



calfordseaden was commissioned to research the comparative costs of five different common house construction methods based on a 20 unit development of 3 bedroom houses.

calfordseaden was instructed to act independently and provide an unbiased, fair and independent report.

The research concluded that the Rå Build method delivers a cost effective masonry construction that end-users prefer, in the time it would normally take to build a framed construction.

## The Rå Build Cost Advantage

### The 8% cost saving building method\*



#### The Research

Amongst other considerations, cost is a key driver when deciding on which construction method to use, so H+H UK Limited commissioned calfordseaden to conduct a cost comparison between it's Rå Build method and other popular methods of construction, taking into account varying labour and material prices.

#### Rationale

Prices for labour and materials were established from a representative selection of market rates, approved contractors and actual prices returned from contractors and suppliers.

#### Specification

The costs are based on the following specification:

- The values relate to a site of 20 dwellings.
- All prices are based on the same house type
- All external walls achieve a U-value of 0.25W/m<sup>2</sup>K
- Ground floors are to achieve a U-value of 0.20W/m<sup>2</sup>K
- Any insulation is specified as rigid board
- All units are specified using best practice foundation solutions
- All units have been priced to the same level of completion, ignoring any external works, services, fees and design costs
- All units have been priced with identical external leaf materials and internal fittings and finishes



#### Summary Information

	Cost (£/m <sup>2</sup> )	Saving
SIPS	715.00	8.2%
Timber frame	715.00	8.2%
Aggregate, masonry blocks	671.00	2.2%
Aircrete masonry blocks	669.00	1.9%
Rå Build	656.00	-

\* When compared to timber frame and Structural Insulated Panels (SIPS) building methods.

Full analysis of the results can be found on page 3.



### Analysis of Results - the savings

Where building like for like weather tight constructions, the results from the study highlight the benefits of the Rå Build method as a cost effective construction method.

**calfordseaden**  
construction & property consultants

calfordseaden is a multi-disciplined construction and property consultancy working across the private and public sectors in the UK housing, building and construction industries.

As a multi-disciplinary Practice we provide a comprehensive range of services comprising chartered surveying, project management, architecture and master planning, civil and structural engineering, mechanical and electrical engineering and health and safety advice.

#### Innovation in Construction

calfordseaden have pioneered the use of modern methods of construction since the early 1990s. Over this period of time we have made considerable investments in the research and development of such methods, and have been involved in a number of significant initiatives.

Cost (£/m<sup>2</sup>)

<b>Rå Build</b>	656.00	<b>1.9% SAVING</b>
<b>Masonry Aircrete blocks</b>	669.00	

Whilst material cost of Rå Build are slightly higher, they are more than offset because the method saves time on-site, therefore saving labour and site management costs.

Cost (£/m<sup>2</sup>)

<b>Rå Build</b>	656.00	<b>2.2% SAVING</b>
<b>Masonry Aggregate blocks</b>	671.00	

Although basic raw materials prices of aggregate blocks are lower than aircrete, the total cost of Rå Build is lower due to time savings on-site.

Cost (£/m<sup>2</sup>)

<b>Rå Build</b>	656.00	<b>8.2% SAVING</b>
<b>Timber frame</b>	715.00	

Compared with timber frame the greatest difference is the cost of the superstructure. Rå Build is similar to timber frame in build speed, but is lower in overall cost due to lower materials and plant costs.

Cost (£/m<sup>2</sup>)

<b>Rå Build</b>	656.00	<b>8.2% SAVING</b>
<b>SIPS</b>	715.00	

Again, with SIPS the greatest difference is found in the cost of the superstructure, with Rå Build similar in build speed, but lower in material and plant costs.

### Cost Summary

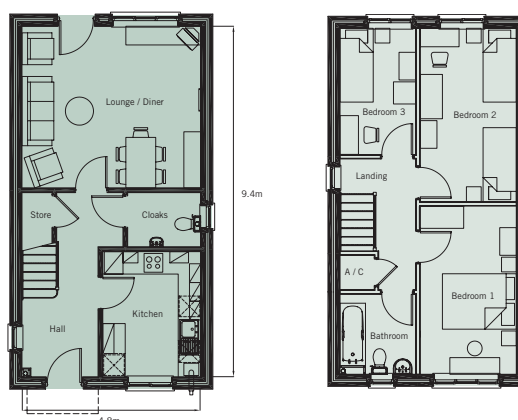
### H+H UK Ltd Construction Cost Comparison

	Rå Build	Masonry Aircrete Blocks	Masonry Aggregate Blocks	Timber Frame	SIPS
<b>Prelims Cost</b>					
Staff	£55,495	£66,085	£66,085	£54,280	£52,515
Site Setup	£15,260	£16,580	£16,580	£15,040	£14,820
Plant	£24,825	£28,875	£28,875	£28,740	£27,690
<b>Build Costs</b>					
Foundations	£131,668	£131,668	£131,484	£131,484	£131,484
Ground Floor	£43,279	£43,279	£46,715	£46,715	£46,715
Superstructure	£367,062	£372,212	£372,179	£458,435	£462,457
Internal Fit Out	£455,540	£455,540	£455,540	£455,540	£455,540
<b>OHP @ 9%</b>	£98,382	£100,282	£100,571	£107,121	£107,210
<b>Total</b>	<b>£1,191,511</b>	<b>£1,214,521</b>	<b>£1,218,029</b>	<b>£1,297,355</b>	<b>£1,298,431</b>
<b>Cost/m<sup>2</sup></b>	£656	£669	£671	£715	£715
% Rate Variance (+)	-8.23	-6.46	-6.19	-0.08	0.00
% Rate Variance (-)	0.00	1.93	2.23	8.88	8.97
<b>Regional Variations</b>					
South East	£1,104,531	£1,125,861	£1,129,113	£1,202,648	£1,203,645
South West	£1,031,849	£1,051,775	£1,054,813	£1,123,509	£1,124,441
Midlands	£1,019,934	£1,039,630	£1,042,633	£1,110,536	£1,111,457
North	£1,104,531	£1,125,861	£1,129,113	£1,202,648	£1,203,645
Scotland	£1,080,701	£1,101,570	£1,104,752	£1,176,701	£1,177,677
<b>UK Average</b>	<b>£1,088,843</b>	<b>£1,109,870</b>	<b>£1,113,075</b>	<b>£1,185,566</b>	<b>£1,186,549</b>

### House type

3 bedroom 5 person narrow frontage – 89.46 m<sup>2</sup>

<b>Ground Floor</b>	
Lounge / Diner	20.6 m <sup>2</sup>
Kitchen	8.8 m <sup>2</sup>
Cloaks	2.8 m <sup>2</sup>
<b>First Floor</b>	
Bedroom 1	11.8 m <sup>2</sup>
Bedroom 2	12.2 m <sup>2</sup>
Bedroom 3	7.0 m <sup>2</sup>
Bathroom	4.4 m <sup>2</sup>
A / C	0.86 m <sup>2</sup>



## Conclusions

H+H UK's Rå Build method of construction provides an 8% overall cost saving over timber frame construction.

H+H UK's Rå Build method offers a reduction in time on site over traditional build methods.

H+H UK's Rå Build method retains the on-site flexibility of traditional build whilst also allowing shorter, less onerous lead times.

## List of Assumptions

### Programme

- Christmas and Easter breaks ignored.
- No allowances for inclement weather.
- Assumed sufficient labour available.
- Assumed no delays due to theft/vandalism.
- Lead times for floors & frames not considered (usually 12-16 Weeks)
- Assumed all truss can be erected using site forklift.
- Assumes small groundworks gang, on site for 21 weeks

### Build Costs

- Assumes payment upon completion for timber frames.
- Insulation priced to meet U-values of 0.25W/m<sup>2</sup>K for walls and 0.20 W/m<sup>2</sup>K for floors.
- Assumed no variation in design costs for alternative methods of construction.

- Assume external works as excluded
- All methods have external brick facade
- Assume good ground conditions i.e. no contamination cost/piling
- All price exclude VAT
- Assumed no change in scaffolding prices for various construction methods.
- Service connections, utility costs, land costs etc. excluded
- Assumed no changes in heating system required between construction methods
- Rates taken from actual contractor & current market rates
- Price current to 3rd quarter 2008
- Prices based on working in outer London
- Block prices taken from current builders merchant rates, excluding any discount
- Timber frame prices taken from actual quotes received

### Masonry Construction - Aggregate Blocks

- Based on traditional cavity wall using blocks with partial fill, rigid board Celotex insulation to achieve U-Value of 0.25W/m<sup>2</sup>K .
- Pre-cast concrete beam and block floor, using aggregate infill blocks with beams laid at centres to accommodate 215mm wide block to achieve span.

### Masonry Construction - Aircrete Blocks

- Based on traditional cavity wall using blocks with partial fill, rigid board Celotex insulation to achieve U-Value of 0.25W/m<sup>2</sup>K .
- Pre-cast concrete beam and block floor, using Celcon Standard infill with beams laid at centres to accommodate 215mm wide block to achieve span.

### Timber Frame

- Open panel timber frame system, with ply sheathing. Two layers of rigid Celotex insulation, 12mm & 80mm, with brick external skin.
- Pre-cast concrete beam and block floor, using aggregate infill blocks with beams laid at centres to accommodate 215mm wide block to achieve span.

### SIPS Frame

- Insulated panels with brick external skin.
- Pre-cast concrete beam and block floor, using aggregate infill blocks with beams laid at centres to accommodate 215mm wide block to achieve span.

### Rå Build

- Cavity wall construction using Celcon 'Jumbo' blocks with Thin layer construction. Brick outer skin with rigid Celotex partial fill cavity insulation.
- Pre-cast concrete beam and block floor, using Celcon Standard infill blocks with beams laid at centres to accommodate 215mm wide block to achieve span.

### Contact details

For enquiries or to receive a free estimate please contact us;  
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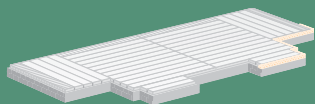
For further details or a copy of the complete report contact H+H UK's Marketing Department on 01732 880520 or email [marketing@hhcelcon.co.uk](mailto:marketing@hhcelcon.co.uk)  
[www.hhcelcon.co.uk](http://www.hhcelcon.co.uk)

The Rå Build method delivers a masonry construction that end-users prefer, in the time it would normally take to build a framed construction.

## The Rå Build Method

### Step 1

Starting with the ground works complete, the Rå Build contractor takes responsibility for the site to build a weather-tight masonry shell.

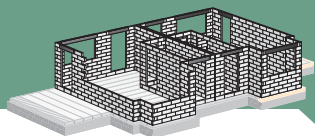


The efficiency of the method minimises wastage on site and reduces the influence of the construction programme by weather, thereby maximising cost-effectiveness.

The H+H Thin Joint System uses sustainable products. H+H Aircrete is manufactured from up to 80% recycled material whilst the system itself and the use of Recommended Contractors reduces site wastage.

### Step 2

The thin joint walls are initially bedded on a levelling course of traditional mortar. Once this first course is complete the build progresses without delay, quickly building the internal leaf of the external walls and any required partition walls to first lift. With the workability of H+H Aircrete, any openings are easily formed for windows or doors.



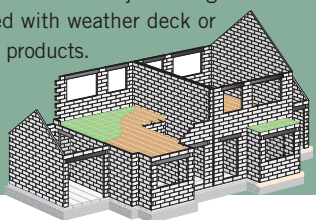
The Rå Build method uses local Recommended Contractors who are specially trained and are regularly assessed. Rå Build comfortably satisfies all areas of the Building Regulations and has been used in constructions achieving the highest levels of the code for sustainable homes.

There is the added reassurance that all products used in the construction of a Rå Build are BBA certified.

“One of the major benefits of the Rå Build method is its ‘buildability’. There is no lead time and anything you can build traditionally you can also build with the Rå Build method. It is very quick and easy whilst removing the time lag between trades on-site.”

### Step 3

With the first lift complete, the floors are installed using the same contractor i.e. I-joists or timber joists, either built into the walls or on joist hangers finished with weather deck or similar products.



### Step 4

The build then continues apace with the second lift soon complete, with any gable ends built or spandrel panels positioned. The roof trusses are installed with felt and fly battens completing the Rå Build structure (which completes the Recommended Contractor's work); handing the weather-tight masonry shell over to allow completion of the external leaf of the envelope whilst internally the first fix can start.

