Dean Moor
Solar Farm

Design Parameters Document

on behalf of **FVS Dean Moor Limited**

March 2025
Prepared by: Stantec UK Ltd
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DEAN MOOR SOLAR FARM
DESIGN PARAMETERS DOCUMENT
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PREPARED ON BEHALF OF FVS DEAN MOOR LIMITED

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, Regulation 5(2)(q)

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1 Introduction

1.1 Introduction

1.1.1 This Design Parameters Document ('DPD') has been produced for FVS Dean Moor Limited (the 'Applicant') to support the Development Consent Order (DCO) application for Dean Moor Solar Farm ('the Proposed Development') on approximately 276.5ha of land located between the villages of Gilgarran and Branthwaite in West Cumbria (the 'Site'), which is situated within the administrative area of Cumberland Council ('the Council').

1.1.2 The DPD has been prepared to set out the guiding 'design parameters' for the detailed design of the Proposed Development and is secured by Requirement [3] the of draft DCO **[REF: 3.1]**. Following development consent, when the detailed design for the Proposed Development is submitted for approval by the Council, that design must be in accordance with the design parameters set out in this document.

1.1.3 Securing the detailed design post-consent is necessary to achieve the technological and design flexibility required for the Proposed Development because solar PV is a rapidly evolving technology. The Proposed Development seeks to allow provision in the DCO for the innovation and improvements that may be realised at the time of construction. This is to ensure that the Applicant can construct the Proposed Development using current technology and based on updating Site assessments to achieve a form and manner that responds effectively to its environment at the time of construction.

1.1.4 This necessary flexibility has been allowed for by the adoption of the 'Rochdale Envelope' approach in the Environmental Statement ('ES'). This approach ensures that the maximum parameters and realistic worst-case scenario have been assessed, and that this envelope is defined by the outline parameters and design principles set out in this document. The

principles of the Rochdale Envelope are considered in further detail at 1.2 below.

1.2 Rochdale Envelope and Detailed Design

1.2.1 The Proposed Development is described in Schedule 1 of the draft DCO where the different elements of the Proposed Development are divided into Works which correspond with the Work Number areas shown on the Works Plans **[REF: 2.3]**.

1.2.2 The ES has assessed the spatial extents of each Work Number shown on the Works Plans, which align with the Parameter Plan (ES Figure 3.4 **[REF: 6.2]**), adopting the principle of the 'Rochdale Envelope' which ensures that the maximum parameters and realistic worst case have been assessed. Therefore, there can be confidence that the environmental effects of the detailed design relating to the parts of the Proposed Development secured by these parameters would be the same as, or no worse than, those assessed and reported in the ES.

1.2.3 The detailed design of the Proposed Development, including the exact layout and locations of infrastructure, will be managed post-consent through the Requirements set out in Schedule 2 of the draft DCO.

1.3 Overview and Structure

1.3.1 This DPD is divided into numbered works which accord with the Work Numbers listed in Schedule 1 of the draft DCO.

1.3.2 Within the ES, these Work Numbers are referred to as

- Work No. 1 – Solar PV infrastructure;
- Work No. 2 – Grid Connection infrastructure;
- Work No. 2A – POC masts;
- Work No. 3 – Associated works;
- Work No. 4 – Temporary construction compounds;
- Work No. 5 – Highways and access; and
- Work No. 6 – Green infrastructure.

1.3.3 Where required, the tables below do not make reference to other documents, such as the Outline Construction Environmental Management Plan (OCEMP) (ES Appendix 5.1) **[REF: 6.3]** and other outline or framework management plans for the Proposed Development's construction, operation, and decommissioning phases. The controls provided by these other documents are secured by other Requirements in the draft DCO and so are not repeated in this DPD.

1.3.4 The Works Plans have accounted for buffers and exclusion areas, the extents of which, and the reason for their inclusion, are set out within ES Chapter 3 – Site and Proposed Development Description **[REF: 6.1]** and explained in the relevant sections of the Design Approach Document **[REF: 5.8]**.

1.3.5 For each individual component of the Proposed Development outlined in Tables 1-6, the parameter has been defined by its:

- **Location** – the location of the Work No. of the Proposed Development assessed within the ES;
- **Scale** – a maximum and/or minimum parameter assessed in the ES; and
- **Design** – the relevant design parameter assessed in the ES.

1.3.6 Within the tables, all heights are given as 'above ground level' ('AGL') and all depths are given as 'below ground level' ('BGL'), unless otherwise specified.

2 Work No. 1

2.1.1 Work No.1 – a ground mounted solar photovoltaic (PV) generating station with a gross electrical output capacity of over 50 Megawatts (MW), including:

a. Solar PV panels;
b. Mounting structures; and
c. Power Conversion System ('PCS').

Table 2.1: Work No.1 Design Parameters

Component	Parameter Type	Design Parameter
Work No. 1	Location	The location of Work No. 1 will be within the corresponding numbered area shown on the Works Plan.
	Location	There will be no Work No. 1 within 3m of the 11kv overhead lines ('OHL') and within 6m from the wooden poles (towers) of these OHL which cross the Site.
Solar PV Panels	Design	The colour of the solar PV panels will be shades of blue or grey facades within a matte silver-grey metallic frame.
	Design	The material of the solar PV panels will be silicone glass PV cells with an anti-reflective coating and metal frame.
Mounting Structures	Design	The mounting framework material will be a metal alloy with a silver-grey metallic colour and matte finish.
	Design	Mounting structures will either be dual post or single post.
	Design	Standard framework posts will be fixed to the ground by piling (driven or screw piling). Alternative mounting methods for different ground condition sensitivities include shallow anchored piles or a ballasted non-intrusive solution.
	Scale	The maximum depth of piles will be 4m.
Solar PV Arrays	Design	Arrays will be fixed and oriented east-west across the Site with solar panel facades generally oriented South.
	Design	The array tilt (slope from the horizontal) will be 10-20 degrees.
	Scale	The maximum height will be 3.3m.
	Scale	The lowest part of solar panels on the arrays will be no lower than 700mm.
	Scale	The aisle width (range of gaps between arrays) will be a minimum of 2m.

Component	Parameter Type	Design Parameter
Power Conversion System (PCS) Units (Central Inverters and Standalone Transformers)	Scale	The maximum dimensions of the PCS unit containers will be 12.2m in length, 2.5m in width, and 3.6m in height.
	Design	PCS Units will be metal container structures that may be fully enclosed or partially open. PCS unit container colours will be limited to shades of the following (matte) colours: white, grey, green, brown, blue.
PCS Unit – String Inverter	Scale	The maximum dimensions of the string inverter container will be 1.5m in length, 1m in width, and 0.5m in depth.
	Design	String inverters will either be mounted on the array mounting structure frameworks at regular intervals or on a mounting structure framework at the end of a row.

3 Work No. 2

3.1.1 Work No. 2 – grid connection infrastructure comprising:

- Up to two substation buildings;
- A control building;
- Point of Connection ('POC') compound comprising external electrical equipment including transformers, relays, circuit breakers and harmonic filters and ancillary infrastructure;
- Communication mast;
- Security fencing; and
- Electrical cables.

Table 3.1: Work No. 2 Design Parameters

Component	Parameter Type	Design Parameter
Work No.2	Location	The location of Work No. 2 will be within the corresponding numbered area shown on the Works Plan.
	Scale	The maximum area to be occupied by Work No. 2 will be 1.2ha.
Customer Substation Building	Scale	The maximum height will be 6.5m.
	Scale	The maximum footprint will be 184m^2.
	Design	The material will be either Glass Reinforced Plastic ('GRP'), metal, or brick. It will have either a flat roof or a lightly pitched roof. Finishes will be limited to shades of green, brown, grey, white, or brick.
Control Building	Scale	The maximum height will be 3.6m.
	Scale	The maximum footprint will be 31m^2.
	Design	The Control Building may be an independent unit or combined with the Customer Substation into one larger building that has a footprint which is not larger than the combined footprints of these two buildings. As an independent building the Control Building will be either a GRP structure or metal container structure. Finishes on an independent Control Building will be limited to shades of green, brown, grey, or white.
DNO Substation Building	Scale	The maximum height will be 6.5m.
	Scale	The maximum footprint will be 140m^2.
	Design	The material will be either GRP, metal, or brick. It will have either a flat roof or a lightly pitched roof.

Component	Parameter Type	Design Parameter
		Finishes of the DNO Substation Building will be limited to shades of green, brown, grey, white, or brick.
Point of Connection ('POC') Compound	Scale	Electrical equipment and ancillary infrastructure within the POC Compound will be a maximum height of 9m.
Security Fencing	Location	Security fencing will be located around the perimeter of the POC compound. At the DNO's discretion a second security fence could also be included around some or all of the buildings outside of the POC compound so as to contain some or all of the Work No. 2 infrastructure.
	Design	Colours will be limited to shades of matte silver-grey metallic, green, or black.
	Design	The material will be metal (weld mesh or similar).
	Scale	The maximum height will be 2.6m.
Communications Mast	Scale	The maximum dimensions will be 15m in height and 2m wide at the base.

3.1.2 Work No. 2A – up to two POC Masts.

Table 3.2: Work No. 2A Design Parameters

Component	Parameter Type	Design Parameter
Work No. 2A	Location	The location of Work No. 2A will be within the corresponding numbered area shown on the Works Plan.
POC Masts	Location	POC masts will be located within Work No. 2A which is a limited part within Work No. 2 in proximity to the existing ENW pylon.
	Scale	Two POC masts a maximum of 30m in height and with a maximum diameter of 5m at their widest point (base).

4 Work No. 3

4.1.1 Work No. 3 – works including:

a. Electrical cables including connecting equipment within Work No. 1 and within Work No. 2 and connecting Work Nos. 1 and 2 to one another;

b. Fencing, gates, boundary treatment and other means of enclosure;

c. Improvement, maintenance, and use of existing private tracks;

d. Laying down of internal access tracks, ramps, means of access, permissive paths, crossing of watercourses, culverts, and roads, including the laying and construction of drainage infrastructure, signage and information boards;

e. Works for the provision of security and monitoring measures such as CCTV columns, lighting columns and lighting, cameras, communication infrastructure, and perimeter fencing;

f. Monitoring, communications, and control systems;

g. Electric vehicle charging points;

h. Operation and maintenance units including storage, welfare and site management;

i. Works, improvements or extensions to the existing drainage and irrigation system and works to alter the position and extent of such irrigation system;

j. Landscaping and biodiversity mitigation and enhancement measures including planting;

k. Site drainage and waste management infrastructure including underground pipework, watercourse outfalls, sub-bases, filter drains, swales, and attenuation tanks;

l. Working sites in connection with the construction, maintenance, and decommissioning of the authorised development, lay down areas and compounds, storage compounds and their restoration; and

m. Noise attenuation works including acoustic barrier.

Table 4.1: Work No. 3 Design Parameters

Component	Parameter Type	Design Parameter
Work No. 3	Location	The location of Work No. 3 will be within the corresponding numbered area shown on the Works Plan.
Electrical Cables	Design	Cabling in a no-dig area will either be within an on-ground trough and/or suspended solution.
Perimeter Fencing	Location	Perimeter fencing will be provided around field perimeters where needed for Site security purposes.
	Design	The perimeter fencing will be a 'deer fence' comprising a plain wire mesh grid fence between wooden posts.
	Scale	The maximum height will be 2.4m.
	Scale	The maximum fence post depth will be 1m.
	Design	Fence posts will be driven into the ground by machine. Where ground conditions or sensitivities require, hand tools may be used or a no-dig solution using concrete blocks or similar would be used to secure the fence posts.
Access Gates	Design	Within the perimeter fencing there will be access gates that will be no taller than the maximum height of the fencing.
	Design	Any gates installed for access from the public highway will be installed internally at least 5m from the highway.
Internal Access Tracks	Design	The material will be permeable aggregate.
	Design	Internal access tracks will be in-ground as standard, with a no-dig alternative provided where ground conditions dictate.
	Scale	The maximum depth of topsoil removal / compaction to form in-ground tracks will be up to 300mm.
	Scale	The maximum width will be 6m.
Site Security Measures	Location	Security cameras (CCTV) will be installed within the Site perimeter fencing and be oriented to only record internally.
	Design	CCTV coverage will use night vision technology (infra-red, motion activated).
	Design	CCTV will be mounted on support columns (poles) made of wood or metal. CCTV poles will have either a natural wood or matte silver-grey metallic appearance unless they are coated. Any finishes other than wood or matte metal will be limited to shades of green, brown, black, grey, or white.
	Scale	The maximum height of CCTV support columns will be 3.3m.

Component	Parameter Type	Design Parameter
Monitoring Equipment	Scale	The weather monitoring station will include a mast with a maximum height of 4m and a maximum width of 1m.
Operation and Maintenance (O&M) Units	Scale	The maximum dimensions will be 12.2m in length x 2.5m in width x 3.6m in height.
	Design	The material will be metal (shipping container style). Colours for O&M units will be limited to shades of green, brown, grey, blue, and white.
Green Infrastructure	Scale	While the existing wind turbines are operational, any new vegetation within 500m of the turbines will be restricted to be no higher than 5m.
Staging Areas	Design	The material will be permeable aggregate over geotextile membrane.

5 Work No. 4

5.1.1 Work No. 4 – up to five temporary construction compounds, including:

a. Site entry security stations;
b. Areas of hardstanding;
c. Parking;
d. Areas for vehicle loading, unloading, and turning;
e. Site management offices, welfare facilities, canteens and workshops;
f. Safety and security infrastructure, including signage, cameras, fencing, gates and lighting; and
g. Areas to store materials, plant, machinery, equipment and waste.

Table 5.1: Work No. 4 Design Parameters

Component	Parameter Type	Design Parameter
Work No. 4	Location	The location of Work No. 4 will be within the corresponding numbered area shown on the Works Plan.
Temporary Construction Compounds	Scale	There will be a maximum of five Temporary Construction Compounds on the Site comprising Primary and Secondary Compounds.
	Scale	Within Temporary Construction Compounds, the maximum height of specific items (e.g. telescopic temporary CCTV) will be 7m. The maximum heights for buildings/structures in a fixed position (e.g. double stacked welfare cabins) will be 6.2m.
	Design	Temporary Construction Compounds will include temporary security fencing (heras fencing or similar) which will have a maximum height of 2.6m.
	Location	No temporary fencing or gates, or other structural elements of Work No. 4 will be located within 5m of an access into the Site from the public highway.
	Design	All construction compounds will be formed of a permeable aggregate base over geotextile membrane material.
Primary Construction Compound	Scale	There will be a maximum of two Primary Construction Compounds.
	Scale	The maximum area of any single Primary Construction Compound will be 6,400m2 (0.64ha). This is the equivalent of 80 x 80m, or variations thereof, leading to a total footprint of no more than 0.64ha for any one Primary Construction Compound.

Component	Parameter Type	Design Parameter
Secondary Construction Compound	Scale	The maximum area of any single Secondary Construction Compound will be 1,600m2 (0.16ha). This is the equivalent of 40 x 40m, or variations thereof, leading to a total footprint of no more than 0.16ha for any one Secondary Construction Compound.

6 Work No. 5

6.1.1 Work No. 5 – works to facilitate vehicular access for all works, including:

a. Enhancement of accesses from the public highway;

b. Visibility splays;

c. Works to widen and surface the public highway and private means of access; and

d. Installation of temporary traffic management measures including traffic lights and signs

Table 6.1: Work No. 5 Design Parameters

Component	Parameter Type	Design Parameter
Work No. 5	Location	The location of Work No. 5 will be within the corresponding numbered area shown on the Works Plan.
Site Access	Scale	Existing accesses which require widening for their intended use will be widened to the minimum required for that use as informed by swept path analysis.
	Design	Any works required will be designed in accordance with LHA specifications. Bound surface materials (e.g. concrete, tarmac) will be utilised to form any access upgrades to the access apron (bell mouth). This bound surface may extend into the Site between 5-20m depending on civil engineering recommendations and LHA requirements.
Visibility Splays	Location	Visibility splays will be provided either side of an access to the highway in accordance with the specifications of the LHA.

7 Work No. 6

7.1.1 Work No. 6 – works to create, enhance and maintain green infrastructure, including:

a. Landscape and biodiversity mitigation and enhancement measures including planting and improvement of existing features;
b. Habitat creation and management including, earth works including embankments, landscaping;
c. Watercourse enhancements;
d. Maintenance of existing access routes and laying down of permissive paths, signage, and information boards; and
e. Fencing, gates, boundary treatment and other means of enclosure.

Table 7.1: Work No. 6 Design Parameters

Component	Parameter Type	Design Parameter
Green Infrastructure	Location	The location of Work No. 6 will be within the corresponding numbered area shown on the Works Plan.
General	Scale	While the existing wind turbines are operational, any new vegetation within 500m of the turbines will be restricted to be no higher than 5m.
Boundary Treatment	Location	Perimeter fencing and/or dry-stone walls will be provided around field perimeters where required.
	Design	Where perimeter fencing is utilised the specifications for this fencing are the same as those set out for perimeter fencing in Work No. 3.
Access Gates	Design	Where access gates are utilised, the specifications for these gates are the same as those set out for access gates in Work No. 3.
Internal Access Tracks	Location	Where internal access tracks are utilised, the specifications for these tracks are the same as those set out for internal access tracks in Work No. 3.