



A design for Fife

HABM discovers how a building system which utilises passive house methodology was used to construct four houses for Fife Housing Association, whilst also generating work for local young adults.

Solving the tricky equation faced by housing associations is a challenge not to be underestimated. With constricted supply from all sectors of housebuilding, households in some areas are waiting ever longer for decent quality accommodation to become available. Add to this the requirements of the government's Code for Sustainable Homes, the budgetary caution mandatory in times of such economic uncertainty and the need to address fuel poverty – which so often affects the most vulnerable members of our communities – and the variables in the equation become increasingly

difficult to combine successfully.

Briefed to design and construct two pairs of three-bedroom semi-detached houses for Fife Housing Association in Scotland, Ron Beattie, managing director of Beattie Passive Build System, embraces the challenge enthusiastically: "This is a once-in-a-lifetime opportunity for some radical thinking, to look beyond traditional construction methods in the challenge to build high-quality energy-efficient homes at an affordable cost to housing associations."

Passionate about developing a solution, Ron masterminded a completely new system based on

German passive house methodology. Passive house is the world-leading building standard in energy-efficient construction, combining comfort and affordability with impeccable ecological credentials. The key to the energy efficiency of this construction concept is ensuring an airtight, thermal bridge-free design and a high level of insulation.

Applying passive house principles, the system delivers a continuously insulated structural thermal envelope which eradicates cold bridging and convection looping. The particular beauty of this MMC is that such an extraordinarily simple principle can be

readily adopted using universally available sustainable materials, built by semi-skilled labour and at less than the cost of a traditional build. Every building is inspected and tested throughout the build process, and any heat loss issues can be easily isolated and addressed immediately.

At structural completion, every structural component is open to inspection by both a warranty inspector and building control, eradicating post-completion construction faults. Because of its simplicity, readily available, tried and tested materials and 'build by numbers' build process, there is nothing elitist or exotic about the company's build philosophy.

The repetitive, methodical nature of the build process means that every single building can achieve an airtightness of below 0.6m³/hm². At structural thermal completion, the company carry out stringent airtightness, thermal imaging and sound migration tests on every property to ensure it has achieved its design criteria. Using the system, both external appearance and internal layout enjoy complete flexibility.

A first for Scotland

Each of the houses in Fife will be certified to Passivhaus standard, and will also reach the Scottish government's new Gold Standard, the first time a real 'live' housing development has achieved this in Scotland. Keith Brown, Scottish Housing Minister, commented during his visit to the site in May: "These new homes will help the Scottish government to meet its commitment to reduce fuel poverty and address climate change and are greatly welcomed."

The Fife build project was launched in February 2012, with Scottish MP Bill Walker and Councillor Brian Goodall joining members of Fife Housing Association to 'dig the first sod'.

A happy consequence of the build philosophy is the scope for employment not only of skilled tradesmen but also of unskilled staff. Ron Beattie emphasises: "Our designs can be transformed into high performance, low-cost homes using

semi-skilled labour." The company is working closely with the Skills Development Centre in Fife, which offers skills training to unemployed young adults in the local community. "The scheme introduces them to the renewable build sector and equips them with transferable skills to help them gain long-term employment as this market sector grows in the future."

Long-term benefits

Lucinda McAllister, of the Skills Development Centre in Fife, comments that: "Our key objectives are to bring people back into employment and equip them with the skills to future-proof against changes in construction methods. Through this scheme, the participants have the potential to benefit from long-term employment and ultimately become the house builders of the future".

Against a background of stark economic deprivation, creating employment opportunities in this locality is no mean challenge. Third-generation unemployment is not uncommon and the social and economic disadvantages inherent in the local economy leave many young people struggling to make their way.

Overseen by Beattie Passive, six participants – one of whom had never before held a hammer – began by constructing the timber frames for the houses in the Development Centre. Some had previously been involved in youth training programmes making timber planters, later graduating to constructing sheds, but had never been offered an opportunity for involvement in a more challenging, far-reaching project which would tangibly benefit their own local community: these trainees will see the very visible evidence of their labours.

Only 14 weeks after beginning construction of the timber frames, the houses' external walls were being rendered and plasterboard was being fitted internally. The timber frames had been erected within three days of delivery to the site – and the entire project remains well within the original budget.

Of lasting and tangible benefit to the tenants, who will take up residence in these four houses later in

2012, is peace of mind that their energy bills will be significantly reduced. As Ron Beattie points out: "We're acutely conscious that the majority of social housing is poorly insulated, so spiralling energy costs often impact hardest on people who can least afford it."

Using Ecobead, a high-performance blown bead EPS insulation system manufactured by Springvale, which is injected into the surrounding void with a specially designed adhesive, thermal performance and energy savings are maximised.

Ensuring flexibility

Flexibility is a watchword of the methodology, so that clients can assess the budgetary and performance levels of components used in each build including windows, photovoltaics and mechanical ventilation heat recovery units. The range of products promoting eco-efficiency is growing weekly, and increasing choice and competition maximises opportunities for builders and designers.

Michael Creech, of Fife Housing Association, sums up: "The Beattie Passive build system offers us the opportunity to achieve Passivhaus-certified homes for the same costs as traditional build methods. Using this method of construction will provide our clients with high quality homes which don't cost the earth to maintain."

● With thanks to Beattie Passive for preparing this article.

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