

# LZ CARBON PROFILE

Profile: 031  
February 2011



## The Saltings

Level 4 Code for Sustainable Homes

CO2 emissions: **85% reduction over Part L2006**  
System Developer: **Beattie Passive Build Systems Ltd**  
Architect: **Haward Architects**  
Completion: **Spring 2011**  
Location: **Suffolk**



The Saltings is a large (300m<sup>2</sup>) 4-bedroom prestige home which is being built to a very high fabric performance standard. It uses a site-assembled timber frame construction system with insulation injected into the wall, floor and roof cavities: an approach that speeds up construction, reduces the risk of thermal bridging and achieves high airtightness performance. This construction method (Beattie Passive Build System) has LABC registered systems approval.

With its solar thermal and solar photovoltaics the design meets Level 4 (Energy) of the Code for Sustainable Homes and could be upgraded to level 5 or 6 with the addition of more PV.

### Low carbon approach

**Fabric** Walls, floors and roof are built with 360mm of insulation (300mm in the structure and 60 mm additional overclad insulation). The house also has triple-glazed windows.

**Heat and power** A mechanical ventilation heat recovery system recycles heat from exhaust air. Solar technologies provide water heating and electrical power.

**Thermal comfort** The thermal mass of components and phase change materials together reduce extremes of temperature. The large south-facing doors have heat reflective window blinds to reduce solar gain. Passive ventilation (with a thermostatically controlled stairwell rooflight) provides summer cooling.



## Outline energy strategy

A very high performance fabric coupled with solar technologies, MVHR and careful design to minimise solar gain.

### Envelope

**Walls**  $U = 0.11 \text{ W/m}^2\text{K}$   
300mm continuous EPS insulation, overlaid with 60mm phenolic insulation.

**Roof**  $U = 0.11 \text{ W/m}^2\text{K}$   
400mm continuous EPS insulation.

**Floor**  $U = 0.11 \text{ W/m}^2\text{K}$   
300mm continuous EPS insulation, overlaid with 25mm phenolic insulation.

**Windows**  $U = 0.9 \text{ W/m}^2\text{k}$   
Triple glazed with low e glass.

**Airtightness**  $1.0 \text{ m}^3/\text{m}^2/\text{hr}$  at 50 pa  
As well as the continuous insulation, the design has a continuous vapour check layer and on site, a methodical taping and joint sealing regime.

### Low impact heat and power

In-line heater in heat recovery system and wood burner in lounge.

### Mechanical Ventilation Heat Recovery

Greenwood MVHR system provides fresh clean air and recovers heat from out-going air.

**Solar Thermal Array**  $3.4\text{m}^2$   
Provides hot water. Immersion heater in tank boosts temperature as required.

**Photovoltaic Array**  $2.7\text{kWp}$   
Electric power provided by roof mounted photovoltaic panels.

**Phase Change Materials** (pcm)  
Pcm in clay boards fitted to ceilings: this stores any excess heat (eg solar gain) and releases it when the building cools down.

### Contacts

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## Low energy alignment with the Code for Sustainable Homes (Design stage)

Energy Issue	Credits awarded
<b>ENE 1 Dwelling Emission Rate</b> 85% reduction in carbon emissions	<b>12 of 15</b>
<b>ENE 2 Building Fabric</b> Heat loss parameter of 0.81	<b>2 of 2</b>
<b>ENE 3 Internal Lighting</b> 100% of fixed fittings are dedicated and energy efficient	<b>2 of 2</b>
<b>ENE 4 Drying Space</b> Rotary dryer in garden and secured by fence and gate	<b>1 of 1</b>
<b>ENE 5 Energy Labelled White Goods</b> A+ rated washer dryer and A+ rated fridge freezer	<b>2 of 2</b>
<b>ENE 6 External Lighting</b> Space light fittings are dedicated and energy efficient	<b>2 of 2</b>
<b>ENE 7 Low or Zero Carbon Technologies</b> 46% reduction in carbon emissions	<b>2 of 2</b>
<b>ENE 8 Cycle Storage</b> Storage space provided in garage	<b>2 of 2</b>
<b>ENE 9 Home Office</b> Study/home office provided	<b>1 of 1</b>

**Total 26 credits**

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

### Construction type

**Foundation:** Concrete beams on pads

**Construction:** Site-assembled timber frame

### Learning points

- 1 The high performance building fabric has been erected successfully by carpenters with no prior knowledge of the system.
- 2 Building Control officers and warranty inspectors have been able to look at all structural elements after the building was structurally completed
- 3 Bifold doors did not achieve designed airtightness performance.
- 4 Thermal and airtightness testing can be carried out on a structurally and thermally completed structure at an early stage.

