

15 Lloyd Close, Hove BN3 6LZ



Overview

Period / age of house:	2010
Type:	Detached
No of bedrooms:	3
No of other rooms:	3
No of floors:	3
Floor area:	170m ²
Cost:	£550,000
Wall:	Timber frame

Features

- + natural materials
- + solid timber frame construction
- + airtight construction
- + photovoltaic panels
- + solar thermal panels
- + biomass boiler
- + underfloor heating
- + rainwater harvesting
- + green roof
- + zero carbon

Introduction and approach

This is a recently completed new build detached eco house designed by eco architects Mark Pellant and Abi Torr of Koru Architects for their family.

The house is zero carbon, benefiting from a good orientation, very high levels of insulation and air-tightness – which exceed building regulations. A wood pellet boiler and solar thermal array provide the small amount of heat required. A large underground rainwater harvesting tank provides water for flushing the toilets. The photovoltaic array exports energy to the 'grid'. Materials are mostly natural, low impact and environmentally friendly and reflect the architects' desire to promote green architecture.

For Mark and Abi, the house is the realisation of a long held dream, following a five year journey of searching for a suitable site in Brighton & Hove, negotiating, designing and finally building their house.

Energy efficiency measures

The house is very well insulated with 300mm hemp insulation in the roof, 100mm hemp plus 160mm wood fibre insulation in the walls, 200mm hemp plus 30mm wood fibre insulation in the floors. The windows are high performance double-glazed with timber frames. U-values: walls 0.15w/m²k, roofs 0.20w/m²k, floor 0.24w/m²k, windows 1.40w/m²k. The tested air-tightness level is an impressive 1.5m³/h/m². The living rooms and bedrooms have been positioned on the south side of the house and have large areas of glazing to benefit from passive solar gain, while the bathrooms and utility are situated on the north side and have relatively small windows. There is a generous roof overhang and louvred solar shading to the south façade to reduce summer over-heating and high-level rooflights draw air through the house to assist with cooling during the hotter months.

Renewable energy systems

A 6kW Schuco Premium line solar thermal system has been installed on the south-west facing sloping roof which will yield approximately 2,200 – 2,400kWh annually. This energy is fed into an 850 litre accumulator tank for heat distribution to the under-floor heating system and domestic hot water recirculation system. A 10.5kW fully automated wood pellet boiler also feeds into the accumulator tank to supplement the solar thermal energy. The south-west facing sloping roof also accommodates twelve 340W Schuco Premium line photovoltaic panels giving a peak output of 4.08kWp and an estimated annual output of approximately 3,335kWh. This energy is fed back to the grid when not being used within the house.

Improvement of efficiency of electrical systems

The lighting for the house is 95% low energy, consisting of a mixture of compact fluorescent fittings and LED fittings. The kitchen appliances and all heating pumps are A rated and above.

Water

All the taps and showerheads have been specified with low flow rates and the WCs are dual flush. A 4,700 litre Freewater UK Elite rainwater harvesting system has been installed to supply the WCs, the washing machine and outside tap.

Materials

The house has been largely constructed from natural materials that breathe including solid cross-laminated timber frame, hemp and woodfibre insulation, lime-based render, oak cladding, zinc roofing, sedum roofing, oak flooring and natural paints and hard oils.

Code for Sustainable Homes

We were aiming at Code Level 5 for our house and, now it is almost complete, we have calculated it will actually fall short of Level 5 by 2 points. Although we have scored almost maximum points in almost all categories of the Code, we have lost the Lifetime Homes points because the house is built on a sloping site and we have lost points under security as our external joinery was fabricated by a local joiner and not part of the 'secured by design' scheme, even though the joinery was up to that standard. We lost further points as our main contractor was not part of the 'considerate constructors scheme', even though he managed the site as expected by the scheme. This perhaps highlights some of the failings of the Code.

Professional contacts

Architects: Koru Architects – www.koruarchitects.co.uk

Structural engineer: QED – www.qedstructures.co.uk

Thermal modelling: John Packer Associates – www.jpaa.co.uk

M&E engineer: Robinson Associates – www.robinsonengineers.co.uk

Air pressure testing: Falcon Energy Ltd – www.falconenergy.co.uk

Lighting consultant: Cadenza Lighting – www.cadenzalighting.co.uk

Landscape architects: Incredible Gardens – www.incrediblegardens.co.uk

Main contractor: Coastal Building Services

Piling sub-contractor: Southern Piling – www.southernpiling.co.uk

Solid Timber super-structure installer: KLH UK Ltd – www.klhuk.com

External and internal timber joinery supplier: Westgate Joinery – www.westgatejoinery.co.uk

Zinc roofing sub-contractor: Imperial Leadwork – www.imperialleadwork.com

Green roof sub-contractor: Cobsen-Davies – www.cobsen-davies.co.uk

Plastering and rendering sub-contractor: B Mather Plastering

Ventilation sub-contractor: Service Vent Ltd – www.servicevent.co.uk

Electrical sub-contractor: D A H Electrics

Heating and plumbing sub-contractor: Verdi Environmental Ltd

Underfloor heating sub-contractor: Jupiter Heating Systems Ltd – www.jupiterunderfloorheating.com

Wood pellet boiler installer: Kithurst Builders – kithurstbuilders.co.uk

Solar thermal and PV array installer: Freesource Energy Ltd – www.freesource.co.uk

Timber flooring supplier: Broadleaf Timber – www.broadleaftimber.com

Ceramic tiling supplier: Royal Mosa – www.mosa.nl

Cabinet joinery: Aaron Miller Woodworking

Fencing sub-contractor: Vertwood Ltd

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