

Cameron Close – Isle of Wight



Client:
Southern Housing Group

Architect:
PCKO Architects

Passivhaus consultant:
WARM

Structural engineer:
Conisbee

Employers agent:
Calford Seaden

Contractor:
Stoneham Construction

Project:
Cameron Close, Freshwater,
Isle of Wight

Project value:
£4.2m

Executive summary:
H+H's Thin-Joint System has been used in the construction of a Passivhaus development of 16 semi-detached houses and 12 sheltered accommodation apartments at Cameron Close, Freshwater, on the Isle of Wight.

Project Description:
Cameron Close is a Passivhaus development of 16 semi-detached houses and 12 sheltered accommodation apartments for Southern Housing Group in the rural village of Freshwater, Isle of Wight.

Southern Housing Group did not initially set out to develop a Passivhaus scheme. The low energy development replaces a sheltered housing scheme that had previously

occupied the site, but which had reached the end of its life. For its replacement Southern Housing wanted to meet the higher levels of the Code for Sustainable Homes without having to rely on micro-renewable technologies so it looked at a fabric first approach embraced by Passivhaus. "This wasn't innovation for innovation's sake – it was a means to an end," says Andrew Hulmes, Area Development Manager, Southern Housing Group.

A Passivhaus must be built according to principles developed by the Passivhaus Institute in Germany. These seek to minimise the need for space heating on the principle that reducing heat losses to a minimum is the most cost-effective and most robust way of achieving a low carbon building.

Cameron Close – Isle of Wight

The system relies on maximising the use of fabric insulation, the removal of thermal bridges and ensuring stringent airtightness to minimise the demand for heating. Homes also include a mechanical ventilation and heat recovery to ensure they can be maintained to be comfortable and healthy.

At the outset the cost of building to Passivhaus standards was estimated to be 7% higher (typically £10,000 per unit) than for a Building Regulations compliant scheme. The Isle of Wight Council provided grant funding to support the additional costs of Passivhaus compliance under its sustainable community strategy.

The extra capital cost of Passivhaus has the potential to be offset by lower running costs for tenants. Southern Housing's Andrew Hulmes says: "It is too early to say how the tenants will benefit in reality, but we estimate that energy bill savings will be circa £900 a year for a three bedroom home". The overall energy cost saving for the entire scheme has been estimated at £25,000 a year, giving a notional payback period for the estimated additional capital cost of around 11 years.

Ordinarily a Passivhaus scheme such as Cameron Close would feature terraced housing because terraced homes have less surface area through which heat can escape than, say, a detached home. A terraced solution would, however, have obscured views out from the site. As an alternative, PCKO Architects came up with a solution based on a series of semi-detached houses and apartment blocks. The houses are two and three-storey units ranging from two to five bedrooms. The apartments are all one-bed, self-contained units.

The low energy scheme has been constructed using H+H's Thin-Joint system of aircrete blocks and Celfix Mortar. The blocks were laid by two gangs of four bricklayers. "We had not used Thin-Joint before but that did not pose any problems" says David Harris, director of Stoneham Construction. He estimates the Thin-Joint system was 20% faster to install than traditional blockwork.

Reason for choosing H+H aircrete products:

"In our view Passivhaus is made simpler when constructed from masonry rather than timber frame," says David Harris, director of contractor Stoneham Construction.

"Passivhaus is all about air tightness so if you can reduce the gap between blocks to 2mm instead of 10mm it makes life a lot easier," he adds.

Internally the block walls have a parge coat and then a plasterboard lining on timber studs. "This solution gives a speedy internal finish and is a robust way to integrate the services while maintaining airtightness," says Karl Parsons, Passivhaus designer at WARM.

All units achieved an airtightness level of less than 0.6 air changes per hour at 50 Pascals. The homes are currently being certified to Passivhaus standard and so far all have complied with the strict airtightness levels demanded by the standard.

"There are several elements of this project that we would happily and readily import to other developments.... primarily the specification of H+H's Thin-Joint System and the mechanical ventilation and heat recovery."

Andrew Hulmes, Southern Housing Group



Cameron Close – Isle of Wight

Products Used / aircrete specification:

External Walls:

The external solid walls are constructed from 200mm thick aircrete blocks, with a compressive strength of 3.6N/mm². The walls of both houses and apartments are insulated externally with phenolic insulation; for the houses the insulation is 230mm thick while for the apartments it is less at 150mm. The walls are finished externally with a white-colour acrylic render finish; a common aesthetic for Isle of Wight homes. This solution gives a U-value of just 0.08W/m²K for the houses and 0.11W/m²K for the apartments.

Separating Walls:

Twin leaf construction using 100mm wide Thin Joint aircrete blocks separated by a 100mm cavity filled with insulation. This form of construction gives an average airborne sound insulation level of 57dB D_{nT,w} +C_{tr}.

Floor Construction

Ground Floor:

Beam and block floor with 125mm power floated reinforced concrete screed on top of 250mm of PIR insulation to give a U-value of 0.10W/m²K.

Intermediate and separating floors:

In the apartments the separating floors were constructed from 200mm precast concrete planks with a 75mm screed, while in the houses the timber intermediate floors are supported on open web ecojoists.

An innovative aspect of the scheme was its use of H+H's Retro Fit Joist Hangers to support the timber joists for the internal floors while helping maintain airtightness and acoustic performance and avoiding the need to cut blocks or to penetrate the walls.

Roofs:

Pitched roofs have a slate tile finish with 600mm depth of Rockwool insulation in lofted areas.

Flat roofs incorporate 250mm of rigid PIR insulation.

Windows:

Passivhaus certified triple glazed units with a U-value of 0.78W/m²K

“With regards to the Thin-Joint System the bricklayers were apprehensive at first but having received all the training and support from H+H's Graham Keenor and his team they never looked back. I'm pleased we went down the route of building in aircrete as I imagine the required air tightness levels must be more difficult to achieve and maintain during the build if it were a timber frame construction”.

Contractor
Stoneham Construction

“Not only did Stoneham have to understand Passivhaus in great detail; the Thin-Joint building system was also new to them. I made many visits with our demonstrator and trainer to provide support and guidance. “Achieving Passivhaus requires an exacting and meticulous approach but the use of a solid aircrete frame using Thin-Joint meant at least the construction process itself was simplified. The external and separating walls were installed straight to storey height and were immediately stable allowing early installation of retrofitted hangers and joists for the houses and precast concrete planks for the apartments”.

Graham Keenor, H+H Development Management



Cameron Close – Isle of Wight



The Thin-Joint method of construction enables a fast, weathertight masonry shell to be built, allowing follow-on trades to start work sooner in a weatherproof environment, whilst retaining the flexibility of on-site construction. Thin-Joint is a recognised Modern Method of Construction and has been fully adopted as the preferred method of wall construction throughout most of northern Europe.

H+H's Thin-Joint System

- Combines the Celcon Plus, Jumbo Blok and MultiPlate ranges of high quality, accurately dimensioned aircrete blocks with specially developed Thin-Joint mortar called Celfix
- Provides simple solutions for Parts L and E of the Building Regulations
- Simplifies the construction process
- Thin-Joint blockwork enables walls to be built quickly to storey height without having to wait the conventional 24 hours for the mortar to set before further loading can be applied
- The Thin-Joint system enables the structure of a building to be erected faster (and to a better quality) allowing follow-on trades to start work sooner in a weatherproof environment while retaining the flexibility of on-site construction.

Other benefits included

- Block-work is highly adaptable, easily allowing for any last minute design changes
- Components for the Thin-Joint system are all readily available off the shelf
- Thin-Joint technology helps achieve a very low airtightness
- Fire resistance with a Class 0 rating for surface spread of flame

H+H aircrete applications

- Internal and external leaves in cavity walls
- Solid walls
- Separating / party walls
- Flanking walls
- Partitions
- Infill to multi-storey buildings
- Foundations

Contact details

For enquiries call
Tel: 01732 886444
or email: info@hhcelcon.co.uk

Head office

H+H UK Limited
Celcon House
Ightham, Sevenoaks
Kent TN15 9HZ

Further reading

Designing & Building with Aircrete
Thin-Joint as an MMC
Fact sheet 9 Solid wall construction
Building with aircrete

For further information about the subjects covered or the H+H products used in this case study, please visit our website www.hhcelcon.co.uk