

LZ CARBON PROFILE

Profile: 001
February 2009



Bramall's Windmill View House

Level 4 Code for Sustainable Homes

CO2 emissions: **At least 44% reduction over Part L2006**

Developer: **Bramall Construction**

Architect: **Acanthus WSM Architects**

Completed: **January 2008**

Location: **Halifax, West Yorkshire**



The Windmill View House is part of a social housing development. Around 67% of homes are for rent with 33% offering affordable shared ownership through Pennine Housing Association. Conventional masonry construction is used for a traditional appearance, in keeping with the local character. The house (a pair of 84m² semi-detached 2- storey, 3- bedroom homes) is notable as the first in the country to be fully certified to the Code for Sustainable Homes and lived in.

The cost of the home was kept low as it is in an area with significant social housing need. Similar homes on this development are available (on a shared ownership basis) from £62,500. The higher thermal performance of the building envelope combined with the use of micro-generation should significantly reduce running costs.



Low carbon approach

Fabric Highly insulated walls and roof, high performance windows and low air permeability reduces heat losses through the building envelope.

The high thermal mass and passive cooling of the masonry wall and floor construction moderates daily and seasonal temperature fluctuations.

Heat and power generation A mix of heat recovery and micro-generation technologies, including combined air source heat pump/ mechanical ventilation heat recovery, a solar thermal array and roof photovoltaic tiles.

Outline energy strategy

The design involves improving building fabric performance and shows how, with some supporting micro-generation and low-emission heating equipment, significant reduction (>44%) in CO₂ emissions is achievable.

Envelope

Walls U = 0.12 W/m²K

300mm cavity fully filled with water repellent glass wool slab insulation, which is free of material with ozone depletion potential.

Roof U = 0.10 W/m²K

450mm of glass wool roll insulation consisting of three 150mm thick layers with first between joists, second at 90 degrees to first and third at 90 degrees to the second.

Windows U = 1.2 W/m²K

Double glazed with low e glass, krypton gas filled, insulated edge technology and uPVC frame.

Airtightness 5.0 m³/m²/hr at 50 Pa

First floor ceiling plasterboard fixed prior to wall studding to reduce number of joints and minimise air loss into roof void.

Low carbon heat and power

Combined MVHR and Air Source Heat Pump

A NIBE 'Fighter 360P' system provides mechanical ventilation and space & water heating. Rooms are heated by low heat radiators.

PV Roof Tiles 0.62 kWp 4.6m²

Solar Century PV laminated roof tiles provide renewable electric power while maintaining the aesthetic profile of the tiled roof.

Solar Thermal Array 2.5m²

Alpha Solar Smart flat plate arrays provide the majority of hot water for the house. An immersion heater within the water tank boosts the temperature when solar energy is insufficient.

Contacts

Design: Acanthus WSM Architects

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Construction: Bramall Construction

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Acknowledgement

This LZ Carbon Profile has been prepared for the Zero Carbon Hub by BRE

Low energy alignment with the Code for Sustainable Homes (Post Construction Stage)

Energy Issue	Credits awarded
ENE 1 Dwelling Emission Rate 54% reduction in carbon emissions	9 of 15
ENE 2 Building Fabric Heat loss parameter of 1.02	2 of 2
ENE 3 Internal Lighting 100% of fixed fittings are dedicated and energy efficient	2 of 2
ENE 4 Drying Space Rotary dryer in garden and secured by fence and gate	1 of 1
ENE 5 Energy Labelled White Goods B rated washer dryer and A+ rated fridge freezer	2 of 2
ENE 6 External Lighting Space light fittings are dedicated and energy efficient, and security lighting not supplied so credit awarded by default	2 of 2
ENE 7 Low or Zero Carbon Technologies 5.65% reduction in carbon emissions	0 of 2
ENE 8 Cycle Storage Bicycle sheds are water-proofed, of adequate size and readily accessible, with fixings set into the ground for security	2 of 2
ENE 9 Home Office Bedroom provided with desk, operable windows for ventilation and daylighting, power sockets and telephone sockets for internet connectivity	1 of 1

Total 21 credits*

* out of a maximum of 29 credits for the Energy Category

Construction type

Foundation: Concrete strip

Walls: Masonry cavity, with reconstituted stone outer leaf

Floors: Insulated pre-cast beam and block system

Roof: Trussed rafters and concrete tiles

Learning from the Bramall Windmill View House

Training Bramall found that additional training of the development team was required on the importance of airtightness in meeting the Code. In future, staff will receive specific training on the correct processes and procedures to achieve the airtightness levels required.

Cavity ties Due to the higher than normal 300mm of cavity insulation required to minimise wall heat loss, special two-part cavity ties were purchased.