

Orchard Cottage: Near Passive New-build in Whittlesford



Property Overview

Project timescale: Nov 2020 - Aug 2021

Type: New-build near-Passive detached house

Wall type: Single layer Porotherm clay blocks

Floor area: 154 m²

Cost of Build: £480,000

Occupants: 2 adults, 2 children

Meet your hosts, Sally and Nik:

We purchased the plot in 2012, when it had a 1950s bungalow with two later extensions. The existing property was in need of some significant work, including repairs, improving energy efficiency and improving the layout. In a typical year, we used 10,000 kWh of oil for heating, and a further 2,000 kWh of electricity - this was clearly unsustainable. We were soon faced with the prospect of replacing the existing property, as we couldn't find a way of renovating to a sufficiently high standard given the limitations of the old house: aging materials, inefficient use of space and unknown structural characteristics. Since we were going to be undertaking major works, it seemed obvious that we should build a new house to be as low-energy as possible. Although primarily driven by environmental concerns, we were also aiming for a reasonably low-cost project.

Design, Financing & Construction

We were heavily involved in the design and specification, and were consulted on many of the implications of technical decisions, but the detailed design work was all completed by the architect. We did consider the payback periods for some of the individual items of technology, but not for the project as a whole e.g. payback analysis of rainwater storage showed that it wasn't worth having more than 1000 litres, so this guided our decision making.

Over the course of the project, we learned that:

- (1) Never assume that architects know what anything costs
- (2) Never assume that anyone is working on something if you don't hear from them.

We had to scale down our initial plans for a more interesting design to be able to afford the performance we wanted. However, we discovered that a Quantity Surveyor (QS) is an excellent source of advice, both in terms of keeping on top of the contractor but also for information about how everything works. Our QS was on a fixed-price contract so was the only person who didn't have a financial interest in the decisions we were making.

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Orchard Cottage, Whittlesford – 2022

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Full-height entrance hall & fused glass sliding door



Rockwool-filled extruded clay blocks





Southern aspect, with solar panels & arboreal shading

Performance

We've lived in our new home for a year now, and there is very little we would change: pretty much everything has performed as expected. We're so glad it's done!

Some of the design changes have clearly been beneficial E.g. moving the solar panels up by a floor height and turning them round from East to South-facing has significantly increased the amount of energy they now produce (from 2,800kWh/pa on the old house to 4,500kWh/pa in the last 12 months). The few design changes that had negative thermal impacts e.g. a velux roof light in the hall, were well worth the small loss in energy as the extra light is wonderful! And the choices of materials and fittings were also worth the impact on the overall budget.

If we were doing the project again, I would be much more diligent in chasing people up to do the things we were paying them for. Once they've mentally moved on to their next big project it's been hard to get people to refocus on finishing things off for us.

Future Plans

Completing the garage and installing a wood-burning stove were part of our original plan, and we hope to have both completed by the end of this year. Other than that, I think that we're due for a rest.

Our top tips:

- Visit homes & exhibitions to get lots of ideas before making any big/expensive decisions
- Talk to other people who have installed & used products or have the same aspirations about what works & why they chose them
- Choose products/changes that are most likely to have a positive effect on your current lifestyle or work in your home – not everything will work for you & small lifestyle changes can be effective.

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Key Specifications

Energy Consumption	Energy kWh/m ² /pa			Carbon kgCO ₂ e/pa	
	Oil	Electricity	Total	/m ²	/person
Old home (135m ²)	76.4	14.8	91	21.7	733
New home (154m ²)	None	29	29	5.7	218

Insulation & Glazing

- Insulated clay block construction (no other wall insulation)
- Triple & quadruple glazing
- Solar shading from eaves
- Integral Venetian blinds in windows
- Cool pantry

Heating & Energy

- 3.96kWp Solar PV used dynamically to heat hot water tank
- LED lights throughout
- Shower waste heat recovery system
- MVHR system

Water, Garden & Natural Systems

- Bamboo flooring
- 4 x 56-gallon beer barrels for rainwater storage
- 4 x swift boxes built into wall beneath eaves

Key Contacts, Products & Advice - all recommended:

Architect: [Gale & Snowden](#) based in Exeter

Main Contractor: [CJ Murfitt](#)

Quantity Surveyor: [Marstan BDB](#)

Bathrooms: [Nicholls & Clarke](#)

Kitchen: [Howdens](#) (~£9k)

Walls: [Porotherm Clay blocks by Weinerberger](#)

MVHR system: [Paul Heat Recovery](#)

Windows & Doors: [Ecohaus Internorm](#) (~£30k)

Glass Sliding Door: [Door by House of Ugly Fish](#) (£3,500)

+ Mechanism by DR Services (~£750)

[Showersave Waste water Heat Exchanger](#) (£400)

Solar Electric: [Apollo GEM Solar Energy Device](#) (£250)

Flooring: [Bamboo Flooring Company](#) (£28/ m²)

