Fenndyke Solar Farm

Design and Access Statement:

Revision 1

September 2014



Submitted on behalf of Fenndyke Solar Limited

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PLANNING APPLICATION

SUBMITTED ON BEHALF OF FENNDYKE SOLAR LIMITED

SOLAR FARM DEVELOPMENT:

AREA LOCATED IN THE PARISH OF SUTTON ST JAMES IN LINCOLNSHIRE, APPROXIMATELY 1.6km WEST OF THE VILLAGE OF SUTTON ST JAMES

DESIGN AND ACCESS STATEMENT (REV 1) IN SUPPORT OF PLANNING APPLICATION TO SOUTH HOLLAND DISTRICT COUNCIL

SEPTEMBER 2014

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GLOSSARY OF ABBREVIATIONS

ALC	Agricultural Land Classification
AONB	Area of Outstanding Natural Beauty
BERL	BE Renewables Limited
CA	Conservation Area
DAS	Design and Access Statement
EPC	Engineering, Procurement and Construction
ER	Environmental Report
Ha	Hectare
HGV	Heavy Goods Vehicle
HV	High Voltage
Km	Kilometers
M	Metres
MM	Millimetres
MW	Megawatt
MWh	Megawatt hour
MWp	Megawatt 'peak'
NG	National Grid
NGR	National Grid Reference
PTZ	Pan Tilt Zoom
PV	Photovoltaic
SHDC	South Holland District Council
SSSI	Site of Specific Interest
SUDS	Sustainable Urban Drainage Systems
TPO	Tree Preservation Orders
UK	United Kingdom
WP	Watts of Power
WPD	Western Power Distribution

CHAPTER ONE: INTRODUCTION

1.1 Assessment:

The Design and Access Statement (DAS) has been prepared to support the re-submission of a planning application for the development of a solar photovoltaic (PV) farm to generate electricity, which will be fed into the National Grid (NG), known as 'Fenndyke Solar Farm' (referred to in the document as the 'project', 'site', 'development' or the 'proposal').

The revised site is comprised of three fields each field of an approximate land area and corresponding installed capacity as indicated:

FIELD NUMBER	AREA (HA)	CAPACITY (MWp)
1	~9.62	8.8
2	~5.94	5.43
3	~3.63	3.32
Total	~19.2	17.55

Energy calculations indicate that the site has a maximum installed approximate peak power capacity for 17.55 Megawatts peak (MWp) sufficient to generate an estimated 16,708 MWh/annum;

Number of homes in the UK that may be supplied with electricity from this solar farm is;

16,708 ÷ 4.9[1] = ~3,410 homes

The estimate of carbon dioxide (CO_2) equivalent saved annually through the electricity generated from the solar farm is;

16,708 x 0.590[2] = ~9,858 tonnes of CO_2 equivalent per year

The DAS is a statutory requirement that has to be submitted with a planning application when any part of the site curtilage lies within either a Conservation Area, Site of Specific Interest (SSSI), New Forest National Park, Area of Outstanding Natural Beauty (AONB) and/or World Heritage Site. The site is not located within any statutory environmental designations or within the close vicinity of a scheduled monument. The nearest residential dwelling is approximately 150m east from the site on Broad Gate, this being Chestnut House. This dwelling is separated from the proposed site for the solar farm by the intervening drainage ditches and arable fields.

Fenndyke Solar Limited believes as a responsible developer it is important to illustrate the manner in which inclusive design and access requirements for the proposed development have been considered and worked into the proposal.

The project will be on approximately 19.2 hectares (ha) of current arable farming land located in the parish of Sutton St. James in Lincolnshire, approximately 1.6km west of the

[1] 4.9 (MWh/annum) is the overall average and is based taking the total domestic electricity consumption in the UK and dividing it by the total number of households.

[2] 0.590 gCO_2/MWh is the overall average of CO_2 emissions taken from the fuel mix disclosure data table for the disclosure period 01/04/2012 – 31/03/2013.

village of Sutton St James. The National Grid Reference (NGR) for the centre of the site is TF375172 (Appendix 1 - Rev 1: Site Location Plan).

The development will:

- Provide an important source of sustainable renewable energy.
- Reduce carbon emissions thereby assisting the UK Government and South Holland District Council (SHDC) achieve its climate change and greenhouse gas emission responsibilities.
- Support local business and farm diversification.
- Provide valuable inward investment into the local community.
- Agricultural activity will be able to continue on the land.
- The sustainability of the existing farm business will be enhanced.
- It will provide for bio-diversity and ecology improvements by managing the environment of the solar farm to increase the presence of British wildlife and flowers.

The Planning Statement that accompanies the application provides detailed appraisal of all relevant planning policies. In summary, the land at Fenndyke is part of;

- National Policy: National Planning Policy Framework (NPPF)
- Local Policy: SHDC 2006

Development proposals should demonstrate any environmental, economic and social benefits as well as how any environmental and social impacts have been minimised through careful consideration of location, scale, design and other measures.

Cumulative impacts have been addressed in Chapter Two of the Environmental Report (ER). The operation of the solar farm would have limited impact on residential amenity as it does not generate odour or pollution and any noise that is emitted is of very low impact and unlikely to affect any receptor beyond the boundary of the solar farm.

The selection of the site has resulted from a though and detailed assessment of sites within the area that has considered a wide range of physical, environmental and engineering requirement. These are discussed in more detail in Appendix F - ALC Impact Assessment and the Sequential Test. However, in summary the site is selected because:

1. The site is in close proximity to an available grid connection to the national grid which has sufficient capacity to enable the full export of the generation.
2. The site is not within any designated area as defined by the EIA Regulations.
3. The site is not within any Conservation Area.
4. The site is not close to residential dwellings that would warrant these dwellings as unattractive places to live.
5. The development on the site will not attract or result in additional flood risk.
6. It is one of the largest areas of sub-grade 3b agricultural and classification within SHDC.
7. The site is temporary and will not create any significant visual or harmful impact.

BE Renewables Limited (BERL) has worked to identify potential solar sites throughout England. All potential sites were screened against a range of common constraints and only those considered to be constraints-free and suitable for the nature of the development proposed have been entered into the planning process.

The re-submission of the project has been discussed with SHDC Planning Department, the local residents and the Councillors of Sutton St James Parish.

1.2 Involving the Community:

1.2.1 PREVIOUS CONSULTATION REGARDING PLANNING APPLICATION: H20-0017-14

Consultation with key statutory and non-statutory bodies is recognised as being critical to the planning application process. It focuses attention on key environmental issues and opens a dialogue to discuss methodologies for undertaking further investigations and possible mitigation process of the development.

During the preparation of the planning application, consultation and desktop surveys have been carried out as part of the specialist assessments being undertaken (for more details regarding the public consultation, and to see the visuals that were on display, please refer to the Statement of Community Involvement submitted as part of the planning application).

A Public Consultation exercise was held on Thursday 11th July 2013 between 3-8pm in Sutton St. James Village Hall, prior to the submission of the planning application. We had a small team present during the consultation, covering all sections of the proposal (e.g., environmental knowledge, design knowledge) so the vast majority of questions and queries could be answered.

Exhibition displays provided information on;

- Site Location
- The Proposal
- Site Characteristics and Area Plan
- Existing Site: Visual Receptors
- Existing Site: Photographs

Accompanying documents provided information on;

- Facts and Figures regarding the proposal at Fenndyke
- Module Specification
- Solar Panel Specification
- NPPF
- Solar Farm Information Pack (Additional Information)

Visitors to the exhibition were invited to complete a questionnaire giving their views on the project. 76 people (including parish councillors and members of the public) attended the exhibition. 35 people registered their views for the scheme on paper;

Questionairre asked... **'Are you able to register your support for the proposed scheme?'**			
Yes	**Do not know**	**No**	**Total**
21	3	11	**35**
60%	9%	31%	**100%**

The majority of the attendees were supportive of the scheme. This was also the opinion of the staff members of BERL who were in attendance at the venue discussing the project with the members of the public that attended. BERL and the applicant have taken this feedback into consideration before submission of the full planning application. Our conclusion is that the proposal at Fenndyke is positive in terms of renewable energy technology and is supported by the wider local community.

BERL and the applicant have taken the feedback from each registered view into consideration before submission of the full planning application.

Those comments in support included;

- *Solar over fossil. Wind over fossil.*
- *I strongly support renewable schemes.*
- *I feel this has less impact that wind turbines.*

We have noted the registered objections / queries / questions that were expressed. Many were of a similar nature and therefore have been categorised into three groups –

1. Rural Character Concerns
2. Community Benefit Requests
3. Other Concerns

Our response to these concerns can be seen in the Statement of Community Involvement report.

In summary, Fenndyke Solar Farm has the potential to create minimal landscape and visual impacts due to the height of the panels, perimeter screening that will take place and the ability to follow topography.

It is considered to meet all the requirements to be compliant with the development plan for the local area since it is not recognised for its;

- Landscape value,
- Quality or importance through designation, and
- Will not reduce the public's quality of life.

We always endeavor to work with the planning authority and local community to find out what would benefit them in terms of a proposed solar PV farm development (For more details on this please refer to the Statement of Community Involvement).

In addition to the public exhibition, we held several further meetings and forums with the local community, the most recent of which was the public meeting held on the 19th July 2014, where a wide selection of the local public were able to attend and listen to a presentation from BERL regarding the scheme and take part in a question and answer session. All members of the public were able, if they so wished, to complete forms registering their support for the proposed development. Invitations for the meeting had been distributed widely within the local community and the event was well attended. Along with local residents there were members of the Sutton St James Parish Council and local councillor for the area. Following the meeting a local community initiated petition that has raised over 100 local resident signatures confirming their support for the proposed solar farm development was submitted to SHDC planning department. This local support was registered for the proposed development.

H20-0017-14 was unanimously rejected at the SHDC Planning Committee Meeting under Decision Notice dated 11th July 2014.

1.2.2 THE PROCESS OF ENGAGEMENT FOR THE REVISED APPLICATION

Following the rejection of the application - BERL held a meeting with SHDC's Mr Richard Fidler and Mr Paul Jackson. BERL proposed an amended development boundary. It was BERL agreed that rather than proceed to an appeal against the rejection of planning application H20-0017-14, BERL would prepare a revised scheme based upon the amended boundary for consideration by SHDC Planning Department and subsequent Planning Committee. This Design and Access Statement is prepared to accompany this amended planning application for the revised scheme.

Following the meeting with SHDC Planning Department BERL arranged to attend Sutton St James Parish Council meeting on the 21st August 2014. The Parish Council agreed to attend and permit BERL to present the outline of the revised scheme and their reasons for the re-submission, prior to the formal Parish Council Meeting. The meeting was well attended by local residents the pre Parish Councillors and the District Councillor.

CHAPTER TWO: DESIGN PRINCIPLES

2.1 Use and Appearance:

BERL in considering the design of the amended solar farm have sought to locate the development site boundary within an area of agricultural land that removes all of the Grade 1 agricultural land and reduces the inclusion of Grade 2 and Grade 3a to a minimum. Any use of Grade 2 or Grade 3a land is as a result of land form within the existing field boundaries. We have considered the existing agricultural field boundaries and constraints and proposed amendments to the existing land drainage to accommodate these design principles.

In addition it has been designed to maximise the installed capacity on the available land thereby ensuring the optimisation of land use and maximising the generation per acre from the solar farm.

The site is within no statutory or local areas designated for landscape quality or nature conservation according to the SHDC Local Plan[3] This makes it an appropriate site to consider the development of a solar PV power plant. The location of the site is within a rural location, minimising proximity to sensitive receptors, and providing sufficient available land for the project.

Agricultural activity will be able to continue on the land, with the overall economic viability of the agricultural business enhanced by the investment. Therefore the project will also provide valuable inward investment into the local community.

The development will include the following components outlined below;

2.1.1 CONSTRUCTION COMPOUND

The construction phase of the project will take approximately 4 months (16 weeks). It will require the delivery and storage of construction materials, plant, machinery and office/welfare accommodation and so a temporary construction compound will be required. The compound will be carefully located in order to minimise environmental or amenity impact.

Size: ~50m x 50m (2500 sqm)

Location: Varies using the installed access track – the compound will, during the course of the construction period, be relocated to alternative areas adjacent to the installation works. No additional hard standing will be necessary. All construction materials will be stored in containers. These compound areas are temporary in nature and will be completely removed upon completion of the construction phase.

[3] **South Holland District Council - Local Plan -** http://www.sholland.gov.uk/localplan/text/00cont.htm

2.1.2 SOIL STRIPPING, STORAGE AND REPLACEMENT

For the installation of the temporary construction compound and access road to the site we propose to use proprietary road mats to minimise the excavation of topsoil. Where as a result of installing permanent access tracks, cable trenches and foundations for e.g., the substation, the soils will be retained on site and distributed within the area of the site so that no soils are lost in accordance with MAFF (2000) 'Good Practice Guide For Handling Soils'[4].

2.1.3 ACCESS TRACKS

The proposed solar farm aims to;

- minimise disturbance to the agricultural land;
- be temporary, capable of removal and 'reversible'; and
- minimise the landscape/visual impact and impact on the rural scene.

During the construction works the installation and use of access tracks will be kept to an absolute minimum. They are provided to avoid significant impacts to the agricultural soil land structure such that the soils to do not become overly compacted from the complex interactions between soils, machinery, crops, weather conditions and field history. The recovery of compacted soil is greatly influenced by the effects of swelling, shrinking and frost action. The effects upon the soils structure as a result of wheeled traffic is likely to persist for several years. The access tracks will be constructed on a permeable weed resistant membrane using permeable graded stone materials in accordance with Appendix 15 - Rev 1: Access Track Elevations.

Only agricultural vehicles, including tractors, quad bikes and forklift trucks using low ground pressure tyres or cage wheels will typically be used to service the facilities on a daily basis. These vehicles on a limited basis will be able to access areas of the works beyond the constructed access tracks. There will be a buffer strip of 1m-5m between hedges and solar panels around the perimeter of the site to promote ecological and biodiversity opportunities. A typical access gate can be seen in Appendix 7.

The access track will utilise the existing field entrance from Bardlings Drove. This can be viewed on the Site Layout Plan: Appendix 2 - Rev 1. During the operation phase the need to access the site will be of very low frequency. Any vehicle traffic will only use the permanent access tracks. A detailed assessment of the proposed vehicular movements associated with the construction, operational and decommissioning phases of the development can be seen in the Transport Assessment within the Environmental Report.

[4] http://www.sustainableaggregates.com/library/docs/l0301a_sheet01.pdf

2.1.4 SECURITY FENCING / LIGHTING

There is a need to ensure solar PV installations are adequately secured, however it should not result in an unacceptable landscape and visual impact. Throughout our design process we have made considerable effort towards minimising this.

The basic principle of all crime prevention is to provide layers of defence to whatever is in need of protection. In this case the protection will be the existing vegetation and proposed fencing alongside the utilisation of appropriate technology in the form of Closed-Circuit Television (CCTV). Please note: We do **not** propose to use security lighting at the Fenndyke Solar Farm. This removes any glare, light pollution and impacts on biodiversity, in particular bats that can be affected by inappropriate security lighting.

We will require vehicular access to the site. The physical security guarding this access will be robust.

We are proposing to use a Wooden Post, Stock Proof Fence (Appendix 6 – Rev 1) as security fencing around the perimeter of the site. It will be ~1.8m in height and offset 1m-5m from the extent of the solar PV modules (for access / shadow gap).

The fence indicates the extent of the solar farm development. It does not indicate the planning application boundary. (The extent of the solar farm development and fence is inset from the planning application boundary between 1m-5m this being left as buffer zone – either undeveloped or developed by enhancing existing flora and fauna).

We will utilise the existing features, such as hedges and landscaping, to screen the security fencing.

Two types of CCTV security will be installed on site (Appendix 5 – Rev 1);

- 3 pole mounted pan tilt zoom (PTZ) cameras will be installed to provide CCTV coverage of the site. The poles will be installed with a maximum height of 3m. The positioning of the cameras has been selected to minimise their visual impact (Appendix 2 – Rev 1). Camera views will be restricted to ensure that there are no views into neighbouring properties. They will incorporate passive infra-red to avoid the need for lighting to be necessary at certain times of the day. These cameras will be located close by the perimeter fence.
- 1 number plate recognition camera will be used to cover the access and egress from the site. These are insurance requirements for the facility. The cameras will be set back from the points of entry and exit, ensuring that they will not be able to inadvertently monitor any passing local traffic. The mounting height of the security cameras will be agreed with the local planning authority in line with the above restrictions.

In addition, we will include for the use of non-intrusive additional security measures to secure the photovoltaic panels and string inverters. The security proposals are also

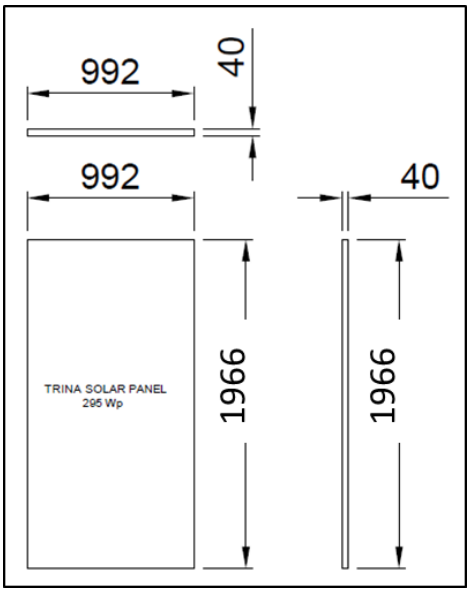
referred to in the Design and Access Statement (as required by Department for Communities and Local Government (DCLG) Circular 1 / 2006 paragraph 87).

2.1.5 SOLAR PANELS / MODULES

The solar farm comprises of the installation of approximately 56,600 solar panels (which may vary subject to the final design, the size of the module and the capacity of the module) mounted to steel and aluminum frame structures, using typically 2-row portrait, at an angle of approximately 20 degrees. The frames are arranged into rows set south facing, at ~3m apart. This distance may vary as a result of final design, size and capacity of the modules.

The solar PV module is made up of 60, 72 or 90 - 156 x 156mm polycrystalline silicon cells (dependent upon its capacity and size). The surface of each panel is constructed from toughened glass, beneath which is a non-reflective layer, electrical connections, silicon and a backing layer, all set in an aluminium frame. The layers of silicon comprise of primarily negatively charged electrons, 'n-type', and positively charged electron silicon, 'p-type', contacting each other in the solar panel. When these are exposed to sunlight, the sun's energy 'excites' these electrons making them move from one layer to another and this movement results in the generation of electricity. The different layers of silicon are designed to absorb different wavelengths of irradiation (i.e. the sunlight).

The frame consists of anodized aluminium. The solar PV module will be dark grey/blue in colour and have anti-reflective coating to minimise glare.

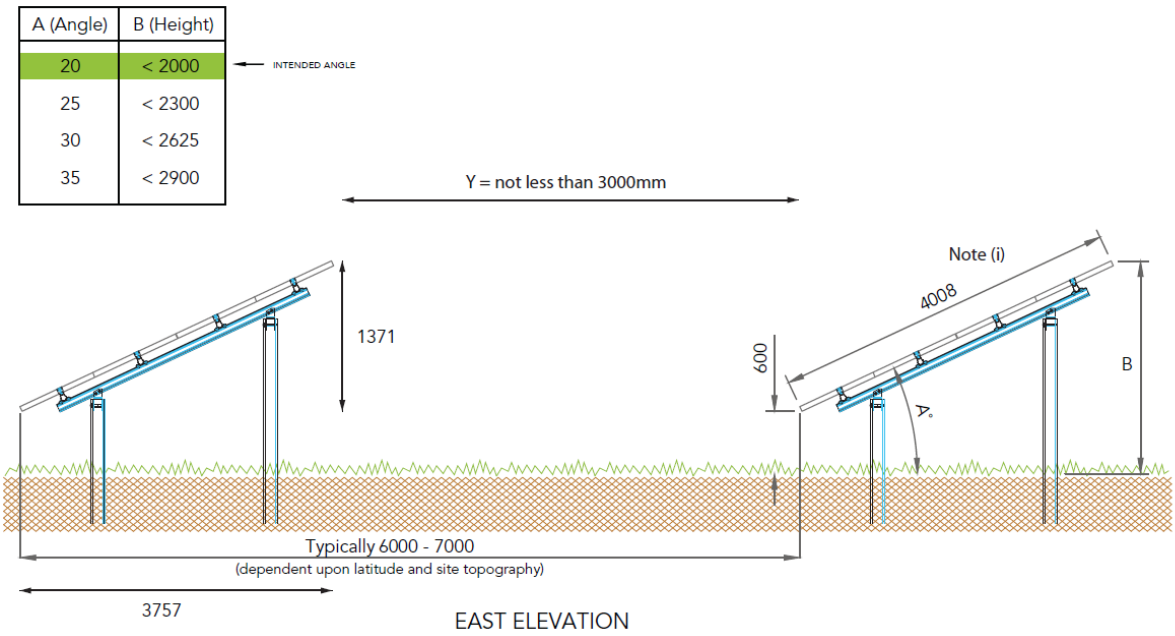


EXAMPLE OF TYPICAL 72 CELL SOLAR MODULE

2.1.6 SOLAR PANEL FRAMES

A side elevation (Appendix 13 – Rev 1) is shown below and a Site Layout Plan can be viewed in Appendix 2 – Rev 1 showing further details of the layout of the proposed scheme.

Note (i) 4 No: Solar Modules in Landscape



EAST ELEVATION

The frame structures consist of steel uprights and aluminum cross bars. The uprights are 'augured' or 'pushed' into the ground to a depth of approximately 1.5m, dependent upon ground conditions. Typically the uprights are not driven into the ground for two reasons;

- To ensure the development is 'reversible' as this method allows the site to be easily restored to a more intensive agricultural use.
- To mitigate the production of construction noise.

The rows of panels are inset from the perimeter site security fence to prevent overshadowing and to permit the construction of the perimeter access track. There is a separation gap of ~3m between each row, to ensure minimal overshadowing and optimisation of the installed capacity, whilst maintaining adequate access between each row for maintenance.

In the unlikely event that site conditions or studies dictate that penetrating into the subsoil's would not be an inappropriate support system then concrete 'shoes' would be employed as an anchoring system for the solar frames. These shoes would be placed on top of the existing ground level and thereby avoid any damage to any unrecorded artefacts or below ground interest that may be present. This may be

required if the location of one of the support posts interferes with any of the existing below ground drainage or cabling within the fields.

The solar panels are fixed and do not track the path of the sun.

2.1.7 INVERTERS

The solar module arrays are connected to an internal electrical collection system, which is suspended from the support tables;



EXAMPLE: SOLAR MODULE ARRAYS CONNECTED TO AN INTERNAL ELECTRICAL COLLECTION SYSTEM

These cables are then connected to each solar arrays string inverter which are mounted to the rear, behind the rows of solar modules;



EXAMPLE: STRING INVERTERS WITHOUT COVER

A string inverter will connect to each row of PV panels to convert the direct current (DC) output to alternating current (AC). The inverters are manufactured with cabinets with an appropriate IP rating to resist the environmental conditions in which they are housed.

The inverters dimensions are approximately 1061mm x 702mm x 292mm. They are solid state and do not emit any noise.

2.1.8 MARSHALLING CABINETS / COMBINER BOX

Each string inverter will be connected to a marshalling cabinet by the installation of below ground cables in accordance with the trenching details as shown in Appendix 8. The marshalling cabinets terminate the connection of multiple string inverters. This

marshalling cabinet enables the combined output of numerous sting inverters to be connected to the adjacent transformer(s) which are then be connected to the substation by installation of further below ground cables.



EXAMPLE: MARSHALLING CABINET / COMBINER BOX ON SITE

2.1.9 TRANSFORMERS

The proposed transformers are mounted adjoining the identified substation compound. The final design of the size and number of transformers has not been completed but typically we would expect there to be no more than 9 transformers, each of ~2MVA. Typical size being 2000mm x 1350mm x 1950mm (high). The transformer will be mounted on a small concrete pad within a permeable compound.



EXAMPLE: TRANSFORMER ON SITE

2.1.10 SUBSTATION

This is primarily a requirement of the DNO to enable the generation from the solar farm to be exported and connected to the regional electricity network system, as operated under their license.

A new single sub-station will be built as part of the development to facilitate connection of the solar power farm to the national grid network via the existing transmission facilities. The substation will be to standard specification of the DNO to

meet their requirements. It will house the Western Power Distributions (WPD) High Voltage (HV) Grid Protection Switches and the applicant's metering and consumer side HV switch. The building will also accommodate a small store room.

The proposed substation is 5200mm x 8300mm 3900mm (high). Building materials for the substation containment are to be agreed with the local planning authority during the planning process. Details of the substation are as shown in Appendix 4 – Rev 1.

The location of the substation building can be seen on Appendix 2 - Rev 1. This location has been determined in relation to the connection requirements to the existing distribution network and the Flood Risk Assessment.

2.2 Additional Information:

The **CONSTRUCTION** period is anticipated to last approximately 4 months. During this time, heavy goods vehicle (HGV) movements will be required to deliver materials and equipment to the site. It is anticipated that at peak approximately 25 vehicle movements will be required per week, for the delivery of materials and components over the course of 16 weeks (Table One).

No of weekly Movements	wk1	wk2	wk3	wk4	wk5	wk6	wk7	wk8	wk9	wk10	wk11	wk12	wk13	wk14	wk15	wk16	Totals
Site welfare and Facivilities	4	1															5
Fencing deliveries	4	4	3	3								2	2	2	2		22
Waste recycling lorries			3	3	3	3	3	3	3	3	3	3	3	3	3	3	44
Delivery of table supports		5	5	5	3	3											21
Delivery of Table materials			6	4	4	4	2	2									22
Delivery of cabling				3	3	3	3	3	3	3	3						22
Delivery of panels				7	7	7	6	6	6	6	6	5	5	5	5		71
Inverters and substation		3	3				2	2			2	2					13
Concrete materials		2															2
Stone	1	2															3
Weekly total	9	17	20	25	20	20	16	16	12	12	14	12	10	10	10	3	225
Daily average	2	3	4	5	4	4	3	3	2	2	3	2	2	2	2	1	**3**

TABLE ONE - ANTICIPATED VEHICLE MOVEMENTS DURING CONSTRUCTION (FIGURES ARE APPROXIMATE)

In order to reduce the impact upon the local road network, HGV movements will be staggered throughout the construction period. It is not expected that local road users would notice a change in the existing road use as a result of the project.

Assuming a 4 month construction period and a 6 day working week, there are approximately 96 days when deliveries could be made to the site. Assuming deliveries are spread across the construction period then the approximate number of HGV deliveries per day is shown in the Table above.

The **OPERATIONAL** lifespan of the site will be 25 years. Very few movements will be expected during this time (for maintenance and repairs only). During this time, low density sheep grazing will be encouraged on the site.

After 25 years, the project will have reached the end of its operational life and will enter a phase of decommissioning. This will involve dismantling and removal of all materials and equipment that have been on site during the operational phase. It will take approximately 1

month. Once the solar modules and supporting infrastructure have been completely removed, the site will be restored to a full suitable agricultural use.

2.3 Layout:

The proposed layout has been developed to;

- achieve the most suitable design for the site and the environmental assessment
- represent feedback from the wider local community as a result of our public consultation and amendments following the previous planning application and;
- include advice given from discussions with SHDC.

The revised scheme has significantly reduced the land area, reduced the agricultural land that has been removed from arable farming and avoided use of any Grade 1 agricultural land and reduced significantly the use of any Grade 2 or Grade 3a land. Leaving the 'best and most versatile' (BMV) land in arable farming available for future food production.

The submitted amended layout is wholly consistent with avoiding as much BMV as is practical within the constraints of land and field boundaries not following, with any consistency, the agricultural land classifications. To address this and ensure that the retention of the BMV is retained for agricultural production we have proposed to complete some amendments to the existing land drainage and thereby maximise the land to the north of the proposed solar farm that is retained in agricultural production. Various layout options were considered as part of the process to ensure that environmental impacts are minimised and to enable the optimum energy generation for the site. These took into consideration the following issues:

- Comments from SHDC planning officers
- Minimising impacts to vegetation, including hedgerows
- Visual impact
- Impacts upon agricultural arable activities viability
- Severance of agricultural fields
- Density of modules per hectare
- Angle of module tilt
- Feedback from our public consultation
- Feedback from our contacts with statutory bodies.

The solar PV panels will be south-facing and tilted at no more than a 20° angle. The panels will be arranged into rows that are parallel east-west. The pitch will be approximately 6m to 7m. The spacing of arrays at such intervals optimises the use of the available land area, whilst minimising shading of the panels. The distance between the rows will be approximately 3m. This allows for maintenance vehicles to access the arrays. The panels will be installed in 4 row landscape configuration. Please refer to Appendix 14 - Rev 1: Typical Front and Piled Front Elevation.

CHAPTER THREE: ACCESS

The site is close to the highway network. Access to the site will be via the network of local roads, Jiggles Gate, Old Fen Dike and then to Bardlings Drove which will lead to the access point. All of the roads are currently used by a wide range of light and heavy vehicles, including heavy goods vehicles. As a result it will be suitable to support the necessary vehicles during the construction of the project.

3.1 Site Access:

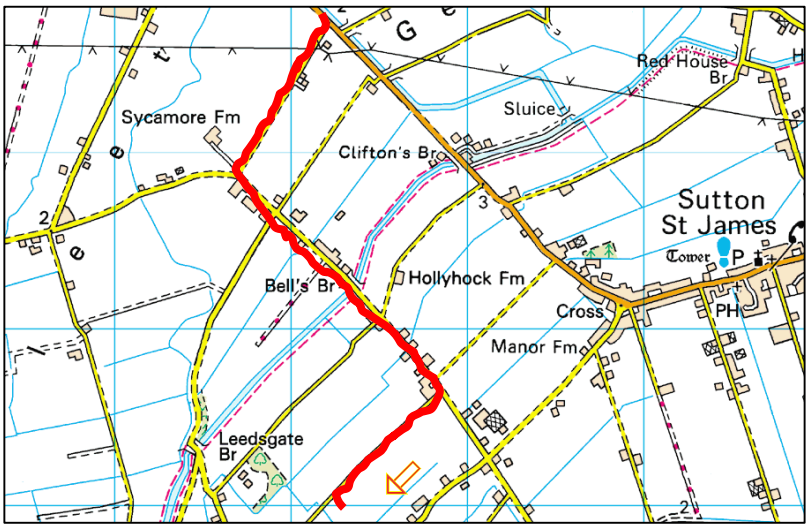
The Site Location Plan (Appendix 1 – Rev 1) indicates that the site access will use an existing access point off Bardlings Drove.



Incoming traffic will enter this road by turning right off the Old Fen Dike. On leaving the site traffic will turn right and return via their incoming route.

3.2 Construction Traffic Management Plan:

The delivery vehicles will travel to the site from the B1165 via the route shown below;



ACCESS TO THE SITE FROM THE B1165 TO BARDLINGS DROVE

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- **ENTERING THE SITE**: From the B1165, take the turn right onto Jiggles Gate at the T-junction turn left onto Old Fen Dyke and proceed until the left turn into Bardlings Drove from where the point of access to the site will be reached.
- **LEAVING THE SITE**: Turn right and re-trace the route taken on delivery to the site.

3.2.1 MANAGEMENT OF JUNCTIONS WITH AND CROSSINGS OF THE PUBLIC HIGHWAY AND OTHER RIGHTS OF WAY

Temporary traffic warning signs will be deployed through the construction period which will ensure that the safety of the public highway is not compromised. BERL have assumed a visibility splay requirement of 9m by 120m based on the Design Manual for Roads and Bridges (DMRB)[5] and assumed traffic speeds although the final required visibility splays are still to be confirmed with SHDC. No obstacles should obstruct the required visibility above 1.05m.

3.2.2 TEMPORARY WARNING SIGNS

Temporary traffic warning signs will be placed according to the local and highway authority requirements. These warnings will cover the main risks associated with construction traffic entering and exiting the site. (Please see Appendix 18 - Rev 1: Traffic Management Schematic).

3.2.3 ACCESS IMPROVEMENT SCHEME

The access will be improved through the installation of a gravel core access track comprising of;

- Installation of approved geotextile as a sub base / sub grade separation membrane in full compliance with the manufacturer's technical recommendations.
- Compact bed of approved, well graded hard core / granular sub base material.
- Lay bed of single size graded clean granite (or similar) spread and levelled around concrete bases and such like. The chippings must have a target wet resistivity.

3.2.4 OTHER ACCESS REQUIREMENTS

CONSTRUCTION COMPOUND, PARKING AND TURNING	The construction compound, parking and turning will be located within the site entrance.
STORAGE	There is no requirement for onsite storage of deliveries. Deliveries will be made as required. Please refer to Chapter Eight of the Environmental Report for more details. The deliveries will be offloaded and taken straight to the area of the site where they are required for installation.
SURFACING	The top soil from the access path will be removed to a depth of approximately 100mm and a terram membrance will be laid here and filled with stone which will then be compacted down by 100mm to provide a suitable surface for vehicles.
DRAINAGE	The access arrangements do not involve impermeable hard surfacing and so no additional drainage measures are required beyond already discussed in Chapter Nine: Flooding of the Environmental Report.
WHEEL WASH FACILITIES	When nessecary the wheels will be cleaned manually within the construction compound before vehicles exit the site.

[5] **Design Manual for Roads and Bridges -** http://www.dft.gov.uk/ha/standards/dmrb/

3.2.5 LIAISON WITH SHDC HIGHWAYS ENGINEER

Once the construction programme has been confirmed contact will be made with the SHDC Highways Engineer to enquire whether they wish to undertake a pre-construction inspection of the site. If required, the project manager and a representative from our specialist Engineering, Procurement and Construction (EPC) contractor will attend this inspection.

3.3 Vehicle Movements:

The majority of vehicle movements associated with the solar farm would occur during the construction of the farm, which would take approximately 4 months. Circa 225 HGVs would be used to deliver the equipment and materials for construction. There would also be a series of light vehicles which would be used to transport the construction staff to site.

As previously mentioned, once operational the operation of a solar farm will require very few maintenance visits and the traffic impacts are therefore anticipated to be minimal.

Within the site there will be a buffer zone between the existing hedgerow and the perimeter security fence. Within the perimeter security fence there will be a perimeter access track 4m wide.

Once operational the solar panel areas, inverter boxes and substation will be enclosed with a security fence (~1.8m) that will surround the site and this perimeter fence will be screened by the existing hedgerows. The fence is for both security purposes and to protect the public.

3.4 Inclusive Access:

The site will not be open to the public so it is considered that the requirements of inclusive access for the public are not relevant to the project.

CHAPTER FOUR: CONCLUSION

This report has assessed the site's full context, including physical, social and economic characteristics and relevant planning policies as described in Section One. Community involvement has been demonstrated by pre-application advice (screening) with SHDC, specialist assessments with various statutory bodies and a number of differing public consultation and meetings held throughout the past year, the most recent of which was held prior to the last Sutton St James Parish Council of the 21st August 2014, where we advised those in attendance of our plans to make this re-submission and where we provided a brief outline of the amended scheme and our reasons for making the re-submission. Members of the Local Public, Parish Councillors and District Councillors were present.

Section Two informs that the scheme has been appropriately discussed, looking at all the different design principles. The solar farm would not cause unacceptable annoyance and great care has been taken to reducing its potential impact to the surrounding neighbours. In addition the overall economic viability of the agricultural business will be enhanced.

The density of the project is fitting for the size of the site. It will only be in operation for 25 years meaning the neighbourhood's services can easily support the amount of development planned. All the proposed space has a purpose, whether for solar panels, grazing or fencing. The space will be practical, safe and secure. The site is within a rural location to provide sufficient available land for the project. The site itself does not fall within any statutory or local areas designated for landscape quality or nature conservation and so the solar panels will sit relatively comfortably within their surroundings.

Section three of the DAS discussed details of all the relevant access routes and the proposed construction traffic management plan. It is not necessary for any persons to be on site during operation (apart from for maintenance and repairs). There will be a security fence and gate that will surround the site for security purposes and protection of the public.

It is vital that a renewable energy scheme has limited environmental impacts and minimal visual impacts. The overall design principles that have been embodied into this proposed development at Fenndyke Solar Farm help achieve this.