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## Miller Zero The Pinnacle, Basingstoke

**Developer:** Miller Homes, Midlands & South region, Spinnaker House, Lime Tree Way, Chineham, Basingstoke RG24 8GG.

**Project:** Miller Homes decided to take real customers, as well as its supply chain, on a journey towards Code level 6 on the 3.65 acre site.

It has built five identical Miller Zero houses to different levels of the Code for Sustainable Homes.

These homes, which are the same in layout to others on the site of 79 units, have been completed to Code levels 1, 3, 4, 5 and zero-carbon 6.

**Location:** The Pinnacle, Chineham Lane, Chineham, Basingstoke, Hampshire RG24 9LR.

**Aircrete installing subcontractor:** Minnett Group, Units 1 & 2 Raymond Close, Wollaston, Northants NN29 7RG.

They wanted to know what the development costs would be between each of the Levels and additionally, how much consumers would be prepared to pay for homes created to the Code for Sustainable Homes.

Building as cheaply as possible was not a consideration for Miller, it was about achieving the different Code Levels using different types of materials and construction methods. They also realised it would be the first time that any house builder would test this decision on the open market.

Having tested how the additional construction costs compare, Miller Homes is now researching the public appeal of homes built to different levels. Once sold, each of the homes will be monitored by Miller (with the approval of the owners) to collect data on their lifestyles. The model can then be value-engineered towards possible future sites nationwide.

**Project description:**  
The CfSH houses are among 79 homes for sale on this development. Miller had planning permission for these houses

based on 2006 Building Regulations; but as an R & D project, it was decided to construct some of these homes to various levels of the Code for Sustainable Homes.

# H+H Case Study

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**Product used / aircrete specification:**

The Code level 6 home is super-insulated with the external walls built using H+H's 200mm Vertical Elements. The Elements themselves have excellent thermal insulation properties = 0.11 W/mK with a compressive strength of 3.0 N/mm<sup>2</sup>. The Vertical Elements in combination with 200mm Webbertherm insulation and render achieved a U-value as low as 0.09 W/m<sup>2</sup>K.

Excellent levels of airtightness were also achieved to help meet the mandatory heat loss parameter required for Code 6 Homes of 0.8 W/m<sup>2</sup>K. This is aided by the fact that the Vertical Elements' larger panel surface areas of aircrete mean fewer joints, higher levels of air-tightness and of course, improved speed of build.

The Vertical Elements are lifted into place using a "cast in" lifting eye at the head of each 2.4m-high Element, which enabled the Contractor Minett Group to build the house in only one and a half weeks. The Elements were installed very specifically by using a layout drawing prepared and supplied by H+H UK, which clearly identified where each element should be placed.

H+H also supplied drawn details and information specifically concerning significantly reduced linear thermal bridging, possible with the use of H+H aircrete material.

The Code level 3 and 4 houses were built with H+H Jumbo Bloks (610 x 270, 100mm thick) alongside the Code 6 house made from H+H Vertical Elements. The H+H Jumbo Bloks were supplied with H+H Celfix, thin layer mortar and were used alongside a 90mm blown-fibre insulation.

Although Thin-Joint is a well established method of construction within the UK, Miller did not traditionally use Thin-Joint on their housing developments.

To align with their determination to create something outside their usual development and build methods, using Jumbo Bloks with Celfix mortar seemed a natural development. Using larger sized aircrete blocks and laying them with a fast setting mortar enabled the houses to be built in less time.

Traditionally, this would also mean a cost saving to the project in time and materials.



"For whatever the reasons that timber-frame is so widely associated with sustainability, we wanted to open up the possibilities. No one thought they could build Code level 6 in a masonry design."

**Ian Beal**  
Managing Director,  
Miller Homes (Midlands and South)



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**Reason for choosing H+H aircrete products:**  
 H+H aircrete can achieve significant results on larger developments. A 20-unit development of three-bed semi-detached houses built to CfSH Level 3 using aircrete panels can be used to achieve an external wall U-Value of 0.25W/m<sup>2</sup>K at a cost saving of £59/m<sup>2</sup> compared to timber-framed or SIPS.

The discussions between Miller Homes and H+H on the benefits of using Celcon Blocks and Vertical Elements, along with the support given during the whole R & D project, made a strong case for the use of H+H aircrete for this very unique development.

“We are now canvassing customers to evaluate why they would consider buying the code-compliant houses. Only our customers can tell us how practical the technical interpretations of the Code are to them. From this ongoing research, maybe we’ll find that some of the details prove to be a waste of time, so we’ll know what to remove for future designs. And we’ll see if the high expense micro-renewables do what they’re supposed to do.”

**Ian Beal**  
 Managing Director,  
 Miller Homes (Midlands and South)

Miller Homes’ MD for the Midlands and South-East, Ian Beal, was also very keen to challenge the industry’s typical belief that timber-frame is the only material which can reach the higher levels of CfSH. Miller decided to test this theory using both masonry and timer framed products and chose the Code Level 6 house to be manufactured from aircrete, specifically to challenge the ‘timber-framed only’ for ‘zero carbon’ myth.

“Assumptions that our usual network of sub contractors and suppliers would not be able to support us with this project and that new companies would have to be sought, perhaps from Europe, proved inaccurate” according to Miller Homes’ Production Director Adrian Corser:



**Initial results:**  
 The extra costs of all the Code level homes was identified almost entirely from the addition of the renewable technology required such as a ground source heat pump and photovoltaics, rather than the fabric of the buildings.

- The Code 3 house cost between £5,000 and £7,000 more than a house typically specified to meet the Building Regulations.
- The Code 4 house cost between an extra £7,000 and £10,000.
- The Code 6 house’s cost to build however was £50,000 more.

Miller Homes wants to work closely with the occupiers to understand what the impact, if any, the code-home features have on their lifestyles.

“The co-operation was already within our own supply chain to make things work in this new territory. This was important, because we wanted a plug-and-play solution to the Code.”

**Adrian Corser**  
 Production Director,  
 Miller Homes (Midlands & South)

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**Aircrete benefits:**

- Excellent thermal insulation
- Excellent fire resistance
- Strong
- Good Thermal Mass
- Airtight
- Excellent Sound insulation
- Robust and Durable
- Lightweight
- Sustainable
- User friendly
- Design flexibility

Developed to enhance the key benefits of our thin joint system; speed and quality of build with reduced waste, H+H UK's Vertical Elements (200) offer all the attributes of aircrete as a building material whilst offering additional value to the project.

These 200mm thick Vertical Elements can be used in housing as well as commercial or mixed tenure projects. Suitable for external walls, specific acoustic solutions and fire walls, the products will offer solutions to meet the requirements of the Building Regulations and Code for Sustainable Homes (CfSH), for Education, Health, Care Homes, Retail outlets, Hotels, Commercial buildings, Leisure, Offices as, well as Housing (social and private).

H+H Vertical Elements (200) are made to extremely tight manufacturing dimensional tolerances, supplied specifically for use with a combination of ancillary products which all complement the 2mm joint of Celfix, our thin layer mortar, with no levelling required, this ensures a quality and quick build with little or no site wastage.

H+H Vertical Elements are sold as a package including most materials required to build the walls, priced either as supply and build (quoted including labour) or supply only (quoted as a materials only price).

**Contact details**

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**Further reading**

- H+H Thin Joint brochure
- H+H Jumbo Blok Brochure
- H+H Multi Plate Brochure
- H+H Râ Build Brochure
- Building a sustainable future
- The Excellence of Aircrete - the all round commercial and industrial building product
- 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](http://www.hhcelcon.co.uk)