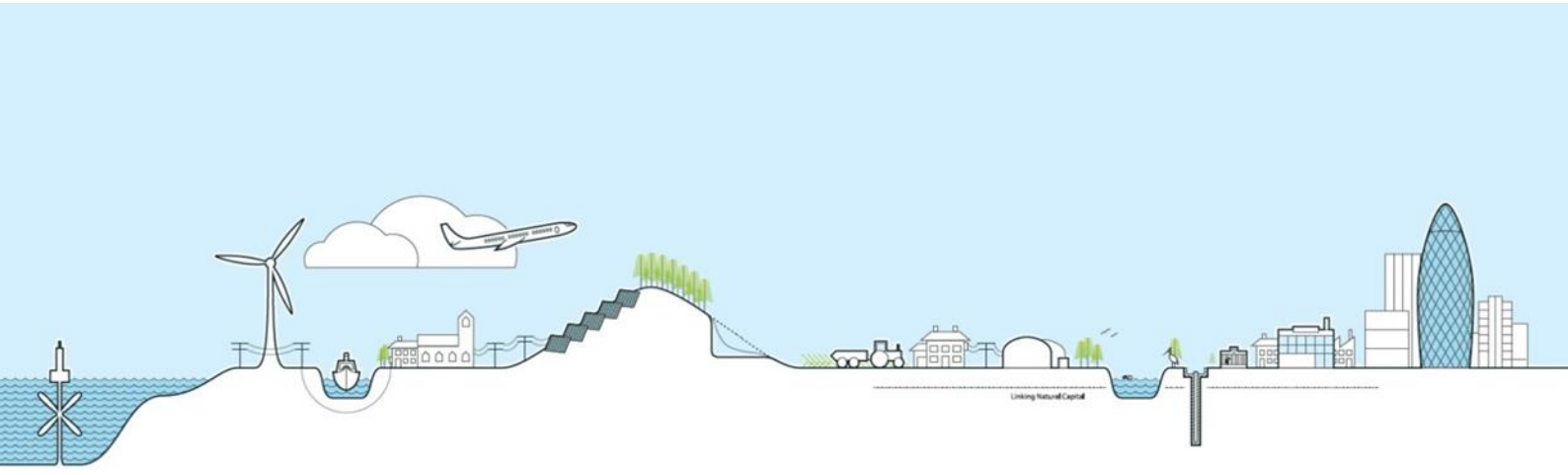
DESIGN & ACCESS STATEMENT

Accompanying a planning application for the construction, operation and decommissioning of a renewable energy generating station comprising ground-mounted photovoltaic solar arrays together with substation, transformer stations, site accesses, internal access tracks, security measures, access gates, other ancillary infrastructure, landscaping and biodiversity enhancements at Low Farm, Grange Road, Wakefield, WF4 4BB

JULY 2021

Prepared By

aardvark
environment matters



Project Quality Control Sheet

ORIGINAL	Author	Checked by	Approved by
Signature			
Date	28/07/2021	28/07/2021	31/08/2021
Company	Aardvark EM Ltd	Aardvark EM Ltd	Aardvark EM Ltd

Location: Land at Low Farm, Wakefield Road, Grange Moor, Wakefield, WF4 4BB

Grid Reference: SE24071600 (E 424071; N 416003) (centre of application site)

Project Manager: Kate Cantwell MRTPI

Report Authors: Nicholas Leaney MRICS

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Report Number: **R004**

Report Status: **FINAL**

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1 Introduction

This Design and Access Statement (DAS) has been prepared by Aardvark EM Limited on behalf of Boom Power Limited ("the Applicant") to accompany a full planning application to Kirklees Council (KC) for the construction, operation and decommissioning of a grid connected solar farm and associated infrastructure ("the Proposed Development") on Land at Low Farm, Wakefield Road, Grange Moor, Wakefield, WF4 4BB ("the Site"). The development will provide a reliable source of clean renewable energy which will be supplied to domestic and commercial consumers via the National Grid network.

The Proposed Development would supply up to 49.9MW to the National Grid, providing the equivalent annual electrical needs of approximately 15,200 homes in Kirklees or the offset of 23,300 t/pa CO2e when compared to fossil fuels which is the equivalent of 7,500 cars.

The Application seeks full planning permission for the following Description of Development (the Proposed Development):

"*Installation of renewable energy generating station comprising ground-mounted photovoltaic solar arrays together with substation, transformer stations, site accesses, internal access tracks, security measures, access gates, other ancillary infrastructure and landscaping and biodiversity enhancements*"

This DAS has been prepared in accordance with the regulations set out in Part 3, Article 9 of the Town and Country Planning (Development Management Procedure) (England) (Amendments) Order 2015, which sets out the requirements regarding the contents of a Design and Access Statement.

The DAS explains the thought process behind the design and indicates how, through good design, the Proposed Development can be delivered in a sustainable manner ensuring social, economic and environmental considerations and objectives are fully met in delivering the benefits of renewable energy to meet the urgent national objectives of climate change and energy security and local benefits of farm diversification and biodiversity enhancement.

Whilst the DAS is set out to be read as a standalone document, it should be read in the context of the entire submission documentation in order to fully understand the Proposed Development, its potential impacts and planning merits. The submission documentation is explained in the Planning Statement (Document Ref: R003).

2 Site Location

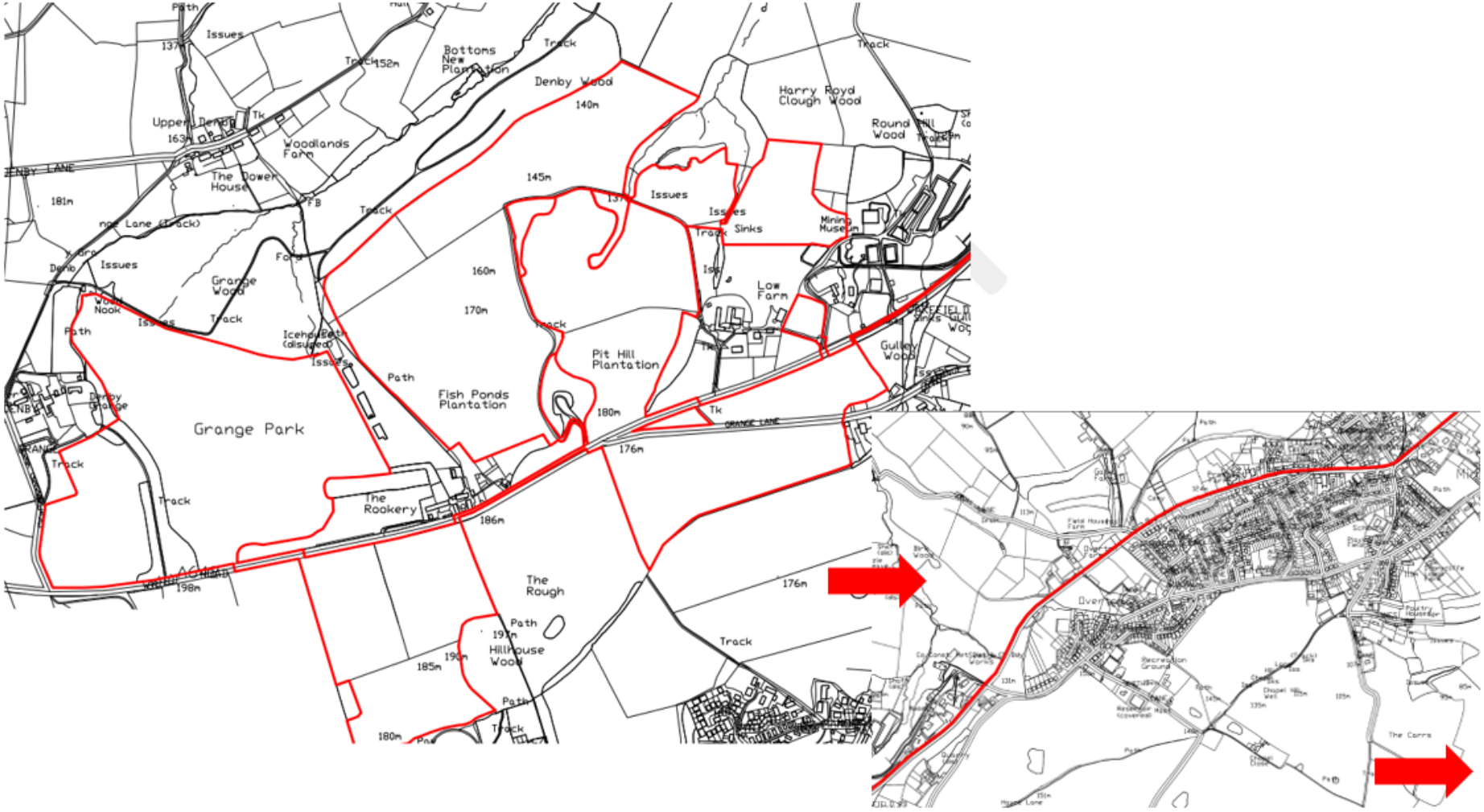
The Site is located in the Parish Council area of Kirkburton and is within the administrative area of Kirklees Council.

The red line indicates the likely extent of the Proposed Development area which is contiguous with the land under the control of the Applicant. Overall, the red line application site area comprising the grid connection cable route between the two land parcels and nine arable fields as shown on Figure 1 below totals an area of approximately 89.3 ha (221 acres). Excluding the grid point of connection and cable route, the Site totals an area of approximately 89.3 hectares (221 acres).

The Site comprises a total of eight parcels of land (plus an additional parcel required for the connection to the national grid), three to the south and six to the north of Wakefield Road, between Overton (approximately 700 m to the east-north-east) and Grange Moor (approximately 800 m to the west). Flockton lies approximately 75 m to the south of the southernmost field, and Briestfield lies approximately 1.2 km to the north of the Site.

The Site lies within the Green Belt, but outside of any national/statutory or local/non-statutory landscape designations.

The fields within the Site are referred to as Parcels 1 to 9 as shown on Figure 1 below.


Grange Park
Fish Ponds Plantation
Pit Hill Plantation
Denby Wood
Harry Royd Clough Wood
Round Hill Wood
Low Farm
Gulley Wood
Grange Wood
Woodlands Farm
The Dower House
Bottoms New Plantation
The Rookery
The Rough
Hillhouse Wood
Mining Museum
Sinks
Issues
Track
Path
Tk
ORANGE LANE
DENBY LANE
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170m
176m
180m
186m
198m

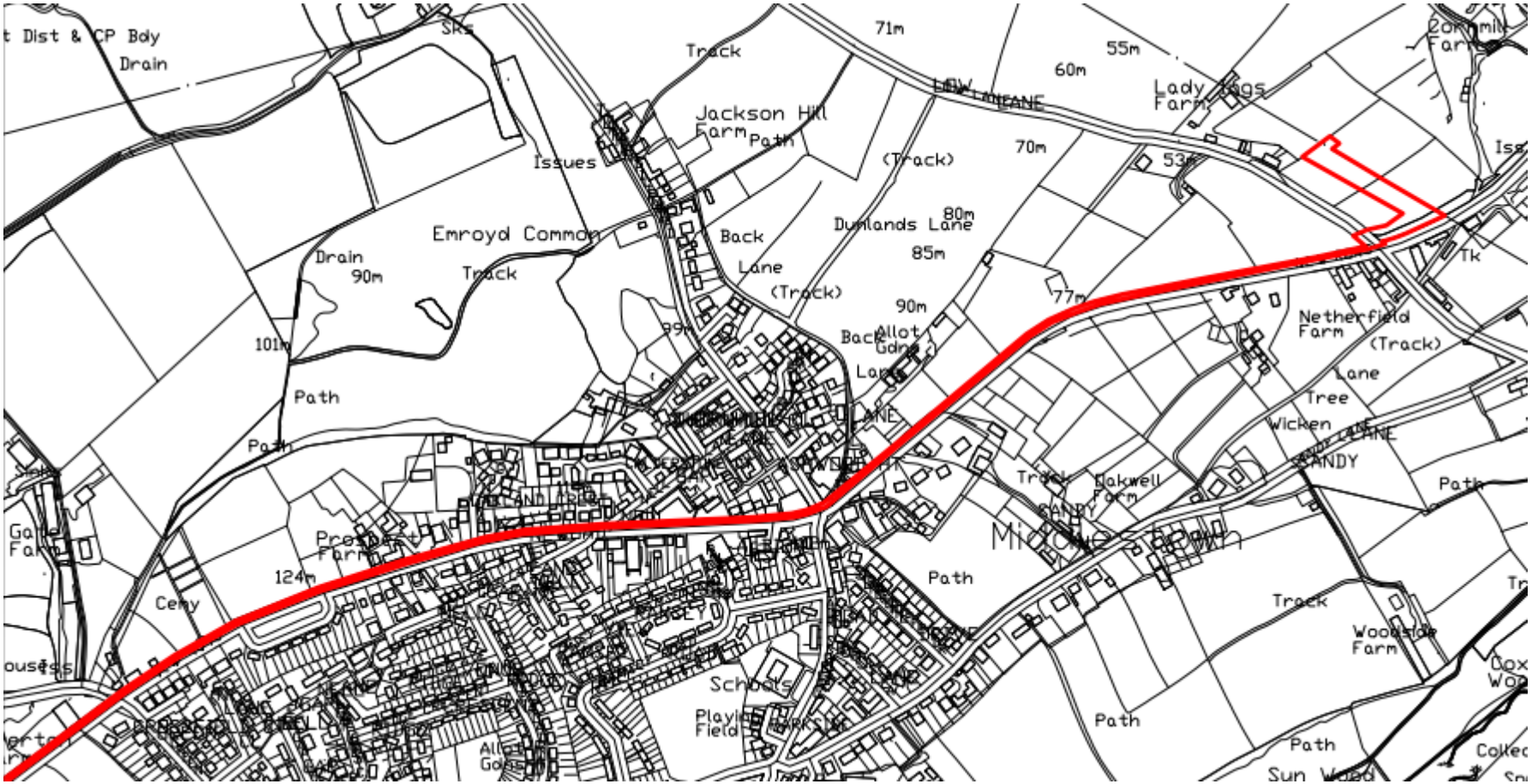

Figure 1: Existing Site Location Plan (see Document Ref: R002 for scale drawing)

3 The Site

3.1 Description

The Site is defined by undulating landform on either side of the A642 which generally falls away to the north and south of the road. The highest part of the Site lies at just below 210 m Above Ordnance Datum (AOD) at the western end of Parcel 1. The lowest part of the Site lies at approximately 125 m AOD at the north-eastern corner of Parcel 2.

There are no watercourses or waterbodies within the Site, though there is a small watercourse just beyond part of the southern boundary of Parcel 5. There are numerous small watercourses within the woodland areas which separate some of the parcels (e.g. Denby Wood to the north of Parcel 7 and Grange Wood to the north of Parcels 1 and 2), and also a number of ponds within Fish Ponds Plantation and The Rookery (to the south-east of Parcel 1).

Vegetation within the Site is generally restricted to the arable cropping within the fields, though field boundary hedgerows and hedgerow trees fall within the Site where parcels comprise more than one field. There are also a number of field trees within Parcel 1.

The boundaries to the various parcels are formed by a combination of hedgerows, often with frequent hedgerow trees, tree belts and woodlands, and these combine to provide a strong sense of enclosure to the majority of the Site. Much of the land between the different parcels is also wooded. Some parcels have more open boundaries – more detail is provided in the submitted LVIA (see Document Ref: R010).

As within the Site, field boundaries within the wider surrounding area are formed by a mix of hedgerows with hedgerow trees, drystone walls in varying states of repair, post and wire fences, and woodlands and narrow tree belts. There are often trees surrounding individual and small groups of residential properties, with strong tree cover also present around the National Coal Mining Museum and associated structures and yards.

The whole of the Site is in agricultural use, being predominantly in arable (cereal) cropping. The majority of the surrounding landscape is also in agricultural use, being a mix of arable and grassland. Historic industrial activity remains evident in the local area and is explored in more detail in the Heritage Assessment (Document Ref: R009).

The Site forms part of a local landscape pattern comprising variable scale fields from small through to quite large and typically irregular in shape. The local landscape is well treed and this often results in a strong sense of enclosure, particularly within the Site, but also within the wider landscape. The undulating topography sometimes combines with the strong tree cover to limit inter-visibility in some locations, while also allowing more open, longer-distance views from higher ground where tree cover is more limited in the immediate vicinity of the viewer.

The settlement pattern consists of farmsteads and individual properties, and nucleated hamlets and villages. Building character varies from old-style farmhouses and cottages constructed of stone, to newer red brick or rendered housing.

A network of main roads (such as the A642 and A637) and narrow, often steep, winding and tree/hedgerow lined rural roads, connects the settlements.

Overall, the Site itself has a semi-open character, with some longer-distance panoramic views outwards across the surrounding valleys. Some parts of the Site are more enclosed due to adjacent tree cover. The wider local landscape shows clear signs of human influence: managed, enclosed farmland; built form and settlements (in places of substantial scale); and infrastructure. These human influences mean that the area does not feel remote, whilst tranquility is reduced by traffic on the A642 and A637. Tranquility mapping undertaken by CPRE[i] places the Site and its environs within an area of medium tranquility.

There are no landscape designations which relate to this site.

In terms of Public Rights of Way (PRoW), there are no PRoW within the site itself, though one does border the eastern edge of Parcel 4, crossing the A642 (Wakefield Road) and proceeding along the western boundary of Parcel 2. There is also a PRoW that passes up the western boundary of parcel 1 towards Denby Grange.

4 The Proposed Development

The planning application seeks permission for the construction and operation of a grid-connected solar photovoltaic farm, other ancillary infrastructure and landscaping and biodiversity enhancements.

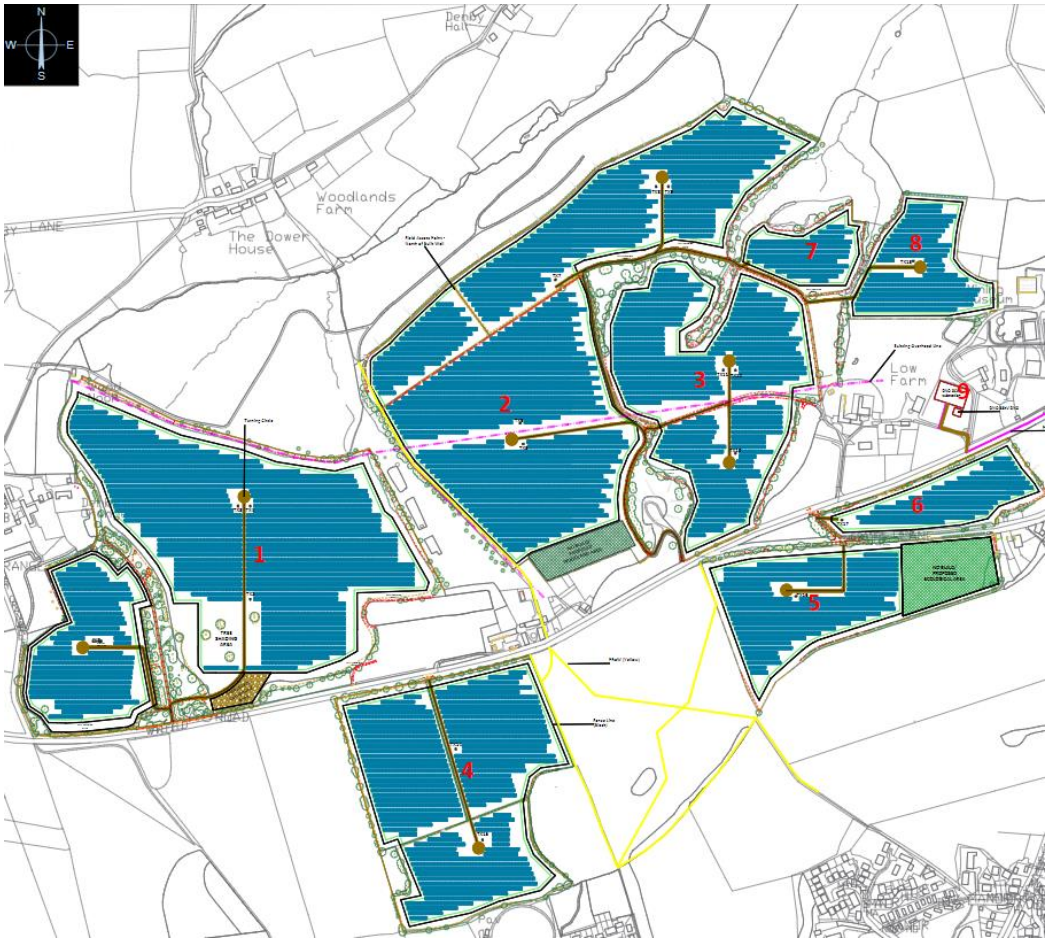

Figure 2: Proposed Site Plan (see Document Reference: R002 for scale drawing)

A summary of the main elements of the Proposed Development is set out below and explained in more detail below:

- Mono facial solar photovoltaic (PV) panels, ground mounted onto a Fixed Tilt system, using a south-facing system at a tilt of 15 degrees mounted on a piled sub structure;
- Transformers;
- Compacted crushed stone internal tracks, rolled in layers to allow vehicular access to the substations and between fields;
- 2m high security deer type fencing and gates to enclose the parameters of the Site and allow sheep to graze securely;
- Security and monitoring CCTV/infra-red cameras mounted on fence posts along the perimeter of the Site;
- Underground and cable tray cabling to connect the panels and transformer stations to the proposed on-site substations;
- A security-fenced enclosed substations compound;
- Underground cable connecting the on-site sub-station to the local electrical distribution network via a Point of Connection (POC) to the 132kV network via the pylon at Lady Ings Farm, 58 Low Lane, Middlestown, Wakefield, WF4 4PT;
- Site access; and
- Landscaping planting, biodiversity enhancements.

4.1 Nature of Solar Farms

The purpose of solar farms is to generate energy from daylight using the passive photovoltaic process and then to feed the clean electricity into the national grid for transmission and distribution.

4.2 Components of a Solar Farm

The solar farm as proposed has the following key components.

4.2.1 Solar Arrays

Solar panels would be laid out in rows with gaps of approximately 5m between each row depending on the topography of each field. Panels are mounted on a fixed tilt system mounted on a structure made of galvanized steel or aluminium. The metal framework that supports the solar panels would be fixed into the ground by posts centred c. 6m apart. The posts would be pile-driven (like a fence post) into the turf to a depth of around 1.5m. This approach means no concrete is needed to secure the system and the posts can be easily removed with no permanent impact at the end of the solar farm's temporary consent.

The arrays would utilise high-efficiency bifacial panels and at a fixed tilt of 15 degrees and orientated broadly facing south.

Bifacial panels absorb light on both sides of the panel – both directly on the top-side, and reflected light is also absorbed on the rear-side.

The panel technology also utilises high efficiency monocrystalline cells meaning fewer panels are required to be installed on the site to achieve the target capacity. The combination of high-efficiency bifacial panels and optimised configuration increases the production of electricity from the Proposed Development by 4% compared to monofacial systems.

The use of best available and state of the art technology on the Site aims to maximise the use and productivity of the land for the generation of renewable energy.

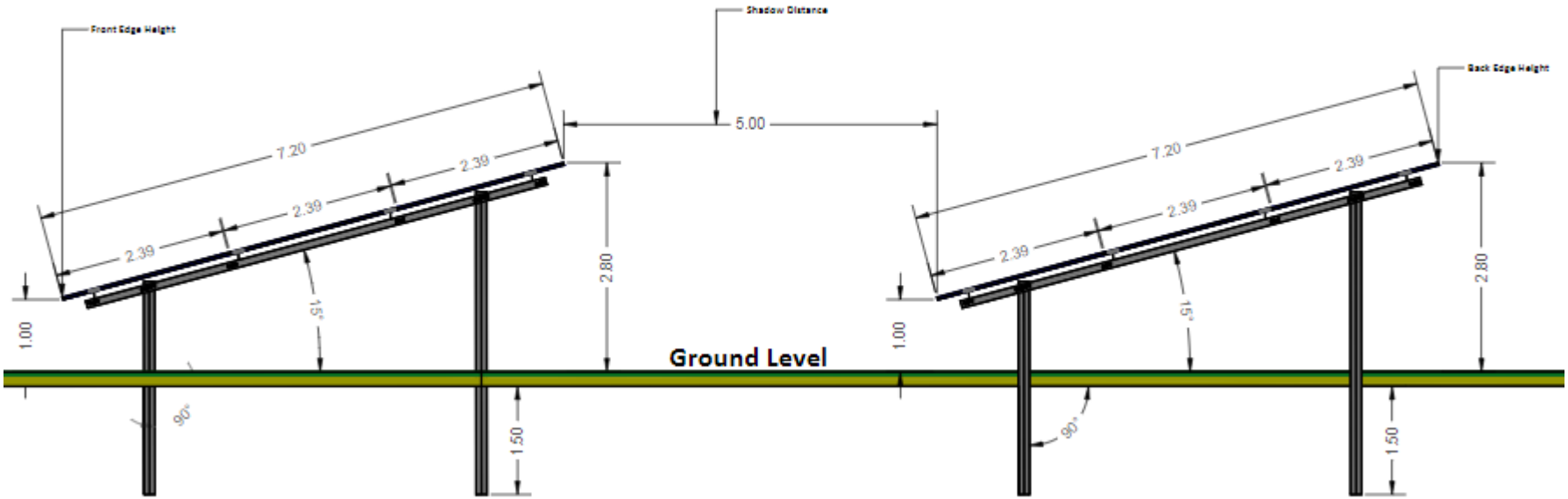

Figure 3: Solar PV Panel Elevation (see Document Reference: R002 for scale drawing)

At their lower edge panels would be approximately 1.0m from the ground and up to approximately 2.8m at their higher edge depending on the position of the static array within the topography of the site.

- The positioning of the arrays responds to existing physical features such as ditches, ponds, trees and hedgerows with panels set back at appropriate buffer distances as informed by technical guidance.

- The Proposed Development conforms to Environment Agency Regulations and maintains a minimum stand-off from watercourses within or adjoining the Site.
- Advice from National Grid has been followed to ensure appropriate stand-off from pylons where required and clearance distances under overhead cables during construction, as well as allowing for the maintenance and access to their assets.
- Guidance has been followed on appropriate stand-off distances from below ground utility services including electricity, water and gas mains that cross the Site.

4.2.2 Transformers

Seventeen transformer stations will be located throughout the solar farm.

Transformers convert low voltage output from the inverters to high voltage suitable for feeding into the substations.

The transformers are located inside metal containers. Each unit measures c. 6m (L) x 2.5m (W) x 3m (H) i.e. relatively low in height. The containerised solution makes their removal at the end of the operational life easier.

4.2.3 Substation

There would be two substations and auxiliary switchgear area on site within a compound measuring 48m (L) x 25m (W) x 3.5 m (H):

- 132kV kit surrounded by a galvanised steel palisade fence, measuring approximately 48m (L) x 25m (W) x 5.9m (H) plus a relay/control room measuring 6m (L) x 5m (W) x 3.5m (H) and both sited on a concrete slab
- 33kV kit housed in a building measuring approximately 3m (L) x 4m (W) x 3.5m (H) sited on concrete slab

The on-site substations would combine electricity from the transformers distributed across the site before transferring it to the local electrical distribution network via a Point of Connection (POC) to the 132kV network via the pylon at Lady Ings Farm, 58 Low Lane, Middlestown, Wakefield, WF4 4PT (see Document Ref: R002 for site layout drawing) via underground electrical cables.

4.2.4 Cabling

Underground cabling will be required to connect the generating substations to the Point of Connection.

The cables linking all the PV arrays to the transformer stations will be underground or cable trays above ground, and between the transformer stations to the on-site substations will be underground.

The High Voltage cables would be 1200mm deep and the other cables would be 600–800mm deep.

4.2.5 Site Security Measures

The generating station would need to be secure to prevent theft and criminal damage during both the construction and operational phases of the development and to ensure health and safety. To deliver this a 2.4m high palisade fencing is proposed around the substations, and planting is proposed along the southern edge of the parcel in which it is located

It is proposed that deer fencing c. 2.0m high would be installed around the perimeter of the Site, comprising wooden fence poles and galvanised fences with gates. The fencing would enclose the solar panels within each field and allow sheep to graze securely. The fence will be erected with a minimum 5m stand-off either side of all PRoW to maintain public accessibility by excluding it from the operational site. Gates will be installed to allow for movement between each area of the development and for operators to access their equipment.

The perimeter of the Site would be protected by a system of CCTV and/or infra-red cameras, which would provide full 24-hour surveillance around the internal perimeter. An intelligent sensor management system would manage the cameras. Cameras would be inward facing on poles of up to approximately 2.5m high, spaced at approximately 50-70m intervals along the fence. (see Document Reference: R002 for scale elevation drawing)

There would be no permanent security lighting within the Site at night-time.

4.2.6 Lighting

Operational lighting is provided only in the substations area located in Parcel 9. This is required for safety purposes and would be well screened from wider view by the existing and proposed hedges. A large existing agricultural building is located between Parcel 9 and the residential properties at Low Farm which will prevent immediate lightspill. Manually operated lights may be attached to the substations and transformer and/or inverter cabinets in the event of an emergency maintenance visit being required in the hours of darkness.

4.3 Materials & Appearance

Details of the materials and appearance of the proposed solar arrays and associated infrastructure are provided on the application drawings contained in Document Ref: R002.

5 Construction

5.1 Construction

It is anticipated that the construction phase will last for approximately 6 months.

Six points of construction access are proposed to the construction compounds and substation compound.

Construction activities which are not noise invasive will be carried out Monday to Friday 07:30-18:30 and between 07:30 and 16:30 on Saturdays. The site will be fully open for all works including heavy machinery and deliveries from Monday – Friday between 08:30 – 17:30 and on Saturdays between 09:00 – 13:00. No construction activities or deliveries will occur on Sunday or Public Holidays. Where possible, construction deliveries will be coordinated to avoid construction vehicle movements during the traditional peak travel hours.

It is anticipated that there will be 245 construction vehicle trips (comprising 16.5m articulated and 10m rigid vehicles) including construction traffic associated with constructing internal access roads, general movements and other site equipment during the construction period. It is expected that there will be an average of around seven HGVs per day accessing the Site over the construction period (14 two-way movements).

The number of construction workers anticipated on-site is not currently known. The location where staff will travel from is also unknown at this stage as it will depend on the appointed contractor. However, it is envisaged that the majority of non-local workforce will stay at local accommodation and be transported to the Site by minibuses to minimise the impact on the strategic and local highway network. Notwithstanding this, appropriate car parking provision for construction workers and visitors will be provided within the contractor compound.

Parking by contractors, visitors and delivery vehicles on the local highway network will be discouraged during the construction phase, and visitors will be advised of the parking arrangements in advance of travelling to the Site. The Site Manager will monitor that parking is taking place in the designated area on a regular basis.

No diversion of pedestrian routes, parking suspensions or closure of lanes or closure/diversion of PRoW are required. An underground cable will be installed to connect to the point of connection to the 132kV network via the pylon at Lady Ings Farm, 58 Low Lane, Middlestown, Wakefield, WF4 4PT and this may involve crossing the public highway. Prior to these works being undertaken, all appropriate licences will be obtained, and traffic management agreed with the relevant authority.

A secure temporary construction compound will be used to store materials and ancillary welfare facilities during the construction period. These does not form part of the Proposed Development. In the event of the Proposed Development being granted planning permission, the compounds will be provided under associated Permitted Development rights.

The temporary compound(s) will likely (but not limited to) include:

- Temporary portable buildings to be used for offices, welfare and toilet facilities;
- Containerised storage areas;
- Parking for construction vehicles and workers vehicles;
- Temporary hardstanding; and
- Wheel washing facilities.

In addition, the Proposed Development will include internal access roads (3.5m wide) throughout the Site allowing for the movement of construction and maintenance vehicles.

If ground conditions dictate, wheel washing facilities and road sweepers will be provided to ensure no mud or loose material is transferred onto the local highway network. In such circumstances all construction vehicles will have to exit through the wheel wash area.

Further detail is contained in the accompanying Construction Traffic Management Plan (CTMP) (Document Ref: R006).

5.2 Maintenance

Solar farms require little maintenance, with activity limited to occasional visits to clean (using only distilled water), check and conduct preventative maintenance on the installation, with personnel using small vehicles (4x4 or transit van type). Use of larger vehicles may be required if necessary to replace any defective components, should any equipment fail during the lifetime of the farm.

Operational Access will be via the accesses shown on the Overall Layout Drawing in Document ref: R002.

The ground around and beneath the arrays will be seeded with a grass mix which will be managed by occasional mowing and/or grazing by sheep Pesticide treatments will not be used as part of the grounds-keeping regime.

Further detail is contained in the accompanying Landscape and Ecological Enhancement Plan (LEEP) (Document Ref: R0011).

5.3 Operational Lifespan and Decommissioning

The Proposed Development would export renewable energy directly to the National Grid for a period of 40 years.

At the end of the useful life of the Project, the Applicant may decommission, replace or refit the modules, or if required to by condition following a period of 12 months of non-continuous generation. An appropriate method statement based on the preferred option for decommissioning will be prepared and submitted to the Council for their consideration and agreement.

The proposed scheme including the penetrative ground fixings are fully reversible and all structures can be removed from the site and the land reinstated to agricultural use. Many of the component parts, including the aluminium framework and silicon in the module panels, can be recycled for other uses. Should the modules be decommissioned, this will be undertaken within six months of notice given to the Council and is anticipated to follow the construction stages in reverse. Reinstatement will occur at each stage of the decommissioning and all waste removed from site to a suitably licensed facility.

Vehicle movements are anticipated to be the same as per the construction period.

5.4 Climate Change

Kirklees Council declared a climate emergency in 2019 and implemented a vision for the administrative area to be carbon neutral by 2038. Phase 1 of the Council plan to achieve this refers to a number of measures including 'environmental impact being considered in all decisions'. Phase 2 is awaited in the form of publication of a Programme and Action Plan in 2021. The Proposed Development will generate electricity from a renewable resource and thus responds directly to the threat of climate change. The Proposed Development would supply up to 49.9MW of clean renewable energy locally to the national grid, providing the equivalent annual electrical needs of approximately 15,200 homes in Kirklees or the offset of 23,300 t/pa CO2e when compared to fossil fuels which is the equivalent of 7,500 cars on the road every year.

The Flood Risk Assessment (FRA) (see Document Ref: R008) takes account of the effects of climate change in calculating potential flood levels, which determine the level at which components of the Proposed Development will be installed.

6 Site Selection

6.1 Environmental Context

A request for a Screening Opinion was submitted to Kirklees Council on 22 April 2021 (ref. 2112-5472/kc). A response was received on 1 June 2021 (2021/20376) confirming an Environmental Statement (ES) would not be required under the Town & Country Planning (Environmental Impact Assessment) Regulations 2017.

The following environmental studies and supporting documents accompany the planning application and are cross referred to in the Planning Statement (see Document Ref: R003);

Document	Author	Reference
Covering Letter, Application Form and Certificates	Aardvark EM Limited	R001
Planning Application Drawing Pack	Aardvark EM Limited and Boom Power	R002
Planning Statement	Aardvark EM Limited	R003
Design and Access Statement	Aardvark EM Limited	R004
Transport Assessment	Hydrock Consultants	R005
Construction Traffic Management Plan	Hydrock Consultants	R006
Noise Impact Assessment	Hydrock Consultants	R007
Flood Risk Assessment and Drainage Strategy	Hydrock Consultants	R008
Heritage Desk Based Assessment	SouthWest Archaeology	R009

Landscape and Visual Impact Assessment	Landscape Visual	R010
Preliminary Ecological Appraisal (including Biodiversity Net Gain Statement)	Western Ecology	R011
Agricultural Land Classification Report	Askew Land and Soil Limited	R012
Statement of Community Involvement	Alpaca Communications	R013
Glint and Glare Assessment	Neo Environmental	R014
Phase 1 Risk Assessment & Coal Mining Risk Assessment	WSP	R015

6.1 Economic Context

The project is one of several solar farm proposals being brought forward by the Applicant across the UK. The proposed scheme will supply up to 49.9MW for export to the National Grid.

Due to the relatively low income from farming, many farmers have had to diversify to secure an economically sustainable profit. Farm diversification is broadly defined as '*the entrepreneurial use of farm resources for a non-agricultural purpose for commercial gain*'. Hence, diversification reflects the reduced dependence of farmers on agriculture as a source of income. Diversification also implies entrepreneurial activity on behalf of the farmer.

Renewable energy is an important form of diversification and the additional income generated by the solar array project will help to subsidise and secure the landowners farming business whilst allowing them to continue farming on the remaining landholding. Farming businesses play a vital role in the rural economy, particularly supporting the agricultural supply chain to include feed merchants, machinery sales, maintenance and repair businesses, local builders, delivery drivers and professional services, to name but a few. The solar array project would help to support the local agricultural supply chain via the income to the farming business, especially following the proposed subsidy reforms post-Brexit.

It is important that solar farm applications such as this one are progressed as urgently needed infrastructure necessary to meet the UK's legally binding commitment to a net zero target. To restrict or limit development for such projects through the planning system, especially those that have significant policy support could be damaging in an economic and social context in the longer term as well as that of climate change given the pressing need to move away from fossil fuels.

6.2 Social Context

The Proposed Development will have no direct adverse social impacts on individual members of the local community or those in the wider area by virtue of noise pollution or other potentially adverse effects on the environment. However, the Proposed Development, which is concerned with the generation of energy from renewable resources, responds directly to the threat of climate change and will thus indirectly provide social, economic and environmental benefits to the wider population.

Farm diversification is key to the long-term survival of farms such as the one on which the Proposed Development is sited. The revenue from the proposed array will provide a diversified income for the farm. The landscape character we enjoy today has been developed by generations of farmers managing the land and before that its industrial mining heritage. This proposed project will help protect the viability of the farm enabling the farming business to continue their stewardship of the land and maintaining after decommissioning, the biodiversity and landscape improvements delivered by this application.

The NFU (National Farmers' Union) announced plans to make British agriculture carbon neutral within two decades and with farming responsible for around a tenth of UK greenhouse gas emissions, this will be a vital step on the road to reaching net zero. Alongside switching to more environmentally friendly working practices and enhancing land and buildings in ways that will help lower emissions, diversifying into renewable technologies presents a natural next step as well as providing an important diversified income resource for farming.

The Proposed Development would supply up to 49.9MW to the National Grid, providing the equivalent annual electrical needs of approximately 15,200 homes in Kirklees or the offset of 23,300 t/pa CO2e when compared to fossil fuels which is the equivalent of 7,500 cars on the road every year.

6.3 Planning Policy

The Solar Trade Association (STA) sets out “10 Commitments” of good practice in solar farm development. In terms of design and access issues, this includes such matters as ensuring consideration is given to minimising disruption during construction and operation such as a suitable plan being in place for construction traffic and where land is damaged by trenching or machinery, ensuring it is reinstated to its current condition at the end of construction. A full description of how the Proposed Development meets these commitments is set out in the submitted Planning Statement (see Document Ref: R003).

The local planning policy framework also encourages the generation of electricity from renewable sources. The detail on the prevailing planning policies pertaining to the Proposed Development is set out in the submitted Planning Statement.

6.4 Evaluation

The environmental studies and other analysis have established that the Site is suitable for a solar farm and informed the design and access issues of the proposed scheme such that it does not give rise to unacceptable impacts.

The renewable led energy scheme is compliant with planning policy and the Site has been carefully selected such that the nature of the local topography coupled with the schemes low profile physical height of the solar panels results in only limited views of the Site being possible.

It is considered that the scheme layout and design will not have an unacceptable adverse effect on the local environment or the visual or amenity value of the local environment nor the wider area.

7 Use

The Application is for the installation of renewable energy generating station comprising ground-mounted photovoltaic solar arrays together with substations, transformer stations, site accesses, internal access tracks, security measures, access gates and other ancillary infrastructure. The nature of such a solar farm, the site selection process and the suitability of the Site for this use are described earlier in this document.

The use of land in the countryside to produce energy is consistent with tradition and practice going back to when woodland was planted and managed to generate wood for fuel. In the present day, fuel is derived from arable crops such as maize and rapeseed, and other crops are grown as biomass fuel.

The UK imports both food and fuel and security of supply is a factor in relation to both. The use of farmland such as this Site for energy production will contribute to the UK's energy security and to a reduction in its reliance on fossil fuels.

The Site is currently used for arable cultivation. Once operational, the Site will no longer be capable of being utilised for this type of harvesting agriculture but may be used for sheep grazing and as such can retain its agricultural use albeit less intensive than the current arable cropping regime, thereby allowing the site to recover, soil condition to improve and allowing nature to recolonise and recover.

8 Layout

The solar modules will be mounted on the structural frame. The arrays are arranged in an east-west aligned linear fashion with suitable spacing across the Site, meaning that when viewed from above, the gaps between rows are wider than the area of ground covered by the panels.

The arrays will be laid out east-west in order for the modules to face south at an optimised angle of 15 degrees for generation. A fence will surround the fields, with gates to allow access (e.g. for security or maintenance) at intermittent locations. There will be an infrared CCTV system installed around the perimeter of the Site adjacent to the fence, on poles facing into the Site. The transformers will be erected and distributed across the Site to combine the output for the PV arrays.

The substations will be located in Parcel 9 which is located east of the Low Farm cluster of development and immediately adjacent to a large agricultural building. To the east of Parcel 9 is the service and storage area serving the Museum. The substations will utilise the service access adjoining the south east corner of Parcel 9, during construction and for subsequent maintenance access. This avoids construction and maintenance traffic needing to travel amongst the farm and residential properties.

The layout of the scheme has evolved over the course of the design process as the project team have continuously refined the scheme's design to encompass the Councils and other stakeholders' feedback and key findings from the survey work undertaken. Local community feedback is set out in the Statement of Community Involvement (Document Ref: R013).

Buffer zones (informed by relevant technical guidance and advice) have been designed into the proposed layout including:

- No solar panels within 10m of a PRoW;
- No solar panels within 9m of a drainage ditch or watercourse;
- No development within 9m of the top of a boundary drainage ditch or watercourse.

The overall extent of ground disturbance on Site would be minimal being approximately 4% of the overall site area as a result of the underground cabling, internal access roads, transformer stations, panel frames and proposed on-site substations.

The initial layout design 'Concept Design' was primarily influenced by land availability, solar irradiation levels and physical site constraints, these were then developed through the EIA Screening process, after the baseline studies/preliminary impact assessments and during the pre-application engagement with the local community to reach the submitted Site Layout plan. This iteration process is shown on the figures below.

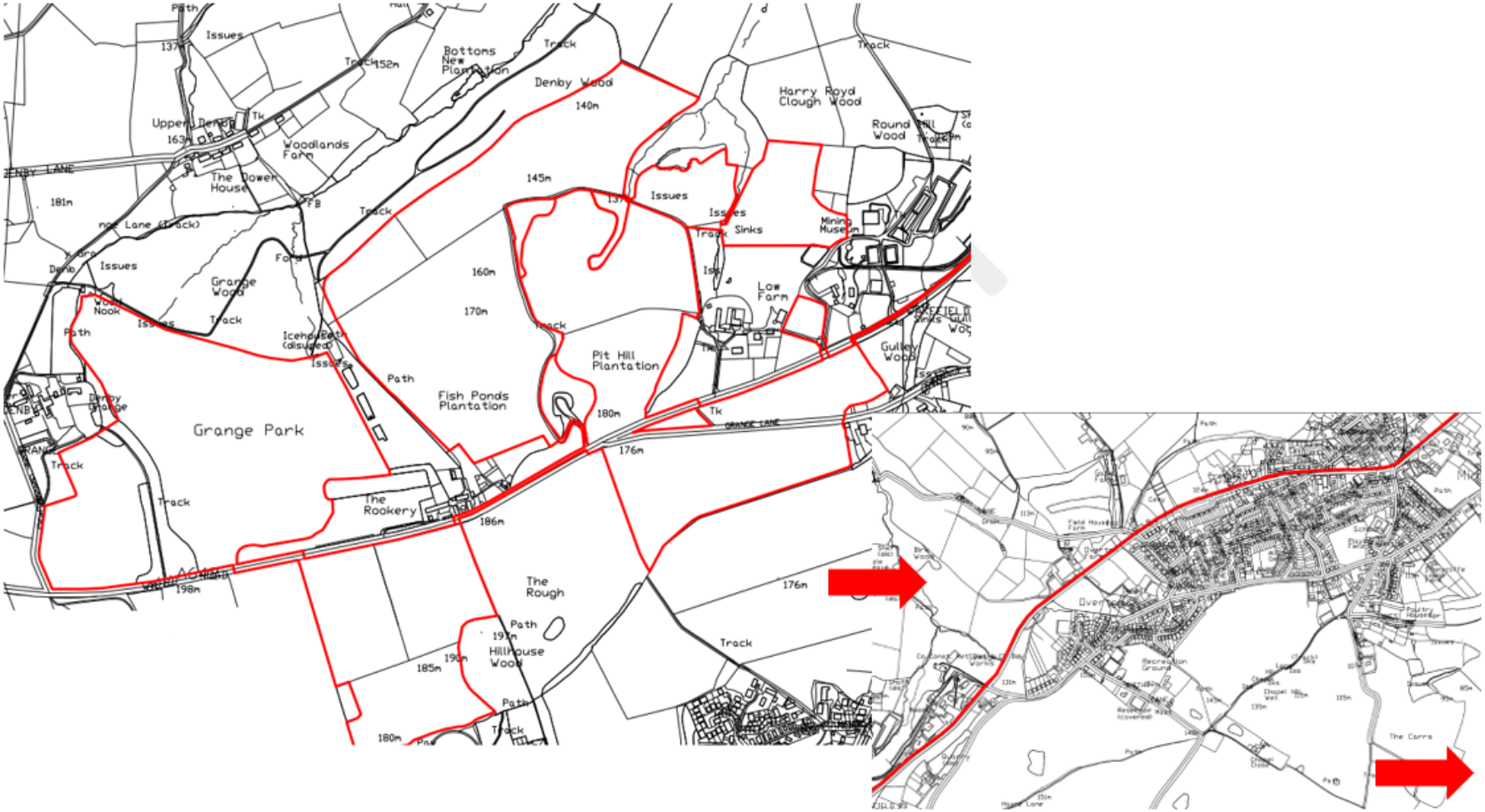

Figure 4: Site Location Plan Parts A and B

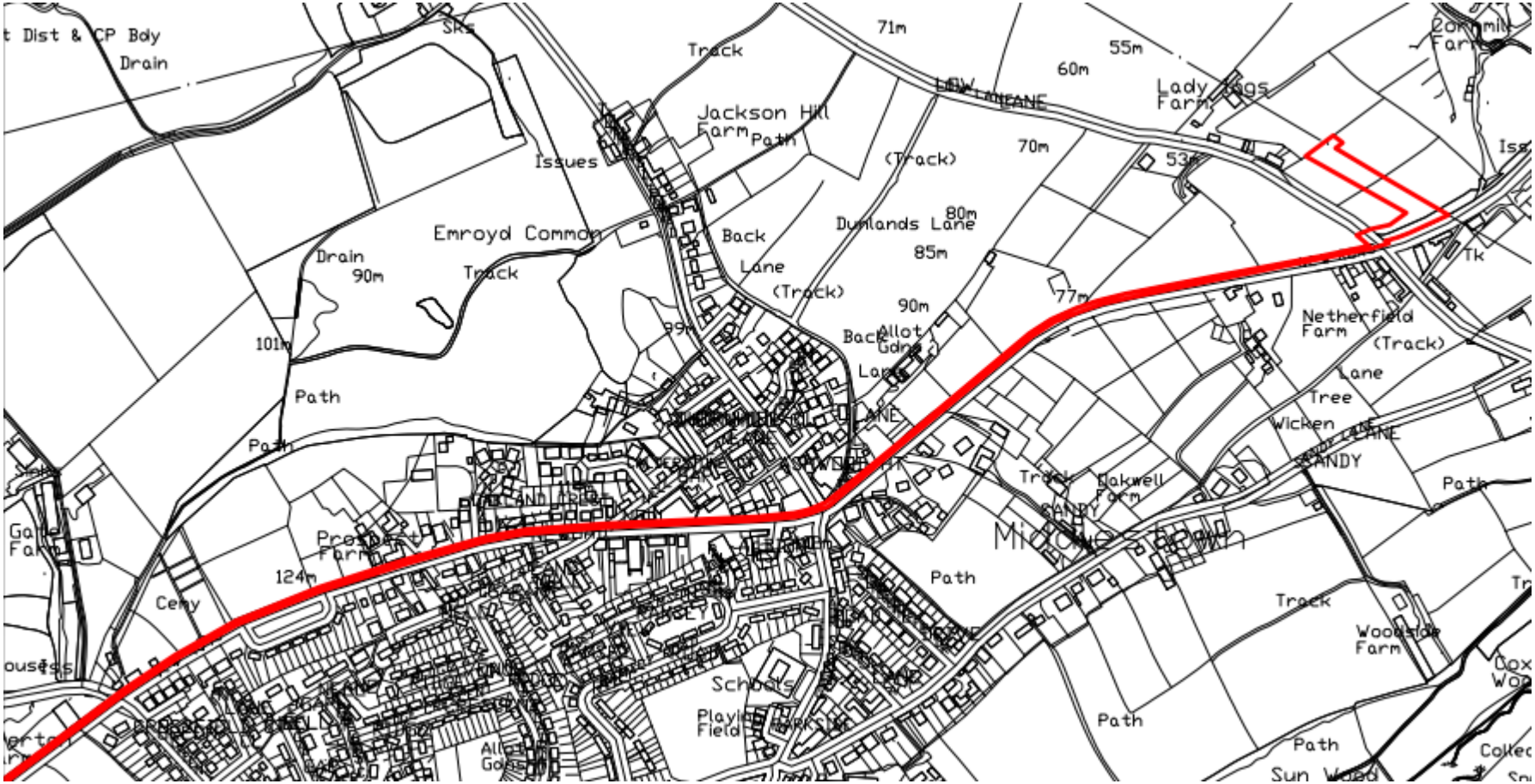

Figure 5: Site Location Plan Part C

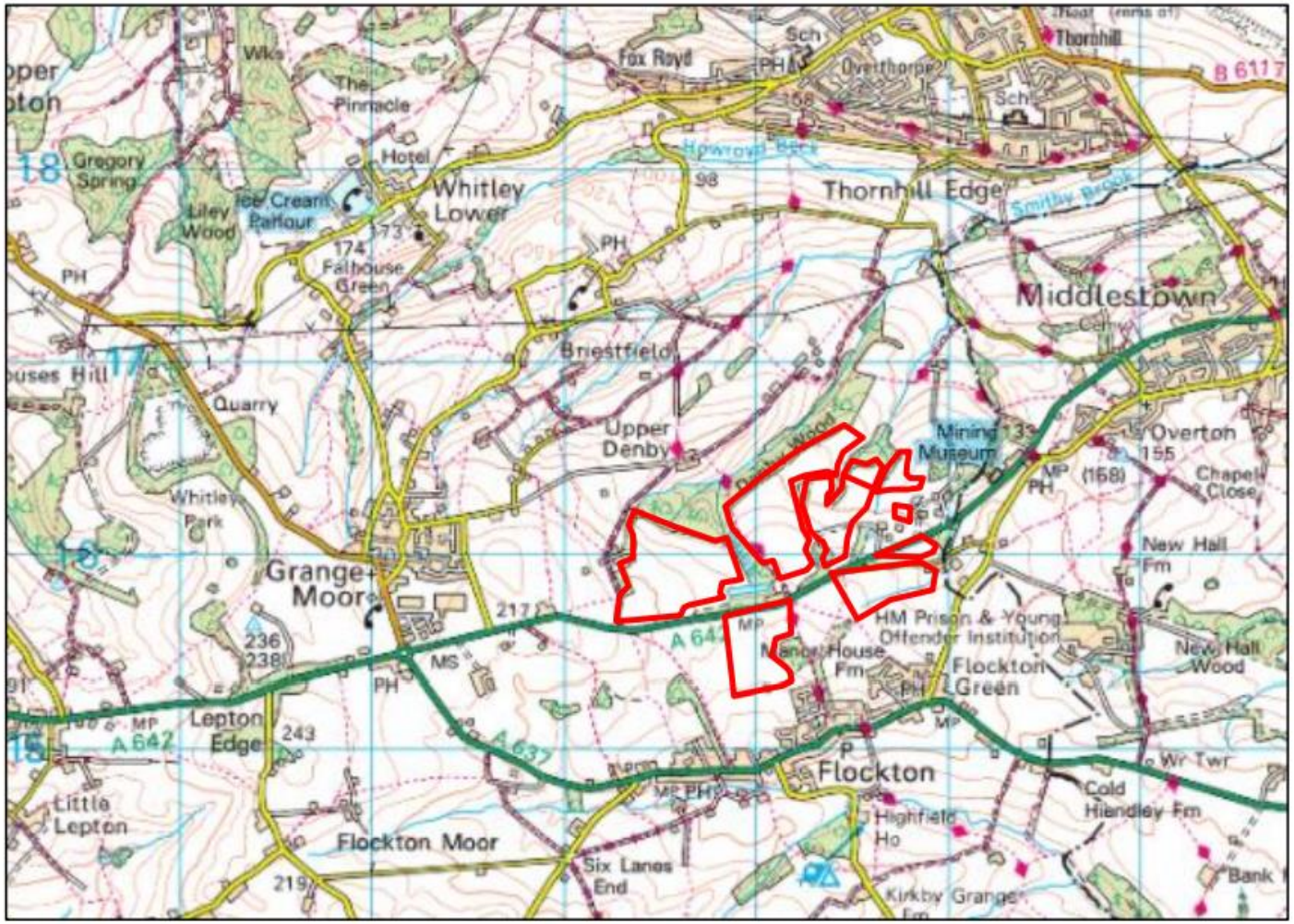

Figure 6: Plan submitted with EIA Screening Request

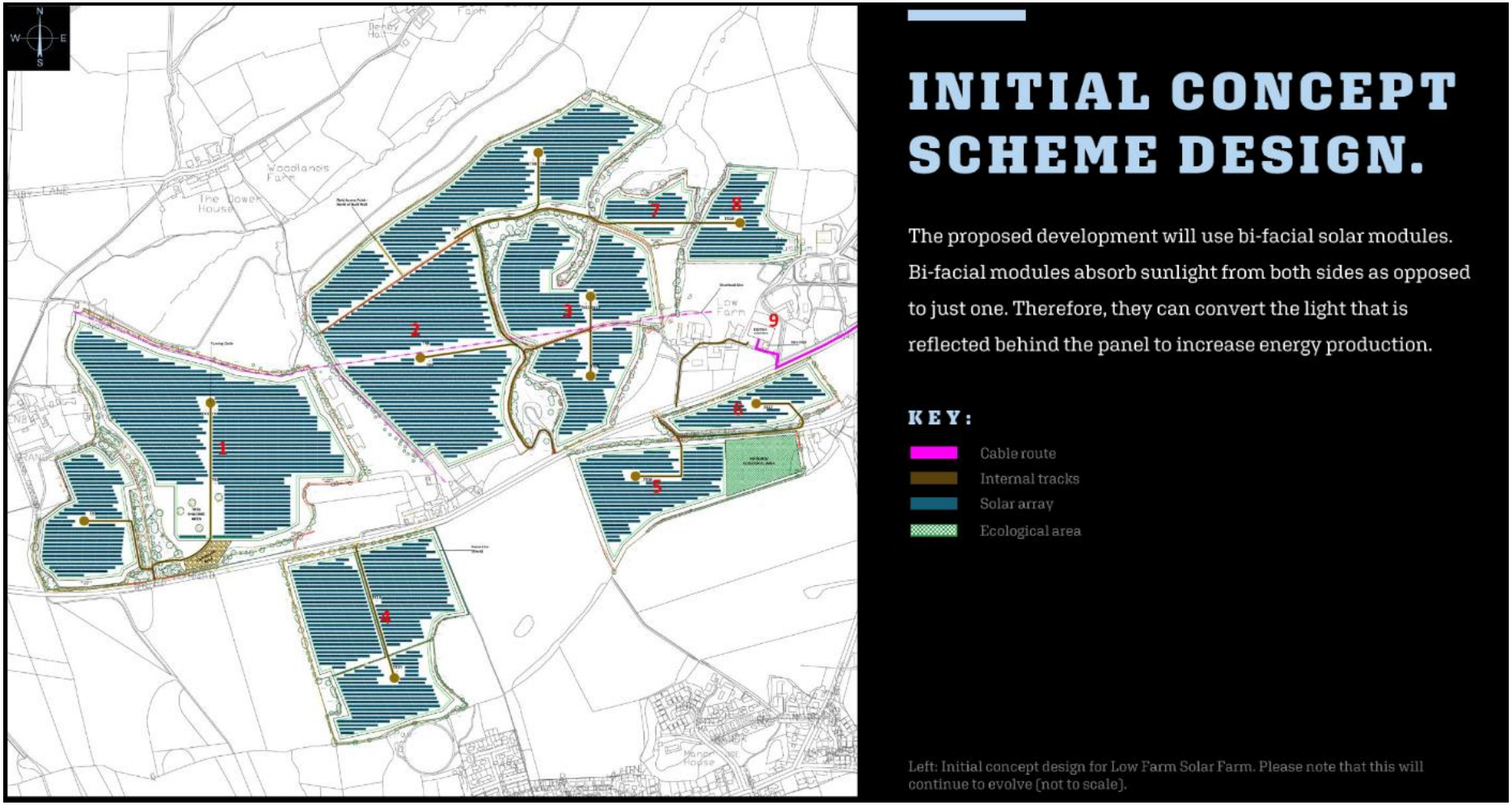

Figure 7: Local Community Consultation Plan

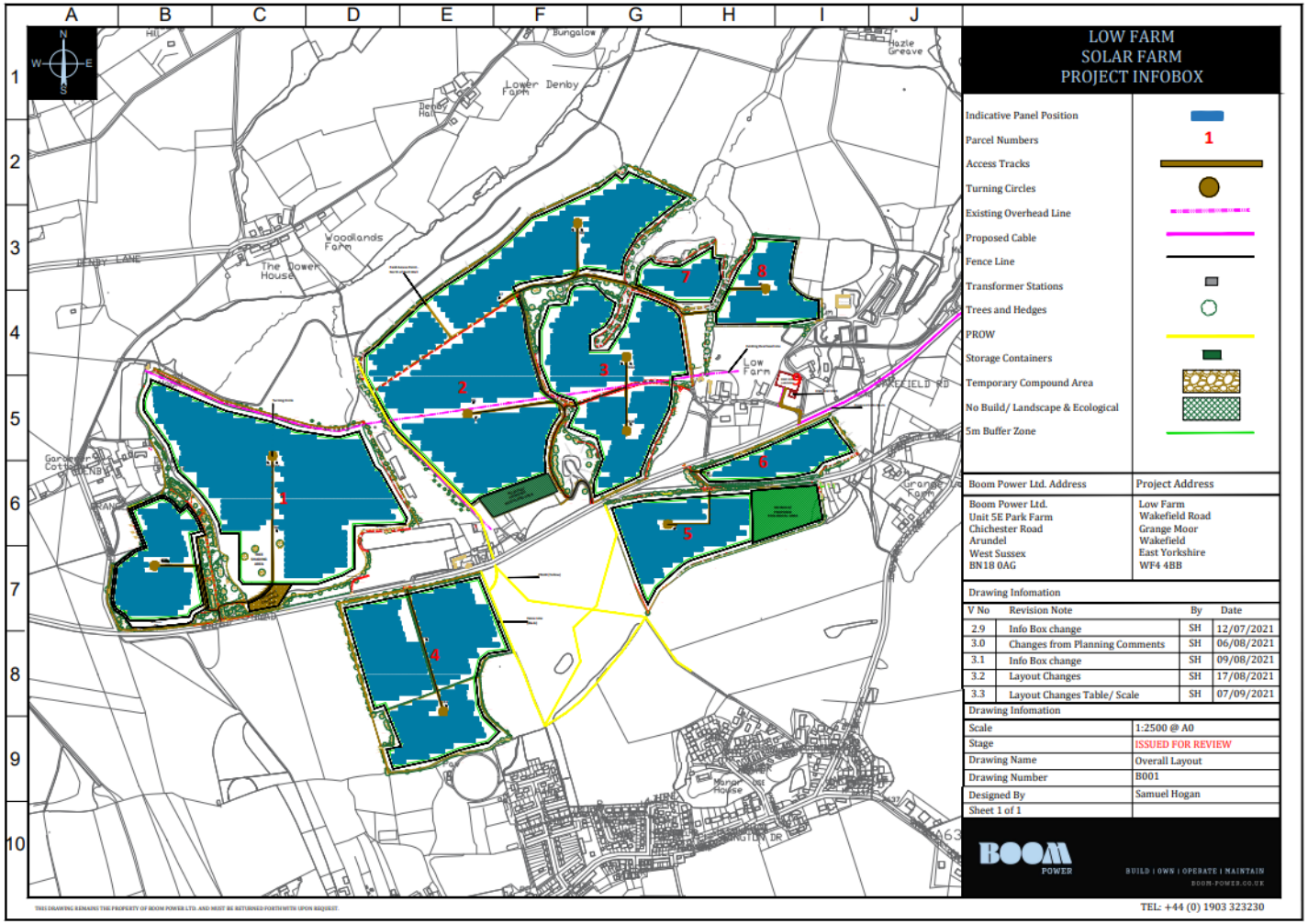

Figure 8: Application Layout (see Document Reference: R002 for scale drawing)

9 Amount & Scale

The red-line application area of the overall Site including the grid connection route is approximately 85 hectares.

Solar panels would be laid out in rows with gaps of approximately 5m between each row depending on the topography of particular fields. Panels are mounted on a frame made of galvanized steel or aluminium.

The metal framework that supports the solar panels would be fixed into the ground by posts centred c. 6m apart. The posts would be pile-driven (like a fence post) into the turf to a depth of around 1.5m. This approach means no concrete is needed to secure the system and the posts can be easily removed with no permanent impact at the end of the solar farm's temporary consent.

At their lower edge panels would be approximately 1.0m from the ground and up to approximately 2.8m at their higher edge depending on the position of the panel within the site topography.

The height of other infrastructure associated with the development, i.e. transformers and substations, will be a maximum of approximately 3m. The pole mounted CCTV cameras will be approximately 2.5m high.

Although the development requires a large area of land, in terms of physical intrusion the development would only impact a small proportion of the red-line site area due to the limited surface area required to support the solar panels above-ground presence. The overall extent of ground disturbance on-site would be minimal with just 4% of the overall site area excavated as a result of the underground cabling, internal access roads, transformer stations, panel frames and proposed on-site substations.

Once the PV system has reached the end of its useful life, the entire system will be removed, and the field will return to agricultural use with no residual impacts therefore the Proposed Development should be considered fully reversible. The soil will have rested and likely to have improved by absence of intensive agricultural farming practices during the operational lifetime of the Site.

10 Appearance

Details of the proposed solar arrays and associated infrastructure are provided on the application drawings submitted with the application (see Document Ref: R002).

Drawing Number	Drawing Title
2112-D001.1	Location Plan 1-v.c
2112-D001.1	Location Plan 2-v.c
2112-D001.1	Location Plan 3-v.c
B001	Overall Layout Planning B001 V3.3
B004	POC Cable Route V 1.3
31351NGLS	Topo 31351NGLS V 1.0
31351NGLS	Topo 31351NGLS Field 9 V A
Data Sheet	20FT Storage Container V 1.0
Data Sheet	DNO 132kV Substation Entrance Gates V 1.0
Data Sheet	DNO 132kV Substation Palisade Fencing V 1.0
Data Sheet	Huawei Inverter SUN2000-185KTL-H1 V 1.0
Data Sheet	Jinko Module TR 550-570W V 1.0
Data Sheet	Perimeter Deer Fencing V 1.0
Data Sheet	Smart Transformer Station STS-6000K-H1 V 1.0
B101	CCTV Pole Elevations Fence V 1.0

B102	CCTV Pole Elevations Fence Photo V 1.0
B104	Compound Area Layout V 1.0
B121	DNO 132kV Substation Entrance Gates Elevations V 1.0
B007	DNO 132kV Substation Foundations + Elevations V 1.0
B120	DNO 132kV Substation Palisade Fencing Elevations V 1.0
B005	DNO 33kV Substation Foundations + Elevations V 1.0
B106	Education Board V 5.0
B105	Education Board Elevations V 1.0
B008	Education Board Location V 1.0
B107	Internal Access Track Cross Section V 1.0
B109A	Perimeter Deer Fencing + Netting Photo V 1.0
B109B	Perimeter Deer Fencing + Netting Photo V 1.0
B112	Perimeter Deer Fencing Elevations V 1.0
B114	Site Entrance Gates Elevation Wooden V 1.0
B115	Solar Farm Cross Section V 1.0
B002	Solar Panel Elevations V 1.0
B116	Storage Container Foundations + Elevations V 1.0
B117	Transformer Substation Foundations + Elevations V 1.0
B119	Trenching Cross Section V 1.0

11 Landscaping and Biodiversity

Landscape and biodiversity mitigation proposals are incorporated into the scheme design and are detailed in the LVIA (Document Ref: R010), the Ecological Impact Assessment and Biodiversity Net Gain Assessment (see Document Ref: R015); and the LEMP (Document Ref: R011).

The landscape and biodiversity mitigation proposals include measures that aim to avoid, reduce, or remedy significant adverse impacts on the landscape and ecology by ensuring that the scheme has a good fit within the landscape and biodiversity setting. It also includes measures that would reduce the visual prominence of the solar arrays in local views by enhancing the condition of key field boundaries on the perimeter of the Site.

The proposals in the LEMP will secure the scheme's net biodiversity benefit. This is tested and set out in the Biodiversity Net Gain Assessment.

The proposed hedgerow, scrub and tree planting and landscape management would produce landscape features of the specified height and provide effective screening towards the Proposed Development within 15 years (medium-term). The proposed elements would also enhance the local landscape character and provide additional screening towards the Proposed Development).

The LEEP sets out how the Proposed Development would:

- Secure Biodiversity Net Gain;
- Protect and enhance the existing characteristics and features of value of the Site including the field structure, mature trees, hedgerows and ditches;
- Create a strong structural planting framework and protect, restore and maintain the existing vegetation network, which would also provide enhanced screening of close- and middle-distance views of the Proposed Development.
- Create greater opportunities for protected species' and species of conservation concern;
- Facilitate opportunities for engagement with the natural environment and renewable energy;
- Secure the long-term future management of the Site for the duration of the Proposed development.

12 Access

The details of the construction vehicle routes are set out in the CTMP submitted with the application (See Document Ref: R006). The design of the proposed Site access/egress is provided in the Planning Application Drawing Pack (Document Ref: R002).

Construction traffic will route to the site via the following route;

- Exiting M62 at J24
- Travel east on A642 via Huddersfield to reach the site.

The details of the construction vehicle routes have been discussed with officers at KC and are considered, subject to management of delivery times to be the most appropriate for use by construction vehicles and are discussed in more detail within the CTMP.

12.1 Construction Access and routing

The designated route for all construction vehicles associated with the construction period is shown in the CTMP. Visitors, delivery drivers and contractors will be advised of the route in advance of driving to the Site.

The designated routes require all construction vehicles to access the Site from the identified construction access points existing agricultural access junctions.

The proposed construction vehicle routes are direct routes straight from the strategic highway network to the Site

The use of any other roads other than the designated and signposted route shall not be permitted and this shall be ensured through the agreement of the CTMP.

Appropriate mitigation measures will be provided throughout the construction phase in order to manage the arrival and departures of HGVs at the Site.

12.2 General Site and Maintenance Access

Monthly maintenance visits will be scheduled after commissioning of the Site, supported by call outs to attend to remedial issues, as required. Once operational there would typically be two maintenance visit per month comprising a small van or car from the existing farm accesses.