

# Learning from Passivhaus living: CB1



## Property overview

**Date built:** Plot purchased in 2012, completed in 2015

**House type:** Detached

**Wall type:** Timber frame and walls

**Floor area:** 160 m<sup>2</sup>

**Cost of newbuild:** Not for disclosure

**Occupants:** 2 adults, 1 child

## Meet your host: Bea

I used to work in bioenergy and am acutely aware of how difficult it is to take carbon out of transport fuels, and how comparatively easy it is to lower the carbon footprint for buildings – hence I am keen to see low carbon buildings implemented in the UK.

We were interested in building a Passivhaus because mechanical ventilation and heat recovery (MVHR) filters out pollen from incoming air, minimising the symptoms of hay fever.

## Performance

Overall, we are very pleased with the performance of the house. The Passivhaus concept works at its very best in spring and autumn, when solar gain leads to beautiful warming of all rooms even during very cold periods. During summer, it is essential to provide shading via the external venetian blinds, else the house will overheat. Opening windows overnight in addition to MVHR air circulation helps to cool the house down if it has become too warm. In the depth of winter, when short days and gloomy weather prevent solar gain, we find we need to provide some heating in the living room and office via small electric heaters.

We are very glad to be able to use rainwater to flush toilets and water the garden. Only once in six years so far – during the 2019 heatwave - have we had to switch back to mains water for these functions. The water can be turbid and lavatory ceramics stain more easily and quickly, but it is worth it. We have had to have repairs to the pump twice, though.

When we first investigated the Passivhaus concept, we were not sure whether it would feel claustrophobic to live in a near-airtight building, and whether the mechanical ventilation would cause uncomfortable draughts. This is not at all the case; each room has at least one window that can be opened, and during summer when heat retention is not needed, we open them all the time. With only small behavioural adjustments it is a very comfortable place to live in.

[www.openecohomes.org](http://www.openecohomes.org)

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## Construction and materials

The main building material was wood for the frame and walls, with Warmcel (made from recycled newspapers) for the wall insulation. 300mm Earthwool (formaldehyde-free) was used for insulating the roof.

## Plans for the future

My dream would be to have an energy-independent house; we are keeping an eye on developments in solar- and battery-technologies for individual homes.

## Advice

Our tip is not to underestimate the carbon footprint of water usage; and to minimise use of drinking water where lower grade water will do. It is lovely to know we are not flushing the toilets with drinking water!

## Key specifications

### Energy usage

Energy kWh/m <sup>2</sup> /yr		
Total/yr	Summer low	Winter high
38.3	24	60

### Insulation

- Wall insulation (Warmcel)
- Roof insulation (Earthwool), 300mm

### Heating and Energy

- MVHR
- Solar gain
- Solar shading via external venetian blinds

### Water

- Rainwater harvesting for toilets and garden

### Natural materials

- Wood for building frame and walls
- Warmcel insulation (recycled newspapers)
- Earthwool insulation (formaldehyde-free)

## Key contacts, products and advice

### Professional Contacts

Project management: [Integrity Buildings Ltd](#)

Timber frame: [Anson Timberworks](#)

Joinery: Ashton Carpentry & Joinery email: [info@ashton-joinery.net](mailto:info@ashton-joinery.net)

Electrics: [Complete Electrical Solutions](#)

### Products

MVHR: [NIBE](#)

MVHR installation: [Eco East Anglia](#)

Rainwater harvesting [Eco East Anglia](#)

Insulation (walls): [Warmcel](#)

Insulation (roof): [Earthwool](#)

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