

# Design and Access Statement

## Gilgal, Pancake Hill, Cheltenham. GL54 4AP

### Description of Proposed Development

To install x 60 ground-mounted solar PV panels to the northeast of our property. The solar array will comprise 2 rows of 15 double landscape mounted panels.

From the west end of the twin arrays an underground DC electric cable will go in a dedicated duct within a 300mm wide trench to a minimum depth of 500mm with sand, electrical warning tape and backed filled with soil running to the northwest corner of the garage/studio and onwards in a second existing duct to the house. Inverters and battery storage will be housed in the garage and in the house cellar with connection to the individual grid connection in each building which both have DNO approval for 10Kw export limit per grid connection. Solar production will be split between the two buildings to support the garage twin EV chargers, existing studio air source heat pump (ASHP), greenhouse heaters and other consumption in the studio, as well as supporting a future house ASHP system with the objective of reducing reliance on oil heating (no gas grid in area) as well as a third EV charger to support replacement of 3 ICE vehicles in future. Excess generation will be exported to the grid. The solar panel angle can be manually adjusted to optimise capture of direct solar irradiance. The system production capacity takes account of lower energy production during winter months to meet our goals of reducing dependence on fossil fuels for transport, heating, and domestic consumption, and to make a positive contribution to the environment utilising sustainable energy.

### Existing Uses & Impact

The proposed site comprises a mainly grassed area which is being prepared for conversion to a native British wildflower area to complement a larger native wildflower meadow in the process of being established to the east of the site in a 4-acre paddock also owned by the applicant. The northern site boundary is formed by a stock proof post and wire fence owned and maintained by the applicant. Along the boundary is a 2-year-old double row native hedge (currently 1.4m height) with 2.5m target height, and a row of mature Acer platanoides trees set back 2 meters from boundary and interspaced along the length of the boundary. The neighbouring agricultural field (Stowell Estate) continues to rise up the valley with a mature copse on the crest 260meters to the north, whilst other field boundaries to the west and east comprising mature native hedging, trees and a mature copse essentially obscuring views of the site from the single-track dead-end lane to the west and from the continuing Horses Ash Footpath lying 240meters to the northwest.

The site is within the Cotswolds AONB but it is outside the Chedworth Conservation Area, however there are no clear views of the site from other accessible vantage points to the west, east or north or from any footpaths. The array will face south to benefit from maximum irradiance. To the south of the site and east of the house and garage, lies the main garden surrounded by Cotswold stone walls (1m) within which are 17 raised flower beds to support the applicant's flower farm business. The stone wall boundary 18 meters to the south, also has an adjacent lower section of wired mesh on chestnut paling with hazel panels to a height of 1.6m acting as a wind break to deter deer and rabbit

damage to flower growing area. Beyond this southern garden boundary is an established orchard (owned by the applicant) with mature apple and cherry trees before reaching a newly restored Cotswold stone wall (50 meters from the site) featuring some native hedging with large, interspersed ash and sycamore trees along the boundary with Pancake Hill. The orchard southern wall forms the boundary with the Chedworth Conservation area. The orchard, flower garden area and the proposed site is not within the Chedworth Conservation Area (see Form 4). Due to the rising ground levels from the southern boundary, with various hedges, trees and fencing between Pancake Hill and the level garden and site itself to the north, the solar panels will not be visible from Pancake Hill to the south or the conservation area in general. Two houses opposite, to the south, will not have views of the solar panels or be subject to glare from the PV panels as the properties lie lower on the valley side below Pancake Hill.

At the west end of the northern boundary 40meters from the site is a pole mounted SSEN 11Kv pole transformer which serves the property grid connections undergrounded by applicant in 2018 and, an overhead LV line to an adjacent neighbouring property on the west side of the lane. Overhead twin 11Kw power lines also run at an angle west to east over the agricultural field. At its nearest point the solar array is outside the DNO stated 12-meter exclusion zone.

### System Design

Placement of the array on the house or garage roof is not possible as the front south facing Cotswold slate roofs are visible from the road and the immediate Conservation Area to the front of the property. Other locations on the adjoining 6-acre paddocks and orchard owned by the applicant, but outside the Conservation Area, were considered but increase the visibility from the AONB and the Conservation Area. The proposed site and the flower growing area whilst included in HM Land Registry Property Register for the Gilgal property is not shown as being within the Chedworth Conservation Area boundary as per Conservation map (Form 4).

The proposed solar array arrangement in Fig. 1 and 2., shows the difference between the summer position of 25 degrees and winter position of 50 degrees on a frame with capacity for 10 panels (not fully installed).

The winter position produces 14% more energy through the winter months at the steeper angle. The proposed ground mount system will be as shown in Fig. 1 and 1., with PV panels in double landscape orientation to form the basis for 2 rows comprising 30 PV modules each and capable of generating of 26Kwp under ideal conditions. No excavation or concrete is required for the foundations or use on site with anchorage being provided by 4 ground anchors on each frame which are manually driven into the existing ground to a depth of 1200mm and are easily removed without excavation of the anchor at end of life.

The steel frame and fittings are easily relocated or recycled at end of life. Form 6 shows the winter position which indicates the panels at their highest point during the winter solstice (Dec 21st), and measuring 1.95metres from ground level. During other months the panel height can be as low as 1.5 meters (summer solstice (June 21<sup>st</sup>) position. The period during which the panel height is at the maximum 1.95 meters is less than 1 month. No power, water or gas services are located on the site.

The site is in Flood Zone 1, and therefore does not require a Flood risk Assessment.



Fig.1 Two PV panels in parallel at 25 degrees on partially completed frame



Fig.2 Two PV panels in parallel at 50 degrees on partially completed frame

### **Site Access**

The MCS registered installer will access the site from the existing properties drive gate on Pancake Hill. One 4x4 vehicle and trailer will transport materials to site without the need for making new access tracks. Parking is also available for additional vehicles on the property drive area thus avoiding roadside parking or unloading.

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