THE DROVES
SOLAR FARM

The Droves Solar Farm

Design Principles, Parameters and Commitments (Tracked)

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1 Introduction

1.1.1 This Design Principles, Parameters and Commitments document has been prepared on behalf of The Droves Solar Farm Limited ('the Applicant') to set out the Design Principles, Parameters and Commitments which will be secured to inform the detailed design in relation to the Development Consent Order (DCO) Application (the 'DCO Application') for the construction, operation, maintenance, and decommissioning of The Droves Solar Farm (hereafter referred to as the 'Scheme').

1.1.2 This document has been updated at Deadline 32 to specify design commitments and parameters in relation to maximum building heights, flood risk and fencing. The document references have not been updated from the original submission. Please refer to the **Guide to the Application APP/1.3.43]** for the list of current versions of documents.

1.2 The Scheme

1.2.1 The Scheme comprises the construction, operation, maintenance, and decommissioning of a solar photovoltaic (PV) electricity generating station and associated development comprising Battery Energy Storage System (BESS), a Customer Substation, and Grid Connection Infrastructure, including a new National Grid Substation. The Scheme would allow for the generation and export of over 50MW Alternating Current (AC) of renewable energy, connecting into the National Electricity Transmission System (NETS) overhead line that passes through the Site.

1.2.2 As the Scheme would have a generating capacity in excess of 50MW, it is considered to be a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008.

1.2.3 The Scheme would be located within the Order limits, also referred to as 'the Site'. The Order limits contain all elements of the Scheme comprising the Solar PV Site, the Customer Substation, the National Grid Substation, the BESS Compound, Grid Connection Infrastructure, Mitigation and Enhancement Areas, and the Highway Works (shown in **Location Plan [APP/2.1]** are described further in **Environmental Statement (ES) Chapter 2: The Order limits and Context [APP/6.1]**).

1.2.4 Highway Works are sections of the highway network that will contain localised improvements, such as improvements to road edge where it is deteriorated, or temporary highway and traffic works required to safely accommodate the Abnormal Indivisible Load (AIL) deliveries. These areas will support the movement of construction vehicles on narrower sections of the local highway network within parts of the construction vehicle routes to the Site (refer to ES **Chapter 9: Transport and Access [APP/6.2]**).

1.3 Purpose of the Document

1.3.1 This document sets out the parameters and commitments by which the Environmental Impact Assessment (EIA) has been undertaken along with the design principles which are to inform the detailed design, should the Scheme receive consent. The parameters and commitments set out in Tables 3.1 to 3.9 are secured by Requirement 5 in the **draft Development Consent Order (draft DCO) [APP/3.1]** in order to prescribe the guiding design principles, parameters and commitments to inform the detailed design of the Scheme post-consent.

1.3.2 This document should be read alongside the **Design Approach Document (DAD) [APP/5.7**] which describes the Scheme's vision and how the Design Principles have been incorporated into the design process and **ES Chapter 5: The Scheme [APP/6.1]**. The DAD provides an explanation of how design principles have informed the Scheme during the pre-application stage, it also explains which project-level design principles are to be secured (through this document).

1.3.3 The spatial extent of the Scheme (the 'Order limits') is shown on the **Works Plan [APP/2.3]** submitted as part of the DCO application and secured by Article 3 of the **draft DCO [APP/3.1]**. The EIA presented in the **ES [APP/6.1/6.2/6.3/6.4]** has adopted the 'Rochdale Envelope' approach in accordance the Planning Inspectorate's Advice Note Nine: Rochdale Envelope which provides guidance on the degree of flexibility that may be considered appropriate. Accordingly, as set out in **ES Chapter 2: EIA Process and Methodology [APP/6.1]**, the maximum (and where relevant, minimum) parameters for the elements where flexibility needs to be retained have been assessed under the Rochdale Envelope approach. The approach recognises that the worst-case parameter for one technical assessment may differ from another, ensuring that worst case overall impacts are predicted.

1.3.4 It is necessary that there will be some flexibility built into the design of the Scheme when submitting the DCO Application so that the detailed design of the Scheme can be informed by technical considerations, post-consent work, and take advantage of innovation in technology. This is of particular importance in order to maintain flexibility due to the rapid pace of change in solar PV and battery storage technology, whilst maintaining a robust and comprehensive assessment of potential effects

1.3.5 When the detailed design for the Scheme is submitted for approval to the relevant local planning authorities, those details must accord with the relevant project-level design principles, parameters and commitments set out in this document.

1.3.6 This document is a certified document within the **draft DCO [APP/3.1]** and the DCO Requirements include reference to this document where relevant.

2 Design Principles, Parameters and Commitments

2.1 Introduction

2.1.1 The Parameters and Commitments have been set out in Tables 3.1 to 3.9 and organised in accordance with the description of the Works Numbers as set out in Schedule 1 to the **draft DCO [APP/3.1]**. The spatial extents of each Work Number are set out in the accompanying **Works Plan [APP/2.3]**. Where required, other submitted DCO Application documentation that are secured by a Requirement in the Draft DCO (such as the **outline Construction Environmental Management Plan (oCEMP) [APP/7.6]** or **outline Landscape and Ecological Mitigation Plan (oLEMP) [APP/7.11]**). Where applicable, these outline management plans will set out further details of the design, parameters and mitigation measures that will be complied with as part of the construction, operation and maintenance, and decommissioning of the Scheme.

2.1.2 A description of the role and purpose of Project-Level Design Principles, Parameters and Commitments is set out below.

Project-Level Design Principles

2.1.3 Project-level design principles are used to guide decision-making throughout the design evolution process in order to deliver the intended outcomes of the Scheme. They should result in tangible outputs that are secured by relevant plans and documents set out in the draft DCO (such as Works Plans, Design Parameters, Design Commitments and relevant management plans). Where these plans and documents allow for flexibility within detailed design, project-level design principles may be secured within the outline management plans to inform future design choices (within the consented parameters) post-consent.

Design Parameter

2.1.4 Design parameters secure the size and location (footprint, width, and height relative to above ordnance datum (AOD)) of different elements of the Scheme in alignment with the Rochdale Envelope approach and are the basis of the EIA.

Design Commitments

2.1.5 Design commitments secure specific elements of the detailed design such as appearance, materials, type, colour, surfacing and offsets and relied upon within the ES.

3 Design Principles, Parameters and Commitments

3.1.1 Set out within Section 3 are the parameters and commitments for the Scheme that the detailed design must accord with as per Requirement 5 of the **draft DCO [APP/3.1].** The project level design principles that have informed the Scheme design are set out within the **Design Approach Document [APP/5.7]**.

3.1.2 The Applicant recognises that good design will continue to inform the design beyond the DCO Application stage and into the detailed design stage. The Applicant has embedded the design principles, where relevant, into the outline management plans as described within the **Design Approach Document [APP/5.7]**.

3.2 Work No. 1

3.2.1 The extent of works defined by Work No. 1 is set out in Schedule 1 of the **draft DCO [APP/3.1]** and shown on the **Works Plan [APP/2.3].**

Work No. 1 - a ground mounted solar photovoltaic generating station with a gross electrical output capacity of over 50 megawatts including—

(a) solar modules fitted to mounting structures;
(b) DC electrical cabling and combiner DC boxes;
(c) 33 kV sub-distribution switch rooms, conversion units including inverters, transformers, switchgear, and monitoring and control systems; and
(d) electrical and communications cabling connecting Work No. 1(c) to Work No. 3A;

and associated development within the meaning of section 115(2) of the 2008 Act

Table 3-1 - Work No 1

Scheme Component	Parameter/Commitment	Description
Solar PV Modules and Mounting Structures	Single Axis Tracker Panels Parameter	Maximum height at greatest inclination: 4.5m. Maximum height at horizontal alignment: 2.5m. Minimum height of lowest part of the solar panel above ground level: 0.4m. Minimum separation between modules: 2.5m at the closest point. Maximum distance between module centrelines: 15m.

Scheme Component	Parameter/Commitment	Description
	Fixed Panels Parameter	Maximum height of modules: 3.5m. Minimum height of lowest part of the solar panel above from ground: 0.4m. Minimum separation between modules: 2.5m. Maximum distance between module centrelines: 14m.
	Tracker / Fixed Panels Commitment	Solar PV Arrays will be offset from existing landscape features by the following (minimum) distances: • Hedgerows – 8m. • Hedgerows – with trees – 10m. • Woodland (Non-ancient) – 15m. • Ditches – 10m. • Badger setts (main) – 30m. • Badger sett (outlier) – 20m. • Individual trees and groups of trees – 10m. • Ponds – 10m. • Non-Statutory Designated sites and Local Wildlife sites – 10m. • Veteran and Ancient trees – 15x width of tree stem diameter.

Scheme Component	Parameter/Commitment	Description
		• Public Rights of Way (PRoWs) – 15m. The Solar PV Arrays will be sited no closer than 4m to the security fencing. The fixed solar modules will be aligned in east-west rows, and slope towards the south at a fixed slope of 10 to 35 degrees from horizontal. The single axis tracking solar modules will be aligned in north south rows, and incline to the east or west up to a maximum inclination of 60 degrees from horizontal. One row of panels would be used for single axis tracker panels where concrete feet or other non-ground penetrative techniques are identified as being required.
	Mounting Structures Parameter	Maximum depth of piled mounting structures will be 4m below ground level.
	Mounting Structures Commitment	The frame type is likely to be anodized aluminium alloy or a material with a similar finish. If archaeological protection is required, concrete feet or other non-ground penetrative techniques will be used to secure the Mounting Structures.
	Solar Module Commitment	The solar modules will be a dark colour, for example black or dark blue. The panel technology will be bifacial panels.

Scheme Component	Parameter/Commitment	Description
	Fencing and Security Parameter	Deer fence will be a maximum height of fencing will be 2.5m around individual fields or groups of fields. Along the A1065, deer fencing will be placed around each individual field (Fields 20, 21, 25 and 26) so as to not bisect the hedgerow boundaries and to allow for the continued free movement of deer along the existing hedgerows away from the A1065.
Integrated Conversion Units / 33kV Sub-distribution Switch Rooms	Parameter	Maximum length 15m. Maximum width 5m. Maximum height 3.5m. A concrete foundation slab, strips or footings up to 16m by 6m and a levelling layer of aggregate with a maximum depth of 1m will be required, or a concrete plinth set atop the topsoil where non-ground-penetrative works are required.
	Commitment	Externally finished to be in keeping with the prevailing surrounding environment. The exact colour will be subject to manufacturer specifications and agreed with the relevant planning authority prior to construction but will be carefully selected in subdued, non-reflective tones to sit as discreetly as practicable within the landscape. Integrated Conversion Units will be located at least 15m away from PRoWs. Integrated Conversion Units will be located at least 250m away from residential properties.

Scheme Component	Parameter/Commitment	Description
		Integrated Conversion Units will not be located within areas of surface water flooding.
Standalone Conversion Units	Parameter	The maximum parameters of an inverter will be 9m in length by 6.5m in width and 3.5m in height. The maximum parameters of a transformer will be 6.5m in length by 5.5m in width and 3.5m in height. The maximum parameters of a switchgear will be 6.5m in length by 2.5m in width and 3.5m in height. A concrete foundation slab, strips or footings up to a metre greater than the maximum dimension of the relevant piece of equipment and a levelling layer of aggregate with a maximum depth of 0.8m, or a concrete plinth set onto the topsoil where non-ground penetrative works are required.
	Commitment	Externally finished to be in keeping with the prevailing surrounding environment. The exact colour will be subject to manufacturer specifications and agreed with the relevant planning authority prior to construction but will be carefully selected in subdued, non-reflective tones to sit as discreetly as practicable within the landscape. Standalone Conversion Units will be located at least 15m away from PRoWs. Standalone Conversion Units will be located at least 250m away from residential properties. Standalone Conversion Units will not be located within areas of surface water flooding.

Scheme Component	Parameter/Commitment	Description
Fencing, Light and Security	Solar PV Arrays and Conversion Units Parameter	Fencing with a maximum height of fencing will be 2.5m around individual fields or groups of fields.
	Solar PV Arrays and Conversion Units Commitment	Fencing around Solar PV Arrays will be a 'deer fence' consisting of wire mesh and wooden or metal posts. Fencing will not be located along the crest of a bund. Along the A1065, deer fencing will be placed around each individual field (Fields 20, 21, 25 and 26) so as to not bisect the hedgerow boundaries and to allow for the continued free movement of deer along the existing hedgerows away from the A1065.
	Conversion Units, 33kV Sub-distribution Switch Rooms Parameter	Metal palisade security fencing around Conversion Units and BESS will be 3m height.
	Conversion Units, 33kV Sub-distribution Switch Rooms Commitment	Fencing will not be located along the crest of a bund.
	Security Surveillance Parameter	Closed circuit television (CCTV) camera poles with a maximum height of 3m.
	Lighting and Security Surveillance Commitment	CCTV cameras will be mounted on wooden poles and utilise night vision technology.

Scheme Component	Parameter/Commitment	Description
		The Solar PV Arrays will not be lit during the operational phase.
Electrical cabling	Parameter	Low voltage cable trench dimensions: • Maximum width of trenches: 1.6m. • Maximum depth of trenches: 1.2m. Interconnecting cable trench dimensions: • Maximum width of trenches: 7m. • Maximum depth of trenches: 2m. Joint bays will link sections of underground cables. These will be a minimum of 250m to a maximum of 2km apart. A joint bay would be up to 10m long and 6m wide and 3m deep. Fibre communications chambers will be provided between every 500m to 2,000m. Fibre communications chamber would be 1.5m in length, 1m wide and 1.5m deep.
	Commitment	Cabling will be above ground between the Solar PV Panels which will be fixed to the Mounting Structures. Cabling between the Mounting Structures and Conversion Units / 33kV Sub-distribution Swich Rooms will be buried within underground trenches, or a trenchless technique will be used, or cables will be suspended where non-ground-penetrative works are required.

Scheme Component	Parameter/Commitment	Description
		Cabling between the Conversion Units / 33kV Sub-distribution Swich Rooms and the Customer Substation will be buried within underground trenches, or a trenchless technique will be used, or cables will be suspended where non-ground-penetrative works are required. High voltage cables will be routed alongside the Access Tracks and / or use existing gaps in hedgerows where practicable to minimize hedgerow loss. Fibre communications chambers will be located in hard surface or at edges of fields. Cabling will not be routed along the Droves or PRoWs. Access tracks will be served by trackside drainage ditches designed to the 1% AEP + 40% climate change event. Cabling will cross the Droves and PRoWs, however the number of open trench cable crossings over Fincham Drove and Petticoat Drove will be restricted to two crossings per Drove. Further crossings would be undertaken using trenchless techniques, such as horizontal directional drilling (HDD).

3.3 Work No. 2

3.3.1 The extent of works defined by Work No. 2 is set out in Schedule 1 of the **draft DCO [APP/3.1]** and shown on the **Works Plan [APP/2.3].**

Work No. 2— an energy storage facility comprising—

(a) battery energy storage system units each containing fire protection systems and components;
(b) a structure protecting the battery energy storage cells comprised in Work No. 2(a) and ancillary equipment, being either one container or multiple containers joined to each other, mounted on a reinforced concrete foundation slab or concrete piling;
(c) interconnection units including heating, ventilation and air conditioning or liquid cooling systems and temperature management either housed within the containers comprised in Work No. 2(b), attached to the side or top of each of the containers, or located separate from but near to each of the containers;
(d) conversion units including inverters, transformers, switchgear and energy management system;
(e) monitoring and control systems housed within a container with Work No. 2(c) or located separately in its own container or control room;
(f) electrical cabling including electrical cables connecting Work No. 2 to Work No. 3A;
(g) bunded impermeable surface or other form of containment system to manage surface water drainage;
(h) water storage facility for the purposes of firefighting water supply; and
(i) bunded impermeable surface or other form of containment system and associated infrastructure to contain used firewater.

Table 3-2 - Work No 2

Scheme Component	Parameter/Commitment	Description
BESS	Parameter	Container will be up to a maximum 16m in length, 3m in width and maximum heights of 3.5m. The BESS Control Building will be up to a maximum 6m in length, 2.5m in width and maximum heights of 3.5m. The maximum height of the BESS will be 4.5m above existing ground levels. Cable trenches will be up to 1.2m in depth and 1.6m wide. Compound will have a maximum size of up to 10.5ha.
	Commitment	External finishing to be in keeping with the prevailing surrounding environment. The exact colour will be subject to manufacturer specifications and agreed with the relevant planning authority prior to construction but will be carefully selected in subdued, non-reflective tones to sit as discreetly as practicable within the landscape. The BESS compound will consist of a bunded impermeable surface or other form of containment system to manage surface water drainage. The BESS will include a bunded impermeable surface or other form of containment system and associated infrastructure to contain used firewater. Each of the BESS Units would have an integrated heating and cooling system (Thermal Management System). The Thermal

Scheme Component	Parameter/Commitment	Description
		Management System would be integrated into the units within which they are housed. Cabling between BESS Units and other infrastructure within the BESS Compound will either be above ground in cable trays or laid in a trench. Cables will be routed alongside the Access Tracks and / or use existing gaps in hedgerows where practicable to minimise hedgerow loss. BESS units will be located outside of pluvial flood pathways ~~or appropriately raised to a minimum of 300mm above the modelled flood level~~, following post-development scenario flood modelling. At the detailed design stage of the Scheme, the detailed foundation design for the BESS will be reassessed against the refined highest groundwater elevation dataset and monitoring from installed boreholes within the relevant Work Area. The BESS will be served by a SuDS network designed to the 1% AEP event plus 40% climate change allowance plus an appropriate volume for firefighting water, based on guidance at the time of the detailed design of the Scheme. A 3.5m wide strip consisting of either an access track or buffer strip will be provided to allow suitable access for maintenance activities associated with surface water attenuation / management features.

Scheme Component	Parameter/Commitment	Description
Standalone Conversion Units	Parameter	The maximum parameters of an inverter will be 9m in length by 6.5m in width and 3.5m in height. The maximum parameters of a transformer will be 6.5m in length by 5.5m in width and 3.5m in height. The maximum parameters of a switchgear will be 6.5m in length by 2.5m in width and 3.5m in height. A concrete foundation slab, strips or footings up to a metre greater than the maximum dimension of the relevant piece of equipment and a levelling layer of aggregate with a maximum depth of 0.8m, or a concrete plinth set onto the topsoil where non-ground penetrative works are required.
	Commitment	Externally finished to be in keeping with the prevailing surrounding environment. The exact colour will be subject to manufacturer specifications and agreed with the relevant planning authority prior to construction but will be carefully selected in subdued, non-reflective tones to sit as discreetly as practicable within the landscape.
Foundations	Parameter	The foundations for the BESS Units will either be a reinforced concrete base to a maximum depth of 1m, or, if a piling solution is required, piles to a maximum depth of 12m would be used.
	Commitment	BESS units will be located outside of pluvial flood pathways ~~or appropriately raised to 300mm above the modelled flood level~~, following post-development scenario flood modelling.

Scheme Component	Parameter/Commitment	Description
		At the detailed design stage of the Scheme, the detailed foundation design for the BESS will be reassessed against the refined highest groundwater elevation dataset and monitoring from installed boreholes within the relevant Work Area.
Electrical cabling	Parameter	Low voltage cable trench dimensions: • Maximum width of trenches: 1.6m. • Maximum depth of trenches: 1.2m. Interconnecting cable trench dimensions: • Maximum width of trenches: 7m. • Maximum depth of trenches: 2m.
	Commitment	High voltage cables will be routed alongside the Access Tracks and/or use existing gaps in hedgerows where practicable to minimize hedgerow loss.
Fencing and Security	Parameter	3m high metal palisade fencing around the compound.
	Commitment	Colour to be in keeping with the prevailing surrounding environment. The exact colour will be subject to manufacturer specifications and agreed with the relevant planning authority prior to construction but will be carefully selected in subdued, non-reflective tones to sit as discreetly as practicable within the landscape. Fencing will not be located along the crest of a bund.

Scheme Component	Parameter/Commitment	Description
Access	Parameter	Accesses required for permanent operation and maintenance access will be a minimum of 3.5m in width up to a maximum of 6m in width.
	Commitment	Constructed of hardcore or gravel over a levelling layer of substrate. Parking bays will be provided will be provided within the BESS Compound. Access tracks will be served by trackside drainage ditches and will include check dams to prevent the rapid transfer of water downslope.

3.4 Work No. 3

3.4.1 The extent of works defined by Work No. 3 is set out in Schedule 1 of the **draft DCO [APP/3.1]** and shown on the **Works Plan [APP/2.3]**.

Work No. 3— works in connection with an onsite substation including—

(a) **Work No. 3A**— a substation with works comprising—
  (i) an up to 400 kV substation, with associated transformer bays, feeder bays, transformers, switchgear, buildings, and ancillary equipment including power quality and reactive power compensation units;
  (ii) control building or container relay rooms with associated offices, storage and welfare facilities;
  (iii) monitoring and control systems for Work Nos. 1 and 3A;
  (iv) maintenance compound;
  (v) electrical cabling; and
  (vi) earthworks, including soil stripping and site levelling.

(b) **Work No. 3B**— works to lay electrical cables up to 400 kV including—
  (i) high voltage electrical cables connecting Work Nos. 3A and 4A;
  (ii) laying down of access tracks, ramps, footpaths, roads, including the laying and construction of drainage infrastructure, signage and information boards;
  (iii) joint bays, link boxes, cable ducts, cable protection, joint protection, manholes, marker posts, underground cable marker,

tiles and tape, communications chambers, fibre optic cables and lighting and other works associated with cable laying;
(iv) tunnelling, boring and drilling works; and
(v) temporary construction and decommissioning laydown areas comprising—
(aa) areas of hardstanding, compacted ground or track matting;
(bb) car parking;
(cc) area to store materials and equipment;
(dd) site and welfare offices and workshops;
(ee) security infrastructure, including cameras, perimeter fencing and lighting;
(ff) safety infrastructure to manage traffic when crossing roads or other obstacles;
(gg) site drainage and waste management infrastructure (including sewerage); and
(hh) electricity, water, waste water and telecommunications connections.

Table 3-3 - Work No 3

Scheme Component	Parameter/Commitment	Description
Customer Substation	Parameter	Maximum compound area – 4ha. Maximum height – 13m to the top of the busbars. The maximum height of the Customer Substation will be 13m above existing ground levels, except for within the 'dashed red box' shown on the plan included at **Appendix 1** of this document, where the maximum height will be 73.75m AOD or 13m above existing ground levels; whichever is the highest.
	Commitment	An acoustic barrier of 3.5m height will be installed proposed along the western boundaries of Field 27 and partially along the western side of Field 24, between the Customer Substation designated area compound and the PRoWs.

Scheme Component	Parameter/Commitment	Description
		The Customer Substation compound will be served by a SuDS network designed to the 1% AEP event plus 40% climate change allowance. A 3.5m wide strip consisting of either an access track or buffer strip will be provided to allow suitable access for maintenance activities associated with surface water attenuation / management features. The Customer Substation building will be located outside of pluvial flood pathways ~~or floor levels will be appropriately raised to a minimum of 300mm above the modelled flood level~~, following post-development scenario flood modelling. At the detailed design stage of the Scheme, the detailed foundation design for the Customer Substation will be reassessed against the refined highest groundwater elevation dataset and monitoring from installed boreholes within the relevant Work Area.
Relay and control Rooms	Parameter	Maximum dimensions of 7m by 19m and maximum height of 4.2m.
Ancillary Buildings	Parameter	Maximum height 3.5m.
	Commitment	External finishing / materials to be in keeping with the prevailing surrounding environment. The exact materials / colour will be agreed with the relevant planning authority prior to construction but will be carefully selected to sit as discreetly as practicable within the landscape.

Scheme Component	Parameter/Commitment	Description
33kV switch room	Parameter	Maximum dimensions of 7m by 19m and maximum height of 4.2m.
Foundations	Parameter	Onsite infrastructure will be mounted on a concrete base or monolith plinth to a maximum depth of 1m. If a piling solution is required, piles to a maximum depth of 15m would be used.
Fencing and Security	Parameter	3m high metal palisade fencing around the compound.
	Commitment	Colour to be in keeping with the prevailing surrounding environment. The exact colour will be subject to manufacturer specifications and agreed with the relevant planning authority prior to construction but will be carefully selected in subdued, non-reflective tones to sit as discreetly as practicable within the landscape. Fencing will not be located along the crest of a bund.
Access	Parameter	Maximum 6m wide.
	Commitment	Constructed of hardcore or gravel over a levelling layer of substrate. Access tracks will be served by trackside drainage ditches and will include check dams to prevent the rapid transfer of water downslope.
Cabling	Parameter	Low voltage cable trench dimensions: • Maximum width of trenches: 1.6m.

Scheme Component	Parameter/Commitment	Description
		• Maximum depth of trenches: 1.2m. Interconnecting Cable / Grid Connection Cables trench dimensions: • Maximum width of trenches: 7m. • Maximum depth of trenches: 2m.
	Commitment	The electricity generated by the PV panels and/or stored by the BESS would be exported from or imported to the Customer Substation to the National Grid Substation via underground Grid Connection Cables. The voltage of the Grid Connection Cables would be 400kV.

3.5 Work No. 4

3.5.1 The extent of works defined by Work No. 4 is set out in Schedule 1 of the **draft DCO [APP/3.1]** and shown on the **Works Plan [APP/2.3]**.

Work No. 4— works in connection with a new National Grid substation including—

(a) **Work No. 4A**— a new National Grid substation with works comprising—

(i) an up to 400 kV double buss bar substation, with associated feeder bays, switchgear, buildings and ancillary equipment;
(ii) control building or container relay rooms with associated offices, storage and welfare facilities;
(iii) monitoring and control systems for Work Nos. 1, 2 and 3B;
(iv) electrical cabling;
(v) 400 kV 3-phase 4000 A circuit breakers for control and protection of the outgoing circuits serving the authorised development;
(vi) 3-phase sets of current transformers for protection of the new outgoing 400 kV feeder circuits and the overlap with the National Grid system;
(vii) 3-phase high accuracy metering current and voltage transformer assemblies for commercial metering of the connections;
(viii) 3-phase 400 kV line disconnector/earth switches for isolation and earthing of the outgoing 400 kV feeder circuits;
(ix) 3-phase sets of 400 kV high voltage cable sealing ends and cables connecting the National Grid substation with Work No. 5;
(x) 3-phase power quality ready capacitor voltage transformers; and
(xi) provision of stand-alone buildings to house duplicate feeder protection systems, commercial metering systems, protection and control equipment and user remote control and data acquisition apparatus.

(b) **Work No. 4B**—works in connection with the new National Grid substation including—

(i) maintenance compound;
(ii) electrical cabling;
(iii) earthworks, including soil stripping and site levelling;
(iv) fencing, gates, boundary treatment and other means of enclosure;
(v) works for the provision of security and monitoring measures including CCTV columns, lighting columns and lighting,

cameras, weather stations, communication infrastructure, and perimeter fencing;
(vi) landscaping and biodiversity mitigation and enhancement measures including planting;
(vii) improvement, maintenance and use of existing private tracks;
(viii) laying down of internal access tracks, ramps, bridges, means of access and footpaths;
(ix) temporary footpath diversions, signage and information boards;
(x) sustainable drainage system ponds, runoff outfalls, general drainage and irrigation infrastructure and improvements or extensions to existing drainage and irrigation systems;
(xi) acoustic barriers;
(xii) electricity and telecommunications connections; and
(xiii) temporary construction laydown areas comprising—
(aa) areas of hardstanding;
(bb) car parking;
(cc) site and welfare offices and workshops;
(dd) security infrastructure, including cameras, perimeter fencing and lighting;
(ee) area to store materials and equipment;
(ff) site drainage and waste management infrastructure (including sewerage); and
(gg) electricity, water, waste water and telecommunications connections.

(c) **Work No. 4C**—works to facilitate temporary construction access and permanent access to Work Nos. 4A and 4B including—

(i) creation of accesses from the public highway;
(ii) creation of visibility splays;
(iii) works to alter the layout of any street or highway temporarily; and
(iv) offsite works adjacent to highways land including those to structures, boundary features, drainage features on private land, in connection with the movement of abnormal indivisible loads.

Table 3-4 - Work No 4

Scheme Component	Parameter/Commitment	Description
National Grid Substation	Parameter	Maximum compound area – 4ha. Maximum height – 13m to the top of the busbars. The maximum height of the National Grid Substation will be 13m above existing ground levels, except for within the 'dashed cyan box' shown on the plan included at Appendix 1 of this document, where the maximum height will be 68m AOD or 13m above existing ground levels; whichever is the highest.
	Commitment	An acoustic barrier of 3.5 m height will be installed proposed along the western boundaries of Field 27 and partially along the western side of Field 24, between the National Grid Substation designated area Compound and the PRoWs. The National Grid Substation Compound will be served by a SuDS network designed to the 1% AEP event plus 40% climate change allowance. A 3.5m wide strip consisting of either an access track or buffer strip will be provided to allow suitable access for maintenance activities associated with surface water attenuation / management features. The National Grid Substation building will be located outside of pluvial flood pathways, ~~or floor levels will be appropriately raised~~

Scheme Component	Parameter/Commitment	Description
		~~to a minimum of 300mm above the modelled flood level,~~ following post-development scenario flood modelling. At the detailed design stage of the Scheme, the detailed foundation design for the National Grid Substation will be reassessed against the refined highest groundwater elevation dataset and monitoring from installed boreholes within the relevant Work Area.
Relay and control Rooms	Parameter	Maximum dimensions of 7m by 19m and maximum height of 4.2m.
	Commitment	External finishing / materials to be in keeping with the prevailing surrounding environment. The exact materials / colour will be agreed with the relevant planning authority prior to construction but will be carefully selected to sit as discreetly as practicable within the landscape.
Foundations	Parameter	Onsite infrastructure will be mounted on a concrete base or monolith plinth to a maximum depth of 1m. If a piling solution is required, piles to a maximum depth of 15m would be used.
Electrical Cabling	Parameter	Low voltage cable trench dimensions: • Maximum width of trenches: 1.6m. • Maximum depth of trenches: 1.2m. Interconnecting Cable / Grid Connection Cables trench dimensions:

Scheme Component	Parameter/Commitment	Description
		• Maximum width of trenches: 7m. • Maximum depth of trenches: 2m.
Fencing and Security	Parameter	3m high metal palisade fencing around the compound
	Commitment	Colour to be in keeping with the prevailing surrounding environment. The exact colour will be subject to manufacturer specifications and agreed with the relevant planning authority prior to construction but will be carefully selected in subdued, non-reflective tones to sit as discreetly as practicable within the landscape. Fencing will not be located along the crest of a bund.
Access	Parameter	Maximum 6m wide.
	Commitment	Constructed of hardcore or gravel over a levelling layer of substrate. Access tracks will be served by trackside drainage ditches and will include check dams to prevent the rapid transfer of water downslope.

3.6 Work No. 5

3.6.1 The extent of works defined by Work No. 5 is set out in Schedule 1 of the **draft DCO [APP/3.1]** and shown on the **Works Plan [APP/2.3]**.

Work No. 5— works in connection with a connection to the existing overhead transmission electric line including—

(a) **Work No. 5A**— works to modify, reconfigure, construct and install a new overhead transmission electric line including—

(i) the installation of new gantries;
(ii) the foundations and steelwork to construct new pylons;
(iii) the installation of overhead transmission electric line;
(iv) the installation of conductors, busbars, switchgear and fittings, including downleads and downdroppers at each realigned and new gantry, to facilitate connection from the equipment within Work No. 4A; and
(v) the installation of fibre optic earthwire conductors, with optical fibres terminated in joint boxes.

(b) **Work No. 5B**—

(i) fencing, gates, boundary treatment and other means of enclosure;
(ii) works for the provision of security and monitoring measures including CCTV columns, lighting columns and lighting, cameras, weather stations, communication infrastructure, and perimeter fencing;
(iii) landscaping and biodiversity mitigation and enhancement measures including planting;
(iv) improvement, maintenance and use of existing private tracks;
(v) laying down of internal access tracks, ramps, bridges, means of access and footpaths;
(vi) temporary footpath diversions, signage and information boards;
(vii) creation of accesses from the public highway;
(viii) creation of visibility splays;
(ix) earthworks;

(x) sustainable drainage system ponds, runoff outfalls, general drainage and irrigation infrastructure and improvements or extensions to existing drainage and irrigation systems;
(xi) acoustic barriers; and
(xii) electricity and telecommunications connections.

(c) **Work No. 5C**—

(i) works in relation to the existing overhead transmission electric line including—
(aa) the realignment of the existing gantries;
(bb) the modification of existing pylons;
(cc) modifications to the existing overhead transmission electric line; and
(dd) the temporary diversion of the existing overhead transmission electric line to facilitate the works.
(ii) temporary construction laydown areas comprising—
(aa) areas of hardstanding;
(bb) car parking;
(cc) site and welfare offices and workshops;
(dd) security infrastructure, including cameras, perimeter fencing and lighting;
(ee) area to store materials and equipment;
(ff) site drainage and waste management infrastructure (including sewerage); and
(gg) electricity, water, waste water and telecommunications connections.

(d) **Work No. 5D— works including**—

(i) the dismantling and removal of all existing overhead transmission electric line and pylons including foundations;
(ii) maintenance and use of existing private tracks;
(iii) laying down of internal access tracks, ramps, bridges, means of access and footpaths; and
(iv) temporary footpath diversions, signage and information boards.

Table 3-5 - Work No 5

Scheme Component	Parameter/Commitment	Description
New Electricity Pylons and OHL	Parameter	Up to 10 new pylons. Maximum height Above Ground Level (AGL) 55m (broadly similar to existing pylons).
	Commitment	Where the route crosses public roads, footpaths, or rights of way, scaffolding and protective netting will be erected to ensure public safety during overhead works.
Potential decommissioning of the existing 400kV overhead line and pylons (temporary works)	Parameter	Up to 5 pylons removed. Up to 1 temporary pylon.
Construction / Decommissioning	Parameter	Working width of up to 150m along the alignment of the new and existing overhead lines. A Haul Road would be up to a maximum of 7m wide. Where passing places are incorporated into the haul road, these will be up to 12m wide. Construction compounds and laydown area(s) will be 100m x 100m (with working zones surrounding each pylon).

Scheme Component	Parameter/Commitment	Description
	Commitment	Haul roads would run directly on the subsoil surface with temporary track matting used where required.

3.7 Work No. 6

3.7.1 The extent of works defined by Work No. 6 is set out in Schedule 1 of the **draft DCO [APP/3.1]** and shown on the **Works Plan [APP/2.3].**

Work No. 6— works including—

(a) fencing, gates, boundary treatment and other means of enclosure;
(b) works for the provision of security and monitoring measures including CCTV columns, lighting columns and lighting, cameras, weather stations, communication infrastructure, and perimeter fencing;
(c) landscaping and biodiversity mitigation and enhancement measures including planting;
(d) improvement, maintenance and use of existing private tracks;
(e) laying down of internal access tracks, ramps, bridges, means of access and footpaths;
(f) temporary footpath diversions, signage and information boards;
(g) earthworks;
(h) sustainable drainage system ponds, runoff outfalls, general drainage and irrigation infrastructure and improvements or extensions to existing drainage and irrigation systems;
(i) acoustic barriers;
(j) electricity and telecommunications connections; and
(k) secondary temporary construction and decommissioning laydown areas.

Table 3-6 - Work No 6

Scheme Component	Parameter/Commitment	Description
Cabling	Parameter	Low voltage cable trench dimensions: • Maximum width of trenches: 1.6m. • Maximum depth of trenches: 1.2m. Interconnecting Cable / Grid Connection Cables trench dimensions: • Maximum width of trenches: 7m. • Maximum depth of trenches: 2m.
	Commitments	The Conversion Units would be connected to the 33kV Sub-distribution Switch Rooms, and on to the Customer Substation via underground Interconnecting Cables. The number of cable trench crossings over Fincham Drove and Petticoat Drove will be restricted to two crossings per Drove. The voltage of the Interconnecting Cables would be between 33kV and 400kV. Cabling will not be routed along the Droves or PRoWs. Cabling will cross the Droves and PRoWs, however the number of open trench crossings over Fincham Drove and Petticoat Drove will be restricted to two crossings per Drove. Further crossings would be undertaken using trenchless techniques such as HDD.

Scheme Component	Parameter/Commitment	Description
		HDD will be the default option for watercourse crossings by cables and is the least invasive, most sensitive method, although it may not be suitable or necessary in some locations, such as for small field drains. In such locations, watercourse/field drain crossings will take one of the following forms, which are listed in order of least to most impact and are likely to be appropriate, respectively, for the most to least sensitive features: • Single-span structures that do not interfere with the channel (banksides, bed or water column); • Span structures with in-stream supports or pre-cast structures with natural bed; • Closed culverts with artificial invert; and • Open trench with over-pumping. An alternative construction methodology to HDD, such as open cut, will be selected if groundwater conditions require it.
Access	Parameter	Internal Access tracks will be up to 6m wide (with up to 8m wide passing places) along with suitably sized bends to accommodate turning radius of vehicles. Internal Access tracks will be offset from existing landscape features, with the exception of crossing points, by the following (minimum) distances:

Scheme Component	Parameter/Commitment	Description
		• Hedgerows – 8m. • Hedgerows – with trees – 10m. • Woodland (Non-ancient) – 15m. • Ditches – 10m. • Badger setts (main) – 30m. • Badger sett (outlier) – 20m. • Individual trees and groups of trees – 10m. • Ponds – 10m. • Non-Statutory Designated sites and Local Wildlife sites – 10m. • Veteran and Ancient trees – 15x width of tree stem diameter. • PRoWs – 15m.
	Commitments	Wherever practicable, existing field accesses will be utilised for access between field parcels. Internal Access tracks will be constructed of compacted stone with excavation kept to a minimum.

Scheme Component	Parameter/Commitment	Description
		Internal Access Tracks will follow the alignment of the existing agricultural tracks, where practicable, with the exception of the Droves and PRoWs, which will not be used for routing construction traffic with the exception of crossing places. The Droves and existing agricultural tracks with associated PRoWs will not be used for routing heavy goods vehicles (HGV) traffic during the operational phase, with the exception of crossing places. The number of access track crossings over Fincham Drove and Petticoat Drove will be restricted to two crossings per Drove.

Fencing and Security	Parameter	The deer fence will be up to 2.5m in height. Palisade fencing would be up to 3m in height. Pole mounted internal facing CCTV systems will be installed at a height of up to 3m. Fencing will be offset from existing landscape features, with the exception of crossing points, by the following (minimum) distances: • Hedgerows – 8m. • Hedgerows – with trees – 10m. • Woodland (Non-ancient) – 15m. • Ditches – 10m. • Badger setts (main) – 30m. • Badger sett (outlier) – 20m. • Individual trees and groups of trees – 10m. • Ponds – 10m. • Non-Statutory Designated sites and Local Wildlife sites – 10m. • Veteran and Ancient trees – 15x width of tree stem diameter. • PRoWs – 15m.

Scheme Component	Parameter/Commitment	Description
	Commitments	Fencing will be directly driven into the ground using a standard post driver. There will be no excavation of foundations. 'Concreting in' of posts will be used in limited circumstances such as corner or tension posts. The deer fence will be wooden or metal posts with a wire mesh. Pole mounted internal facing CCTV systems will be deployed around the perimeter of the Site. The CCTV cameras would use night-vision technology. Clearances above ground or mammal gates will be included within the deer fence to permit the passage of wildlife. Vehicular access gates will be of similar construction and height as the perimeter fencing. Wherever practicable, existing gaps in hedgerows will be used to route fencing. The existing agricultural tracks will not be fenced off and will remain accessibly during the operational phase. Fencing will not be located along the crest of a bund. Along the A1065, deer fencing will be placed around each individual field (Fields 20, 21, 25 and 26) so as to not bisect the hedgerow

Scheme Component	Parameter/Commitment	Description
		boundaries and to allow for the continued free movement of deer along the existing hedgerows away from the A1065.
Acoustic Barrier	Parameter	Maximum height of 3m.

3.8 Work No. 7

3.8.1 The extent of works defined by Work No. 7 is set out in Schedule 1 of the **draft DCO [APP/3.1]** and shown on the **Works Plan [APP/2.3]**.

Work No. 7— temporary construction and decommissioning laydown areas comprising—

(a) areas of hardstanding;
(b) car parking;
(c) site and welfare offices and workshops;
(d) security infrastructure, including cameras, perimeter fencing and lighting;
(e) area to store materials and equipment;
(f) site drainage and waste management infrastructure (including sewerage); and
(g) electricity, water, waste water and telecommunications connections.

Table 3-7 - Work No 7

Scheme Component	Parameter/Commitment	Description
Temporary construction and decommissioning compounds	Parameter	Temporary portacabins for construction operatives will be up to a height of 3m. The maximum height of perimeter fencing will be 3m. The maximum height of CCTV poles will be 3m.
	Commitments	For further details, please refer to the **oCEMP [APP/7.6].**

3.9 Work No. 8

3.9.1 The extent of works defined by Work No. 8 is set out in Schedule 1 of the **draft DCO [APP/3.1]** and shown on the **Works Plan [APP/2.3]**.

Work No. 8— works to facilitate access to Work Nos. 1, 2, 3, 6, 7, 9, 10 and 11 including—

(a) **Work No. 8A**— works to facilitate temporary construction, maintenance and decommissioning access to Work Nos. 1, 2, 3, 6, 7, 9, 10 and 11 including—
  (i) creation of accesses from the public highway;
  (ii) creation of visibility splays;
  (iii) works to alter the layout of any street or highway temporarily; and
  (iv) offsite works adjacent to highways land including those to structures, boundary features, drainage features on private land, in connection with the movement of abnormal indivisible loads.

(b) **Work No. 8B**— works to facilitate permanent access to Work Nos. 1, 2, 3, 6, 9, 10 and 11 including—
  (i) creation of accesses from the public highway;
  (ii) creation of visibility splays;
  (iii) works to alter the layout of any street or highway permanently; and
  (iv) offsite works adjacent to highways land including those to structures, boundary features, drainage features on private land, in connection with the movement of abnormal indivisible loads.

Table 3-8 - Work No 8

Scheme Component	Parameter/Commitment	Description
Access Points	Parameter	Access points into the Solar PV Site have been designed to accommodate articulated HGV with a maximum length of 16.5m. Access tracks will be up to 8m wide along with suitably sized bends to accommodate turning radius of vehicles.
	Commitments	The access points from the public highway will comprise reinforced concrete.

3.10 Work No. 9

3.10.1 The extent of works defined by Work No. 9 is set out in Schedule 1 of the **draft DCO [APP/3.1]** and shown on the **Works Plan [APP/2.3]**.

Work No. 9— works to create and maintain habitat management areas, including—

(a) fencing, gates, boundary treatment and other means of enclosure;
(b) signs, interpretation boards or any other information display board;
(c) earth works including bunds, embankments, ponds, trenching and swales;
(d) landscaping and biodiversity mitigation and enhancement measures including planting;
(e) means of access; and
(f) drainage.

3.10.2 The design and implementation of the habitat management areas is set out in the **oLEMP [APP/7.11]**.

3.11 Work No. 10

3.11.1 The extent of works defined by Work No. 10 is set out in Schedule 1 of the **draft DCO [APP/3.1]** and shown on the **Works Plan [APP/2.3]**.

Work No. 10— creation of permissive paths for the exclusive use of pedestrian users comprising—

(a) ramps, bridges and other means of access;
(b) fencing, gates, boundary treatment and other means of enclosure;
(c) signs, interpretation boards or any other information display board; and
(d) landscaping and biodiversity mitigation and enhancement measures including planting.

Table 3.9 - Work No 10

Scheme Component	Parameter/Commitment	Description
Permissive paths	Parameter	Minimum usable width for pedestrian access: 2m.
	Commitments	Permissive paths will have a 15m buffer to any infrastructure associated with the Scheme. Permissive paths will be made from compacted earth planted over with grass.
Gates and enclosure	Parameter	Where permissive paths are gated, or where bollards or posts are used to prevent vehicular access there will be a minimum clear width between gate posts or bollards of 1.2 m for pedestrian access.

Scheme Component	Parameter/Commitment	Description
Fencing	Parameter	The maximum height of fencing will be 2.5m.
	Commitment	Fencing will comprise deer wire mesh and wooden post security fence with wooden posts. Fencing will not be located along the crest of a bund. Along the A1065, deer fencing will be placed around each individual field (Fields 20, 21, 25 and 26) so as to not bisect the hedgerow boundaries and to allow for the continued free movement of deer along the existing hedgerows away from the A1065.

3.11.2 The design and implementation of the permissive paths is set out in the **outline Public Rights of Way Management Plan (oPRoWMP) [APP/7.12]** and **oLEMP [APP/7.11]**.

3.12 Work No. 11

3.12.1 The extent of works defined by Work No. 11 is set out in Schedule 1 of the **draft DCO [APP/3.1]** and shown on the **Works Plan [APP/2.3]**.

Work No. 11— works to create and maintain ecological mitigation measures, including—

(a) fencing, gates, boundary treatment and other means of enclosure;
(b) earth works including bunds, embankments, ponds, trenching and swales;
(c) landscaping and biodiversity mitigation and enhancement measures including planting;
(d) signage and information boards;
(e) means of access; and
(f) drainage.

3.12.2 The design and implementation of the mitigation areas is set out in **oLEMP [APP/7.11]**.

3.13 Appendix 1

THE DROVES

SOLAR FARM