



Longfield Solar Farm

Other Documents [PINS Ref: EN010118]

Outline Design Principles

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Longfield Solar Energy Farm Ltd

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INTRODUCTION AND SUMMARY

This Outline Design Principles document ('ODP') has been prepared to accompany the Development Consent Order (DCO) Application for Longfield Solar Farm ('the Scheme'). It provides the guiding principles for the detailed design of the Scheme and is secured by a requirement in the draft DCO. When the detailed design for the Scheme is submitted for approval to the relevant planning authorities, those details must be in accordance with the design principles set out in this ODP.

Securing the detailed design post consent, is necessary to achieve technological and design flexibility for the Scheme because solar photovoltaic (PV) and battery energy storage system (BESS) technology is rapidly evolving. Longfield Solar Farm seeks to allow provision in the DCO for the technological innovation and improvements that may be realised at the time of procurement and construction, in order to ensure that it can construct the Scheme taking advantage of innovation, safety improvements and cost-efficiencies.

That necessary flexibility has been facilitated by the adoption of the 'Rochdale Envelope' approach in the Environmental Statement (ES). The Rochdale Envelope approach ensures the maximum parameters and realistic worst case have been assessed, and that envelope is defined by the design principles set out in this document. Therefore, by requiring that the detailed design of the Scheme must be in accordance with the design principles, there can be confidence that the environmental effects would be the same as or no worse than those assessed and reported in the ES.

Design Principles

The Scheme is described in ES Chapter 2 – The Scheme of the ES [EN010118/APP/6.1]. It is classified as an NSIP because it includes a generating station with a generating capacity of over 50 MW. The Scheme is also described in Schedule 1 to the draft DCO [EN010118/APP/3.1] where the different components of the Scheme are divided into works packages which correspond with the work number areas shown on the Works Plans [EN010118/APP/2.2] which will be subject to differing levels of development and/or management. The main operational components of the Scheme are:

Solar PV generating station (the NSIP);

An energy storage facility comprising a battery energy storage system (BESS) compound;

A substation located within the Solar Farm Site, the Longfield Substation;

Electrical connection to the National Grid;

An extension to the existing Bulls Lodge Substation;

Ancillary infrastructure including:

a network of cable circuits;

works for the provision of security and monitoring measures such as CCTV columns, lighting, weather stations and communication infrastructure;

landscaping and biodiversity enhancement measures including planting;

laying down of internal access tracks, ramps, means of access, footpaths, cycle routes and roads, including the laying and construction of drainage infrastructure, signage and information boards;

temporary footpath diversions;

earth works;

SuDs Ponds, runoff outfalls, general drainage and irrigation infrastructure and improvements or extensions to existing drainage and irrigation systems;

secondary temporary construction compounds, both within the permanent work area and outside the permanent work area;

fencing, gates, boundary treatment and other means of enclosure;

improvement, maintenance and use of existing private tracks; and

works to divert and underground existing electrical overhead lines.

Office, warehouse and plant storage building;

Works to facilitate access from the public highway; and

Areas of habitat management.

Parts of Work No. 6 and Work No. 7 address temporary construction areas. The parameters for these temporary laydown areas are addressed in the Works Plans [EN010118/APP/2.2] and in the Outline CEMP [EN010118/APP/7.10] and therefore the temporary construction elements of Work No. 6 and Work No. 7 are not included in Table 1 of this document.

Work No. 9 relates to access and the parameters for access works are addressed in the Framework Construction Traffic Management Plan (fCTMP) [EN010118/APP/6.2] with the parameters for their ongoing use during operation addressed in the outline Operational Environmental Management Plan (oOEMP) [EN010118/APP/7.11] and therefore Work No. 9 is not included in Table 1 of this document.

The design principles which apply to the Scheme within these areas are set out in Table 1. Further associated development in connection with the above works (as listed in the final paragraph of Schedule 1 to the draft DCO) may be necessary across the Order limits and will be subject to the design principles where they apply.

Construction activities are subject to the controls included in:

Construction Environmental Management Plan which will be substantially in accordance with the Outline Construction Environmental Management Plan [EN010118/APP/7.10];

Construction Traffic Management Plan which will be substantially in accordance with the Framework Construction Traffic Management Plan [EN010118/APP/6.2];

Public Rights of Way Management Plan which will be substantially in accordance with the Outline Public Rights of Way Management Plan [EN010118/APP/6.2];

Battery Safety Management Plan which will be substantially in accordance with the Outline Battery Safety Management Plan [EN010118/APP/7.6]; and

Soils Resource Management Plan which will be substantially in accordance with the Outline Soils Resource Management Plan appended to the outline CEMP [EN010118/APP/7.10].

These Plans are secured by requirements in the draft DCO.

The operation of the Scheme is also subject to the controls included in:

The ES, which has informed the proposed requirements in the draft DCO;

Operational Environmental Management Plan, which will be substantially in accordance with the Operational Environmental Management Plan [EN010118/APP/7.11];

Battery Safety Management Plan which will be substantially in accordance with the Outline Battery Safety Management Plan [EN010118/APP/7.6].

Soils Resource Management Plan which will be substantially in accordance with the Outline Soils Resource Management Plan appended to the outline CEMP [EN010118/APP/7.10];

Landscape and Ecology Management Plan which will be substantially in accordance with the Outline Landscape and Ecology Management Plan [EN010118/APP/7.13];

Drainage Strategy which comprises the SuDS Strategy and the Bulls Lodge Substation Extension Drainage Strategy and which will be substantially in accordance with the outline versions of these documents [EN010118/APP/6.2] and [EN010118/APP/6.2];

Soils Resource Management Plan which will be substantially in accordance with the Outline Soils Resource Management Plan appended to the outline CEMP [EN010118/APP/7.10];

Works Plans [EN010118/APP/2.2]; and

Streets, Access and Rights of Way Plans [EN010118/APP/2.3].

The controls in these other documents are not duplicated here.

Table 1 Design principles

Element of Scheme	Parameter Type	Design Principle
<p>Work No. 1— a ground mounted solar photovoltaic generating station with a gross electrical output capacity of over 50 megawatts including— solar panels fitted to mounting structures; and balance of solar system (BoSS) plant.</p>		
Solar PV Array	Location	The Solar PV Array Works Areas will be located as shown as Work No. 1 on the Works Plans [EN010118/APP/2.2].
	Scale	The maximum total land area occupied by the Solar PV Array Works Areas will be 275.3ha as listed by Potential Developable Area (PDA) in Appendix A to this ODP document.
Solar PV Panels and PV Mounting Structure	Location	All PV Panels will be located within the Solar PV Array Works Areas marked as Work No. 1 on the Works Plan [EN010118/APP/2.2].
	Scale	The total surface area of PV Panels in each PDA within the Solar PV Array Works Areas will not exceed the surface areas set out in Appendix A and a total surface area of 191.6646ha. If additional PV Panels are located within the area of Work No. 2B shown on the Works Plans, those PV Panels will not contribute to this total but will be subject to the other limiting controls in this ODP document.
	Scale	The maximum height of highest part of the PV Panels will be 3m above ground level (AGL) (existing levels).
	Scale	The minimum height of the lowest part of the PV Panels will be 0.6m AGL (existing levels).
	Scale	The minimum spacing gap between consecutive rows of PV Tables will be 2m.
	Design	The PV Tables will slope towards the south.
	Design	The arrangement of PV Panels within a PV Table will be the same across all PV Arrays.

Element of Scheme	Parameter Type	Design Principle
	Design	The PV Panels will be dark blue, grey or black in colour.
	Design	The PV Mounting Structures will be bare metal in appearance.
	Design	The maximum depth of PV Mounting Structure piles will be 2m below ground level.
	Design	Up to 5% of PV Mounting Structure legs could be supported on concrete footings (rather than piles being driven into the ground).
	Design	The PV Panels will be positioned on the PV Tables at an angle of between 10 and 30 degrees from horizontal.
	Design	5.3m minimum clearance shall be maintained in still & conductor swing from the National Grid OHL to the highest point of the PV Tables.
	Design	Access will be maintained to all OHL towers currently passing through the Order limits.
	Design	A minimum safety distance of 2.6m vertically and 9m horizontally from the UKPN 132kV Overhead Line to any plant, object or building, will be maintained at all times. Groundworks will be a minimum of 9m from any supporting tower leg of the UKPN 132kV Overhead Line.
Balance of Solar System (BoSS)	Location	All BoSS plant will be located within the areas marked as Work No. 1 on the Works Plan [EN010118/APP/2.2].
	Scale	There will be up to 150 BoSS locations.
	Scale	If string inverters are used, these will be distributed throughout Work No. 1. Centralised inverters would be located at the up to 150 BoSS locations.
	Scale	The maximum total footprint of BoSS plant at each BoSS location will be 59.5m ² .

Element of Scheme	Parameter Type	Design Principle
	Scale	Where any components of the BoSS will utilise concrete pad foundations, these will have a depth of no greater than 1m.
	Scale	If fewer BoSS locations are required, or the infrastructure requirement is reduced BoSS can be substituted for PV Panels according to the parameters set out above.
	Scale	BoSS plant will not exceed 3.5m in height AGL (existing levels).
	Design	The embedded design will ensure the use of acoustic barriers around inverters within 250m of receptors.
Electrical cables (Work No. 6)	Design	Electrical cables within the Solar PV Array Works Areas will be secured to the PV Mounting Structures, the BoSS, or will be underground. No new overhead lines will be constructed.
	Design	The Solar PV Arrays will be connected by a buried cable laid at one end of a row of PV Panels. These cables will feed into larger cables (either through a junction box, string inverter, or combination of the two) and in turn will connect to a central inverter or transformer.
<p>Work No. 2— an energy storage facility comprising—</p> <p>Work No. 2A – a battery energy storage system compound including -</p> <p>battery energy storage system (BESS) units each comprising an enclosure for BESS electro-chemical components and associated equipment, with the enclosure being of metal façade, joined or close coupled to each other, mounted on a reinforced concrete foundation slab or concrete piles;</p> <p>transformers and associated bunding;</p> <p>inverters, switch gear, power conversion systems (PCS) and ancillary equipment;</p> <p>containers or enclosures housing, all or any of Work Nos. 2A(ii) and (iii) and ancillary equipment;</p> <p>monitoring and control systems housed within the containers or enclosures comprised in Work Nos. 2A(i) or (iv) or located separately in its own container or enclosure;</p> <p>heating, ventilation and air conditioning (HVAC) systems either housed on or within each of the containers or enclosures comprised in Work Nos. 2A(i), (iv) and (v), attached to the side or top of each of the containers or enclosures, or located separate to but near to each of the containers or enclosures;</p> <p>electrical cables including electrical cables connecting to Work No. 3;</p>		

<i>Element of Scheme</i>	<i>Parameter Type</i>	<i>Design Principle</i>
		<p>fire safety infrastructure including water storage tanks and a shut-off valve for containment of fire water and hard standing to accommodate emergency vehicles; and</p> <p>containers or similar structures to house spare parts and materials required for the day to day operation of the BESS facility.</p> <p>Work No. 2B – a battery energy storage system compound including -</p> <p>battery energy storage system (BESS) units each comprising an enclosure for BESS electro-chemical components and associated equipment, with the enclosure being of metal façade, joined or close coupled to each other, mounted on a reinforced concrete foundation slab or concrete piles;</p> <p>transformers and associated bunding;</p> <p>inverters, switch gear, power conversion systems (PCS) and ancillary equipment;</p> <p>containers or enclosures housing, all or any of Work Nos. 2B(ii) and (iii) and ancillary equipment;</p> <p>monitoring and control systems housed within the containers or enclosures comprised in Work Nos. 2B(i) or (iv) or located separately in its own container or enclosure;</p> <p>heating, ventilation and air conditioning (HVAC) systems either housed on or within each of the containers or enclosures comprised in Work Nos. 2B(i), (iv) and (v), attached to the side or top of each of the containers or enclosures, or located separate to but near to each of the containers or enclosures;</p> <p>electrical cables including electrical cables connecting to Work No. 3;</p> <p>fire safety infrastructure including water storage tanks and a shut-off valve for containment of fire water and hard standing to accommodate emergency vehicles; and</p> <p>containers or similar structures to house spare parts and materials required for the day to day operation of the BESS facility.</p>
Battery Energy Storage System (BESS)	Location	The BESS Compound will be located within the areas marked as Work No. 2A and 2B on the Works Plans [EN010118/APP/2.2].
	Design	The BESS will utilise a lithium ion energy storage system.
	Design	The enclosures forming part of the BESS will be white or light grey or green in colour.
	Design	No component of the BESS, except the CCTV towers will exceed 4.5m in height AGL (existing levels).
	Design	Where any components of the BESS will utilise concrete pad foundations, these will have a depth of no greater than 1m.
	Design	The BESS will incorporate fire detection and suppression measures including adequate

Element of Scheme	Parameter Type	Design Principle
		provision for water storage to provide a minimum supply of 1,800 litres per minute for 4 hours.
	Design	Adequate space of a minimum of 250m ² at two locations for emergency response vehicles will be provided at the entrances to the BESS Compound.
	Design	The BESS will be designed to ensure that the impacts of the BESS will be no worse than the conclusions set out in the Battery Safety Strategy Report - Plume Assessment [EN010118/APP/Appendix A16B]. This will be demonstrated by an updated assessment.
	Design	Noise emissions from the BESS experienced in nearby amenity areas (the Public Right of Way (PROW)) will be designed as low as practicable as to not exceed 50 dB L _{Aeq,T} with an upper value of 55 dB L _{Aeq,T} (guidance levels from BS8233:2014 for external amenity areas).
	Design	Noise levels at Public Rights of Way (PRoW 213_19 and PRoW 90_36) from the BESS will be reduced to below 50 dB L _{Ar,Tr} through implementation of an acoustic barrier of up to 4m height and with maximum length as illustrated in the Concept Design and Figure 11-4 of the ES and/or through selection of plant with quieter sound power levels than what has been assessed in the ES.
	Design	No lighting will be permanently operated.
	Design	Operational lighting will be directed within the Order limits i.e., not principally towards land outside the Order limits and will include features designed to reduce light spill beyond the areas required to be lit.
<p>Work No. 3— works in connection with an onsite substation including— substation, switch room buildings and ancillary equipment including reactive power units; control building housing offices, storage and welfare facilities; monitoring and control systems for this Work No. 3 and Work Nos. 1 and 2 housed within the control building in Work No. 3(b) or located separately in their own containers or control rooms;</p>		

Element of Scheme	Parameter Type	Design Principle
400 kilovolt harmonic filter compound; and electrical cables including electrical cables connecting to Work No. 2.		
Longfield Substation	Location	The Longfield Substation will be located within the area marked as Work No. 3 on the Works Plans [EN010118/APP/2.2].
	Scale	The components of the Longfield Substation will be a maximum of 13m in height AGL (existing levels).
	Scale	The dimensions of any building (i.e., a structure with a roof and walls) forming part of the Longfield Substation will be limited to a maximum footprint of 540m ² (e.g., 27m by 14m) with a maximum height of 7.1m AGL (existing levels).
	Scale	Where any components of Longfield Substation will utilise concrete pad foundations, these will have a depth of no greater than 2m.
	Design	The total impermeable area within the Longfield Substation will not exceed 2.33ha.
	Design	No lighting will be permanently operated.
	Design	Operational lighting will be directed within the Order limits i.e., not principally towards land outside the Order limits and will include features designed to reduce light spill beyond the areas required to be lit.
<p>Work No. 4— works to lay high voltage electrical cables, access and temporary construction laydown areas for the electrical cables including -</p> <p>Work No. 4A – works to lay electrical cables including one 400 kilovolt cable circuit connecting Work No. 3 to Work No. 5;</p> <p>laying down of internal access tracks, ramps, means of access, footpaths, roads, including the laying and construction of drainage infrastructure, signage and information boards; and</p> <p>Work No. 4B - temporary construction laydown areas.</p>		
Grid Connection Route	Location	The Grid Connection Route from the Longfield Substation (Work No. 3) to the Bulls Lodge Substation Extension (Work No. 5) will be

Element of Scheme	Parameter Type	Design Principle
		located within the area marked Work No. 4 on the Works Plans [EN010118/APP/2.2].
	Scale	The Grid Connection Route will comprise one 400kV cable circuit.
	Design	The Grid Connection Cables between the Longfield Substation (Work No. 3 on the Works Plans [EN010118/APP/2.2]) and the Bulls Lodge Substation Extension will be underground.
	Design	The 400kV cable trench will be up to 3m deep and 3m wide (except where other separation is required to avoid existing services).
	Design	Horizontal Directional Drilling (HDD) will be used to install the 400kV cables beneath watercourses. The HDD depth will be up to 4m below ground level except where this is required to be exceeded to avoid services or watercourses etc. The cables would be a minimum of 1.5m below the bed of any watercourse in order to prevent risk of any scour exposing the cable.
	Design	A minimum buffer of 10m around watercourses (measured from the water/channel edge under normal flows) will be maintained within which there will be no built development (other than essential works such as watercourse crossings or drainage etc.).
	Design	The 400kV cable will be buried at a minimum depth of 0.9m when within 50m of receptors sensitive to effects from electromagnetic fields.
	Design	The Grid Connection Route requires three watercourse crossings of Boreham Brook. These will be installed using horizontal directional drilling (HDD) beneath the watercourse, thus maintaining the 10m buffer and avoiding trenching or disturbance of the watercourse bed and banks.

<i>Element of Scheme</i>	<i>Parameter Type</i>	<i>Design Principle</i>
	Design	Vegetation loss will be restricted to the maximum extents shown on the Vegetation Removal Plan [EN010118/APP/Figure 10-15] and described in Chapter 10 of the ES [EN010118/APP/6.1.10].
<p>Work No. 5— an extension to the existing substation including—</p> <p>Work No. 5A – an electricity switching station including-</p> <ul style="list-style-type: none"> a main substation building to include an indoor gas insulated switchgear (GIS) switch hall, ancillary plant rooms, amenities block, storage and workshop units; outdoor air insulated (AIS) switchgear, GIS busbars, two overhead line gantries and associated foundations and structures; a new permanent access road from the existing private road including a new bellmouth entrance; internal roadways and footpaths; earthworks; car parking area; lighting columns and lighting; perimeter fencing and security cameras; drainage system and a new drainage outfall to Boreham Brook; new connections from pylons 4VB061A and 4VB061B including pylon modifications; and <p style="padding-left: 40px;">Work No. 5B – temporary overhead line alterations including two new temporary pylons and realignment of the existing 400kV overhead line.</p>		
<i>The Bulls Lodge Substation Extension</i>	Location	The Bulls Lodge Substation Extension will be located within the area marked as Work No. 5A on the Works Plan [EN010118/APP/2.2] with associated temporary works located within Work No. 5B.
	Scale	The components of the Bulls Lodge Substation Extension will be a maximum of 15m in height from above finished ground level.
	Scale	The finished ground level will be at maximum 33m AOD.
	Scale	The footprint of the main substation building in Work No. 5A(i) (i.e., a structure with a roof and walls) forming part of the Bulls Lodge Substation Extension will be limited to a maximum footprint of 1,750m ² (e.g. 65m by 27m).

Element of Scheme	Parameter Type	Design Principle
	Scale	The temporary pylons required for Work No. 5B will have a maximum height of 41m.
	Scale	Where any components of Bull's Lodge Substation Extension will utilise concrete pad foundations, these will have a depth of no greater than 2m.
	Design	Lighting will be controlled by switching and will generally be switched off during the night during normal operation.
	Design	Lighting will be designed with directable light output to minimise light pollution except at access gates to facilitate safe entry at night. The installation will be designed to minimise visual intrusion outside the main substation periphery.
	Scale	The permanent security fencing around the Bulls Lodge Substation Extension will not exceed 2.5m in height above finished ground level. The electric pulse fence system will extend a maximum of 3.5m above finished ground level.
<p>Work No. 6 — works including—</p> <p>electrical cables including electrical cables connecting to Work No. 1 to Work No. 3;</p> <p>fencing, gates, boundary treatment and other means of enclosure;</p> <p>works for the provision of security and monitoring measures such as CCTV columns, lighting columns and lighting, cameras, weather stations, communication infrastructure, and perimeter fencing;</p> <p>landscaping and biodiversity mitigation and enhancement measures including planting;</p> <p>improvement, maintenance and use of existing private tracks; and</p> <p>laying down of internal access tracks, ramps, means of access, footpaths, permissive paths, cycle routes and roads, including the laying and construction of drainage infrastructure, signage and information boards;</p> <p>temporary footpath diversions;</p> <p>earthworks;</p> <p>SuD's Ponds, runoff outfalls, general drainage and irrigation infrastructure and improvements or extensions to existing drainage and irrigation systems;</p> <p>up to 10 secondary temporary construction compounds, both within the permanent work area and outside the permanent work area;</p> <p>works to divert and underground existing electrical overhead lines.</p>		

Element of Scheme	Parameter Type	Design Principle
Electrical cables	Design	The maximum underground cable trench dimensions will be up to 0.8m wide and up to 1.5m below existing ground level or ditch bottom (except where other separation is required to avoid existing services, or where trenches converge at connections).
	Location	Underground cable circuits will avoid root protection areas of trees and hedgerows, except where a hedgerow crossing is required.
Fencing	Location	Fencing and security measures will be located within the area shown as Work No. 6 on the Works Plan [EN010118/APP/2.2].
	Scale	Fencing around the Solar PV Array Work Areas will not exceed 2.5 m in height AGL (existing levels).
	Design	Fencing around the Solar PV Array Work Areas will be a “deer fence” design, with wooden post supports and metal stock fencing.
	Location	All fencing will be a minimum of 15m from all National Grid overhead line (OHL) tower bases.
	Design	Steel palisade security fencing with a maximum height of 2.75m AGL (existing levels) will be installed to prevent public access to the BESS Compound (Work No. 2), Longfield Substation (Work No. 3) and the compound adjacent to the permanent office, warehouse and plant storage building (Work No. 8).
	Scale	Fence posts will be installed to a maximum depth of 1m below ground level (BGL).
Security measures including CCTV and lighting	Scale	CCTV towers will not exceed 5m in height.
	Design	CCTV lighting will be infrared (not visible) during hours of darkness.
	Design	No lighting will be permanently operated. If required, any visible lighting will be operated by

<i>Element of Scheme</i>	<i>Parameter Type</i>	<i>Design Principle</i>
		a manual switch or by a motion detection system.
	Design	Operational lighting will be directed within the Order limits i.e., not principally towards land outside the Order limits and will include features designed to reduce light spill beyond the areas required to be lit.
	Design	Potentially visible operational lighting will not be located within 100m of residential properties.
	Design	CCTV poles, CCTV feed or weather stations will be a minimum of 30m from National Grid OHL towers to prevent potential Transient faults.
<i>Access tracks</i>	Design	New access tracks will have a permeable surface.
	Design	Up to 21km of permanent access tracks will be constructed within Work No. 6 including new and upgraded tracks.
	Scale	Access tracks will have a running width of up to 6m.
	Design	Internal access tracks (where new or upgraded) will be of permeable stone construction.
	Design	Internal access tracks within 100m of residential properties will not be proposed or relocated closer to those properties at the detailed design stage.
		Internal access tracks greater than 100m from residential properties will not be proposed or relocated to within 100m of those properties at the detailed design stage.
<i>Ditch crossings</i>	Design	Ditch crossings to facilitate internal access track construction, fences and cable crossings of ditches will be upgraded (if they currently exist and require upgrading) or constructed.

<i>Element of Scheme</i>	<i>Parameter Type</i>	<i>Design Principle</i>
	Design	A minimum buffer of 10m around watercourses (measured from the water/channel edge under normal flows) will be maintained within which there will be no built development (other than essential works such as watercourse crossings or drainage etc.).
	Design	The maximum extension of existing ditch crossing culverts is 2m. Culverts/culvert extensions will be designed to reduce any alteration of watercourse alignment where possible and would have a sunken bed to allow a naturalised bed substrate to develop in order to maintain ecological continuum.
<i>Existing Ponds</i>	Design	A minimum buffer of 5m from the edge of all ponds will be maintained within which there will be no built development.
<i>Existing Ancient Woodland</i>	Design	A minimum buffer of 15m from the edge of all designated ancient woodland will be maintained within which there will be no built development.
<i>Permissive paths, Public Rights of Way, cycle routes</i>	Location	A cycle route will be created to connect Waltham Road to Terling Hall Road, utilising sections of access track and new dedicated cycle route. Where new sections of cycle route are created, they will be of the same permeable stone construction as the internal access tracks.
<i>Undergrounding of existing overhead line</i>	Location	The existing 11 kV overhead line in PDA 28 and 29 will be removed and replaced with an underground 11kV cable via as direct a route as practicable allowing for existing and Scheme infrastructure. These works will be undertaken within Work No. 6.
<i>Vegetation Removal</i>	Design	Vegetation loss will be restricted to the maximum extents shown on the Vegetation Removal Plan [EN010118/APP/Figure 10-15] and as described in Chapter 10 of the ES [EN010118/APP/6.1.10].

Element of Scheme	Parameter Type	Design Principle
<p>Work No. 8— office, warehouse and plant storage building comprising— offices and welfare facilities; storage facilities; waste storage within a fenced compound; parking areas; and a warehouse building for the storage of spare parts, operational plant and vehicles.</p>		
<p>Permanent office, warehouse and plant storage building</p>	Location	The permanent office, warehouse and plant storage building will be established within the area marked Work No. 8 on the Works Plan.
	Scale	The permanent office, warehouse and plant storage building will be a maximum height of 7.1m (above ground level).
	Scale	The permanent office, warehouse and plant storage building will occupy a maximum footprint of 540 m ² within Work No 8.
	Design	Any external waste storage will be located within a fenced compound adjoining the permanent office, warehouse and plant storage building within Work No. 8.
	Design	The appearance of the building will reflect the local vernacular with standard agricultural style cladding.
<p>Work No. 10 – areas of habitat management landscape and biodiversity enhancement measures; habitat creation and management, including earthworks, landscaping, means of enclosure, and the laying and construction of drainage infrastructure; and laying down of permissive paths, signage and information boards.</p>		
<p>Habitat Management Area</p>	Location	A minimum of 55.8ha of habitat management areas will be located as marked as Work No. 10 on the Works Plan.
		There will be no built development associated with the Scheme within Work No. 10 (with the exception of any stock proof fencing used to control conservation grazing and any

<i>Element of Scheme</i>	<i>Parameter Type</i>	<i>Design Principle</i>
		conservation related surface water control structures).

Appendix A – PDA Data

Table 2 sets out the total area of each of the 29 PDAs and the maximum surface area of solar PV panels in each PDA (to the nearest 1 metre) in order to limit the maximum coverage of solar PV panels included in the Scheme. The PDA reference numbers in Table 2 are shown on the Works Plans submitted as part of the DCO Application [EN010118/APP/2.2]. PDAs 24 and 25 were present in earlier versions of the Scheme design but were removed from the final Concept Design, therefore whilst the PDA numbering runs from 1 to 31, there are a total of 29 PDAs.

In order to derive a maximum surface area of PV Panels within each PDA, a hypothetical row spacing of 2.4 metres has been used (compared to 3 metres shown in the Concept Design), with the same PV Table parameters as the Concept Design, in order to demonstrate a realistic minimum row spacing for the chosen PV Table arrangement. This arrangement represents a realistic worst case maximum coverage of Solar PV Panels (derived by multiplying the number of PV Panels by the surface area of a single PV Panel) which is secured by this document and cannot be exceeded.

Table 2 Maximum Coverage of PV Panels within each PDA

PDA	Area of PDA (ha)	Maximum Surface Area of PV Panels within PDA (ha)
1	9.86	6.7954
2	21.21	15.2309
3	11.86	8.3860
4	2.40	1.6091
5	6.03	4.3199
6	13.79	9.7290
7	5.99	3.9857
8	5.11	3.4163
9	17.34	12.3098
10	3.86	2.5870
11	4.95	3.5339
12	10.23	7.1606
13	0.76	0.5075
14	5.90	3.8433
15	20.83	14.8534

<i>PDA</i>	<i>Area of PDA (ha)</i>	<i>Maximum Surface Area of PV Panels within PDA (ha)</i>
16	7.27	5.0625
17	0.93	0.6065
18	2.71	1.7577
19	7.83	5.5019
20	9.29	6.5355
21	3.78	2.4694
22	13.60	9.6423
23	17.52	12.2169
26	8.18	5.6072
27	3.92	2.5251
28	25.27	17.8922
29	9.95	6.9130
30	7.17	5.1059
31	17.69	11.5609
Total	275.3*	191.6646**

* rounded up to one decimal place to avoid rounding errors.

**to four decimal places to provide area to the nearest square metre.