

This paper has been prepared to provide the Westcott Village Association and Mole Valley District Council with some further detail regarding the proposed (solar) garden structures and the rationale for the planned development at Chartfield.

The House & Plot

Chartfield is a substantial detached house build in 1928 and positioned in the South-West corner of a 2.75 acre plot overlooking the private lake owned by The Mill in Westcott Street. Essentially it is a 1920's style house with generous bay windows either side of the front door & covered porch. The front bays were recently restored with (insulated) lead caps & clay tiles. The brickwork on the South facing Gable ends above the bay windows was restored – removing cedar boarding from the 1970's.

The current owners have lived in the house since 1996 and used local craftsmen to gradually restore and improve the main house and gardens. A good deal of effort has been directed at improving the thermal efficiency of the house and we have been researching options for solar generation for many years.

Choice of Solar Structure

The twin gables at the front of the house create a handsome (South facing) roof line – but it is wholly unsuitable for any type of solar generation. We have therefore researched ground (or flat roof) mounted solar arrays – but they are ugly and areas of the garden where they could be set up – such as the Northern boundary – would interrupt our views of the garden & lake.

We finally alighted on a solution when I visited the Hockerton Housing Project in Nottinghamshire – where I saw a 20 year old solar panel perched on top of a garden pergola. We have coupled this idea with glass solar photovoltaic (PV) panels from Polysolar <https://www.polysolar.co.uk/>. This company exhibited at the Grand Designs (& EcoBuild) exhibitions over 10 years ago. They now produce (high output) thin film (semi-transparent) laminated glass solar PV panels – which charge from both sides. These panels can be integrated into a building or garden structure and they have recently teamed up with a glazing specialist who has developed a commercial system for installing the panels into carports and garden structures. We have been designing a bespoke solution for Chartfield over the last 12-18 months.

Power Requirement & Proposed Solution

Chartfield has both mains electricity & gas. Consumption of both is substantial and the recent purchase of an electric car (replacing the dirty diesel) has added a substantial further load.

Annual consumption

- Electricity approx. 8,000 Kwh (the car will add approx. 2,500Kwh or more).
- Gas – In round figures approx. the same.

Power Generation & Resilience:

In readiness for the planned solar generation we have installed a Tesla PowerWall, providing off-grid functionality & power supply resilience. We hope a long term, strategic solution.

Structure	Output (Est.)	% of Total
<ul style="list-style-type: none">• Canopy 1 (Schuco Aluminium powder coated frame) (10 PV panels x 1m x 1.7m) in 5 x 2 mono-pitch layout	3,800 Kwh	
<ul style="list-style-type: none">• Canopy 2 (Oak Frame – traditional pegged construction) (20 PV panels x 1m x 1.7m in dual pitch layout (West/East) <p>This configuration has been selected to minimise the visual impact from both house & garden. Only 10 of the panels being visible from any aspect. Also, although glass, the panels absorb light – they are non-reflective.</p>	6,700 Kwh	
<ul style="list-style-type: none">• Total (Seasonal variation will impact % cover of annual total)	10,500	Approx 80%

Site Selection & Rationale

Canopy 1

Is to be located by the house & external garage – positioned immediately behind an existing wooden frame on which we have a (climbing) Wisteria. The canopy will provide a covered seating area close to the house (rather than a car port!). We will integrate further into the garden by creating small flower beds and adding more climbing plants around the frame – adding simple trellis frames to soften the initially bare industrial appearance.

Canopy 2

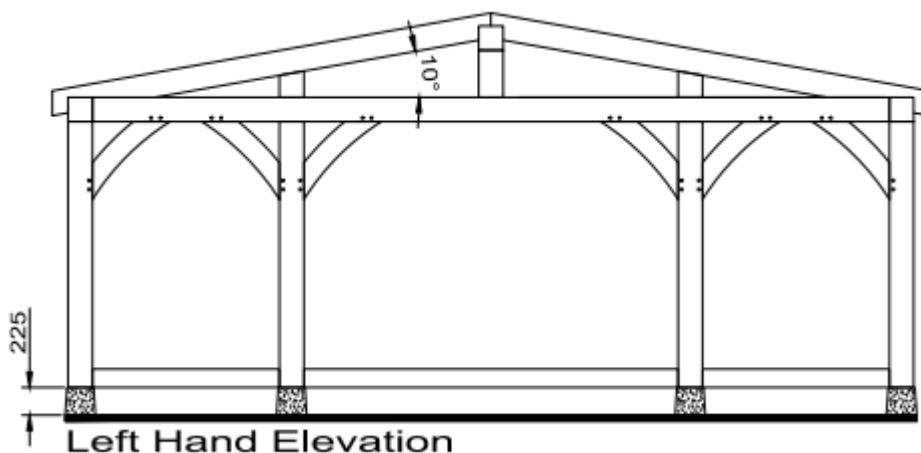
We have selected a site on the Eastern side of the garden, nestling close to the mature trees (Oak & Silver Birch etc) – but clear of trees at the relevant angles to provide good sun capture. The location also fits with the way we use the garden, it provides a natural stopping point as we walk around the grounds. It is secluded from all neighbours and the foot path running along our boundary – which has a hedge standing high above the footpath.

In this location, the high-quality Oak canopy makes an attractive addition to the garden – with minimal impact from the use of solar panels. Sympathetic planting of fruit trees, climbing plants & creation of flower borders is planned to integrate the structure into the garden. We will continue to cultivate the meadow grasses in this area (and a similar area on the Western side of the grounds).

Electrical cabling is to be installed to extend the power supply to the canopy – enabling the generated power to be fed back to the Tesla battery pack (& grid – subject to connection). The power in the garden will also be powering the GPS controlled auto-mower system – enabling reduced use of the diesel tractor.

Illustrative Images

1. Outline drawing of planned structure for Canopy 2



2. **Photo: Oak Frame Carport – South Downs National Park (ANOB)**

Canopy 2 proposed for Chartfield will be similar to the photo below, except for the use of a dual pitch. The height to the eaves being approx. 2.4m and to the apex approx. 3.2m – with a 10-15 degree pitch. There would also be minor differences in detailing, such as rafter ends will be cut to a shape which reflects that adopted on the main house. We will have 12 supporting posts to ensure the structure looks like a garden canopy – rather than a carport. Essentially 4 legs in the proportions consistent with the image above on each elevation (25-50-25).



3. **Aluminium canopy** – Canopy 1

The small aluminium canopy proposed would be similar to this – although marginally wider. At 5m wide – this being the maximum width that can be accommodated with only 4 legs.



4. **Photo from house to Eastern Boundary.**

Photo taken in mid Jan'24 – illustrates the sun fall, even in Winter, towards the northern boundary where it is intended to position Canopy 2.

