

Flockton – West Yorkshire

**Principle contractor:**

JD Commercial Builders Ltd,
The Workshop, Maxfield Lane,
Three Oaks TN35 4JN

Client: Brian Green (Self-Build)

Project: Self-build
construction of one detached
three-bedroom property with
garage

Location: Flockton, near
Wakefield, West Yorkshire

Type of contract: Self-build

Aircrete contractor: N/A

Executive summary:

H+H Celcon Blocks were specified in Brian Green's self-build project. His property was constructed with the aim of being as thermally efficient as possible. Special attention was paid to detailing of the insulation, thermal bridging and envelope penetrations. Due to planning constraints, the build had to be sensitive to existing adjacent residential properties which are 200-400 years old.

Project Description:

Brian's self-build project is constructed on a split-level, narrow site which meant due care and consideration had to be taken on the products used and how they would be delivered.

H+H Jumbo Bloks Standard Grade were constructed on top of 65mm Marmox Thermoblocks with regular ongoing support from an H+H representative who was able to advise on the best way to work with the product. The inner leaf was constructed, insulation glued on and wall ties hammered in where appropriate. This whole process was expediated by using the Thin-Joint system: as H+H Celfix mortar sets incredibly quickly, with an initial set of 10 to 15mins and full strength achieved within one to two hours, Brian was able to benefit from significantly improved build speed in comparison to the traditional forms of masonry he initially considered.

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The wall U-value achieved was just 0.10 W/m²K with a construction of 150mm stone, residual cavity, 160mm Kingspan Kooltherm K8, 100mm Thin Jointed aircrete and drylining, as this provided good air tightness with the Thin-Joint system.

Cavity wall bats were placed in two layers; a 100mm and a 60mm layer with the joints staggered. Each bat was glued to the blocks and the other bats with all the joints secured with foil tape.

Catnic CCS Channel Section Lintels were used in the build, with the H+H Jumbo Bloks Standard Grade manipulated on-site to tie into the adjoining courses and to fit the shape of the channel section. A mixture of concrete and brick pad stones were used internally.

Where the joist hangers coincided with the H+H Jumbo Bloks, an ordinary woodworking router was used to cut pockets out of the blocks with the assistance of a wooden template so that the blocks were accurately cut to

match the joist hangers. Where the joist hangers did not meet blockwork, a slot cutter was used. The joist hangers were then nailed into place with 90mm big twist nails and mortared into place with H+H Celfix mortar.

Passivhaus approved triple glazed windows were used throughout the build, achieving a U value of 0.75W/m²K.

“Brian was particularly impressed with how versatile the H+H products were: The Celcon Blocks could easily be cut to fit into the adjoining courses and to fit the channel section lintels over the doors and windows of the house. It was similarly easy to accurately cut the blocks to the shape of the gable. Another advantage we found with Celcon Jumbo Bloks was that we weren't restricted

in the positioning of wall ties; we could build the inner leaf up; install the insulation and then hammer in the wall ties as the stonework was installed. Because the Thin Joint method achieves high strength very quickly the wall ties could be driven in soon after the inner leaf was built.”

Contractor

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Reason for choosing H+H aircrete products:

H+H products were primarily specified to achieve excellent thermal performance. An air penetration test on bare blockwork produced a result of $1.02 \text{ m}^2 \text{ h}^{-1} \text{ m}^{-2} @ 50\text{Pa}$ and an air changes per hour result of $1.1 \text{ h}^{-1} @ 50\text{Pa}$.

Brian was confident the H+H Celcon Blocks were the best solution to meet his aim and also recognised the benefits associated with the ease of use of the product, which makes it ideal for use in self-build projects like Brian's.

Products used / aircrete specification:

H+H Jumbo Bloks (630 x 250mm) in Standard Grade (3.6N/mm^2) and High Strength Grade (7.3N/mm^2) were used in the build, along with H+H Celfix mortar as part of the H+H Thin-Joint System.

The Standard Grade Jumbo Bloks were used with a 200mm cavity and 160mm of Kingspan rigid cavity wall bats.

The High Strength Jumbo Bloks were used around the garage door and in the south facing gable end of the property, which has three large windows and patio doors.

Foundations:

Reinforced concrete slab foundations were used in the build.

External walls: Reclaimed random coursed stone has been used in the external walls to ensure the property remains close to its "traditional build" aesthetic and blends in to the existing rural Yorkshire surroundings.

Roof:

The roof in Brian's property is a simple trussed roof, with 160mm of Celotex insulation between and underneath the rafters which achieved a U value of $0.10\text{W/m}^2\text{K}$.

Floor:

150mm concrete slabs were combined with 500mm of Jablite insulation and screed to achieve a U value of $0.10\text{W/m}^2\text{K}$.

For a self-build project, technical advice and guidance is crucial and H+H ensured they were able to provide the necessary assistance every step of the way. Brian explained: "H+H sent their local trainer to work with my builder who hadn't used these blocks before. The trainer was very helpful throughout the build, calling in at regular intervals with help and advice and to see how we were getting on."

H+H comment

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Product benefits:

- Easily meets or exceeds Part L and Part E of the Building Regulations
- Simplifies the construction process
- H+H aircrete products use up to 80% recycled material
- Achieves A+ rating in the BRE Green guide

Other benefits included:

- Block-work is highly adaptable, easily allowing for any last-minute design changes
- Aircrete achieves an air permeability of $0.12\text{m}^3/\text{hr}/\text{m}^2$
- Has excellent fire resistance with a Class 0 rating for surface spread of flame

H+H aircrete applications

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



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

Contact details

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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