October 2013
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Revolution Homes
Maidenhead, Berkshire

Principle Contractor: Revolution Homes, Unit 9e, Vinnetrow, Business Park, Chichester, West Sussex, PO20 1QH

Client: Private individual

Project: Private one-off custom-build residential home

Build method: Rå Build system of aircrete blockwork construction with thin-joint Celfix mortar

Location: Bottle Lane, Littlewick Green, Maidenhead, Berkshire

Type of contract: Design and Build self build

Architect: Revolution Homes

Aircrete contractor: Revolution Homes

Build time: The project began in April 2012 and was completed in March 2013. The ten month build was completed while the client was overseas at a cost of £350,000 (not including land costs)

U-Value: The client was interested in a highly thermally efficient property which was a main reason aircrete was specified. The external walls recorded a U-Value of 0.18W/m^{2}K

Project description:

Bottle Lane is a private custom build home designed and constructed by Revolution Homes. The four-bedroom, detached house stands on the site of the client's old property which was demolished to make way for a new more acoustically and thermally efficient build. As the client was overseas for the duration of the build, they wanted a company that could offer a full system build package from conceptual design to a finished product.

Specialists in the custom-build market, Revolution Homes was able to supply this by employing the H+H Rå Build method of thin-joint aircrete construction.

Revolution Homes recommended the Rå Build method due to its excellent thermal and acoustic properties. Rå Build also allows a rapid construction of the inner weatherproof shell of the building. This enabled a faster build time whilst still maintaining the robustness of a masonry build.

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"We understood the importance of being able to offer a full package with this project as the client would be overseas during the build. We worked with Revolution Homes to provide wall U-Value calculations, movement joint and BJR guidance. This was followed up by on site Thin-Joint Celfix training. Due to the nature of Thin-Joint Celfix masonry we were able to reduce block strength requirement which also gave a cost benefit."

John Churchett, National Development Manager, MMC

Executive summary:

This one off custom-build house at Bottle Lane, Maidenhead used H+H's unique Rå Build method as part of a private project. Rå Build is a cost effective way of building homes using masonry. It creates the ground floors, exterior walls, upper floors and partitions as an inclusive package for a time-efficient, cost-effective solution.

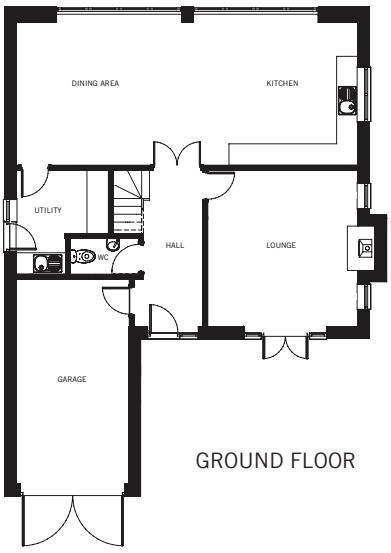
The method competes effectively with timber frame solutions and uses only H+H's network of recommended contractors. This maintains quality and ensures the speed benefits of the method are fully realised.

At the outset of the project the client stated that he preferred the solid feel of a masonry fabric shell along with the thermal mass benefits associated with it.

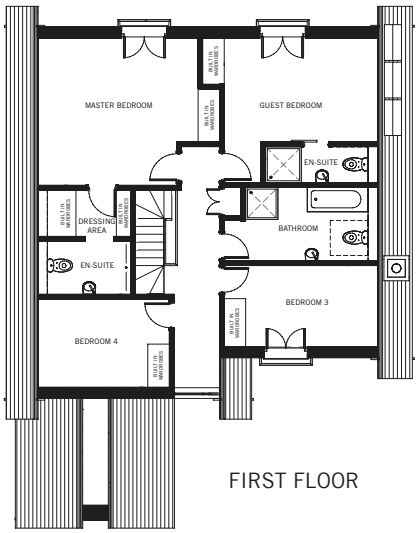
Being an H+H approved contractor, Revolution Homes informed its client about Rå Build. The end result is a dwelling with high thermal performance, and importantly a B rating in the Energy Performance Certificate.

Underfloor heating and an air source heat pump helped in achieving this figure. Translating this into actual estimated running costs means the client's energy bill averages £50 - £60 per month.
This figure could be further reduced by the installation of renewables such as PV.

The high performance of the building fabric has also been carried through to the second fix, this can be clearly seen in both the kitchen and shower room areas.



GROUND FLOOR



FIRST FLOOR

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"For a self-builder who wants masonry we only use thin-joint aircrete construction not traditional dense block-work with standard sand cement mortar. In this case the Rå Build method was ideal because it offered everything the client specified: a masonry solution, with excellent acoustic and thermal properties and the same build time as timber-frame solutions. We are such advocates of Rå Build, it has proved its worth time after time."

Andrew Edwarrds, Partner
Revolution Homes.

Build Method:

The entire house is constructed with 100mm Standard Grade Celcon blocks, with a timber-cut roof and solid concrete foundation. This grade of Standard Celcon block, (3.6N/mm^2 compressive strength), can be used across the entire build due to its all-round performance and versatility, eliminating any site confusion.

100mm Standard Grade Celcon blocks are ideal for internal partition walls because they create a robust partition which contributes to overall structure rigidity. They also easily meet the sound insulation requirements of current British Regulations. The interior walls were dry-lined and plastered.

The cavity wall used contained Celotex within the 100mm cavity, 100mm wide block with a brick outer leaf. The overall wall being 300mm thick.

For the beam and block floors 100mm Celcon Blocks were used again. When used as floor blocks, Celcon blocks contribute to energy conservation due to their inherent thermal properties.

Product benefits:

- Provides a fast watertight masonry shell enabled internal trades to start sooner compared to traditional build
- 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:

- The components for the Rå Build method are all available off the shelf
- Block-work is highly adaptable, 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

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, weather tight masonry shell, allowing follow-on trades to start work sooner in a weatherproof environment, whilst retaining the flexibility of on-site construction. It is 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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Further reading
Designing with Aircrete
Building with Aircrete
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**