Environmental Impact Assessment presented in the **ES [EN010157/APP/6.1 – 6.4]** has been undertaken based on the maximum (or minimum where appropriate) extents of the parameters set out within this document which reflect the worst-case scenario for the Proposed Development. This approach is known as the use of the 'Rochdale Envelope' which is described in footnote 106 to paragraph 4.3.12 of NPS EN-1 as being an assessment "sufficient to fully assess the project's impact on the environment and establish clearly defined worst case

parameters for the assessment". As the detailed design of the Proposed Development will be in accordance with these assessed parameters, the conclusions of the ES will be upheld.

1.1.7 Paragraph 4.3.11 of EN-1 recognises that in some instances, it may not be possible at the time of the application for development consent for all aspects of the proposal to have been settled in precise detail. Paragraph 4.3.12 continues that where some details are still to be finalised, the ES should set out to the best of the applicant's knowledge, what the likely worst-case environmental, social, and economic effects of a project may be and assess on that basis to ensure that the impacts, as it may be constructed, have been properly assessed.

1.1.8 Paragraph 2.10.70 of NPS EN-3 also accepts that not all aspects of a project may have been settled in precise detail at the point of application. Such aspects including the type, number and dimensions of panels, layout and spacing are among aspects of the Proposed Development which are not settled at DCO Application down to a final design.

1.1.9 The Applicant wishes to retain flexibility regarding the design detail of certain components of the Proposed Development, as is acknowledged in NPS EN-1 Paragraph 4.3.11 and Paragraph 2.10.70 of NPS EN-3. The extent of flexibility sought by the Applicant is described in **ES Volume 1, Chapter 5: Approach to the EIA [EN010157/APP/6.1]**.

1.1.10 Due to the rapidly evolving technology within the solar photovoltaics and energy storage system sectors, the in-built flexibility allows for the most up-to-date technology to be utilised for the Proposed Development. The full detailed design at the point of construction will be managed post-consent through the requirements set out in Schedule 2 to the **Draft DCO [EN010157/APP/3.1]**.

1.1.11 The Design Parameters have been set out in **Chapter 2** of this document, organised in accordance with the description of the Works Numbers as set out in Schedule 1 to the **Draft DCO [EN010157/APP/3.1]**. The spatial extents of each Work Number are set out in the accompanying **Works Plans [EN010157/APP/2.2]**.

1.1.12 For each component of the Proposed Development outlined in **Chapter 2**, the parameter has been defined by its:

- Location – the location of the Proposed Development component within the Proposed Development as assessed within the ES;
- Scale – either a minimum or maximum parameter which has been assessed in the ES; and

- Design – relevant design parameter or principle which has been assessed in the ES.

2 Design Parameters

Work No.1		
Element of Proposed Development	**Parameter Type**	**Design Parameter**
General	Location	The location of Work No.1 will be as shown on the **Works Plans [EN010157/APP/2.2].**
Solar panels fitted to mounting structures	Location	Solar PV modules which are affected by simulated fluvial flooding will be raised to mitigate against fluvial flood risk. These will be raised a minimum of 300mm freeboard above the modelled 1-in-100 year plus climate change flood level (the design event flood level) and also be above the maximum flood level predicted by the simulated breach scenarios during a 1 in 100 year plus climate change event.
	Scale	For fixed array, the maximum height of the solar panels will be 3m. For a tracking array the maximum height of the solar panels will be 3m which would vary throughout the day.
	Scale	The minimum height of the lowest part of the solar panels (i.e. not including the mounting structure) will be 0.8m AGL (above ground level) for both fixed array and tracking array.
	Scale	The mounting structures will be fixed to the ground by galvanized steel poles which are typically driven into the ground to a maximum depth of 2m. Where further work identifies the need for archaeological protection, an alternative mounting structure will be proposed, in the form of ballast slabs which sit on the

		surface rather than penetrating the ground.
	Design	For fixed array there will be a distance between 4m to 12m between the rows. For tracking array there will be a distance between 4m to 6m between the rows.
	Design	The solar PV modules will be positioned on the mounting structures at an angle of: +/- 10° to 30° for a fixed array; and +/- 60° for a tracking array.
	Design	For fixed array the rows of solar PV modules will be aligned in east-west rows with panels facing south.
	Design	The mounting structure for the solar PV modules will be a metal frame (usually anodised aluminium alloy).
	Design	Solar PV modules will have a surface material of smooth glass with anti-reflective coating.
Balance of solar plant	Location	Balance of the solar plant which are affected by simulated fluvial flooding will be raised to mitigate against fluvial flood risk. These will be raised a minimum of 300mm freeboard above the modelled 1-in-100 year plus climate change flood level (the design event flood level) and also be above the maximum flood level predicted by the simulated breach scenarios during a 1 in 100 year plus climate change event.
	Location	Inverters will be located a minimum of 200m from existing sensitive residential receptors unless it can be demonstrated to the satisfaction of the relevant local planning authority that the location of inverters within 200m of existing residential receptors, would not give rise

		to materially new or materially different noise effects compared to those reported within **ES Volume 2, Chapter 12: Noise and Vibration [EN010157/APP/6.2].**
	Scale	Up to 7 switchgears will be located across the Land Areas.

Work No. 2		
Element of Proposed Development	**Parameter Type**	**Design Parameter**
General	Location	The location of Work No. 2 will be as shown on the **Works Plans [EN010157/APP/2.2].**
Battery energy storage system (BESS)	Location	The BESS will be co-located with the solar panels forming Work No. 1.
	Location	BESS will be raised to mitigate against fluvial flood risk. These will be raised a minimum of 300mm freeboard above the modelled 1-in-100 year plus climate change flood level (the design event flood level) and also be above the maximum flood level predicted by the simulated breach scenarios during a 1 in 100 year plus climate change event.
	Scale	BESS will be contained in hybrid packs. Hybrid packs comprise four BESS units, one inverter and four direct current (DC)-DC converters.
	Scale	There will be up to 84 hybrid packs.
	Scale	Inverters will be up to 3.5m in height, 12.5m in length and 2.5m in width.
	Scale	DC-DC Converters will be up to 2.3m in height, 1.8m in length and 1.2m in width.

	Scale	Switchgear will be up to 3m in height, 12.5m in length and 2.5m in width.
	Scale	The BESS will be 3.5m in height, 6.5m in length and 2.5m in width.
	Design	The BESS will require heating, ventilation and cooling systems which will be integrated within the individual containers.
	Design	The BESS units will be raised on concrete pads or plinths sat above a gravel base.
	Design	The footprint for any hybrid pack will be a maximum of 13m by 22m and a maximum height of 3.5m.
	Design	Containers will be light grey, white, dark green or similar in colour.

Work No. 3		
Element of Proposed Development	**Parameter Type**	**Design Parameter**
General	Location	The location of Work No. 3 will be as shown on the **Works Plans [EN010157/APP/2.2].**
Electrical cabling	Scale	The dimension of the 33 kV cable trench will be: - a minimum depth of 1.2m - a maximum depth of 1.6m in depth - a maximum width of 0.8m
	Scale	The dimension of the 132 kV cable trench will be: - a minimum depth of 1.2m - a maximum depth of 1.6m

		- a maximum width of 1.5m
	Scale	Maximum working width for installation of the 33 kV cable will be 15m.
	Scale	Maximum working width for installation of the 132 kV cable will be 30m.
	Design	Cable ploughing will be utilised where ground conditions and other site factors allow. Where this is not possible, other methods such as open cut trenching or horizontal directional drilling (HDD) will be used.
	Design	Cables will be located in existing gaps in hedgerows where reasonably practicable.
Trenching tunnelling, boring and drilling works	Location	Drilling launch/reception pits will not be located: - within 50m of a bank of a Main River (Monk Dike) - within 20m of the bank of all other watercourse under which the HDD will take place.
	Location	Drilling launch/reception pits will not be located within 50m of railway infrastructure.
	Location	Drilling launch/reception pits will not be located within 10m of a highway verge.
	Scale	The launch/reception pits dug for HDD of crossings will be a maximum of 7m by 3m in area and 1.5m in depth.
	Scale	HDD will be a minimum depth of 7m below the bed of the River Hull. HDD will be a minimum depth of 7m below railway lines.

		HDD will be a minimum depth of 5m below any public highways.
Fencing, gates, boundary treatment	Scale	The maximum height of access gates will be 2m with a maximum width of 7m.
	Scale	The maximum height of perimeter security fencing will be 2m.
	Design	The perimeter security fencing will be either wire mesh or deer fence.
	Design	The perimeter security fencing will include small mammal gates.
Security equipment	Scale	The maximum height of the poles for the mounting of the security detection cameras will be 3m.
	Design	The security detection cameras will be pointed directly within the Order Limits and away from any land outside of the Order Limits.
Access tracks	Design	Access tracks will be constructed of permeable materials to allow water to filtrate through and maintain greenfield runoff rates.
	Design	Internal access tracks will have a maximum width of 4m with the exception of internal access tracks leading to the on-site substations which will have a maximum width of 4.5m.
Lighting	Design	On-site lighting will be sensor triggered infrared security lighting to be located around key electrical infrastructure and will not be continuous.
Permissive paths	Design	Width of permissive paths to be between 2m and 5m.

Work No. 4

Element of Proposed Development	Parameter Type	Design Parameter
General	Location	The location of Work No. 4 will be as shown on the **Works Plans [EN010157/APP/2.2].**
On-site substations	Location	The two on-site substations will be located a minimum of 250m from existing residential properties.
	Location	The two on-site substations will be located a minimum of 250m from any existing environmental designated sites.
	Location	The two on-site substations will be located a minimum of 15m from any existing vegetation.
	Location	The two on-site substations will be located on high ground outside the flood extents for the Credible Maximum Flood Scenario (to 2100) and the maximum breach extents. All sensitive infrastructure contained within the substations will be at least 0.3m above the Credible Maximum Flood Level.
	Scale	The footprint of the two on-site substations will each be a maximum of 60 m in length and 110m in width.
	Scale	The highest electrical equipment will have a maximum height of 7m.
	Scale	The communications tower will have a maximum height of 15m.
	Scale	Any control building or container housing offices to be a maximum height of 4m.
Fencing	Scale	The maximum height of palisade security fencing will be 2.4m.

	Design	The fencing around on-site substations will be palisade security fencing.

Work No. 5		
Element of Proposed Development	**Parameter Type**	**Design Parameter**
General	Location	The location of Work No. 5 will be as shown on the **Works Plans [EN010157/APP/2.2].**
132kV electrical cabling	Scale	The dimension of the cable trench will be: - a minimum depth of 1.2m - a maximum depth of 1.6m - a maximum width of 1.5m
	Scale	The maximum working width for installation of the 132kV cabling will be 30m.
	Design	Open cut trenching is proposed. Where the existence of other infrastructure requires, HDD will be used.
	Design	The working width of the Grid Connection Corridor will be demarcated by temporary (Heras style) fencing where required.
	Design	The cable beneath the River Hull will have 'an insulating layer' as specified within Section 7.5.6 of the **Habitats Regulations Assessment - Information to inform Appropriate Assessment (REP1 – 015).**
Trenching tunnelling, boring and drilling works	Location	Drilling launch/reception pits will not be located: - within 50m of a bank of a Main River (River Hull, Monk Dike, Meaux and Routh Drain,

		Holderness Drain and Beverley and Barmston Drain) - within 20m of the bank of all other watercourse under which the HDD will take place.
	Location	Drilling launch/reception pits will not be located within 50m of railway infrastructure.
	Location	Drilling launch/reception pits will not be located within 10m of a highway verge.
	Scale	The launch/reception pits dug for HDD of crossings will be a maximum of 7m by 3m in area and 1.5m in depth.
	Scale	HDD will be a minimum depth of 7m below the River Hull HDD will be a minimum depth of 7m below railway lines HDD will be a minimum depth of 5m below any public highways.

Work No. 7		
Element of Proposed Development	**Parameter Type**	**Design Parameter**
General	Location	The location of Work No. 7 will be as shown on the **Works Plans [EN010157/APP/2.2].**
Temporary construction compounds	Scale	Main compounds will have a footprint of up to 6000 square metres (m^2). Satellite compounds will have a footprint of up to 3000m^2.
	Scale	There will be up to 17 construction compounds; seven main compounds and 10 satellite compounds.

Work No. 8		
Element of Proposed Development	**Parameter Type**	**Design Parameter**
General	Location	The location of Work No. 8 will be as shown on the **Works Plans [EN010157/APP/2.2].**
Works accesses	Design	Creation of accesses from the public highway to be constructed in accordance with the Department for Transport's Manual for Streets and ERYC adoption standards.
Passing Places	Design	Where passing places are proposed on public highways, these will be designed to provide a minimum of 5.5m and a maximum of 8.5m in width. Passing places will be 20m in length with the provision of 10m tapers at each end.
	Design	Surfacing of any passing places on public highways will be in accordance with the Department for Transport's Manual for Streets and ERYC adoption standards to enable these areas to be adopted by ERYC as Local Highway Authority.

Work No. 9		
Element of Proposed Development	**Parameter Type**	**Design Parameter**
General	Location	The location of Work No. 9 will be as shown on the **Works Plans [EN010157/APP/2.2].**
Fencing	Design	The perimeter security fencing will be either wire mesh or deer fence.
	Design	The perimeter security fencing to include small mammal gates.

	Scale	The maximum height of perimeter security fencing will be 2m.