Hern Head House

Solar Array

DESIGN AND ACCESS STATEMENT

1. Introduction:

1.1. This Planning Statement accompanies and supports the full planning application submitted by Bramhall Blenkharn on behalf of Mr and Mrs Barrett for the installation of a ground mounted solar photovoltaic (PV) array and ancillary infrastructure on land situated at Hern Head House, Troutsdale, North Yorkshire YO13 9PS.

1.2. The proposal to install a solar PV array at Hern Head House is driven by the families ongoing commitment to the environmental and continue its investment in a low carbon future.

1.3. The purpose of this Planning statement is to provide an assessment of the proposal against relevant national and local planning policy and guidance. The statement will demonstrate that the applicant has considered the constraints of the site and that the proposal is in accordance with current national and local planning policy.

1.4. This planning application is comprised of a series of drawings and reference documents. These include:

• Site Plan: 1273_AR20_01

• Location Plan: 1273_EX10_01

• Array Elevations 4 Panels Landscape:

• Solar Panel Specification: JAM60S09 PR 310-330

• Mounting Frame Product Information: Corbin Brochure 2015

2. Proposal:

2.1. The proposal is for the installation of a 40kWp ground mounted solar PV array to produce a supply of renewable electricity for domestic lighting & power.

2.2. An assessment of the existing buildings at Hern Head House for roof mounted solar highlighted excess shading, inappropriate orientation and inadequate structural stability for solar PV. This assessment led to the proposal being for a ground mounted array. Ground mounted solar has additional benefits over roof mounted by way of ease of access for maintenance and optimal pitch and orientation for electrical yield.

2.3. The proposed site is along north boundary of the field on grade 3 agricultural land that is presently laid fallow. Mechanical and chemical control of weed growth is currently being used to keep the site in a manageable condition. This programme of management will continue once the solar array has been installed in order to prevent growth of pernicious weeds around the framework and shading of the panels by unwanted vegetation.

2.4. The installation of solar PV provides a low-cost source of renewable and sustainable energy to owners of the land. Over the 25+ year life of a solar PV array electricity will be produced at approximately a quarter of the cost of grid supplied electricity. In addition to the cost saving, a solar PV array reduces a site's overall demand for electricity from the National Grid. This provides meaningful carbon savings that at Hern Head House are estimated to be in the region of 36 tonnes of CO2 per year. The opportunity to provide low cost green energy generation to existing business owners and to provide a surplus for export to the grid is an underlying goal of the Government's commitment to a low carbon economy. It is expected that approximately 90% of the electricity generated by this proposal will be used on site.

2.5. The 'red line' site area for this application is the area of land occupied by the PV panels together with the underground cable route from the array to the grid connection point in the farmstead. This is indicated on the Site Plan referenced 1273_AR20_01 and has been calculated as being 855 sq. m or 0.0855ha.

3. Amount:

3.1. The proposal is for the installation of 440 solar PV panels. Each panel has a nominal output of 310Wp providing a total installed capacity of 40.92kWp. An array of this size and in this location has been calculated to yield 31.14kWh of electricity in its first year of operation.

3.2. It is anticipated that the solar panels will be supplied by Canadian Solar and Hi-Tech Resources, previously Corbin Industries, will supply the galvanized steel and alloy ground mounting system. (See product datasheets provided with the application)

4. Layout: Site Plan referenced 1273_AR20_01

4.1. The layout of the proposal has been carefully considered to achieve optimal electricity generation, minimise land take and disruption to farming operations and keep the grid connection cable as short as possible. The proposed location offers the best opportunity to use land that has a marginal value for agricultural purposes. The location is not hampered by shading and provides an easily managed site that is contiguous with the house to which the array will supply electricity.

4.2. The underground cable route from the array to the grid connection point in the house is located alongside an existing field line boundary and so minimises disruption to open ground.

4.3. Solar PV panels produce electricity in direct current and this needs to be inverted into alternating current to be useable in the house's existing electricity distribution network. The solar inverters have an IP66 rating and as such are designed to be mounted in the open air under the panels. No additional building or cabinet is therefore required to house them.

5. Scale:

5.1. The scale of this proposal has been governed by both the site's requirement for electricity and the local electricity grid's ability to receive exported surplus generation.

5.2. At Hern Head House the house has an annual requirement for approximately 62400kWh of electricity. However, due to both the site's seasonal use of electricity and nature of solar generation, an array larger than the one proposed here would deliver a surplus of electricity during the summer months that the local electricity grid network would not be able to take back. The 31.14Wp proposal is an optimum size to satisfy as much of the site's needs as possible whilst avoiding disproportionate export to the grid and its associated upgrade costs.

6. Landscaping:

6.1. The proposed site has distant public accessible views from any highway. The location is contiguous with the farmstead to which it will supply electricity and is bordered to the east and west by existing hawthorn hedging and a soft wood shelter belt to the north. No additional landscaping is therefore proposed, and no existing landscape vegetation will be affected by the proposal.

7. Appearance & Visual Impact:

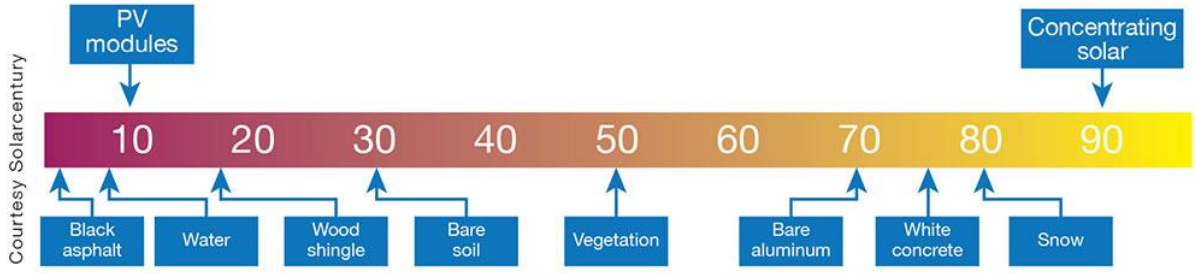
7.1 The PV panels will be arranged in 3 banks of rows of 44 panels, mounted in landscape format. The array will appear similar to Image1 below.

Image 1 – Example of 4 solar panels mounted in landscape format

7.2 The mounting framework is a combination of galvanized steel piles and alloy cross rails. Typical projection of the array above the ground is 2.6m at its tallest point. This may vary slightly due to local ground conditions and the gradient of the landscape. A small quantity of dry mixed concrete will be used to secure each pile. Please refer to elevation drawing referenced Array Elevations 4 Panels Landscape.

7.3 The effect of glare from PV panels is a common misconception; PV panels, by virtue of their task of capturing sunlight, are of comparatively low reflectivity. Figure 1 below illustrates reflectivity from various surfaces with the inference that solar PV modules are very much towards the lower end of the reflectivity scale. In addition, as there are no publicly accessible views of the proposal, it follows that there will be no issues around visual impact.

Figure 1 The labels across the bottom of this figure identify typical albedo values for common materials, according to data published by the FAA. The upper labels identify typical albedo values for PV versus concentrating solar.



The FAA is the American Airport Authority and due to lack of policy from the UK's Civil Aviation Authority reference is made here from the FAA.

8. Access:

8.1. Well maintained private access roads to Hern Head House are in existence from public highway located to the south of the site. It is more than adequate for the purpose of delivery of goods and will be unaffected by this proposal. There will be two HGV deliveries to the site for the panels and mounting frames and up to 4 light contractor vehicle movements per day for the estimated 3-week duration of the installation.

9. National & Local Planning & Energy Policy:

9.1. The UK's Renewable Energy Strategy (RES) and Low Carbon Transition Plan sets out the UK's vision for the change to a low carbon economy and society, aiming to reduce overall carbon emissions in the UK by 80% by 2050 from the 1990 base level.

9.2. The UK's National Planning Policy Framework (NPPF), revised edition February 2019, provides policy pertinent to this application. The NPPF states that 'Renewable energy developments should be capable of being accommodated throughout England in locations where the technology is viable and environmental, economic and social impacts can be addressed satisfactorily.' It continues, 'Regional spatial strategies and local development documents should contain policies designed to promote and encourage, rather than restrict the development of renewable energy resources.'

9.3. NPPF (Feb 2019) Section 2 Achieving Sustainable Development, Paragraph 8, Section C: An Environmental Objective, is relevant as a key aspect of the planning§ system for mitigating and adapting to climate change and promoting the growth of a low carbon economy. Paragraphs 93 and 95 of the NPPF discuss the need to support a low carbon future. Energy efficiency improvements to existing buildings should be supported and measures to reduce greenhouse gases must be taken.

Paragraphs 148 to 151 of the NPPF discuss the need to support a low carbon future in a changing climate and support renewable and low carbon energy and associated infrastructure. Particular reference to this application is drawn from 'the increased use and supply of renewable and low carbon energy, providing a positive strategy for energy from these sources and identifying opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems.

9.4. The proposed solar PV array at Hern Head House will provide the opportunity for the family to use clean, renewable electricity with significant wider environmental and economic benefits. Thus, this proposal adheres to objectives and policies contained within the NPPF.

9.5. NYMNPA Local Plan Strategy (LPS) contains two policies relevant to this application. The first of these policies is SP18 Renewable and Low Carbon Economy. In précis this policy states that, 'Developments that generate renewable and/or low carbon sources of energy will be supported providing that individually and cumulatively proposals can be satisfactorily assimilated into the landscape and they will not impact adversely on the local community, economy, nature conservation, air quality or soil and water resources. Policy SP19 of the LPS, Presumption in Favour of Sustainable Development, states that the Council will take a positive approach to development proposals that reflect the presumption in favour of sustainable development contained in the NPPF.

9.6 NYMNPA Policy ENV8 – Renewable Energy refers:

10. Conclusion:

10.1. The applicant believes this proposal is supported by both the NPPF and NYMNPA Local Plan Strategy. This proposal will not give rise to any meaningful or adverse environmental or visual impacts and will positively contribute to meeting national and regional targets for reducing greenhouse gas emissions and the development of the UK's low carbon economy.

10.2. Solar PV arrays are economic to install and simple to maintain. They are silent in their operation, emit no exhaust gas and generate green electricity for over 25 years at a 75% cost reduction to open market prices.

10.3. The applicant is passionate about the future development of the environmental and cost saving measures throughout its household. In addition, the applicant wishes to continue their investment in low carbon operations in a way that is unobtrusive, sensitive to the wider environment and supported by both national and local planning policy.

10.4. This proposal will significantly assist the applicant in reducing their dependence on grid supplied electricity and deliver a meaningful economic benefit.

.

10.5. The applicant trusts that North York Moors National Park Authority will take into consideration the environmental and economic benefits of this proposal and will move to grant a planning consent. Should the Council have any questions in connection with this proposal they should direct them to the applicant's agent, Mark Bramhall

NEW

NYMNPA

02/11/2020

CanadianSolar

KuPower

HIGH EFFICIENCY POLY MODULE

CS3K-295|300|305|310P

(1000 V / 1500 V)

MBB 5BB

***Black frame product can be provided upon request.**

MORE POWER

Low power loss in cell connection

Low NMOT: 42 ± 3 °C
Low temperature coefficient (Pmax): -0.37 % / °C

Better shading tolerance

High PTC rating of up to: 93.10 %

MORE RELIABLE

Lower hot spot temperature

Minimizes micro-cracks

Heavy snow load up to 6000 Pa,
wind load up to 4000 Pa*

25 years **linear power output warranty***

10 years **product warranty on materials and workmanship***

*According to the applicable Canadian Solar Limited Warranty Statement.

MANAGEMENT SYSTEM CERTIFICATES

ISO 9001:2015 / Quality management system
ISO 14001:2015 / Standards for environmental management system
OHSAS 18001:2007 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

IEC 61215 / IEC 61730: VDE / CE / CQC / MCS / INMETRO
UL 1703 / IEC 61215 performance: CEC listed (US) / FSEC (US Florida)
UL 1703: CSA / IEC 61701 ED2: VDE / IEC 62716: VDE / IEC 60068-2-68: SGS
Take-e-way

* As there are different certification requirements in different markets, please contact your local Canadian Solar sales representative for the specific certificates applicable to the products in the region in which the products are to be used.

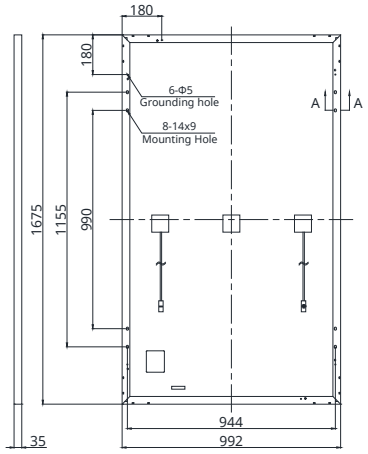
CANADIAN SOLAR INC. is committed to providing high quality solar products, solar system solutions and services to customers around the world. No. 1 module supplier for quality and performance/price ratio in IHS Module Customer Insight Survey. As a leading PV project developer and manufacturer of solar modules with over 33 GW deployed around the world since 2001.

* For detailed information, please refer to the Installation Manual.

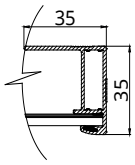
CANADIAN SOLAR INC.
545 Speedvale Avenue West, Guelph, Ontario N1K 1E6, Canada,

ENGINEERING DRAWING (mm)

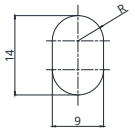
Rear View



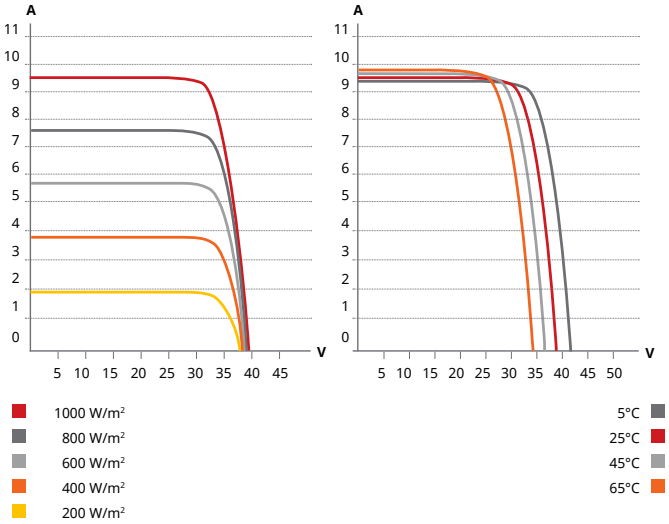
Frame Cross Section A-A



Mounting Hole



CS3K-300P / I-V CURVES



ELECTRICAL DATA | STC*

CS3K	295P	300P	305P	310P
Nominal Max. Power (Pmax)	295 W	300 W	305 W	310 W
Opt. Operating Voltage (Vmp)	32.5 V	32.7 V	32.9 V	33.1 V
Opt. Operating Current (Imp)	9.08 A	9.18 A	9.28 A	9.37 A
Open Circuit Voltage (Voc)	39.1 V	39.3 V	39.5 V	39.7 V
Short Circuit Current (Isc)	9.57 A	9.65 A	9.73 A	9.81 A
Module Efficiency	17.75%	18.05%	18.36%	18.66%
Operating Temperature	-40°C ~ +85°C			
Max. System Voltage	1500V (IEC/UL) or 1000V (IEC/UL)			
Module Fire Performance	TYPE 1 (UL 1703) or Class C (IEC 61730)			
Max. Series Fuse Rating	30 A			
Application Classification	Class A			
Power Tolerance	0 ~ + 5 W			

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

MECHANICAL DATA

Specification	Data
Cell Type	Poly-crystalline
Cell Arrangement	120 [2 X (10 X 6)]
Dimensions	1675 X 992 X 35 mm (65.9 X 39.1 X 1.38 in)
Weight	18.5 kg (40.8 lbs)
Front Cover	3.2 mm tempered glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4.0 mm² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	Portrait: 400 mm (15.7 in) (+) / 280 mm (11.0 in) (-); landscape: 1160 mm (45.7 in)*
Connector	T4 series or H4 UTX or MC4-EVO2
Per Pallet	30 pieces
Per Container (40' HQ)	840 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

ELECTRICAL DATA | NMOT*

CS3K	295P	300P	305P	310P
Nominal Max. Power (Pmax)	219 W	223 W	227 W	230 W
Opt. Operating Voltage (Vmp)	30.2 V	30.4 V	30.6 V	30.8 V
Opt. Operating Current (Imp)	7.26 A	7.34 A	7.42 A	7.49 A
Open Circuit Voltage (Voc)	36.7 V	36.8 V	37.0 V	37.2 V
Short Circuit Current (Isc)	7.72 A	7.78 A	7.85 A	7.91 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.37 % / °C
Temperature Coefficient (Voc)	-0.29 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	42 ± 3°C

PARTNER SECTION

* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. Canadian Solar Inc. reserves the right to make necessary adjustments to the information described herein at any time without further notice. Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

CANADIAN SOLAR INC.
545 Speedvale Avenue West, Guelph, Ontario N1K 1E6, Canada,