



The Samsung ASHP heating system is designed to be 'on' full time but is calibrated to external temperatures to deliver just enough background heat to reach a steady state offsetting the heat losses. This will mean floor and radiator temperatures that are often not warm to the touch but will nevertheless be delivering the necessary heat to reach the target temperature of 20/21 °C. The ASHP will learn what this temperature needs to be over the course of the first winter.

The roof PV supplies electricity to heat hot water in the cylinder and also provides small power electricity from the battery system.

BLF has mostly east or west-facing windows because of its orientation towards the views. Windows in these directions face lower sun angles and so can be prone to higher solar gains in summer. To prevent overheating, west facing windows have integral louvre blinds or, for the sliding door, an external blind. Lowering these blinds using the remote controls and angling the blades prevents excessive summer gains.

If internal temperatures still rise during the day, spaces can be cooled by cross-ventilating with colder air overnight by tilting open ground windows and setting the rooflights horizontal.

Brook Lodge Farm by numbers

U-values

Ground Slab - 0.116 W/m²K

External Wall - 0.120 W/m²K

Roof - 0.102 W/m²K

Windows (average, installed) - 0.89 W/m²K

Rooflights (average, installed) - 1.25 W/m²K

Treated Floor Area - 130.2 m²

Airtightness - 0.5ach @ 50Pa

Space Heating Demand - 15 kWh/m²/yr

Start date - Aug 2023

Practical completion of house - May 2024

Build cost (house) - approx £483K

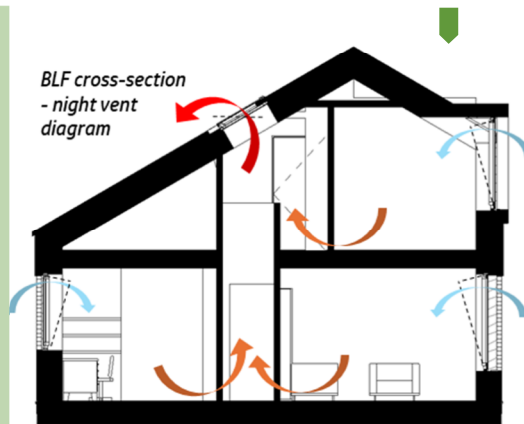
Build cost (landscape & garage) - £71K

Substructure/superstructure - £179K

Windows/doors - £45K Fit-out - £145.5K

Roof and cladding - £63.5K MVHR - £7K

PV and ASHP - £25K Utilities - £18K



Awen Design



BROOK LODGE FARM PASSIVHAUS *Case Study*



Brook Lodge Farm is a brick and cedar shingle-clad, rural dwelling in East Sussex certified to the Passivhaus standard by Mead Consulting in 2025.

The original concept by Nic Pople architect was adapted for Passivhaus compliance by Mark Elton, initially at Cowan Architects and latterly via his own practice, Awen Design.

The project was largely managed on site without a main contractor by the client and now resident, Carolyn, whose passion and determination to realise her vision for a stylish but environmentally-conscious home meant she was able to overcome her lack of experience in the construction industry.

The superstructure comprises a twin-stud timber-framed system sitting on an insulated raft foundation, all fabricated and constructed by MBC Timber Frame who were involved in the project from an early stage.

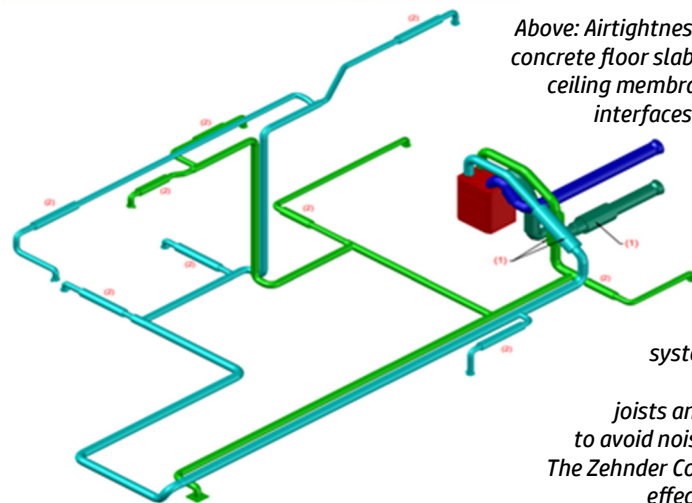


The high standards of thermal comfort required for a Passivhaus were met using a 300mm thick polystyrene insulated formwork system for the concrete raft ground slab and 300mm of blown cellulose insulation within the timber framing, increasing to 400mm for the roof. The Internorm windows, supplied and installed by Ecohaus, are quadruple-glazed on the 'west' façade where they incorporate an integral louvre blind system in the outer chamber.

The east façade uses their striking glass-to-glass corner units, with the roof loads being carried by cantilevered glulam beams within the structure. External doors are also from the Internorm range while all the Fakro rooflights are also quadruple-glazed.



Brook Lodge Farm and its garage outbuilding are clad with a combination of Vandersanden Ledbury brick slips and Marley cedar shingles. The dormer features on the west façade are all clad with aluminium metal sheeting from Prefalz. A PV array on the east-facing roof slope is integrated into the shingles and slim downpipes are concealed within the facade depth.



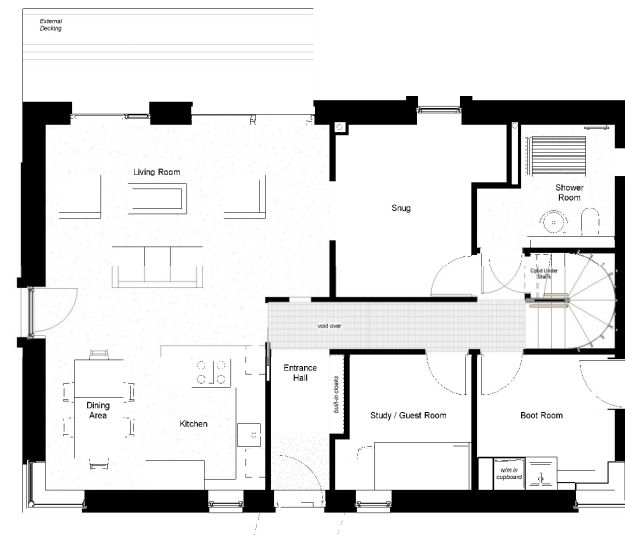
Above: Airtightness is achieved by a combination of the concrete floor slab, coated OSB sheathing, vapour open ceiling membranes and careful sealing between the interfaces with specialist tapes and grommets, (for all service penetrations).

Left: Designed and supplied by 21 Degrees, the ventilation system uses spiral-wound metal ducting threaded between the metal-web joists and incorporates acoustic attenuators to avoid noise transfer between adjacent rooms. The Zehnder Comfoair Q350 heat exchanger has an effective heat recovery efficiency of 88%.

The original concept design was not optimised for energy efficiency, having a poorer form factor due to a number of indent features and overhangs. By rationalising and slightly enlarging the footprint, it was just possible to meet the Passivhaus target, despite the building's orientation being predominantly west-northwest to take advantage of the best views.



First Floor Plan



Ground Floor Plan

Below: Internal floor finishes are either polished concrete for the ground floor slab or oak industrial parquet for the hallways, stairs and upper floors. Microcement finishes line the bathrooms and premium birch ply has been used throughout for door frames and fitted joinery.

