

Juggs Road

Address: Juggs Road, Lewes, BN7 3PP

Owners: Charles & Hannah Meloy?

Type: ? New build PassivHaus

Age: ? In construction

Beds: 4

Walls: ?SIPS

Residents: 4

Book Tour

[Sunday 16th October](#) [1]

[Sunday 23rd October](#) [2]

Features

Certified Passivhaus

Air source heat pump

Airtightness

SIPS construction

Super insulation

Woodburning stove??

Triple glazing

Mechanical Ventilation Heat Recovery (MVHR) with room heating

Solar orientation

Summary

Two years ago, architect Charles Meloy and his wife Hannah bought this plot of land where derelict chicken sheds had previously stood. The site is situated within the South Downs National Park (SDNP) and outside the development boundary of Lewes. To achieve planning consent a highly sustainable dwelling was proposed that recollected the derelict sheds and responded to the wooded nature of the site.

Consent was achieved for what will become the first fully certified Passivhaus within the SDNP. To construct the house Charles has both supervised subcontractors and also been hands on in completing much of the construction work himself.

This is a simple, elegant design that due to the Passivhaus standard conserves heat so well it needs almost no heating. A wood burning stove within the lounge can amply supply extra heat

in the coldest spells and an air source heat pump delivers hot water in addition to raising the incoming temperature of the MVHR to provide room heating.

The motivation throughout has been to create a house built to the highest sustainable and architectural standards. The success of this project has led to the development of further PassivHaus projects for clients within Sussex.

Energy efficiency measures

It is first necessary to understand that this house is being built to PassivHaus standards, which stipulates very low heating consumption of $<15\text{W/m}^2$, which is only around 10% of the usage of a typical house. This requires extremely high levels of insulation and very efficient heating and ventilation.

PassivHaus modelling of the design was done by APE consultants in London.

Heating and hot water

In effect the heat given off by occupants, appliances and solar gain means that no additional heating is needed for most of the year. It is projected that a small heat input will be needed only in the two coldest months which is catered for by underfloor heating. In addition, there is a woodburning stove in the main living area that would allow near zero carbon heating instead.

An air source heat pump provides hot water and also warms incoming air to augment heating in winter.

Insulation

Walls – The walls are made from SIP panels, which comprise a sandwich of two external layers of layers of OSB board bonded to 190mm expanded polystyrene. On top of this there is an internal layer of 60mm PIR rigid insulation, finished in plasterboard. The external finish is chestnut boarding. This give a very low projected u value of 0.14, twice as good as Building regulations.

Windows - HON triple glazed windows are fitted, which have a robust aluminium finish and a timber core to preserve insulation. The u value is around 0.8.

Roof - This is also SIP construction, but has an even thicker 80mm additional layer of PIR foam insulation.

Floor - There is a concrete slab floor with a polished finish, which is essential to give the very lightweight structure some thermal mass to keep temperatures balanced. Below this is 210mm of PIR to maintain the very high levels of insulation (Building regs. only insist on 80mm).

Draughtproofing/Airtightness - Passivhaus stipulates that airtightness under a pressure test should not exceed $0.6 \text{ m}^3/\text{m}^2.\text{h} @ 50\text{Pa}$. During building, this has meant that all joints have had to be foam filled and taped to ensure a good seal. Measured airtightness is 0.54 (vs Bldg. Regs. 10).

Ventilation – because the building is almost airtight, there is a system of ducted ventilation via a heat exchange unit, which recovers outgoing heat by warming incoming air.

Renewables and Low carbon technology

As the building is set in a wooded grove, there is too much shading to make either solar PV electricity or solar thermal hot water possible. However, there is a small Ariston thermal store and air source heat pump

Electricity

As would be expected, all appliances are low energy rated and all lighting is LED.

Carbon emissions

This is a new build, so no consumption figures are available, however Passivhaus design projects energy use of around 10% that of a conventional house.

Professionals

Architect – MELOY architects. meloy.co.uk

M&E – Alan Clarke, Gloucester.

Passivhaus consultant – APE Architecture and Design Ltd, London. ape-ad.co.uk/

Structural engineer – DUD engineers

Planning consultant – Pro Planning

Ecologist and Arboriculturalist – PJC

Highways engineer – Reeves Transport Planning Ltd

Builder – Self build

Selected suppliers

SIPS frame – SIPS Eco Panels, Suffolk. sipsecopanel.co.uk

Windows – HON Windows, Crawley. honwindows.co.uk

Polished concrete – Steysons Granolithic

Woodburning stove – Westfire 35 (4.3kw)

Doors and Ironmongery – Aspex

Cladding – Wenban Smith, Lewes.

Bespoke Kitchens and cabinetry: JM Furniture

Bathrooms – Duravit and Catalano by CP Hart

Brassware: Mike Pro by Crosswater

Bathroom walling and flooring – Beton cire by Mecardier

Links:

[1] <http://lewesecoopopenhouses.org.uk/booking#JuggsRoad16th>

[2] <http://lewesecoopopenhouses.org.uk/booking#JuggsRoad23rd>