

Sedgwick Rd – CB1 3AL

Stylish low energy new build by the author of *Housebuilder's Bible*.

Meet your hosts Mark and Mandy

Mark says...

Mandy and I sold both of our homes so we could build this one together. We wanted to build something contemporary and worked with Meredith Bowles and Sasha Edmonds of Mole Architecture in developing a new build design.

We demolished a 1930s warehouse, the only commercial building on an otherwise Victorian residential street, and replaced it with a contemporary-style house. Whilst the planners and neighbours have generally been very supportive, the fact that the neighbourhood has recently become a Conservation Area has meant that our plans have been through a few modifications during the 18-month planning process. At each turn in the planning process, the size diminished and the shape became a little more interesting and a little harder to build. As a result the design is interesting but not as energy efficient as it could be.

Building design and the Low Energy Building Standard

I have been interested in low-energy building since the 1970s, and have been delighted by the growing interest in Passivhaus in recent years. But because of the nature of the build site we decided it would be just too troublesome to make ours a Passivhaus. The further you get away from a rectangular box, the harder it gets to build in an energy-efficient way. We now have a design which mixes single with double storey, and includes no less than 14 surface planes, about double the ideal Passivhaus number.

The Passivhaus design software can cope with this but it also demands increases in the wall thickness. On a narrow site, which of course is what we have, wall thickness is a critical factor. 50mm here and there is the difference between getting a wardrobe that works and one that is an annoying waste of space.

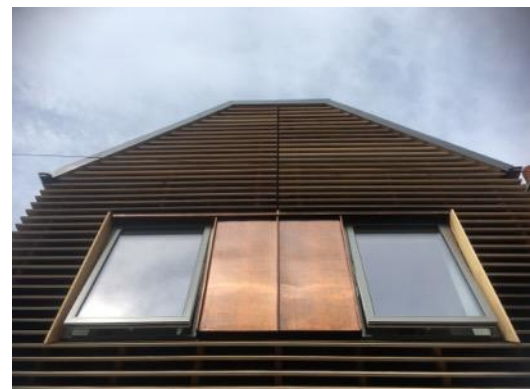
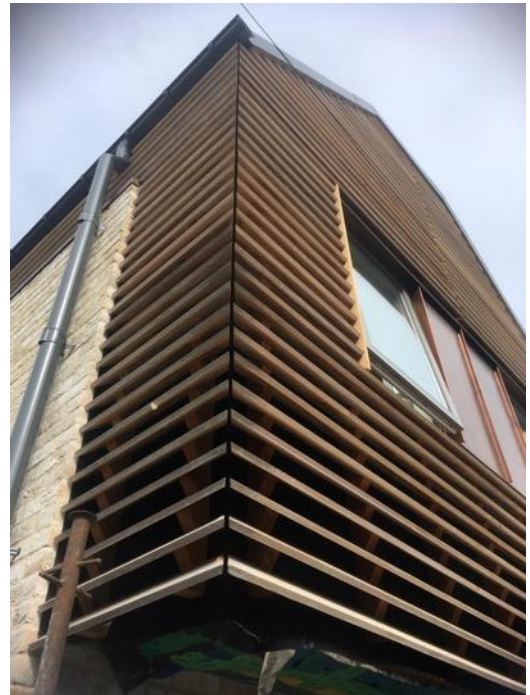
We balanced conflicting desires, budget considerations and site restrictions and decided to go for what could be described as a Passivehaus lite standard known as the Low Energy Building Standard. LEBS is still exacting and very much better than current British Building Regulations.

Wall construction

The walls are constructed using structural insulated panels (SIPs) manufactured by Kingspan Potton with an extra 70mm of external insulation. These are factory manufactured cut to fit wall panels, made up of two OSBs (oriented strand boards) with foam insulation in-between. They are exact, very fast to build and easily achieve good U-values and air tightness.

Heating

Heating costs are very low compared to most new-builds, because of the LEBS standard. The difference in annual heating cost between the LEBS and Passivhaus for this house is about £100. £200 for LEBS and £100 for Passivhaus. Underfloor heating in the kitchen is the primary heating source. We also have a



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mechanical ventilation and heat recovery (MVHR) unit called Paul. This extracts heat from stale air as it leaves the house, which is then used to warm cooler fresh air being pulled in.

Energy

To reduce heating demand further we're using a 3.5 kW PV array fitted with an Iboost switching system that allows us to use excess electricity generated by the PV panels for water heating. This saves us almost double the power we would save by switching from LEBS to Passivhaus.

Glazing

The site has also dictated the window positioning, size and type. The house can't have windows to the south and north because of planning restrictions, and the east faces the street. As a result the large west-facing triple-glazed windows are Low G to reduce the chance of summer over-heating. Low G glazing reduces the amount of solar radiation that passes through the glass from 60 per cent to 30, keeping the house cooler than it otherwise would be. This reduces potential solar thermal gain in the winter but this is less of a problem than summer overheating. We also have a sliding flat roof window in the kitchen manufactured and installed by Cantifix. This increases daylighting in the kitchen/dining room area without overlooking the neighbours.

Working with the neighbours

We set out to work with the neighbours from the off. After some initial suspicions, all of them supported the project and proved to be very helpful, as it involved access to three gardens and closing off a couple of side passages with scaffolding for nine months. It wasn't a perfect process – we upset one neighbour when we made a post-planning change to a window position and failed to notify them. In retrospect, precisely what I was striving to avoid throughout the build and managed to completely overlook. It's a tricky process – I've never had so many plates spinning at the same time and trying to do it all to a deadline was very challenging.

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Property age: 2018

Type: New-build detached

Wall type: Structural Insulated Panels (SIPs)

Floor area: 148

Cost of build: £420,000

Occupants: Two adults

Insulation and Glazing

- Low Energy Building Standard Construction
- SIPs by Potton Homes + 70mm extra insulation
- 230mm floor insulation
- Low G triple glazing
- Sliding flat roof window

Heating/energy

- Underfloor heating downstairs
- Paul mechanical ventilation with heat recovery (MVHR) with air tightness of 1.0
- 3.5 kW PV system (with Iboost switching) inset in to zinc roof
- LED lighting throughout
- High efficiency appliances

Other features

- Zinc roofing panels
- Copper 80 wall plates
- Louvered cedar wall cladding protected with Organo Wood, a natural wood treatment
- Soakaway

Key contacts, products and advice

www.molearchitects.co.uk architects

www.wholehouseenergy.com

www.artisanstructures.co.uk carpentry

www.potton.co.uk SIPs construction

www.whiteroofingservices.com

www.artisanstructures.co.uk

www.huttie.com electrics/renewables

www.conisbee.co.uk structural engineers

www.mead-construction.co.uk

www.cjacksonandsons.co.uk demolition

www.lathamconstruction.com site prep

www.cambridgegrandscapes.co.uk garden

www.myspacestudios.co.uk studio

www.cantifix.co.uk

www.livingwoodwindows.co.uk

www.midsummerenergy.co.uk

www.camtechbp.co.uk

www.tomas-kitchen-living.co.uk

Burwell Building Services – 01638 604897

Housebuilder's Bible 12 by Mark Brinkley is the UK's best-selling building guide.

