Springwell Solar Farm

Environmental Statement

Volume 1
Chapter 3: Proposed Development Description

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

EN010149/APP/6.1.2
Revision 2
Deadline 1
June 2025
Springwell Energyfarm Ltd

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3. Proposed Development Description

3.1. Introduction

3.1.1. This document has been updated at Deadline 1 to account for a minor amendment to paragraph 3.4.22 in response to the Environment Agency's Relevant Representation. The document references have not been updated from the original submission. Please refer to the **Guide to the Application [EN010149/APP/1.2]** for the list of current versions of documents.

3.1.2. This chapter provides a description of the Proposed Development, alongside the proposed construction, operation (including maintenance) and decommissioning activities. **ES Volume 1, Chapter 2: Location of the Proposed Development [EN010149/APP/6.1]** provides an overview of the Proposed Development's location.

3.1.3. The Proposed Development comprises the installation, construction and decommissioning works, with the details to be defined by the appointed contractor(s) and subject to approval by the Local Authority. All works will be required to be undertaken within the parameters assessed for the Proposed Development. The Proposed Development will be located within the 'Order Limits' (the land shown on the **Works Plans [EN010149/APP/2.3]** within which the Proposed Development can be constructed, operated and decommissioned). The extent of the Order Limits is shown on **ES Volume 2, Figure 1.2: Order Limits [EN010149/APP/6.2]**.

3.1.4. The design of the Proposed Development has evolved throughout the environmental assessment process to avoid or minimise environmental effects and in response to consultation and engagement feedback, where appropriate. The location of the Proposed Development is shown in **ES Volume 2, Figure 1.1: Location Plan [EN010149/APP/6.2]** and described in **ES Volume 1, Chapter 2: Location of the Proposed Development [EN010149/APP/6.2]**, with the consideration of alternatives and the evolution of the design of the Proposed Development presented in **ES Volume 1, Chapter 4: Reasonable Alternatives Considered [EN010149/APP/6.1]**.

3.1.5. The area subject to the DCO Application (the Order Limits) where the Proposed Development will be carried out is shown as the Order Limits (**ES Volume 2, Figure 1.2: Order Limits [EN010149/APP/6.2])**. The principal components of the Proposed Development include:

- Solar PV development including;
  - Ground-mounted Solar PV generating station. The generating station will include Solar PV modules and mounting structures;

- Balance of Solar System (BoSS), which comprises inverters, transformers, and switchgear;

- 400kV Grid Connection Corridor to connect the Springwell Substation and proposed National Grid Navenby Substation;
- Satellite Collector Compounds comprising switchgear, transformers, ancillary equipment and operation, maintenance, security and welfare units;
- A project substation (the 'Springwell Substation') compound, which will include substation, Main Collector Compound, switching and control equipment, office/control/welfare/security buildings, storage areas, and provisions for vehicular parking and material laydown;
- Battery Energy Storage System (BESS) compound, including batteries and associated inverters, transformers, switchgear and ancillary equipment and their containers, enclosures, monitoring systems, air conditioning, electrical cables, fire safety infrastructure and operation, maintenance, security and welfare facilities;
- Underground cabling will connect the Solar PV modules and BESS compound to the BoSS, Collector Compounds, and the Springwell Substation.
- Ancillary infrastructure works, including boundary treatments, security equipment, earthing devices, fencing, lighting, earthworks, surface water management, internal tracks and any other works identified as necessary to enable the development;
- Landscaping, habitat management, biodiversity enhancement and amenity improvements; and
- Works to facilitate vehicular access to the Site.

3.2. Project Parameters and Rochdale Envelope

3.2.1. The design of the Proposed Development is an iterative process informed by ongoing environmental assessment, consultation, and engagement with statutory and non-statutory consultees.

3.2.2. In accordance with policy requirements, the approach for achieving good design was considered at the outset of the project and a framework for good design was developed. Further details of how the Proposed Development has fulfilled the requirement for good design are set out in the **Design Approach Document [EN010149/APP/7.3]**. This includes the evolution and application of Project Principles, which have been used to inform the planning and design process to date and will continue to inform the design at later stages of the project.

3.2.3. The Project Principles are based on an understanding of the Proposed Development's local context, the people it will affect, and the potential benefits and outcomes it can deliver. They have been used to drive design related decision making throughout the lifecycle of the project and are continually tested and improved in response to further baseline survey work, design evolution, environmental assessment and stakeholder feedback to deliver the best outcomes for the project.

3.2.4. Project Principles are not secured under the DCO and design outcomes will be secured via Project Parameters, Design Commitments and other control documents (such as the **oLEMP [EN010149/APP/7.9]**). This includes embedded mitigation identified through the EIA process — for example, Design Commitment - B1 perimeter fencing surrounding the Solar PV modules will be offset at least 15m from existing woodland. The DCO application contains several Control Documents set out in the **Guide to the Application [EN010149/APP/1.1]**, which will be secured through the **Draft Development Consent Order (DCO) [EN010149/APP/3.1]**.

3.2.5. It is important to note that the exact design details of the Proposed Development cannot be confirmed until after consent is granted; where the construction tendering process for the design has been completed and the local planning authority have approved the detailed design in advance of the Proposed Development commencing (or phase thereof). This is to allow for flexibility to accommodate changes in technological advancements. For example, the enclosure or building sizes may vary depending on the contractor selected, their specific configuration, and plant selection. This is of particular importance to maintaining flexibility due to the rapid pace of change in solar PV and energy storage technologies, as technology could be utilised that does not currently exist. Therefore, sufficient flexibility has been sought for the final design within the DCO Application.

3.2.6. To maintain flexibility in the design, the Applicant intends to use the 'Rochdale Envelope' approach to assessing the impacts of the Proposed Development within the maximum parameters set out in this ES. The Planning Inspectorate's Advice Note Nine 'Rochdale Envelope' **[Ref. 3-1]** provides specific guidance to applicants on the degree of flexibility that could be considered appropriate under the Planning Act 2008 regime.

3.2.7. This involves specifying parameter ranges, including details of the maximum and, where relevant, the minimum, size (footprint, width, and height relative to above ordnance datum (AOD)), technology, and locations of the different elements of the Proposed Development, where flexibility needs to be retained. Therefore, the Rochdale Envelope approach has been adopted to present a likely worst-case assessment of the potential environmental effects of the Proposed Development.

3.2.8. Establishing the maximum parameters enables a robust assessment of likely significant environmental effects to be undertaken within this ES for topics where the nature of the assessment requires a specific level of detail, such as maximum heights, massing, or noise levels. Thus, the assessment parameters form the basis of the assessment. The assessment parameters are detailed in the works descriptions below which are linked to the works packages in Schedule 1 within the **Draft DCO [EN010149/APP/3.1]** and are in full in **ES Volume 3, Appendix 3.1: Project Parameters [EN010149/APP/6.3]**, the **Works Plans [EN010149/APP/2.3]** and a number of control documents as listed with the **Guide to the Application [EN010149/APP/1.1]** and supported by the following figures presented in **ES Volume 2 [EN010149/APP/6.2]**:

- **Figure 3.1: Zonal Masterplan**
- **Figure 3.2: Height Parameters**
- **Figure 3.3: Green Infrastructure Parameters**
- **Figure 3.4: Indicative Construction and Operational Access**

3.2.9. Design Commitments have been developed to guide the practical application of the Project Principles for detailed design, within the spatial extent parameters set by the Work Plans; the quantitative Parameters set out in **ES Volume 3, Appendix: 3.1: Project Parameters [EN010149/APP/6.3]**; and other control documents (such as the **oLEMP [EN010149/APP/7.9]**), through the setting of specific design requirements for the detailed design stage. For example, this may include commitments relating to the size, type and colour of elements of the Proposed Development. Where Design Commitments are necessary, these have been identified in the **Design Approach Document [EN010149/APP/7.3]** and listed in the **Design Commitments [EN010149/APP/7.4]**.

3.2.10. The following sections describe the different elements of the Proposed Development along with details to help understand each element's design. Each section should be read in conjunction with **ES Volume 3, Appendix 3.1: Project Parameters [EN010149/APP/6.3]** and sets out the maximum parameters assessed within this ES. The **Works Plans [EN010149/APP/2.3]** show the maximum spatial extent to which each of the elements described below can be located. Each environmental factor has assessed the maximum parameters within the Rochdale Envelope to determine the potential for significant environmental effects and identify suitable mitigation measures.

3.3. Components of the Proposed Development

3.3.1. The Order Limits comprise 1,280 hectares (ha) of land and include the following components. The Proposed Development is described in Schedule 1 of the **Draft DCO [EN010149/APP/3.1]**, where the "authorised development" is divided into work packages. The Work Numbers (Work No.) for those packages are identified below and are referred to throughout this ES and correspond to the **Works Plans [EN010149/APP/2.3]**. Note that there is overlap of Work No's in some locations, and so the sum of the Order Limits is not the total of these areas:

- Work No. 1: Ground-mounted Solar PV generating station
- Work No. 2: Springwell Substation Compound
- Work No. 3: Satellite Collector Compounds
- Work No. 4: Battery Energy Storage System Compound
- Work No. 5: Grid Connection Infrastructure
- Work No. 6: Cables
- Work No. 7: Temporary Construction and Decommissioning Compounds
- Work No. 8: Highways Works (Facilitate access)
- Work No. 9: Green Infrastructure

3.3.2. The **Draft DCO [EN010149/APP/3.1]** also allows for the following works to occur in connection with and in addition to the Work Nos. set out above within the Order Limits for those work areas. This has been considered within the assessments undertaken in this ES:

- fencing, gates, boundary treatment and other means of enclosure;
- bunds, embankments, trenching and swales;
- works to the existing irrigation system and works to alter the position and extent of such irrigation system;
- surface water drainage systems, storm water attenuation systems including storage basins, oil water separators, including channelling and culverting and works to existing drainage networks;
- electrical, gas, water, foul water drainage and telecommunications infrastructure connections, diversions and works to, and works to alter the position of, such services and utilities connections;
- works to alter the course of, or otherwise interfere with, non-navigable rivers, streams or watercourses;
- works for the provision of security and monitoring measures such as CCTV columns, security cabins, lighting columns and lighting, cameras, lightning protection masts and weather stations;
- improvement, maintenance, repair and use of existing streets, private tracks and access roads;

- laying down, maintenance and repair of new internal access tracks, ramps, means of access, footpaths, permissive paths, cycle routes and roads, crossings of drainage ditches and watercourses, including signage and information boards;
- temporary footpath diversions and closures;
- landscaping and biodiversity mitigation and enhancement measures including planting;
- tunnelling, boring and drilling works;
- earthworks, site establishments and preparation works including site clearance (including vegetation removal, demolition of existing buildings and structures); earthworks (including soil stripping and storage and site levelling) and excavations; the alteration of the position of services and utilities; and works for the protection of buildings and land; and
- other works to mitigate any adverse effects of the construction, maintenance, operation or decommissioning of the authorised development.

3.4. Work No. 1 – Ground Mounted Solar PV generating station

3.4.1. The Solar PV development (Work No. 1) comprises the electricity generating station for the purposes of section 14 of the Planning Act 2008. Work No. 1 includes the following elements.

Solar PV modules

3.4.2. The Proposed Development consists of Solar PV modules fixed to a mounting structure (see further details below), known as a 'table'. Individual Solar PV modules consist of a series of bifacial, mono-crystalline cells. Solar PV modules convert sunlight into electrical current (Direct Current (DC)).

3.4.3. The DC generating capacity of each Solar PV module will depend on advances in technological capabilities at the time of construction. Once the Solar PV modules are electrically connected together in groups, they are known as 'strings'. Various factors will help inform the number and arrangement of Solar PV modules, and some flexibility will be required to accommodate future technology developments.

3.4.4. The DCO Application seeks flexibility to allow for different configurations of Solar PV modules. The final elevations of the Solar PV modules will be influenced by various design factors such as local topography and PV module type and configuration. The gap between the rows of PV tables will vary in response to local topography but will have a minimum separation distance of 2.5m.

3.4.5. The maximum height of the Solar PV modules will be 3.0m Above Ground Level (AGL) (existing levels), except in flood risk areas which would be up to 3.5m AGL (existing levels). **ES Volume 2, Figure 3.2: Height Parameters [EN010149/APP/6.2]** provides the different height parameters for the Solar PV modules across the Site.

3.4.6. The Solar PV modules would typically measure 2.4m in length and 1.3m in width with a depth of 30-40mm and consist of a series of photovoltaic cells beneath a layer of toughened glass with an anti-glare/anti-reflective coating.

3.4.7. Solar PV mounting structures are designed to withstand the wind and snow loading and other environmental impacts expected for the operational life of the Proposed Development. Solar PV modules are constructed and tested to withstand wind loading and temperature in some of the harshest environments.

3.4.8. The total number and arrangement of Solar PV modules will depend on the available technology at the time of construction. For the purposes of enabling an assessment, the ES has assumed 1.5 million Solar PV modules would be required to deliver approximately 800MW of installed DC capacity. The **Grid Connection Statement [EN010149/APP/7.6]** describes the grid connection agreement between Springwell Energyfarm Ltd and National Grid Electricity Transmission to export 800MW (AC) of clean power to the national grid.

3.4.9. Work No. 1 occupies the area beneath the Solar PV modules and will be converted from arable land to grassland managed through a combination of sheep grazing and/or hay/silage production to maintain the field vegetation during the operational phase of the Proposed Development.

3.4.10. At the detailed design stage, subject to the chosen technology/ configuration/topography, etc, it may transpire that the full extent of the land within an individual field parcel, as shown in Work No. 1, is not required. If this is the case, where any areas of Work No. 1 within an individual field parcel that are no longer needed and are not required for ancillary works such as fencing and cabling, they may remain in their current use and/or be used for additional habitat creation. This will be confirmed through the detailed design process and through the **Outline Landscape and Ecology Management Plan [EN010149/APP/7.9]**, which is secured by a Requirement in the **Draft DCO [EN010149/APP/3.1]**.

Mounting structure

3.4.11. The Solar PV modules would typically be mounted on a galvanised steel structure supported by vertical posts, known as a mounting structure, as shown indicatively in **Plate 3.1** and **Plate 3.2**.

3.4.12. The mounting structure of the Solar PV modules will be designed to face southwards on a fixed platform. The Solar PV modules would be angled at a tilt of 10 to 30 degrees from horizontal to optimise daylight absorption.

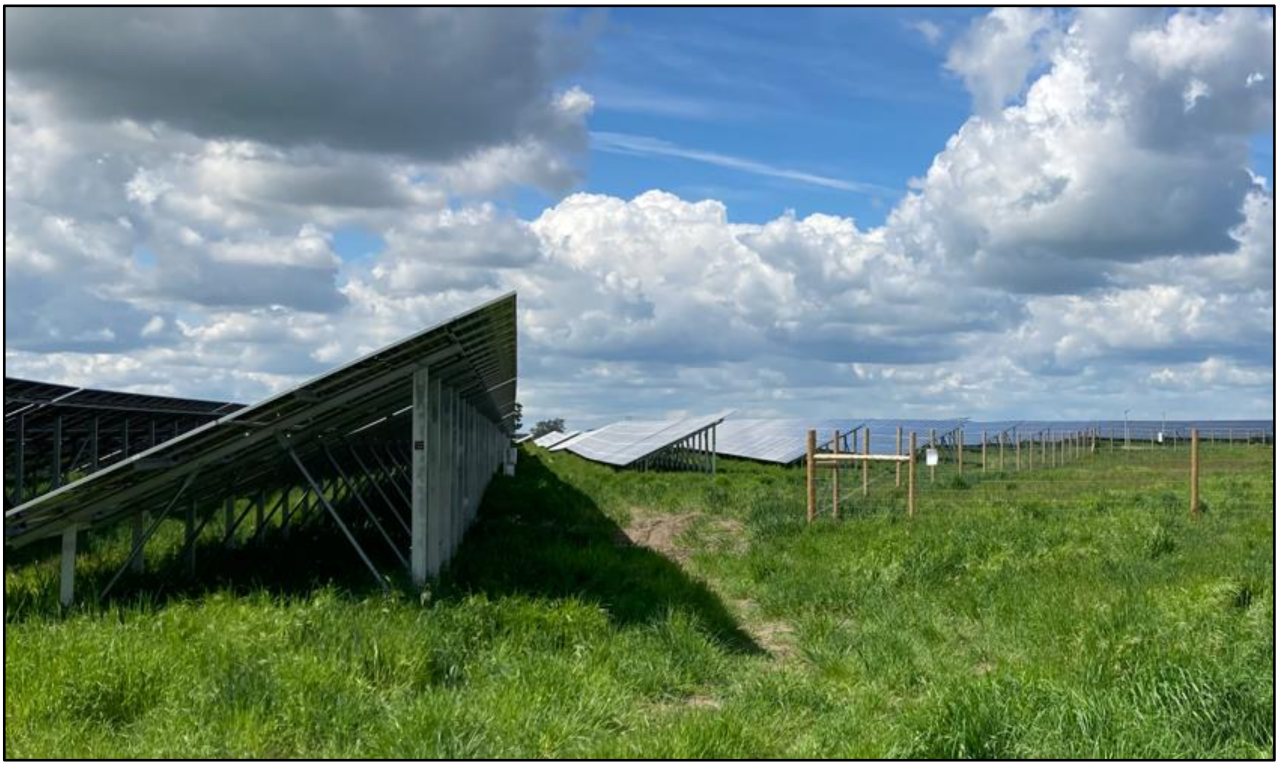
3.4.13. Depending on local ground conditions, the posts would be mounted into the ground to a depth between 1.5-3m using driven or helical piles. Site ground conditions will determine the appropriate post-anchoring system and depth. There is also an option for some structure legs to be supported by concrete footings to avoid piling depths, if required due to the ground conditions or to reduce impacts on areas of archaeological sensitivity.

3.4.14. Once attached to the mounting structure, the minimum height of the lowest part of the Solar PV modules will be 0.8m AGL (existing levels). The maximum height of the Solar PV modules will be 3.0m AGL (existing levels), except in areas of flood risk where the maximum height will be up to 3.5m AGL (existing levels) to ensure enough freeboard and climate resilience.

3.4.15. **ES Volume 2, Figure 3.5: Indicative Solar PV and String Inverter Cross Sections [EN010149/APP/6.2],** provides an illustrative example of the Solar PV modules and the string inverter arrangements.

Plate 3.1 Example of a Solar PV module and Mounting Structure

Plate 3.2 Example of a Typical Mounting Structure



3.4.16. The different height parameters for the Solar PV modules across the Site are provided in **ES Volume 2, Figure 3.2: Height Parameters [EN010149/APP/6.2]**.

3.4.17. **Table 3.1** provides the basis for the assessment of the Solar PV modules and mounting structures.

Table 3.1: Solar PV module and mounting structure Parameters

Component	Parameter	Securing mechanism
Solar PV modules		
Module type	Bifacial with an anti-glare/ anti-reflective coating	Design Commitment
Module colour	The Solar PV modules would be dark blue or black in colour, held with a metallic frame structure.	Design Commitment
Maximum height of highest modules (AGL)	3.0m except in areas of flood risk, which will be at	Parameter

Component	Parameter	Securing mechanism
	3.5m AGL (existing levels).	
Minimum height of lowest modules (AGL)	0.8m AGL (existing levels).	Parameter
Slope of Solar PV modules from the horizontal	The Solar PV modules would be sloped towards the south, at a fixed angle of 10 to 30 degrees from horizontal.	Parameter
Separation distances between rows	Minimum inter-row spacing of 2.5m	Parameter
Mounting structure		
Depth of foundations	Maximum depth 3m	Parameter
Foundation type	Driven or helical piles or concrete footings	Design Commitment
Mounting structure material	Steel	Design Commitment

Balance of Solar System (BoSS), including Inverters, Transformers and Switchgear

3.4.18. The inverters, combiner boxes, transformers and switchgear form the BoSS and are required to manage the electricity generated by the Solar PV modules.

3.4.19. Inverters are required to convert the DC electricity collected by the Solar PV modules into alternating current (AC), which allows the electricity generated to be exported to the National Grid.

3.4.20. Transformers are required to increase the voltage of the AC electricity generated by the inverters across the Order Limits before reaching the Springwell Substation.

3.4.21. There are several possible arrangements for the BoSS components; therefore flexibility is required with the optionality presented in the design. The main optionality relates to:

- the use of central or string inverters; and

- Locating equipment as Independent Outdoor Equipment or as containerised Inverter and Transformer Stations (ITS).

3.4.22. To ensure climate resilience, all BoSS options would be located within fields suitable for the Solar PV modules and outside Flood Zones 2 and 3. Therefore, the Applicant has committed through the design of the Proposed Development to ensure that no built structures, including central inverters, are located within Flood Zones 2 or 3.

3.4.23. Each factor assessment chapter of the ES includes a section explaining which BoSS configuration option is used in that assessment and explains why that option represents the worst-case impact of the BoSS options set out here. This approach ensures that the realistic worst-case design has been assessed, and the **Project Parameters** which are presented in **ES Volume 1, Appendix 3.1 [EN010149/APP/6.3]** secured will ensure that the constructed effects won’t be worse than those assessed within the ES.

3.4.24. As the design of the Proposed Development develops, the configuration will be determined based on environmental and technical factors. A reasonable worst-case scenario has been assessed and presented in this ES.

Inverters

3.4.25. Inverters are required to convert the DC electricity collected by the Solar PV modules into AC, which allows the electricity generated to be exported to the National Grid. Inverters are sized to manage the characteristics of the DC electricity output from the Solar PV modules.

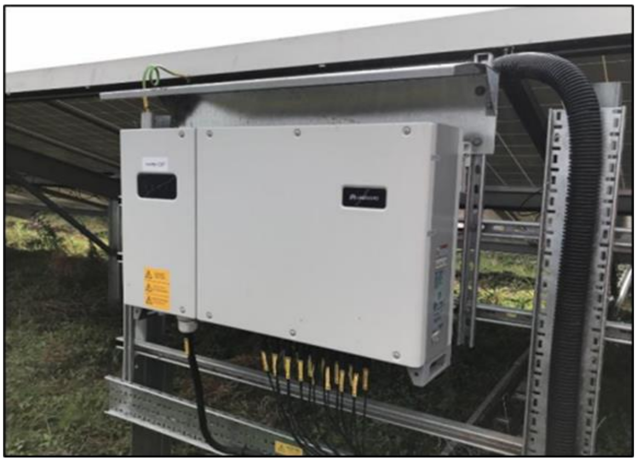
3.4.26. There are two different options for inverters, string or central inverters, which could be used as part of the BoSS and within the parameters set in Work No. 1.

3.4.27. The ES has assessed two options for inverters to maintain flexibility within the DCO Application. These are string or central inverters. However, not all fields are able to retain this flexibility due to noise restriction, these fields are listed in **ES Volume 1, Appendix 3.1 Project Parameters [EN010149/APP/6.3]**.

String inverters

3.4.28. String inverters are small enough to be mounted underneath the Solar PV modules, as shown in **Plate 3.3** and **Volume 2, Figure: 3.5 Indicative Solar PV and String Inverter Cross Sections [EN010149/APP/6.2].** String inverters will be sited within the footprint of the PV tables.

Plate 3.3 Typical string inverter



3.4.29. **Table 3.2** provides the basis for the assessment of the string inverters.

Table 3.2: String inverters parameters

String inverters	Parameter	Securing mechanism
Mounting	Mounted to the mounting structure below the Solar PV modules	Design Commitment
Colour	Grey or white	Design Commitment

Central inverters

3.4.30. Central inverters will be located at intervals amongst the Solar PV modules along with the DC combiner boxes, transformers and switchgear, either outside as Independent Outdoor Equipment, or inside a containerised ITS.

Transformers

3.4.31. Transformers are required to increase the voltage of the electricity generated across the Site before it reaches the Springwell Substation or a Collector Compound.

3.4.32. Transformers will be located at intervals amongst the Solar PV modules along with the central inverters and switchgear, either outside as Independent Outdoor Equipment, or inside a containerised ITS.

Switchgear

3.4.33. Switchgear is the combination of electrical disconnect switches, fuses, or circuit breakers used to control, protect, and isolate electrical equipment. It is used to de-energise equipment to allow work to be done and clear faults downstream.

3.4.34. Switchgear will be located at intervals amongst the Solar PV modules along with the central inverters and transformers, either outside as Independent Outdoor Equipment, or inside a containerised ITS.

Independent Outdoor Equipment

3.4.35. Independent Outdoor Equipment comprises standalone outdoor central inverters, transformer and switchgear. The equipment will be located amongst the Solar PV modules as shown in **Plate 3.4**.

3.4.36. Each group of central inverters, transformer and switchgear would typically have a maximum footprint of 80m² with a height of up to 3.5m.

3.4.37. The Independent Outdoor Equipment is anticipated to sit on compacted hardcore material or concrete pad foundations.

Plate 3.4 Typical Independent Outdoor Equipment (left to right: switchgear, transformer, central inverter)

3.4.38. **Plate 3.5** shows a typical standalone central inverter as part of Independent Outdoor Equipment. **Table 3.3** provides the basis for the assessment of standalone central inverters when used as Independent Outdoor Equipment.

Plate 3.5 Typical Outdoor Central Inverter

Table 3.3: Standalone Central Inverter Parameters

Central inverter	Parameter	Securing mechanism
Container/ cabinet maximum height	Height – 2.3 m (AGL)	Parameter
Mounting/foundations	Mounted on adjustable legs or metal skids on concrete pads or concrete columns or compacted hardcore material, surrounded by permeable hardstanding	Design Commitment
Colour	Grey or dark green, with metal mesh fencing	Design Commitment

3.4.39. **Plate 3.6** shows a typical standalone transformer as part of Independent Outdoor Equipment. **Table 3.4** provides the basis for the assessment of standalone transformers when used as Independent Outdoor Equipment.

Plate 3.6 Typical Outdoor Transformer

Table 3.4: Standalone Transformer Parameters

Transformer	Parameter	Securing mechanism
Transformer maximum height	Height – 2.5m (AGL)	Parameter
Mounting/foundations	Mounted on adjustable legs or metal skids on concrete pads or concrete columns surrounded by permeable hardstanding	Design Commitment
Colour	Grey or dark green, with metal mesh fencing	Design Commitment

3.4.40. **Plate 3.7** shows typical standalone switchgear when used as part of Independent Outdoor Equipment. **Table 3.5** provides the basis for the assessment of standalone switchgear when used as Independent Outdoor Equipment.

Plate 3.7 Typical Standalone Switchgear

Table 3.5: Standalone Switchgear Parameters

Switchgear	Parameters	Securing mechanism
Outdoor switchgear maximum height	Height – 2.5m (AGL)	Parameter
Mounting/foundations	Mounted on adjustable legs or metal skids on concrete pads, concrete columns or foundation slab, or compacted hardcore material, surrounded by permeable hardstanding	Design Commitment
Colour	Grey, white, dark green	Design Commitment

3.4.41. **Table 3.6** provides the basis for the assessment of the combined Independent Outdoor Equipment.

Table 3.6: Independent Outdoor Equipment Parameters

Independent Outdoor Equipment	Parameter	Securing mechanism
Maximum height of independent outdoor equipment (switchgear, transformer and central inverters)	Height – 3.5m Footprint – 80m^2	Parameter
Mounting/foundations	Mounted on adjustable legs or metal skids on concrete pads, concrete columns or foundation slab, or compacted hardcore material, surrounded by permeable hardstanding	Design Commitment
Colour	Painted light grey/dark green	Design Commitment

Inverter and Transformer Stations (ITS)

3.4.42. An ITS combines central inverter(s), transformer, and switchgear into a single containerised unit. **ES Volume 2, Figure 3.6: Indicative ITS Cross Section and Elevation [EN010149/APP/6.2]** provides a plan showing the ITS's illustrative elevation within the maximum parameters.

3.4.43. Each ITS is typically the size of a shipping container of approximately 6m x 2.5m in plan and up to 3m in height. The ITS will be mounted on concrete pad, columns, foundations or plinths or compacted hardcore material placed on metal skids and will be painted light grey or dark green

3.4.44. **Plate 3.8** below shows a typical ITS.

Plate 3.8 Typical Inverter and Transformer Station (ITS)

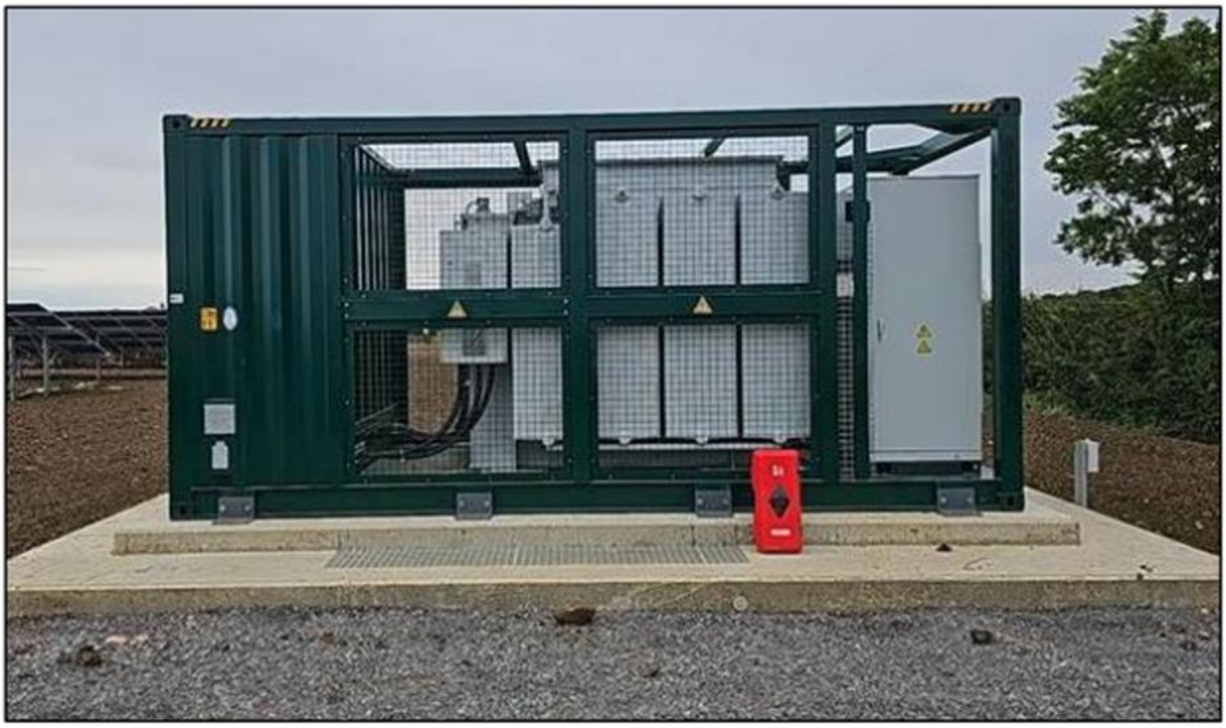


Table 3.7: ITS Parameters

ITS	Parameter	Securing mechanism
Maximum height of ITS container	3m	Parameter
Number of units	There will be up to 8 storage containers for every 20MW of installed DC Capacity.	Parameter
Mounting/foundation	Mounted on adjustable legs or metal skids on concrete pads, concrete columns or foundation slab, or compacted hardcore material, surrounded by permeable hardstanding	Design Commitment
Colour	Painted light grey/dark green	Design Commitment

3.5. Work No. 2 – Springwell Substation Compound

3.5.1. A new single Springwell Substation will be located within Springwell West in Field Tb2. The Springwell Substation will comprise electrical infrastructure such as the Main Collector Compound, transformers, switchgear, control buildings and metering equipment required to facilitate electricity export from the Proposed Development to the National Grid. The Springwell Substation will also include ancillary buildings.

3.5.2. The footprint of the entire Springwell Substation Compound is to be up to 62,500m² with a height up to 12m FGL at 50m AOD.

3.5.3. The Springwell Substation includes up to seven transformers to step up the voltage of the electricity generated across the Site. Each transformer would sit on a concrete stand with a low boundary wall. Fire barriers of up to 9m height will be installed where needed around the transformers. The total footprint of each transformer would be up to 200m² in plan with the transformer equipment with a maximum height of 12m FGL at 50m AOD. To reduce noise levels, a 6m high absorbent barrier is positioned around the Springwell Substation transformers' west, north and east faces.

3.5.4. The Springwell Substation would consist of electrical infrastructure such as transformers, switchgear, harmonic filters, reactive power compensation, and metering equipment. The ancillary buildings would include an office, control functions, warehouse, welfare and workshop facilities in one or more buildings with a total footprint of 1200m² and up to 6m in height AGL.

3.5.5. Switch rooms will also be housed within single-storey container buildings, each of which are to be approximately 200m² with a maximum height of 6m AGL.

3.5.6. Throughout the Proposed Development, there are Collector Compounds that will manage the underground cabling across the Site and/or provide local maintenance facilities.

3.5.7. The Main Collector Compound would be located adjacent to the Springwell Substation to connect all the underground cables from the independent outdoor equipment and/or ITSs within the surrounding solar fields, or from the Satellite Collector Compounds. The Main Collector Compound will also receive the underground cables from the BESS. Underground cabling will then connect the Main Collector Compound to the Springwell Substation. The switchgear and transformers would be in contained indoor units or a separate outdoor fenced area. The Main

Collector Compound would also include an operation, maintenance, security and welfare building, assumed to be single-storey.

3.5.8. The footprint of the Main Collector Compound is to be 21,600m², with a maximum height of 6m AGL. Equipment and buildings are expected to sit on shallow concrete pad foundations. This footprint does not include the buried cable trenches or tunnel that will route cables from the Solar PV modules and BESS into the Main Collector Compound.

3.5.9. **Table 3.8** provides the basis of the assessment for the electrical infrastructure and ancillary buildings within the Springwell Substation Compound.

Table 3.8: Springwell Substation and Ancillary Buildings Parameters

Springwell Substation and Ancillary Buildings Parameters				Securing mechanism
Item	**Quantity**	**Maximum Footprint**	**Maximum Height**	
Substation Compound				
Substation compound	1	62,500m2	12m (*FGL at 50m AOD*)	Parameter
Substation Electrical Infrastructure				
Lightning/surge protection located within the Substation			12m (*FGL at 50m AOD*)	Parameter
400/33kV Transformer (including plinth)	7	200m² each transformer	12m (*FGL at 50m AOD*)	Parameter
Busbar system			12m (*FGL at 50m AOD*)	Parameter
Main Collector Compound				
Main Collector Compound indicative dimensions and maximum height	1	21,600m²	6m	Parameter

Springwell Substation and Ancillary Buildings Parameters				Securing mechanism
Main Collector Compound Electrical Infrastructure				
Switch rooms	8		6m	Parameter
Ancillary Buildings				
Main operations buildings (*across the substation and main collector compound)*	2	1,200m^2 each building	6m	Parameter

3.5.10. **ES Volume 2, Figure 3.7: Indicative Substation Layout [EN010149/APP/6.2]** provides a plan showing the illustrative layout of the Springwell Substation.

3.6. Work No.3 – Satellite Collector Compounds

3.6.1. The Proposed Development will include Satellite Collector Compounds as Work No. 3 to consolidate the electricity generated by the Solar PV modules and export it to the Main Collector Compound, as well as manage the underground cabling across the Site, and/or provide local maintenance facilities. One Satellite Collector Compound is anticipated at each Springwell East, Springwell Central and Springwell West, as displayed in **ES Volume 2, Figure 3.1: Zonal Masterplan [EN010149/APP/6.2]**.

3.6.2. The Satellite Collector Compounds may include switchgear and transformers to combine the voltage from the strings to increase the voltage to 66kV. The switchgear and transformers would be in a contained indoor unit or a separate outdoor fenced area. The Satellite Collector Compounds would also include operation, maintenance, security, and welfare buildings and/or containers, which are assumed to be single storey.

3.6.3. The maximum footprint of each Satellite Collector Compound is 1,500m^2, with the maximum height of the equipment within each compound being 6m in height (AGL).

3.6.4. The proposed structures will be grey or dark green containers or brick or block buildings, rendered/painted to suit local building styles and to be sensitive to the local environment.

3.6.5. **Table 3.9** provides the basis for the Satellite Collector Compounds assessment.

Table 3.9: Satellite Collector Compound Parameters

Satellite Collector Compound		Securing mechanism
Maximum dimensions	Footprint – 1,500m2 Height – 6m	Parameters
Foundations	Mounted on concrete pad foundations or plinths	Design Commitment
Colour	Grey or painted green	Design Commitment
Palisade fencing height	2.75m	Parameter

3.7. Work No. 4 - Battery Energy Storage System (BESS)

3.7.1. The Proposed Development will include a BESS as Work No.4, located within the BESS Compound. The BESS is designed to provide peak generation and grid balancing services to the National Grid. It can do this by allowing excess electricity generated from Work No. 1 to be stored in batteries and dispatched when required. As a secondary function, it may also import surplus energy from the electricity grid when the energy available exceeds demand.

3.7.2. **Plates 3.9** shows an example of an operational BESS compound and what it could look like, and **Plate 3.10** shows an example of the construction of a BESS compound.

Plate 3.9: Example of an Operational BESS Compound

Plate 3.10: Example of the Construction of BESS Compound

3.7.3. The proposed BESS is to be consolidated within a single compound, located within Springwell West. The footprint of the BESS compound will be adjacent to the Springwell Substation (Work No. 2) up to 125,000 m^2. The defined number of BESS containers will depend upon the most appropriate design power output capacity and energy storage duration required at construction.

3.7.4. The assumption is that the BESS will be constructed within the entire area shown on **ES Volume 2, Figure 3.1: Zonal Masterplan and Figure 3.2: Height Parameters [EN010149/APP/6.2]** and in accordance with National Fire Chief Council (NFCC) Grid Scale Battery Energy Storage System planning – Guidance for FRS[1] to ensure a safe operation of the proposed BESS. These guidance documents and standards, alongside the safety provisions designed into the BESS compound, are outlined in the **Outline Battery Safety Management Plan [EN010149/APP/7.14].**

3.7.5. The BESS typically comprises of several container-sized units that house the BESS batteries and associated equipment. The transformers will have small bunding around them. The main components will be mounted on a either a compacted hardcore, reinforced concrete foundation slab or concrete piles. The dimensions and quantities will depend on the number, size and weight of the BESS units chosen at detailed design stage. The remaining surface of the BESS will be made up of permeable compacted gravel. The spacing of the BESS containers is, in part, aimed at avoiding overheating of one container by another in the event of a fire. The entire compound will be surrounded by an acoustic fence approximately 4m AGL.

3.7.6. The BESS units each comprise an enclosure for BESS electro-chemical components and associated equipment, including transformers, inverters, switchgear, power conversion systems, monitoring and control systems, Heating, Ventilation and Air Conditioning (HVAC) systems, electrical cables, fire safety equipment, water storage tanks and a shut-off valve. An example of a BESS facility is shown in **Plate 3.9**.

3.7.7. Where appropriate, water storage tanks will be included in the BESS Compound to provide water supply for firefighting. Additional tanks will be used to store any used firefighting water which may be contaminated. The current assumption for ES is for a total water storage of approximately 450m^3.

3.7.8. Each BESS would require a HVAC system to ensure the efficiency of the batteries, which are integrated into the containers. This may involve an

[1] https://nfcc.org.uk/wp-content/uploads/2023/10/Grid-Scale-Battery-Energy-Storage-System-planning-Guidance-for-FRS.pdf

external HVAC system for the containerised unit located either on the top or attached to the side of the unit. If this uses air to heat and cool, it will have a fan built into it that is powered by auxiliary power from an incoming supply from the grid.

3.7.9. **Table 3.10** provides the basis of assessment for the BESS units and ancillary buildings within the BESS compound.

Table 3.10: BESS Compound Parameters

BESS Compound	Parameters	Securing mechanism
Compound		
Maximum dimensions	Footprint – 125,000m2 Height – 6m	Parameter
BESS containers and transformer units		
Maximum height	3.5m	Parameter
Colour	grey or green	Design Commitment
Foundations	Mounted on either compacted hardcore, reinforced concrete foundation slab or concrete piles.	Design Commitment
Ancillary buildings and infrastructure		
Main operations buildings to provide control room, office, welfare, storage, workshop and metering.	Footprint - 1,400m2 Height - 6m	Parameters
Switch rooms maximum height	6m	Parameters

3.8. Work No. 5 – Grid Connection Infrastructure

3.8.1. The electricity generated by the Proposed Development would be exported via 400kV underground cabling from the Springwell Substation (Work No. 2) to a new National Grid Navenby Substation. The Grid Connection cabling would form a single connection between the Springwell Substation and the National Grid Navenby Substation. This connection would also facilitate the importing of electricity to be stored within Work No. 4.

3.8.2. The Grid Connection cables to the National Grid Navenby Substation will comprise of 400kV cable circuits buried within trenches, each up to 2m in width and approximately 1.5m in depth. To avoid overheating, the cables within the trench will have an approximate separation distance of 0.5m to 1m between them, as shown on **ES Volume 2, Figure 3.8: Indicative Cable Trench Section [EN010149/APP/6.2]**.

3.8.3. The Grid Connection cabling working width would be up to 25m to account for the inclusion of the cable trenches, a two-lane haul road for construction and maintenance access, space for temporary storage of topsoil and subsoil and working space between these features.

3.8.4. Jointing bays would be required along the Grid Connection cabling route to connect the lengths of the cable and to help with any maintenance and replacement requirements, should a fault develop.

3.8.5. It is anticipated that the cables would need to be joined at every 500-800m in a jointing bay. Each jointing bay is below ground and approximately 5.5m in width, 20m in length and up to 2.5m in depth.

3.8.6. Jointing bays would be buried underground, typically including concrete chambers with concrete or metal inspection covers. For example, the jointing bay may have concrete slab floors or one or more concrete chambers and may include concrete roof slabs to facilitate maintenance access.

3.8.7. The proposed Grid Connection corridor shown in **ES Volume 2, Figure 3.1: Zonal Masterplan [EN010149/APP/6.2]** runs up the eastern side of the agricultural fields adjoining the A15. The total length of the underground cabling is to be determined; it is assumed that the cable route would extend up to 2.8km north of Gorse Hill Lane to the Site of the proposed National Grid Navenby Substation.

3.8.8. **Table 3.11** provides the parameters for the assessment of the Grid Connection works.

Table 3.11: Grid Connection Infrastructure Parameters

Parameter type	Parameters	Securing mechanism
Maximum cable trench dimensions	Depth – 1.5m, except for utility, road or ditch crossings, which may require deeper trenches Width – 2m	Parameter

Parameter type	Parameters	Securing mechanism
Minimum separation distance between cables	500mm	Parameter

3.9. Work No. 6 – Cables

3.9.1. Low voltage electrical cabling is required to connect the Solar PV modules to inverters and the inverters to the transformers. Cabling will be laid underground, except for the cabling between the Solar PV modules and string inverters which are fixed to the mounting structure within the parameters of Work No. 1. The dimensions of trenching will vary, subject to the number of underground cables and the number of ducts they contain. The width of cable trenches will vary depending on the detailed design.

3.9.2. Combiner boxes may also be required to rationalise cabling between the Solar PV modules and the inverters/transformers. If required, these would be similar in size to string inverters and would be mounted on the mounting structures beneath the Solar PV modules before being routed in buried ducts to central inverters at the ITS locations.

3.9.3. Multiple cables will be required across the Proposed Development. The width of these cable trenches will vary depending on the number of cables in each, up to 19m. Cable spacing within trenches is expected to be approximately 0.5-1.0m to avoid overheating. The widest trenches would be limited to areas with large numbers of cable circuits, typically adjacent to the Springwell Substation and Main Collector Compound or in the main cable corridors between Springwell East, Springwell Central and Springwell West. The cabling is expected to be up to 1.5m in depth, except in areas were utilities, road, or ditch crossings may be required.

3.9.4. Higher voltage electrical (typically up to 66kV) cables are required between the Ground-mounted Solar PV generating station (Work No. 1) and the Satellite Collector Compounds (Work No. 3) to the electrical infrastructure within the Springwell Substation and Main Collector Compound (Work No. 2), and BESS (Work No. 4). The cables can also be directly from Ground Mounted Solar PV generating station (Work No. 1) to the electrical infrastructure within the Springwell Substation and Main Collector Compound (Work No. 2).

3.9.5. The electrical design of the Proposed Development will be fixed at the detailed design stage after the DCO has been granted. It is anticipated that the 33kV cables will run alongside the internal access tracks where feasible but would otherwise be located within agricultural land. The cables would cross the adopted highway within the extent of Work No. 6 in order to connect back to the Springwell Substation and Main Collector Compound. Any cables crossings which cross the adopted highway will be perpendicular to the highway as far as practical. The cables would be contained within Work No. 6 as shown on the **Works Plans [EN010149/APP/2.3]**. The flexibility to locate electrical and other cables within Work No. 6 is required to ensure that the Proposed Development can be implemented as efficiently as possible.

3.9.6. It is anticipated that the working width for the cable route construction will be 5m on either side of the trench. Therefore, it has been assumed that the maximum cable route corridor width would be up to 19m in width and an additional 10m for working width, as shown in **ES Volume 2, Figure 3.8: Indicative Cable Trench Section and Figure 3.9: Indicative Cable Crossings [EN010149/APP/6.2]**.

3.9.7. Open-cut trenching methods will be used for the majority of the cable routing. However, specialist trenchless techniques (such as Horizontal Directional Drilling (HDD)) may be required for crossings of roads such as the A15, environmental receptors (including watercourses and ditches), and other existing below-ground utilities infrastructure.

3.9.8. If HDD is used, cables will typically cross existing below-ground utility infrastructure at 90 degrees (perpendicular) to the alignment of the utility infrastructure. The cable crossings will be above or below the existing below-ground utility infrastructure, in line with the requirements of the relevant Statutory Undertakers.

3.9.9. Data cables are anticipated to be installed alongside the electrical cables to allow monitoring of the infrastructure during the operational (including maintenance) phase of the Proposed Development. The data cables would be installed within the same trenches as the electrical cables.

3.9.10. The existing above and below-ground utilities across the Proposed Development are not intended to be altered. The offsets to these assets have been discussed with the statutory undertakers as part of the design process and are accounted for within Works No. 1, as set out on the **Works Plans [EN010149/APP/2.3]**. However, if diversions are required, these will be carried out in accordance with the protective provisions between the Applicant and the Statutory Undertaker within the DCO.

3.9.11. **Table 3.12** provides the basis for the assessment of the onsite cabling.

Table 3.12: Onsite Cabling Parameters

Parameter Type	Parameters	Securing mechanism
Maximum width of the cable trench	1.5m for single cable circuit up to 19m for multiple cable circuits	Parameter
Cable spacing within trenches	0.5 - 1.0m	Parameter
Maximum depth of the cable trench	1.5m except for utility, road or ditch crossings, which may require deeper trenches.	Parameter

3.10. Work No. 7 – Temporary Construction and Decommissioning Compounds

3.10.1. During the construction phase, three Primary Construction Compounds will be provided onsite, with temporary Secondary Construction Compound(s) provided at different locations throughout the Solar PV development. The locations of the Primary and Secondary Construction Compounds are shown within Work No. 7 on the **Works Plans [EN010149/APP/2.3]** and indicatively in **ES Volume 2, Figure 3.10: Location of Primary and Secondary Construction Compounds [EN010149/APP/6.2]**.

3.10.2. Once the construction works have been completed, the location of the construction compounds can be used for Solar PV modules and/or cabling routing, as set out on the **Works Plans [EN010149/APP/2.3]**.

3.10.3. Of the three Primary Construction Compounds, one compound would be located within Springwell East and two compounds in Springwell West, as illustrated in **ES Volume 2, Figure 3.10: Location of Primary and Secondary Construction Compounds [EN010149/APP/6.2]**.

3.10.4. One of the Primary Construction Compounds in Springwell West is co-located with the Springwell Substation as there is potential for the footprint of the Springwell Substation Compound to be partially used as the Primary Construction Compound subject to phasing. Once construction has been completed, the footprint of the Primary Construction Compound outside of the Springwell Substation Compound will be established as green infrastructure, as shown on the **Works Plans [EN010149/APP/2.3]** and in accordance with the measures set out within the **oLEMP [EN010149/APP/7.9].**

3.10.5. Five temporary Secondary Construction Compounds will be located within the Solar PV development at or close to access points within the Order

Limits to minimise the extent of ground disturbance outside of the Solar PV development.

3.10.6. A dedicated construction car park will be located at or adjacent to each Primary Construction Compound, with some parking where required, and at Secondary Construction Compounds.

3.10.7. As part of Works Number 7A and 7B within Schedule 1 of the **Draft DCO [EN010149/APP/3.1]** the potential activities to occurring within the temporary Construction Compounds include the following –

(i) areas of hardstanding;

(ii) car parking;

(iii) site and welfare offices, canteens and workshops;

(iv) area to store materials and equipment;

(v) storage and waste skips;

(vi) area for download and turning;

(vii) security infrastructure, including cameras, perimeter fencing and lighting;

(viii) site drainage and waste management infrastructure (including sewerage); and

(ix) electricity, water, wastewater and telecommunications connections.

3.10.8. **Table 3.13** provides the basis of assessment for the Primary and Secondary Construction Compounds.

Table 3.13: Primary and Secondary Construction Compound Parameters

Construction Compounds			Securing mechanism
Primary Construction Compounds (Works No. 7a)	Three Primary Construction Compounds are located within Springwell East and Springwell West, as shown in **Volume 2, Figure 3.10: Location of Primary and Secondary Construction Compounds [EN010149/APP/6.2]**, containing laydown area, car parking and staff welfare facilities.		
	Footprint	$25{,}000m^2$ each compound	**Outline Construction Environmental Management Plan (oCEMP) [EN010149/APP/7.7]**
	Material	Compacted hardcore surface and membrane, with temporary	**Outline Construction Environmental Management Plan (oCEMP) [EN010149/APP/7.7]**

Construction Compounds			Securing mechanism
		mats or plates used in areas with high traffic.	
	Drainage	Infiltration or attenuated - provided with a slight camber on the compound and French drains at the edges.	**Outline Construction Environmental Management Plan (oCEMP) [EN010149/APP/7.7]**
Secondary Construction Compounds (Works No. 7b)	Five Secondary Construction Compounds across the site would contain a laydown area, car parking and staff welfare facilities.		
	Footprint	1,250m^2 each compound	**Outline Construction Environmental Management Plan (oCEMP) [EN010149/APP/7.7]**
	Material	Compacted hardcore surface and membrane, with temporary mats or plates used in areas with high traffic.	**Outline Construction Environmental Management Plan (oCEMP) [EN010149/APP/7.7]**
	Drainage	Infiltration or attenuated - provided with a slight camber on the compound and French drains at the edges.	**Outline Construction Environmental Management Plan (oCEMP) [EN010149/APP/7.7]**

3.11. Work No. 8 – Highways Works

3.11.1. The main access points to the Solar PV development will be from the A15, B1191, B1188 and Temple Road, along with a road crossing of Navenby

Lane, Heath Lane and the lane leading to Thompson's Bottom Farm. The A15 provides access to the Springwell Substation, ancillary buildings, and the Primary Construction Compound that will be located off Gorse Hill Lane. The existing Gorse Hill Lane will be widened to 7.3m wide to enable two-way access for construction vehicles and ensure the kerb radius is suitable to allow construction vehicles to travel in either direction from the Primary Construction Compound to the Secondary Construction Compound.

3.11.2. Operational accesses to the Solar PV modules within Works No. 1 are indicatively shown in **ES Volume 2, Figure 3.4: Indicative Construction and Operational Access [EN010149/APP/6.2]**. Each access will be up to 6.0m wide, with a gate located a minimum of 18m from the edge of the public highway. This will enable vehicles to pull off the public highway and wait before entering the Solar PV fields.

3.11.3. Following the removal of the temporary Construction Compounds, these access points and a network of internal access tracks will provide operational access to the Work No.1 (Solar PV development) for management and maintenance.

3.11.4. The points of access will be taken from existing agricultural tracks and field entrances, where feasible. Where this has not been feasible, five new accesses are proposed on the B1188, B1191, Gorse Hill Lane and Temple Road. In order to create the points of access, vegetation will need to be removed to either widen an existing field access or create a new point of access. The vegetation on either side of the point of access will need to be removed or managed to create visibility splays. Where vegetation removal/pruning is required for access and/or visibility splays, the works should be limited to the required amount to achieve the appropriate access/visibility. Pruning of vegetation will be preferred over removal wherever possible. Further details can be found in the **oLEMP [EN010149/APP/7.9]**. A plan showing the locations of the primary and secondary access points and a plan showing the proposed areas of vegetation removal is provided in **ES Volume 2, Figure 3.4: Indicative Construction and Operational Access** and **Figure 3.11: Vegetation Removal Parameters [EN010149/APP/6.2]**.

3.11.5. Highway improvements will be required to support construction Heavy Good Vehicles (HGVs) travelling on the local highway network to/from the proposed Site access on the B1191. These improvements are expected to comprise relatively minor verge clearance, hedge cutting or carriageway widening to achieve a minimum carriageway width of 7.3m at the compound entrance (as agreed with Lincolnshire County Council Highways) along Heath Road (B1191), Navenby lane, and Temple Road (i.e. the agreed construction vehicle route). Passing bays are proposed on

Temple Road to support two-way construction traffic. These works will be retained permanently for future use and benefit to future road users.

3.11.6. Further widening at the A15/B1191 junction is required. This will increase the width of the B1191 to accommodate two lanes on the approach to the A15 junction to support the increase in construction traffic. On the A15 southbound approach to the B1191 junction, widening of the existing road will be required to bring this approach up to standard to achieve appropriate visibility splays; this will entail the addition of a longer diverge deceleration lane, which will improve the southbound turning movement into the B1191. The widening of the A15 will also facilitate a longer turning lane for Temple Road for southbound HGV vehicles. All proposed carriageway widening is within the public highway boundary and will be retained permanently for future use and benefit to future road users. Further details are presented in **ES Volume 1, Chapter 14: Traffic and Transport [EN010149/APP/6.1]**.

3.11.7. Gorse Hill Lane will provide the main point of access for the main Primary Construction Compound west of the A15 and for the Springwell Substation. Highway improvements will require the widening and reconstruction of Gorse Hill Lane up to the compound entrance. The A15 will be widened to accommodate a right-turn lane for A15 southbound traffic turning into Gorse Hill Lane. Widening into the west verge of the A15 will be required to provide merge and diverge facilities. The construction of these works and the widening of Gorse Hill Lane will require the removal of some length of hedgerow and widening into grassland verges. The proposed improvements to Gorse Hill Lane and the A15 junction will be retained permanently for future use and benefit to future road users.

3.11.8. Passing bays on Temple Road will be permanent and retained for future use and benefit to future road users. If, during the operational (including maintenance) phase, HGVs are required to access the Proposed Development, this will be managed through the use of temporary traffic management measures, as described within the **Outline Construction Traffic Management Plan (oCTMP) [EN010149/APP/7.7]** and **Outline Operational Environmental Management Plan (oOEMP) [EN010149/APP/7.9]**.

3.11.9. Improvements are proposed to the B1191 to facilitate two-way articulated HGV's passing each other in discrete locations. Localised widening of the B1191 is proposed on the outside of a bend south of Ashby-de-la-Launde. This will require carriageway widening, ditch regrading and vegetation management. At the Navenby Lane junction at Ashby-de-la-Launde the give way markings layout will be revised to improve the width of road available to HGV's. Similarly at the entrance to RAF Digby on the B1191 the give way markings are proposed to be set back to improve the width of road available to HGV's. These works are permanent and will be retained for the future benefit of road users.

3.11.10. At the western extent of the B1191 at Scopwick village, a new 85m length of footway is proposed to be constructed in the north verge providing a safe link to the new PROW route. To improve safety, the speed limit and associated village name sign and flower bed that are located within the extents of the proposed footway, will be relocated 55m to the west. This will reduce the speed limit to 30mph over the extents of the proposed footway.

3.11.11. To facilitate the movement of Abnormal Indivisible Loads (AIL), which are required to transport components of the Springwell Substation, works are required within A15 and Gorse Hill Lane, as shown on the **Works Plans [EN010149/APP/2.3]** and described in **paragraph 3.11.6** above. Lincolnshire County Council AIL team have been consulted in respect to the proposed AIL movements. This confirmed no width or height mitigation works are required to Lincolnshire County Council structures. The permanent works form part of the junction improvement measures and will be retained for future operational use to access Springwell Substation after the AIL movements have been completed and are shown on the **Streets, Rights of Way and Access Plans [EN010149/APP/2.4]**.

3.12. Work No. 9 – Green Infrastructure

3.12.1. The existing hedgerows, woodland, ditches, ponds and field margins will be retained within the Order Limits, with the exception of small breaks and/or crossings required for new access tracks, security fencing, cable routes and new access junctions. Any hedgerow or ditch crossings will be designed to use existing agricultural gateways/tracks or gaps in field boundaries (where practicable) and the width of any new crossings will be kept to a minimum. Where a cable crosses a hedgerow and the hedgerow is removed, these will be reinstated post-construction.

3.12.2. The minimum offsets from the perimeter fencing surrounding the Solar PV development as set out in **Table 3.14** and secured within the **Design Commitments [EN010149/APP/7.4]**. The offsets will apply to existing features within the Order Limits, with the exception of where access tracks, security fencing and/or cable routes are required to cross an existing feature. Based on best practices these offsets have been established as a minimum distance. They will be used to deliver additional planting of diverse habitats to either increase habitat connectivity and structural diversity through combinations of hedgerow, scrub and grassland planting.

Table 3.14: Landscape and Ecology Features and Designations Parameters

Landscape/ ecological feature & designations	Minimum offset to perimeter fencing surrounding the Solar PV development	Securing mechanism
Ditches	6m	Design Commitment
Locally designated wildlife sites	20m	Design Commitment
Existing hedgerows	10m	Design Commitment
Existing woodlands	15m	Design Commitment
Main badger sett	30m	Design Commitment
Existing and proposed PRoW	15m	Design Commitment

* with the exception of where access tracks and/or cable routes are required to cross an existing feature; however, these will be kept to a minimum and restored where practical.

3.12.3. The existing PRoW that crosses the Site have been retained and incorporated within multifunctional green corridors. The exact construction phasing and methodology are unknown; therefore, temporarily diverting PRoWs during the construction phase for 6 months, as set out within the **Outline Public Rights of Way and Permissive Paths Management Plan (oPRoWPPMP) [EN010149/APP/7.12]** and **Outline Construction Environmental Management Plan (oCEMP) [EN010149/APP/7.7]**. As part of the Public Rights of Way and Permissive Paths Management Plan, a programme of PRoW closures and alternative/new links will be produced by the Applicant and its Principal contractor prior to the construction phase. Appropriate advanced notification will be provided to all relevant stakeholders prior to commencement. Measures will be implemented to maintain public safety, the details of which are set out within the **oCEMP [EN010149/APP/7.7]**.

3.12.4. A 700m section of the A15 at the south of Springwell West requires mitigation to reduce glint and glare impacts upon roads users. This includes hedgerows to be infilled and maintained to a height of at least 3m. Until the advance planting (to be planted in Winter 2024/25) in this area has grown to sufficient density and height of 3m to mitigate impacts of glint and glare, temporary mitigation will be implemented to mitigate impacts. This temporary mitigation may include temporary screening or suitable alternative mitigation to be confirmed in the detailed LEMP. This would be removed once the hedgerows are of sufficient height. It is anticipated that a temporary hoarding or suitable alternative would be required for approximately 3 years following the construction phase. The landscape planting proposals are secured within the **oLEMP [EN010149/APP/7.9]** and further detail on the glint and glare assessment is detailed in **ES Volume 3, Appendix 5.4 [EN010149/APP/6.3]**.

3.12.5. The mitigation within the Order Limits, is shown in **ES Volume 2, Figure 3.3: Green Infrastructure Parameters [EN010149/APP/6.2].** The habitat creation proposed includes the creation of grassland open fields and margins with wildflower, hedgerows and tree belts.

3.12.6. Grassland habitats include calcareous grassland, neutral grassland meadow, arable field margins, tussocky grass margins, flower rich neutral grassland margins and lowland meadow grassland as set out within the **oLEMP [EN010149/APP/7.9]**.

3.12.7. Under the Solar PV modules, there will be habitat enhancement including the creation of legume rich modified grassland, as identified in the **oLEMP [EN010149/APP/7.9]**.

3.12.8. The proposed design of the earth bund in Field Tb2 would have a minimum crest height of +3m and maximum crest height of +5m above existing ground levels. The eastward facing lee slope of the bund would have a typical gradient of 1:20 to blend with the existing character of the landform when viewed from the road. It would have a natural vegetated appearance in keeping with the existing agrarian landscape. Tree planting is proposed on top of the bund to provide additional visual screening. As set out within the **oLEMP [EN010149/APP/7.9]**.

3.12.9. The Green Infrastructure strategy will deliver a minimum 10% net gain as demonstrated within the **ES Volume 3, Appendix 7.14: Biodiversity Net Gain Assessment [EN010149/APP/6.3]**.

3.12.10. Further habitat enhancement will be achieved through the planting of approximately 16ha of structural tree planting and approximately 15,563 linear meters of structural hedgerow planting as identified **ES Volume 2, Figure 3.3: Green Infrastructure Parameters [EN010149/APP/6.2]**.

Recreation and amenity improvements

3.12.11. The Proposed Development will include recreation and amenity improvements. These will be designed to retain and enhance recreational connectivity across the Site, as set out within the **oLEMP [EN010149/APP/7.9]**.

3.12.12. The Proposed Development is proposing to create an enhanced and better-connected footpath and cycle network. This includes approximately

3.49km of additional PRoW and approximately 8.58km of additional permissive paths. New signage and/or waymarking will be provided along new statutory PRoW and permissive paths.

3.12.13. Three new PRoWs would be created:

- A new PRoW linking RAF Digby to Scopwick (approx. length 1,670m).
- A new PRoW connecting the existing PRoW (AshL/4/1) west of the A15 (near Navenby Lane) to New England Lane. (approx. length 830m).
- A new PRoW from Temple Road (north of Brauncewell) to the Bloxham Woods Car Park to provide a connection across the A15 (approx. length 990m).

3.12.14. Four new permissive paths would be created:

- A new permissive path along the western edge of the Proposed Development linking New England Lane to Temple Road, north of Brauncewell (approx. length 4,130m).
- A new permissive path connecting the B1191 (Heath Road) with the existing PRoW between RAF Digby and Rowston (Rows/5/1) (approx. length 1,610m).
- A new permissive path linking Bloxholm Wood to Brauncewell Village (approx. length 1,120m).
- New permissive paths to provide a series of circular walking loops from Bloxholm Woods (approx. length 1,720m).

3.12.15. The Proposed Development would also include a permanent upgrade to the existing PRoW between Scopwick and Blankey to bridleway status (approx. length 2,090m). This would include an upgrade of the existing surface conditions of the trail to better allow user access and enjoyment to 'all-weather' standard allowing year-round accessibility for all users.

3.12.16. In addition to the PRoW enhancements identified above, a new community growing area is proposed to the north of Scopwick in response to stakeholder feedback. The area is located adjacent to existing community facilities along Vicarage Lane (including the Scopwick cemetery and recreational area) and is adjacent to the Spires and Steeples Trail and Stepping Out Scopwick Loop. The community growing area will be secured via the **oLEMP [EN010149/APP/7.9]**. It will be made available to the public, 364 days a year, by permission of the landowner and allows for an area of up to 2ha. The detail design of the space will be developed post DCO consent in conjunction with the community liaison group.

3.12.17. **ES Volume 2, Figure 3.3: Green Infrastructure Parameters [EN010149/APP/6.2]** illustrates the PRoW improvements and new PRoW and permissive path proposals. The **oPRoWPPMP [EN010149/APP/7.12]** sets out details on how PRoW will be managed to ensure user safety.

3.13. Works in Connection with and in addition to Work Nos. 1 to 9 Fencing, Security & Ancillary infrastructure

3.13.1. Fencing will enclose the Solar PV modules located within Works No. 1. The fields encompassing the Solar PV modules and supporting infrastructure will likely be fenced using 'deer-proof fencing', which is formed of wooden or metal posts and wire mesh, up to 2.5m in height. Pole-mounted internal-facing closed circuit television (CCTV) systems will be installed at a height 1.5m above the Solar PV modules around the perimeter of the Solar PV fields. Access gates will be metal and of similar height as the perimeter fencing. Clearances above ground, or mammal gates, will be included to permit the passage of wildlife.

3.13.2. CCTV cameras would use night-vision technology, which would be monitored remotely and avoid the need for night-time lighting. For security requirements, Passive Infra-red Detector (PID) systems (or similar) will be installed around the Solar PV field perimeter to provide the CCTVs night vision functionality.

3.13.3. Fencing would be installed around the perimeter within Works No. 2, Works No. 3, and Works No. 4 and be either palisade design or mesh design with pulse monitoring. Palisade fencing would be up to 2.75m in height and comprise steel rails attached to horizontal-running rails connected to vertical steel joints. Mesh fencing would comprise a mesh fence up to 2.75m in height with a pulse monitoring security fence up to 3.4m height inside the mesh fence. Pole-mounted facing CCTV systems, which typically have a maximum height of 5m, would be positioned around the perimeter of the operational areas of the Site with fixed views of the Proposed Development as a security measure. CCTV will not be positioned to face any residential properties and will be directed along the perimeter within the Order Limits.

3.13.4. The lighting of the Springwell Substation and within Work No.4 and Work No. 5, would be in accordance with health and safety requirements, particularly around any emergency exits where there would be lighting, similar to street lighting that operates from dusk. Otherwise, lighting sensors will be implemented around the Springwell Substation and Work No. 3, Work No. 4 and Work No. 5, for security purposes and a sensitive lighting scheme will be developed to ensure inward and downward distribution of light, avoiding light spill onto existing boundary features.

3.13.5. The lighting design would seek to limit any impact on sensitive receptors by directing lighting downward and away from the Order Limit boundaries and existing vegetation. During operation (including maintenance), no part of the Proposed Development would be continuously lit; manually operated and motion detection lighting would be utilised for operational and security purposes.

3.13.6. **Table 3.15** and **Table 3.16** provide the assessment basis for fencing and security CCTV.

Table 3.15: Fencing Parameters

Component	Parameters	Securing mechanism
Fencing type (Solar PV development)	Deer-proof fence, with Hi-tensile wire mesh with wood posts	Design Commitment
Fence post height	2.5m	Parameter
Fence height	2.5m	Parameter
Fence type (Springwell Substation, BESS, and Satellite Collector Compound)	Palisade fence (metal) or Mesh (metal) with pulse monitoring (wires)	Design Commitment
Palisade fence heights	2.75m	Parameter
Mesh fence with pulse monitoring heights	2.75m mesh with 3.4m pulse monitoring fence	Parameter

Table 3.16: CCTV Parameters

Component	Parameters	Securing mechanism
Type	Passive Infra-red Detector	Design Commitment
Support column	Wooden pole	Design Commitment
Camera height	1.5m above Solar PV modules' height (Solar PV development) 5m AGL in Springwell Substation, BESS, and Satellite Collector Compound	Parameter Parameter
Camera position	Pole mounted internal facing. Deployed at	Design Commitment

Component	Parameters	Securing mechanism
	regular intervals to provide a sufficient field of view within the boundaries of each site area, typically every 50-60 metres.	
CCTV/lighting	Passive Infrared Detectors (PID) implemented around Solar PV modules, and lighting sensors were implemented around the Springwell Substation and BESS compound.	Design Commitments

3.13.7. **ES Volume 2, Figure 3.12: Typical Security Details [EN010149/APP/6.2]** presents an illustration of the proposed elevation of the fencing and access gates within the maximum parameters, as stated in **ES Volume 3, Appendix 3.1: Project Parameters [EN010149/APP/6.3].**

Internal access tracks

3.13.8. Internal access tracks within the Site will follow the alignment of existing agricultural tracks, where practicable, limiting the requirement for new drainage ditch crossings, disturbance to soils and habitat removal. The access tracks would typically be constructed of permeable materials such as gravel and have a running width of up to approximately 6m.

3.13.9. Where drainage is required, a ditch or a swale with check dams may be located downhill of the internal access track to control any potential surface water runoff.

3.13.10. **Table 3.17** provides the basis for the assessment of internal access tracks.

Table 3.17: Internal Access Track Parameters

Internal Access Track	Parameters	Securing mechanism
Maximum internal width	6m	Parameter

Internal Access Track	Parameters	Securing mechanism
Material	Permeable material e.g. compacted gravel	Design Commitment
Drainage	Swale or ditch on the downhill side of the track, indicative depth of 0.2m	Design Commitment

3.13.11. A plan showing an illustrative section of an internal access track is provided in **ES Volume 2, Figure 3.13: Indicative Drainage Cross Sections, Figure 3.14: Indicative Location of Internal Access Tracks** and **Figure 3.15: Indicative Watercourse and Ditch Crossings [EN010149/APP/6.2].**

Drainage

3.13.12. The Solar PV modules would not materially increase the impermeable area and, therefore, are not anticipated to increase the volume of surface water runoff. A rainwater gap will separate the individual Solar PV modules, allowing rainwater to drain freely to the ground between the panels and helping to replicate the greenfield runoff conditions.

3.13.13. The **Outline Drainage Strategy** which forms an appendix to the **Flood Risk Assessment [EN010149/APP/7.16]** outlines the principles of the drainage strategy for the Proposed Development. The principles for the drainage design have been established in conjunction with the Flood Risk Assessment to ensure no increase in flood risk to offsite receptors and manage onsite drainages.

3.13.14. Due to the increase in impermeable area resulting from the construction of the BESS and Springwell Substation, a surface water drainage system is required to ensure no increase in surface water runoff from the Proposed Development. Therefore, a Sustainable Drainage Systems (SuDS) design will be implemented to control surface water runoff from these areas. With the control and limit on surface water runoff from the Proposed Development considered, the SuDS will ensure no increase in flood risk offsite and can provide a flood risk betterment for higher severity rainfall events.

3.13.15. With regard to the BESS Compound, if an incident results in potentially contaminated runoff, to ensure this runoff does not enter the wider hydrological network a system would be installed to isolate and contain any firewater runoff. This would likely include the use of a system which can stop surface water discharge offsite within the onsite drainage network. The potentially contaminated runoff would then be contained within a storage tank before being collected, tested and tankered offsite to be suitably disposed of.

Earthworks

3.13.16. Earthworks are required to facilitate the Proposed Development, the management of which is set out in the **oCEMP [EN010149/APP/7.7]**, and the **Outline Soil Management Plan [EN010149/APP/7.11].** Excavation will be required for cable trenching and equipment foundations. Excavated material will be replaced where possible (e.g. backfilling of cable trenches) or used elsewhere onsite.

3.13.17. More extensive earthworks will be required to create level platforms for Works No. 2 and Works No. 4, with any excess material generated being used for landscape bunding within the same field.

3.14. Construction Phase

Indicative construction programme

3.14.1. The construction phase is anticipated to be split into two phases over a 48-month construction period and commissioning, and subject to being granted consent, the earliest construction is anticipated to start is in 2027. The final programme will depend on the detailed layout design and potential environmental constraints on the timing of construction activities.

3.14.2. The Proposed Development currently has phased grid connection dates of 2029 and 2030. It is currently anticipated that construction works would commence at the earliest in Q1 2027 and run to Q4 2030. As such, there is a potential likelihood of overlapping construction works on the different parts of the Sites. **Table 3.18** indicates the potential construction durations across the different parts of the Proposed Development, showing a series of overlapping phase.

Table 3.18 Indicative Construction Programme

Site / Year	**2027**	**2028**	**2029**	**2030**
Springwell Substation phase 1				
Springwell Substation phase 2				
BESS				
Springwell West				
Springwell Central				
Springwell East				

3.14.3. For the purposes of the EIA, it has been assumed that the Proposed Development would be built in a single phase across the 48-month period, assuming a peak construction year (the year during which the greatest level of construction activity would occur) of 2028, and that peak construction year occurs for the full 48 months. Assuming a construction period of 48 months is considered to be the likely worst case for the majority of environmental factor assessments, as it would result in a greater extent of construction activities and associated impacts (noise, dust etc.) and traffic volumes, in comparison to assuming multiple phases construction phases of shorter individual durations.

3.14.4. The only exception to the above is for **ES Volume 1, Chapter 10: Landscape and Visual [EN010149/APP/6.1]**, which has assumed that the construction of the BESS and Springwell Substation would be up to 48 months, with other parts of the Site being constructed over a period of 24 months in any given part of the Site. This assumption is considered to be the worst-case scenario for landscape and visual impact.

Pre-commencement activities

3.14.5. The initial works for each Works No. would include enabling works required, including installation of any internal access tracks, enabling works, installation of temporary construction compounds and installation of fencing.

3.14.6. The Site preparation and permitted preliminary works would involve the following activities (not necessarily in order):

- environmental surveys, geotechnical surveys, intrusive archaeological surveys and other investigations for the purpose of assessing ground conditions;
- removal of plant and machinery;
- above ground site preparation for temporary facilities for the use of contractors;
- remedial work in respect of any contamination or other adverse ground conditions;
- diversion of existing services and the laying of temporary services;
- the provision of temporary means of enclosure and site security for construction;
- the temporary display of site notices or advertisements; or
- site clearance (including vegetation removal, demolition of existing structures or buildings); and
- Work No. 8 (works to facilitate access to Work No. 1 to 7 and 9).

Construction activities

3.14.7. The general construction activities will be undertaken in accordance with the principles set out within the **oCEMP [EN010149/APP/7.7]**. The indicative construction activities that would be required comprise (not necessarily in order):

- Site preparation, including minor localised site levelling, vegetation clearance, landscape planting and establishment of perimeter fencing and security measures;
- Import of construction materials, plant and equipment to Site;
- Establishment of Site construction compounds and welfare facilities;
- Appropriate storage and capping of soil;
- Management of waste;
- Upgrading of existing field accesses and construction of new accesses from the highway;
- Upgrading existing tracks and construction of new access roads within the Site;
- Marking out the location of infrastructure;
- Cable installation;
- Trenching in sections;
- Installation of HDD launch and reception compounds;
- Drilling of HDD crossings;
- Appropriate construction drainage;
- Sectionalised approach of duct installation;
- Excavation and installation of jointing pits;
- Cable pulling;
- Testing and commissioning; and
- Site reinstatement (i.e., returning any land used during construction for temporary purposes to its previous condition).

3.14.8. The erection of the Solar PV mounting structures and the mounting of the Solar PV Modules within Works No. 1 would include the following activities (not necessarily in order):

- Import and delivery of materials to the Site;
- Piling (where required) and installation of the Solar PV Mounting Structures (see **Plate 3.11** and **Plate 3.12**); and

- Mounting of the Solar PV modules.

Plate 3.11: Example Solar PV mounting structure

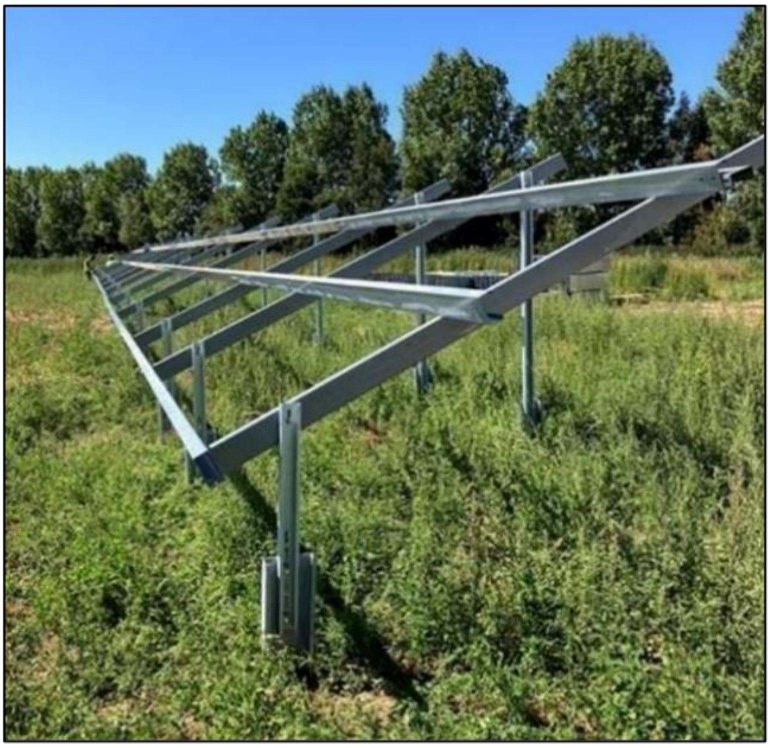


Plate 3.12: Example construction piling for the installation of the Solar PV mounting structures

3.14.9. The installation of electric cabling, inverters, transformer, switchgear, Works No. 3 and Works No. 4 infrastructure would include the following activities (not necessarily in order):

- Import and delivery of materials to the Site;
- Trenching and installation of cabling;
- Transformer, Inverter and Switchgear installation and construction. Lorry mounted cranes or mobile crane would be used to lift the equipment into position;
- Foundation excavation for the BESS and Transformer, Inverter and Switchgear (if required);
- Pouring of the concrete foundation base, where required;
- Installation of transformers that form part of the BESS;
- Construction of control and other buildings that form part of the Collector Compounds and BESS; and
- Installation of control, monitoring and communication systems.

3.14.10. The construction of the Works No. 2 and installation of equipment would include the following activities (not necessarily in order):

- Import and delivery of materials to the Site;
- Foundation excavation and construction;
- Pouring of the concrete foundation base; and
- Installation of the Springwell Substation.

Construction access

3.14.11. The primary construction route and point of construction and operational access to the Site is to be directly from or via the A15 Sleaford Road, utilising the existing Gorse Hill Lane and B1191. The main access to the Site for the construction of the Springwell Substation will be via Gorse Hill Lane off the A15 Sleaford Road.

3.14.12. The primary construction route has been considered for construction traffic, including HGVs, to access the Site from the strategic road network. Primary access to the Site would be directly from the A15 and via the B1191 to provide access to the east section of Springwell West, Springwell Central and Springwell East. Springwell West northern field parcels will be accessed from the A15 via Gorse Hill Lane, and access to the southern fields will be from the A15 via Temple Road.

3.14.13. The previously considered secondary construction route utilising the B1202 was discounted for use by HGVs following the PEIR production in response to stakeholder feedback. However, the summary of this option is included in **ES Volume 1, Chapter 4: Reasonable Alternatives Considered [EN010149/APP/6.1]**.

3.14.14. All Abnormal Indivisible Loads would access the Site, travelling from the nearest port of Immingham via the A180, M180, A15 Sleaford Road and onto Gorse Hill Lane. The preferred entry and exit route for Abnormal Indivisible Loads have been included within the Order Limits. An initial swept path analysis along this route identified the need for localised road widening from the A15 and on Gorse Hill Lane, which have been incorporated into the proposed A15 and Gorse Hill Lane junction improvements.

3.14.15. Several access points and road crossing options to Springwell West, Springwell Central and Springwell East have been identified to access the Site. Access points for construction and operation are displayed in **ES Volume 2, Figure 3.4: Indicative Construction and Operational Access [EN010149/APP/6.2]**.

3.14.16. Approximately 10 staff per compound would be onsite for the initial site set-up, including forming the access points and preparing the ground, which would increase once the compounds are set up and construction of the access tracks within each parcel begins.

3.14.17. The construction phase is anticipated to require an average of 400 workers onsite, with a maximum of up to 650 construction staff at the peak construction period. The traffic assessment has assumed a conservative estimate of 1.5 workers per vehicle per day/per shift, acknowledging that most workers will travel as a team daily, further information can be found within the **oCTMP [EN010149/APP/7.8].**

3.14.18. An Outline Travel Plan has been prepared as part of the **oCTMP [EN010149/APP/7.8]**. The Outline Travel Plan sets out strategies to encourage the use of sustainable transport for the construction workforce, particularly car sharing, while including the potential for a commuter bus service to be implemented in the event that junction improvement works at the A15/B1202 junction are not constructed before commencement of the Proposed Development. .

3.14.19. **Table 3.18** provides the assessed details for construction staff. Details of the Abnormal Indivisible Loads and construction equipment details are provided in **Table 3.19**.

Table 3.18: Construction Staff Details

Construction Staff & Parking	Details
Number of construction staff	Average of 400. Peak of 650
Dedicated construction car park	To be located at or adjacent to each of the Primary Construction Compounds with some parking also at the Secondary Construction Compounds.
Construction hours	Working hours on site would be from 7 a.m. to 7 p.m. Monday through Friday; and 7 a.m. to 12 noon Saturday. No working on Sunday or Bank Holidays.

3.14.20. Working days will be one 12-hour shift, with employees travelling to and from Site an hour on either side of these times (i.e. between 6am and 7am, and 7pm and 8pm). Where onsite works are to be conducted outside the core working hours, they will comply with the restrictions pursuant to the **oCEMP [EN010149/APP/7.7]**.

Table 3.19: Abnormal Indivisible Loads

Abnormal Indivisible Loads (AIL) and construction equipment	Details
Details of large construction equipment and AILs	Up to seven AILs for the main transformer deliveries which would be 6.2m wide and forming an overall length of 64m. Up to three AILs for cranes. Up to 18 AILs for the delivery of the 400kV cable drums.
Details of crane for unloading at Secondary Construction Compounds	Unloading at satellite compounds will be by telehandler/forklift or lorry-mounted crane. Large stand-alone cranes will be used at the project substation to unload the main transformers and other equipment (e.g. pre-packaged

Abnormal Indivisible Loads (AIL) and construction equipment	Details
	switch rooms). Smaller standalone cranes are expected to be used at the BESS compound to unload BESS containers and other equipment.
Construction vehicles	Construction vehicles will include excavators, dump trucks, tractors, trailers, bobcats, piling rigs, telehandlers and personnel transport vehicles.
Internal construction movements	Construction and personnel vehicles will move across the site sequentially as work in each area progresses. Therefore, different site areas will experience different types and numbers of vehicles at different times. Vehicles will either move to/from each work area from/to the relevant construction compound at the start/end of each working day or may be parked overnight in their work areas if it is safe and secure to do so.

Construction Traffic Management

3.14.18 An **oCTMP [EN010149/APP/7.8]**, including details on construction logistics and construction worker travel; alongside controls to guide the delivery of material, plant, equipment and staff during the construction phase.

Public Rights of Way management

3.14.19 All PRoW would be kept open during construction as far as is practicable and safe. However, where it would not be practicable and safe, there may be a requirement for some existing PRoW to be temporarily diverted or closed for the duration of the construction in that area with a maximum time of 6 months. An **oPRoWPPMP [EN010149/APP/7.12]** details how PRoW would be managed to ensure they are safe to use.

Construction Environmental Management

3.14.20 An **oCEMP [EN010149/APP/7.7]** has been submitted in support of the DCO Application. This sets out legislation, guidance, best practice guidance, and mitigation measures identified through the EIA process to be employed during the construction phase, such as construction lighting to avoid ecologically sensitive habitats. The **oCEMP [EN010149/APP/7.7]** will form the framework for a detailed Construction Environmental Management Plan to be approved by the host local planning authority prior to construction.

Construction reinstatement and habitat creation within the Proposed Development

3.14.21 A reinstatement and habitat creation programme would commence following the construction phase. This would include landscaping, habitat management and biodiversity enhancement. Areas under the Solar PV modules and the landscape buffers would be planted with grassland open fields and margins with wildflower. Woodland blocks and belts would be planted strategically to provide visual screening and ecological habitats to achieve a biodiversity net gain. The reinstatement and creation of the landscape and habitat will be undertaken in accordance with the commitments set out in the **Design Commitments [EN010149/APP/7.4]**. All measures will be documented within and secured by the **oLEMP [EN010149/APP/7.9]**.

3.15. Commissioning

3.15.1. Following construction and during the 6 month commissioning period, the Proposed Development would be required to undergo various stages of testing before the electricity can be generated and supplied to the National Grid network. This work has been incorporated into the 48 month construction phase and the commissioning will likely involve inspections and electrical and equipment testing before the Proposed Development can become operational.

3.16. Operational (including Maintenance) Phase

3.16.1. The operational life of the Proposed Development is 40 years per phase, which is to be controlled by Requirement 19, Schedule 2 in the **Draft DCO [EN010149/APP/3.1]**.

3.16.2. During the operational (including maintenance) phase of the Proposed Development, onsite activities would include routine servicing, maintenance, and replacement of Solar PV development or BESS equipment as and when required, as well as solar panel cleaning and vegetation management.

3.16.3. Any equipment that needs to be replaced during the operational (including maintenance) phase will be disposed of following the waste hierarchy, with materials being reused or recycled wherever possible. Electrical waste will be disposed of per the Waste from Electrical and Electronic Equipment Regulations 2013, minimising the environmental impact of replacing any elements of the Proposed Development.

3.16.4. **Table 3.20** provides the equipment service life assumptions that have been applied. Assets with a service life of 40 years would not require any replacement unless damaged or faulty.

Table 3.20 Service life of the Proposed Development components

Item	Service life (years)
Solar PV	40
Solar PV frames	40
Solar PV foundations	40
BESS	17.5
BESS containers/control containers	40
Switchgear	30
Inverters	10
Inverter and Transformer Stations	40
Transformers	40
BESS building	40
Main Collector Compound building	40
Cables	40
Concrete	40
Aggregates and stone	40
Fencing	40

3.16.5. It is anticipated that up to 24 permanent staff per day would typically be onsite during the operational (including maintenance) phase, with additional staff attending when required for maintenance, replacement of solar equipment, vegetation management and cleaning.

3.16.6. In the event of the need to replace any of the Proposed Development operational equipment, there may be a level of HGV activity required to complete these works within the Order Limits.

3.16.7. The land underneath and around the Solar PV modules along with the Green Infrastructure will be managed in accordance with the **oLEMP [EN010149/APP/7.9]**.

3.16.8. The operational and maintenance activities will be undertaken in accordance with the **oOEMP [EN010149/APP/7.10]**. This includes measures that control the following types of activities:

a) Working hours;

b) Lighting;

c) Parking;

d) Security;

e) Monitoring and maintenance of electrical equipment (including cleaning of Solar PV modules) and drainage;

f) Storage of materials;

g) Vegetation management;

h) Management of permissive paths;

i) Noise limits; and

j) Management of waste.

3.16.9. An **Outline Battery Safety Management Plan [EN010149/APP/7.14]** sets out the approach to be taken to manage the safety of the BESS in accordance with regulatory requirements, guidance, and good industry practice. The Outline Battery Safety Management Plan will address aspects such as safe design, construction, operation, and disposal and the strategy for firefighting and emergency planning.

3.17. Decommissioning Phase

3.17.1. The Proposed Development is to be operational for a period of 40 years per phase. Following the operational (including maintenance) phase, the Proposed Development will require decommissioning. This would involve the removal of all of the Solar PV infrastructure, including the Ground

Mounted Solar PV generating stations, Collector Compounds, Springwell Substation, BESS and ancillary infrastructure, including any onsite compounds.

3.17.2. Temporary decommissioning compounds would be created to house necessary plant and equipment and provide areas for parking for Site staff. These would be removed upon completion of the decommissioning phase.

3.17.3. At the end of the operational (including maintenance) phase, any above-ground infrastructure will be dismantled and removed per industry best practices. Solar PV modules are made up of several materials, including a metal frame. Approximately 99% of the Solar PV modules can currently be recycled. When decommissioning, options to reuse or recycle materials available at the time will be explored to ensure that as much of the materials as possible are recycled and diverted from landfills.

3.17.4. All concrete, hardstanding areas, foundations for the infrastructure and any internal tracks will be removed to a depth of up to 1m. All the below-ground cables will be left in situ.

3.17.5. The Solar PV development would be reinstated in accordance with the **Outline Decommissioning Environmental Management Plan [EN010149/APP/7.13]**. The Decommissioning Environmental Management Plan will be subject to the approval of the local planning authorities at the time of decommissioning.

3.17.6. Decommissioning would include removing any permissive paths and the land will be returned to the landowner. Landscape structural planting, including tree planting, hedgerows, scrub, etc., created to deliver biodiversity mitigation and enhancement associated with the Proposed Development would be left in situ when the Site is handed back to landowners, except for the planting within Tb2, which will be removed to facilitate the releveling and removal of the earth bund to allow the field to be returned to the landowner. Otherwise, it is assumed that the landowner would return the land to agricultural use when it is handed back.

3.17.7. Decommissioning is expected to take approximately 24 months and may be undertaken in phases.

3.17.8. The effects of the decommissioning phase are often similar to, or of a lesser magnitude than, the effects generated during the construction phase. The decommissioning effects have been addressed within **ES Volume 1, Chapters 6 to 15**. However, there can be a high degree of uncertainty regarding decommissioning as engineering and technologies evolve over the operational life of the Proposed Development, and assumptions have therefore been made where appropriate.

3.18. References

- **Ref. 3-1**: Planning Inspectorate (July 2018). Advice Note Nine: Rochdale Envelope (Version 3). Available online: Advice Note Nine: Rochdale Envelope | National Infrastructure Planning (planninginspectorate.gov.uk)

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