

Carlyle Avenue - Brighton



Project description:

The developer adopted a fabric-first approach when it came to constructing this four-unit apartment block on a restricted site in order to meet the local planning requirements, which required a 25% reduction in CO² emissions compared to Building Regulations (2010).

As the building's fabric becomes more energy efficient, the amount of heat lost at junctions (eg walls/floors, corners etc.) becomes increasingly significant. The y-value gives a value for the heat loss through non-repeating thermal bridging areas of a building. Using Accredited Construction Details with SAP (2005) enables a y-value of 0.08W/m²K to be used for heat loss calculations. However using H+H's Aircrete Construction Details enabled this figure to be reduced to 0.04W/m²K. This resulted in a significant reduction in CO₂ emissions, equivalent to reducing the U-value of every external element by 0.04W/m²K.

Principle Contractor: Canning Ericsson

Client: Joshua Charles Developments Ltd

Project: 4 unit Apartment Block, Carlyle Avenue, Brighton, East Sussex
Build method: Thin Joint aircrete construction

Location: 39C-F, Carlyle Avenue, Brighton, East Sussex

Type of contract: Design and Build

Architect: Canning Ericsson

Aircrete contractor: Canning Ericsson

Build time: 3 months

Executive summary: The developer used H+H Thin Joint system of large format aircrete blocks and quick-drying Celfix Mortar to achieve Level 4 requirements of Code for Sustainable Homes for a four-apartment development on a confined site in Brighton.

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This was the first time the contractor had used the H+H Thin Joint system for external wall construction, although Canning Ericsson had used H+H's Jumbo Bloks for the construction of internal partitions on previous developments.

The Thin Joint system also worked well with the limited storage available on this tight site, which has been slotted into the end of the back garden of an existing home. Because of the restricted site storage, just-in-time deliveries of blocks were made by PBS, a local H+H Aircrete stocking merchant.

In addition to the scheme's highly insulated building fabric and as part of the planning requirement photovoltaic panels were used to generate electricity from the sun on the roof of the project. This ensured one apartment achieved an EPC A rating on one apartment, with the remainder of the development achieving a B-rating.



Reason for choosing H+H aircrete products:

The scheme had to achieve Code for Sustainable Homes Level 4, so not only did it have to achieve very good thermal performance but good sound resistance and airtightness too. The development was also on a confined site, so the Celfix Mortar supplied dry, pre-mixed in bags helped minimise material storage on site.

Product used / aircrete specification:

Thin Joint aircrete construction using Jumbo Bloks and Celfix Mortar.

Foundations:

Celcon Foundation Blocks, High Strength 440mm x 215mm x 300mm.

Ground and first floor:

Cast in-situ poured concrete.

Internal floors to maisonettes:

Timber joists supporting timber floors.

"The scheme had to achieve Code for Sustainable Homes Level 4, so not only did we have to achieve very good thermal performance but good sound resistance and airtightness too; this appeared to be the best system to do this.

Using Jumbo Bloks and the Thin Joint system was ideal because the mortar comes bagged and can be mixed in buckets, so we didn't have to have piles of sand and other materials lying around and taking up space.

The Jumbo Bloks are lightweight and they are relatively easy to cut and shape when compared to a dense block. It definitely saved time. I'd use it again."

**Michael Alderton, Director,
Canning Ericsson**

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External walls:

610mm long x 270mm high x 100mm wide High Strength (7.3N/mm² compressive strength) Jumbo Blok internal leaf; 100mm Celotex PIR insulation board to fully-fill the cavity; with 610mm long x 270mm high x 100mm wide Standard Grade (3.6N/mm² compressive strength) Jumbo Blok external leaf. Thin Joint Celfix Mortar was used throughout.

Additional insulation was added to the external wall using 50mm Kingspan Kooltherm K5 insulation board, attached using Kingspan's mechanical fixing system, and rendered with Knauf Marmorit pre-coloured polymer render system.

Internally the walls were finished in a Gyproc parge coat to seal the wall prior to dry lining with gypsum plasterboard attached on dabs. The walls had a U-value of 0.12W/m²K.

The Separating walls between apartments were also constructed using the Thin Joint system, which enable one block type to be used for both external and internal separating walls. The walls were constructed from two skins of 100mm wide, High Strength Jumbo Bloks, 100mm cavity fully filled with Isover round the house mineral insulation. These were finished with a Gyproc parge coat and Plasterboard on dabs. A sound test on the walls resulted in (DnT,w + Ctr = 57dB), this exceeded the minimum requirement under the Building Regulations Approved Document E (2003) and enabled additional Code for Sustainable Homes points to be claimed.

Internal partition walls:

Jumbo Blok Thin Joint system finished with gypsum plasterboard on dabs. Additionally, the compartment walls were full-fill cavity construction using an Isover party wall batt to give the necessary acoustic performance.



Roof:

Cut and pitched timber roof supporting interlocking clay tiles with a dry-fix system on ridges and verges. Insulation is installed between and over the rafters to create a 'warm roof'. The external bicycle stores have a sedum green roof.

Acoustics:

The walls performed well under acoustic test, achieving up to 8dB better than Building Regulations.

Product/system benefits:

- Providing a fast watertight masonry shell enabled internal trades to start sooner compared to traditional build
- Easily met or exceeded Part L and Part E of the Building Regulations
- Simplified the construction process
- H+H aircrete products use up to 80% recycled material
- Achieves A+ rating in the BRE Green guide

Other benefits included:

- The components for Thin-Joint block-work are all available off the shelf

- Blockwork is highly adaptable, easily allowing for any last minute design changes
- Aircrete achieves an air permeability of 0.12m³/hr/m²
- Celfix mortar can be stored within the footprint of the building and small quantities mixed as required
- Has excellent fire resistance with a Class 0 rating for surface spread of flame

"The scheme had to achieve Code for Sustainable Homes Level 4, so we had to achieve very good sound resistance and airtightness and this appeared to be the best system to do this. It also gives you the thermal mass needed to prevent overheating in summer when compared to timber frame."

**Michael Alderton, Director,
Canning Ericsson**

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“The contractor wanted a fabric first, high performance masonry construction solution for this tight construction site. Our Thin Joint aircrete construction solution was ideal because the Jumbo Bloks provide a thermally efficient, highly productive building system and the quick-drying Celfix mortar is supplied dry in 25kg bags minimising the need for storage on site.”

John Churchett at H+H



H+H aircrete applications:

- Internal and external leaf in cavity walls
- Solid walls
- Separating / party walls
- Flanking walls
- Partitions
- Multi-storey
- Foundations

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

Aircrete is an excellent all round commercial and industrial building material. Used in partition and external walls (both solid and cavity), fire walls and as infill to steel and concrete framed buildings it provides durability, fire resistance and superb thermal and acoustic insulation.

H+H aircrete has exceptional sustainability credentials: not only does it provide excellent thermal and acoustic insulation and contributes to air-tightness but, being manufactured from up to 80% recycled materials, it is sustainable both in manufacture and in use. We also have BES 6001:2008 accreditation for responsible resourcing of materials in addition we have an A+ rating under in the BRE green guide on both cavity and solid external walls. Couple this with H+H UK's rigorous approach to pursuing the highest environmental standards throughout the whole of its business and it's easy to see why this innovative and award winning system is now firmly established within the UK.



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