

Sheepfair eco-refurbishment 2009-2010

We moved to Lewes in 2008 and chose this 1950s Nevill house, smaller than our previous Victorian terraced house. The garden slopes gently south and there is a south-facing gable wall overlooking a flat-roofed extension built in 1965. The house is nearly on the Downs and is windy and cold at times. It had solid floors, double-glazing, insulated cavity walls, but little other insulation or draught-proofing. There is a bedroom and bathroom on the first floor that make it quite difficult to insulate. The bathroom has a dormer window facing west, and there is a window seat in the east-facing dormer.

We were advised by a sustainable building designer, [Maria Hawton-Mead](#), and an ex-builder and engineer, [Ken Neal](#), who provided technical drawings and calculations. They had both been on a green architecture course at the Centre for Alternative Technology. The builders, who have long experience of this kind of work, were [Chalmers & Co.](#)

We have super-insulated the roof around the bedroom and bathroom, put insulation on the outside of the walls, and added a porch and sunspace to trap warmth, as well as solar hot water and solar PV to generate some of our electricity. By reducing heat loss from walls and roof, we hope to compensate for the concrete floors where we cannot insulate very much. We are reducing electricity use by fitting compact fluorescent bulbs and LED lights everywhere, making sure we can switch off individual lights and appliances, and having a sunpipe to bring daylight into a windowless room.

Changes include:

1. Insulation of gable wall on outside. Because of not wanting to extend the roof over the gable, the insulation had to be as thin and efficient as possible: this is what led to the choice of Celotex. The thickness is 90mm.
2. Insulation in loft above first floor rooms; insulation of first floor room eaves and skelings (sloping ceilings). Celotex polyurethane foam is used on sloping parts and awkward spaces, and Warmcel recycled newspaper loose fill in the loft and where otherwise practicable. The loft hatch has been built up to keep in the Warmcel, and the hatch lid itself insulated.
3. We have had to compromise a bit with the slope near the bedroom door, to avoid losing too much headroom. There is only one 90mm thickness of Celotex instead of two. On the other side, in the wardrobe, we have the full thickness.
4. A layer of insulation on the sides of the dormers (90mm Celotex), and render on the sides. The roof of each dormer has 180mm of Celotex, a breathable membrane, and new roofing felt on top. The appearance has not changed much but looks good.
5. Thick Celotex insulation (180mm) on top of existing extension room flat roof.
6. Removal and replacement of concrete gutters and insulation around blocks left when gutters removed, so as to insulate ground floor ceilings fully.
7. External insulation of walls on ground floor below gutter level (cavities already filled) including walls of extension room.
8. There is even insulation inside the garage because this forms part of an outside wall of the extension room. There is insulation inside the sunspace on the house external walls, because the sunspace counts as outside.
9. With all this insulation, heat loss could still occur through draughts – we depended on the builders' attention to detail to ensure gaps were filled. A breathable membrane was used in many places to let vapour (water in the air in the form of a gas) pass through and avoid having a cold impermeable surface where condensation could occur. Ken Neal specified Klobo Perma Forte membrane. We have had to fill gaps in obscure parts of cupboards because, even after all this, there were some unexpected minor draughts. There was a bigger problem in the bathroom, where it was difficult to seal the heat-store cupboard area because the equipment took more space than anticipated.
10. Rewiring throughout to replace 1950s wiring. Sufficient switches to enable lights to be turned off independently. We are choosing fittings taking low energy bulbs and generally simple light fittings. Under-cupboard lights in the kitchen are LEDs.
11. Enlargement of downstairs loo to accommodate shower.
12. New hearth for fireplace in Welsh slate from Blaenau Ffestiniog: Grey Slate and Stone Supplies 01766 514700.
13. Wood-burning stove ([Stratford Eco boiler](#) from www.bolneystoves.co.uk) in sitting room, with back boiler and a heat store upstairs serving the radiators and also receiving hot water from the solar hot water panel and new gas condensing boiler (as back-up). We have managed mainly with the stove during the winter, with only occasional use of the gas boiler.

We should manage better next winter by having a woodstore and being more organised about wood supply. We can also put some wood in the garage and sunspace. We estimate we shall use about 4 tonnes a year. We get ours in bags from Sussex Roundhouse (07815148034 & <http://www.fromthewood.com>). OVESCO <http://www.ovesco.co.uk> has a list of reputable local suppliers, an advice sheet on wood, and much other information on renewables and energy efficiency.

14. Renewal of upstairs bathroom with water efficient loo but keeping existing bath and washbasin.
15. Enlargement and refurbishment of kitchen northwards, making study smaller. New French windows into sunspace.
16. Extractor fans in shower room, bathroom and kitchen, one with heat exchange.
17. Rainwater collection system with outside tanks and provision to add to it. The internal piping and header tank in the loft have been done with the [Rain Director](#) system recommended by [Simon Beach](#), of the Greener Alternative, who did the stove and plumbing. The two tanks we have so far are ex-juice containers, each 1000 litres in volume, from D&V Fuels in Wrexham, N. Wales. Cost around £140 for two plus carriage.
18. A sunspace (unheated conservatory) around kitchen in locally grown coppiced and finger-jointed sweet chestnut from Inwood Developments www.in-wood.co.uk. This has an insulated tiled concrete floor to act as a heat collector. It is double glazed, as are the house windows looking into it. The sunspace and the new windows and doors have been made in chestnut by AA Taylor, a small woodworking company in Brighton: www.aataylor.co.uk.
19. New windows as needed: east dormer, study, kitchen and extension room, in sweet chestnut. Existing PVC windows kept where functioning well. New windows directly onto the outside are triple glazed.
20. One new window unit (low-E argon filled double glazed) to replace a cracked one at front of house but other two at front not changed. We plan insulated Roman blinds.
21. To get daylight into the shower room, we have a 300mm diameter sunpipe similar to <http://www.monodraught.com/other-products/monovent/index.php>. There is also one to light a dark area of the bathroom. A dome on the roof catches the light, and a tube lined with highly polished aluminium reflects it downwards, including around bends.
22. A new front door with an unheated lobby behind and an inner door to conserve heat.
23. New doors into sunspace from kitchen and hallway.
24. We have reused old doors to rooms where possible.
25. Flooring in a laminated cork with additional 10mm of cork insulation sheet underneath everywhere downstairs except the shower room and sunspace. There is existing parquet in two rooms, and after some consideration, we will be covering this. Cork flooring – Cityfloors www.corkfloor.co.uk: cork flooring planks for kitchen, study, hall and extension room: UNICLIC Floating Floor (Colour: Sand)
26. Solar hot water tubes on the garage roof supplying hot water to heat-store in bathroom. These are from [Southern Solar](#) who are based in Offham near Lewes. We are getting credits from Good Energy gas for the heat produced.
27. Photovoltaic (PV) panels to generate some of our electricity, and export some when we have surplus. Nine panels (180W peak each) are mounted on the flat extension roof. These will supply more than 1170 kWh per year. Good Energy will pay us for what we produce, and we keep the savings we make on sunny days.
28. Kitchen designed by Tom Snell, (tom@tomsnell.eu 07974 707158) using mainly FSC birch ply. Existing 1950s gas cooker. Kitchen surfaces in stainless steel from Top Notch fabrication (01273 857711), on a standard mdf board.

There are some details and updates on a Guardian website:

<http://www.guardian.co.uk/environment/series/green-your-home>

Also see <http://www.sustainable-energyacademy.org.uk/superhomes/lewes-sheepfair> Assessors from SEA's Old Home Superhome scheme have calculated from the plans and by visiting, that the house now requires 72% less energy than previously. This is calculated for typical occupancy.

Email ann@sharedenergy.org.uk for a copy of this information with live links to websites

Ann Link and Richard Hudson, March 2010.