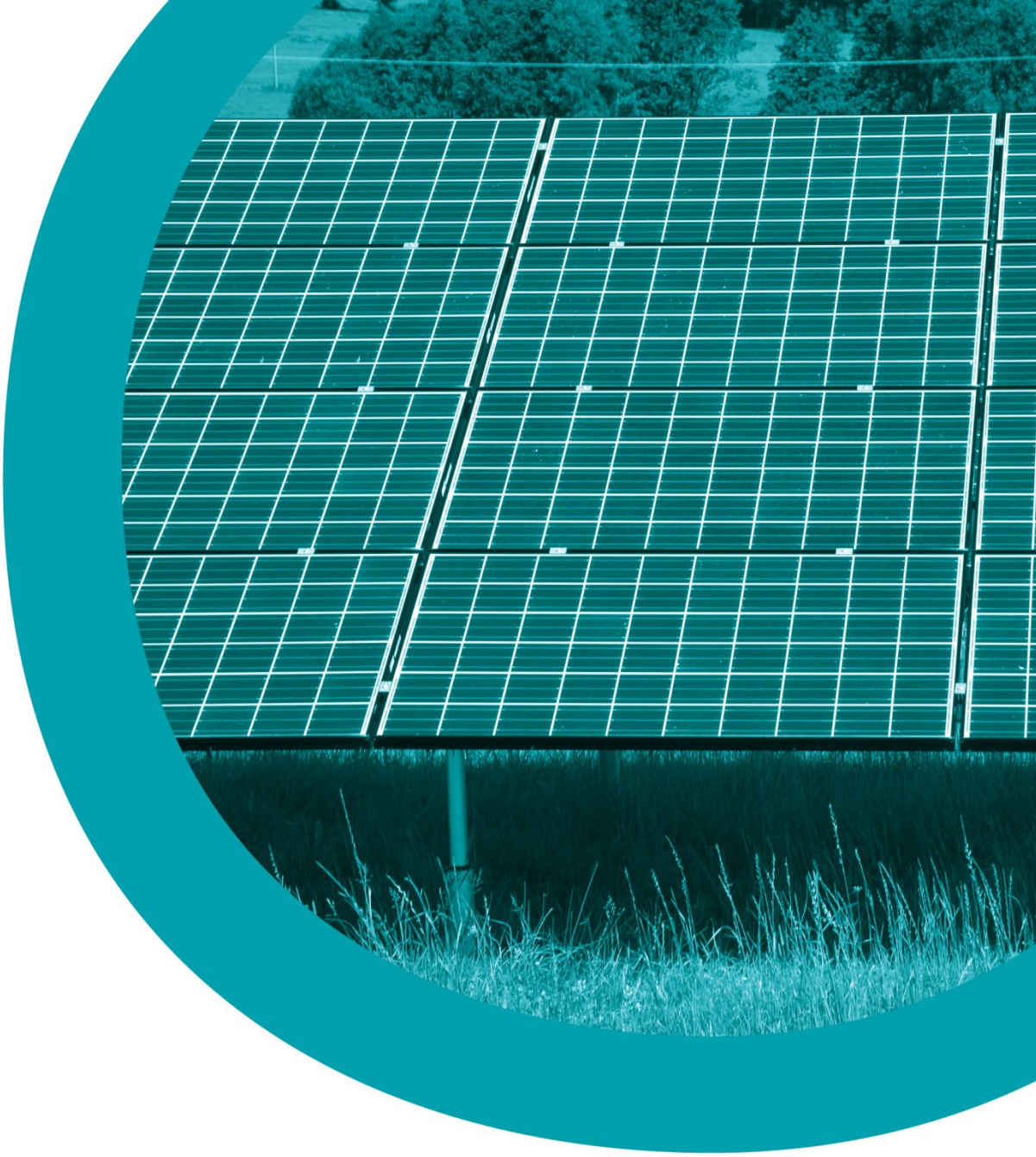


Hafod Road Solar Scheme

Design and Access Statement

Applicant: National Trust

Date: August 2025

dulas
inspiring renewable energy

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1.1 Introduction

1.1.1 This Design and Access Statement (DAS) accompanies a planning application submitted on behalf of National Trust for the construction and operation of the proposed solar scheme at Hafod Road, east of Johnstown, Wrexham, see Figure 1 - Site Location.

1.1.2 This DAS is based on the guidance presented in Welsh Government Technical Advice Note 12: Design (2016) and the CABE guide Design and access statements (2007).

1.1.3 This DAS is submitted to Wrexham County Borough Council (WCBC) to describe and explain the design and access concepts and principles applied to the proposed development as advised in the guidance.

1.1.4 Accordingly, the DAS presents information on the design approach applied to this Development, in order to demonstrate that the Applicant and consultants have considered the local environment, amenity and access in the formulation of this development proposal.

1.2 Context to the Development

1.2.1 National Trust ('the Applicant') are committed to achieving net zero organisational emissions by 2030. They aim to achieve this through combining an ambitious plan for carbon sequestration with a programme to install renewable energy technologies at their sites. The Hafod Road Solar Scheme would supply green electricity, contributing to National Trust net zero targets, with the electricity generated being used to off-set the requirements of the wider Erddig Estate (of which this site is part of).

1.2.2 Clear, scientific evidence has established that global warming is driving climate change across the planet. The Inter-governmental Panel on Climate Change (IPCC) established in its Fifth Report on Climate Change that it is "unequivocal" that the earth's climate is warming due to human activity. The IPCC estimates that there is greater than a 90% likelihood that increased concentrations of man-made, heat-trapping gases caused most of the observed increase in global average temperatures since 1950. A primary cause of global warming is the burning of fossil fuels, whereby the resulting carbon dioxide emissions lead to increases in global temperatures.

1.2.3 The British government have committed to reaching net zero by 2050. In September 2023, Prime Minister Rishi Sunak reiterated the government's plan to curtail carbon emissions by 77% by 2035[1]. The proposed scheme has emerged as part of the National Trust's sustainable development aspirations.

1.2.4 Renewable energy is identified in UK and devolved Welsh policy as an important element in tackling the effects of climate change through the displacement of power typically derived from fossil fuels. Planning Policy Wales Edition 12 (2024) states that "*Local authorities should facilitate all forms of renewable and low carbon energy development … planning authorities should seek to ensure their area's full potential for renewable and low carbon energy generation is maximised and renewable energy targets are achieved.*" We understand that this is the purpose of deposit draft LDP policy RE2: Renewable Energy Schemes, which seeks to support renewable and low carbon sources of energy, including from small scale and/or community–based proposals less than 5MW.

1.2.5 The estimated annual output would be in the region of 1.05MW hours, which is equivalent to the annual average domestic requirements of up to 420 homes and displacing approx. 453 tonnes of GHG associated with fossil fuel power annually[2]. This would make a useful contribution to the Authority's renewable energy generation capacity and would provide generation to the local area, thereby according with planning policy at the national and local levels whilst also embracing many elements of the seven well-being goals under the Well-being of Future Generations (Wales) Act 2015.

1.3 Design Principles and Scheme Evolution

Design Process

1.3.1 The process began with National Trust providing boundaries of all of their landholdings in England, Wales and Northern Ireland. Dulas reviewed the sites against national constraints such as National Parks, Sites of Special Scientific Interest (SSSI) and Agricultural Land Classification (ALC). This was used to identify suitable sites for further feasibility.

[1]https://www.gov.uk/government/news/pm-recommits-uk-to-net-zero-by-2050-and-pledges-a-fairer-path-to-achieving-target-to-ease-the-financial-burden-on-british-families#:~:text=The%20UK%20has%20set%20the,target%20of%2077%25%20for%202035.

[2] based on average home use of 25000kWh per annum

1.3.2 Further selection criteria was based on a number of factors including the availability of export capacity on the Local Distribution Network ('the grid') and the distance of the solar scheme to the point of connection, proximity to sensitive receptors (such as residential properties and ecological sites), ground conditions, current use of the land and vehicle access.

1.3.3 Based on the criteria mentioned above, the Proposed Development site was considered suitable to accommodate the proposed scheme.

1.3.4 As environmental survey work was undertaken, this influenced the proposed layout.

Environmental surveys

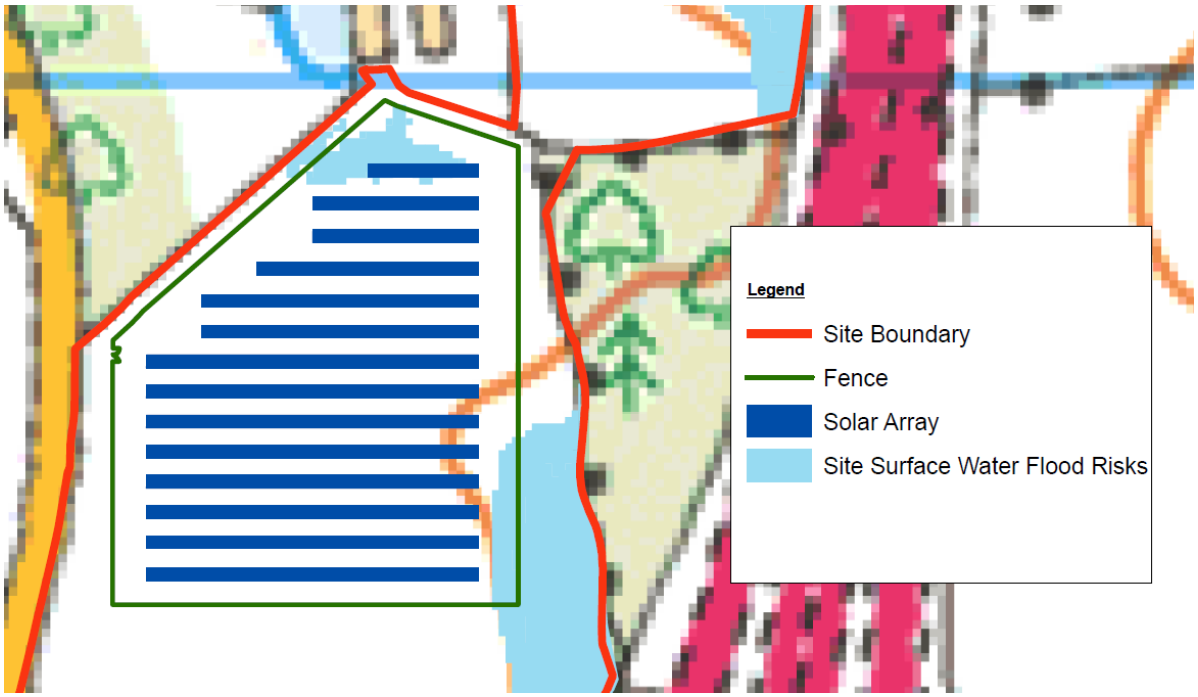
1.3.5 Following site identification, the Applicant undertook a detailed review of site conditions and national environmental constraints to confirm that the Site not only demonstrated the requisite technical and commercial characteristics for viable development but also to ensure that the Site was absent of sensitive environmental, technical and amenity features that may be conflicted by new development.

1.3.6 The Applicant has conducted environmental surveys of the available landholding to inform the layout of a well-designed solar scheme that limits affects to other on-site land-uses and receptors.

1.3.7 The main constraint applied at the early stages of design was ensuring a setback of the scheme from the surrounding woodland and trees, to minimise shading of the solar panels.

1.3.8 Initial baseline work identified surface water flood risk areas within the survey area. This affected the northernmost row of panels and western fencing, as shown in Plate 1 below.

Plate 1: Surface Water Flood Risk areas



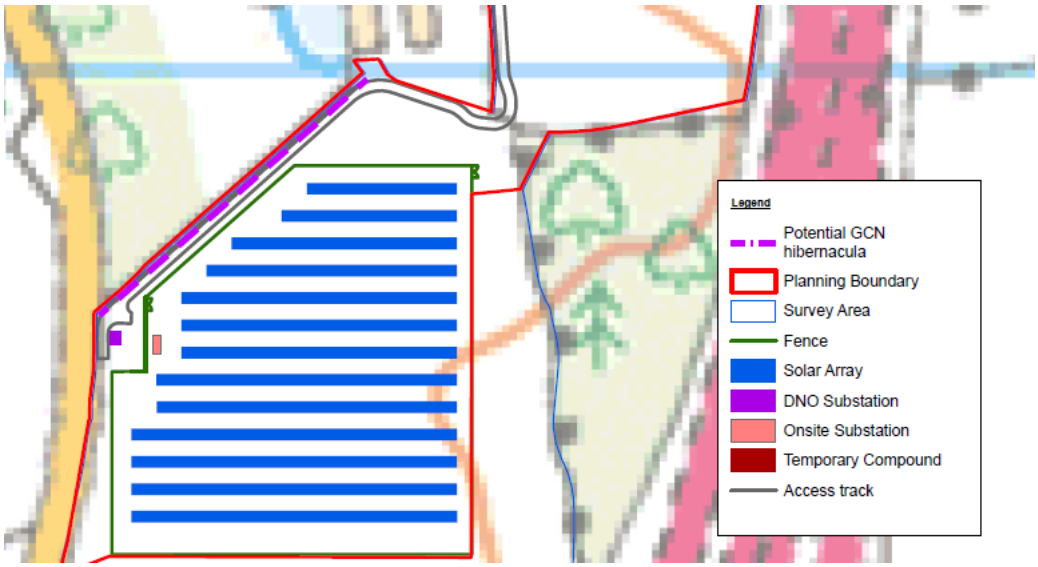
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1.3.9 The initial layout was redesigned so that infrastructure such as panels and fencing were located outside of these zones.

1.3.10 The following assessments were undertaken: Flood Consequence, Landscape and Visual assessment, Noise, Glint and Glare, Coal mining risk, traffic, contaminated land, ecology and archaeology. These reports accompany the planning application as stand alone documents.

1.3.11 The ecological survey, completed in April 2025, identified that there was an area of rubble and tipped material running along the boundary to the north of the array, which would be suitable hibernacula for Great Crested Newts (GCN) (see Plate 2). To mitigate potential impacts to the GCN, it was decided to move the access track inside the fence. This provides a buffer between 1-2m of the hibernacula and the fence.

Plate 2: Layout showing access track adjacent to potential GCN hibernacula



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1.4 Character

Characteristics of the site and its context

1.4.1 The proposal site is divided into two land parcels, the main area is an arable field (area 1), with a smaller area to the north (area 2).

1.4.2 Both areas are arable fields with a patch of tall trees and a short ditch in the north east corner. The field is bordered by hedgerows, scrub/tall ruderals and woodland. Area 1 has been recently used for a maize crop and area 2 has been left to grass.

1.4.3 The main solar scheme is located in area 1 with the entrance to the site, access to the solar scheme and temporary compound located in area 2.

1.4.4 Based on available data, the Agricultural Land Classification (ALC) across the whole site is Grade 3b, therefore the site is NOT best and most versatile land.

1.5 Scheme Design

Layout

1.5.1 The layout of the solar scheme has been designed to best harness the power of the sun's irradiation whilst ensuring that adequate separation distance of 5 metres is maintained between the arrays.

1.5.2 The solar panels are to be arranged in an east to west alignment, with each panel angled so that the southern edge is lower than the northern edge, thereby maximising sunlight exposure. All panels will be south facing and tilted at a 22 degree angle in order to maximise energy generation.

1.5.3 The final design of the module units, rows and arrays will depend on the final procurement of modules and detailed design of the scheme. Typically, the individual panels are expected to be arranged in module units comprising 4 panels in landscape orientation, by 8 panels wide joined together on mounting frames, with multiple module units connected to form rows or arrays.

1.5.4 Following is an illustration of a typical metal mounting system:

Plate 3: Standard Metal Mounting Frame and Tables



1.5.5 The mounting frames are usually fabricated from extruded aluminium.

1.5.6 The panels will be ground mounted through the use of poles which are pushed into the ground. In addition to the rows of panels, there will also be string inverters and substations (Distribution Network Operator (DNO) and client). The site will be secured by security fencing and CCTV.

1.5.7 The grid connection point for the solar scheme will be at the DNO substation, as shown on Figure 2 – Site Layout. There will be an underground cable from the client substation to the DNO substation.

1.5.8 The principal design components, as shown on Figure 2 – Site Layout for the Hafod Road solar scheme are:

- Indicative Track cross section (Figure 3);
- Panels and mounting system (Figure 4);
- Client substation (Figure 5);
- DNO substation (Figure 6);
- Indicative Cable trench cross section (Figure 7);
- Fencing including CCTV (Figure 8);

1.5.9 In addition to the above listed components, a temporary construction compound will also be required for the duration of the construction phase.

Amount and Scale

1.5.10 The overall area required for the proposed solar farm will be approximately 2.9ha, including the areas between the arrays, fencing, substation, access track and temporary compound (see Figure 2 - Site Layout for siting of the individual components).

1.5.11 The indicative installed capacity of the entire installation is 1072kW, comprising approximately 2256 solar PV panels. In addition, there will be site cabling and a client substation. String inverters, attached to the underside of the solar arrays, will be connected back to the substation which in turn is connected to the DNO substation west of the array.

1.5.12 The solar panels, mounting frames and inverter will be delivered to site in approximately 216 HGV loads, which themselves will be staggered throughout the construction period. Ground-mount steel frames will be required for the panels, which will be anchored to the ground using piles (see Figure 4 for details of the mounting system).

1.5.13 The output of electricity to be generated is estimated at 1.05MWh annually, which is equivalent to the annual average domestic electricity requirements of up to 420 homes and

displacing approximately 453 tonnes of greenhouse gas emissions associated with fossil fuel power annually.

1.5.14 *Site Compound and Delivery Area:* Due to the requirement under the Construction Design and Management (CDM) Regulations 2015 for the provision of on-site welfare facilities, a cabin would be needed in the construction compound. This would have welfare facilities for construction workers and would be self-contained. No discharge of sewerage would be made to the surrounding land – all waste will be removed from site after being stored in the appropriate waste and recycling containers here.

Landscaping and Appearance

1.5.15 A Landscape and Visual Appraisal (LVA) has been prepared by Viento Environmental to accompany the application. The full report is available as a standalone document.

Community Safety

1.5.16 Access from Hafod Road will utilise an existing track along which footpath ESC/31 also runs. During the construction phase use of this right of way will be managed to ensure safety . A Construction Traffic Management Plan (CTMP) accompanies this planning application which gives details of how traffic will be managed during the construction period.

1.5.17 It has been established that there will be no threat to community safety from the operation of the solar scheme as there are no mechanical moving parts accessible to the public.

1.5.18 During construction, the principal contractor will have responsibility for implementation of the Applicant's health and safety requirements, which will include the safe management of the site and construction vehicles entering / leaving the site. See the CTMP that accompanies this planning application.

1.6 Environmental Sustainability

1.6.1 The scheme would reduce the need for fossil fuel derived fuel and as such would contribute to reductions in greenhouse gases associated with such conventional generation. In addition to contributing to global measures to mitigate the effects of climate change, the scheme would also make a contribution to renewable energy targets in Wrexham.

1.6.2 As established through the reports accompanying the planning application, the scheme is not expected to harm or adversely impact archaeological features, recreational assets such as rights of way, residential amenity or transport access.

1.6.3 The overall context of the proposed scheme has been considered by the Applicant in making its decision on whether to proceed with a scheme at this site. It has been established that the social, economic and policy benefits will provide a significant benefit to the area without detriment to the local community or national interests.

1.6.4 As detailed in the ecology report, enhancement and creation of habitats have been put forward as a Net Benefit for Biodiversity.

1.6.5 The National Trust are tackling the causes of climate change by reducing emissions, capturing and storing carbon on the land they look after. They are reducing emissions from over 500 historic buildings by improving energy efficiency, installing more renewable energy schemes and reducing reliance on fossil fuels for heating and operations. They have recently delivered over 130 projects that have reduced the National Trust's reliance on fossil fuels, helping them and have helped them generate over 50% of their energy from renewables. We're now going further, With a target of net zero by 2030, they are going further by delivering more renewable energy projects like this one proposed on the Erddig Estate.

1.7 Access

1.7.1 Plate 4 below (presented as part of the CTMP) shows the proposed vehicle routes to site.

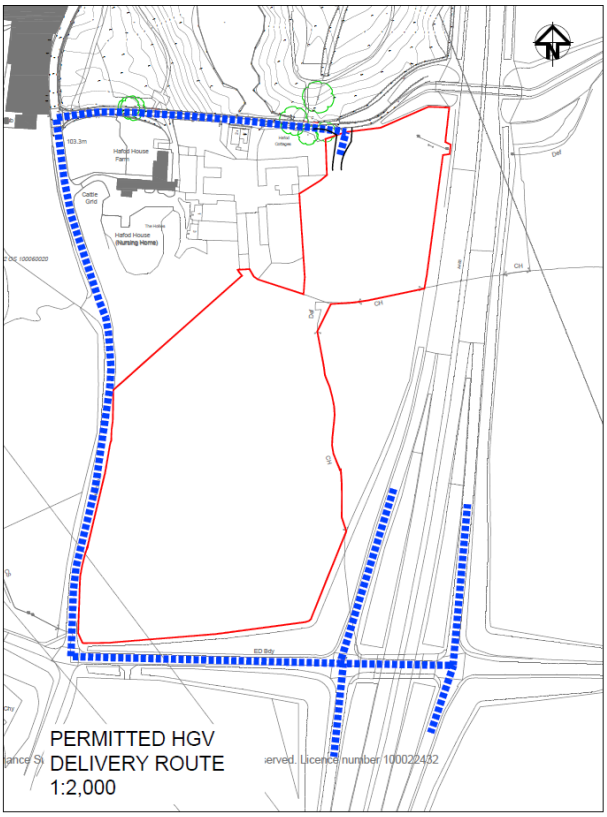


Plate 4 – Proposed vehicle routes to site

1.7.2 Access to the site during the construction phase will be from the north east of the site, along an existing track off the Hafod Road, opposite the brickworks. An existing entrance into the site will be utilised.

1.7.3 There will be a temporary construction compound adjacent to the track on entering the Area 2. It will be constructed from compacted crushed stone, and reinstated following completion of construction. The new access track within the site will be agricultural style (See Figure 3).

1.7.4 The main traffic and transport related effects will be during the construction phase of the development. A total of approximately 216 HGV deliveries are expected over the 16 week construction period. As an average this equates to around 14 deliveries per week or 3 deliveries a day.

1.7.5 It is considered that this level of trip generation is unlikely to have a severe impact on the local highway network.

1.7.6 Overall, few modifications or improvements to existing site access arrangements will be required for the construction of the development.

1.7.7 After commissioning, the site will only be visited during routine monthly maintenance checks, using 4x4 vehicles or similar. The access route during the operational phase will be the same as per the construction route.