People Exploring Low Energy Homes

Auckland Road, CB5 8DW

Jeremy Ashworth and Emma Parkes – they say:

We are both fully qualified Architects, running our own Cambridge based practice, Ashworth Parkes Architects.

We purchased the site for our house in 2006. It is very small, measuring 7.5m by 10.5m, and is flanked by 3m high walls to the East and the North, and a 2m high wall to the West.

The house is clad in a **larch rainscreen**, there is a **grass and wildflower roof** and **several rooflights** to mitigate the restriction on windows on three of the main elevations.

A key idea in the house was trying to create **different spaces and little moments of interest** that would help to make the house feel larger than in fact it really is.

Overview

Age, Type: **2009, Custom built, Detached**

Wall type, Floor area: **Combination of concrete existing garden walls and timber, 155 sq m**

Project timescale: **Planning 3 yrs, Build 1 yr**

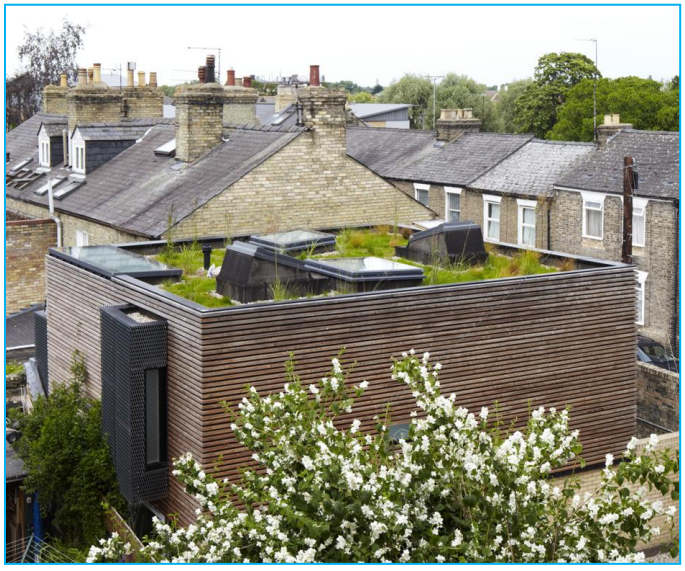
Cost of build: **£240,000**

Energy usage – 2 adults, 2 children

32 kWh per sq m pa electricity
55 kWh per sq m pa gas
80 cubic metres pa water = 45% of regional average

Key features

+ 'keep it simple' principle: maximise insulation, natural daylight, air-tightness
+ insulation: roof, walls, floors, green roof
+ thermal mass: concrete, temperature moderation
+ underfloor heating
+ stack effect: hot air buoyancy, passive heating
+ daylight: roof lights
+ flooring:
+ windows, doors: high-performance double-glazed
+ lighting: low energy throughout
+ condensing gas boiler
+ energy efficient appliances
+ water: dual low flush toilets, green roof



Low Energy Measures

Our aim was to design a practical efficient house that would use as **little energy as possible** using the **'keep it simple' approach**. That is, **insulate as much as possible**, **maximise on natural daylight** and build to a good standard of **air-tightness**.

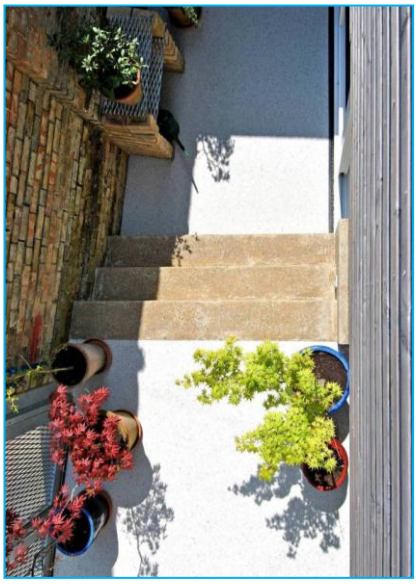
We used 175mm of **sheep's wool insulation within the walls and the roof.** On the roof, we also incorporated 200mm of **soil to create a semi-intensive green roof,** this roof, as well as providing even **more insulation**, means that rate of rainwater run-off from the roof is reduced dramatically. The planting on the roof also provides an environment for biodiversity.

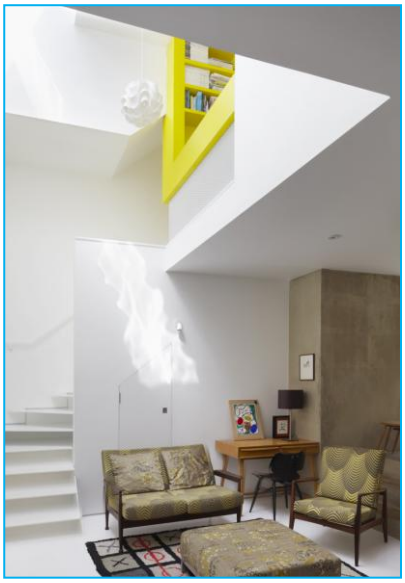
Within the house, on the ground floor, is a lot of **exposed thermal mass** in the form of the large elements of **fairfaced concrete**, that we use to **moderate the building's temperature**, keeping it warm in winter and cool in summer.

The ground floor has an **underfloor heating system**, but there is no heating to the first floor apart from two heated towel rails in the bathrooms.

The **natural buoyancy of the hot air** means that it **rises up the double height space**, into the first floor of the house in the winter, and the levels of **insulation mean that the first floor of the house warms up** very nicely **without need for heating** of its own.

The house is behind high walls on three sides and the number of windows were severely limited for planning reasons. We used a number of **rooflights to maximize daylight** within the house in order to **limit the time that artificial lighting** is used.





Future Plans

We are keen to continue to **work on sustainable projects**, however grand or small, and address each with the **simple approach**, or in other words **'sustainability without too much stuff'**.

In many cases the best results are achieved where the **environmental characteristics of the building** are designed into the fabric, thus the **elements with the most benefit**, from a cost and environmental point of view, **become intrinsic to the design**. There is little merit in installing technologies such as photovoltaic cells without **maximising on such things as insulation and air-tightness first**.

Professional Contacts

Architect: Jeremy Ashworth and Emma Parkes, Ashworth Parkes Architects
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Groundworks and Concrete: Westwood Structural Services dave@westwoodstructuralservices.co.uk
020 85020203

Carpenter: Richard Barker,
rmbarker63@googlemail.com 07970 596868

Structural Engineer: Gary Elliott,
info@elliottwood.co.uk 0208 544 0033

Heating Engineer: Kevin Turner, 07810 697233

Roof works: Semi-intensive green roof by Camflat Roofing Ltd www.camflatroofing.co.uk
01223 835400

Products

Insulation

Underfloor: 100mm Rockwool Rockfloor below 75mm underfloor heated screed
www.rockwool.co.uk

Walls: 175mm thickness thermafleece natural undyed sheeps wool insulation, Black Mountain Insulation Ltd www.blackmountaininsulation.com
01745 361911

Green Roof: Zinco System by Alumasc Exterior Building Products www.alumascwaterproofing.co.uk
01744 648400

Windows

Windows: Composite timber aluminium inward opening windows, double glazed, argon filled Glasfacades www.glasfacades.com 020 7561 8749

Rooflights: Fixed and opening flat roof rooflights Glazing Vision Ltd www.glazing-vision.co.uk
0333 8000 881

Flooring

Ground floor & bathrooms: White resin floor Stratum Resin Flooring www.stratum.uk.com 0970 7704316

Heating

Gas Condensing Boiler: EcoTech Plus by Vaillant
www.vaillant.co.uk