

Installation of a Ground-Mounted Solar Photovoltaic Array with domestic battery back up electrical supply

22 panels · 10.1 kW · 14 m × 4 m · Fernpatch, BA13 4NX, Wiltshire

Applicant: Mr & Mrs Riley

Site address: Fernpatch, 1 Coulston, Westbury, Wiltshire BA13 4NX

Local planning authority: Wiltshire Council

Application type: Full planning permission

1. Introduction

This planning statement accompanies an application for full planning permission for the installation of a ground-mounted solar photovoltaic array comprising 22 panels, with a combined generating capacity of 10.1 kW and an approximate overall array dimension of 14 m × 4 m. The installation also provides for integration with a battery back for the domestic electricity supply.

The proposed array will be situated within the land associated with the existing property at Fernpatch, 1 Coulston, Coulston, Wiltshire. This land is bordered by further land owned by the property owner and which serves as a non-commercial domestic smallholding for horses and sheep. The solar array will be mounted within an area of grassland which is used in the springtime as an orphan lamb nursery and the land will continue to be used for this purpose.

The proposal is primarily intended to provide the property with a back up electricity supply during power outages and will also be used to supply renewable energy to the property at other times. The property is not connected to normal water / sewage or gas utilities and as a result is vulnerable when electricity outages occur. The established private water supply requires both electricity to pump water from the pre-existing 1930's well water source on demand and requires continuous electricity supplies for the installed ultra-violet water disinfectant system to operate correctly. During an electricity outage various ad hoc battery/inverter and or petrol generator systems currently have to be deployed to make drinking water available to the residential premises and also water to livestock troughs around the property. This is not a sustainable long term solution as the number and frequency of power outages to the property is increasing.

The Solar Array is larger than normal domestic solar arrays which are normally roof mounted and subject to permitted development. The proposed solar array has not been

designed as a typical household solar array which would be used to offset householder electricity bills, but has been designed to supply an adequate electricity supply to the premises in the event of an electricity utility outage scenario during the winter months.

Due to the inefficiencies of solar arrays during the low light winter months this has caused the array to be larger than a typical domestic roof mounted installation. The solar array has been carefully designed to act as a viable short term electricity supply for the property during the winter months when the property experiences the most electricity supply outages and a crucial part of this design is the integration with the Tesla Powerwall 3 battery / inverter system.

Regrettably the National Grid Operator (NGO) for the area, which has been consulted, cannot absorb the bulk of the excess electricity that will be generated in the summer months by the system due to the state of the rural electricity infrastructure in the area, so as much as possible of the generated renewable electricity will be stored in the Powerwall system for domestic use.

2. The site and its surroundings

The application site comprises land associated with an existing residential property in the rural area of Coulston, Wiltshire. The proposed array would be located within an existing grassed area some 55m away from the dwelling.

The surrounding land is characterised by a combination of residential garden, vegetation and agricultural land. Mature trees and other existing vegetation are present in the vicinity of the proposed installation. Many of the mature trees within the property boundary fall within the Natural England “Long Established Woodland” definition, so the proposed solar array has been placed well outside the Natural England boundary both to protect the existing tree root structures and to ensure minimal shading. This siting has led to an unusually long (for a domestic solar array) supply cable requirement of 55m, which will require upgraded cabling between the Solar Array and the Powerwall battery mounted at the domestic premises. The cable will be buried in a 600mm backfilled trench to meet the relevant regulations and the ground restored and reseeded with an appropriate grass mix where necessary.

The site is a mix of sloping and level ground, the level ground being used for access by domestic grass cutting equipment and the proposed mounting arrangements have been designed with regard to the existing ground profile and to allow continued access. The drawings accompanying the application identify the proposed array location, its dimensions and its relationship to the existing dwelling, boundaries and vegetation. Due to the hilly nature of the terrain and the rural location of the sight, the installation will offer minimal visual disturbance.

The existing use of the land, including the land used as an orphan sheep nursery, where the solar array will be constructed, is intended to continue.

3. Description of the proposed development

Number of panels: 22 – Sunpower Performance 7, supplied by Mole Energy. Each panel dimension is 1134mm x 1790mm and it is proposed they be fixed 2 high in portrait on the mounting system.

Combined installed capacity: 10.1 kW integrated with a Tesla Powerwall 3 battery / inverter system to provide a back up supply during electricity outages.

Approximate array dimensions : 14 m × 4 m

Mounting: Ground-mounted (screw in – see below) frame. It is proposed that 2 panels are fixed in portrait fashion on the mounting system, by 11 panel lengths wide.

Ground conditions: Sloping grassland

Land use: Residential, as a domestic non commercial small holding, with spring lamb grazing to continue

Panel orientation and tilt: The solar array will be oriented to the South West direction with the exact orientation to be finalised at point of installation to maximise winter solar collection efficiency. The panel tilt is likely to be 30 degrees and the lowest part of the panel will be approximately 0.5 m from the ground.

An elevation drawing is supplied.

Foundations: A screw type panel mounting system provided by Sunfixings (see <https://www.sunfixings.co.uk/mounting-system/park-tegra-ground-anchor/>) is to be utilised so conventional concrete foundations are not used. This system minimises ground disturbance whilst providing an economic construction mechanism.

Associated equipment: No other equipment is installed at the Solar Array location, other than the panels, cabling and the mounting system. The battery storage system and electrical inverter is provided by a single unit – the Tesla Powerwall 3 – which will be mounted on the external wall of the domestic premises. The interconnecting cables (6mm sq two core steel wire armoured and 6mm sq 4 wire steel wire armoured) between the array and the Powerwall 3 will be connected via a 55m long x 600mm deep x 250mm approx wide backfilled deep trench to meet current installation regulations. The switch over control circuitry required to safely interface and isolate the existing electricity supply with the back up system will be mounted within the property adjacent to the current electricity internal distribution arrangements to meet appropriate regulations.

4. Planning policy and the principle of development

The proposal would contribute to the generation of renewable electricity at a small scale associated with an existing property and would greatly increase the property power supply resilience during winter power outages which currently result in the loss of essential utilities at the property.

The application has been prepared with particular regard to Wiltshire Core Strategy Policy CP42 and the relevant policies concerning biodiversity, landscape, design and the historic environment.

The applicant considers that the modest scale of the proposal and its relationship to the existing property provide a reasonable basis for supporting the development, subject to the site-specific considerations addressed in this statement.

5. Renewable-energy benefits

The proposed installation will have the capacity to generate up to 10.1kW/h renewable electricity at the point of use in the most favourable summer conditions, helping to reduce reliance on electricity imported from the grid during these months. The array will provide renewable energy benefit during the winter months, but at a much reduced level and the effectiveness of the system will be optimised by the use of a battery storage system.

The scale of the array has been selected to meet the property's energy requirements in the winter months when power outage is more likely and most disruptive. Coupled with the integration of the Tesla Powerwall 3 battery and with residential non-essential usage minimised during an electrical supply outage, the system should be capable of delivering up to a 24 hour back up electricity supply for the property.

The installation can make limited contributions to the nations wider objective of increasing renewable-energy generation and reducing greenhouse-gas emissions and will eliminate the need for the current fossil fuelled electrical generators being required at the property during electrical supply outage conditions.

6. Landscape and visual impact

The proposed array has a compact footprint and is located as close to the existing dwelling as possible rather than as an isolated installation within open agricultural land. The site location is hidden by the surrounding terrain as the domestic property sits in a natural valley which offers screening to the West, North and East – with the foothills of Salisbury Plain rising to the South. The proposed installation generally will not be seen from the B3098 to the South of the property as the road is in a cutting along most of the boundary, with the exception of one small area where high sided vehicles will have a glimpse (see the figure 4 below). Coulston Road which forms the South Western boundary of the land owned by the property owners is screened by the high natural hedges. There is no visibility from the Northern or Eastern boundary of the property. The proposed installation is to be sited well away from trees and hedges.

The assessment of landscape and visual effects takes account of the site's topography, the proposed maximum height of the panels, the existing vegetation and the relationship between the array and the surrounding landscape.

Existing trees and vegetation will be retained. The design will seek to minimise ground disturbance and avoid unnecessary changes to the existing landform.

The submitted elevations and site section demonstrate the relationship between the panel structure and the sloping ground. The applicant considers that the proposal can be accommodated without unacceptable landscape or visual effects, subject to the detailed dimensions and visibility shown in the accompanying plans.



Figure 1: North View from the installation site

Figure 1 is the north view from the installation site showing the property some 55m away – the cable trench will go along the line of the centre of the picture. The Natural England established tree boundary is some 25m to the North between the house and the installation site. The two green post markers show the northern extent of the installation site.



Figure 2: View south from the installation site

Figure 2 shows the installation site, southerly view towards Salisbury Plain escarpment. The property southern boundary is the B3098 which is obscured in the Coulston Hollow cutting.



Figure 3: North View from the installation site

The ground rises behind the installation site to the northern side and the proposed array cannot be seen from this direction.



Figure 4: West view from the installation site

The west view from the site overlooks the lower edge of the Salisbury Plain escarpment over land owned by the applicant and then across to neighbouring farmland. The B3098 runs along the south side of the property boundary and a lorry can just be seen above the hedge row before it descends into the Coulston Hollow cutting. This is probably the only point where the array will be visible from the B3098. Views from Coulston road, which forms the west most boundary of the property are obscured by the hill on owners land in the foreground and by the high hedgerow along the rest of the owners land boundary.

7. Continued agricultural use and sheep grazing

The proposal is intended to allow the existing use of the land to continue alongside renewable-electricity generation.

Sheep grazing will be retained – the land is currently used as an Orphan lamb grazing area, with the layout designed to provide appropriate access around the array for livestock and land management.

The installation design will ensure that the mounting structure, electrical cabling and associated equipment are designed and installed with appropriate regard to livestock safety and routine land maintenance operations.

The proposal therefore seeks to combine renewable-energy generation with continued residential use rather than permanently displacing the current small holder activity and amenity of the land.

8. Biodiversity and Biodiversity Net Gain

The applicant claims exemption from the Biodiversity Net Gain requirement on the basis that this application is of limited scope and size.

9. Historic environment

The application has considered the potential relationship between the proposed development and designated heritage assets in the surrounding area.

The proposed array is associated with the existing property and has a limited physical extent. The assessment takes account of the location of nearby heritage assets, their settings, intervening vegetation and landform, and the visibility of the proposed panels.

The applicant does not believe that the proposed installation has any impact on the local historic environment.

11. Access, drainage and construction

This section is brief as the proposal does not require new access, significant excavation or extensive hardstanding.

The installation is expected to involve limited construction activity, comprising the installation of the support structure, photovoltaic panels and associated electrical equipment. No new access tracks or arrangements are required to support the construction phase, there is minimal excavation associated with the cable trench work and no new areas of hardstanding are being created. Drainage and surface water will be naturally managed as at the present and no new water courses or drainage are required nor being created.

12. Conclusion

The proposal is for a 10.1kW solar panel array and associated equipment which is intended to provide the applicants property at Fernpatch, 1 Coulston BA13 4NX with a back up electricity supply during power outages and will also be used to supply renewable energy to the property at other times.

The residential property is not connected to the public water / sewage or gas utilities and as a result is vulnerable when electricity outages occur. The established private water

supply requires both electricity to pump water from the pre-existing 1930's well source on demand and requires continuous electricity supplies for the installed ultra-violet water disinfectant system. During an electricity outage a back up electrical system is required.

Most significant power outages occur during the winter months when sunlight levels are low, therefore the solar array has been designed to be capable of charging a storage and generation system to enable electricity to be available at the domestic premises during these times. As a result, the solar array is larger than normally found on rooftops in domestic premises that simply use solar energy to reduce electrical bills.

The application has considered the relevant planning policies and the potential effects on landscape character, visual amenity, neighbouring properties, heritage assets and biodiversity. The design seeks to minimise ground disturbance, retain existing vegetation and accommodate the sloping site.

For the reasons set out in this statement and the accompanying plans and supporting information, the applicant respectfully requests that Wiltshire Council grant full planning permission, subject to any reasonable conditions considered necessary.