Flat 12, 27 Bedford Place, Brighton BN1 2PT

OVERVIEW
Age: 1980s
Type: Purpose built flat (top floor)
Beds: 2
Floors: 1
Walls: Cavity rendered
Area: 48 m²
Residents: 2 adults
Conservation Area

FEATURES
+ Condensing boiler
+ Double glazing
+ LED lighting
+ Loft hatch – insulated and draughtproofed
+ Loft insulation
+ Solid Wall insulation (Internal)

Introduction and approach

When Kathy and Andrea bought this flat in a Conservation Area just before Christmas 2012, it was boarded up and in an appalling state. Since then they have achieved wonders in clearing out soiled carpets and filthy mattresses, to get down to restoring it and making it energy efficient.

First step was to just catch the last of the free deals for loft insulation and have 270mm of mineral blanket put in the loft. Next, the old boiler was replaced with a much more efficient condensing combi, and the leaky single glazed rear windows and door were exchanged for modern double glazing. Lighting is also being changed to ultra low energy LEDs.

At this point, a Green Deal assessment took place, primarily to tackle the much harder technical challenge of internal solid wall insulation.

For the future, as soon as planning approval is received, the front single glazed windows will also be changed for new double glazing, to complete the package. Planning permission may be required when replacing windows in a flat or in a Conservation Area. Asking the Local Planning Authority is always advisable.

As a result, a run down 1980s flat has been quickly transformed into a cosy, superinsulated space with much reduced energy bills.

Energy and CO_2 performance

As the work has only recently been completed, it is not yet possible to measure the impact of energy saving measures on consumption and CO_2 emissions. However it is estimated that these should be about 70% lower than a typical UK dwelling.

Energy efficiency measures

Heating and hot water

On acquiring the flat last year, one of the first steps Kathy and Andrea took was to install a new Worcester Bosch condensing boiler. This immediately improved heating and hot water efficiency by 10–15%.

Insulation

The 270mm of loft insulation, installed via CERT, was not only the cheapest, but also one of the biggest impact measures to reduce heat loss. This has been further improved by the installation of a new, draughtproofed loft hatch.

The flat has cavity walls, but it was not certain whether they had been filled properly, or at all. The project therefore worked on the premise that they were not and had a poor u value of 1.5 W/m²K.

As this forms part of a larger, purpose built block, external wall insulation would not have been possible for appearance reasons, nor was it practical for a high, third floor flat. Instead, the walls have been lined with internal solid wall insulation. On the front and back walls this is in the form of 70mm phenolic foam boards mechanically fixed to the plaster using wide head plastic anchor bolts. This solid foam layer was then skimmed with resin-based render, into which was bedded a tough fibrous mesh, with the wall finished with normal multifinish plaster. This method allowed the maximum possible proportion of insulation in the overall thickness, thereby saving space.

The side kitchen wall was tackled differently, in that it was important to leave a robust surface to which kitchen units could be securely screwed. 70mm phenolic board was again used, but in this case it was inserted between 70 x 50 studs fixed to the wall, over which was fitted a 12mm skin of plywood, then a layer of 9.5mm plasterboard which was finally skimmed with multifinish plaster.

The flank wall bordering the staircase also presented problems in that 70mm phenolic board could not be used, as it would have compromised the width of the passageway. Instead 30mm phenolic was used, again mechanically fixed to the wall and coated with the render/mesh/plaster combination used elsewhere.

These methods enabled wall u values of below 0.30 W/m²K to be achieved nearly everywhere, with the staircase only slightly lower,

cutting wall heat losses by over 80%.

Double glazing has recently been fitted at the rear, which will cut window and door heat loss by around two thirds. This has not yet been done at the front, where the existing single glazing is a major source of heat loss and suffers from condensation in the bedrooms. Installation has had to be delayed as the flat is in a conservation area and planning consent is necessary. However, this should be done shortly.

Electricity

The flat is still being refurbished, but will eventually have low energy LED lighting throughout, cutting the lighting load to 10–20% of old halogen and incandescent lamps.

Lessons learned/ further improvements

Although the flat was already being refurbished, Kathy and Andrea were initially living there, which was not an ideal situation for installing internal wall insulation. The installation process was very disruptive, involving the temporary removal of the boiler and sink in the kitchen as well as extensive plastering work, which was inevitably messy and disruptive. On reflection, such a comprehensive refurbishment would best have been done with the residents moving out for a couple of weeks.

When a property is occupied during refurbishment, it is essential to coordinate the various trades, to minimise the duration of disruption.

Because of the timescale for the work, internal wall insulation was fitted before the front windows were replaced. Normally this would be easier to accomplish after the new windows were in.

Some costs of the energy efficiency measures

Please note that these do not include a Green Deal Assessment or project management of the works

Solid walls internal	8,225
Move condensing boiler & re-fit including moving any pipe work	1,879
Fit insulated, draught proofed loft hatch with integral ladder	1,084
Total	**11,188**

Professional team

on behalf of The Green Building Partnership

Project Management
Earthwise Construction: www.earthwiseconstruction.org

Contract Management
The Green Building Partnership: www.greenbuildingpartnership.co.uk

Design
Cityzen: www.cityzendesign.co.uk

Solid wall insulation
Beaumont Facades: www.beaumontfacades.co.uk

Carpentry
Minton Young: www.mintonyoung.com

Electrics & plumbing
Woodmans: www.woodmans.net

Materials

Wetherby insulation system: www.wbs-ltd.co.uk

Insulation board: Kingspan Kooltherm Phenolic. www.kingspaninsulation.co.uk

This house was renovated as part of the Green Deal Pioneering Places project delivered by Brighton & Hove City Council, Brighton & Hove 10:10, The Green Building Partnership and Low Carbon Trust. The project was funded by the Department of Energy & Climate Change through the Local Authority Fund

Eco Open Houses is an annual collaborative project between Low Carbon Trust, Brighton Permaculture Trust and Brighton & Hove City Council. This year the event is run as part of the ECOFab 2 project and has been selected within the scope of the INTERREG IV A France (Channel): England cross-border European cooperation programme and is co-financed by the ERDF. The Green Deal strand of the project has been funded by the Department of Energy and Climate Change through the Local Authority Fund