POWER FOR GOOD

Steeple Renewables Project

Design Approach Document

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Executive Summary

This Design Approach Document ('DAD') has been prepared on behalf of Steeple Solar Farm Limited (the 'Applicant') in relation to an application for a Development Consent Order ('DCO') for the Steeple Renewables Project (the 'Proposed Development'). The Proposed Development comprises the installation of a ground mounted solar energy generating station, associated Battery Energy Storage System ('BESS'), and associated development comprising substation and a grid connection integral to the construction, operation (including maintenance) and decommissioning of the development for the delivery of over 50 Megawatts ('MW') of electricity. The Proposed Development has a design life of 40 years, after which time it will be decommissioned.

The DCO Application Order limits comprises 888.31 hectares ('ha') of land (the 'Site') located on land to the east and west of Sturton-le-Steeple, south of West Burton Power Station, within the county of Nottinghamshire.

The Applicant has submitted an application for the Proposed Development to make a significant contribution to the production, supply and storage of a renewable and more sustainable form of energy.

The overarching vision of the Proposed Development is to contribute to renewable energy policy targets and objectives; responding to site context, baseline analysis and assessment of potential impacts through the delivery of design that responds to local context whilst delivering potential substantial benefits to energy production, climate change and biodiversity enhancements. Negative impacts to local environment and residents have been mitigated where necessary and kept to a minimum. To achieve this, several design objectives have been set as follows:

- Delivery of significant amounts of affordable renewable energy to support policy objectives and national targets for reducing carbon emissions to net zero by 2050;
- Delivery of improved energy resilience, affordability and security by diversifying energy production and stored energy;

- Contribution towards strategy improvements to local ecology and biodiversity;
- Develop a Proposed Development sensitive to surrounding landscape, limiting impact on views for key landscape receptors, residential properties and recreational routes;
- Develop a Proposed Development sensitive to heritage assets and settings;
- Safeguard surrounding hydrological systems and resilience to flooding without increasing flood risk elsewhere taking into account impacts of climate change;
- Develop a Proposed Development sensitive to existing land quality; and
- Provide safe access, minimise impact on the local highway network; and protect and enhance existing Public Rights of Way ensuring continued safe use.

1. Introduction

1.1 This Design Approach Document ('DAD') supports an application for a Development Consent Order ('DCO') for the construction, operation, and decommissioning of a ground mounted solar photovoltaic (PV) electricity generation station with a capacity of over 50 Megawatts (MW) and associated development comprising of energy storage and grid connection infrastructure (hereafter referred to as "the Proposed Development") on land at Sturton le Steeple (hereafter referred to as "the Site"), in accordance with the EIA Regulations and the Planning Act 2008.

1.2 The purpose of the DAD is to consolidate good design and the design principles as applied to the Proposed Development for ease of reference and should be read alongside the submitted **Design and Access Statement** [**EN010163/APP/7.3**], which sets out the main design evolution, principles and process undertaken for the Proposed Development and Environmental Statement (ES) **Chapter 4: Proposed Development** [**EN010163/APP/6.2.4**] as well as the **ES Appendix 4.5 Outline Design Principles [EN010163/APP/6.3.4]**.

2. Good Design – Policy and Guidance

Overview

2.1 The Order Guidance and policy relevant to the design of major energy infrastructure is considered in this section including policies set out in the NPSs for Energy, the National Planning Policy Framework ('NPPF') as well as relevant local planning policies. Other sections of this DAD and the supporting plans demonstrate how the Proposed Development complies with these policies, as supported by the **Planning Statement [EN010163/APP/7.1]**.

National Policy

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

2.2 The Overarching National Policy Statement for Energy (hereafter 'NPS EN-1') sets out the UK Government's policy for delivery of major energy infrastructure. NPS EN-1 is clear regarding the urgent need for renewable energy infrastructure of all types to be developed in order to achieve the Governments decarbonisation targets.

2.3 Section 4.7 of NPS EN-1 sets out the criteria for good design for energy infrastructure.

2.4 Paragraph 4.7.1 of NPS EN-1 identifies both visual appearance of a piece of infrastructure and its functionality, including fitness for purpose and sustainability, as being equally important factors in good design.

2.5 Paragraph 4.7.2 of NPS EN-1 states:

> "*Applying good design to energy projects should produce sustainable infrastructure sensitive to place, including impacts on heritage, efficient in the use of natural resources, including land-use, and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible" and "that the nature of much energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of the area*".

2.6 Paragraph 4.7.3 of NPS EN-1 advises that good design can meet NPS policy objectives, for example, in terms of siting, use of appropriate technologies, modern methods of construction and sustainable design practices.

2.7 Paragraph 4.7.4 of NPS EN-1 states that:

"*applicants should consider how good design can be applied to a project during the early stages of the project lifecycle*".

2.8 Footnote 122 to paragraph 4.7.5 of NPS EN-1 states:

"*Design principles should take into account any national guidance on infrastructure design, this could include for example the Design Principles for National Infrastructure published by the National Infrastructure Commission, the National Design Guide and National Model Design Code, as well as any local design policies and standards*".

2.9 Paragraph 4.7.6 of NPS EN-1 acknowledges that:

"*Whilst the applicant may not have any or very limited choice in the physical appearance of some energy infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, land form and vegetation" and "Applicants should also, so far as is possible, seek to embed opportunities for nature inclusive design within the design process*".

2.10 Paragraph 4.7.7 of NPS EN-1 states:

"*Applicants must demonstrate in their application documents how the design process was conducted and how the proposed design evolved. Where a number of different designs were considered, applicants should set out the reasons why the favoured choice has been selected*".

2.11 Paragraph 4.7.10 of NPS EN-1 requires energy infrastructure developments to be satisfactorily sustainable and be as "*attractive, durable, and adaptable (including taking account of natural hazards such as flooding) as they can be*", taking into consideration both functionality and aesthetics, and potential limitations of choice in available energy infrastructure designs.

2.12 Paragraph 4.7.12 of NPS EN-1 expects the Secretary of State to consider the "*ultimate purpose of the infrastructure*" and bear in mind its "*operational, safety and security requirements which the design has to satisfy*" in considering whether good design can be demonstrated.

2.13 NPS EN-1 identifies adapting to climate change as a key consideration of design. Specifically, paragraph 4.10.8 of NPS EN-1 requires applicants to consider the

impacts of climate change "*when planning the location, design, build, operation and, where appropriate, decommissioning of new energy infrastructure*".

National Policy Statement for Renewable Energy Infrastructure ('NPS EN-3')

2.14 National Policy Statement for Renewable Energy Infrastructure (hereafter 'NPS EN-3') sets out expectations on good design for renewable energy schemes and photovoltaic generation.

2.15 Section 2.5 of NPS EN-3 reiterates criteria for good design set out in section 4.7 of NPS EN-1. Paragraph 2.5.2 of NPS EN-3 states:

> "*Proposals for renewable energy infrastructure should demonstrate good design, particularly in respect of landscape and visual amenity, opportunities for co-existence/co-location with other marine and terrestrial uses, and in the design of the project to mitigate impacts such as noise and effects on ecology and heritage*".

2.16 Paragraph 2.10.98 provides design guidance for solar and states:

> "*Applicants should follow the criteria for good design set out in Section 4.7 of EN-1 when developing projects and will be expected to direct considerable effort towards minimising the landscape and visual impact of solar PV arrays especially within nationally designated landscapes*".

2.17 Paragraph 2.10.60 of NPS EN-3 states that:

> "*applicants will consider several factors when considering the design and layout of sites, including proximity to available grid capacity to accommodate the scale of generation, orientation, topography, previous land–use, and ability to mitigate environmental impacts and flood risk*".

2.18 Paragraphs 2.10.61 to 2.10.64 of NPS EN-3 acknowledge a number of design requirements for efficient delivery of solar energy generation, including:

- type, spacing and aspect of panel arrays will depend on the physical characteristics of the site such as site elevation;
- favouring a south-facing arrangement of panels to maximise output although other orientations may be chosen; and
- Design considerations for the provision of cabling between electrical assets, including provision of method statements for cabling trench design.

2.19 Paragraph 2.10.98 of NPS EN-3 acknowledges the role of good design in minimising landscape and visual effects of solar arrays.

2.20 Paragraph 2.10.100 of NPS EN-3 sets out that applicants:

> "*should consider as part of the design, layout, construction, and future maintenance plans how to protect and retain, wherever possible, the growth of vegetation on site boundaries, as well as the growth of existing hedges, established vegetation, including mature trees within boundaries*".

Other Policy and Guidance

National Planning Policy Framework ('NPPF') (2025)

2.21 Whilst the NPPF is not the primary policy for determination of DCO applications it is noted that the NPPF sets out the UK Government's planning policies for England and how these should be applied. Chapter 12 of the NPPF is concerned with how development can achieve well-designed places.

2.22 Good design is described in paragraph 131 of the NPPF. It explains that:

> "*the creation of high quality, beautiful and sustainable buildings and places is fundamental to what the planning and development process should achieve. Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities*".

2.23 The NPPF goes on to define well-designed places at paragraph 139, with an emphasis given to ensure developments are reflective of "*local design policies and government guidance on design, taking into account any local design guidance and supplementary planning documents such as design guides and codes*".

2.24 The NPPF also expects applicants to proactively engage with local planning authorities and communities during the evolution of development proposals, so that they can be more favourably considered.

2.25 The NPPF specifically demonstrates its requirement for the planning system to "*shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure*" (paragraph 161),

and for new development to be planned such that it is sufficiently resilient to the impacts of climate change (paragraph 164).

National Significant Infrastructure Projects: Advice on Good Design (2024)

2.26 The "Nationally Significant Infrastructure Projects: Advice on Good Design (2024)" document provides guidance for applicants and other stakeholders involved in the design of NSIPs. It emphasises good design is a material consideration in decision-making and should be an integral part of a proposal from the onset. The document clarifies that good design extends beyond aesthetics, encompassing functionality, sustainability, and the projects contribution to the quality of the surrounding area.

National Infrastructure Commission: Design Principles of National Infrastructure (2020)

2.27 As referred to in NPS EN-1, The NIC "Design Principles for National Infrastructure" identifies that the purpose of the design process is "to bring together technical and creative expertise to produced infrastructure which provides good value and works well for climate, people and places". The guidance sets out four thematical principles to shape the design of NSIP projects. It sets out how each principle should be used to appreciate the wider context, engage meaningfully, and continually measure and improve. The four principles are:

- Climate: Mitigate carbon 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.

2.28 These principles aim to promote a holistic approach to infrastructure design that improves environmental performance whilst focussing design measures around improving the scope of beneficial impacts infrastructure can bring.

National Design Guide ('NDG') 2021

2.29 The NPS and the NSIP Advice on Good Design reference the approach to design principles adopted in the NDG being of assistance in ensuring good design outcomes are secured.

2.30 The NDG is a comprehensive document published by the UK Government that outlines principles and practice of creating well-designed, response environments.

It sets out characteristics of well-designed places and demonstrates what good design means in practice. The guide is based on NPS, practice guide, and objectives for good design in the NPPF.

Solar Energy UK: 11 Commitments on Solar Farms

2.31 Solar Energy UK is a non-profit trade association which represents a significant portion of the UK's solar energy businesses. Members of the association are expected to comply with best practice industry guidance through the adoption of 11 key commitments on their solar sites (Solar Energy UK: 11 Commitments on Solar Farms (2020)). Those related directly to design are:

- for design measures to enhance the biodiversity and natural capital value of all solar sites,
- being sensitive and complementing nationally and locally protected landscapes and nature conservation areas;
- deliver multi-functional land use by proposing colocation with agriculture and/or nature recovery projects for solar and energy storage developments;
- accommodate needs for rights of way and sites of archaeological importance; and
- minimise visual impact where possible, making visual enhancements, including appropriate screening.
- BRE: Planning guidance for the development of largescale ground mounted solar PV system

2.32 The Building Research Establishment ('BRE') provides research, advice, training, testing, certification and standards for both public and private sector organisations in the UK and abroad within the construction sector.

2.33 The BRE have published guidance on the development of large-scale solar farms (BRE Planning Guidance for the Development of Large-Scale Ground Mounted Solar PV Systems (2013)), which addresses documents that need to be provided within a planning application, as well as relevant considerations to the determination of planning applications for large scale solar.

Local Policy

2.34 Whilst the NPS is the primary determining policy relating to NSIP development and would take precedence over any local planning document, where there is a conflict, local context matters may be informed by consideration of the local plan policy. NPS EN-1 sets out developments should also be guided by local design policies and standards. Bassetlaw District Council and Nottinghamshire County Council do not currently have any local design standards documents (Supplementary Planning Documents) which relate to large scale ground mounted solar or BESS energy developments. The **Planning Statement [EN010163/APP/7.1]** sets out the detailed consideration of the important and relevant considerations arising from the local plan policies, an overview of those relating to design is provided below.

2.35 Policy ST33 (Design Quality) states that developments must be of a high-quality design that "*has a clear function, character and identity based upon a robust understanding of local context, constraints and distinctiveness, while reflecting the principles of relevant national and local design guidance*". The policy goes on to set out the ways in which new developments can achieve high quality design.

2.36 Policy ST35 (Landscape character) sets out that the Council will be supportive of proposals that contribute to the nature and quality of Bassetlaw's landscapes, where it can be demonstrated they protect and enhance the distinctive qualities of the relevant landscape character zone.

2.37 Policy ST37 (Green and blue infrastructure) covers the importance of enhancing, extending and managing the connectivity, quality, multifunctionality, biodiversity and amenity value of the green and blue infrastructure network. The policy sets out the ways in which this can be achieved, including providing for biodiversity net gain, protecting and enhancing ancient and mature woodland and hedgerows, and applying climate change mitigation and adaptation measures.

2.38 Policy ST38 (Biodiversity and Geodiversity) sets out that:

> *"in line with national legislation, all new development should make provision for net biodiversity gain on site, or where it can be demonstrated after following the mitigation hierarchy that this is not practicable, off site provision will be considered. Management for a minimum of 30 years in accordance with a maintenance scheme will be sought to manage the biodiversity assets in the long term."*

2.39 Policy ST39 (Trees, woodlands and hedgerows) states that proposed developments that will adversely affect trees or hedgerows must provide a tree survey and arboriculture assessment, along with details of protective measures to be implemented to ensure the health and safety of each specimen and hedgerow to be retained, a strategy for replacement planting for those being lost and a management plan providing details of maintenance arrangements for the next 10 years.

2.40 Policy ST46 (Protecting Amenity) states that:

> "*Proposals for development should be designed and constructed to avoid and minimise impacts on the amenity of existing and future users, individually and cumulatively, within the development and close to it*". Proposals are expected to: "*a) not have a significant adverse effect on the living conditions of existing and new residents and future occupiers of the proposed development through loss of privacy, excessive overshadowing or overbearing impact; and b) not generate a level of activity, noise, light, air quality, odour, vibration or other pollution which cannot be mitigated to an appropriate standard*."

2.41 Policy ST49 (Renewable Energy Generation) states that:

> "*Development that generates, shares, transmits and/ or stores zero carbon and/or low carbon renewable energy including community energy schemes will be supported subject to the satisfactory resolution of all relevant site specific and cumulative impacts upon:*
>
> *a) location, setting and position in the wider landscape, resulting from its siting and scale;*
>
> *b) natural and heritage assets and their settings;*
>
> *c) air and water quality;*
>
> *d) hydrology and hydrogeology;*
>
> *e) the best and most versatile agricultural land;*
>
> *f) existing highway capacity and highway safety;*
>
> *g) noise, light, glare, smell, dust, emissions or flicker;*
>
> *h) aviation and radar; and*
>
> *i) recreation and local amenity.*

Proposals must take into account operational and approved developments, as well as any proposed intensification to operational or approved proposals."

2.42 The policy also states that:

"*All renewable energy development will be expected to provide details of the expected power generation based upon expected yield or local self-consumption to enable effective monitoring of the district's contribution to the national zero carbon targets"* and that *"A decommissioning programme applied by a Condition to any planning permission granted will be required to demonstrate that the site can be returned to an acceptable state, three years after cessation of operations*".

2.43 Sturton Ward covers the parishes of North and South Wheatley, North Leverton with Habblesthorpe, South Leverton, and Sturton-le-Steeple including Bole and West Burton. This therefore covers the Order limits of the DCO including its grid connection point at West Burton National Grid Substation.

2.44 The Sturton Ward Neighbourhood Plan Review (2024) sets out the requirement for development outside the defined development boundaries to be carefully controlled in accordance with national and local planning policies in Policy 1: Sustainable development, infill and the development boundary.

2.45 Policy 2a: Protecting the landscape character, significant green gaps and key views – requires development to protect the positive attributes of the open countryside and landscape character as appropriate to their scale, nature and location, and should demonstrate they have regard to the guidance in the Sturton Ward Design Code (2020).

2.46 Policy 5: Design Principles – sets out that developments should demonstrate a high design quality that will contribute positively to the character of the Ward as appropriate to their scale, nature and location. Furthermore, developments should respond to the local character, demonstrate sensitive positioning, scale and form, provide a clear rationale of response to history and design quality, use native trees and hedgerows where possible in landscaping schemes, use a sensitive colour palette, be of a scale and mass that is sympathetic to heritage assets and their setting.

2.47 The Clarborough and Welham Parish comprises two villages whose centres are 1 mile apart. The Parish extends to 900 hectares and the western boundary runs up to

the built edge of Retford. Part of the CWNP falls within part of the western extremity of the Order limits near its western boundary.

2.48 Policy 5: Reducing the Risk of Flooding - sets out the requirements in terms of ensuring development does not increase flood risk and encouraging the use of sustainable urban drainage systems and permeable surfacing.

2.49 Policy 6: Improving Green Infrastructure and the Natural Environment - focuses on improving green infrastructure and the natural environment, protecting landscape character and ecological value, protecting and enhancing biodiversity and improving access to local wildlife sites. The policy requires development proposals to demonstrate how they protect and enhance existing green infrastructure assets affected by the development and show the opportunities taken to improve linkages both to existing and new green infrastructure assets and to residential areas.

Summary

2.50 The Applicant has considered the design of the Proposed Development from the outset and the following sections of this DAD demonstrate how good design has been embedded into the Proposed Development visions and principles, it has influenced the overall siting and aesthetics of the Proposed Development, and how it has been considered and will be taken forward at the detailed design stage.

2.51 The design evolution of the Proposed Development is also explained within the **DAS [EN010163/APP/7.3]** including how the Proposed Development has been through an iterative process and evolved as constraints and opportunities have emerged over time, through various stages of assessment work and consultation.

3. Design Vision and Objectives

Vision

3.1 The Applicant's vision for the Proposed Development is to make a significant contribution to the production of renewable energy that will assist in tackling the climate emergency, help the UK Government meet its target for net zero emissions by 2050 and reduce UK's reliance on foreign energy supplies. Potential impacts on the surrounding environment have been carefully considered and where possible mitigated. For example, the Proposed Development has taken full account of site baseline analysis and assessed potential impacts whilst delivering an urgently needed contribution to the UK's energy system should consent for the DCO be granted. This will assist the UK in achieving legally binding renewable energy targets and policy objectives.

3.2 The Applicant's vision is underpinned by eight key Design Objectives that have acted as a set of decision making reference points and informed the DCO application up to submission. These objectives, set out below, align with design principles published by NIC 1) Climate (mitigate greenhouse gas emissions and adapt to climate change), 2) People (reflect what society wants and share benefits widely) and 3) Places (provide a sense of identity and improve our environment).

3.3 NIC Design Principle 4 Value (achieve multiple benefits and solve problems well) is not explicitly addressed through a single Design Objective for the Proposed Development. However, its aim of achieving multiple benefits and solving problems generally underpins the Vison and Objectives of the Proposed Development more broadly and is an overarching project aim.

Objective

Objective 1) Delivery of significant amounts of affordable renewable energy to support policy objectives and national targets for reducing carbon emissions to net zero by 2050.

3.4 The Proposed Development has been designed to have a capacity of over 50MW with the Proposed Development having a total expected capacity of 450MW of renewable solar energy generation and 150MW of associated energy storage for a maximum of 40 years. This will replace approximately 20% of the former generation capacity of the coal powered West Burton A Power Station.

3.5 In terms of carbon emission removal, the Proposed Development equates to saving 3.12 million tonnes of carbon emissions to the atmosphere as calculated in **ES Chapter 12: Climate Change [EN010163/APP/6.2.12]**. This carbon reduction supports policy objectives and national targets to each net zero by 2050, NPS EN-1, NPS EN-3 and NP2-EN-5 as well as NPPF.

3.6 The generation of a substantial renewable energy capacity connected to the National Electricity Transmission System positively contributes to the UK's delivery of net zero by 2050.

3.7 This Objective relates to NIC Design Principle 1: Climate.

Objective 2) Delivery of improved energy resilience by diversifying energy production and facilitating stored energy.

3.8 Electricity generation through solar generation reduces the need for fossil-fuel based energy production and therefore improves national energy resilience and security by creating a resilient supply of energy helping fulfil domestic energy demand less sensitive to price volatility. Solar energy production is independent of, and not influenced by, international energy market pricing and or supply fluctuations often affected by world events.

3.9 The inclusion of BESS into the design of the Proposed Development will enable energy produced on site to be stored on site or surplus from the national grid released back to the grid at peak demand times or energy deficit. This also enables predict needs of the energy market to be met and provides opportunity to respond to advancements in solar panel and BESS technology. This supports policy objectives for delivery of renewable energy by reducing demand for non-renewable energy at peak times, producing grid balancing services and increase in the resilience of electricity distribution network.

3.10 Objective 2 relates to NIC Design Principle 1: Climate.

Objective 3) Contribution towards strategy improvements to local ecology and biodiversity.

3.11 The Proposed Development should seek opportunities to enhance biodiversity through the protection and enhancement of existing green infrastructure as well as the creation of new habitat.

3.12 The design and landscape strategy for the Proposed Development has been informed by the assessment of potential significant effects on ecological and ornithological features, including species specific surveys and assessments presented in **ES Chapter 7: Ecology and Biodiversity [EN010163/APP/6.2.7]**.

3.13 Most of the Proposed Development consists of low biodiversity agricultural land as well as fragmented areas of good quality ecological habitats. Through design, areas of ecological significance with green infrastructure interventions will be supported, enhanced and linked by the Proposed Development. New planting will increase local biodiversity. BNG will also be delivered as set out in **ES Chapter 7: Ecology and Biodiversity [EN010163/APP/6.2.7]**. High value linear habitats such as hedgerows, ditches, watercourses and woodland will be retained and enhanced through significant planting of new hedgerows and trees. Additionally, sensitive and higher value ecological features outside the Site have been protected within the design through adoption of generous ecological buffer zones that along with other safeguard measures and large scale reversion of arable land to grassland will be sympathetically managed to maximise biodiversity value as outlined in **ES Appendix 7.14 Outline Landscape and Ecological Management Plan (OLEMP) [EN010163/APP/6.3.7]**.

3.14 Extensive embedded habitat creation to diversify and strengthen biodiversity interest of the Proposed Development and neighbouring areas also forms part of the Landscape Strategy. ES Chapter 7: Ecology and Biodiversity [EN010163/APP/6.2.7] and **ES Appendix 7.14 outline Landscape and Ecological Management Plan (OLEMP) [EN010163/APP/6.3.7]** set out how the landscape strategy translates into the establishment and management of various vegetation and habitat types in addition to features of the Site.

3.15 Objective 3 relates to NIC Design Principle 1-3: Climate, People and Place.

Objective 4) Develop a Proposed Development sensitive to surrounding landscape, limiting impact on views for key landscape receptors, residential properties and recreational routes.

3.16 The Proposed Development sensitively integrates into the landscape setting as well as avoids and minimises adverse landscape and visual effects where possible.

3.17 A Landscape and Visual Impact Assessment, as present in **ES Chapter 6: Landscape and Visual Impact and Residential Amenity [EN010163/APP/6.2.6]**, has informed

the design of the Proposed Development and demonstrates how the landscape strategy and design of the Proposed Development has been prepared to mitigate impacts on the surrounding context.

3.18 The scale and siting of the Proposed Development can be accommodated into the local landscape due to its design and mitigations measures against direct impacts by enhancing existing landscape features through planting and landscape improvements as set out within **ES Appendix 7.14 outline Landscape and Ecological Management Plan (OLEMP) [EN010163/APP/6.3.7]**.

3.19 Measures provided in the OLEMP include planning improvements and management; woodland and shelterbelt planting and management; scattered trees with native shrub planning and management; buffer areas including flower rich strips and successor scrub beneath panels; and bird mitigation habitats including wetland and set aside.

3.20 **ES Chapter 11: Noise and Vibrations [ENO10163/APP/6.2.11]** describes how the Proposed Development has been designed to ensure noise remains low during all phases of development. Best Practice Means ('BMP') are proposed to be used during construction and decommissioning as detailed within **ES Appendix 4.1 Outline Construction Environmental Management Plan (OCEMP) [EN010163/APP/6.3.4]** and **ES Appendix 4.2 Outline Decommissioning Plan (ODP) [EN010163/APP/6.3.4]**. No mitigation beyond implementation of construction and decommission BPM is required.

3.21 A **Statutory Nuisance Statement [EN010163/APP/5.4]** has also been prepared, which concludes the Proposed Development will not give rise to any statutory nuisance through its design.

3.22 Objective 4 primarily relates to NIC Design Principle 2 and 3: People and Place.

Objective 5) Develop a Proposed Development sensitive to heritage assets and settings

3.23 The design of the Proposed Development has evolved to reduce potential effects upon heritage assets as set out in **ES Chapter 9: Cultural Heritage [EN010163/APP/6.2.9]**. For example, Segelocum Scheduled Monument, remains of a roman town have been removed from the Order limits.

3.24 Direct impacts on above and below ground heritage assets have been avoided by the Proposed Development's design, preserving the setting of heritage assets within

and surrounding the Order limits. A number of measures will ensure the impact on heritage assets are avoided as set out in **ES Appendix 4.1 outline Construction Environmental Management Plan [EN010163/APP/6.3.4]**.

3.25 Measures include provision for archaeological mitigation are detailed in **ES Appendix 9.4 outline Written Scheme of Investigation for Pre-Determination Trial Trenching [EN010163/APP/6.3.9]** and **ES Appendix 9.5 outline Written Scheme of Investigation for Post-Determination Archaeological Works [EN010163/APP/6.3.9]**; use of concrete feet in areas as required to be laid out by a surveyor in accordance with the requirements of the WSI; archaeological works to be undertaken by qualified and experienced archaeological specialist; archaeological work undertaken in line with national guidance; and archaeological project management or Heritage Team monitor completion of works in accordance with the WSI.

3.26 Objective 5 relates to NIC Design Objectives 2 and 3: People and Place.

Objective 6) Safeguard surrounding hydrological systems and improve resilience to flooding without increasing flood risk elsewhere taking into account impacts of climate change.

3.27 The Proposed Development should be resilient to flooding now and in the future, without increasing flood risk elsewhere and without contamination of the water environment.

3.28 As set out in **ES Chapter 8: Hydrology, Hydrogeology, Flood Risk and Drainage [EN010163/APP/6.2.8]** the Proposed Development has been deigned to be safe without increasing flood risk elsewhere. Design mitigation measures include an appropriate sequential design of the site to ensure onsite infrastructure avoids, as far as possible, areas of elevated flood risk and incorporates flood resilient and resistance measures so that equipment can remain operational during times of elevated flood risk. This includes integration of earth bunds to protect the on-site substation and BESS, whilst solar panels and inverters are located above the design flood level.

3.29 Pollution prevention measures are included in the Proposed Development's design such as containment of firewater at the BESS compound and construction compounds with designated refuelling areas. Surface water drainage details include

SuDSs that include attenuation basins, permeable surfacing, gravel filled trenches, and filter drains.

3.30 Two large detention basins have been strategically placed within the Proposed Development on land to the west (up-gradient) of Sturton-le-Steeple. Their locations and sizes have been carefully designed to intercept overland flows generated up-gradient of the site, with water held in the basins before being released at a controlled rate to the existing drainage ditches after the peak of the rainfall event. The two basins combined would provide an attenuation capacity of approximately 4300m3 to potentially address the flooding issue reported by the local residents.

3.31 In the highly unlikely event of a fire, **ES Appendix 4.3 Outline Fire Risk Management Plan (OFRMP) [EN010163/APP/4.3]** describes the drainage strategy for the BESS compound to ensure any potential contaminants in firewater can be contained and will not contribute to the wider water environment through a bund around the BESS area and attenuation basins designed to capture runoff from the BESS (and substation) areas, with water released to local drainage ditches at a controlled greenfield rate, with the ability to shut off the outlet for the BESS in the event of a fire or other pollution incident. The attenuation basins in the BESS and substation areas will be lined to prevent infiltration.

3.32 The Proposed Development will improve resilience to climate change and changes to hydrological systems will not be exacerbated by the Proposed Development. Mitigation measures have been built into the Proposals design with regards to flood risk and drainage.

3.33 Objective 6 relates to NIC Design Objectives 1-3: Climate, People and Place.

Objective 7) Develop a Proposed Development sensitive to existing land quality

3.34 Where the use of BMV agricultural land cannot be avoided, disturbance has been minimised through local structures which require creation of hardstanding away from this land and through 'no dig' solutions.

3.35 **ES Chapter 15: Land Use and Agriculture [EN010163/APP/6.2.15]** has had regard to agricultural land quality and identified the grade of land within the Order limits. **ES Appendix 15.1 Agricultural Land Classification Report [EN010163/APP/6.3.15]** provides more detail of the land classification within the Order limits and **ES Appendix 15.2 Outline Soil Management Plan**

[EN010163/APP/6.3.15] details how soil within the Order limits will be managed for the lifetime of the Proposed Development.

3.36 Approximately 72.1% of the land within the Order limits forms BMV agricultural land. The Applicant has sought to minimise impacts on BMV agricultural land through layout design of the Proposed Development by siting hardstanding on lower grade land where possible.

3.37 At the start of construction arable management of land within the Order limits will cease for a temporary reversible time limit.

3.38 During operation, grass below and between the panels will need to be managed such as through grazing by livestock where appropriate.

3.39 Upon decommissioning above ground physical infrastructure will be removed, the Site reinstated to its current state and BMV grade and returned to the landowners.

3.40 Objective 7 relates to NIC Design Objectives 1-3: Climate, People and Place.

Objective 8) Provide safe access, minimise impact on the local highway network; and protect and enhance existing Public Rights of Way ensuring continued safe use.

3.41 **ES Chapter 13: Transport and Access [EN010163/APP/6.2.13]** and **ES Appendix 13.1 Transport Assessment [EN010163/APP/6.3.13]** describe how the construction traffic route has been chosen to utilise the most appropriate roads available, avoid designated or protected areas, height and weight restrictions as well as residential areas.

3.42 A total of 26 access points will be used for the construction phase with details provided in **ES Chapter 13: Transport and Access [EN010163/APP/6.2.13]**. 2no. will serve primary construction compounds and 3no. will serve secondary construction compounds. The remaining 21no. access points will serve the dedicated haul routes. 5no. construction access will be used during operation. Traffic during the decommissioning phase is currently proposed to egress the site using the inverse of the construction route(s), but this will be agreed in advance of the decommissioning phase in accordance with the DCO Requirements.

3.43 PRoWs will be safeguarded by the Proposed Development's design by preventing unnecessary diversion or closures, ensuring they are protected, integrated into the Proposed Development, enhanced by planting and greater connectivity by 2no.

permissive paths. The safety of the public highways will also be protected ensuring desirability of all users. Public Rights of Way will be managed during construction through **ES Appendix 4.1 Outline Construction Environmental Management plan (OCEMP) [EN010163/APP/6.3.4]**.

3.44 Objective 8 relates to NIC Design Objectives 2 and 3: People and Place.

4. The DCO Design Approach

Use

4.1 The key aspect of the Proposed Development is the construction, operation (including maintenance) and decommissioning of a ground mounted solar farm, associated BESS, substation and associated development including connection cable and grid connection point.

4.2 The operational period sought for the solar farm is a maximum of 40 years from the date of final commissioning.

4.3 The phased construction period will run for a period of 24 months in accordance with **ES Appendix 4.1 Outline Construction Environmental Management Plan (OCEMP) [EN010163/APP/6.3.4.1]**.

4.4 The detailed design of the Proposed Development will follow a successful tender process. This is to allow for flexibility to accommodate changes in technological advancements. The need for flexibility in design, layout and to address uncertainties in developing technology is acknowledged within the relevant NPSs. This is particularly pertinent to the solar and energy storage sector which continues to see constant advancement in technology. Accordingly, the Applicant is seeking to ensure a degree of flexibility (through the accepted 'Rochdale Envelope' approach) within the DCO to allow for changes in equipment and materials. Requirement 4 of the draft DCO secures the detailed design of the Proposed Development to be submitted and approved in writing by the relevant planning authority before development commences.

Design Masterplan

4.5 The Design Masterplan is indicative and consists of a plan set showing how the site has developed up to the point of submission.

4.6 The Proposed Development's Design Masterplan has considered findings from the multi-disciplinary baseline study, environmental assessment, input from the local community, stakeholders and technical consultants representing completing of an extensive exercise from design concept to DCO application submission. This demonstrates how the Applicant has achieved the Design Objectives set out in section 4 and achieved an exemplar solar development providing benefits to local communities and significant contribution to renewable energy generation whilst been sensitive to its environment and mitigating its impacts.

Principle Design Considerations for the Components of the Proposed Development

4.7 All of the works that are part of the Proposed Development are listed in Schedule 1 of the **draft DCO [EN010163/APP/3.1]**. A summary of the work packages is set out below. The extent of each Work Number is shown on the **Works Plan [EN010163/APP/2.2]**:

- Work No. 1 – a ground mounted solar photovoltaic generating station;
- Work No. 2 – a BESS compound;
- Work No. 3 – works in connection with a new 400/33kV onsite substation;
- Work No. 4 – works to install 400kV electrical cables;
- Work No. 5 – connection and installation works to the existing transmission network substation;
- Work No. 6 – works to facilitate project access and cabling;
- Work No. 6A – works to install 33kV cabling;
- Work No. 7 – general works;
- Work No. 8 – works for areas of habitat management;
- Work No. 9 – works to implement new permissive paths through the Order limits; and
- Work No. 10 – temporary construction and decommissioning of site compounds Outline Landscape and Ecological Management Plan (OLEMP).

4.8 The Proposed Development presents considerable opportunities for landscape and biodiversity mitigation and enhancement. **ES Appendix 7.14 Outline Landscape and Ecological Management Plan (OLEMP) [EN010163/APP/6.3.17]** sets out landscape and biodiversity proposals with the purpose of establishing overarching principles for the promotion of sensitive management approaches that protects, manages and enhances the Site for the benefit of habitats, landscape character and visual amenity long-term as well as during construction works.

4.9 The main aims for landscape management of the Site, informed by the Landscape Management Considerations within published Landscape Character Assessments, are as follows:

- Ensure new development is sensitively located to allow for green infrastructure, a contribution to biodiversity and maintaining long views;
- Diversify habitats in arable areas by creation of grassland habitat network, field margins, waterside buffets etc. This will further help diversify habitats for insects and birds.
- Protect and improve public enjoyment of the landscape by retaining and improving the existing PRoW;
- Restore and enhance wetland habitats, including introduction of emergent species;
- Create new woodlands to complement existing woodland pattern and provide valuable habitat for wildlife and local corridors for biodiversity;
- Enhance existing hedgerows to maintain landscape structure; and
- New development should be sited to take advantage of existing screening and in order to retain more open, long views.

4.10 Prior to commencement of each phase of the Proposed Development a LEMP covering that phase will be submitted to and approved by the local planning authority, as secured by way of a DCO.

Operational Lifespan

4.11 The operation lifespan of the Proposed Development is a maximum of 40 years starting from the date of final commissioning.

4.12 Once operational, activities on Site are expected to consist of maintenance activities such as servicing plant and equipment, including solar panels, invertors, transformers, BESS and substation compound as well as vegetation management and livestock husbandry. Movement within the site (discussed in section 7 of the **DAS [EN010163/APP/7.3]**) is likely to be minimal and undertaken by quad bike or small farm utility vehicles as outlined in **ES Appendix 7.14 Outline Landscape and Ecological Management Plan (OLEMP) [EN010163/APP/6.3.17]**.

Statutory Undertakers

4.13 The provisions of easements for existing services that transverse the Site are incorporated into the layout design as shown on the **Site Layout Plan [EN010163/APP/2.6]**. No arrays will be erected in the agreed easements, allowing access at all times. Internal access track roads crossing any existing underground

services, the crossing method will be agreed with the asset owner in advance including agreement of Risk Assessments and Method Statements.

Decommissioning

4.14 Following cessation of energy generation and exportation at the Site all PV modules, mounting structures, cabling, inverters and transformers will be removed and recycled or disposed of in accordance with good practise and market conditions at that time. Decommissioning is anticipated to take approximately 12 months.

4.15 Mitigation measures for the Proposed Development's decommissioning phase are set out in **ES Appendix 4.2 Outline Decommissioning Plan (oDP) [EN010163/APP/6.3.4]**.

Requirements

4.16 Various outline management plans and documents are intended to be detailed and finalised post-consent secured through the discharge of Requirements including:

- Phasing of the Proposed Development;
- Detailed design of the Proposed Development;
- Landscape and Ecological Management Plan (LEMP);
- Construction Environmental Management Plan (CEMP);
- Construction Traffic Management Plan (CTMP);
- Operational Environmental Management Plan (OEMP);
- Soil Management Plan (SMP);
- Written Scheme of Investigation for Pre-Determination Trial Trenching;
- Written Scheme of Investigation for Post-Determination Archaeological Works;
- Fire Risk Management Plan; and
- Decommissioning Plan.

5. Commitments

Design Flexibility and Concept Design Parameters

5.1 Mitigation NSIPs are acknowledged in the NPSs to involve uncertainty regarding the exact design, layout and technology to be used by these projects.

5.2 To this end the Proposed Development has adopted a maximum design ('Rochdale Envelope', as acknowledged by NPS EN-1, and worst-case scenario to assess environmental impacts. This has enabled the Proposed Development to be framed in a set of parameters that are assessed to provide flexibility and ensure all likely significant effects (positive or adverse) are considered.

5.3 Key areas of optionality include:

- PV panel type – whilst the proposed panel type is not fixed the top panel height, due to design evolution, has been reduced from 3.6 to 3 metres and the maximum tilt from 30 to 26 degrees.

- Fire Suppression – Each BESS enclosure will have a dedicated fire protection system, comprising flammable gas detection and venting, fire detection and alarm, and an automatic fire suppression system. Water will be stored on site in close proximity to the energy storage system in open attenuation basins. As part of the Proposed Development, a leak detection system and alarm will be fitted to the cooling system, and the drainage strategy for the BESS area includes provision for the automatic retention of any contaminated fire-fighting runoff in the event of a fire. A bund around the BESS area will prevent surface water from other areas entering the BESS areas. The attenuation basins have been designed to capture runoff from the BESS and substation areas, with storage provided for the 1 in 100 year plus climate change event (plus an additional volume for firefighting water for the BESS area). Runoff would be released to local drainage ditches at a controlled greenfield rate, with the option to shut off the outlet for the BESS in the event of a fire or other pollution incident. The attenuation basins in the BESS and substation areas will be lined to prevent infiltration.

5.4 The **Work Plans [EN010163/APP/2.2]** show the maximum extents of components within the Proposed Development (panels, substation, energy storage, cabling) and the parameters within which each Work Number comprising the authorised development may be constructed.

5.5 The **Site Layout Plan [EN010163/APP/2.6]** represents how areas of the Proposed Development will be developed. Micro-siting during construction is an important consideration and necessary for changes in plant design, shape or technological advancement to be incorporated. The detailed design of the Proposed Development is secured by way of Requirement in the draft DCO and is subject to the approval of the local planning authority.

5.6 Therefore, the final design of the Proposed Development will remain within the parameters of the **outline Design Principles [EN010163/APP/4.5]** and Rochdale Envelope assessed in the **Environmental Statement [EN010163/APP/6.2.0 to 6.2.19]**.

5.7 For ease, the outline Design Principles are as follows:

Table 5.1 - Outline Design Principles

Scheme component	Parameter type	Design parameter and principles
Work No 1 - a ground mounted solar photovoltaic generating station		
Solar panels fitted to mounting structures	Solar module height	The maximum height of the highest part of the solar modules will be 3.0m. The minimum height of the lowest part of the solar modules at its greatest inclination will be 0.8m.
	Associated electrical infrastructure height	Electrical infrastructure associated with the panels will be elevated by the mounting structures so that it is no less than 0.3m above the 1% Annual Exceedance Probability (AEP) plus climate change fluvial flood level.
	Separation distance	Separation distance between rows of panels will be a minimum of 2.0m at the closest point, and there will be a maximum distance of 12.0m between solar module centrelines.

Scheme component	Parameter type	Design parameter and principles
	Foundation depth	Maximum depth of piled mounting structures will be 2.4m below ground level.
	Alignment and slope	The solar modules will be aligned in east-west rows, and slope towards the south at a fixed slope of 10 – 26 degrees from horizontal.
	Colour	The solar modules are likely to be either black or dark blue. This will be fixed during detailed design.
	Frame type	The frame type is likely to be galvanised steel or aluminium.
	Panel technology	The panel technology will be either monofacial or bifacial panels.
	Rack type	Modules will be mounted on a rack likely to be made with galvanised steel, aluminium or similar design material.
	Foundation type	Foundations will typically be galvanised steel poles driven into the ground. These will either be piles rammed into a pre-drilled hole or a pillar attaching to a steel ground screw. Foundations in areas of archaeological interest may constitute concrete feet to which the mounting structures will be affixed. In such circumstances, concrete feet will be set directly on the topsoil with no excavation.
Solar conversion units general	Location and elevation	All equipment will be located outside of 1% AEP plus cc fluvial flood extent and sensitive equipment will be raised as high as reasonably practicable.
Solar conversion units – containerised option	Maximum dimensions	The maximum dimension of a containerised conversion unit will

Scheme component	Parameter type	Design parameter and principles
		be 15.2m in length and 6m in width, to a maximum height of 3.2m.
	Appearance	Containerised conversion units will sit in containers, externally finished to be in keeping with the prevailing surrounding environment.
	Monitoring and control	Monitoring and control systems will consist of manual controls at the containerised conversion units, and automatic and centralised monitoring and control features at the control rooms on the onsite substations.
Solar conversion units – skid option	Maximum dimensions	The maximum dimension of a skid conversion units will be 11m in length and 3.9m in width, to a maximum height of 2.8m.
	Appearance	Skid conversion units will be exposed to the open air. Externally finished to be in keeping with the prevailing surrounding environment.
	Monitoring and control	Monitoring and control systems would consist of manual controls at the solar conversion unit, and automatic and centralised monitoring and control features at the control rooms on the onsite substations.
Solar inverter – separated option	Maximum dimensions	Separated equipment will all fit within inverter / transformer station areas of 15.2m length and 6m width.
	Appearance	Externally finished to be in keeping with the prevailing surrounding environment. The exact colour will be subject to manufacturer specifications and

Scheme component	Parameter type	Design parameter and principles
		agreed with the relevant planning authority prior to construction but will be as similar as feasibly possible to light grey (RAL 7035) colour finish.
Solar transformer – separated option	Maximum dimensions	Separated equipment will all fit within inverter / transformer station areas of 15.2m x 6m.
	Appearance	Externally finished to be in keeping with the prevailing surrounding environment. The exact colour will be subject to manufacturer specifications and agreed with the relevant planning authority prior to construction but will be as similar as feasibly possible to light grey (RAL 7035) colour finish.
Solar switchgear – separated option	Maximum dimensions	Separated equipment will all fit within inverter / transformer station areas of 15.2m length and 6m width.
	Appearance	Externally finished to be in keeping with the prevailing surrounding environment. The exact colour will be subject to manufacturer specifications and agreed with the relevant planning authority prior to construction but will be as similar as feasibly possible to light grey (RAL 7035) colour finish.
DC electrical cabling	Depths and elevations	Cabling from and between solar modules, to inverters and transformers: Onsite trench will be a minimum of 0.4m deep and 0.4m wide where cables are buried, or a trenchless technique will be used.

Scheme component	Parameter type	Design parameter and principles
		Suspended cables will be suspended between 0.4m to 2.4m above ground level.
	Location	Cabling will be above ground level between the solar modules. These will be fixed to the mounting structure along the row of racks. Cabling between the solar modules and conversion units will be buried within underground trenches, or a trenchless technique will be used. Where non-ground-penetrative works are required, cables will be suspended.
Work No. 2 – a battery energy storage system compound		
BESS compound (compound to house the BESS components and containers)	Maximum area	2.9ha
	Surfacing	Stone or localised asphalt dependent on earthing solution
	Foundation	Granular material forming subbase and capping, underlain by geotextile or geomembrane. Maximum depth of 700mm.
Battery Storage Enclosures (BSE)	Maximum number	82
	Dimensions (in metres)	6.1 x 2.4 x 2.9 (length width height)
	Colour	Dark green or recessive grey
	Elevation	Containers will be raised to a maximum of 0.5m above ground level.
BESS Power Conversion System (PCS) Units	Maximum number	41
	Dimensions (in metres)	8.1 x 2.4 x 2.4 (length width height)
	Colour	Dark green or recessive grey
	Elevation	PCS will be raised to a maximum of 0.5m above ground level.
BESS Auxiliary Transformer	Number	2 (2.5MVA each)
	Dimensions (in metres)	3.1 x 2.5 x 2.1 (length width height)

Scheme component	Parameter type	Design parameter and principles
	Colour	Dark green or recessive grey
Internal BSE Fire Suppression System	Type	Each BSE will have a dedicated fire protection system, comprising flammable gas detection and venting, fire detection and alarm, and an automatic fire suppression system.
External BSE fire suppression	Type	It is the intention that the site would be self-sufficient during a potential battery-based fire event and would not require fire service intervention to prevent fire spread or any other significant risks to people or property. During detailed design and following battery product selection a detailed Fire Risk Management Plan will be developed, in liaison with the Fire Service and with due consideration of the NFCC Guidance. In development of detailed design and liaison with the Fire Service, fire service intervention may be deemed a necessary part of the BESS fire suppression strategy. In this outcome, fire water storage will be provided adjacent to the BESS compound access tracks to supply water to firefighters for an adequate duration.
	Number and dimensions of water storage tank areas (in metres)	Up to 2 water storage tank areas each with dimensions of 17.3m x 13m.
Lighting	Type	Downward facing security lighting either on columns 3m high or attached to buildings.
Work No. 3 - works in connection with a new 400/33kV onsite substation		

Scheme component	Parameter type	Design parameter and principles
Substation Compound (compound to house development substation buildings and components)	Maximum Area	2.42
	Surfacing	Stone or localised asphalt dependent on earthing solution
	Foundation	Granular material forming subbase and capping, underlain by geotextile. Maximum depth of 700mm.
Substation Transformer(s)	Number	3 (each is 260/130/130MVA and 400/33/33kV). Each is a three winding transformer.
	Dimensions (in metres)	16.5 x 10.0 x 5.0 (length, height, width)
	Fire wall (in case of explosion)	4 walls up to 0.6 metres thick, up to 10 metres high above ground level. Material to be confirmed.
Substation Busbars and overhead electrical infrastructure	Dimensions	Overhead busbar height = 12.0m
Substation control building (400kV)	Number	1
	Dimensions (in metres)	15 x 10 x 4 (length width height)
	External appearance	Will be constructed per relevant substation regulations and specifications. Walls made of concrete blocks, glass reinforced plastic (GRP) or steel construction with cladding. Finished in dark green or recessive grey paint. Roof could be tiled, metal or other materials depending on final design and requirements.
Substation control building (33kV)	Number	3
	Dimensions (in metres)	12 x 3.5 x 4 (width, length, height)
	External appearance	Will be constructed per relevant substation regulations and specifications. Walls made of concrete blocks, glass reinforced plastic (GRP) or

Scheme component	Parameter type	Design parameter and principles
		steel construction with cladding. Finished in dark green or recessive grey paint. Roof could be tiled, metal or other materials depending on final design and requirements.
Harmonic filters	Number	6
	Dimensions (in metres)	3.0 x 6.0 x 2.7 (width, length, height)
	Elevation	Harmonic filters will be raised to a maximum of 0.5m above ground level
	External appearance	Metallic containers finished in Dark Green or Recessive Grey paint as necessary
Reactors	Number	6
	Dimensions (in metres)	3 x 5 x 2 (width, length, height)
	Elevation	Reactors will be raised to a maximum of 0.5m above ground level
	External appearance	Metallic containers finished in Dark Green or Recessive Grey paint as necessary
Capacitors	Number	6
	Dimensions (in metres)	2.8 x 6.4 x 2.6 (width, length, height)
	Elevation	Capacitors will be raised to a maximum of 0.5m above ground level.
	External appearance	Metallic containers finished in Dark Green or Recessive Grey paint as necessary
Permanent lighting	Type	Downward facing security lighting either on columns 3m high or attached to buildings.
Work No 4 – works to install 400kV electrical cables connecting Work No. 3 to Work No. 5		
Cable installation	Type	400kV underground cable, laid either by directional drilling or trenching and ducting as required.

Scheme component	Parameter type	Design parameter and principles
		With directional drilling, a pipeline would be bored underground to emerge at a target point. Location of the drill bit is monitored using the Horizontal Directional Drilling (HDD) locating system. If trenching is chosen instead of directional drilling, standard trenching techniques to break open the ground to install trench and ducting for cabling will be used, per final detailed construction designs.
	Number	One continuous trench with sections of directional drilling as required.
	Maximum width of trench (in metres)	3
	Maximum depth of trench (open trenching, in metres)	3
	Maximum depth of directional drilling (in metres)	10
	Minimum depth of cable (in metres)	1.0 – 1.2m (It is noted that warning tape would be placed at approximately 0.4 m depth for safety purposes, and an earthing cable would be placed at a similar depth)
	Maximum working width of cable corridor construction (in metres)	20m to facilitate storage/laydown/access and working machinery
	Associated works	Works associated with cable laying including trenching, jointing bays, fibre bays, cable ducts, cable protection, joint protection, manholes, kiosks, marker posts, underground cable

Scheme component	Parameter type	Design parameter and principles
		marker, tiles and tape, send and receive pits for horizontal directional drilling, trenching, storage of excavated material, lighting, and a pit or container to capture fluids associated with drilling. All these works will be undertaken within the maximum parameters described above.
Work No. 5 – connection and installation works to the existing transmission network substation		
Grid connection works	Type	Grid connection assets installed as required adjacent to transmission network substation. 400kV underground cable, laid either by directional drilling or trenching and ducting as required. With directional drilling, a pipeline would be bored underground to emerge at a target point. Location of the drill bit is monitored using the Horizontal Directional Drilling (HDD) locating system. If trenching is chosen instead of directional drilling, standard trenching techniques to break open the ground to install trench and ducting for cabling will be used, per final detailed construction designs.
	Maximum width of trench (m)	3
	Maximum depth of trench (m)	3
	Maximum depth of directional drilling if required (m)	10

Scheme component	Parameter type	Design parameter and principles
	Maximum depth of cable (m)	1.0 – 1.2m (It is noted that warning tape would be placed at approximately 0.4 m depth for safety purposes, and an earthing cable would be placed at a similar depth)
	Maximum working corridor (m)	20m to facilitate storage/laydown/access and working machinery
	Associated works	Works including trenching, directional drilling, clearing of vegetation and felling of trees, installation of jointing bays, fibre bays, cable ducts, cable protection, joint protection, manholes, electrical kiosks/cabinets, marker posts, underground cable marker, tiles and tape, send and receive pits for horizontal directional drilling, trenching, lighting, and a pit or container to capture fluids associated with drilling, storage of equipment, plant, materials, installing drainage features, lighting, and welfare facilities, facilities for storage and removal of waste. All these works will be undertaken within the maximum parameters described above.
Work No. 6 – works to facilitate project access and cabling		
Site entrance	Works	Works to create a new permanent access junction from the public highway or right of way. Works to widen and / or reinforce the public highway or right of way. Works to excavate and store soil, clear vegetation and fell trees, level, shape and prepare surface

Scheme component	Parameter type	Design parameter and principles
		for construction track and permanent operational track to be installed. Temporary traffic lights or other measures to manage traffic.
Cabling (between transformer stations and proposed development substation)	Type	33kV underground cables, laid either by directional drilling or trenching and ducting as required. With directional drilling, a pipeline would be bored underground to emerge at a target point. Location of the drill bit is monitored using the Horizontal Directional Drilling (HDD) locating system. If trenching is chosen instead of directional drilling, standard trenching techniques to break open the ground to install trench and ducting for cabling will be used, per final detailed construction designs.
	Maximum cable trench dimensions	Maximum dimensions per cable circuit: 1.5m deep and 1.2m wide
	Minimum cable depth (in metres)	0.9 m (It is noted that warning tape would be placed at approximately 0.4 m depth for safety purposes, and a very thin earthing cable would be placed at the same depth)
Cabling (between PV modules and inverters and from inverters to transformers)	Type	Low voltage (typically electrical cabling is required to connect the inverters to the transformers onsite, this cabling runs from ducts fastened to underside of PV module mounting structure and down one of the mounting piles to ground, where it runs in trench to the nearest transformer station)

Scheme component	Parameter type	Design parameter and principles
		Cabling between the inverters and the transformer will be buried within underground trenches.
	Maximum cable trench dimensions	Maximum dimensions per cable circuit: 1.5m deep and 1.2m wide
	Minimum cable depth (in metres)	0.9 m (Warning tape will be placed at ~0.4 m depth for safety purposes. An earthing cable will be installed at the same depth as the electric cable)
Work No. 6A – works to install 33kV cabling		
Cabling (between transformer stations and proposed development substation)	Type	33kV underground cables, laid either by directional drilling or trenching and ducting as required. With directional drilling, a pipeline would be bored underground to emerge at a target point. Location of the drill bit is monitored using the Horizontal Directional Drilling (HDD) locating system. If trenching is chosen instead of directional drilling, standard trenching techniques to break open the ground to install trench and ducting for cabling will be used, per final detailed construction designs.
	Maximum cable trench dimensions	Maximum dimensions per cable circuit: 1.5m deep and 1.2m wide
	Minimum cable depth (in metres)	0.9 m (When installed via trenching, warning tape will be placed at ~0.4 m depth for safety purposes. An earthing cable will be installed at the same depth as the electric cable)
Work No. 7 – general works		
	Type	Low or medium voltage

Scheme component	Parameter type	Design parameter and principles
Onsite cabling (between battery containers, Power Conversion System (PCS) units, and from PCS to transformers)	Maximum cable trench dimensions	Maximum dimensions per cable circuit: 1.5m deep and 1.2m wide
	Minimum cable depth (in metres)	0.9 m (When installed via trenching, warning tape will be placed at ~0.4 m depth for safety purposes. An earthing cable will be installed at the same depth as the electric cable)
Onsite cabling (between transformer stations and proposed development substation)	Type	33kV underground cables, laid either by directional drilling or trenching and ducting as required. With directional drilling, a pipeline would be bored underground to emerge at a target point. Location of the drill bit is monitored using the Horizontal Directional Drilling (HDD) locating system. If trenching is chosen instead of directional drilling, standard trenching techniques to break open the ground to install trench and ducting for cabling will be used, per final detailed construction designs.
	Maximum cable trench dimensions	Maximum dimensions per cable circuit: 1.5m deep and 1.2m wide
	Minimum cable depth (in metres)	0.9 m (When installed via trenching, warning tape will be placed at ~0.4 m depth for safety purposes. An earthing cable will be installed at the same depth as the electric cable)
Onsite cabling (between PV modules and inverters and from inverters to transformers)	Type	Low voltage (typically electrical cabling is required to connect the inverters to the transformers onsite, this cabling runs from ducts fastened to underside of PV module mounting structure and down one of the mounting piles

Scheme component	Parameter type	Design parameter and principles
		to ground, where it runs in trench to the nearest transformer station) Cabling between the inverters and the transformer will be buried within underground trenches.
	Maximum cable trench dimensions	Maximum dimensions per cable circuit: 1.5m deep and 1.2m wide
	Minimum cable depth (in metres)	0.9 m (Warning tape will be placed at ~0.4 m depth for safety purposes. An earthing cable will be installed at the same depth as the electric cable)
Onsite earthing infrastructure	Location	Within and around perimeter of BESS compound, substation compound, and electrical equipment foundations.
	Type	Bare copper earthing cables and rods
	Minimum buried infrastructure depth	0.5m (earthing cable)
	Maximum buried infrastructure depth	2m (earthing rod)
Perimeter fencing (around solar area)	Type and height	Stock wire deer fencing up to 2.4m tall with wooden posts piled into ground.
Perimeter fencing (around BESS and substation compounds)	Type and height	Two options: Palisade security fencing up to 3.0m tall with steel posts fixed into ground with concrete foundation. Lockable double leaf access gates. Mesh grid fencing up to 2.4m tall with stell posts fixed into ground with concrete foundation. Lockable double leaf access gates.
CCTV poles	Maximum height	3.5m
	Maximum number	750

Scheme component	Parameter type	Design parameter and principles
Temporary lighting columns	Location	Construction compounds
	Maximum height	5m
	Maximum number	6 per construction compound (6 construction compounds in total to maximum of 36)
Weather stations	Maximum height	1m
	Maximum number	10
Permanent internal access tracks	Width	4.0m wide. Widths increase at bends to accommodate vehicle turning circles
	Construction and depth	Running course overlying a sub-base layer with capping if required. Maximum depths of 0.5m.
Drainage infrastructure (solar area)	Type	Mixed grassland planting beneath panels to reduce erosion and enhance interception and evapotranspiration. Gravel filled trenches along access tracks. Gravel filled filter trenches around inverter stations.
Drainage infrastructure (BESS and substation compounds)	Type	Linear drainage features connecting to pipes that convey water towards water containment feature. Inspection chambers and manholes between runs of pipe. Outfall pipe and manhole with flow control unit discharging at limited rate into watercourse.
Water containment features (detention basin)	Type	Detention basin with banks sloping at 1:3 gradient, underlined with geosynthetic clay liner or similar.
	Number	4 – 1 serving BESS compound, 1 serving substation compound, 2 within western parcel to reduce existing flood risk within Steeple village.

Scheme component	Parameter type	Design parameter and principles
Water containment features (swale)	Location	Along the eastern extent of western parcel, conveying water into detention basins reducing Steeple village flood risk. Swales and shallow ditches at the lower edge of fields within the solar area.
Equipment foundations	Location	Underlying and localised to electrical equipment throughout development
	Type	Concrete pad, strips or footings. Heavier equipment may require pile foundations dependent on ground conditions. Substation 260MVA transformers may require sunken concrete chambers up to 2m in depth.
Building and structure foundations	Location	Underlying and localised to buildings and structures throughout the development including control rooms, storage containers, walls / fences.
	Type	Concrete pad, strips or footings. Pile foundations may be required dependent on ground conditions.
Craneage hardstanding	Location	Adjacent to solar inverter / transformer station areas.
	Size	15m x 15m
	Foundation	Granular material forming surface, subbase and capping, underlain by geotextile. Maximum depth of 700mm.
Solar inverter / transformer station area groundworks	Location	At inverter / transformer station areas across Work No 1.
	Size	15.2m x 6m
	Surfacing	Stone or localised asphalt dependent on earthing solution
	Foundation	Granular material forming subbase and capping, underlain

Scheme component	Parameter type	Design parameter and principles
		by geotextile. Maximum depth of 700mm.
Works No. 8 – works for areas of habitat management		
Landscape and biodiversity enhancement measures; and habitat creation and management including earthworks, landscaping, means of enclosure and the laying and construction of drainage infrastructure.		
Work No. 9 – works to implement new permissive paths through Order limits comprising		
Permissive Paths	Width of path	4-5m with associated deer fencing and hedgerow as required
	Surface	Mown grass path with wooden board walk/ditch crossings as required.
Work No. 10 - temporary construction and decommissioning of site compounds comprising		
Construction compounds	Number and size	6 in total. 2 in development substation area sized 3ha and 0.9ha. 1 in centre of eastern parcel sized 0.6ha. 2 in north of western parcel sized 1.7ha and 0.6ha. 1 in centre of western parcel sized 0.6ha.
	Associated works	Soil stripping to 300–400 mm depth, installation of non-woven geotextile membrane to separate subsoil and enhance drainage, placement of 300–400 mm compacted crushed stone (40 mm down-to-dust or MOT Type 1), depth based on load requirements. a) storage of excavated material for reinstatement following removal of construction compound b) temporary drainage measures, stormwater management, erosion and environmental controls; c) temporary access tracks, vehicle turning areas, and car and cycle parking area;

Scheme component	Parameter type	Design parameter and principles
		d) storage of equipment and materials; e) temporary site lighting, fencing and security infrastructure; f) worker facilities including site offices, toilets, break areas, first aid station; g) electricity, water, and telecommunications connections; h) waste management systems; i) fuel storage and refuelling stations; temporary road signage for construction period; and removal of temporary infrastructure.

The DCO

5.8 The draft DCO seeks development consent for the Works set out in Schedule 1 of the DCO, which defines the "authorised development". Work numbers are specifically allocated to key elements of the Proposed Development with Schedule 2 of the DCO setting out Requirements of how the Proposed Development must be constructed, operated, maintained and decommissioned. This includes a commitment that detailed design of the Proposed Development is subject to the approval of the relevant local planning authorities.

Environmental Commitments

5.9 **ES Appendix 7.14 outline Landscape and Ecological Management Plan [EN010163/APP/6.3.7]** will deliver landscape and ecological features of the design described in the statement. **ES Appendix 8.2 Surface Water Drainage Strategy [EN010163/APP/6.3.8]** as well as **ES Appendix 4.1 outline Construction Environmental Management Plan [EN010163/APP/6.3.4.1]** will secure and deliver flood risk mitigation and drainage details. Requirements attached to the DCO, should consent be granted, will secure delivery of commitments set out in these documents.

Detailed Design Process

5.10 Finalised design of the Proposed Development cannot occur until the tendering process for design has been completed and approved in advance of the Proposed Development commencing (or first phase thereof). A framework, guidance and commitment for the detailed design is provided within the **Design and Access Statement [EN010163/APP/7.3]**.

6. Conclusion

6.1 The design approach of the Proposed Development has followed that set out within the NIC Design Principles and the Design Objectives to deliver good design outcomes. The detailed design of the Proposed Development will accord with the Outline Design Principles and Objectives discussed within this document.

6.2 As per the Design Objectives, the adopted approach to design sought to avoid and minimise adverse impacts wherever possible and to take opportunities to deliver enhancement, including matters such as biodiversity and green infrastructure and through the provision of two additional permissive paths. The adoption of the "Rochdale Envelope" approach has ensured that the Proposed Development incorporates the required degree of flexibility whilst ensuring certainty within the DCO process and robustness in the assessment of impacts.

6.3 The careful and successful design approach adopted has resulted in a high-quality Proposed Development which will deliver substantial decarbonised renewable energy (its first objective). Additionally, it would provide a number of environmental, social and economic benefits over the operational period of 40 years, whilst ensuring that the development is undertaken in a sustainable manner, minimising and mitigating adverse impacts.