

People Exploring Low Energy Homes

Magnolia Close, CB1 9TU

Barbara and Peter – they say:

We've always wanted to build our own house, but building plots are rare so we waited until a property suitable for demolition came on to the market. We bought a 1960s bungalow with poor insulation and internal layout, but a south facing aspect.

We were keen to build a low impact contemporary house with ground floor living spaces, kitchen, living and dining rooms connected to garden.

Light and space were very important considerations in the design phase. The planners were very supportive and recommended that the scheme be given approval at committee because the property 'enhances the local environment'.



Low Energy Measures

The house is constructed using a **timber frame** on a substantial deep strip concrete foundation. The frame work is partially clad with sweet chestnut and partially rendered. The roof is zinc sheeting.

The **insulation** for the house comprises **blown cellulose fibre**, which is recycled newspaper, and **wood fibre boards**. We also have high performance **triple glazed windows and doors**.

The building incorporates a number of integrated environmental and MVHR passive (solar) design features. Because we face due south we are able to maximise solar gain and have large glazed units at the back of the house for this purpose.

Also the design allows an abundance of **natural light** to flood in to all areas. The **rear overhang** of the upper section prevents the downstairs living areas overheating in summer, whilst upstairs **external louvres** are fitted for the same reason.

We wanted a **mechanical heat and ventilation recovery (MVHR)** system and this has been brilliant, controlling the house ventilation and keeping fresh clean air in all parts of the property.

We have six **photovoltaic (PV) cells** on the kitchen roof, providing half our electrical usage and a net income of £200pa - an efficient return!

Underfloor heating throughout is powered by a **condensing gas boiler** and allows great flexibility in controlling the **heat efficiency** in parts of the house not being used.

A **woodburner** provides supplementary heat, which we use on cold winter nights.

Our **entrance lobby** provides an efficient barrier to any heat loss from the house and the utility room puts out lots of heat!

Overview

Age, Type: **2010, Custom built, Detached**

Walls, Floor area: **Timber framed, 220 sq m**

Project timescale: **Planning 2 yrs, Building 1 yr**

Cost of build: **£400,000 +**

Energy usage – 2.5 adults

After: **11 kWh** per sq m pa electricity (new home)
33 kWh per sq m pa gas (new home)
1 cubic metre logs pa for woodburner

Before: **18 kWh** per sq m pa electricity (old home)
72 kWh per sq m pa gas (old home)

Key features

- + insulation: roofs, walls, floors
- + thermal mass: substructure, floors, features
- + windows & doors: high-performance triple glazed
- + air-sealed entrance lobby
- + underfloor heating
- + condensing gas boiler
- + woodburner
- + mechanical heat & ventilation recovery (MHVR)
- + passive solar gain, natural light south facing
- + external louvres, small north facing lights
- + photovoltaic (PV) cells
- + low energy lighting, LEDs
- + water: flow restrictors, low flush toilets, water butts
- + biodiversity: pocket habitats, bees, butterflies

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Other environmental features

- flow restrictors on taps, and dual flush toilets,
- large water butt (900L) to collect rain water,
- low energy lighting with numerous LEDs fitted,
- small glazing areas to north facing elevations,
- thermal mass to substructure, floors and features,
- ballasted brown roofs,
- native flower pocket habitats to support bees, butterflies and wildlife.

Overall we achieved 59% performance improvement on then current building regulations for emissions.

Professional Contacts

Architect: Gavin Langford Architects
www.gavinlangfordarchitects.com 01223 847200

Builder: Britania Build www.britaniabuild.com
01638 666605

Structural Engineer: Haskins Robinson Waters
www.engineers-hrw.co.uk 020 74079575

Products

Biodiversity: pocket habitats on flat roofs,
Grey 2 Green www.gey2green.co.uk

Wood stain: Osmo natural Oil

Flat Roofs: Evalastice membrane

Pitch Roof: CEL Ltd Rheinzink zinc

Floors: Forbo Marmoleum acoustic, Reeve oiled oak
and Stonell basalt, honed and sealed

Timber Cladding: Vincent Timber, sweet chestnut

Ironmongery: John Planck Limited

Mesh Screen: Mesh UK

Insulation

Roof and Walls: Excel Warmcell; Excel Panelvent;
Natural Building Technologies Pavaclad

Timber framed cavities 200mm; Flat Roofs 280mm;
Pitched Zinc Roof 260mm

Floor Insulation: Celotex

Windows and doors – triple glazed throughout

External doors and windows: Green Build Store

Internal doors: Bridgeman Doors

Pitched Roof Windows: Velux

Flat Roof Lights: Glazing Vision

Heating system

MHVR system: £6500

Underfloor heating: thermostats in each room,
controlled centrally from service cupboard £8500

Condensing boiler: £2000

Woodburner: Ivett & Reed HWAM Vivaldi 4.5Kw
www.hwam.com £2500

Passive solar gain: South facing windows and roof
lights

Photovoltaic panels