Pegasus Group

BUBNEY SOLAR FARM

Design and Access Statement

March 2021 | P20-1083

renewable connections


GRINDLEY BROOK
A49
CHESTER ROAD
A41
WHITCHURCH
REDBROOK
WREXHAM ROAD

Contents

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Prepared on behalf of Renewable Connections
March 2021 | project code P20-1083

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1.0 | Introduction

This Design and Access Statement supports a planning application submitted to Shropshire Council [as the "Local Planning Authority"] by Pegasus Group on behalf of Renewable Connections Developments Ltd ["the applicant"]. Planning permission is sought for the provision of a renewable energy scheme comprising ground mounted solar photovoltaic (PV) and other ancillary equipment on agricultural land at Bubney Farm, Grindley Brook, Whitchurch, Shropshire, SY13 4QH. The proposal is referred to collectively as the 'Proposed Development' and the project is referred to as 'Bubney Solar Farm'.

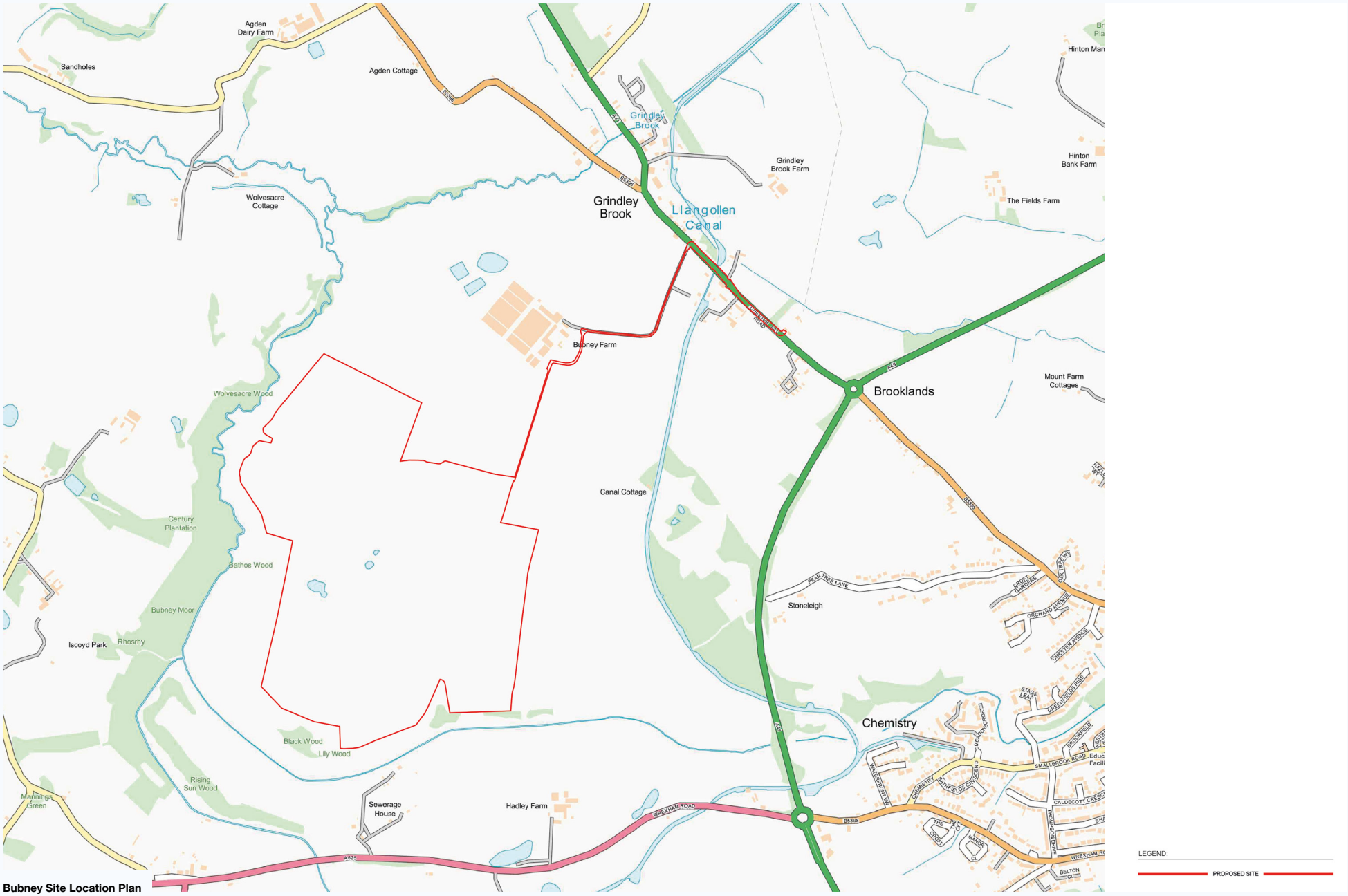
1.1 The main element of the proposal is the construction, operation, maintenance and decommissioning of circa. 30 megawatt (MW) ground mounted solar park and associated infrastructure.

1.2 The proposal would provide a clean, renewable and sustainable form of electricity and will also make a valuable contribution to the generation of electricity at a local level. The scheme would add to Shropshire Council's progress in meeting its renewable energy target and would also assist in meeting national targets for both energy supply and low carbon energy development.

1.3 This Design and Access Statement should be read in conjunction with the accompanying Planning Statement which sets out the planning policy context relating to the design and access issues of the application proposal. Notwithstanding the above, this design and access statement is set out to be read as a standalone document if required.

1.4 This document has been prepared in line with Section 4(3) of the Town and Country Planning (Development Management Procedure) (England) (Amendments) Order 2013, which sets out the requirements regarding the contents of a Design and Access Statement.

1.5 The overarching objectives of the development proposal are to meet the objectives of climate change and energy security.



Bubney Site Location Plan

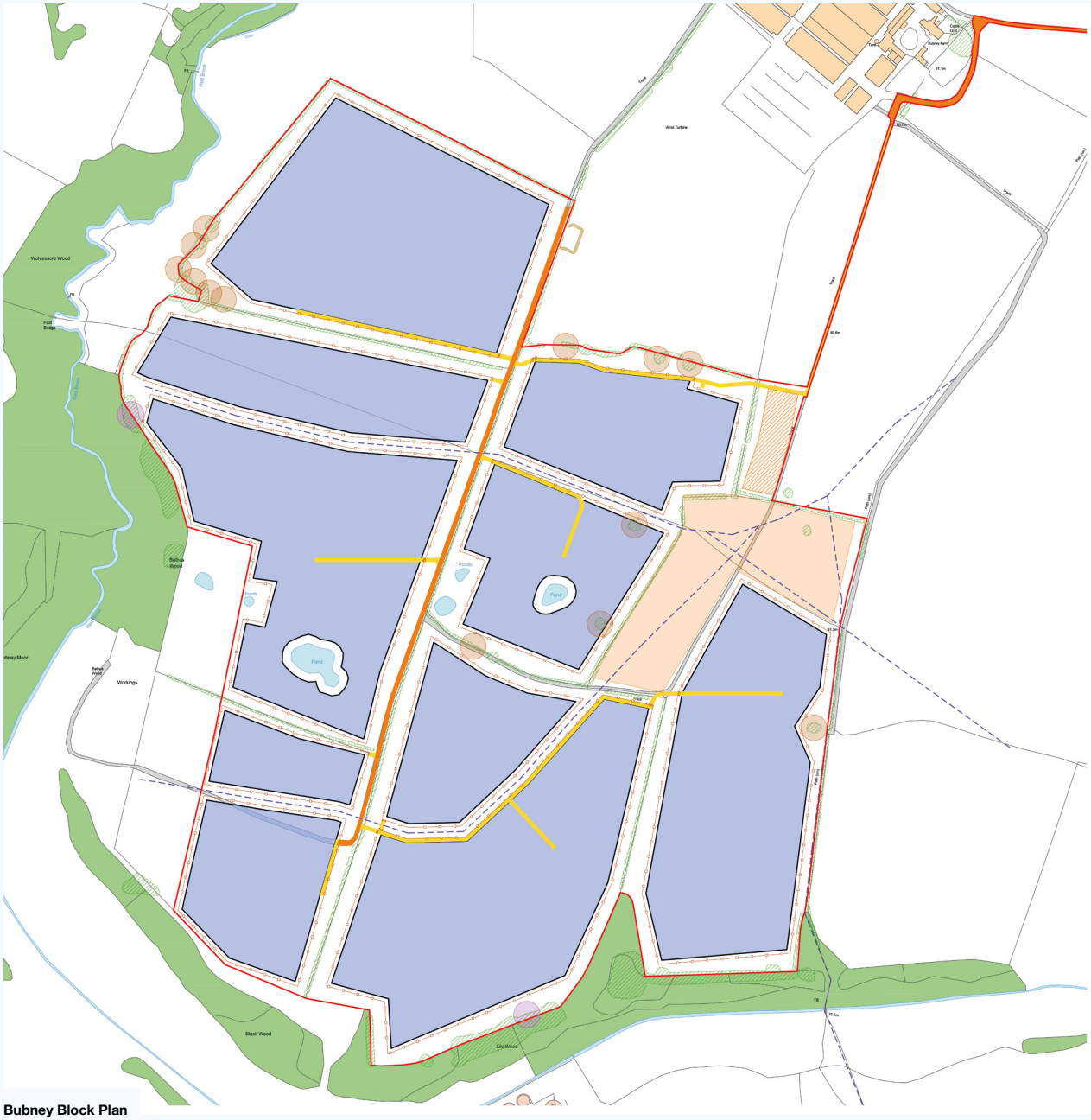
2.0 | The Site

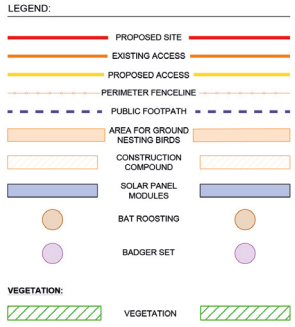
The site is located on land within Bubney Farm, Grindley Brook, Whitchurch, SY13 4QJ. The proposed 30MW solar PV development is situated within open countryside within a site which extends to c. 60 hectares. To the south, the site effectively shares a common boundary with a water works station and two residential properties, beyond these is the A525 Wrexham Road. To the north of the site is the existing Bubney farmstead, beyond which is the settlement of Grindley Brook. The site is bounded by agricultural fields to the east beyond which is the Llangollen/Shropshire canal; woodland belts; and then the A41/A49 Whitchurch Bypass which is administrative with Cheshire East Council. The west boundary is defined by a linear woodland belt which also forms the administrative boundary between Shropshire and Wrexham Council, beyond which is a registered park and garden.

2.1 The site is served by an existing farm access track leading from the A41 at Grindley Brook. This is the main access point for the farmstead and is considered to be appropriate for agricultural vehicles and therefore HGVs.

2.2 The main site is located within gently undulating arable farmland with levels set at 92AOD along the southern boundary, 90AOD along the western boundary and 90AOD along the northern boundary. Within the site localised levels fall to 85AOD whilst it appears that the land falls towards the east, with the eastern boundary set at 80AOD. The Historical Park and Garden to the west of the site has a similar topography, averaging at 85AOD and as such it is anticipated that the existing woodland belt provides adequate visual screening.

2.3 The adjacent site location plan shows the position of the site. A grid connection route is proposed to the north east to connect the proposed solar PV development to the existing Whitchurch substation located on the A41. This includes a simple cable route through the fields along the track and onto the A41.





Bubney Block Plan

3.0 | Design Approach

This section sets out the approach that the applicant has taken through the design of the Proposed Development and how the design has evolved through the pre-application process.

3.1 The main design principles adopted by the Applicant are set out below:

- Design Principle 1: position the main components to minimise environmental impact.
- Design Principle 2: seek opportunities for the management and enhancement of biodiversity.
- Design Principle 3: provide a functional design that makes the best use of the location and provides for efficient generation of electricity.
- Design Principle 4: seek to assimilate the Proposed Development into the local landscape as far as possible.
- Design principle 5: ensure safe and efficient access to the public highway.
- Design Principle 6: ensure the approach to design is inclusive.
- Design Principle 7: seek to minimise any impact of the development on the historic built environment.

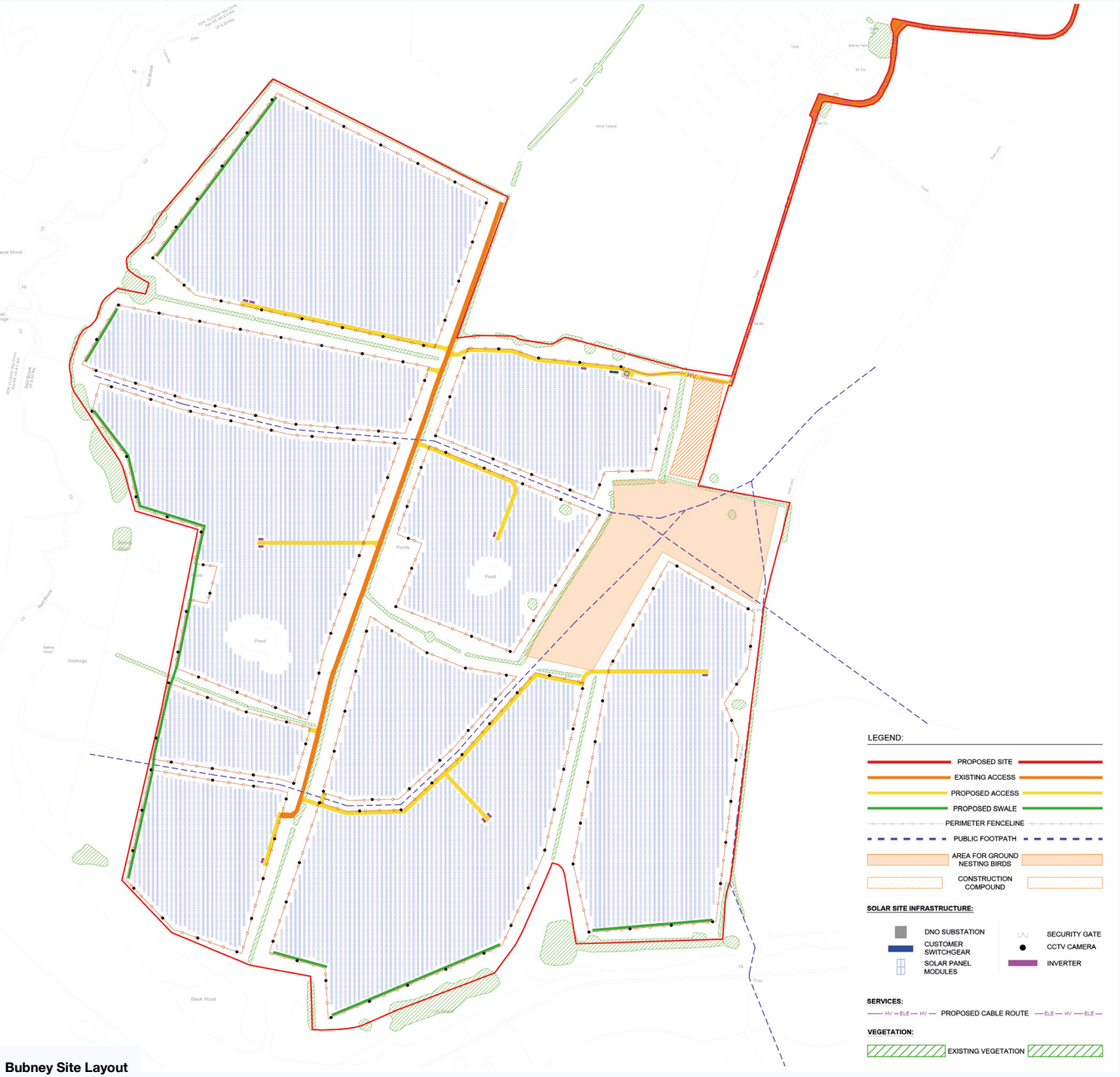
3.2 In addition to the principles outlined above, the design of the proposal has been developed primarily from five sources; the physical opportunities and constraints the site provides; the physical needs of the development itself; the policy context which surrounds the development; and the technical design comments and advice put forward by the Applicant, the Local Planning Authority and wider consultant team.

Development Constraints

- Appropriate design and siting required to take account of established built form and surrounding heritage designations.
- Need to ensure visual amenity is not detrimentally affected from any nearby residential receptor.
- Proximity of site to Bubney Moor Local Wildlife site (LWS).
- Proximity of PRoWs both within and surrounding the site.

Development Opportunities

- Land take requirement – the site is an appropriate size for the development proposal.
- The application site will be served by appropriate vehicular access via an existing farm access road from the A41.
- The site itself is not subject to any environmental designations.
- Biodiversity net-gains – The proposal would present opportunities to introduce biodiversity enhancement measures which will provide significant benefits for a diverse array of native wildlife for a 40 year period such as invertebrates; small mammals; larger mammals; and birds.
- Sunlight intensity levels – the site is well located geographically for solar gain and is relatively flat and is free of any buildings or landscape features that could cause overshadowing.
- The proposal will contribute to the provision of renewables and low carbon energy.



Bubney Site Layout

3.3 Given the site's context, the proposed development has been designed to be sympathetic to its surroundings (in accordance with Design principles 1, 2, 4 and 7), whilst being practical in terms of technical and engineering considerations (in accordance with Design Principles 3 and 5).

3.4 Key elements of the design approach have included the following:

- Preserving existing trees, hedgerows, woodland and ecological features both within and in close proximity of the site (in accordance with Design Principle 2).
- Use of ground mounted tracker solar panels which are programmed to follow the route of the sun and benefit from maximum solar irradiation (in accordance with Design Principle 3).
- Use of an existing established farm access road considered suitable to support both operational construction vehicles (in accordance with (Design Principle 5).
- Providing additional screen planting, including where there are currently gaps or no vegetation, to minimise the visual impacts of the proposed development on surrounding sensitive receptors, including nearby residential dwellings, PRoWs and heritage designations (in accordance with Design Principle 3 and 7).
- Providing significant habitat improvements within the site, including the conversion of arable farmland to higher value grassland, the provision of swathes of wildflower meadow and the provision of new hedgerows and trees (In accordance with Design Principle 2).

3.5 The infrastructure related to the Proposed Development is functional in appearance and has been situated in such a way to avoid any environmentally sensitive areas and mitigation has been included to reduce any other impacts. For example, gaps of at least 8m have been retained from any existing mature field boundaries.

3.6 The approach that has been taken to the design of the Proposed Development is considered appropriate given its context and purpose to generate and export electricity to the local distribution network.

Design Through Consultation

3.7 The Applicant has carried out a comprehensive pre-application consultation exercise in respect of the Proposed Development (in accordance with Design Principle 6). In addition to a formal pre-application enquiry submitted to Shropshire Council in June 2020, the pre-application consultation exercise has included engaging key consultees and local stakeholders (including Parish Councils and Ward Councillors) the circulation of an information leaflet to local businesses and residents within the surrounding area and the creation of an online consultation website and online consultation form.

3.8 Usually, a pre-application consultation exercise would have included a number of face-to-face meetings and a public exhibition at a venue close to the Site. However, due to the circumstances brought about by COVID-19 this was not possible. The project website and online consultation form was utilised to fill the gap left by the inability to carry out a public exhibition, as it allows consultees to review a significant amount of information about the Proposed Development, make comments on specific aspects and complete a feedback form. In addition, a freepost service was setup to provide postal feedback, whilst a dedicated email address and a telephone line was set up and manned by the Applicant.

3.9 The objective of the consultation was to introduce the Proposed Development, including elements of the design approach and proposed management measures. Examples of the consultation materials produced, including leaflets and extracts from the website, are appended to the Statement of Community Involvement (SCI) report that forms part of the planning application submission.

3.10 The points raised by consultees have been considered and the Applicant subsequently made a number of changes and additions to the Proposed Development. The comments raised are discussed further in the supporting SCI.

4.0 | Design Approach

The remainder of this section explains how the Proposed Development addresses the site context and local characteristics in respect of its use; amount; layout; scale; location; materials; duration; landscaping; and, access.

Use and Amount

4.1 The main element of the proposal is the construction, operation, maintenance and decommissioning of a ground mounted solar farm and associated infrastructure. The site currently comprises agricultural land (arable) within a predominately rural setting located within Bubney Farm, Grindley Brook, Whitchurch, SY13 4QJ.

4.2 Given the Site's largely agricultural context, the Proposed Development has been designed to be sympathetic to its surroundings (including a comprehensive landscaping and biodiversity scheme), whilst being practical in terms of technical and engineering considerations. It is therefore considered that, on balance, the proposed use is compatible with the surrounding area.

4.3 The Proposed Development includes the construction and operation of the following equipment:

- Arrays of solar PV panels.
- 10no. containerised inverters.
- DNO substation and customer switchgear.
- Internal access tracks of permeable construction.
- Perimeter Fence and Access Gates.
- CCTV cameras positioned along the perimeter of the arrays on 3m high poles.

4.4 This is considered the minimal level of development necessary to ensure that the site performs effectively with regard to its main purpose of generating electricity.

Layout, Scale and Materials

4.5 The design principles for the layout of the solar farm are:

- The solar panels would be laid out in straight arrays running in a north-south direction. The panels will pivot from a central point tilting from east to west to follow the path of the sun.
- There will be a gap of approximately 3.2m between each row of arrays.
- The maximum top height of the solar panels would be 2.4m.
- The solar panel modules are made from photovoltaics which are dark blue, grey or black in colour.
- The solar panel module frame would be constructed of anodized aluminium alloy.
- The minimum standard height of the lowest part of the solar modules fixed onto the framework will be 0.5m.
- Inverters cabins will be situated across the site towards the centre of each agricultural field to reduce visual impact.
- Customer Switchgear and DNO Substation.
- Temporary construction and main site access tracks of permeable construction.
- Internal access tracks of permeable construction.
- Typical minimum distance between edge of panels and perimeter fencing would be 3m.
- Enhancement of existing hedgerow and tree field boundaries to promote biodiversity across the site

Bubney Cable Route

4.6 The solar photovoltaic modules would convert solar irradiance into direct current (DC) electricity. A solar PV module consists of a layer of silicon cells, an anodised aluminium frame, a glass casing, and various wiring to allow current to flow from the silicon cells. Silicon is a non-metal with conductive properties that allow it to absorb and convert sunlight into electricity. When light interacts with a silicon cell, it causes electrons to be set into motion, which initiates a flow of electric current. The photovoltaic modules would be mounted on aluminium metal racks. The racks will be laid out in multiple parallel rows running east to west across the various field enclosures. The distance between the arrays would respond to topography but would typically be approximately 3.2 metres. Land between and beneath the panels would be used for biodiversity enhancements.

4.7 The top north edges of the panels would be up to 2.4 metres above ground level and the lower edges of the panels would be approximately 0.5 metres above ground level.

4.8 The insulated DC cables from the solar modules will be routed in channels fixed on the underside of the framework. The DC string cables will run along the entire underside of each row. The electrical cabling from each array will be concealed through shallow trenches linking the modules to the transformers and then to the main substation. The cable trench may also carry earthing and communications cables and will be backfilled with fine sands and excavated materials to the original ground level.

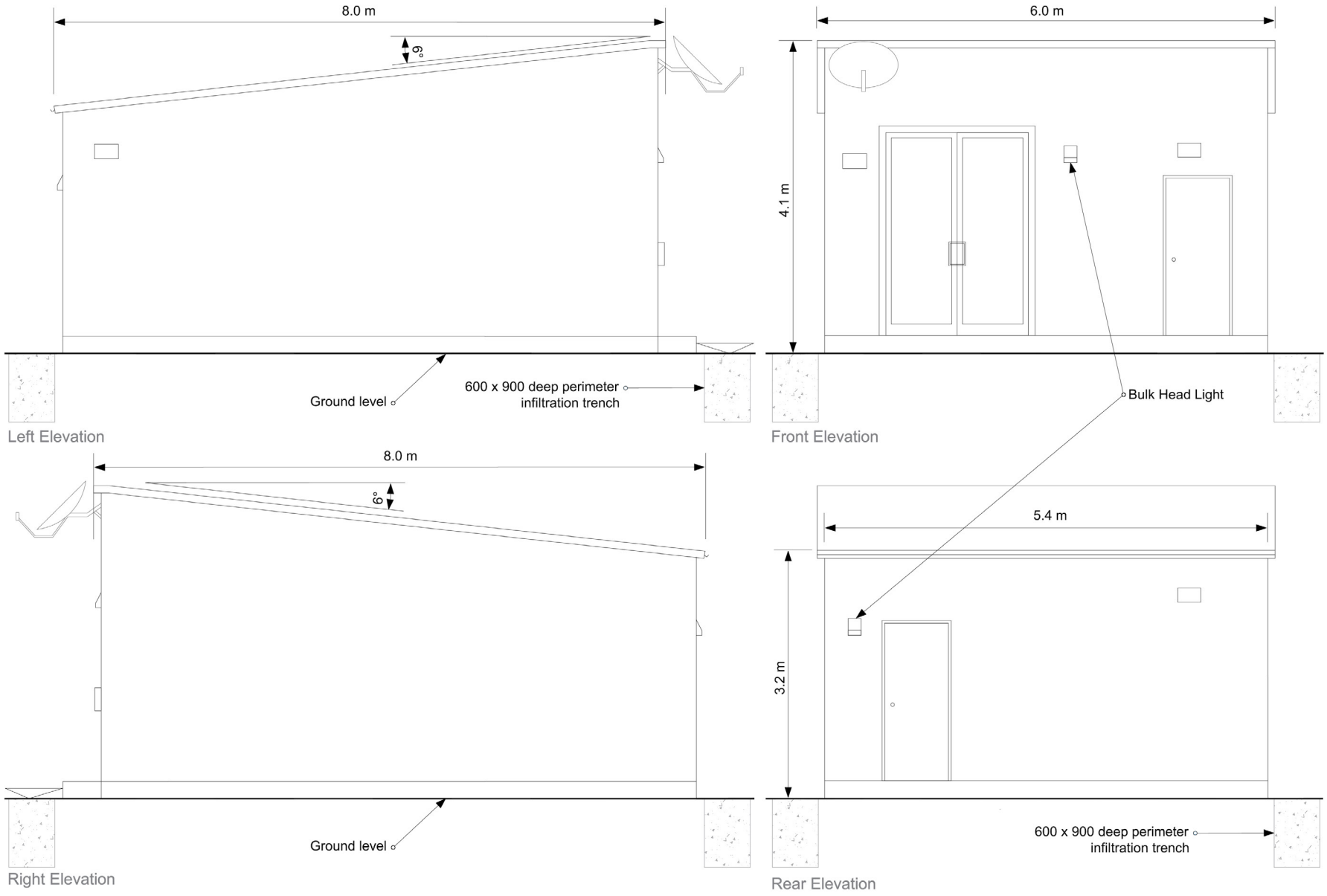
4.9 All of the buildings at the Site would be single storey, ensuring that it would not be significantly visible from most viewpoints outside of the Site. Even when viewed from nearby vantage points, the scale of development would not be overbearing due to its low profile. This would be further improved when proposed screen planting matures, which, in addition to the significant existing screening around the Site, would effectively assimilate the Site into the local landscape over time.

4.10 The inverters are required to convert the DC energy produced by the arrays into AC energy, these will be located towards the centre of each of the agricultural field parcels across the main site compound. The arrays would be set within stock-proof fencing up to 2m in height with wooden supporting posts placed at intervals of c. 3.5m.

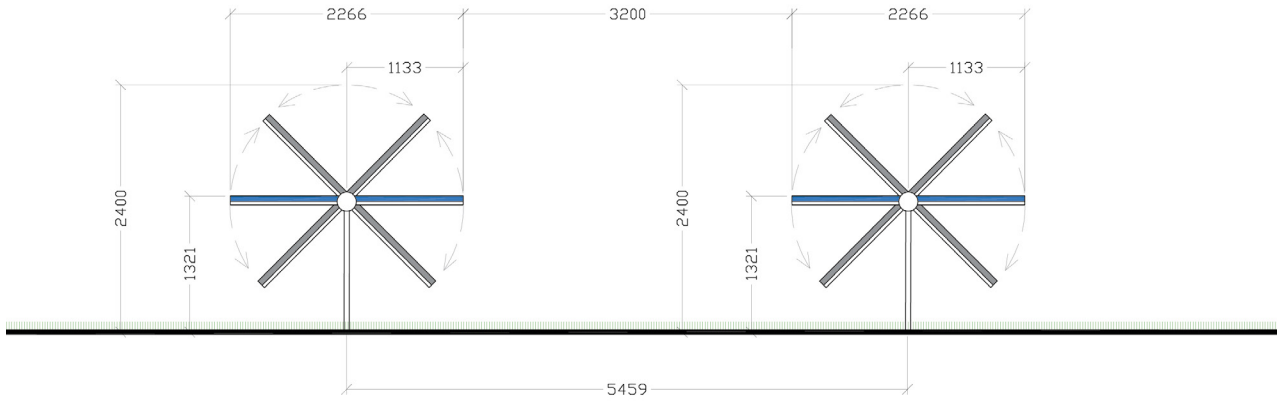
4.11 The deer fencing would typically follow the outer field boundaries containing the solar panels. The minimum distance between the edge of the arrays and the fence would be 3m. In addition to fencing, it is proposed pole mounted CCTV security cameras would be positioned at intervals along the inside face edge of the fencing (between the fence and the arrays). Badger friendly/small mammal access points will be prescribed at various locations along any fencing to allow the passage of badgers and mammals across the site.

4.12 The existing Public Rights of Way that cross the site will be retained and enhanced as part of the development proposals will be maintained with areas of wildflower meadow and new hedgerow planted either side. The proposed arrays will be offset approximately 3m further in from the fence lines either side of the retained footpath to minimise visual impacts from along the PRoW.

4.13 The highest structures associated with the Proposed Development would be the substation and switchgear buildings, at approximately 4m high. It is proposed that the majority of the other structures would be no more than 3-4m high; broadly the height of a mature hedgerow. The solar panels themselves would be no more than 2.4m high. It is therefore considered that the scale of the Proposed Development is appropriate to the location.



DNO Substation Elevation and Dimension Layout



Panel Cross Section

Appearance

4.14 The most visible components of the Proposed Development would be the solar panels. These would be mounted on a metal frame and constructed from non-reflective glass.

4.15 It is notable that the solar panels are designed to absorb sunlight, therefore there would be no significant issues associated with glint and glare. It is also notable that the metal frame is treated to avoid any significant issues associated with glint and glare. The metal frame is necessary because it is durable and is sufficiently strong to hold the panels in position; a functional design requirement.

4.16 It is envisaged that the containers/cabins and other small buildings would be appropriately coloured or clad to minimise any visual impact and comply as far as practicable with the local vernacular. The structures would however be functional in appearance, reflecting their purposes, which is for the generation of electricity.

Landscaping & Biodiversity

4.17 The proposed solar farm is an example of a development which presents considerable opportunity for landscape and biodiversity mitigation and enhancement. The objectives for biodiversity are:

- Retain and protect existing habitats of local value within and adjacent to the site during construction and operation, specifically hedgerows, woodland, trees and watercourses.
- Identify protected or notable species that may be present and potentially affected by the proposed development, and incorporate suitable avoidance, protection and mitigation measures to ensure their continued favourable conservation status.
- Provide habitat and landscape enhancements though new planting and creation of connected habitat linked to the wider area, using native species appropriate to the locality.
- Provide opportunities for wider species diversity through planting and seeding, including hedgerow creation and infilling and creation of a diverse wildflower/grass meadows.

4.18 Habitat creation and ongoing management practices are proposed that will enhance the Site's biodiversity (See supporting Ecological Assessment for further details). The design and long-term management of the land seeks to maintain and improve functionality through protecting and enhancing potentially valuable wildlife corridors through strengthening the hedgerow network within and around the site. Habitat enhancement measures include new native species hedgerow planting and gapping up of existing hedgerows, creation of new hedgerows, extensive grassland areas to replace arable land, species diverse wildflower meadows, and swale creation. It is proposed to enhance existing hedgerows with supplementary planting of native species where required.

4.19 New lines of native hedgerows are also proposed along the north east, south and western boundaries of the main site as well as along the routes of the existing Public Rights of Way which cross the site. Again, species will be native and consistent with existing hedgerows within and around the site. In addition, the strengthened hedgerow network will benefit habitat linkages in the local landscape.

4.20 These, combined with wildflower meadow and grassland plating, an associated reduction in intensive agricultural management practices such as chemical spray applications and ploughing, will create significant ecological gain.

Operational Lifespan

4.21 An operational lifespan of 40 years is sought.

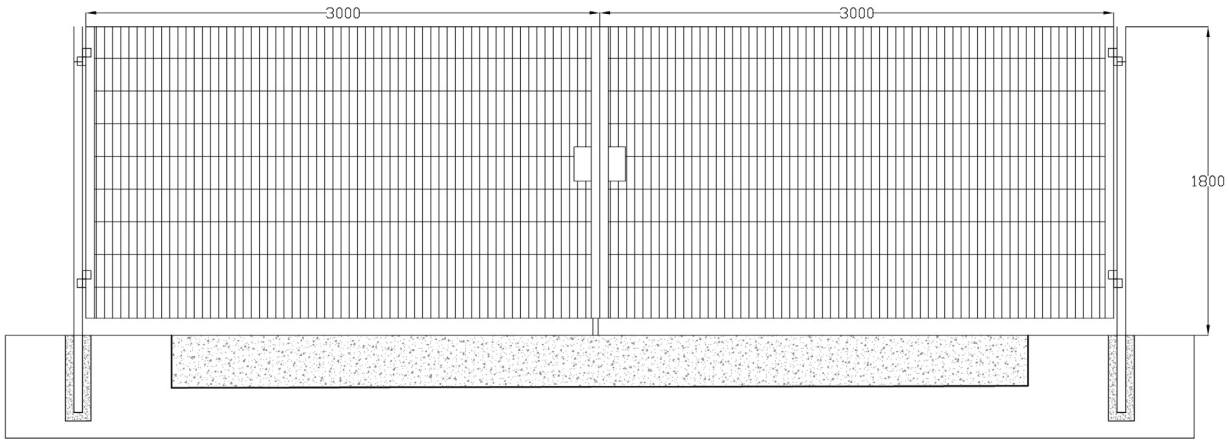
4.22 During the operational phase, the activities on site would amount to servicing of plant and equipment and vegetation management.

Access

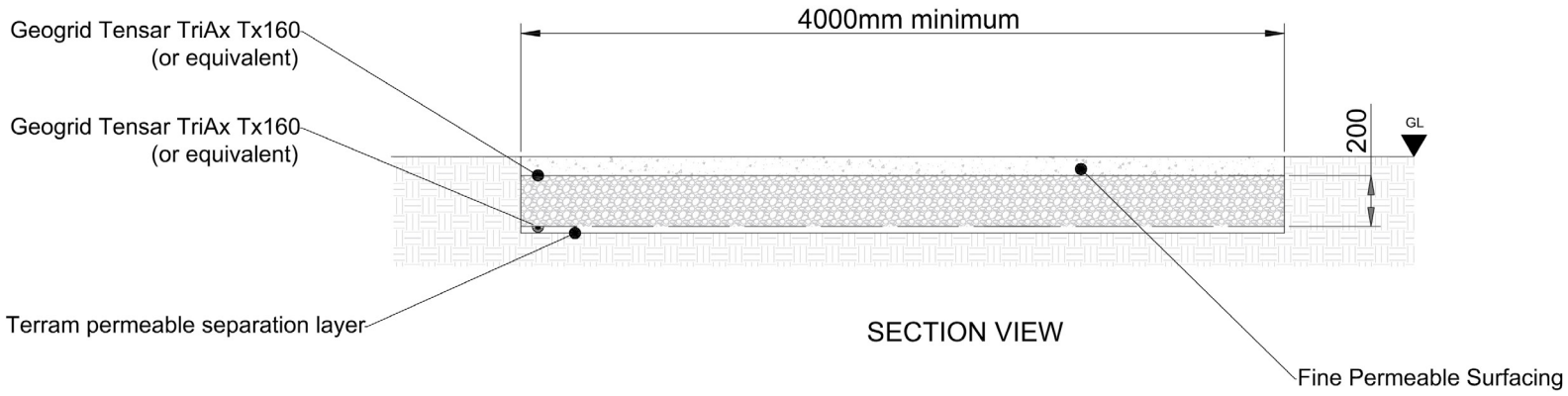
4.23 The proposed access to both the main site is via the existing Bubney Farm access road to the north of the site which will accessed directly via the existing priority junction on the A41 to the north east. The existing access road and junction already serve a variety of agricultural vehicles and commercial HGVs such that the existing access is considered appropriate for supporting both the operational and temporary construction traffic associated with the development. From the existing farm access road, access to the main solar compound will be achieved via an existing farm track which extends southwards from the farmstead towards the main site from where a new 3.5-4m wide crushed stone internal access track will extend across the site to provide vehicular access to the separate field/PV enclosures across the site. 6m wide access gates will be installed at the access point to each separate parcel of arrays within the field enclosures for maintenance access. The access, when operational, will only be utilised by operatives in a van.

4.24 It is proposed that during the construction phase, one main temporary construction compound will serve the proposed development and this will be located off the main site entrance), thus reducing the distance delivery vehicles will need to travel after reaching the site's entrance. This temporary construction compound would also be required for decommissioning. Any vehicles associated with construction or decommission will either be contained within the temporary construction compound or within the main site, thus no unnecessary parking will occur on the local highway network.

4.25 Temporary signage will also be erected in the vicinity of the site and farm access junction on the A41 during the construction phase to indicate that heavy construction vehicles are turning.



Access Gate Elevation



Access Track Cross Section

5.0 | Crime Impact Assessment

The Crime Impact Assessment process involves identifying, evaluating and mitigating the crime and disorder effects of a development proposal early in the design process. The goal is to reduce the developments vulnerability to crime by taking into account the analysis of the development context and the crime issues in the area.

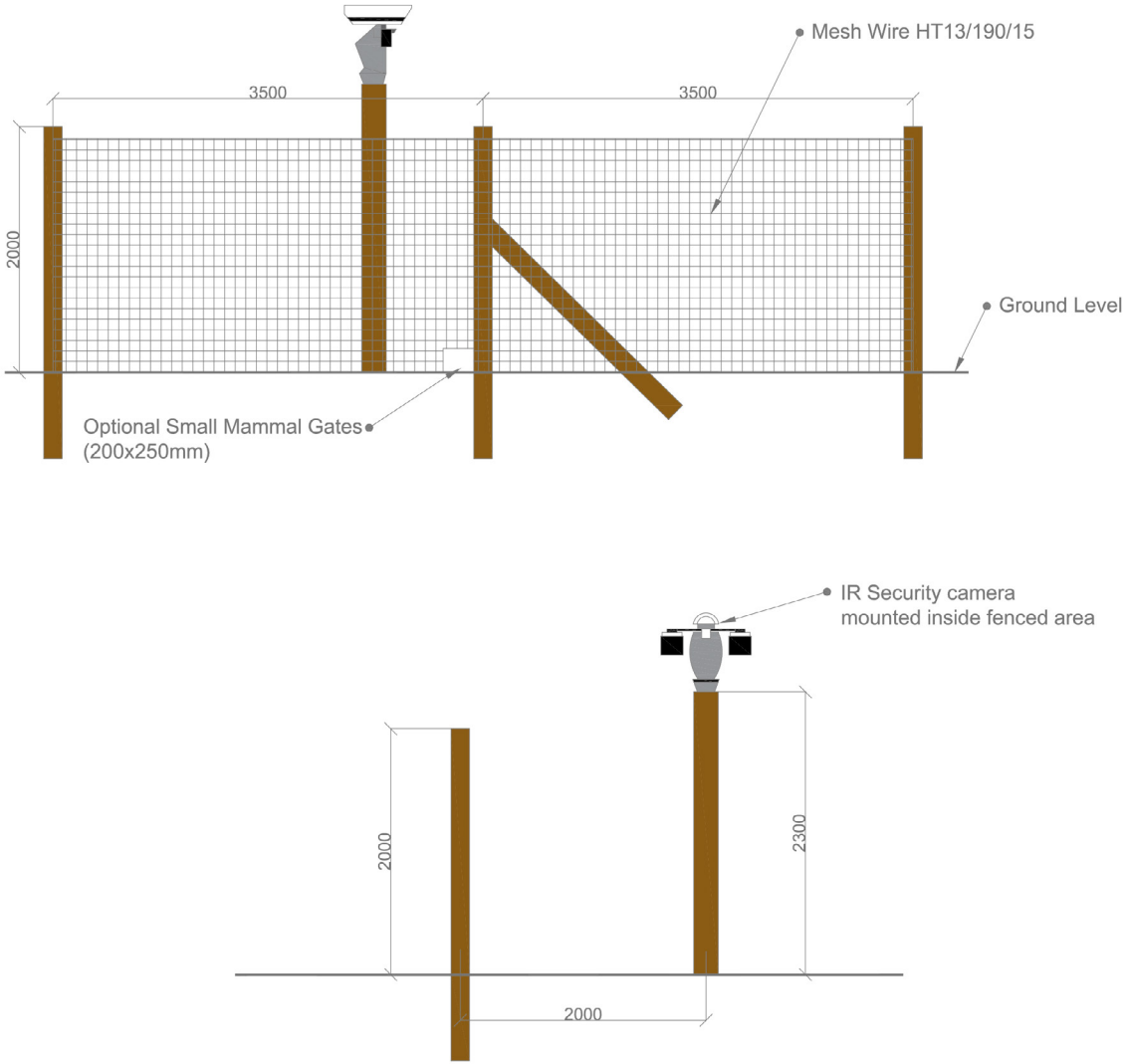
General Risk Assessment

5.1 The typical security issues for a development of this nature are:

- Acts of criminal damage during the construction period.
- Theft of components during the construction phase.
- Criminal damage during operational phase.
- Theft of components during the operational phase.
- Theft of components during site restoration.

Construction Site Risk Assessment

5.2 A secure temporary compound will be used to store materials and ancillary welfare facilities during the construction period. During construction, the site will have an on-site security presence overnight.



Security Fence and CCTV Standard Details

Design, Layout and Security Requirements

5.3 Taking into account the low level of recorded crime for the locality, the following security measures are considered to be appropriate to combat potential criminal activity and unauthorised access into the arrays:

- A 2.0 m high fence will encompass the entire gated solar farm development site.
- Pole mounted CCTV cameras will be positioned at intervals along the fence.
- A secure heras fencing will be installed around the perimeter of the temporary construction compound which will remain locked outside of construction hours.

6.0 | Construction Phase

Temporary Construction Compound

As set out above and detailed within the submitted Construction Traffic Management Plan (CTMP), during the construction phase one main construction compound will serve the proposed development which will be located at the north east of the site, close to the main entrance into the solar compound.

6.1 The construction phase is expected to take around 6 months. Construction activities will be carried out Monday to Friday between 0800-1700 and between 0800 and 1330 on Saturdays.

6.2 It is expected that there will be approximately 494 deliveries (or 988 two-way movements) to the site during the construction phase, at an average of around 3 deliveries, or 6 two-way movements per day.

6.3 The temporary compound will likely 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.
- Temporary gated compound.
- Wheel washing facilities.

6.4 If ground conditions dictate, a wheel wash facility will be provided ahead of the construction compound, allowing vehicles to be hosed down so that no mud or debris will be taken onto the local highway network.

6.5 All construction vehicles will have to exit through the wheel wash area and as such will reduce the spread of mud and dirt onto the local highway network.

7.0 | Operation and Decommissioning

Operation

7.1 During the operational phase, the activities on site would amount to servicing of plant and equipment and vegetation management. The solar farm would generate clean renewable energy for the equivalent of up to 9,090 homes a year. The anticipated CO_2 displacement would be up to 12,900 tonnes per annum[1].

Decommission

7.2 The solar farm would export renewable energy to the grid up to a maximum of 40 years. After the 40-generation period the development would be decommissioned.

7.3 When the proposed solar farm is decommissioned, the solar panels and other infrastructure will be removed and the site restored to agricultural land. Due to the limited quantity of foundations, hard surfacing and heavy infrastructure, combined with the fact that the majority of the site will be retained as grassland, the land will be easier to restore than more intrusive development with more significant foundations.

7.4 The restoration process is intended to ensure that the site is restored to the same quality as existing and it is anticipated that this can be secured by the Council through the use of a suitably worded planning condition.

1. For every 5MW installed, a solar farm will power 1,515 homes for a year and save 2,150 tonnes of CO_2 (source: http://www.solar-trade.org.uk/solarFarms.cfm)

8.0 | Conclusion

The design and access issues of the proposed renewable energy scheme have been proportionately addressed. It is considered that due to the benign appearance of the scheme together with its rural location and proposed landscape enhancements, that the development proposal will not have an unacceptable adverse impact on the visual or amenity value or character of the local or the wider countryside by way of its siting, scale, form, massing or appearance.

8.1 The renewable energy scheme is compliant with the relevant provisions of Policies MD8 (Infrastructure Provision), MD2 (Sustainable Design) and CS6 (Sustainable Design and Development Principles) and would not have an adverse effect on landscape character or residential amenity. The site has been carefully selected and is afforded with natural screening, which coupled with its low profile of the solar panels, results in only limited views of the site.

8.2 Overall, the development proposal meets the requirements of the NPPF's presumption in favour of sustainable development and is compliant with all relevant policies of the adopted Development Plan. On that basis it is considered that planning permission should be granted, subject to the imposition of any necessary planning conditions.

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DESIGN ENVIRONMENT PLANNING ECONOMICS HERITAGE