

# Lime Tree Lodge – Swaffham, Norfolk



**Architects:** Parsons + Whitley Architects

**Principle contractor:** Grocott and Murfit Ltd

**Client:** Private Clients

**Project:** Construction of a single bungalow, a two bedroom, single storey, mono pitched property built to Passivhaus standards.

**Cost of build:** The total cost of the aircrete was £7350 with approximately 140m<sup>2</sup> of aircrete. Contract value – below £250,000

**Location:** Swaffham, Norfolk

**Type of contract:** JCT agreement for Minor Works Contract 2011

**Aircrete contractor:** Grocott and Murfit Ltd

**Build Time:** Construction on the bungalow took 28 weeks to complete with the inner aircrete shell going up in three weeks.

## Executive summary:

H+H products were selected for this project due to the aircrete's high thermal performance which helps meet Passivhaus standards. Passivhaus is achieved by the application of high levels of insulation, avoidance of thermal bridging within the structure, low levels of air leakage all of which are qualities addressed with the use of the H+H range of Celcon Blocks.

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## Project Description:

Contractors Grocott and Murfit designed and built a single bungalow in Norfolk, designed by architects Parson + Whittley to Passivhaus standards. This was the first Passivhaus project for the team at Grocott and Murfit who specified H+H's Celcon Block Standard Grade for the internal leaf and external leaf to the timber boarded elevations on the structure. Having looked at other alternatives, to meet the stringent Passivhaus standards, the contractors opted for H+H products due to their delivery time, speed of construction, stability and thermal mass. Faced with both brick and timber the bungalow has an external U-value of 0.096 W/m<sup>2</sup>K for the timber faced walls and 0.098W/m<sup>2</sup>K for the brick faced walls. H+H's Celcon Block Standard Grade is a key contributor to achieving these results with a thermal conductivity of 0.15W/m<sup>2</sup>K.

## Reason for choosing H+H aircrete products:

Speed, delivery time, stability and thermal mass qualities were all driving forces behind the contractor's choice of H+H products. Having looked at other alternatives the decision to go with H+H came mainly due to the contractor's positive past experiences. Grocott and Murfit have confirmed that they are likely to use the 140mm thick Celcon Blocks as opposed to the 100mm on more projects as they provide a level platform more easily due to their width and mass. H+H offer the contractors a superior product that provides very little difference in dimensional tolerance compared to competitors and with very little damage on delivery.

## Products used / aircrete specification:

H+H 140mm and 100mm Celcon Block Standard Grade 3.6N with a thermal conductivity of 0.15W/m<sup>2</sup>K was used in an effort to reach Passivhaus standards.

## Foundations:

300mm in-situ reinforced concrete raft with 200mm diameter pre-augered and driven piles.

## External walls:

Brick faced walls with a U-value of 0.098W/m<sup>2</sup>K and 0.096 W/m<sup>2</sup>K for the timber faced walls with a 300mm cavity fully filled with Polypearl Platinum graphite EPS bead insulation.

## Roof:

47 x 356mm timber 'I beams' at a maximum of 600mm centres for the roof structure with Polypearl Platinum graphite EPS bead insulation in the voids.

## Floor:

Floor finishes on 22mm moisture resistant P5 'peel clean' tongue and groove chip chipboard glued to form a floating floor on 200mm PIR insulation. An engineered oak flooring to entrance hall, study, bedrooms, dining room and sitting room with porcelain floor tiling to the kitchen, bathrooms and en-suites.

"H+H provided us with advice on block types and their suitability for this Passivhaus project. Compared to a timber frame solution the H+H products allowed for a faster build process, enhanced stability and better thermal mass qualities allowing us to reach Passivhaus standards. This was the preferred building material for the contractors at Grocott and Murfit whose previous experience and desire to again build using H+H aircrete was the reason we opted for the H+H solution."

**Dan Higginbotham, Parsons + Whittley**



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“The development’s energy efficiency rating and environmental assessment was a primary concern. By using H+H Celcon Blocks Standard Grade with a conductivity value of  $0.15\text{W/m}^2\text{K}$  they were able to achieve the Passivhaus standards they were aiming for. Aircrete has the advantage of having an inherent thermal efficiency which helps achieve low fabric U-values. Further benefit is gained with reduced heat loss from thermal bridges and hence reduced energy demand to provide heat in winter.”

**Steve Knight, H+H Internal Development Manager**

## Product benefits:

- Easily meets or exceed 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



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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.

#### Contact details

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#### Further reading

Designing and Building with Aircrete  
Building with Aircrete  
H+H Thin-joint System  
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)