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Homebuilding &Renovating

*Britain's
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Self-build
Magazine*

BRITAIN'S 20 BEST NEW HOMES

**Inside: What You Can Learn
from the Best Self-builds
and Renovations of 2015**

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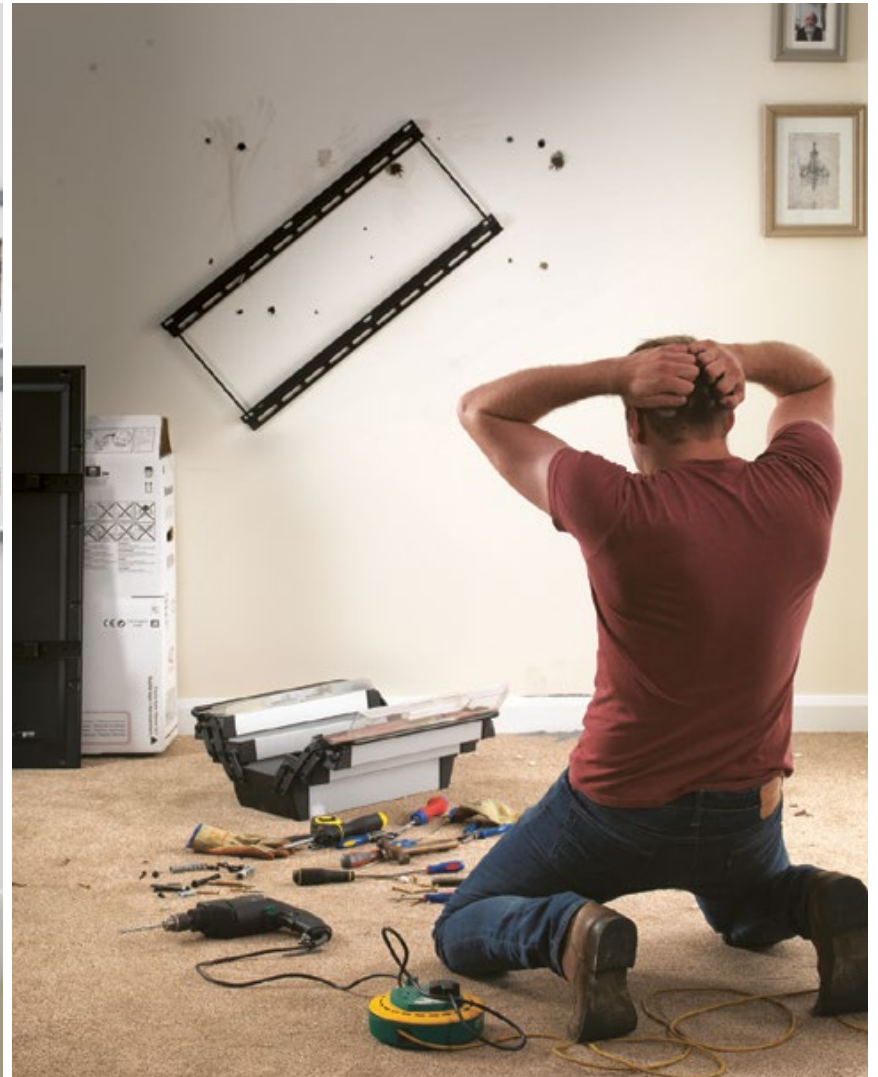
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QUOTE FROM JASON ORME - EDITOR, HOMEBUILDING AND RENOVATING MAGAZINE

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WELCOME JANUARY 2016

Where Good Design Meets Practical Advice

**Jason Orme is the Editor of
*Homebuilding & Renovating***

If you want to make sure your new self-built or renovated home is at the cutting edge of design (and build quality, for that matter) then you've come to the right place. In this issue we profile the top 20 homes entered into our Daily Telegraph Homebuilding & Renovating Awards earlier in 2015. Flick through and you'll find amazing self-builds, renovations and conversion projects that will serve as the ultimate in design inspiration.

There are so many things to learn about creating brilliant new homes, but the one thing I always take away from these Awards is the importance of design. Too many self-builders and renovators scrimp on design fees and end up going through all the hard work of a building project – not to mention the expense – only to create something that is, well, a bit disappointing.



Homebuilding & Renovating is about much more than beautiful homes, of course – we actually tell you how to build them! So elsewhere in this issue, we kick off two new comprehensive series – analysing build costs (p.132) and, secondly, getting an electrician to explain electrics to those of us who don't know our amps from our volts (p.136). We also take a major look at the options for renewable energy in the context of declining Government incentives (p.119). I hope you enjoy the issue. **H**

@JasonPOrme

homebuilding@centaur.co.uk

Jason Orme is currently rebuilding a 1960s house (described as 'Frank Lloyd Wrong' by HB&R's Contributing Editor Mark Brinkley) and is an experienced self-builder and renovator



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DARRYL BERTIE

Darryl has 33 years' experience as an electrical engineer, working across the world on projects. He is also a smart home specialist. He starts his new series on electrics on page 136



MARK BRINKLEY

Mark is the author of *The Housebuilder's Bible* and an experienced builder; he's just bought another plot. He is also a regular expert contributor to *Homebuilding & Renovating*



TIM PULLEN

Tim is *Homebuilding & Renovating's* expert in sustainable building and energy efficiency. He runs the green home consultancy Weather Works, advising clients on renewables and energy efficiency in the home



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UPFRONT

DESIGN DIGEST

The latest house design ideas and news from around the world

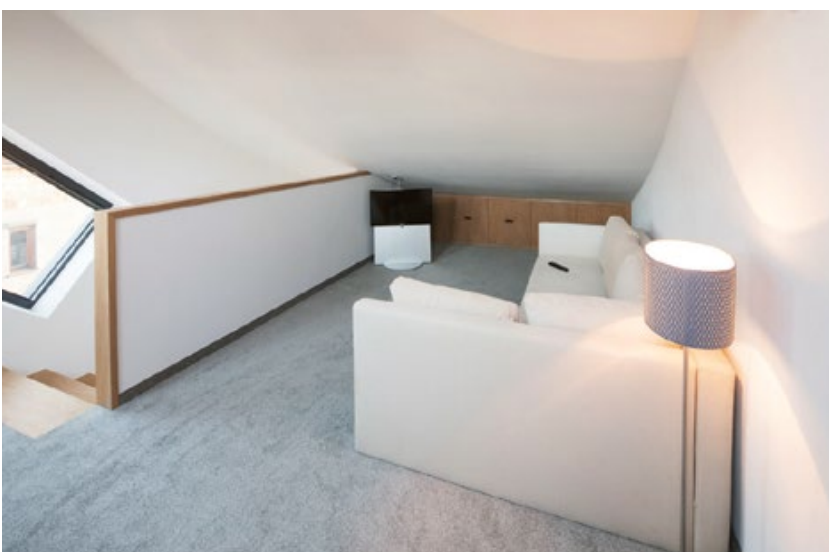


Raising the Roof

Providing a unique design solution to include a 22m² garage within this small 40m² home (minus garage) in Krakow, Poland, architectural practice Architekt Tadeusz Lemanski have delivered an inspired concept to direct the building upwards in a sloping motion, creating space below for the client's much-needed garage/storage space.

The main element of the house forms a simple cube shape containing the open plan living room with kitchenette and bathroom, while the bedroom is placed in the loft, accessed via stairs along the wall of the garage below — carefully positioned windows here have been orientated to rise in the same direction as the stairs, enhancing the home's dynamic structure.

Externally the garage section has been coated with grey sandstone, while the living element of the building is marked clearly by black titanium zinc cladding plates which help the project blend in with the neighbouring houses.



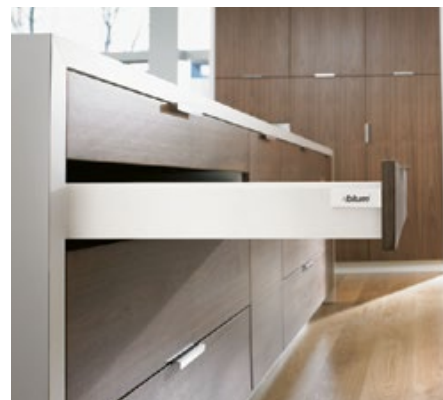
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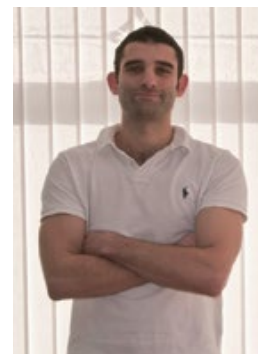
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“We’re Finally Making Progress”

We catch up with self-builder Joe Shimbart, who’s building an energy-efficient oak frame house in Hampshire using natural materials



With getting materials delivered to the site on time becoming increasingly more difficult, there is a real danger my build team will run out of work to do unless things improve. As far as I can tell there is little motivation for companies to deliver on time as there is no financial loss to them if they do not.

Despite this, the build itself is progressing very well and the house is looking fantastic. The room created above the garage is a surprisingly inspiring space that has a quality I did not expect. The Fakro roof windows have all been fitted and look fantastic too, flooding extra light into the house and the white frames make the sky the focus rather than the window.

We needed some extra oak beams for the garage and adjoining room, and I was delighted to be able to source these from a local country estate less than 10 miles from the build. The English oak looks to have a wonderful grain and I am looking forward to revealing it when the frame is sandblasted in the coming months.

The western red cedar fascia boards have also now started to be fitted and this has allowed the gargantuan task of slating the roof to begin. Excitingly, this means that we will be weathertight fairly soon. The casement windows, doors and applied oak glazing will seal the building from the elements and we’ll then be able to move forward with the internal works. **For more updates on Joe’s project, visit homebuilding.co.uk/blogs**



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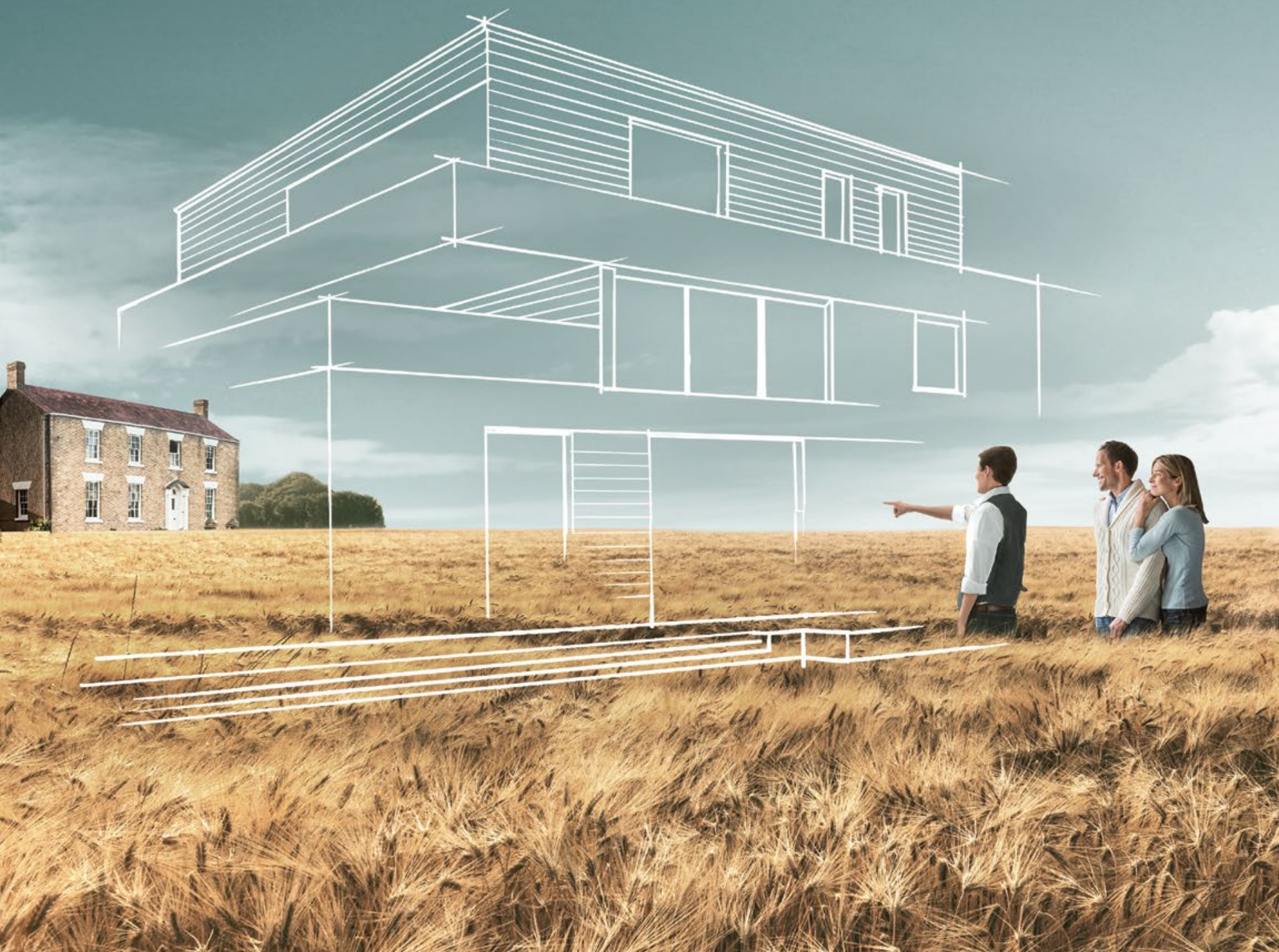
Top Tweets

“New draft legislation requires councils to provide more land for custom and #selfbuild housing”
@HolmesMike

“My structural engineer tells me #steel beams are a third of the price of last year. Quite a drop”
@JasonPOrme

“Exciting to see this self-build community in Lewisham getting a site and architects. All systems go!”
@swix

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UPFRONT

MATERIALS

Latest looks for finishes and fittings



Cherished Gold Roller Blinds from Apollo Blinds

Now available in the new on-trend 'Cherished Gold' Pantone, Apollo Blinds' roller blinds will add the Midas touch to your home. Prices start at £65 for a 610x610mm made-to-measure roller blind, with motorised options from as little as £75 including remote, lithium batteries and charger.

ARCKIT

Providing an architectural freeform modelling system, ARCKIT allows you to physically explore designs and bring your project to life. The system uses interconnecting modular components, enabling you to create a range of scaled models that can be quickly assembled, modified and built upon. There are four kits available (Go, 60, 120, 240) depending on the floor area, and prices start from £49.99.



Iconic's Giuly Towel Rail Radiator

The Giuly steel towel rail radiator from Iconic with its contemporary design acts as a focal point to any bathroom and is available in a variety of sizes to meet your heat output requirements. Prices start from £1,152.

Top Wood Floor Tiles

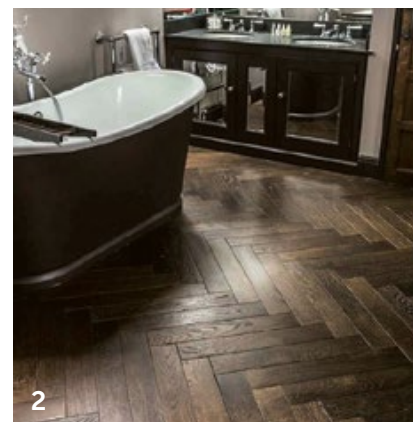


1



Jointing Mortar from Natural Paving Products

The new Jointing Mortar from Natural Paving Products' Pavetuf range is available in Gun Metal Grey and Silver Grey, resulting in a smoother and more concrete-like finish for landscaping installations. Designed to fill joints 3-50mm wide and 20-200mm deep, each 15kg tub will cover between 7m² and 12.5m² depending on the paving and joints size. POA.



2

Dimplex's Burgate Opti-myst® Electric Stove

Offering the charm of a woodburner with the convenience of an electric fire, the Burgate Opti-myst® Electric Stove from Dimplex offers an authentic woodburning stove effect at the flick of a switch. The stove features a 2kW heat output, a black gloss enamel finish, has opening doors and a log-effect fuel bed, while the Opti-myst® technology gives a realistic (and fully variable via remote control) flame and smoke effect which can even be used independently of heat. It costs £699.99.



1. The monochrome Vintage Gris 16x100cm wall and floor tiles from Tiles-Direct cost £41.94/m²

2. Indigenous' new Herringbone wood floor is made from sustainable European oak and is suitable for underfloor heating. It costs £73.20/m²

THE LATEST

Events, news, tips and ephemera

South London Borough Council Gets In-house Architecture Department

In a bid to design schemes for the delivery of new housing on 80 sites across the borough, Croydon Borough Council has set up an in-house architecture practice.

While some have labelled the move as 'unusual' – given that many councils had previously removed architectural services from their departments for being inefficient – it is hoped that the new unit, headed up by Chloe Phelps (who was shortlisted in January 2015 for the AJ Emerging Woman Architect of the Year award), will provide sustainable and socially conscious developments to the south London borough.

Of the change, Colm Lacey, Director of Development at Croydon Council, says: "Our emphasis will be very much on collaboration rather than domination. For some projects, the internal team will directly design schemes to planning and beyond, and take an active role in seeing through delivery on site. For others, its role will be to lead a small stable of practices to get the job done."

Housing and Planning Bill 2015-16 Close to Becoming a Reality

Despite facing heavy opposition in Parliament on 2 November, the Housing and Planning Bill 2015-16 has passed its second reading in the House of Commons.

While the Bill was criticised by labour MPs as having a lack of vision for planning, Communities Secretary Greg Clark defended the Government's proposals, stating that under new regulations the planning system would be: "speedier and more accommodating of the need for more homes, especially on brownfield sites".

Along with reforming the planning system, the Bill also outlines plans to extend Government's Right to Buy scheme to housing association tenants to allow them to buy their own home at a discounted rate, as well as amendments to the Self-build and Custom Housebuilding Act 2015, requiring local authorities to keep a register of people seeking to buy a plot of land in their local area to self-build or custom build their own home. The Bill specifically requires local authorities to grant "sufficient suitable development permission" of serviced plots of land to meet the demand based on this register. Cross-party support for initiatives to promote self/custom build was demonstrated during the passage through Parliament of the 2015 Act, although the Local Government Association has questioned the need for legislation in this area.

The Bill will next face close scrutiny at public committee stage in due course.



ISTOCK

New Roof Tile Fixing Site Launched

Forticrete, the manufacturer of concrete construction products, has launched a new roof tile fixing specification website designed to help self-builders during the selection process.

Recognising the growing need for faster lead times, Forticrete's new website allows homeowners to easily complete a request for a roof tile fixing specification in a matter of clicks, as opposed to the previous method of filling out manual request forms and waiting for a specification document to be produced.

"The roof is the most exposed area of any building and the one where incorrect detailing can have a major detrimental effect to both the exterior and interior," explains John Lambert, General Manager at Forticrete. "With that in mind, we felt it necessary to provide housebuilders with a website that enables them to identify the correct roof tile fixing specification for their projects at speed and with minimal effort."

Forticrete's new roof tile fixing specification website can be found at: myforticreteroof.co.uk. 

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BRITAIN'S BEST SELF-BUILDS & RENOVATIONS

Following a nationwide search for Britain's best self-build, renovation and conversion projects, we reveal the winners of the 2015 Daily Telegraph Homebuilding & Renovating Awards



OVERALL WINNER AND BEST CONTEMPORARY HOME

PEAR TREE HOUSE

Built around a 100-year-old pear tree, this contemporary courtyard-style masterpiece from architect, and homeowner, Jake Edgley in London marries raw, industrial materials with mid-century modern design — the result is a thing of beauty.

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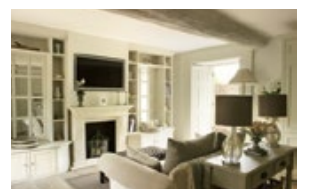
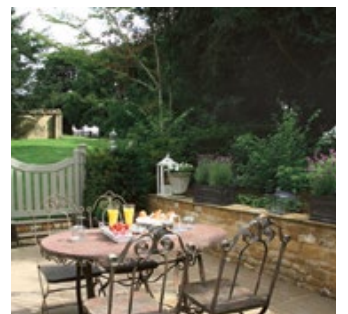


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THE PRIZE

This year's Overall Winner will enjoy a fabulous week-long getaway (together with welcome hamper) at Unique Home Stays' luxury self-catering cottage, **The Parisian** — a sympathetically restored 18th-century cottage in Rutland.





AWARDS

BEST TIMBER FRAME HOME LOWER GARDEN

Proof that timber frame homes need not always be traditional in style, this modern home on the Isle of Man is the result of Richard and Chrissie Baker's four-year determination to build their forever home. The timber frame was provided by package company Potton.

BEST RENOVATION ANSTY PLUM

Thanks to architect and homeowner Sandra Coppin, this formerly rundown '60s architectural gem has been subject to a successful renovation — bringing the property into the 21st century.



BEST CONVERSION CHAPEL ON THE HILL

The conversion of this former derelict chapel in the Pennines into a breathtaking holiday home was a labour of love for Stefan Camenzind and his brother-in-law Rob Broomby. Modern-day luxuries now sit side-by-side with many of the building's charming original features.



BEST ECO HOME

DUNDON PASSIVHAUS

Nestled discreetly into the foot of a hill in rural Somerset, this project — the home of architect Graham Bizley and his wife, interior designer Emily — has been built to Passivhaus standard. Constructed in timber frame — with timber used to clad both inside and out — the home is packed with blown cellulose and hemp insulation and includes a 4,500 litre rainwater harvesting tank and triple-glazed windows.



BEST EXTENSION/REMODEL AND READERS' CHOICE WINNER LAUREL HOUSE

Sitting within an Area of Outstanding Natural Beauty, Lucy and Andrew Thompson's rather rundown cottage has been transformed thanks to a substantial contemporary – yet pleasingly sympathetic – extension, designed by CaSA Architects. The natural palette of materials includes blue lias stone, cedar, zinc and oak, all weathering to a subtle grey.



BEST TRADITIONAL HOME ARTS & CRAFTS HOME

A tribute to the best of Arts & Crafts architecture, Jean and Ian Rhodes' inspired home, designed by Snell David Architects, features all of the fine details associated with this traditional genre – from the steeply pitched roofs to the gables, tall chimneys, use of natural materials and creative use of brick and render.



RESIDENTIAL DESIGN EXCELLENCE AWARD WOODRIDGE

Proving that brick can work on contemporary homes, Peter and Annelies Tompkins' new home features traditional building materials to create a striking house which sits comfortably against its brick neighbours – bringing a 21st-century twist to the streetscene. The result is a masterclass in bold, modern design built with family life in mind.



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2016 DESIGN TRENDS

Daisy Jeffery reveals the award-winning trends which caught the eyes of this year's judges — and may just make their way into your project in the coming year

CREATIVE CONCRETE

Whether it's shuttered, polished or even replica (one project featured cementitious resin as a flooring — a lower-cost alternative to polished flooring and softer underfoot), concrete has become the favourite raw material of choice for homeowners looking to introduce industrial style to their projects.

Used sparingly throughout Jake Edgley's winning project (shown here), with a pairing of polished concrete floors and shuttered concrete walls — the wood grain finish was achieved using timber formwork — the result is simply stunning.



TIMBER CLADDING

Versatile, rustic and lending warmth, timber has become the go-to material for those seeking to bring texture to their projects — both inside and out. Whether it's dark-stained pine (above) to add contrast and help the home to blend in with its surroundings, rough sawn oak left to weather to a silver grey (right), birch, western red cedar, larch or plywood lining the walls, ceilings and floors to provide a warm and cosy space, timber cladding featured heavily among this year's shortlisted homes.

Paired with traditional or modern furnishings, this raw material can easily be integrated into any home as these projects go to show.





HIDDEN LIGHTING

While bringing natural light into the home is a recurring theme, it can be easy to forget how important achieving a well-balanced artificial lighting scheme can be — many treating this element of the design as an after-thought, placing a few pendants and downlights wherever there's space.

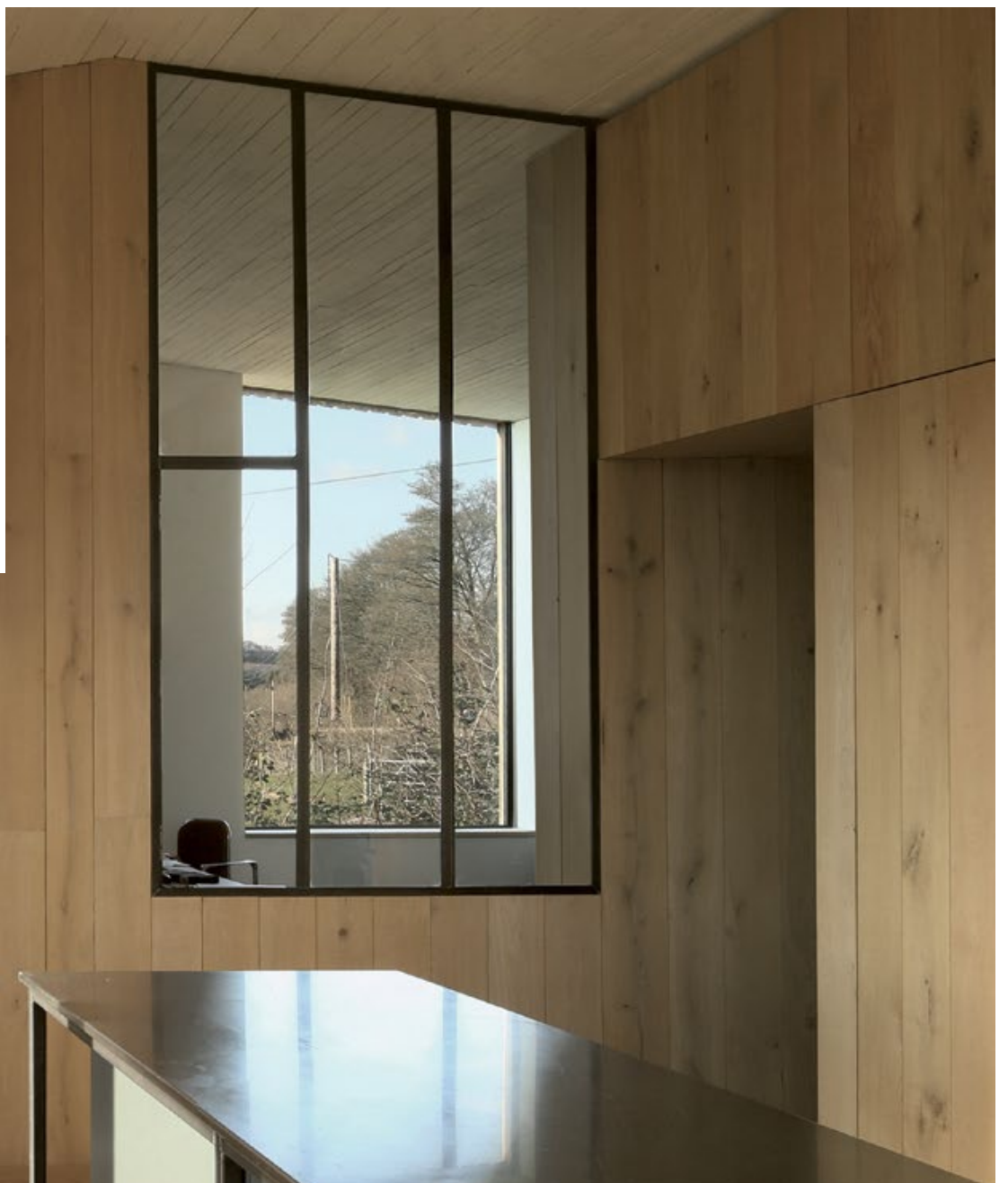
Consideration of your home's lighting should be planned out well in advance, but some of this year's architects have gone one step further and taken to introducing lighting within the fabric of the building. Overall Winner Jake Edgley's project (left) was no exception — in order to create the illusion of the glazed bridge (which connects the two halves of his London self-build) floating when lit at night, he attached strips of LEDs to aluminium foils (which act as a heat sink) and fitted these to the ceiling edges. The result is truly spectacular to see. In fact, this proved so atmospheric that Jake took to lighting the entire home from the room edges, with no downlights in sight. That's not to mention the dramatic handmade pendants in the double-height stairwells.

INTERNAL GLAZING

Extending views through the house, the use of internal glazing has gained in popularity with 2015's crop of houses.

Allowing light to reach into even the most central sections of the floorplan, incorporating internal glazing can offer glimpses of adjacent rooms and create the illusion of space and volume.

Whether you run a series of clerestory windows between rooms to allow light but maintain an element of privacy, or go big with large glazed panels running up to the ceiling (such as in this project by Graham Bizley), internal glazing is a great way of bringing light, and views, into the home.





AWARDS



BUILT-IN JOINERY

Wishing to shut clutter off from the rest of the house, it seems homeowners and architects are coming up with new solutions for introducing clever storage into their homes.

One of the most chaotic rooms in the house is often the kitchen, which sees all manner of activities taking place — from cooking to cleaning, eating and socialising. Given today's trend for open plan kitchen diners however, it can be difficult to hide cooking mess when guests come round for dinner. Built-in units behind doors (such as in this project above from Phillips Tracey Architects) allows the homeowners to close off unsightly dirty dishes while entertaining friends and family.



VERANDAS

A key staple of traditional architecture, the veranda appears to be making a comeback if this year's best homes are anything to go by. From New England-style wrap-arounds to sheltered timber frame additions — allowing homeowners to enjoy the outdoors even on wintery days — the veranda has proved the perfect accessory to homes both contemporary and classic. 🏡



PROJECT NOTES

Project:

Contemporary
self-build

Location:

Dulwich, London

Build time:

Jan 2012 – Apr 2014

Size:

407m²

Plot cost:

Undisclosed

Build cost:

£2,000/m²

Value:

Unknown

**BEST
HOMES
of 2015**

HOMES CONTEMPORARY SELF-BUILD

A Lesson in 'Wow'

Rising up from a former derelict, rubbish-laden site in London comes an impressive new home which brings together mid-century modern design and raw materials, all built around a century-old pear tree

Words: Daisy Jeffery Photography: Jack Hobhouse c/o Edgley Architects



The Daily Telegraph
**Homebuilding
& Renovating**
AWARDS
2015 sponsored by **CRIGIN**
Overall Winner
& Best Contemporary
Home

HOMES CONTEMPORARY SELF-BUILD

Exterior

This contemporary home is built in two halves, joined by a bridge (below right) — this glazed walkway is on the same level as the ground floor but is supported beneath by steelwork, designed to accommodate the pear tree roots. The entrance to the house is tucked beneath a cantilevered element supported on glulam beams. Concrete walls, cast in situ within timber formwork, dominate the ground level, while timber cladding (pine, stained in Sikksens) above allows the house to nestle among the surrounding trees. Slim gold trims help break up the mass of the building and frame the large glazed panels.





HOMES CONTEMPORARY SELF-BUILD

The Snug

Ideal for keeping an eye on the kids from the formal living space, the snug acts as a cosy retreat. With built-in seating it's perfect as a reading spot or for watching TV (which is hidden behind the joinery when not in use)



HOMES CONTEMPORARY SELF-BUILD



THE QUICK READ

➤ Architect Jake Edgley has built a stunning contemporary home for his family — becoming the Overall Winner of the Daily Telegraph Homebuilding & Renovating Awards 2015

➤ Despite a problematic plot and receiving 70 objections, the Edgleys won planning permission at appeal

➤ In order to preserve the 100-year-old pear tree on site, the home has been designed around the tree. This led to the creation of an internal courtyard, which provides the house with both privacy and light

The Overall Winner of this year's Daily Telegraph Homebuilding & Renovating Awards is living proof that modern design can also make for a warm, comfortable and practical family home — indeed, it rather leaves you wondering why everyone else doesn't do it quite like this.

While this remarkable self-build in south-east London, the home of architect Jake Edgley of Edgley Design and his family, now oozes effortless style, the starting point for the project was not without its challenges. Indeed, the Edgleys faced a six-year long journey battling the plot itself, risking the unknown in the process.

Jake takes up the story: "We looked at about 400 sites before we found this plot which was up for sale by public auction, and although we came second in the bidding we fortunately ended up with the plot as it transpired the winning bidder didn't have any money. As the plot had no access or planning permission we got a good deal — you couldn't even get on to the plot as the neighbours had put railings up and the site hadn't been entered for 50 years."

A Problematic Plot

The plot in question had originally been a Victorian fruit orchard, but had since become a derelict backland site surrounded by houses and filled with trees growing from piles of rubbish. The neighbours were nervous about the trees on site being cut down, so the council ➤



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HOMES CONTEMPORARY SELF-BUILD



Kitchen

Stepping down from the snug, the kitchen is a lesson in pared-down style, with warm oak joinery and brass trim sitting alongside polished concrete flooring and shuttered concrete walls. High ceilings here also provide visual impact

had agreed to place a blanket Tree Preservation Order on the site until an agreement could be reached on which trees needed to be removed — a process which took a year. A year of planning negotiations then followed, with the scheme approved on appeal following resistance to new housing in the area. Once planning was approved it then took a further four months just to clear all of the rubbish from the site.

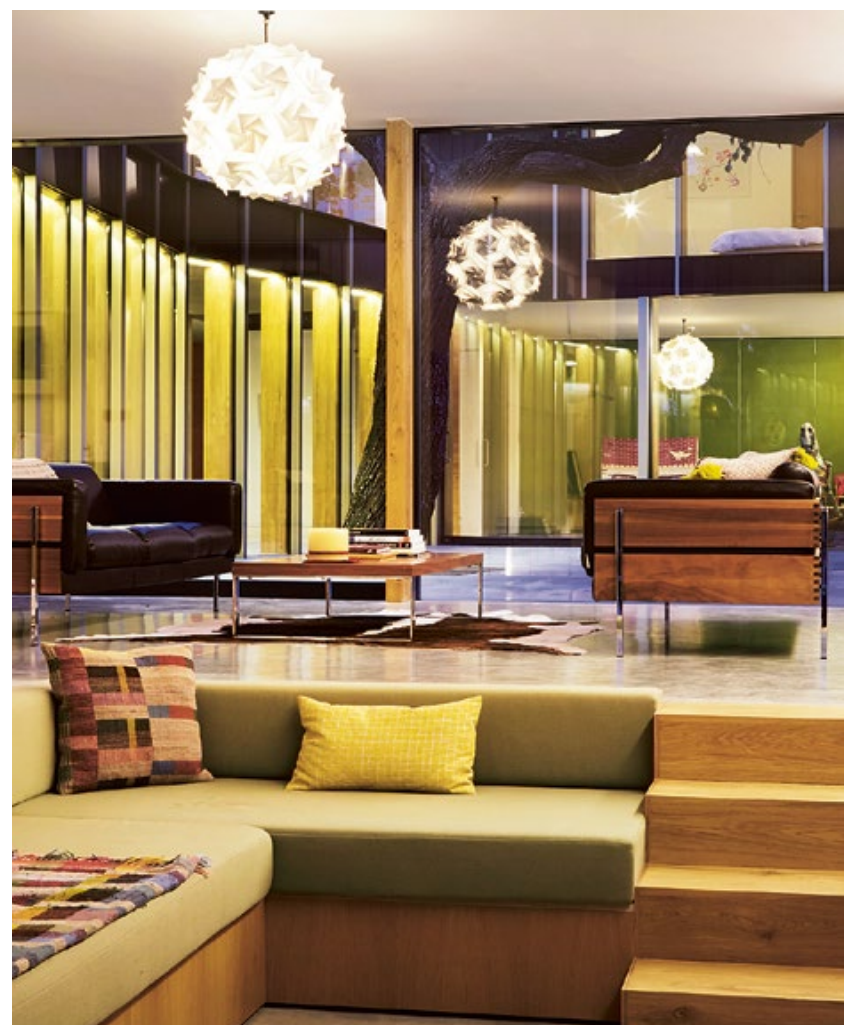
“We had a lot of objections – 70 to be exact! – as people found it hard to accept the loss of trees, but of course they couldn’t have known that beneath the branches the site was littered with piles of rubbish,” explains Jake. “Once we achieved planning permission though the neighbours were very good.

“It’s important to know that the process not easy though,” he continues. “The bank said they’d fund the project and we started clearing the site using our savings, but then the bank turned round and said they couldn’t see the point of what we were doing and wouldn’t lend us the money. We had to sell our house as fast as possible and move into rental to fund the project.”

The Bold Build

For a hugely ambitious site, many people would have rightly been put off seeing the project through, but for Jake and his wife – who had self-built their previous house – it was an exciting adventure. Thanks to Jake’s architectural skills, there was also the confidence they could pull such a scheme off.

“When I first stepped on site I was attracted by the wilderness appearance and could envisage a house snaking around the existing 100-year-old pear tree on site, creating an internal courtyard design





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Top: Dining Space

Open plan to the kitchen and snug, the dining space provides uninterrupted views of the garden and terrace thanks to full-height glazed sliding doors from Fineline Aluminium. The gold trim on the joinery here is a subtle nod to the gold running down the exterior, and the timber formwork used to create the concrete walls was recycled for the garden fencing

which allows the house to look inward and offer privacy,” says Jake. “As the pear tree’s root protection area spans the full width of the site, however, the house ended up in two halves and the only way of connecting the two was to build a bridge structure which doesn’t touch the ground but instead sits on steelwork.” Fortunately, the bridge allowed for an interesting flow between spaces, with the pillars between the glazed panels tilting slightly to guide the eye through the house. “It offers privacy and separation depending on where you are in the house, but as you move around you catch glimpses of rooms and the views beyond which is exciting,” says Jake.

The ground floor features concrete walls which provide the structure with a solid base; the first floor is constructed in timber frame. The concrete provides the building with a lot of thermal mass. The solar-coated glazing on the southern elevations also prevents overheating in the summer months. The upper storey, supported by the concrete walls below and also glulam beams, is clad in dark-stained pine, helping the house to blend in to its surroundings. Meanwhile, vertical slim gold trims go some way to breaking up the mass of the building.

While concrete plays a key role in the house, the experience was new to Jake. “I’d never done any concrete work before, but I got the idea from the National Theatre (one of my favourite buildings) and wanted to take that style of materiality and refine it into a scale suitable for a house. Concrete is a joinery craft and the contractors made a lot of samples of timber formwork especially to achieve the different textures and wood grains. The concrete was then poured into these and, once we’d finished the timber formwork was used to construct the courtyard fence. Everything left over in this project was reused — even the chandeliers in the double-height stairwells were made from timber offcuts.

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“The most successful designs come down to contrast, proportion and composition,” explains Jake. “We chose contrasting materials by using the warm tones of the sharp oak joinery which offsets the roughness of the concrete on the ground floor interiors. It’s important when using these raw materials not to make everything else white, but instead create atmosphere through materials. We also tried to eliminate the use of any downlights but instead light the walls around the edges so that the lighting in the spaces is not too oppressive. The advent of quality LED strips transformed everything too and allowed us to glue these strips to aluminium which sits in the ceiling of the bridge and provide a brilliant lighting solution.”

“We spent a lot of time looking at ’60s and ’70s architecture and their use of materials and mid-century modern design — the furniture being more crafty than flat-pack,” continues Jake. “Upstairs though we decided to keep everything simple, not architectural, with different coloured walls and a very easy-going feel. We then approached the glazing by only putting it in places that provided a view, and instead of buying windows we bought pieces of glass and glued these into the timber frame. It was a much more cost-effective method.”

The use of low-toxicity products was also a key part of the brief. “For my wife it was quite a personal thing to use these products — it’s something she’s very passionate about,” says Jake. “It’s part of what sustainable building is all about and I was amazed how many products we could find and how much nicer they were to use.”

With a friend working as site manager and teams of people on board to handle the different tasks one section at a time, everyone worked hard to get the project done. While not having the bank or a main contractor on board was financially tough, Jake believes this only allowed them to create a much better building. And what a building it is. “I’m very happy that it is now my house and not a project!” laughs Jake. “It takes a long time before it changes and you can relax in it.” While Jake remains very humble about what is without question a significant achievement, one can’t help but feel incredibly inspired, if not slightly jealous. 🏡



Above: Master Suite

A secluded oasis situated above the first ‘half’ of the house – and the opposite end to the kids’ bedrooms – the master suite enjoys full-height views of the courtyard and pear tree as well as a long dressing area and en suite bathroom. Lino flooring here was just one of the many low-toxicity products used throughout the house



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HOMES CONTEMPORARY SELF-BUILD

The Project



Jason Orme
Judge and
Homebuilding &
Renovating Editor

THE JUDGE'S VIEW

From the moment we entered Jake's home we knew we had found something truly special. Firstly, the vision and ambition to take on such a difficult site, take on the planning battle others had given up on and, of course, prove the power of high-quality design.

Secondly, the design itself, taking into account its difficult immediate surroundings, and managing to avoid the problems of overlooking and jarring that almost any other design would have suffered from — the new house truly is a positive addition to its neighbourhood.

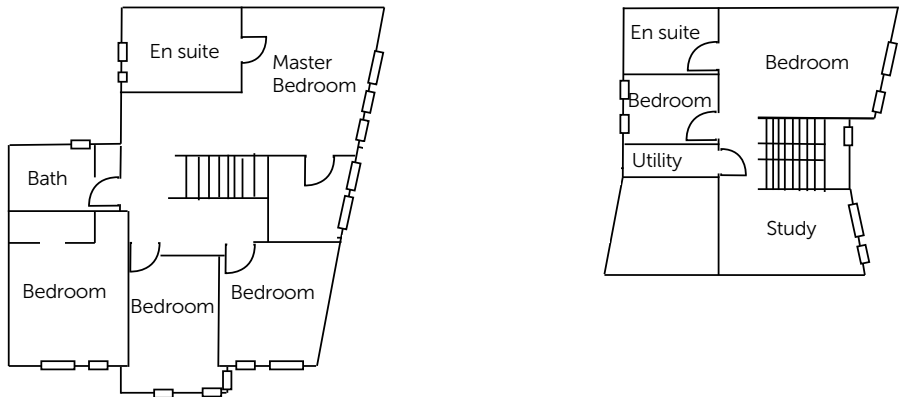
Best of all, the execution. What stuck us first of all was, for a tricky urban site, how large the house was — one of the most spacious and serene inner-city homes we have ever come across. The glazed link, the courtyard around the tree — such clever solutions to problems others would have considered insurmountable.

My favourite element was the blend of materials. This is the last word in modern house design: strong, bold shapes and tactile, warm floors, details and walls, with concrete, glass and timber providing the palette. To add to the distinctly mid-century feel, the joinery is critical, with built-in furniture a major feature.

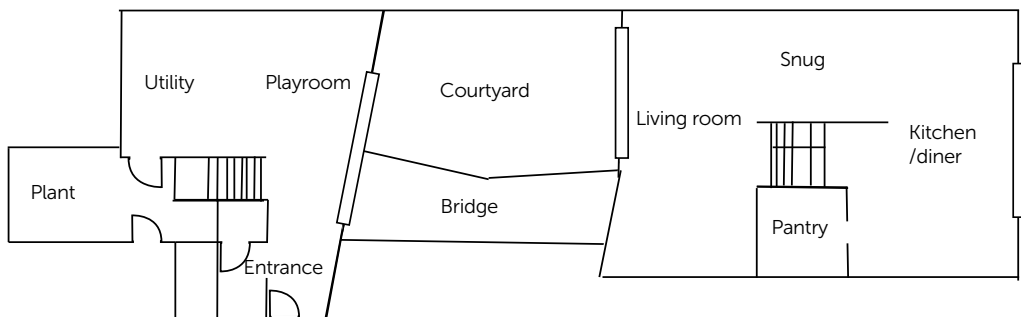
SUPPLIERS

- Architect** Edgley Design
.....edgleydesign.co.uk; 020 7033 9522
- Engineers** Hardman Structural Engineers ..
.....020 7729 7900
- M+E consultants** Mendick Waring
.....020 8446 9696
- Planning consultant** Greer Pritchard
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- Building Control inspector** BBS Approved
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- Planting design** Helen Robson of
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HOMES RENOVATION

Sixties Revival

One architect brings a decaying architectural gem into the 21st century

Photography: **Simon Maxwell**



Overlooking a series of 12th-century buildings in a hidden valley village in Wiltshire, Ansty Plum (now the home of Sandra Coppin and her family) exemplifies how modern homes can not only fit in to their setting but improve it exponentially. Originally designed by David Levitt for Roger Rigby, a partner at Ove Arup in 1964, Ansty Plum sits on a steep slope and has an open plan layout inside, with a simple monopitch roof following the line of the land.

When the previous owner came to sell, this unusual property struggled to find much interest. Coming to sale before the current revival in interest in mid-century modern design, a relatively modest footprint and, worst of all, terrible thermal performance, Ansty Plum had fallen into rather sad repair.

Cue new owner, architect Sandra Coppin. Not only has she restored this decaying architectural gem back to its former glory, and made it livable for the 21st century, but managed to make it even more impressive through a considered programme of additions, tweaks and subtleties. The thermal performance of the house has also been improved dramatically — comparing like with like, emissions from heating are now just 20 per cent of those from before the retrofit. 

PROJECT NOTES

Location: Wiltshire

Build times:

Sep 2013 –
Dec 2014

Size: 135m²
+ 30m² annexe

House cost:
£510,000

Build cost:
£235,000

Architect: Coppin
Dockray Architects
(coppindockray.co.uk)

See more in an
upcoming issue





**BEST
HOMES
of 2015**

A Faithful Conversion

When Stefan Camenzind and his brother-in-law Rob Broomby stumbled across a derelict chapel in the Pennines, they both knew it wasn't a project they could walk away from — its subsequent transformation has been a labour of love

Words: **Claire Lloyd**

Photography: **Chris Humphreys c/o Evolution Design**



PROJECT NOTES

Project:
Chapel
conversion

Location:
County Durham

Build time: Mar
2013 – May 2015

Size: 141m²

Plot cost:
Undisclosed

Build cost:
£1,500/m²

Value: Unknown

The Daily Telegraph
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Best Conversion





Kitchen Diner

The kitchen diner sits within the former vestry. Much of the timber within the building was beyond repair due to wet rot, but the original trusses were salvageable; they now make for a characterful feature beneath the impressive vaulted ceiling. The handmade wall tiles, with their monochrome ecclesiastical pattern, from Cement Tiles, form a striking backdrop to the Howdens' Greenwich Shaker kitchen. The Seraphin pendant lamp above the dining table is from Maison du Monde

HOMES CHAPEL CONVERSION



HOMES CHAPEL CONVERSION



THE QUICK READ

- ➡ Architect Stefan Camenzind and his brother-in-law Rob Broomby have converted a Victorian Methodist chapel into a characterful holiday home. The building now features an impressive kitchen, dining and living space, with the main bedrooms and en suites on a mezzanine level above
- ➡ Purchasing the building in the late 1990s, Stefan and Rob saved funds for almost a decade prior to commencing the conversion project
- ➡ Key to the design ethos was maintaining the character of the building, with original features restored and the floorplan designed so as to retain the open, vaulted chapel spaces

Open Plan Living Area

The ground floor is now home to a spacious, open plan kitchen, dining and living area (there is also a bathroom and bedroom on this level) — the central Hunter Herald 14 multi-fuel stove is double-sided, allowing it to be enjoyed from both the kitchen diner and living area

Stefan Camenzind and his brother-in-law Rob Broomby were not looking for a project when they happened upon a 19th-century chapel in the remote reaches of the North Pennines, County Durham. But, as fate would have it, the former Ebenezer Methodist chapel, which had been derelict for over 30 years, was to become a decade-long labour of love for Stefan and Rob.

“We found the chapel quite by chance while exploring the area on holiday, and spotted a weathered sale board outside,” begins Stefan. “We both thought, ‘this could be amazing’.” They put in an offer for the building, which was being sold by the Raby Estates. The lack of land registry records and paperwork, however, meant the sale took almost a year to complete. “The deeds were very interesting though; the chapel has a fascinating history,” says Stefan.

“By the time the sale went through it was winter,” continues Stefan. “We unfortunately visited during a snow drift and had to abandon the car and walk a kilometre across fields to reach the chapel. When we finally reached it the interiors were covered in a layer of snow — we did think at the time, ‘what have we bought!’ The weather can be brutal in this area.”

Remedial work was swiftly undertaken to make the building weathertight, but plans to turn the chapel into a dwelling went on hold. “We had the funds to buy it, but not to do it up,” explains Stefan. And so, over the following decade, Stefan and Rob visited twice a year to keep an eye on the condition of the building, commissioning maintenance when required. “It was like an old friend. We’d have to fix the roof every winter.”

Plans finally began to take shape in 2013, when they were “mentally and financially ready for the challenge,” as Stefan describes. ➡

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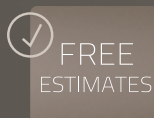


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Ground Floor Spaces

The bespoke joinery – including the windows and shutters – was crafted by Star Projects, who also provided the staircase (right), which leads to the mezzanine level bedrooms and en suites. The space beneath the staircase has been put to good use as an office, with tongue and groove cladding helping to zone this area



The Design and Planning Stages

Fortunately, as an architect and Executive Director of Zurich-based practice Evolution Design, Stefan, and his team, were well placed to develop plans for the chapel. At the core of their approach was ‘keeping the essence of the building’. Indeed, Stefan credits this design ethos as key to achieving planning permission for the change of use. But again, the ‘red tape’ surrounding the change of use meant this preliminary stage was yet another lengthy process. “We had lots of reports: a damp report, ecological report, heritage report, structural report, etc. It took a long time to get everyone on board. We also ensured we spoke to the local planning authority early on to discover if they had any concerns.”

One of the most difficult design challenges faced by the team was the introduction of the first floor mezzanine level to accommodate the bedrooms and bathrooms. “We wanted to retain the quality of the space and the elegant Gothic-arched windows,” explains Stefan. The mezzanine required careful planning so as to avoid subdividing the fine windows.

Another vital – but costly – element was bringing services to this remote location. “No one quite knew where the water mains was located, and so we spent a day digging up adjacent fields to find the mains,” says Stefan.

Going on Site

One of the first major undertakings on site was restoring the fabric of the existing building. The foundations fortunately proved structurally sound, but several large cracks to one of the gable ends resulted in the entire wall being underpinned. The ‘patchy’ stonework also required repointing in numerous places. “Due to the driving rain in this exposed location, the contractors would often arrive in the morning to find a puddle of water inside; we were constantly



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HOMES CHAPEL CONVERSION

Bedrooms and Bathrooms

The ground floor bathroom features a traditional-style roll-top bath (the Winchester bath is from Victoria Plum), ornate bathroom furniture and a chandelier; all add drama to this space. The mezzanine level features two en suite double bedrooms, with built-in storage making the most of the sloping ceiling

having to locate the areas of stonework which needed attention,” explains Stefan, who kept a close eye on proceedings through video calls and regular phone discussions with the project manager and the main contractor. Once the stonework was finished, the building was insulated internally.

Years of dereliction and exposure to the elements also meant that the interiors needed considerable TLC. Wet rot had rendered much of the timber within the building – including the floor joists and floorboards – beyond repair. “Unfortunately the interior timber panelling could not be saved either,” adds Stefan. A number of the rafters also had to be replaced, with the slate roof taken off and relaid; the contractor did however save many of the old slates. They also managed to save the original roof trusses in the vestry, which are now exposed in the vaulted kitchen dining area to striking effect.

Stefan and his team were so meticulous in their approach to rescuing as much of the building as they could, that every item was catalogued on a spreadsheet before being repaired and reinstated.

Once the project was in full swing, the mezzanine was again to prove a challenge. “It was the biggest headache on site, due to height tolerances and head height,” says Stefan. “The roof was 20cm lower than anticipated, meaning the three bedrooms beneath the sloping eaves were not working. We had to stop work while the mezzanine was re-evaluated. It was a low point during the build.”

Constructed in steel frame, the new mezzanine level now houses three bedrooms and two en suite bathrooms comfortably, with clever built-in storage making the most of the space beneath the sloping ceilings and bringing architectural interest to the bedrooms.

In fact, such care and attention to detail has been applied to all the finishing details throughout the interiors. “Once the spaces began to emerge, we felt there was something missing on the back wall of the kitchen diner,” says Stefan. A monochrome tile with a pleasingly ecclesiastical pattern was subsequently specified to create an eye-catching backdrop to the kitchen. The Dutch cement tiles are nearly 3cm thick — and very heavy. “They were a challenge: we had to take specialist advice as to how to bond them to the wall.”

The finished building is now a far-cry from the leaky, snow-battered shell which Stefan and Rob were presented with more than a decade ago. Now, the chapel is the perfect retreat throughout the seasons, with a woodburning stove and electric-based heating system keeping this insulated building cosy throughout colder snaps.

And what are Stefan’s final words of wisdom to others taking on a conversion project similar to the chapel? “Practical advice aside, my advice would be don’t be too wise with buildings like this — otherwise you’ll never end up taking it on,” he smiles. “You not only have to be brave, but passionate about it. Secondly, you can’t measure a project by financial success; it’s also about the energy and happiness a place gives you. The chapel has a special energy, and we feel very lucky to have had the opportunity to bring this building back to life.” Wise words indeed. 





HOMES CHAPEL CONVERSION

The Project



Michael Holmes
Judge and
Content Director

THE JUDGE'S VIEW

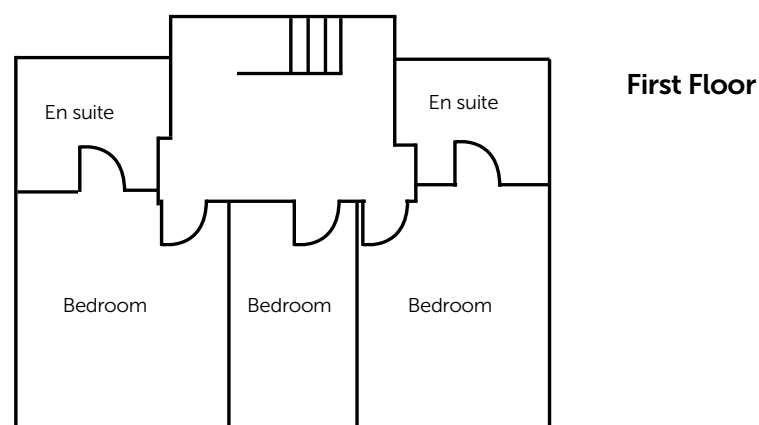
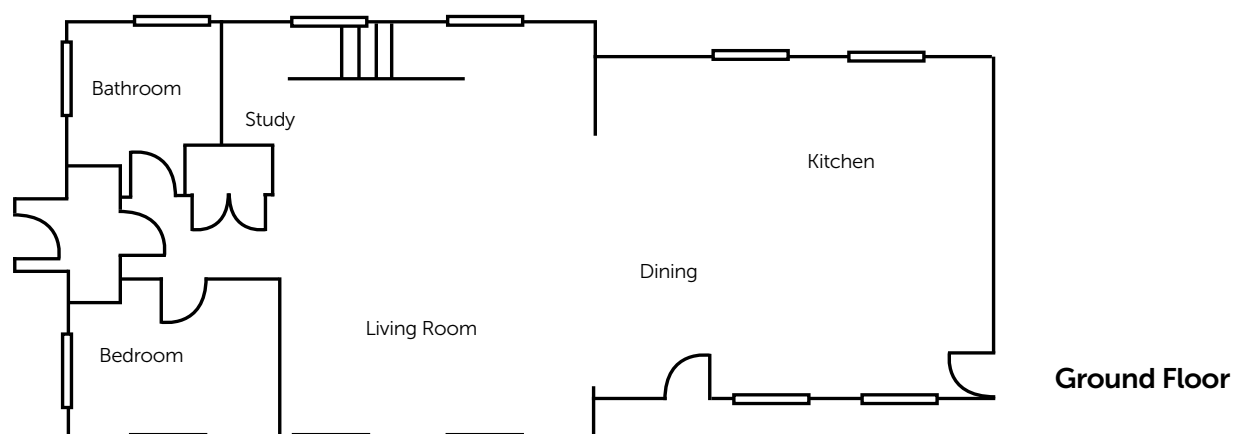
Chapel on the Hill is one of the most sensitive conversion projects we've seen in recent years. From the exterior there's very little hint of this former Methodist chapel's current purpose, and yet the interiors give a very different story — original features sit alongside modern-day luxuries. Handcrafted details take their cue from the building, but also lend contemporary flair. Clever design solutions are aplenty too, from the built-in bedroom and bathroom storage which make the most of the sloping eaves, to the nook beneath the stairs, utilised as a home office.

This project was a labour of love in which the building was put first, and the new floorplan carefully crafted so as to incorporate all the accommodation needed without compromising the chapel's original features or spaces.

SUPPLIERS

Architects Evolution Designevolution-design.info
Main contractor Francis W Construction01325 721997
Structural engineer Bleasdale Wand01229 588585
Hunter Herald 14 woodburning stove Stoves Online.....stovesonline.co.uk
Rooflight Veluxvelux.co.uk
Staircase, windows, shutters and built-in storage Star Projects..
.....starprojects.co.uk
Limestone kitchen floor tiles Flagstone Direct
.....flagstonesdirect.co.uk
Lobby floor tiles Beswick Stone01285 885795
Handmade kitchen wall tiles Cement Tiles.....cementtiles.com
Kitchen units Howdens.....howdens.com
Kitchen diner feature lighting Maison du Monde
.....maisonsdumonde.com
Winchester bath (main bathroom) Victoria Plum.....
.....victoriaplum.com
Basin (main bathroom) Bathstore.....bathstore.com
En suite shower and basin Ideal Standard....ideal-standard.co.uk
En suite shower door Rolling Glass.....01423 566500

● Chapel on the Hill is available for holiday let at:
chapel-on-the-hill.com





Coming Home to Copper

Be inspired by this unique house, designed by Graux & Baeyens Architecten, which won 'Public Choice' in the European Copper in Architecture Awards

This copper-clad family home, located outside the town of Ghent in Belgium, has just been named winner of the 'Public Choice' category in the European Copper in Architecture Awards. Its untreated copper cladding will evolve with age, changing colour from bright copper to brown then green over the years.

"The silhouette of the building alludes to rural buildings, such as farmhouses or barns, and the simplicity of the design is broken up by large glass façades, which establish relationships with the surrounding trees and a nearby listed castle wall," says Nick Hay, of the Copper Development Association.

"Copper was chosen as a cladding material not only because of its colouration, but also its environmental credentials — with more than 100 years' service life and 100 per cent recyclability. The material is increasingly being used on residential projects where homeowners appreciate the unique qualities that only copper can bring to a property." For more information, visit come-home-to-copper.co.uk. 



Left and above: The untreated copper cladding on this award-winning Belgian house will oxidise and change colour over the years

Right: Large glass façades bring light into the interior of this family home and maximise views of the surrounding trees and castle walls

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HOMES CONTEMPORARY EXTENSION

Double Vision

A contemporary 'wing' updates a rundown cottage for 21st-century living

Photography: **Simon Maxwell**

Lucy and Andrew Thompson's cottage was a simple, modest and rather rundown affair, but it had a wonderful setting within an Area of Outstanding Natural Beauty and offered plenty of potential for improvement.

Working with CaSA Architects, the couple gained consent for a substantial contemporary-style extension which went well beyond the normal planning allowance. The simple form of the existing gable structure to the front was replicated at the rear to provide two additional bedrooms at first floor level, with an open plan kitchen and dining room below. A new entrance, staircase and hall is contained within a narrow 'spine' located between the two gable structures, clearly defining three separate volumes which express their different functions.

Quality natural materials are used externally, including blue lias stone to match the cottage, as well as cedar, zinc and oak, all weathering to a subtle palette of different greys, sitting comfortably against the original cottage and within the wider landscape. Internally, the spaces are carefully arranged to allow flexible family living, with double doors allowing spaces to work together or in isolation. Double-height spaces within the hall provide a dramatic sense of volume and allow light to flood into the adjacent spaces.

Polished concrete floors throughout the ground floor connect these spaces, with oak joinery and flush frameless doors and cupboards creating a streamlined and spacious feel to the interior. Super-insulated walls and underfloor heating provide an extremely comfortable and efficient living environment in this extremely exposed site. **H**



PROJECT NOTES

Location:
Wiltshire

Build time:
Sep 2011
– Apr 2014

Build cost:
£375,000

Size: 225m²

Architect: CaSA
Architects (casa-architects.co.uk)

See more in an
upcoming issue



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Photo credit: Simon Maxwell



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Photo credit: Simon Maxwell



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HOMES CONTEMPORARY SELF-BUILD



Box Clever

A stunning SIPs home with a crisp rectangular form has been achieved, despite strict planning requirements

Photography: c/o Adrian James Architects



Despite its wholly rural setting, this contemporary home nestles beautifully into its location. With an aim from the outset to keep the design as simple as possible, Louisa Cohn and Simon Tiensa were keen to build a stripped-down, “easily buildable” house within an energy-efficient envelope.

Employing Adrian James Architects, the couple had fairly firm ideas of what they wanted to achieve within the restrictions the site imposed (the height was restricted to no higher than their neighbour’s house and the footprint could be no larger than the bungalow which stood on the plot previously).

A flat roof was constructed to maximise the internal spaces and also to maintain the unfussy ethos of the house. The building has been clad in low-maintenance cedar, with the underlying structure of the simple ‘cuboid’ form being made up of SIPs (structural insulated panels).

Internally, a large open plan space dominates the ground floor, working perfectly as a family space. The huge expanse of sliding doors here is reflected in the window layout of the upstairs bedrooms, affording stunning countryside views. A basement has also been included to make up for the lack of loft space and also to house the plant cupboard needed for the renewable features. 

PROJECT NOTES

Location:
Oxfordshire

Build times:
Nov 2012
– Oct 2013

Size:
150m²

Plot cost:
£300,000

Build cost:
£375,000

Architect: Adrian
James Architects
(adrianjames.com)

See more in an
upcoming issue

HOMES TIMBER FRAME SELF-BUILD

A Labour of Love

Richard and Chrissie Baker's new timber frame self-built home on the Isle of Man is a triumph of determination and inspiration

Words: **Jason Orme** Photography: **Jeremy Phillips**



If you happened to wander past Richard and Chrissie Baker's building site some three and a half years ago, you would have found Richard partway through shifting 220 tonnes – 220 tonnes! – of rubble, part of the 1,200 tonnes dug out of the site overall (the other 81 wagon loads removed more conventionally) to form backfill for the newly built basement walls. All by wheelbarrow. Each barrow fed by a digger that Richard had spent £5,000 or so on when they started. Richard remembers that he wheeled 50 barrow loads a day, every day for five months. You just hope he had a good wheelbarrow. With the exception of some of the groundworks, the basement formwork, some steelwork and all of the timber frame, he and Chrissie went on to effectively build the home single-handed over a period of four years, two of which he fitted in around his work, two of which were full-time upon his retirement. To call this a self-build barely does it justice.

"We've had a lifetime of doing up homes," explains Richard in the sun-drenched kitchen of their now complete home, which enjoys glimpses of the sea in a lovely hidden corner of the north-east of the Isle of Man. "We moved eight times in 20 years and I built up some considerable experience of working around the house," he adds. "We always wanted to build a house from scratch. All the other homes, regardless of what we achieved, had some degree of compromise. We wanted to build our own home to truly get what we wanted."

Plots on the Isle are sparse and when an opportunity came up, Richard and Chrissie had to move fast. "It was around a third of an acre, heavily wooded and sloping — it was effectively the bottom of the garden of a house up the hill," explains Chrissie. "We could see it would have great views, and decided to go for it." Given the location, which is in close proximity to local areas of historical interest, their offer was made subject to the satisfactory outcome of a geophysical survey, assessing the site too for any archeological ➤➤

PROJECT NOTES

Project: Timber frame self-build

Location:
Isle of Man

Build times: Oct 2010 – Jul 2014

Size: 285m²

Land cost:
£270,000

Build cost:
£398,000
(£1,396/m²)

Value: £675,000



The Daily Telegraph
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Front Elevation

The new home successfully navigates the challenges of a sloping site, with a formwork basement holding cantilevered steels which support the overhanging deck and Potton timber frame. The cedar cladding was fitted by Richard

HOMES TIMBER FRAME SELF-BUILD



Above and Right: Living/Dining/Kitchen Space

The large kitchen, from Nolte, supplied by B&B Furniture, flows into the dining and living space (note the lack of internal doors). Amtico luxury vinyl flooring provides the perfect surface over underfloor heating, while large triple-glazed Internorm windows feature minimal frames. The large circular features are in fact acoustic baffles, specified to address potential sound problems with high ceilings (they're 2.9m high here), lots of glass and hard floors. A woodburning stove, from Stoves Online, is hardly used thanks to the building's airtight, insulated envelope and mechanical ventilation heat recovery unit



HOMES TIMBER FRAME SELF-BUILD

interest which would have put the kibosh on any development. When this was received, the couple went ahead and acquired the plot, which came with outline planning permission. That's when Richard and Chrissie really got going.

Designing their Own Home

"We wanted to build a home to our very own design and specification without compromise. We wanted a contemporary but unfussy design with lots of glass, inside/outside living, an open plan living area and a garage underneath. The house had to be low energy with the plumbing all located in the same quarter of the house to reduce pipe runs.

"On this project we didn't use an architect, a quantity surveyor or a project manager," says Richard. Instead Chrissie and Richard spent endless hours planning and designing their dream home on a fairly simple piece of home design software, using magazines and the internet to guide their schemes. "That was one of the many benefits for us of using Potton, the timber frame supplier," says Richard. "Their service stretched well beyond simply designing and erecting the kit. They turned all of our conceptual drawings into real working constructional drawings, as well as drawings to submit for planning. They helped with everything and kept in touch throughout the project — the service was excellent." The contemporary scheme, which Richard had informally ran past a planning officer before submitting, was approved without trouble.

An Energy-Efficient Home

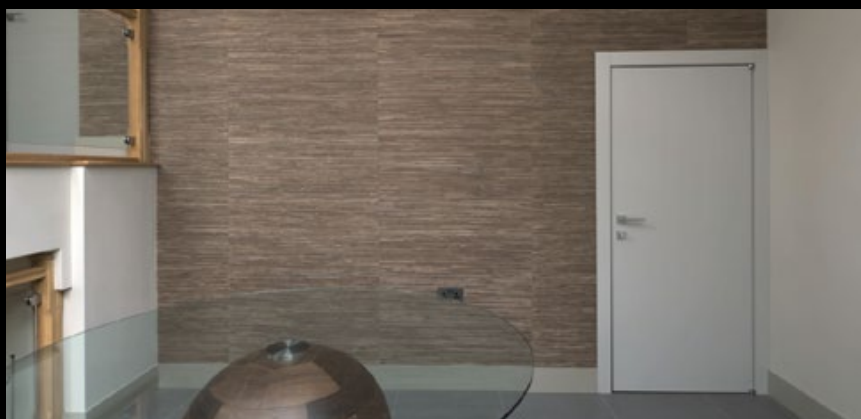
"We knew we wanted our home to be as energy efficient as possible," continues Richard. But, given the island setting, local expertise on cutting-edge Passivhaus-style site practice was lacking — leaving Richard to take the lead in minimising energy use. "We considered structural insulated panels (SIPs) but in the end went for Potton's closed panel timber frame system, maxing out the Kingspan insulation to 120mm (achieving U values of 0.15 in the process)." The basement is built out of concrete formwork, with steel beams cantilevering out to provide support for the deck. The timber frame sits off the basement walls. Triple-glazed windows from Internorm provide excellent performance throughout (U values of around 0.8 compared to typical double glazing of 1.6) as well as pleasing looks — large areas of glazing with minimal frames and lovely large sliding doors. The heating system consists of an Earth Save 4kW heat pump powering underfloor heating with a MVHR (mechanical ventilation heat recovery) system from Genvex managing ventilation as well as using heat generated in the kitchen and bathrooms to help heat

Right: Generous Spaces

As self-builders Richard and Chrissie aren't slaves to the vagaries of building to the market, so have designed in fewer, but bigger bedrooms, all with large picture windows. The sanitaryware is from Laufen, supplied by Riverside Ceramics. Large PVCu Whiterock wall panels from Altro ensure a low-maintenance and smart finish for the shower enclosure. The bespoke staircase runs off a central timber beam spine







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HOMES TIMBER FRAME SELF-BUILD



the rest of the home. With a woodburning stove providing bags of heat for the open plan ground floor space, Richard and Chrissie have had the underfloor heating on a grand total of once over the 15 months they have lived in the house. In many ways the key issue is controlling overheating, which they have accounted for in the design (covered outdoor spaces minimising direct sunlight) and specification (the Internorm windows are coated to reduce solar gain — the triple glazing helps in this regard too). Meanwhile, 15 photovoltaic (PV) panels hidden behind a parapet on the flat roof (single-ply membrane) provide a significant contribution to the bills. LED lights throughout minimise energy use too.

Sound performance was important to Richard and Chrissie too — having noticed the occasionally echoey nature of some modern builds with lots of glass, hard floors and high ceilings. “After completion we found a firm (Sonata Acoustics) who specialised in commercial buildings who would provide acoustic panels,” says Chrissie. “They sit on the ceiling and some walls and make a massive difference. In a way they have become a bit of a feature in their own right,” she says.

As an example of the evolution of timber frame packages, Richard and Chrissie’s home is outstanding — on several levels. Not least that it marks the evolution of design in this sector – it is difficult to imagine one of our longest-established timber frame companies building something like this a decade ago – but also that it stands as an example of the performance and desirability of timber frame homes in their own right.

The thought of Richard’s endeavours takes some comprehending. To name but a few of their achievements, between them they handled the blockwork, all the plumbing and electrics, drainage, bathroom and kitchen fitting, installation of the western red cedar cladding, the finishes, all the landscaping and much else besides. Just imagine having to install 300 sheets of Fermacell boards (at 40kg each) — and that’s only a fraction of the job. “The truth is that a lot of the work on a build site requires only modest skill levels. You can learn an awful lot simply by reading installation manuals and, of course, researching on the internet. It took its time to build, but we’re delighted with it,” concludes Richard. 🏠 ➡



Above: Energy Efficiency

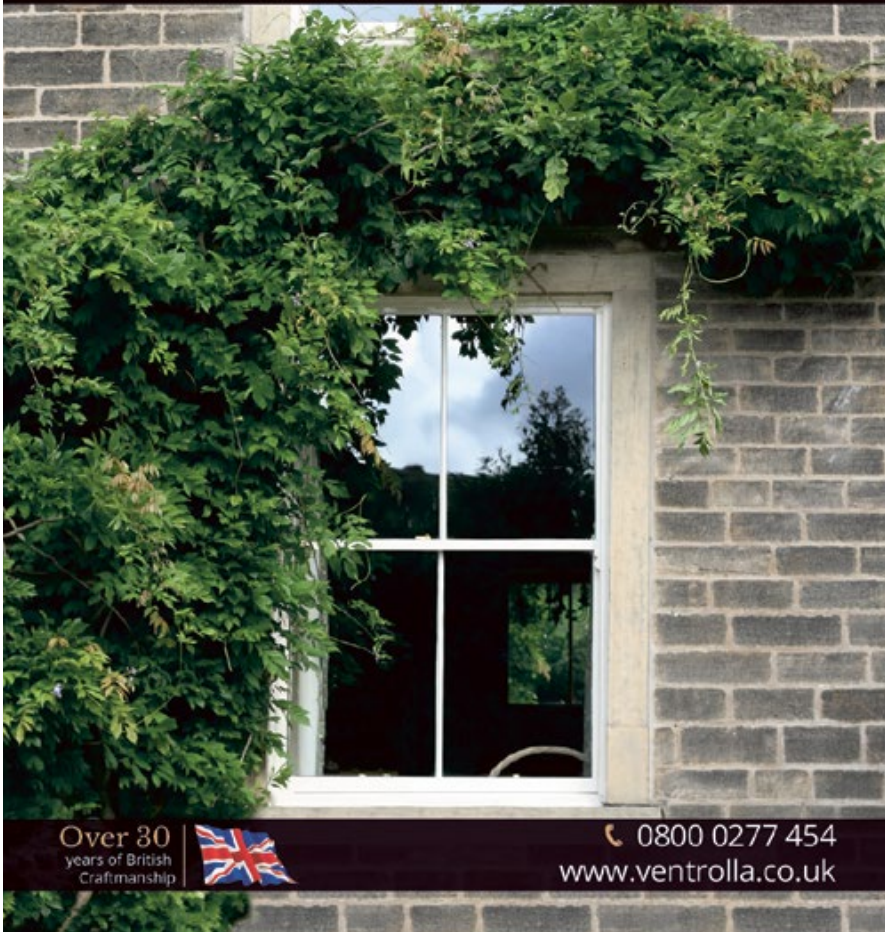
Minimising long-term running costs was very important to Richard and Chrissie, so in addition to the high-spec wall build-ups (120mm of Kingspan in the timber frame) they have also added in solar PV (photovoltaic) panels, placed behind parapets on the flat roof to hide them. Richard did almost all of his own plumbing and heating engineering, so the plant room is immaculately organised, housing everything from the buffer tanks to the underfloor heating manifold

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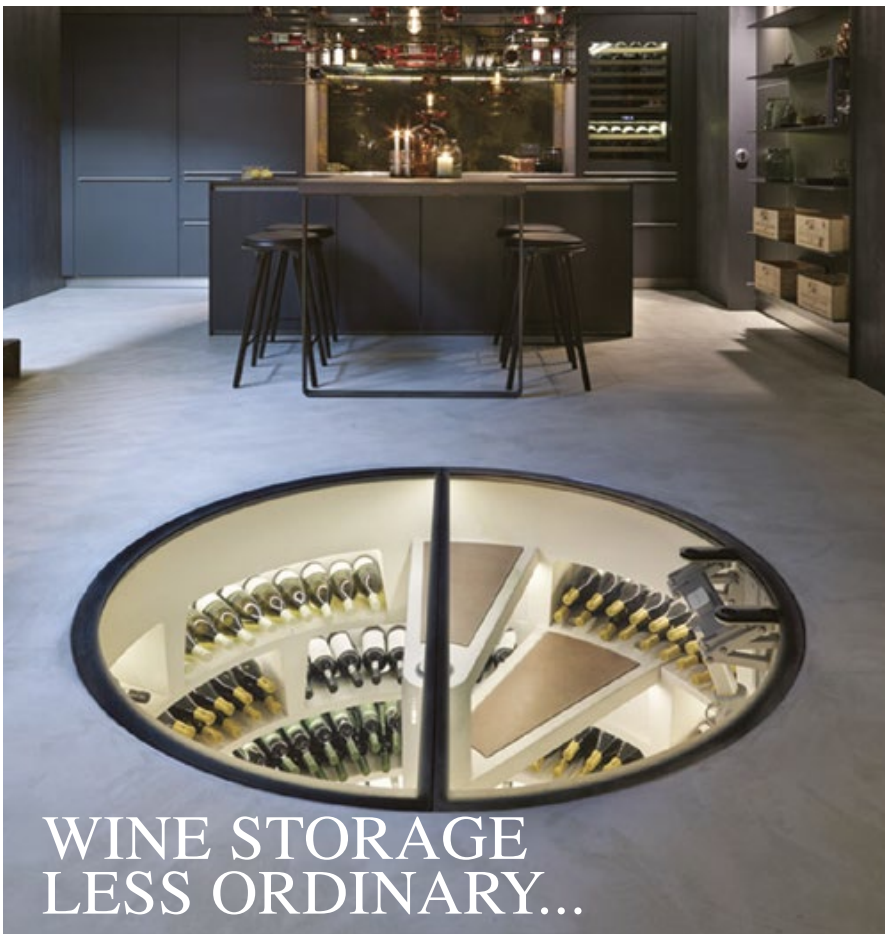
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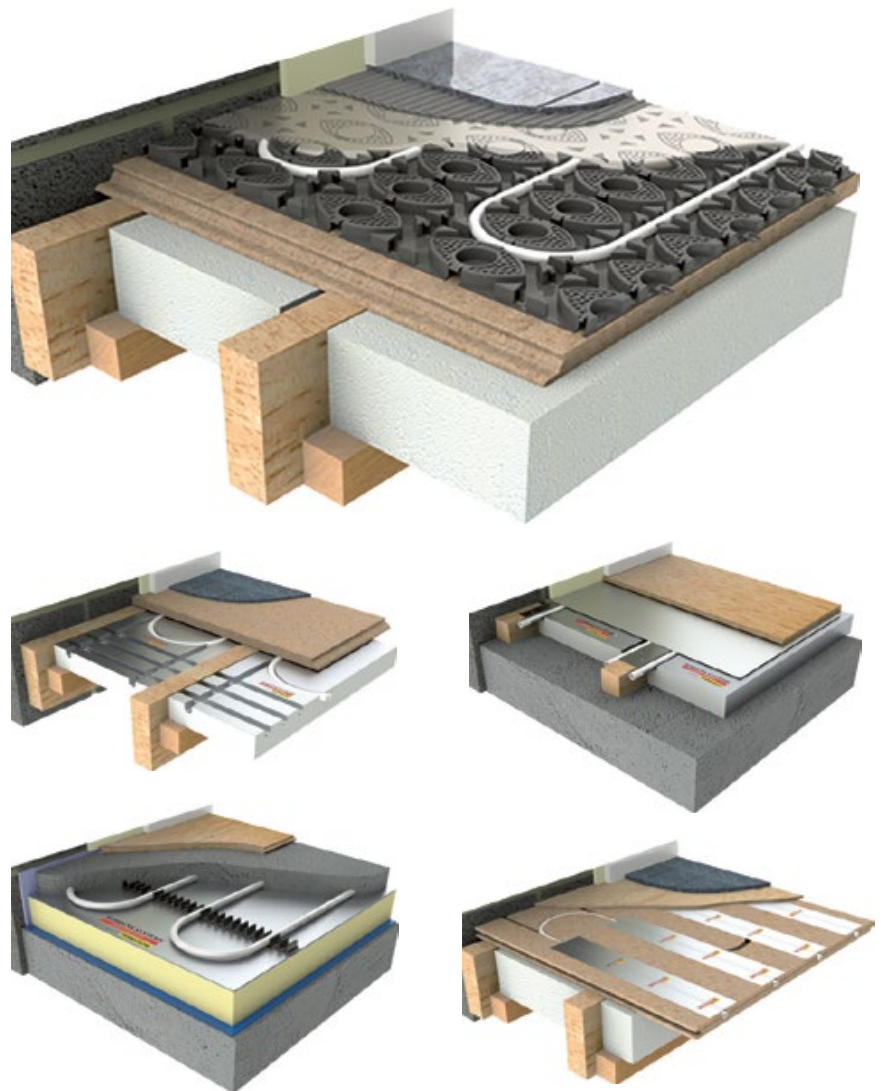
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HOMES TIMBER FRAME SELF-BUILD

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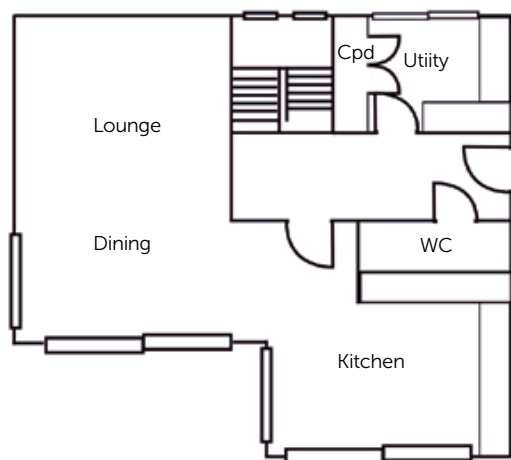
Jason Orme
Judge and Editor
of *Homebuilding
& Renovating*

THE JUDGE'S VIEW

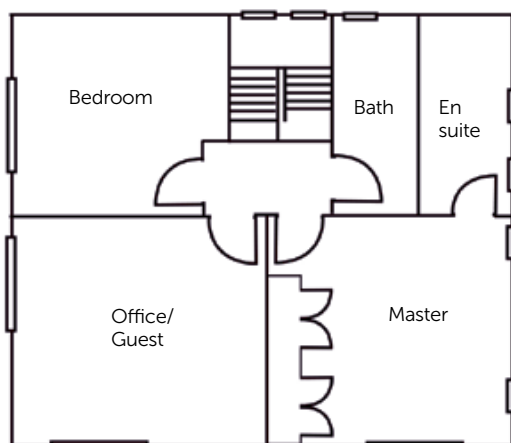
With award-winning homes we look for schemes that push forward the boundaries a little bit. When most of us think of timber frame homes, we think of traditional styles, conservative layouts and, frankly, function over form. It might conjure up the idea of 'out of the brochure' designs from a handful of house styles. What the Bakers' home exemplifies is that timber frame is a perfectly sensible option for those looking to build beautiful bespoke homes at the top end of contemporary architecture: that, most importantly, using a timber frame company now means you're open to exciting design in the same way that you would be using an independent architect. Richard and Chrissie Baker's home pushes forward the image of timber frame homes — and shows what can be achieved.

In addition to that brilliant design, it was impossible not to be overawed by Richard and Chrissie's determination to tackle almost all of the building work themselves. The huge amount of DIY involvement clearly enabled them to feel much more connected to the finished home and it is an absolute triumph of hard work, determination and that spirit of 'can-do' entrepreneurship that typifies the best self-builds — this one included.

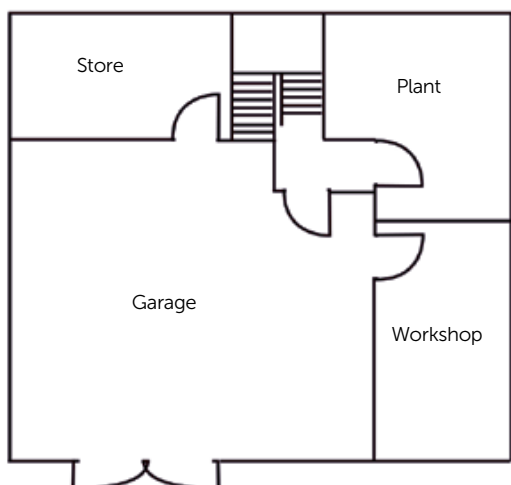
Ground Floor



First Floor



Basement



SUPPLIERS

Timber frame	Potton	01767 676400
Windows	Internorm	020 8205 9991
Flooring	Amtico	amtico.com
Blinds	Luxaflex	luxaflex.co.uk
MVHR	Total Home Environment	0345 260 0123
Heat pump	Earth Save Products	01865 598158
Bathroom panels	Altro	01462 489516
Appliances	Appliances Direct	0871 984 4416
Plasterboard	Fermacell	0121 311 3480
Cedar cladding	Silva Timber	0151 495 3111
Sanitaryware	Laufen	01530 510007
Garage door	Hörmann	01530 513000
General building materials	Island Timber & Building Materials	01624 827338
	J. Qualtrough & Co	01624 822581
	Macs Builders Merchants	01624 844588
	Jewson (IOM)	01624 813389
	C. Kniveton	01624 828840
	CuPlas Callow Ltd	01624 618169
	Corlett Building Materials	01624 842200
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HOMES TRADITIONAL-STYLE SELF-BUILD

American Dream

A New England-style home, in East Sussex, designed and built by its owners

Photography: **Simon Maxwell**



PROJECT NOTES

Location:

East Sussex

Build times:

Sep 2013
– Jun 2014

Size: 276m²

Plot cost:

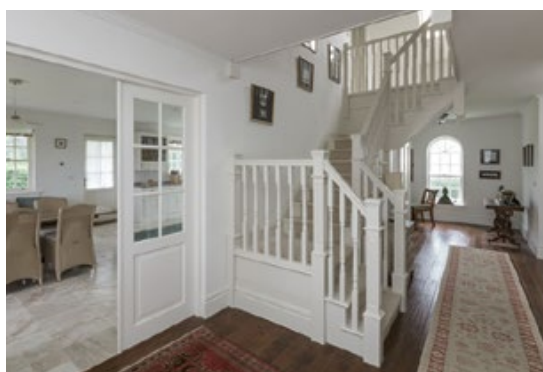
£415,000

Build cost:

£270,000

Current value:

£900,000



That Richard and Jane Gane designed and built it all themselves isn't the most remarkable thing about their new, American-style home in East Sussex — it is that the house, regardless of its origin, is achingly beautiful in its own right, regardless of how it came to be. Its well-proportioned windows, both in shape and size, its picturesque storey-and-a-half front elevation, its covered outdoor porches and, most impressively, its open layout, with big internal doors and classically generous proportions (despite its modest footprint) would be proud additions to any architect's portfolio.

Richard's philosophy is simple: "If you are going to self-build then do it — completely. Design the house and all the components within it, design the immediate environment it sits within, deal with the planners and Building Control, specify and order all the parts, deal with technical and practical issues along the way, manage the finances, recruit, schedule and manage all the subcontractors — and do a chunk of the work yourself."

Everywhere you look, Richard and Jane's home is a result of their tastes — it sounds obvious, but it's not always done so well. Self-built and self-designed, this is a masterly home that successfully navigates two very dangerous paths: pulling off American design in the UK; and avoiding professional design. That it succeeds so well is testament to the time and effort put in by its owners.

"You'll need spare time and lots of it," says Richard. "This 100 per cent commitment over the best part of two years was only possible because I was retired. We have realised our desire to create something unique — it's a building with integrity and a real personal statement." **H**

See more in an
upcoming issue





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HOMES MODERN EXTENSION AND REMODEL

Outside the Box

A dated home with an awkward layout is transformed for 21st-century living

Photography: Martin Gardner c/o AR Design Studio



See more in an upcoming issue

PROJECT NOTES

Project: Extension and remodel

Location: Hampshire

Build time: Apr 2013 – Jun 2014

Extension size: Approximately 100m²

House cost: Already owned

Build cost: £250,000

Current value: Unknown

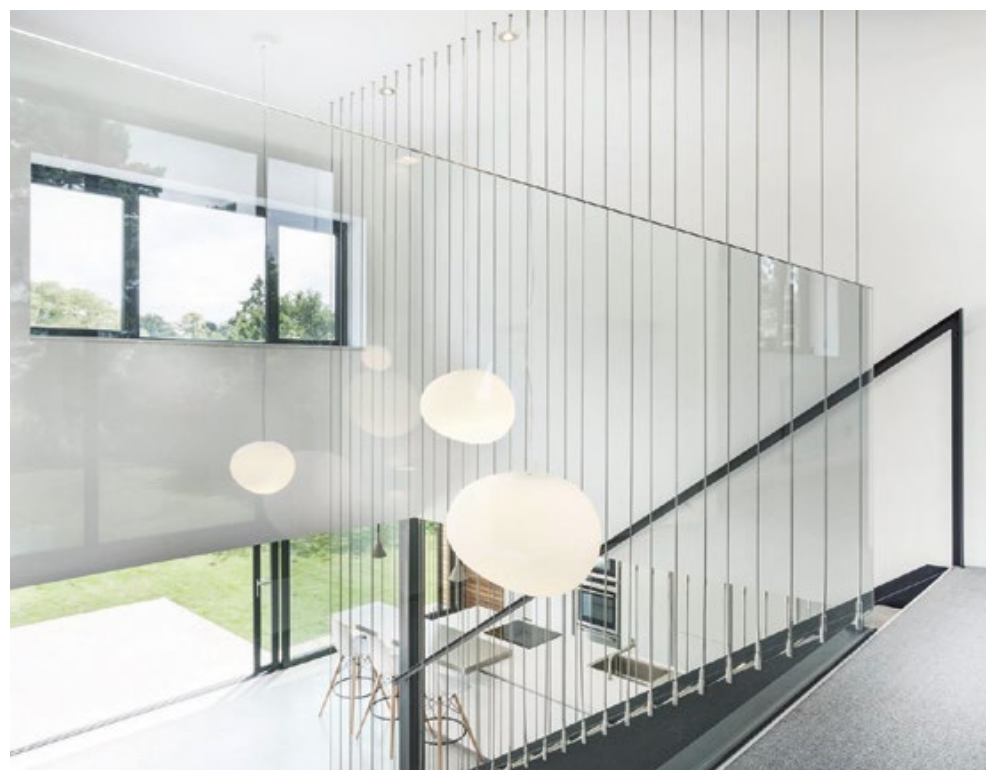
Architect: AR Design Studio (ardesignstudio.co.uk)

In a tired state and with an awkward, maze-like layout, unsuitable for modern family life, this home was in desperate need of updating, remodelling and extending. The four-bed house also suffered from both a lack of natural light and architectural wow.

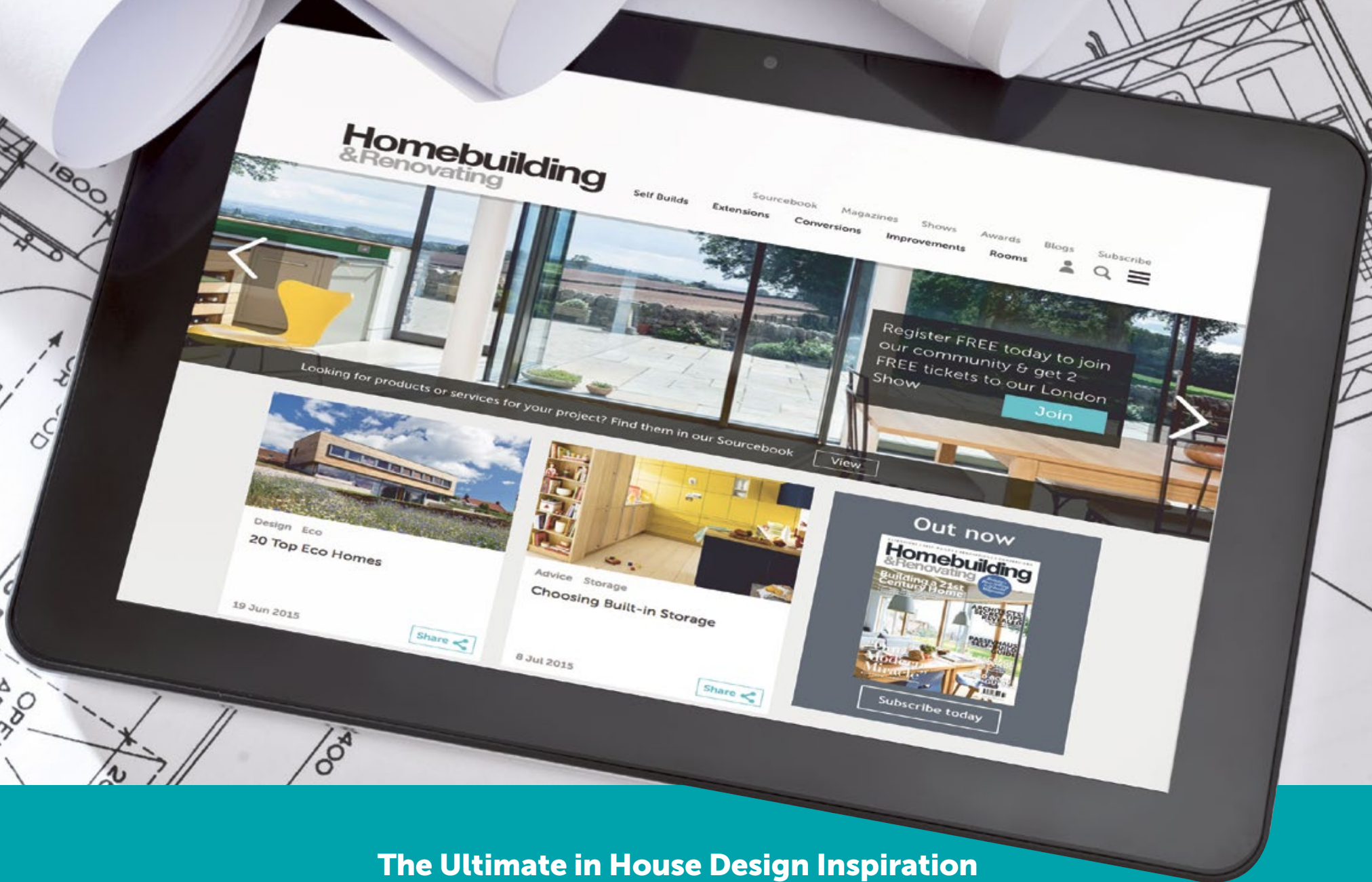
The owners asked architectural practice AR Design Studio to open up the ground floor space and create a central area where the whole family could gather together.

The house has now been radically transformed. A grand double-height entrance hall awaits behind the front door, leading straight into one large living space with an expanse of glazing opening the rear of the house to the garden. A striking staircase, constructed from stainless steel with concrete treads and stainless steel cables, acts as a dramatic space divider, neatly separating the kitchen, dining and living areas.

The two 'wings' of the house at the rear have been connected by a timber-clad extension featuring a large concrete plinth which flows from inside to out. The interior and exterior spaces are further connected by the use of western red cedar cladding on the walls. Upstairs there are now five bedrooms and a bridge landing spans across the double-height entrance space. 



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HOMES CONTEMPORARY EXTENSION

Terrace Transformed

A terrace is opened up thanks to an innovative take on the side return extension

Photography: Tim Soar c/o Coffey Architects



PROJECT NOTES

Location: London

Build time:
Jun – Oct 2014

Build cost:
£203,000

Extension size:
Approximately 16m²

Architect:
Coffey Architects
(coffeyarchitects.com)

See more in an
upcoming issue

While the side return extension may be something of a given for most Victorian terraced houses these days, few have the design impact and imagination of this one. Coffey Architects were asked by the owners of this three storey London home to address the lack of light in the main rooms on the ground floor, to unite the awkward and separate rooms into one sociable space and, finally, to connect it all to the outdoors.

Thanks to a series of complex steel beams, it has been possible to create both the cantilevered section over the bi-fold doors, as well as the highly unusual angled brickwork wall with its run of frameless rooflight glazing above.

Many of the existing ground floor walls were removed in order to create one large open space for dining and entertaining, while a separate room at the front of the house uses solid bi-fold doors to maintain an element of privacy.

Finally, the continuation of the concrete floors and London stock brick from inside to out and clever touches such as the inset LED 'channels' make this one side return that is anything but ordinary. 





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BEFORE

PROJECT NOTES

Project:

Restoration,
remodel and
extension

Location:

Nottingham

Dates: Jun 2013

– Aug 2014

Size: 150m²**House cost:**

£300,000

Project cost:

£250,000

(£1,666/m²)

Value: £600,000

HOMES RESTORATION, REMODEL AND EXTENSION

Three into One

A programme of renovation and extension works transforms a trio of
rundown cottages into a charming home for a young couple

Words and styling: Anna Morley

Photography: Jeremy Phillips

HOMES RESTORATION, REMODEL AND EXTENSION



HOMES RESTORATION, REMODEL AND EXTENSION



THE QUICK READ

⇒ Sean Peel and Alice Shread have renovated three Grade II farmworkers' cottages, uniting them to form one family home

⇒ The focus was on bringing in as much light as possible while working within the existing footprint of the building and with the existing fabric

⇒ Despite double glazing being ruled out on the basis of the property's listed status, the home is still thermally efficient thanks to the insulation added

Open Living Area

The original beams, which had been painted in a thick, tar-like paint, were stripped back and lime washed to create a fresh look. The large open plan spaces also maintain the building's original agricultural feel

For most first-time buyers, the task of not only restoring three 17th-century, Grade II listed farmworkers' cottages, but uniting them to form one family home, may seem like a challenge too far. However, for architect Sean Peel and partner Alice Shread, it was the perfect opportunity to create a forever home.

The dilapidated condition of the building did not put the couple off when they were presented with the auction brochure by Alice's Dad back in 2012. "We saw it and drove down to Nottinghamshire the same night," explains Alice. "We looked over the wall and saw it was in quite a bad state."

The property hadn't been touched in about 30 years, but with Sean's architectural experience and encouragement from Alice's Dad, they decided to put in a bid — which was accepted. Their friend and local contractor Michael Shipman of Shipman and Bee is a specialist in this type of project, which helped too. "He was really helpful throughout the whole process, making sure the historical detail remained accurate," says Sean.

The couple, who had been living together in Liverpool where they met and both studied before moving back to their roots in Nottinghamshire, already knew the area. "My parents live fairly close by and I always knew I wanted to live here as it's such a beautiful village," says Alice. "We felt it was the perfect opportunity to put our stamp on something and since properties hardly ever come up for sale here, we just knew it was right for us."

The Planning Process

Sean had taken a job in nearby Newark and was working for a large international architectural practice when the couple bought the ⇒



HOMES RESTORATION, REMODEL AND EXTENSION



property, but this was their first project of their own. The property came with planning permission already in place, but with its Grade II listing the couple's proposed plans took several months to be agreed.

Sean chose to submit for pre-application advice so works could be negotiated before the final plans were proposed. It was stipulated that the three staircases and three door openings needed to be retained to be in keeping with the original house. "We chose to make it three bedrooms, three bathrooms and to keep the kitchen light and airy, rather than make a fourth bedroom and lose ceiling height," explains Sean.

A Sensitive Restoration

Work started on site in March 2013 and the couple chose to project manage the work while living close by with Alice's parents. With this project, Sean wanted to challenge the traditional notions of blending the old with new, so his plans carefully incorporated the restrictions of renovating a Grade II listed property, with modern living. "The ethos was that we knew what we had to work with and couldn't really change too much. The rooms had to link through and we wanted to make things as light and airy as possible, including making the kitchen area feel spacious with high ceilings and large windows to bring in as much light as possible," he says. The original footprint remained the same, including the kitchen extension, which had originally been a coal shed and outhouse. Double glazing was not to be used in any part of the original house, but with good insulation, this wasn't an issue.

The couple had a surprise find early on, when an original oak frame wall at the back of the house was uncovered; trapped behind cement-based plaster for many years, the frame was rotten and ➤



Left: Family Kitchen

The modern family kitchen from Magnet has a galley-like layout to maximise the space available and is flooded with light thanks to the runs of French doors and banks of rooflights

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HOMES RESTORATION, REMODEL AND EXTENSION

Front Elevation

Sean created a shutter-style feature within the original doorways — each is now a window with a wooden slatted frame hung on top. This makes for an attractive finish and also offers an element of privacy. “From the road where the house is first viewed, these shutters obscure the view into the living area,” says Sean

warped. This meant the whole rear elevation had to be rebuilt, so with the help of James Cranes of Timber Framing Ltd they propped up the existing beams up, rebuilt the wall and then added insulation.

Since the property had been three houses, the floors were at differing heights, meaning the whole floor area had to be dug out. “We recast the floors with 120mm of insulation and underfloor heating,” explains Sean. They also raised the height of the master bedroom and en suite.

The End Result

The interiors now have a beautiful lightness and flow to them. The modern kitchen, with south-facing windows, bi-fold doors and skylights is flooded with natural light, but thanks to Sean’s clever design, retains the agricultural feel of the original space. It runs into the dining and living room in a way that keeps each zone both separate yet connected.

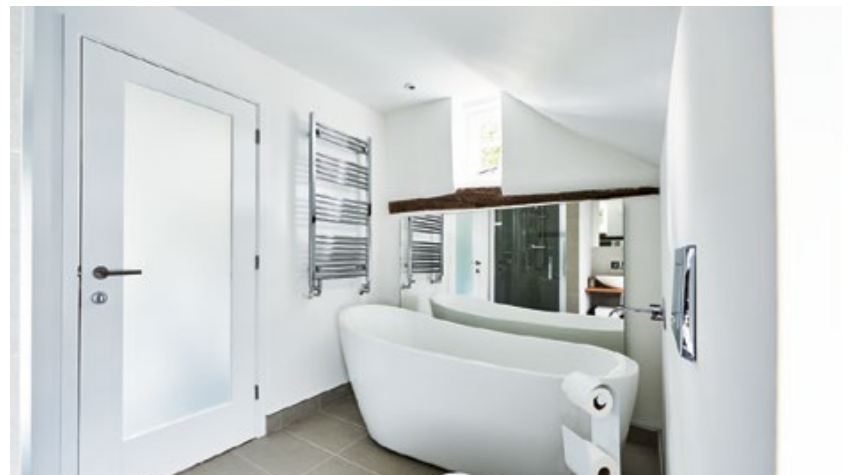
Upstairs, the guest bedroom has been kept separate so that visitors can have their own space, whilst the remaining two bedrooms are linked, with a separate staircase to each.

The couple had a budget of £200,000 and Alice kept a spreadsheet for tracking this. “We went slightly over, but it became a labour of love,” she says.

Throughout, the couple opted to use traditional techniques wherever possible. (Although there is also lots of hidden steel in various areas of wall supporting the building, including supporting one of the chimneys). Where original materials could not be saved, new products sensitive to the building were used. “The roof tiles are all new, handmade from clay, and the wall finish had to be in lime render. Michael is a specialist in this and the horsehairs used can be seen in the walls.”

The energy-efficiency credentials of the house were limited by what they were allowed to do, but Sean’s approach was that this was a recycling project. “Since it is a reused property, this in itself is environmentally efficient,” he says. “It’s been here for 300 years and hopefully will still be here for another 300.”

It was important to Sean and Alice that there was an honesty in the materials and modern designs were needed to blend with the original building. “I found it kind of a test — what you can do with a listed building in terms of making it environmentally friendly and comfortable for modern living whilst retaining its integrity,” says Sean. And with chickens wandering in the beautiful acre of grounds that surround the property in its idyllic setting, it’s easy to imagine how this listed property looked when occupied by three families — Sean and Alice’s interpretation is truly exceptional. 



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HOMES RESTORATION, REMODEL AND EXTENSION

The Project



Jason Orme
Judge and Editor
of *Homebuilding
& Renovating*

THE JUDGE’S VIEW

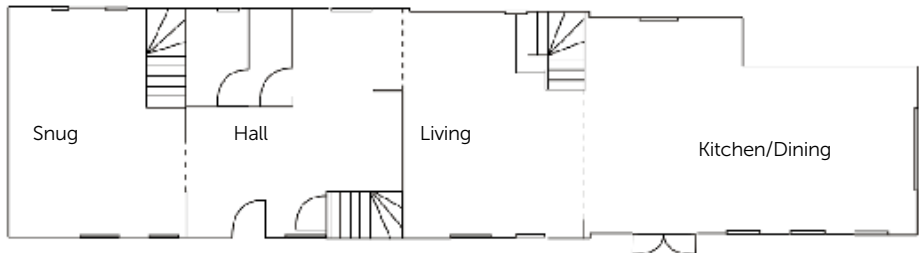
On their first project Sean and Alice have achieved what few very experienced renovators get close to — a textbook improvement of an existing home, upgrading its overall appearance so that somehow it looks even more ‘aged’ than the original, combined with interiors that are stylish, sympathetic and yet perfectly suited to the needs of its young, modern owners.

What the judges liked most about this project was that it solved the design problems of a narrow, long floorplan with imagination and boldness. The three original tiny cottages now have a flow and a logic to them, allowing different zoned uses. Best of all, the extension, allowing a kitchen and living space with vaulted ceiling, connects well with the garden and allows a sense of openness, contrasting with the other cosy interiors.

It’s smart, imaginative and totally in keeping — the very best of renovation projects.



First Floor



Ground Floor

SUPPLIERS

- Architect**
Sean Peel of Guy Taylor Associates.....
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- Specialist heritage contractor** Michael Shipman of Shipman and Bee
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PROJECT TIMELINE

- Aug 12** Purchased property
- Sep 12** Pre-application planning submitted
- Jan 13** Full planning permission application submitted
- Mar 13** Planning permission approved
- Jun 13** Work started
- Aug 14** Work finished



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HOMES CONTEMPORARY ECO SELF-BUILD

A Triumph in Timber

A timber frame Passivhaus replaces a rundown bungalow in Somerset

Photography: Graham Bizley



Nestling discreetly into the foot of a hill in rural Somerset, Graham and Emily Bizley's self-build is not only a striking piece of organic architecture, it's also a highly efficient family home, certified to Passivhaus level.

With plans for the lower level bedroom accommodation to be built into the sloping site, the couple secured planning permission to build this two storey home in place of a rundown 1920s bungalow — the new shallow-pitched, chalet-like roof, sitting just above the original roofline.

Timber frame was the construction system of choice, with blown cellulose and hemp used to insulate the build. (Architect Graham and interior designer Emily took on a considerable amount of the work during the build, including installing the insulation and applying the airtightness tape themselves.) In fact, wood is a particular feature of this home, with rough sawn oak cladding — now silvering to a soft grey — chosen as the rain screening, and smooth oak boards lining the first floor spaces, with painted softwood to the ceiling.

The kitchen diner and adjacent snug are among the highlights of the build, with expansive triple-glazed picture windows and sliding doors to the south and east not only designed to frame the far-reaching countryside views and adjacent orchard, but facilitating passive solar gain; the veranda meanwhile provides shade from the midday summer sun, preventing overheating.

Graham and Emily's fabric-first approach has paid off. With planning permission already in place for PV (photovoltaic) panels, there's potential for all energy used in the running of this house to be generated on site. The 4,500litre rainwater harvesting system completes the sustainable picture. **H**



PROJECT NOTES

Project:

Contemporary self-build

Location:

Somerset

Build time:

May 12 – Mar 15

Build cost:

£485,000

Size: 226m²

Architect: Prewett Bizley Architects
(prewettbizley.com)

See more in an upcoming issue

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HOMES CONTEMPORARY SELF-BUILD

Brick Revolution

A 21st-century home constructed from local brick
and designed to maximise natural light

Photography: Simon Kennedy C/O Tompkins Rygole



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Proving that contemporary houses can indeed blend into an existing street scene, Peter and Annelies Tompkins' new home is a masterclass in how to combine modern design with family-friendly living.

Having come across a 1960s bungalow which was proving difficult for the owners to sell, due to a number of covenants and planning restrictions (including height restrictions and various Tree Preservation Orders on site), Peter and Annelies were not to be put off, seeing the restrictions as a challenge. They set about designing a replacement which overcame everything thrown in their way — the result is a totally unique home.

Shunning the white-rendered box in favour of an altogether warmer approach, the new house uses a local brick, carefully laid in a bond which matches the vernacular style. Even the mortar colour and texture was carefully selected in order to ensure the overall look was just right.

Inside there is just as much attention to detail. Huge thought has gone into making this a home that will grow with this young family. Window seats snuck into full-height units, sliding doors that open up and close off spaces when needed, hidden pantries and clever laundry chutes are in abundance — not to mention a whole host of eco features which make the house cheap and easy to run. **H**

PROJECT NOTES

Location:
Berkshire

Build times:
Nov 2010 –
Aug 2012

Size:
224m²

Plot cost:
£250,000

Build cost:
£335,000

Current value:
£850,000

Architect:
Tompkins Rygole
(tompkinsrygole.com)

See more in an
upcoming issue



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HOMES CONTEMPORARY SELF-BUILD

Hidden Gem

A low-profile self-build, located in a London Conservation Area, is full of surprises

Photography: Jack Hobhouse C/O Phillips Tracey Architects

PROJECT NOTES

Location:
London

Build time:
Oct 2013 –
Jan 2015

Build cost:
Undisclosed

Size:
144m²

Architect:
Phillips Tracey
Architects
(phillipstracey.com)

See more in an
upcoming issue

Digging down to create a basement level enabled Phillips Tracey Architects – the architectural practice behind this striking self-build – to achieve a two storey home on this sensitive site, located in a Conservation Area and surrounded by listed buildings. From the frontage, this low-profile home is discreetly tucked behind its brick boundary walls.

To keep the project simple, a palette of just four materials – brick, concrete, oak and white painted walls – has been used, and the layout has been kept to an easy open plan space with the only cellular room being the master suite. Along the boundary, the walls have been rebuilt in reclaimed brick, while the blockwork of the new house itself has been clad in London stock brick. Below ground the concrete walls, which support the structure and courtyard above, have been left exposed, adding a raw, industrial style to the spaces. While sedum planting softens the flat roof.

From the streetscape the property looks very modest, however upon entry guests are met with a dramatic double-height hallway to reveal the home's two storey nature. The hallway leads into an open plan living/dining/kitchen area which has an almost gallery-like feel with its white-wash walls, quirky artwork and concrete flooring, while the basement level houses the bedroom accommodation and a second lounge.

Not just stylish, the house is efficient too thanks to the solar thermal panels on the roof, underfloor heating and highly insulated walls that go above and beyond Building Regulations standard.

The external spaces feature clean lines too, with ramps (for disabled access) and planters on the courtyard all built up to seat height, making this space a handy hang-out spot when the weather permits. It's a real entertainer's haven — contemporary, clutter-free and effortlessly cool. **H**





PROJECT NOTES

Project:

Contemporary
self-build

Location:

Hampshire

Dates: Dec 2013

– Sep 2014

Size: 200m²

House cost:

£800,000

Build cost:

£495,000
(£2,475/m²)

Value: £1.6m

HOMES CONTEMPORARY SELF-BUILD

New Meets Old

A new home in Hampshire mixes contemporary design with traditional materials

Words: **Jason Orme** Photography: **Nigel Rigden**



The Daily Telegraph
**Homebuilding
& Renovating**

AWARDS

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So often have we talked about ‘bringing the outside in’ that it has become an almost meaningless cliché to use when describing everything from a patio to a set of bi-fold doors. Everyone appears to want to do it, without much thought as to what it really means. Which makes it all the more difficult to describe Spinners, the new home designed by PAD Studio for Vicky and Andrew Roberts in Hampshire.

Andrew has a fascinating occupation as a custodian/manager/caretaker of a listed RHS garden, open all year round to the public. “We need to be on site all of the time,” explains Andrew. “The existing house – a single storey cottage owned by the previous manager – was OK, but we wanted something better suited to us. We knew a new build was the best way to go in terms of creating something highly efficient, but given the sensitivities of the site, we had to make sure we were prioritising high-quality design. We knew of PAD’s work already, and when we met architect Wendy Perring we knew that we had found our match.”

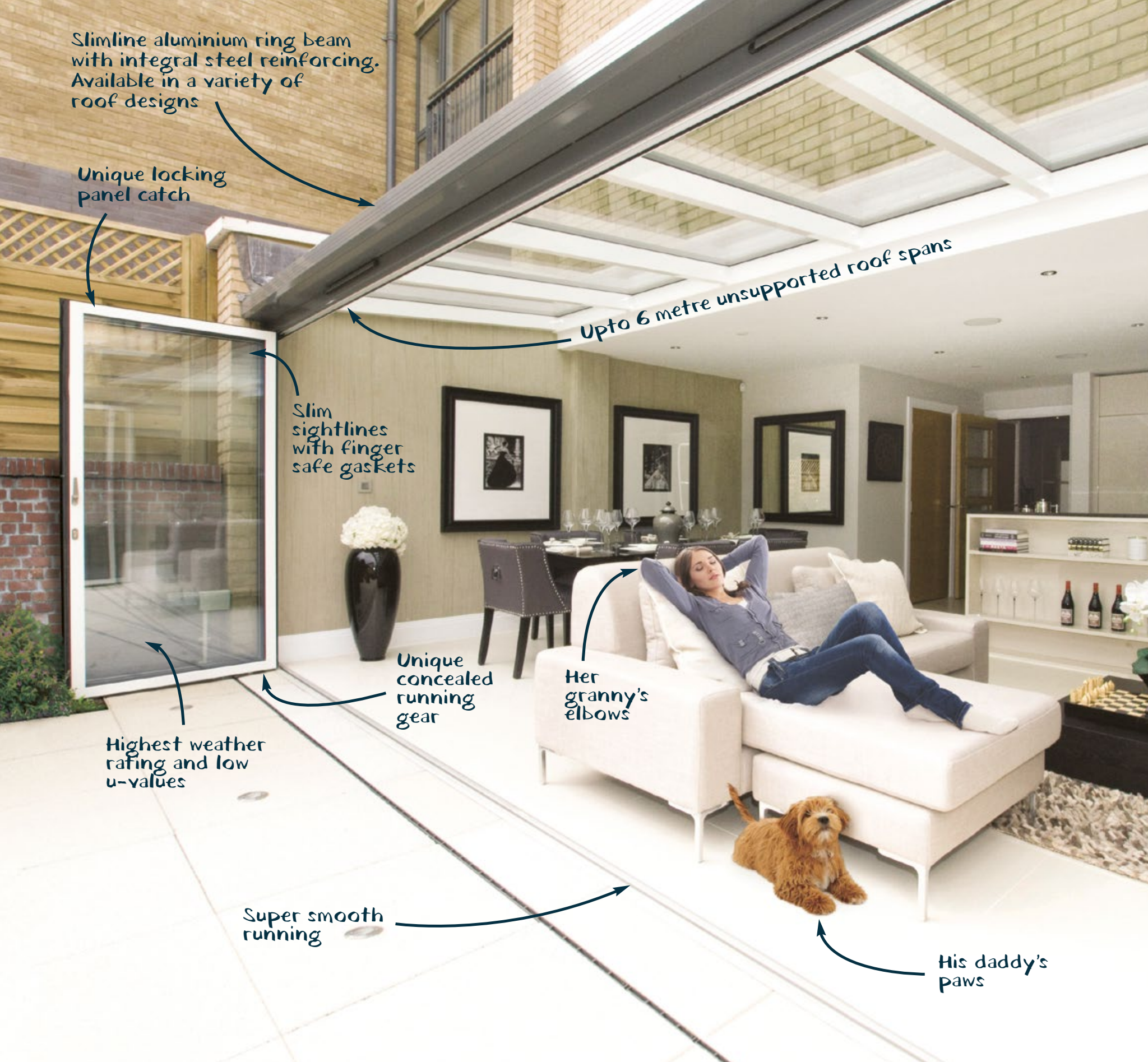
PAD are an award-winning architectural practice and came with the added benefit of having had experience working with the New Forest National Park authority, who oversee all planning applications in the area. Wendy Perring (the ‘P’ in PAD) takes up the story: “Vicky and Andrew wanted sufficient space to accommodate their visiting children and grandchildren, and were open to a shape and form that was quite contemporary. We knew, however, given the relatively public nature of the house (it can be seen by garden visitors and is essentially part of the landscape) that the materials selection would have to be quite traditional.”

This blending of old and new is key to the success of Spinners — showing that contemporary design doesn’t have to follow the usual white render and cedar cladding template but instead embrace natural (and low-maintenance) materials to, effectively, satisfy both camps. For example, the first view of the new house is of a very traditional pitched clay roof tiled form and a brick wall — which hardly belies the contemporary style inside. “The result is a vernacular home that is truly rooted in its site and brings the beautiful garden into the heart of the house,” says Wendy.

Despite its traditional coat, this house is cutting-edge in terms of construction. Utilising a structural insulated panel (SIPs) walling and roofing system (enabling the rooms in the roof to be vaulted without the need for tie beams — in fact SIPs were originally introduced to the UK as a roofing panel) with large glulam (engineered timber) beams allowing larger spans, the interior spaces feel roomy and open. Most pleasingly, the windows are positioned to perfectly frame little hidden views of the woodland garden (truly ‘bringing the outside in’) and everywhere you look you get a sense of this home’s truly magical position. High insulation levels and extra airtightness measures help to make it very energy efficient.

One of the real highlights internally is the kitchen and dining space that opens (through bi-folds) on to a large courtyard — truly it feels like an outdoor room. Vicky and Andrew should be applauded for not oversizing any of the rooms — everything is perfectly scaled and homely, which can hardly be said of every contemporary house.

“We’re very happy with the result,” says Vicky. “It is very comfortable to live in and costs hardly anything to run. Best of all, it feels as though it has added something to the landscape — it’s achieved our aims perfectly.”



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HOMES CONTEMPORARY SELF-BUILD

The Project



Wendy Perring
Architect

ARCHITECT'S VIEW

The client's brief for Spinners was to create a home within a garden that was unpretentious, in tune with the natural surroundings and which allowed them to enjoy Spinners' wonderful setting while retaining their privacy (particularly when the gardens are open to the public). Heavily influenced by architect Peter Aldington's use of the walled courtyard, we conceived the idea of a house organised around a south-facing courtyard.

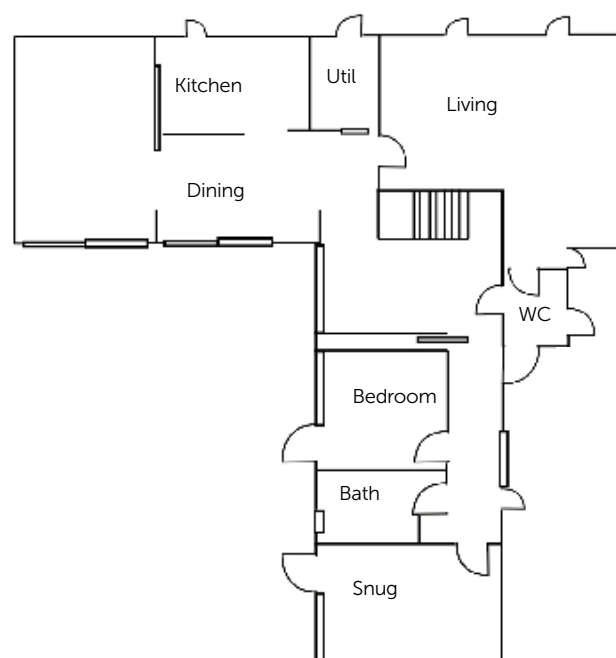
The courtyard wall acts as a backdrop for planting and provides privacy as you descend into the garden and the house is gradually revealed. This is a continuing theme of PAD's work, where the approach and progression through the house is imagined as a journey. We believe this is largely to do with the sites that we work with; many of which are in secluded forest settings and require effort to reach. We enjoy emphasising these journeys and avoid revealing everything at first glance. Equally the building's spaces are slowly revealed, changing views are framed and shadows are allowed to change the home's atmosphere and interior light quality. This design approach fosters a

strong connection with the natural environment in which our projects sit.

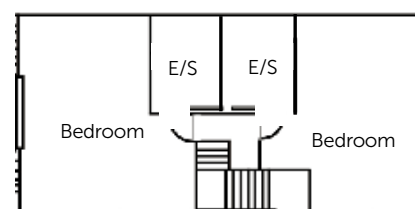
Spinners' internal arrangement is simple and divided into two wings. Andrew and Vicky's children are older, but do visit from time to time. As a result, the ground floor wing can be closed off if required, allowing the clients to feel more cosy in the main wing. To satisfy the stringent planning policies of the New Forest National Park, an economical floorplan was developed and height is used throughout to help the home feel more generous (the guest bedrooms have mezzanine levels above where grandchildren can play or boat sails can be stowed).

The house can be viewed from the public paths which surround the building and look down upon the roof from the north. As a result, Spinners has been designed in the round, with the sculptural roof form carefully detailed clay tiles, and brickwork offering a feeling of earthy robustness which work beautifully when viewed from the gardens below and from above through the delicate tree canopy.

Ground Floor



First Floor



SUPPLIERS

Main contractor HA & DB Kitchin01420 87868
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Above Cedral Lap weatherboard can be used to give a New England-style feel to properties

Below Cedral Lap has been provided for a new development at Beaulieu Park in Chelmsford

With the start of the New Year, thoughts often turn to new home-improvement projects, and one simple way to achieve a real transformation is by refreshing your property's exterior.

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For more information on Cedral fibre cement weatherboard, visit cedral.co.uk

 **MarleyEternit**





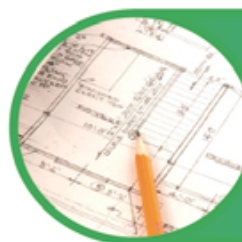
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HOMES BARN CONVERSION

Cleverly Converted

This listed barn has been converted into a stunning home with an inner courtyard

Photography: **Ioana Marinescu**



Barn conversions are notoriously hard to get right — plagued by planning restraints and throwing up all sorts of issues, such as how to make their vast internal spaces feel homely. However, this project is one that has got it seriously spot on. Sold at auction in a dilapidated state, architect Niall Maxwell of Rural Office for Architecture was tasked with the brief to develop the existing Grade II tythe barn from agricultural use to residential. The challenge was to retain as much of the traditional vernacular fabric as possible while including the required new accommodation within the existing remains.

The new T-shaped plan connects an existing piggery to the barn, with the connection offset in order to lessen the impact of this new section from the roadside. The new accommodation has been cleverly arranged around two courtyard gardens which connect the spaces.

While the appearance of the barn from the road remains relatively unchanged, with the existing window openings retained, a new 'portal' structure now retains the flint piggery walls and supports a 'floating' standing seam pitched roof.

Throughout the materials have been chosen to reflect both the heritage of the barn as well as its modern use as a home and includes zinc cladding, timber finishes and the striking brick floors which run throughout the ground floor and out on to the terraces. 

PROJECT NOTES

Location:

Norfolk

Build time:

Feb 2012
– Aug 2013

Size: 99m²

Build cost:

Undisclosed

Architect:

Rural Office
for Architecture
([ruralofficefor
architecture.co.uk](http://ruralofficeforarchitecture.co.uk))

See more in an
upcoming issue

PROJECT NOTES

Project:

Contemporary extension and remodel

Location: London

Build time: Jan 2012 – Sep 2012

Size: 212m²

House cost:

Already owned

Build cost:

£312,000
(£1,472/m²)

Value: Unknown



Double-Height Lightwell

Providing a play on levels within the centre of the home, the new double-height 6m high lightwell allows the front living room to overlook the kitchen/diner and offers glimpses of the garden. The glass and timber staircase also leads down to the basement play/family room



HOMES CONTEMPORARY EXTENSION AND REMODEL

Clear Vision

An inventive design from Coffey Architects has transformed a traditional Edwardian terrace in a London Conservation Area into a contemporary, open plan home with architectural flair

Words: **Daisy Jeffery** Photography: **c/o Coffey Architects**

THE QUICK READ

- The extension and remodel of an Edwardian terraced home in a London Conservation Area pairs contemporary design with original period features
- The new rear extension at garden level leads down to a newly excavated basement, both providing additional space
- Carefully designed glazing (the project was designed by Coffey Architects) blurs the boundaries between inside and out

As far as connecting a home to the outdoors goes, especially in a built-up area such as London, Well House – the latest triumph from architect Phil Coffey of Coffey Architects – ticks every box. Formerly made up of multiple rooms, many of which weren't used, the new extension and renovation project breathes new life into this four storey, five-bed Edwardian terraced house in Highbury Fields' Conservation Area. "The clients wanted to upgrade the house as it was split into cellular spaces and, with a young family, a lot of the rooms weren't being used," begins Phil. "The kids were the real driver of the whole thing — the couple were after open plan accommodation where they could keep an eye on the children."

Expanded Design

"With projects like this there's always the task of striking that balance between what the house needs and what the client wants — luckily they both matched on this occasion," says Phil. "With split-level terraced houses there is always the problem of too many bedrooms and not enough living spaces, which makes the house feel top-heavy, and so to create sufficient accommodation on the lower floors we chose to extend out as well as down. By digging down to create a new basement, we needed light to reach this area of the home and that's where the concept of the lightwell came from — hence the name Well House. This double-height void in the centre of the plan connects the varying levels and garden together. The key was to achieve this without it being obvious where the house ends and the extension starts — it was important to make these changes feel like they'd always been there."

Fortunately, considering the level of internal structural work, the planning process was fairly straight-forward. "The only thing we had to be careful with was the material choices for the rear extension — we chose white render to remain sensitive to the existing property," says architect Phil.

However, problems arose when work began on site and the team hit a large lump of concrete when digging out the basement, right where the planned lightwell was to be. "As with all basement extensions the expense really is in the ground and you never know what you're going to find until you start digging down," Phil explains. "We had to have that concrete lifted out before work could continue."

Once the basement had been excavated and tanked, work on the reconfigured layout began to take shape, with the new design offering the family their desired open plan accommodation. "The house originally featured an old-fashioned layout typical of the ➤

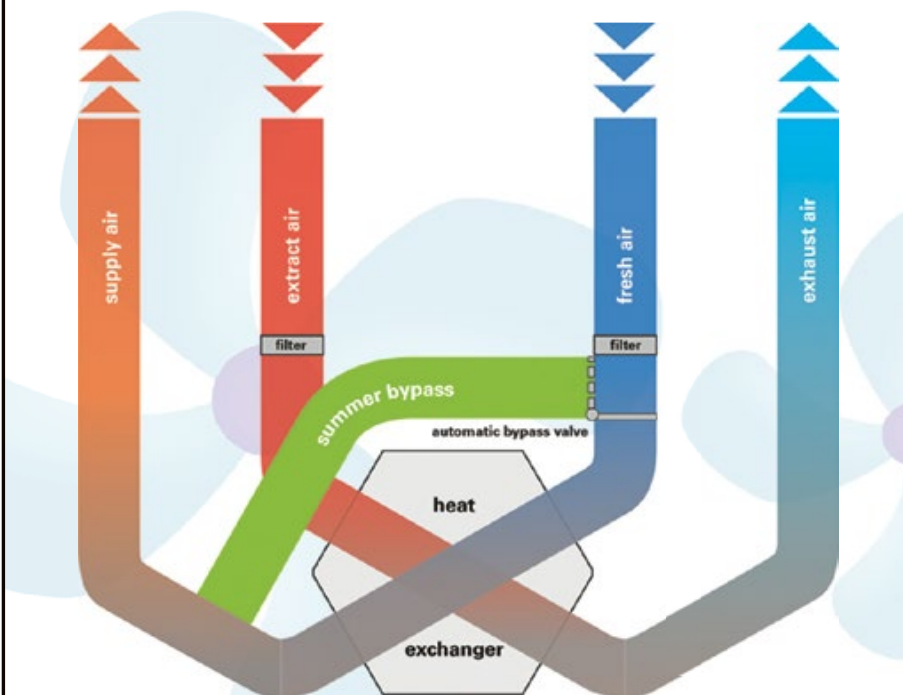


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HOMES CONTEMPORARY EXTENSION AND REMODEL

Victorian and Edwardian eras, with a formal living room to the front, a family/dining room situated in the middle and a kitchen placed at the back,” says Phil. “So often people knock through the wall between the front and middle spaces but this only leaves you with an awkwardly sized room to the front.” Now, from the hallway you enter into the ground floor living space, which has been left open to overlook the new extension thanks to the double-height void, with stairs leading down to the kitchen/diner at garden level, and then down into the family/play room in the basement.

“The rest of the house didn’t require much work — the only adjustments we really made were in terms of storage space and working this into the design using bespoke built-in joinery. We also tried to maintain as many features as we could in order to be respectful and keep the building’s charm and character.”

Defined Details

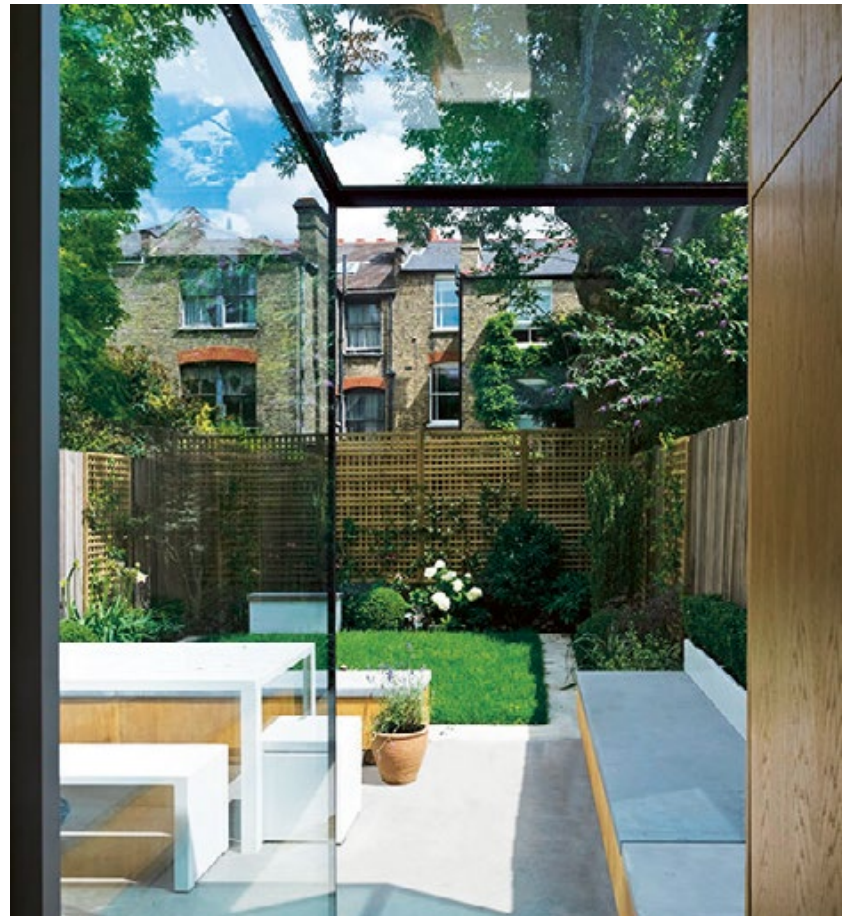
While the period features have been retained on the upper levels, the contemporary spaces in the new extension have been finished to a high standard with careful attention to detail, from the crisp lines to the carefully considered materials. “We specified self-finished materials here,” says Phil. “The concrete flooring and brick walls are both materials which can be used just as well inside the home as they can on the outside, while the use of wood in the kitchen and for the staircases adds warmth.”

Glass plays a key part in the home’s new design too. Features include a large rooflight, full-height sliding doors and the inventive structural glazed ‘box’ with its concrete bench appearing to run seamlessly from inside to out. “When adding structural glazing and rooflights it’s important that they don’t feel stuck on,” says Phil. “They need to be planned in advance, and one well-placed rooflight can be much more effective than several. In the kitchen we raised the ceiling up over the exposed brickwork and installed a rooflight above. By running the brickwork all the way up to the rooflight the eye is led upwards and creates a real feature. It also lets natural daylight flow into the centre of the home.

“The large sliding doors and structural glazed box also bring in plenty of light and help the house to feel connected to the outside,” continues Phil. “The trick with sliding doors is not to think about the glass, but think more about the views instead. Everyone always focuses so much on the glass but in reality the point is to get the detail right so that the glass disappears. By hiding the frames within the walls your vision doesn’t end at the frames, but in the garden.”

Indeed, the views have been prioritised, and are accessible from each level. Even in the basement at the bottom of the 6m high lightwell you can still see up and out into the garden. “Long views can make a house feel massive and that’s what we wanted to achieve here,” says Phil. “It’s the detailing on the central wall though which is a highlight for me, particularly the abstract glass. It’s elements like this which take a lot to get just right, and the simplicity of the lines, crisp details and abstract shapes are really beautiful.

“We were fortunate to have good clients — they were very trusting and let us get on with the task at hand, giving their input as and when, which helped a lot. They love the house and admit to having had plenty of parties since!” says Phil. “The kids are happy with the house too and it’s really added a huge amount of lifestyle value. What more could you ask for?” 



Top: Structural Glazing

A real focal point of the home, the frameless glazed box leads off the rear extension and features a concrete window seat that appears to continue on into the garden — perfect as a quiet reading spot, while the glass ceiling allows glimpses of the sky



HOMES CONTEMPORARY EXTENSION AND REMODEL

The Project



Jason Orme
Judge and Editor
of *Homebuilding
& Renovating*

THE JUDGE'S VIEW

Phil Coffey is one of the UK's most highly regarded architects and this project shows why — an imaginative and innovative solution to the problems caused by a lack of space and other constraints.

The excavation work here has paid dividends, providing not only additional floorspace but more importantly extra volume — all too difficult to come by in restricted urban homes and seen, too often, as a luxury.

Best of all, Phil's clever blending of inside and outside spaces through the near-transparent rear wall (and continuation of the furniture and joinery) allows the room to essentially carry on into the garden.

Additional detailing, not least in the staircase, adds to the feeling of this being a well-considered, intelligent design that takes the concept of the London rear extension to, quite literally, another level.

Homeowners looking to take on this kind of project take note: Phil felt that one of the keys to its overall success was the clients' ability to stand back and let talent do the rest. If you can't trust your architect to do that, you've got the wrong architect.

COSTS

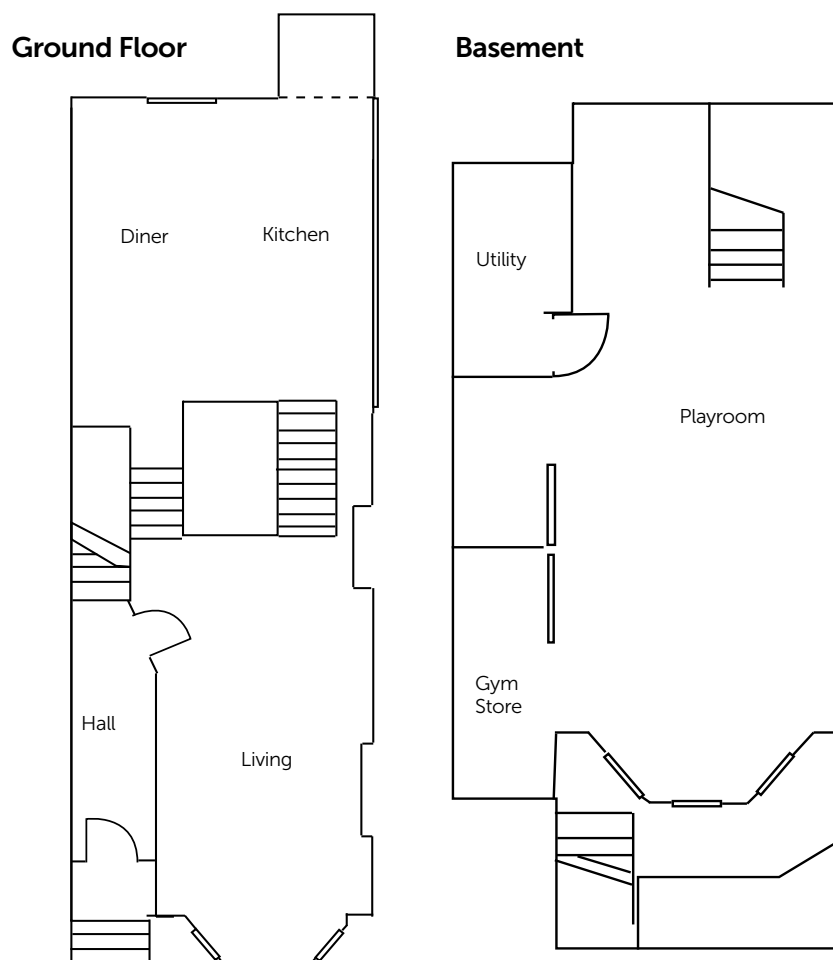
Prelims	£34,300
Site setup, closure and scaffolding	£2,805
Demolition/strip out	£8,060
Groundworks	£53,488
Brickwork and blockwork	£8,750
Steelwork and beams	£22,950
Roofing and external joinery	£9,770
Internal joinery	£15,667
Doors, windows and fireplaces	£31,220
Joinery	£23,490
Plumbing	£23,712
Gas and central heating	£12,227
Appliances	£5,235
Electrics	£13,440
Finishes	£36,655
Additional works	£49,015
Total	£312,000

SUPPLIERS

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Structural engineer	
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Lowinfo Design	01623 835311
Concrete floor Steyson Granolithic Contractors	020 8553 2636

BUILD TIME

Jul 10	Planning application submitted
Oct 10	Planning approved
Nov 10	Work started on site
Apr 11	Foundations completed
May 11	House watertight
Jun 11	First fix
Jul 11	Second fix
Sep 11	Completion





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HOMES TIMBER FRAME SELF-BUILD

Modern Masterpiece

A contemporary self-build in the green belt, bursting with creative flair

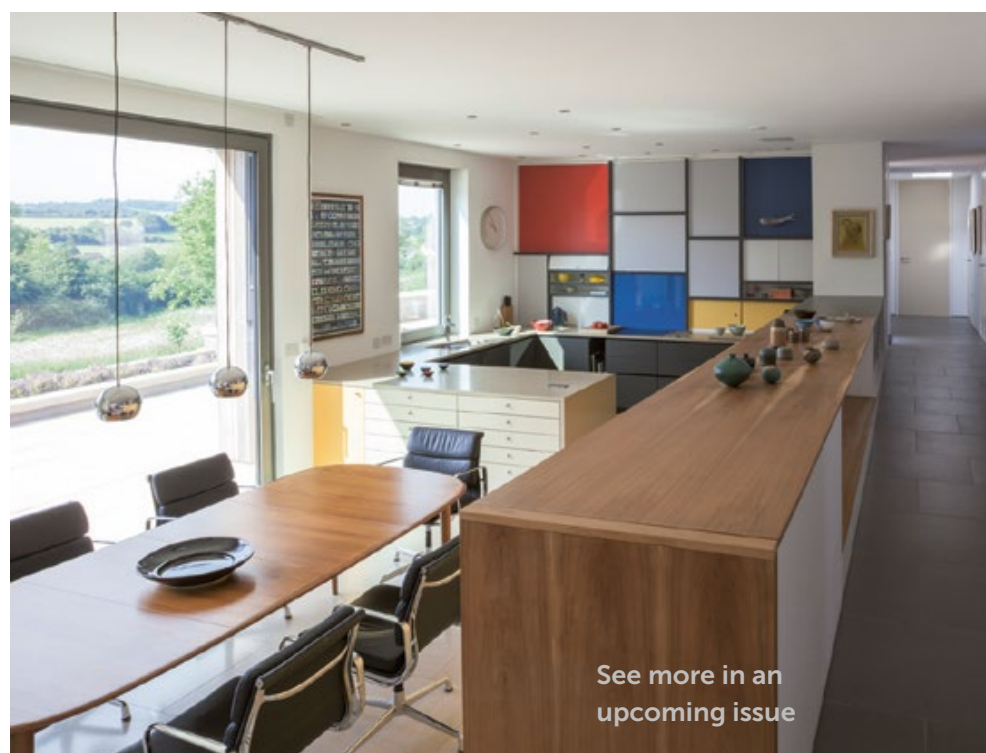
Photography: **Mark Bolton c/o Designscape Architects**

“We had two architects for two architects,” smile Max and Diana Aiken, the couple (who met at internationally acclaimed architectural practice Foster + Partners in the seventies, prior to turning their hands to farming and a series of other interesting projects) behind this stunning contemporary home, located in the green belt a stone’s throw from Bath. The brief presented to Andrew Wood Associates was for a unique home filled with ‘spaces’, not just rooms, and scope to include the Aiken’s fine collection of artwork.

And space they have got — the pièce de résistance of this timber frame self-build lies at the heart of the house, in the form of the spacious kitchen diner and living area, where changes in level, lofty ceilings and rural views through expansive sliding doors offer wow-factor. In contrast, one of the most interesting surprises (and there’s many within this new home) is the snug; a cosy, intimate space, lined with orange Valchromat bookcases.

Designscape Architects provided the detailed construction drawings — all 90 or so of them — for the build, with the couple taking a very hands-on role on site, and overseeing proceedings. Max and Diana’s ingenious solution to the British weather — a covered enclosure which protected the entire build from the elements — also ensured a day wasn’t missed when the build went on site.

From Trespa exterior cladding (a high-pressure compact laminate), which lines the staircase ‘tower’, to the coloured ply used to create the Piet Mondrian-inspired kitchen, the project is brimming with interesting materials and ideas. **H**



See more in an upcoming issue



PROJECT NOTES

Project:

Contemporary self-build

Location: Bath

Build time:

Nov 2013
– Dec 2014

Build cost:

Undisclosed

Size: 258.8m²

Architects:

Planning permission: Andrew Wood Associates (andrewwoodassociates.co.uk); Detailed design and construction drawings: Designscape Architects (dscape.co.uk)



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HOMES CONTEMPORARY EXTENSION

Shining Example

A copper-roofed extension has turned this house into a light-filled family home

Photography: **Tom St. Aubyn**

Annie and Oli Doherty's stunning extension to their late Victorian London home manages to combine contemporary design with details that are decidedly traditional and in keeping with the period in which the original house was constructed. When the couple moved into the house with their two children, Henry and William, and expecting their third child, Emmie, they craved more space, yet the current galley kitchen was so tiny "you could literally stand in the middle with your arms outstretched and touch the walls," says Annie.

The Dohertys commissioned Richard Bridges of Alexander Owen Architecture to design the extension, which has extended the house outwards into the garden and incorporates the old kitchen and breakfast room to create a new kitchen/dining/living space.

The new design had to be carefully planned and sensitive to the location, with the house being located in a Conservation Area and within an Archaeological Priority Area.

The shell of the extension was built using brick and block construction. Traditional brickwork has been used, but detailed in a contemporary way by recessing the areas beneath the new aluminium windows by 25mm in order to accentuate the structural openings. The large expanses of glass and sliding doors, using frames just the same width as a 20 pence piece, provide views of the garden, while the huge feature rooflight, cleverly lit from beneath, floods the space with even more light.

But it is the copper roof that really sets this extension apart — despite the extra cost this added to the project, it is wholly agreed that this is a feature that was well worth it. **H**

PROJECT NOTES

Project
Extension

Location: London

Build Times: Nov
2014 – Mar 2015

Build Cost:
Undisclosed

Architect:
Alexander Owen
Architecture
(aoarchitecture.co.uk)



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Moving Up

A two storey extension adds curb appeal and extra space to a 1950s bungalow

Photography: Alistair Nicholls



PROJECT NOTES

Location:
Hampshire

Build time:
Jul 2013
– Apr 2014

Build cost:
Approximately
£188,500

Size: 216m²

Architect: LA
Hally Architect
(lahally.com)

See more in an
upcoming issue

The existing modest but sprawling 1950s bungalow had a charm the clients loved, but it was too small for their large family. The solution proposed by LA Hally Architect was to design a two storey bedroom wing incorporating the required additional accommodation, with the master bedroom including a glass balcony overlooking the private front courtyard. A vaulted double-height study space overlooks the hall, with its 4m tall opaque glazed window flooding the space with light while preserving privacy. The extension was built in rough painted brick with horizontal and vertical board-on-board cedar cladding to the upper level. Large fixed glazed panels gently introduce the modern addition and timber cladding wrapping up and over the roof provides a division between old and new. 



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Renewable Heat Update

With ever-improving technology, advances in our understanding and, of course, changes to Government incentives, anyone thinking about opting for a renewable heating system might be forgiven for feeling a bit confused.

In this nine-page dossier, we provide the latest analysis and help make things a lot clearer...



Renewables: An Overview

Choosing an alternative to fossil fuels requires specialist expertise — but the prize is worth having. Jason Orme explains the basics

Whether you're building a new house or renovating an old one, you have the perfect opportunity to set up a new heating system for the next decade (ideally more). And, particularly if you're off the mains gas network, you will almost certainly want to consider alternatives to the expensive (and volatile) fossil fuel options. Of course, oil (kerosene) is at a long-time low at the moment, but regardless, reducing your reliance on the whims of the 'Big Six', National Grid and/or President Putin seems like a wise choice.

The problem is that renewable heating is not like conventional heating. Specifying a gas or oil-fired boiler is a well-trodden path: the trusted plumber turns up, takes a look at the house and, prob-

ENERGY PRICES

Approximate prices for a 20,000kWh per annum use:

Gas	£620
(2.6p/kWh + £100 standing charge)	
Electricity	£2,180
(10.5p/kWh + £80 standing charge)	
Oil (3.7p/kWh)	£740
LPG (6.5p/kWh)	£1,300
Biomass (pellets, bagged: 4.2p/kWh)	
.....	£840

ably with no calculations at all, will know exactly which boiler to install. He might suggest a boiler with 25kW capacity in the sure and certain knowledge that it will be enough. The boiler will be capable of producing anything from 5kW to 25kW (the

modulation range), and the requirement will be something in that range. The peak space heating load for the average modern house will be around 10kW; add another 4kW or 5kW for domestic hot water and the 25kW machine is still ample. The mantra is to over-specify and be sure. As an example of how this thinking pervades the industry, the Worcester Bosch Greenstar range of condensing boilers start at 12kW and go up to 30kW. The price difference between these machines is trivial (relatively) and the efficiency is broadly the same whatever the output.

The story is quite different when specifying renewable technology. Although a few heat pumps offer a degree of modulation, generally a 10kW heat pump will output 10kW. An oversized heat pump will be significantly less efficient than one that is the right size. To some extent the same issue applies to all renewable en-



THE RENEWABLE HEAT INCENTIVE

Launched in April 2014, the Renewable Heat Incentive (RHI) provides payments to anyone installing (or who has installed, since July 2009) certain approved renewable heat-generating technologies. It is particularly suited to the 1 in 10 of the population who currently live in an area not benefitting from mains gas, but the scheme is open to anyone looking to replace their boiler. In its simplest sense, the RHI is a Government-financed boiler replacement scheme. The overall aim of the scheme, according to Steve Roberts from the RHI team at the Department of Energy & Climate Change (DECC), is to: "Broadly pay back the cost of installing renewable heat technologies over seven years."

The technologies that are included in the scheme are biomass boilers, ground and air-source heat pumps, and solar thermal. Each homeowner applying for the scheme will need to carry out a Green Deal assessment and receive an Energy Performance Certificate (EPC), which is expected to cost a total of £150 and will provide an estimated annual heat demand figure based on the energy efficiency of the house. For heat pumps and biomass, payment is based on deemed heat usage, rather than metered, unless the property is a second home or the homeowner retains an existing non-renewable heat source (e.g. oil boiler) as a secondary source. Payments for solar thermal panels are based on an estimate



JAMES FRENCH

Above: Best of Both

Steven Harris and Catherine Roberts' new self-build home in Wales is an exemplar for low-energy living. Packed with insulation and designed with passive solar gain in mind, it generates the little energy it needs through a woodburning stove with back boiler

ergy heating systems — an oversized solar thermal system will do well in winter but will need to dump heat in summer. It is therefore critical to calculate exactly how much heat the house needs before selecting the heat source.

What is the Best Way to Proceed?

Simply, with the help of an accomplished heating engineer. There are two ways to approach renewables: by picking a technology you think is right for you and getting them to approve a local installer; or getting a local heating engineer with a good broad knowledge of the options available to you and designing a system specific to your unique home, needs — and wallet.

The latter option is probably the best. The reason for this is that not all technologies are best suited to every house, and the engineer will design and specify the whole system (and install it, service it, and come out to help you in a cold-shower crisis).

Pros and Cons?

Renewables undoubtedly reduce reliance on fossil fuels and provide greater (although far from total) price stability. Plus, thanks to the Renewable Heat Incentive, after seven years you'll have, in essence, a heating system paid for by the Government with lower running costs, probably, too. The main negative is the high capital cost compared to the standard alternatives and the undoubted specialist nature of the kit. It is usually well beyond your friendly local plumber.

of system performance, measured as part of the EPC.

According to the latest reports, over 40,000 homeowners have qualified for payments, the majority of which are for 'legacy' schemes installed before 2014. By some distance, biomass is proving the most popular technology.

There has been widespread speculation as to the future of the scheme. Latest reports suggest that the scheme will definitely continue until at least April 2016, if not 2017. What is certain is that the quarterly degression in tariff rates will continue to reduce the incentive — so act early for maximum gain. For the latest rates visit the Ofgem website: ofgem.gov.uk.



RAYOTEC

SOLAR THERMAL PANELS FAQs

WHAT DO THEY DO?

Panels on your roof use the heat from the sun to heat up water for use in the home. According to independent tests, panels can supply typically 50-60% of your home's annual hot water requirement (i.e. most of it in summer, hardly any in winter).

HOW DOES IT WORK?

The water running through the panels — known as collectors — on your roof heats up thanks to absorbing heat from the sun. The hot water is pumped through a coil in your hot water cylinder and this heats up your cylinder's water. You will need a hot water cylinder with two coils and, ideally, a cylinder large enough to enjoy the full benefits of the heat generated by your panels.

On a like-for-like basis the cost per kWh produced is similar whether you use flat plate or evacuated tubes. As with all good things the technology moves on and there are now flat plate systems that look quite good (they do not need to be south facing either).

Bear in mind that currently the Renewable Heat Incentive (RHI) specifically excludes systems that combine with space heating systems.

WHAT WILL IT PRODUCE?

A typical domestic solar hot water system — be it a 4m² flat plate or 24 evacuated tubes — will deliver up to 2,000kWh over the course of a year. Typically, hot water accounts for around 25% of a home's total non-electricity energy use (i.e. a typical gas bill is split 75:25, space heating to hot water). The slight complication in terms of bills is standing charges, which account for, on average, 95p/day (£346/year) and you pay regardless of usage; the rest of it is measured per kWh used. So on an annual gas bill of £1,000 you'll be spending £161 of it on hot water (£1,000 - £346 = 654 x 0.25). Bear this in mind when you are calculating your potential savings on thermal solar panels. **H**



Heat Pumps: How to Choose, How to Use

Heat pumps require specialist installation and expertise to get right — but when they receive both, they tick all the boxes, says Tim Pullen

HEAT PUMPS: A PRIMER

We all own a heat pump in our home already, in the shape of a fridge. Heat pumps simply move heat from one place to another and there are two main types used in UK homes:

GROUND-SOURCE

Pipes extract latent heat from below the ground (either in trench-based 'slinkies' or more expensive boreholes).

Typical cost:
£10,000-£15,000

AIR-SOURCE

A unit similar in look to an external air conditioning kit extracts heat from the air and runs it through a heat exchanger.

Typical cost:
£6,000-£8,000

RENEWABLES HEAT PUMPS



TIM PULLEN

An expert in sustainable building and energy efficiency, Tim runs the green home consultancy Weather Works

Heat pumps are now a long-established technology in the UK. The general level of understanding on the part of the installers and wider industry has come on in leaps and bounds in recent years — but for the homeowner they remain quite difficult to understand. This results in a huge reliance on the installer to give correct advice, which means finding a good installer is absolutely critical to the success of the entire venture. For the most part, heat pumps (both air-source and ground-source) are established as the go-to solution for those off mains gas looking for a renewable alternative to oil.

And quite rightly so. They are cheap to install (relative to other renewables and not too much more expensive than oil boilers), are 'clean' and, above all, are a fit-and-forget technology. Not only has the general expertise among installers improved but the Government incentives have moved in their favour, too. The latest round of changes to the Renewable Heat Incentive (RHI) on 1 October 2015 brought little actual change from the existing (positive) position. The tariff for air-source heat pumps remains at 7.42p, ground-source at 19.10p and solar thermal at 19.51p. Only biomass has been affected with a cut to 6.43p. But the generally accepted wisdom in the industry is that the RHI for all renewable heat sources will end, if not in April 2016 then April 2017. The Department of Energy and Climate Change (DECC) have said that the gradual degeneration of tariffs will allow the budget to remain until April 2017.

The general problems with heat pumps have been in poor design installation; effectively, the wrong heat pump in the wrong house. As a general rule, heat pumps work best when flow/return temperatures are lower than the 60°C to 70°C range required for older radiators and, of course, hot water. But for anyone building from scratch off mains, they should be a serious consideration.

Mitsubishi Electric have been selling heat pumps in the UK for 10 years. They are, in terms of number of units sold, the biggest supplier in the UK. They sold air-source heat pumps before the RHI was introduced and are confident they will continue to sell them after the incentive ends. Ben Hodges of Source Energy — one of Mitsubishi Electric's biggest installers — says: "Installing an air-source heat pump has always been as much an emotional decision as a commercial one."

Whatever the motivation, it is clear that heat pumps are here to stay and will continue to be sold. It is also clear that the demise of the RHI scheme will see a shake-out of the — shall we say — less than committed suppliers. So how do you get it right, and what are the latest things to look for?



Above: Ground-Source Heat Pump Install

Steven Bowes decided on a ground-source heat pump combined with solar thermal panels for his off mains barn conversion in North Yorkshire. The NIBE system has reduced his bills by two-thirds compared to what they would have been if he had chosen oil. Thanks to the RHI, the system will pay for itself in seven years

THE ISSUES

Heat pumps have a very good level of success, but where they tend to disappoint in installation (usually resulting in higher-than-expected electricity bills) it is down to two reasons:

POOR DESIGN

Installing only to the right kind of property. Heat pump manufacturers take a somewhat broader view of what constitutes the right kind of property but there is agreement that installing to the wrong kind of property leads to a bad reputation.

POOR USAGE/CONTROLS

Users need to know how to use a heat pump. It is not like a gas or oil boiler and you need to read the manual, watch the DVD, pay attention during the training and learn how to operate the heat pump in the most effective and efficient way.

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RENEWABLES HEAT PUMPS



KENSA

Above: Heating a Period Home

Keith Clarke replaced his gas boiler with a Kensa 24kW Single Phase Twin Compressor to harness heat energy from a nearby lake to provide space heating and hot water to his Grade II listed farmhouse

THE CALCULATION

Heat pumps enjoy a payment through the Renewable Heat Incentive (RHI) which, as mentioned elsewhere, is likely to be reviewed by Government shortly. Typically, on a 20,000kWh annual heat demand, an air-source installation, costing around £6,500, would expect around £1,400 in annual payments (every year for seven years). A ground-source heat pump, costing closer to £15,000 to install, would expect annual payments of £3,820 (again, for seven years) — both clearly more than pay their own capital cost back.

EFFICIENCY

The performance of the heat pump after installation will be expressed as a Seasonal Performance Factor (SPF). This number is a factor not just of the kit but of the specific design (e.g. use of underfloor heating, etc.). Typically, air-source heat pumps would expect to enjoy around 2.8 (i.e. 1kW of electricity creates 2.8kW of heat) and ground-source more like 4. As electricity, used to power the pump, is around three times as expensive as gas, heat pumps are usually not viable for those properties on mains gas.

Inverter Heat Pumps

Until relatively recently inverter heat pumps were the exception. Non-inverter heat pumps were the norm and they operate by being either on or off. Inverter heat pumps act more gradually, increasing or decreasing output to meet the prevailing conditions and demand. Each time a heat pump starts up it consumes energy in balancing the pressure in the system and bringing the refrigerant to the right temperature before the heating process can start. An inverter heat pump can operate 24/7, never or seldom switching off, eliminating the losses caused by stopping and starting.

A continuous 24/7 operation may seem counterintuitive to those of us used to being in tyrannical control of the boiler, but some manufacturers are claiming up to 30% reduction in running costs by using this method of operation. It also enables effective remote control; using an App on a smartphone or tablet to adjust the temperature in the house rather than just simply switching the heating on or off.

The Right Size Heat Pump

The effect of an oversized heat pump is similar to that of a non-inverter heat pump; because it is outputting more heat it needs to operate for a shorter period of time to reach the desired temperature — this is called short-cycling. Equally, an undersized heat pump will be working at its maximum, and least efficient, output for most of its operational time.

Getting the size right is therefore critical and the problem is that the standard plumber is not equipped to calculate what the right size is — they have never had to do it because a conventional boiler is far more tolerant. It needs a specialist heat pump installer, backed-up with good manufacturer software, to get

the calculation right. Judging an installer's attempts at sizing your heat pump correctly is a great way to start understanding whether they are the right installer for you.

Bivalent Systems

Bivalent is a bit of jargon for a system with two heat sources — a heat pump and a conventional boiler, say. "We can design a bivalent system to get 85% of the RHI with 50% of the capital cost," says Max Halliwell, Business Development Manager at Mitsubishi Electric. The ideal system would be an air-source heat pump (low capital cost) that operates in spring, summer and autumn, when the weather is mild (highest efficiency), and a conventional boiler (also low capital cost) that operates in winter (at good efficiency). Heat pumps now have weather compensation as standard and so can be programmed to shut down when the outside temperature drops below 7°C (when it starts to get inefficient), and allow the boiler to kick-in.

Conclusion

It is fair to say that heat pumps do not have the best of reputations. It is also fair to say (and supported by an Energy Saving Trust field trial) that most of the problems can be traced to poor installation and inappropriate use. The industry is dealing with the issues with solutions such as quieter machines, an electrical start-up load that means they could run on a solar PV system, better training for installers and end-users, and with technological innovation. The industry wants heat pumps that have wide appeal and that are justified in their own right, without recourse to Government support or to an emotionally motivated decision. Looking at the heat pumps now on offer and the competence of the dedicated installers, they seem to have achieved it. 

Biomass: Your Questions Answered

Using wood chips, logs or most commonly pellets to heat our homes is a complex affair, but the rewards are great. Tim Pullen solves the key issues

HOW MUCH DOES IT COST?

A simple log-burning stove might cost £500, while a fully automated wood pellet boiler £25,000, and there is a lot to choose from in between. A 'typical' house might expect to spend £3,000 on a stove boiler, £5,000 on a log boiler and up to £15,000 on a wood pellet boiler, but the variation in price reflects varying levels of quality and sophistication. Installation can be expensive too — up to another £5,000-£10,000 on some systems.

THE OPTIONS

Stoves Room heaters that use logs, briquettes or pellets.

Stove boilers Essentially a stove but with a back boiler to heat water for central heating and domestic hot water. Bear in mind that you need hot water year-round; will the stove be running in the summer? Pellets tend to be a good fuel for these stoves as the output is more controllable than with logs.

Boilers Operate in largely the same way as an oil-fired boiler, in that the fuel hopper is loaded and the boiler takes over from there.

BIOMASS: MY EXPERIENCE

Editor Jason Orme installed a biomass boiler this summer. He reveals his key learnings:

- **Think carefully about the positioning of the boiler if you'll be using bagged pellets;** at 15kg they are quite light but you want to store them next to the boiler, and that's not practical in most utility rooms.
- **Choose one with a big hopper** (200kg), otherwise you'll be filling it all the time. I intend to upgrade to an automated feed but tipping six to seven bags in once a fortnight is hardly onerous.
- **Quality is key.** We went for a Mercedes rather than Dacia, using local company Eulinx to install the system, based around a Windhager BioWIN 2. Total cost around £20,000.

WHAT WILL I BE BURNING?

Biomass fuel comes in the four forms that we are accustomed to:

Chips They are made from forestry waste and look more like flakes, variable in size. They are used in automatic loading applications and typically where there is a very high heat load — the reasons being that chips are about 1.1p/kWh cheaper than pellets but just as automated. Boilers suitable for chips are, however, bigger and more expensive than wood pellet and log boilers.

Pellets Wood pellets are available bagged — typically 10kg, 12kg or 15kg — or by the pallet load, delivered to the road outside your house, or in bulk delivered directly to your fuel store.

Logs An industry has grown up in the last few years supplying logs — usually, but not always, kiln-dried.

Briquettes Effectively a manufactured log, made in largely the same way as a pellet, but bigger. They are as large as a log and used in the same applications, but provide a higher heat output per kg.

With all biomass fuel, quality is the key and the issues to look for are moisture content, bulk density and ash. In all cases the lower the figure the better.

WHAT ABOUT A MIXED SYSTEM?

Biomass could work with another heat source. Solar thermal and air-source heat pumps are both relatively cheap and both work best in spring and summer. A pellet stove boiler could take over main duties during the rest of the year. Using a wood pellet stove boiler with solar thermal back-up to supply underfloor heating will achieve low running costs.





Left: Biomass Boiler Install

Editor Jason Orme's biomass boiler (the BioWin2 from Windhager) sits in an old stable block. A 10m heat main connects it to a large cylinder in the utility room. This way, it's easy to store pellets close by, hand fed into the top of the 200kg hopper

WHAT SHOULD I CONSIDER WHEN PURCHASING?

- **Reputation** How long has the manufacturer been making boilers or stove boilers and how many have they installed in the UK?
- **Controls** Does the control system address the whole house or individual zones in the house? Does it have remote monitoring and can it be controlled from a PC or App?
- **Automation** How much work will the user have to do to keep it working.
- **Burner control** The quality of the burner determines the efficiency of the boiler. Good boilers automatically control the air flow over the burner, ensuring it always operates at optimum efficiency and allowing the heat output to match the demand (called modulation).
- **Efficiency** Not less than 90%.
- **Fuel loading** All but fully automated systems need manual loading with fuel. The size of the hopper or combustion chamber will determine how often the owner has to load it.
- **Maintenance** How much work does the user have to do in terms of cleaning — some are self-cleaning, some partially so and some entirely manual. All boilers need servicing but it should cost no more than a gas or oil boiler.
- **Warranties** Good boilers will have at least a two-year warranty (parts and labour) and some offer up to five years.

- **Compliance** Microgeneration Certification Scheme (MCS) accreditation is necessary for the RHI, but actually does not tell us how good the machine is.

Left: The Pellet Stove Boiler

Klover's Smart 120 range cooker, providing heat for the cooking but also central heating and domestic hot water, runs on wood pellets (firepowerheating.co.uk)



WHAT ABOUT FUEL?

WHERE DO I GET THE FUEL?

It seems that most biomass fuel is bought via the internet. It is at least the starting point in finding a suitable and/or local supplier. So far as wood pellet is concerned, always look for ENplus accreditation as this indicates quality, and Biomass Supplier List accreditation, as this indicates that you will be able to claim on the Renewable Heat Incentive (RHI). Beyond that the issues are:

- **Quality** Moisture content (MC) is the key issue with all biomass fuel. Some kiln-dried log suppliers advertise as having 20% to 30% MC. That is what could be called poor quality — almost a third of the log you are putting in the stove is water. Logs need to be below 20% MC and pellets below 10%. Good quality manufacturers, like Verdo Renewable, get MC down to 8%. Beyond MC there are a number of quality measures for pellets and briquettes: dust, ash, density and durability being the key ones. Ash content is key and Verdo claim to have this down to 0.7%.

- **Reliability** Not only of product quality but of availability. The reality is that we always need a delivery of fuel within a few days of noticing that we need it. The supply needs to be able to meet that requirement.

- **Biomass Supplier List (BSL)** A list maintained by Ofgem of suppliers that manufacturer or supply wood fuel from a sustainable source. If you want to claim RHI, your fuel source needs to be on the BSL list.

WHAT ABOUT PELLET FUEL STORAGE?

Pellets can also be used immediately and a one tonne pallet of bagged pellets will take up roughly the same floor area as the boiler (and about the same height). Plan it into your installation as the bags need to be close to the boiler (unless you particularly like physical exercise). Bulk (as in lorry-delivered, blown in) will put a bit of downward pressure on price but in the case of wood pellet it means installing a bulk storage tank, together with a system for delivering the fuel from the store to the boiler. These add a significant cost to the system (between £2,000-£5,000).

WHAT ABOUT RUNNING COSTS?

Logs Difficult to generalise, but you are likely to be paying around £200-£250/tonne for 20% MC logs. They will provide 3,500kWh/tonne, giving an average cost of 7.14p/kWh.

Briquettes Are likely to cost around £280/tonne, providing 4,500kWh. This averages out at a cost of 6.2p/kWh.

Chips Based on chips with 20% MC, expect to pay £150/tonne. Providing 4,100kWh/tonne this works out at an attractive cost of 3.66p/kWh.

Pellets Bagged or bulk, expect to pay around £220/tonne. Providing 4,800kWh/tonne, at 4.6p/kWh. **H**

N.B: Efficiency not accounted for

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The End of Incentives?

If you're considering renewables purely for Government tariff payments, you'll have to act fast. Tim Pullen ponders how the end of incentives impacts the case for installation

Last year marked a watershed moment for renewables (quite possibly with May 2015's election result): both homeowners looking to install them and, of course, the growing industry around solar, wind, biomass and heat pumps. For several years Government had established exceedingly generous incentives – in the shape of regular tariff payments – to homeowners willing to take on the large upfront capital cost of installing these technologies. Simply put, those lucky enough to be able to afford the systems could enjoy not only lower long-term running costs but enjoy a significant return on their investment. And this is how many of the technologies, photovoltaic (PV) panels most of all, were marketed – better than an annuity.

That all looks set to change and with it, one of the key drivers for installing renewables (the key sales pitch, really) is consigned to history. It could be argued that the Government incentives for producing low-carbon energy were always a bad idea. The Renewable Heat Incentive (RHI) is paid out of our taxes for the heat energy actually consumed – and therefore, as payments increased for those needing more heat, encouraged us to build the least efficient house possible. The Feed-in Tariff (FiTs) is paid by energy companies to anyone with the good fortune, and available funds, to install eligible technology and funded by increased energy bills to those who can't install that technology.

So it can be argued that the Government's recent announcements, effectively scheduling the end of these incentives, is a good thing – but try telling that to the tens of thousands of people it will put out of work, destroying an industry that those very incentives created.

WHAT IS THE SITUATION?

The incentives have always been subject to degression – a reduction in the tariff available to **new** applicants. In the case of FiTs (electricity), degression occurs twice each year on 1 October and 1 April, and for RHI (heat), quarterly on 1 October, 1 January, 1 April and 1 July.

As 1 October 2015 the RHI tariffs are:

Biomass:	6.43p/kWh – down 10% (and halved from 2014)
Air-source heat pump (ASHP):	7.42p/kWh – no change
Ground-source heat pump (GSHP):	19.10p/kWh – no change
Solar thermal:	19.51p/kWh – no change

This means that the 'Government standard' house – using 22,000kWh for space heating and 2,800kWh hot water – installations will have payback times of:

Biomass at £15,000:	9.4 years
ASHP at £10,000:	8.2 years
GSHP at £12,000:	3.4 years
Solar thermal (hot water only) at £3,900:	8.9 years

These are no more than rough estimates as actual capital cost and payback periods will vary with installation to each house.

As of 1 October 2015 FiTs are:

Photovoltaic (4kW max):	12.47p/kWh – down 6%
Wind (15kW max):	13.73p/kWh – down 5%
Hydro (15kW max):	15.45p/kWh – down 10%

(Plus 4.85p/kWh export tariff).

The anticipation, based on DECC announcements, is that the tariff for PV will be cut by 87% to just 1.63p/kWh from 1 January 2016. If we assume a capital cost for a 4kWp PV system of £7,000 and that 50% of the electricity produced is used in the home, the simple payback would be around 19 years.

WHAT TO DO?

The Department of Energy & Climate Change (DECC) has said that there is a budget for RHI until April 2016, implying that there is probably no budget after that date. Clearly PV tariffs will go altogether soon enough, but wind and hydro will probably remain as so few are actually installed.

For the self-builder or renovator the message is clear: invest in the building rather than renewable energy. Changes to the incentives are also directing our attention to the least popular technologies – wind, hydro power and ground-source heat

pumps – perhaps because the opportunity to install them is available to the smallest number of people (both due to cost and the site-specific requirements). The technologies that most homeowners can actually use are being degressed to the point where they are no longer worth the investment.

What has always been true is that £20,000 invested in insulation, airtightness, LED lighting, voltage regulation and energy efficiency generally, will provide a better and longer return than investing that same amount in renewable energy. **H**



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Understanding Build Costs



MARK BRINKLEY
Mark is the author of *The Housebuilder's Bible* and an experienced builder; he's just bought another plot

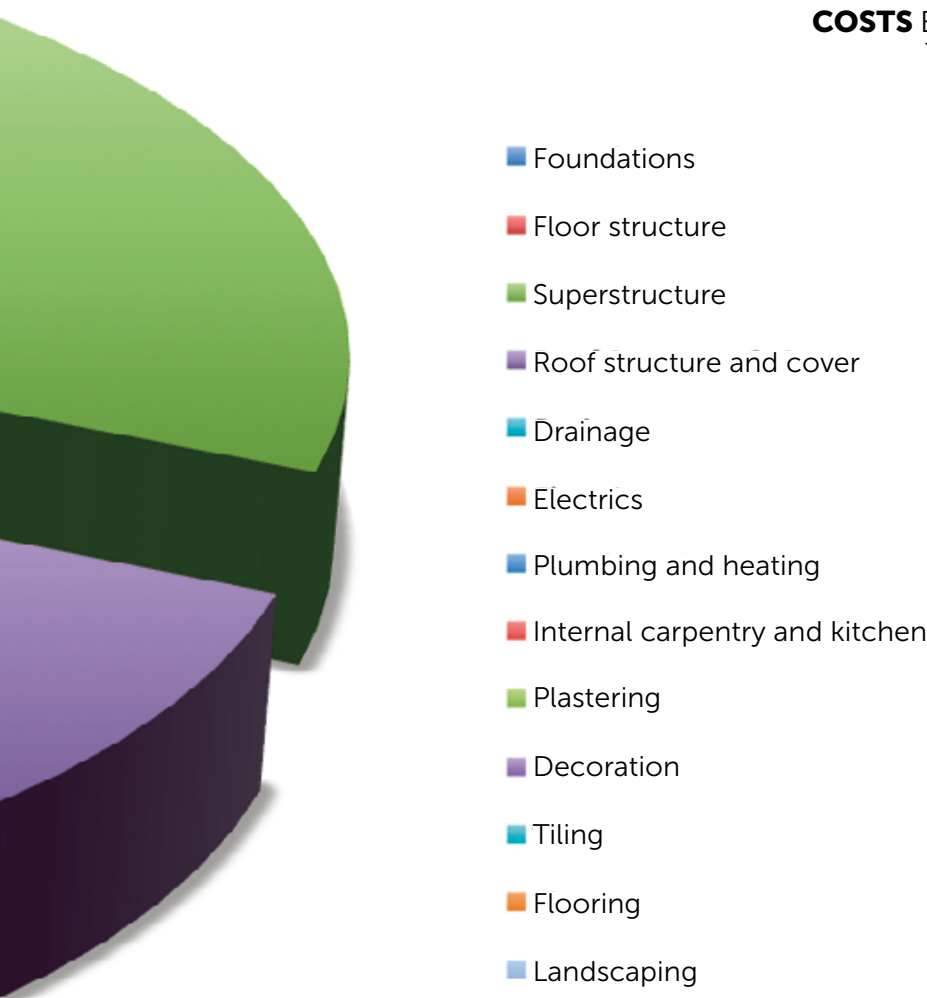
Kicking off a new series helping you to better estimate the costs of your self-build, renovation or extension project, Mark Brinkley establishes the basics

Taking on a large building project is daunting at the best of times, even for seasoned professionals. The majority of self-builders do not come from a construction background and few of them know much about the ins and outs of project management. The prospect of spending a six-figure sum on something as intangible as a 'new house' can cause anxiety. Because of this, self-build in the UK today is still

seen as being a little heroic, because many people would baulk at undertaking a large building project with their own money, when the outcome cannot be known in advance.

It doesn't have to be reckless, however. One of the keys to reducing the amount of risk involved in self-build is to take control of the budget at an early stage. To do that, you need to develop an understanding of how building projects work and where exactly all that money goes.

COSTS ESTABLISHING A BUDGET

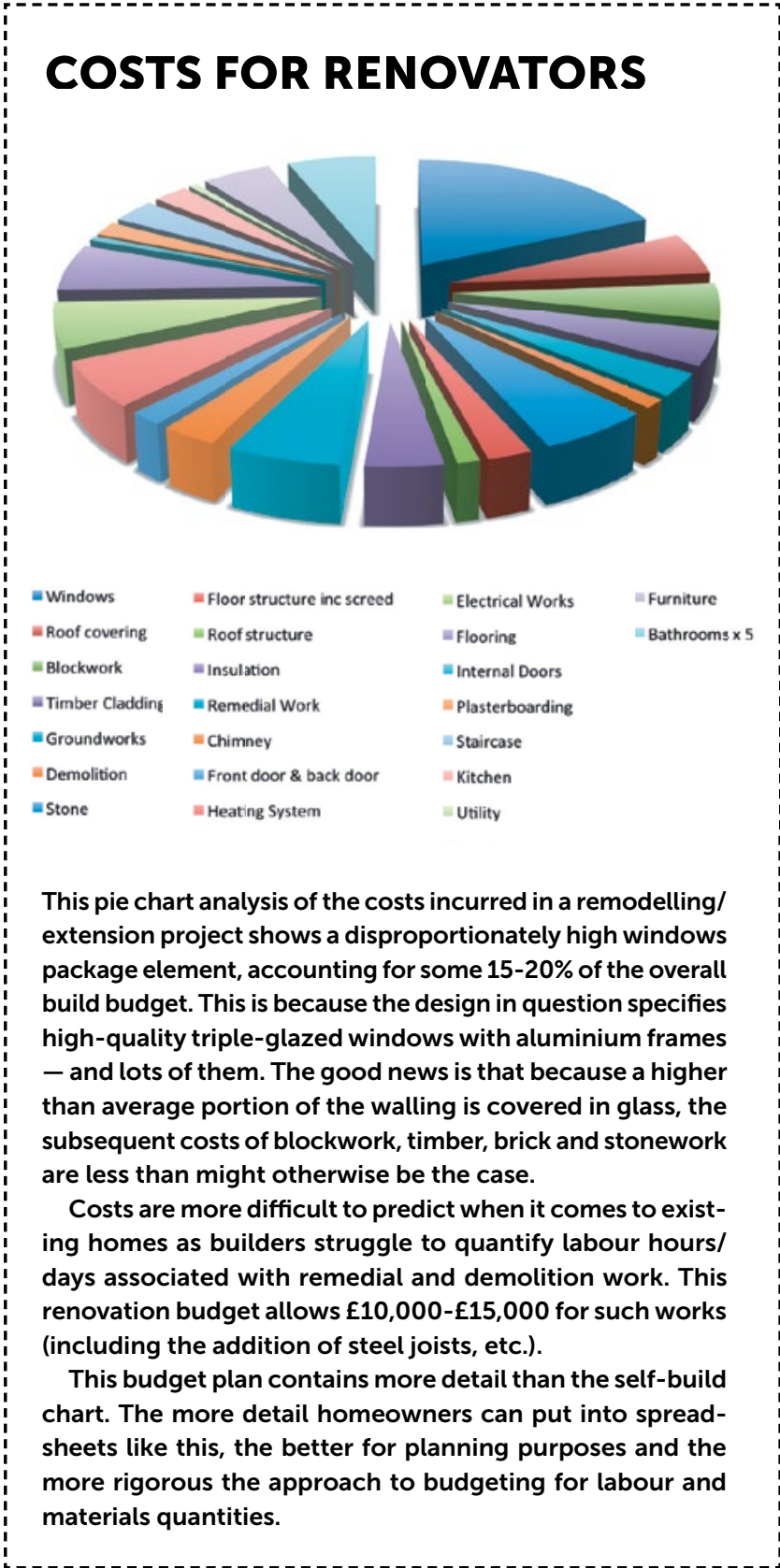


COSTS FOR SELF-BUILDERS

The pie chart above provides a breakdown of the costs involved in a typical self-build project. It shows that the superstructure (i.e. the structural walling and external cladding, as well as roofing) accounts for the largest proportion of the costs, typically 25-30%, with the foundations and floor structure following closely behind.

Most importantly of all, it reveals that the remaining elements of a build each tend to account for between 5-10% of the total cost. The key is to recognise that individual elements can be reduced later on if other elements go over the initial budget.

The outline of the packages in this pie chart also serves as a useful starting point for self-builders looking to assign budgets against particular elements.



COMPARING WALLING COSTS

- Windows: £370/m² £300/m² materials + £70/m² labour
- Blockwork: £25/m² £10/m² (£1/block) materials + £15/m² labour
- Bricks: £60/m² £30/m² materials (50p a brick at 60/m²) + £30/m² labour (500 bricks laid per day (8.3m²) @£250/day)
- Stone: £150/m² £75/m² materials + £75/m² (labour based on 3m² laid per day)
- Timber: £50/m² £30/m² materials + £20/m² labour

NB: Costs are approximate but designed to provide a starting point for a budget. Bricks, for example, vary between 30p-£1.20 per brick. Stone can cost £25/m² up to £180/m², plus laying.

» The Build Cost Calculator

A simple cost-estimating guide for people building their own home

One of the most important aspects when planning your self-build or home renovation/extension project is working out how much it is going to cost.

This figure will depend on the size and shape of the house, the level of your own involvement, where in the country you intend to build, and the materials you're going to use. If you can make even rough decisions about these factors, then you can begin to work out how much it is going to cost.

As a very general rule of thumb, expect a building plot to cost between a third and a half of the end value of the finished house. The costs of building a house will then depend on the variables listed above. All building work is usually quoted on a cost/m² basis. For example, a typical new four bedroom self-built home is around 200m² (with 100m² on two sto-

reys) and usually varies between £900-£1,500/m² (although self-builders achieve costs between £300-£3,000/m²).

Renovation costs are more difficult to establish as they involve many variables, but allow at least £1,000-£1,300/m² for work. This, added to the cost of the plot/house and with a 10-30% contingency, should result in less than the final end value of the house.

The table below, based on information from the Build Cost

Information Service (part of RICS), is updated monthly to help you work out a more accurate estimate (note, however, that these figures are for build costs only and do not account for VAT, which is not charged for self-build projects). There is an interactive online version at www.homebuilding.co.uk/calculator which guides you through the process.

HOW TO USE THE TABLE

1. Identify your build route from the four options; 2. Identify your expected level of specification: 'standard', 'good' or 'excellent'; 3. Identify the estimated size of your finished house (either single or two/more storeys); 4. Choose your location; 5. Multiply the figure by your house size (the internal floor area).

		BUILD ROUTE A (DIY + Subbies)			BUILD ROUTE B (Subbies)			BUILD ROUTE C (Builder/Subbies)			BUILD ROUTE D (Main Contractor)		
		Standard	Good	Excellent	Standard	Good	Excellent	Standard	Good	Excellent	Standard	Good	Excellent
SINGLE STOREY													
>90m ²	Greater London	1227	1419	1707	1299	1503	1807	1371	1586	1908	1443	1670	2008
	South-East	1076	1245	1497	1139	1318	1585	1202	1392	1673	1266	1465	1761
	NW, SW, East & Scotland	978	1133	1362	1036	1200	1442	1093	1266	1522	1151	1333	1602
	Mids, Yorks, NE & Wales	936	1083	1302	991	1147	1379	1046	1210	1456	1101	1274	1532
91-160m ²	Greater London	1123	1363	1771	1189	1443	1876	1255	1524	1980	1321	1604	2084
	South-East	986	1195	1553	1044	1265	1646	1102	1336	1736	1160	1406	1827
	NW, SW, East & Scotland	897	1088	1414	949	1152	1498	1002	1216	1581	1055	1280	1664
	Mids, Yorks, NE & Wales	858	1040	1352	908	1102	1432	959	1163	1511	1009	1224	1591
161m ² +	Greater London	1000	1312	1646	1059	1389	1743	1118	1466	1840	1177	1544	1936
	South-East	877	1150	1444	929	1218	1529	980	1285	1613	1032	1353	1698
	NW, SW, East & Scotland	798	1046	1315	845	1108	1392	892	1170	1469	939	1231	1546
	Mids, Yorks, NE & Wales	763	1001	1256	807	1060	1330	852	1119	1404	897	1178	1478
TWO STOREY													
90-130m ²	Greater London	1181	1368	1678	1250	1446	1776	1319	1526	1875	1389	1607	1974
	South-East	1036	1198	1472	1096	1268	1558	1157	1338	1645	1218	1409	1731
	NW, SW, East & Scotland	942	1090	1340	997	1154	1419	1053	1219	1498	1108	1283	1577
	Mids, Yorks, NE & Wales	900	1043	1280	953	1104	1356	1006	1166	1431	1059	1227	1506
131-220m ²	Greater London	994	1204	1526	1053	1274	1616	1111	1345	1706	1170	1416	1796
	South-East	872	1056	1339	924	1118	1418	975	1181	1496	1026	1243	1575
	NW, SW, East & Scotland	793	961	1218	840	1018	1290	886	1074	1362	933	1131	1433
	Mids, Yorks, NE & Wales	759	919	1165	804	973	1233	848	1027	1302	893	1081	1370
221m ² +	Greater London	917	1174	1474	971	1243	1561	1025	1313	1648	1079	1382	1734
	South-East	805	1029	1294	853	1090	1370	900	1151	1446	947	1211	1522
	NW, SW, East & Scotland	732	937	1177	775	992	1246	818	1047	1315	861	1102	1385
	Mids, Yorks, NE & Wales	701	895	1126	742	948	1192	783	1001	1258	824	1053	1324

WANT MORE BUILD COST ADVICE?

Visit our interactive build cost calculator online: homebuilding.co.uk/calculator

ESTABLISHING THE INITIAL BUDGET

The majority of self-builders start off their journey with a figure in mind of what they can afford to spend. Many of them will refer to the build cost calculator in this magazine (shown opposite), where a sample of different projects are compared in price, presented as price/m². The current costs range from around £800/m² through to just over £2,000/m². The table identifies five variables impacting on the final sums:

- **Build route** (how you manage the project) — 40% variation.
- **One or two storey** (two storey buildings are cheaper on a m² basis, but only marginally)
- **House size** (it gets slightly cheaper per unit area as the size increases)
- **Standard of finish** (the table allows for a 40% difference between 'standard' and 'excellent')
- **Location** (the UK is divided into four zones — the most expensive being 30% more than the cheapest)

There is not much you can do about location — short of deciding to build somewhere else — but the other variables are very much in your control. What you choose to build, how you choose to build it and what finish standard you are looking for are all factors determined by you at the outset.

If it's your first house, you might well be trying to build as much space as you

can afford and to fit it out as cheaply as possible, using all that youthful energy to undertake DIY and/or project management. In contrast, a retired couple might choose to build a smaller home but fit it out to a higher standard, and to let the professionals carry out all or most of the work. Not everyone wants to shave costs. The cost calculator enables you to work out where in the self-build spectrum you

stand and to give you some indication of what you might get for your money.

Bear in mind that over the years *Homebuilding & Renovating* has covered self-build projects with costs ranging from £300-£3,000/m². The build cost calculator, however, deals with the most common projects.

In theory, you have control. In practice, it may not be quite so simple. For instance, if you are living well away from the site, it will be impractical to take on the management of the project. To do this, you need a site presence. Not necessarily all day every day, but at least at some point every day. You are going to have to be taking delivery of materials, arranging storage and making sure that everyone working on site is fully occupied. This sort of thing doesn't happen by magic: while many people are quite capable of taking on this role successfully, they have to be fully engaged in it otherwise it will tend to be done rather badly, which in turn adds to delays and costs. So while the calculator indicates that a DIY management build route may save 40% over a professionally managed fixed-price job, it is not an option for everyone. **H**

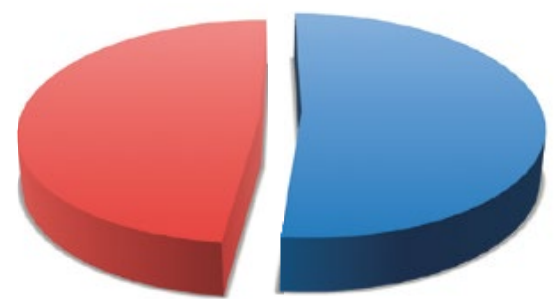
LABOUR VS. MATERIALS?

Installation can be the hidden cost when it comes to preliminary budgeting — ignore it at your peril. But the amount of labour required on each package varies hugely



WINDOWS

Labour (in blue) tends to account for around a fifth of the total price, depending on the window specification



STONEWORK

Stone can be expensive to purchase, but takes a long time to lay, with most stonemasons managing 2-4/m² a day — hence the high labour costs

WHAT'S INCLUDED IN THE FLOOR AREA?

One trap for the unwary is the way that building areas are defined and referred to. It's all very well deciding on a budget per m², but what exactly do you get for your m²? What's included and what's excluded? The m² used in the calculations is the internal floor area, or heated area, of the house. It specifically excludes the ground taken up by the external walls and any ancillary buildings such as garages and out-houses. It also excludes unused areas in lofts and under the eaves, unless they are specifically opened up as living space. A four bedroom house with an internal floor area of 150m² might easily have a gross floor area, including the garage, of 200m².

Does this matter or is it just academic? It can do, especially if someone tells you they can build you a house for, say, £1,000/m² only for you to find out later that their m² is somewhat smaller than the industry standard way of measuring. It is also worth bearing in mind that other countries (Sweden, Germany) use different measuring criteria and that their build costs/m² cannot be easily compared.



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An Electrician's Guide to Electrics

PART ONE: In this four-part series, electrician Darryl Bertie explains all you need to know about getting the electrics right in your new home or extension project

GETTING STARTED

Designing and installing a new electrical system in your home is one of the more complicated elements of the overall building project. Most renovators, faced either with historic systems untouched since the era of Bakelite's dominance (if not before) or, perhaps worse, 'improved' and amended over years of previous owners' marginal projects (closed off faceplates and switches that don't work being classic signs) will also be keen to bring things up to date.

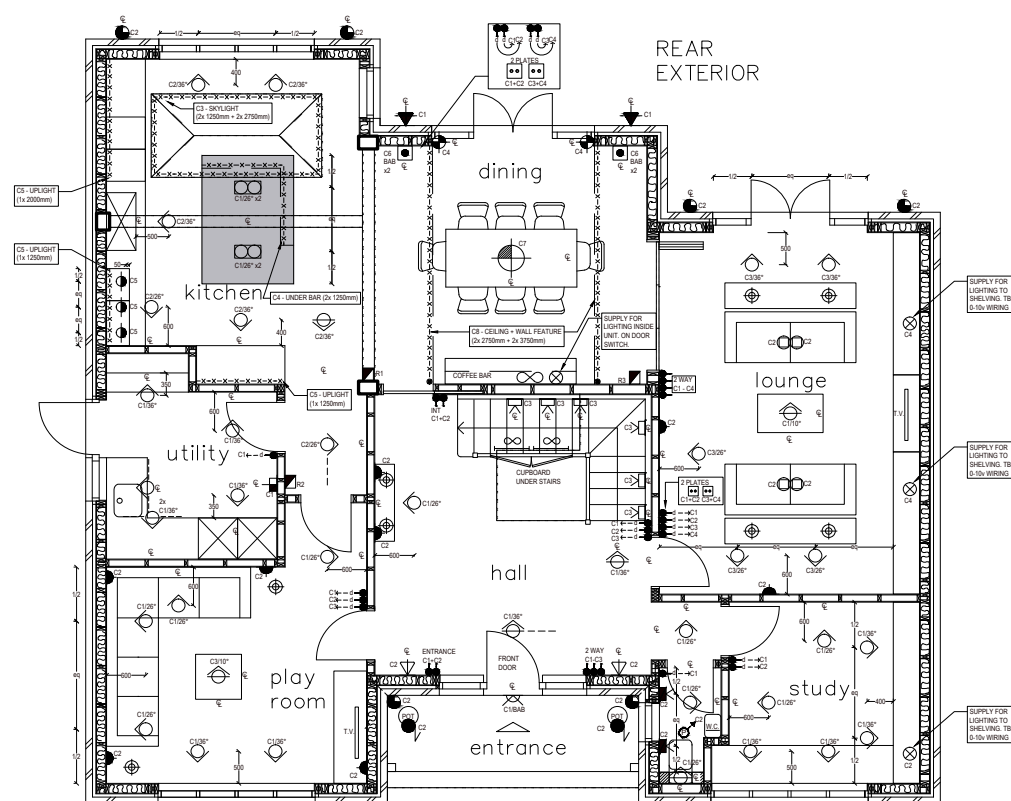
For those of us who didn't listen much in physics classes, the world of electrics can be quite scary and for most, the services of an electrician are essential.

However, it is critical to approach the specification of a new electrical system with a few key bits of knowledge, such as:

- How an electrical system works, the rules regarding electrical work, and what you would like it to do.
- Information on systems that go beyond the basics.
- Typical cost expectations.

Above: The Plan

The lighting plan is a major part of the overall electrics scheme. Note the importance of furniture planning early in the process



A WORD ON DIY...

Electrics is one of the more dangerous elements of a home construction project. Each year, on average, 10 people die and 750 people are seriously injured as a result of electrical work — so approach any attempts at DIY seriously.

Part P of the Building Regulations legislates for DIY electrical work. Electrical work is split into jobs that are either 'notifiable' or not. If a job is notifiable, it either needs to be carried out or certified by a registered competent person (e.g. a NICEIC member) or inspected by Building Control. (So you can undertake the jobs on a DIY basis, but need to get someone to certify them.) If it's not notifiable, work can be carried out in the same way as regular DIY: i.e. no one needs to be informed.

Notifiable Work:

- Work involving new circuits, replacements of consumer units or work in 'special locations' (parts of bathrooms)

Non-notifiable Work

- Everything else, including additions and alterations to existing installations (as long as new circuits are not required)

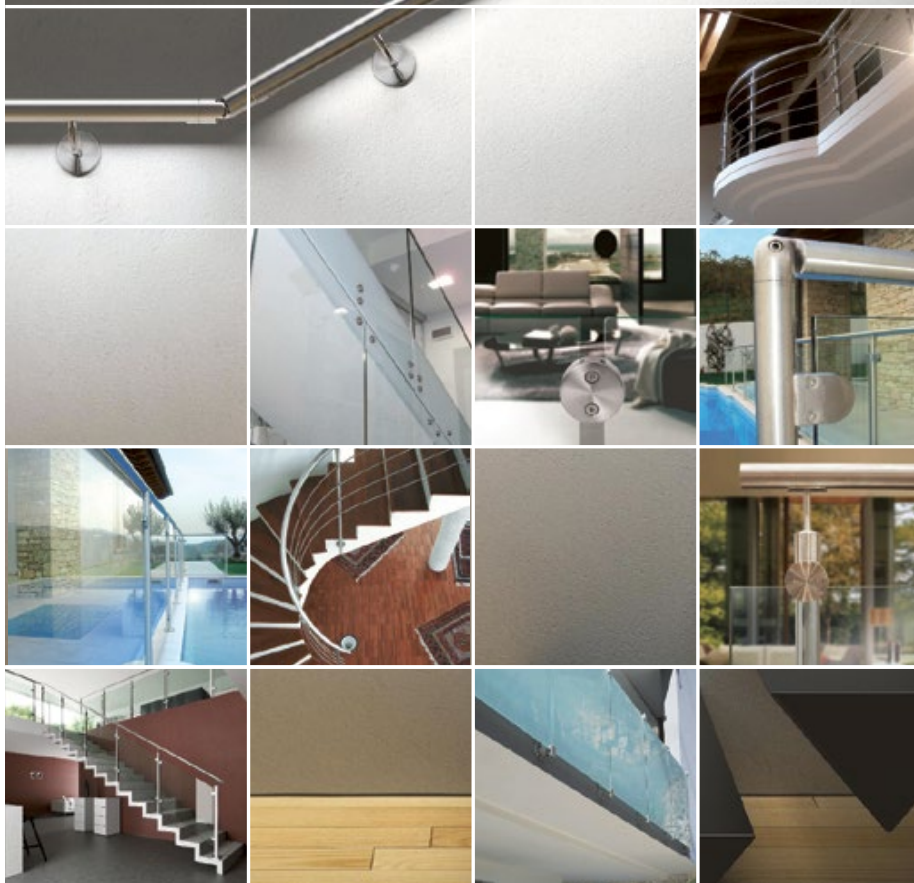
ABOUT THE AUTHOR

Darryl Bertie has 33 years' experience as an electrical engineer. The owner of Bert Electrics, Darryl has successfully delivered projects across the world, including a Caribbean cruise liner's in-house theatre, Hong Kong International airport, Buckingham Palace, and the Houses of Parliament. In this series Darryl, who is also a smart home specialist, will guide you through the electrics for your new build, conversion or renovated home.

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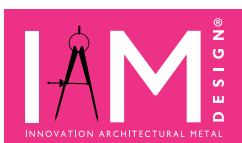
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THE BASICS

Electrical systems start with, and from, the meter, which belongs to the electricity board. From there it goes to your consumer unit (also known as a distribution board or fuse board) which has a main switch, and to the lifesaver RCD (Residual Current Device), and then it feeds all the circuits in your house via a miniature circuit breaker — MCB (fuse).

RCDs really are lifesavers: they trip out on leakage, not overload, meaning they cut off the flow of electricity automatically when they sense a 'leakage' — or imbalance — of electric current from a circuit. Whatever's going into the circuit, carried on the live and neutral wires, must remain balanced as it flows through and returns — or the RCD will trip. Even a small leakage can lead to harm or a fatal electric shock. Consequently, the need for RCDs and their potentially life-saving qualities is clear.

Right: At the Helm

Darryl checking out a consumer unit. They act as the heart of the home's electricity distribution system



WILL DENNEHY

THE KEY REGULATIONS

Under Part P, socket heights are now required to be a minimum of 450mm from the floor, while light switches must be a maximum height of 1.2m above the floor. These heights are intended to reduce back strain and difficulties for those less able, but they don't apply to kitchens and garages.

Other regulations stipulate that you run cables vertically or horizontally across walls to sockets and switches — not diagonally. This is based on the assumption that a cable is most likely to run down/up a wall, meaning you should be wary of drilling holes or fixing equipment above it.

Amendment 3 to BS 7671: 2008, 17th Edition Electrical Regulations, was issued in January 2015 and came into effect on 1 July 2015. Electrical installations designed after 30

June 2015 are to comply with BS 7671:2008 incorporating Amendment 3, 2015.

One particular regulation of note, Regulation 421.1.201, relates to fuseboards in domestic dwellings and the need for them to be kept in a metal enclosure. Investigation into several household fires involving plastic consumer units, by the London Fire Brigade, has concluded that a key cause of the fires was substandard cable connections made by the 'incompetent electrician' within the consumer unit. These resulted in overheating, which subsequently ignited the plastic enclosure. This regulation does not come into effect until the 1 January 2016, but this does not preclude compliance with this regulation prior to this date.



A PRIMER ON CIRCUITS



ISTOCK

CIRCUIT BASICS

Circuits are basically a path through which electrical current flows. You'll typically have separate circuits for the lighting upstairs, lighting downstairs, sockets upstairs and sockets downstairs.

Plus you'd have a circuit for sockets in the kitchen, a separate circuit for the induction hob, because that's a big load (approximately 7kW), and another for the oven. If there's underfloor heating, that would get its own circuit, as might your boiler and central heating. An immersion heater, too, would have its own circuit.

Having different circuits is beneficial because if, say, the downstairs lighting trips due to a fault, you've still got the upstairs to play with. There's also loading to consider — we can't overload circuits, which is why we have separate ones.

THE LIMITS OF CIRCUITS

There can sometimes be a little confusion when it comes to units of measurement in electrics. Always remember that voltage (V) stays the same while power (watts — W) and current (amps — A) can vary. The voltage system in your house will be around 230V.

Let's say you've got a GU10 Halogen 50W light bulb — the type of bulb you would have seen a lot in downlights a few years ago. (By the way, that's 50W of energy you're paying for — and not 50W of light output.) To work out how much current the bulb uses, divide the power by the voltage. In other words, amps equals watts divided by volts ($A = W \div V$).

In practice, here's how this formula might look. Let's say you have a 3kW immersion heater. That's 3,000W divided by 230V, which means you're going to be pulling 13A — meaning that particular heater can go on a 16A circuit with a 2.5mm cable because that cable is big enough to carry that current.

To calculate how many lights will go on a circuit,

more maths is required. For example, it's no good putting 100 lights on a circuit because you'll overload it. You've got a 6A MCB (fuse) for lighting in the fuseboard, and we know that you have a 230V system in the house. Therefore, we can calculate how much power can be used. Power (watts) equals amps multiplied by volts ($W = A \times V$), so the power in this case is $6A \times 230V = 1,380W$ (1.38kW).

If you use 50W bulbs, you could use up to 27 on that circuit. But today, of course, we're using more and more LED lights, which use much less power — usually in the 5-10W range — and cost less to run.

But do be mindful: once you've replaced your traditional 50W halogen bulbs with LEDs, there might be a temptation to put 50W halogens back in again when the LEDs need replacing. This clearly needs avoiding as you could easily overload the circuit.

Typically, I would stick to a maximum of 20 lights on a circuit, but you can use more if need be. **H**

Are there limits on what can go on each circuit?

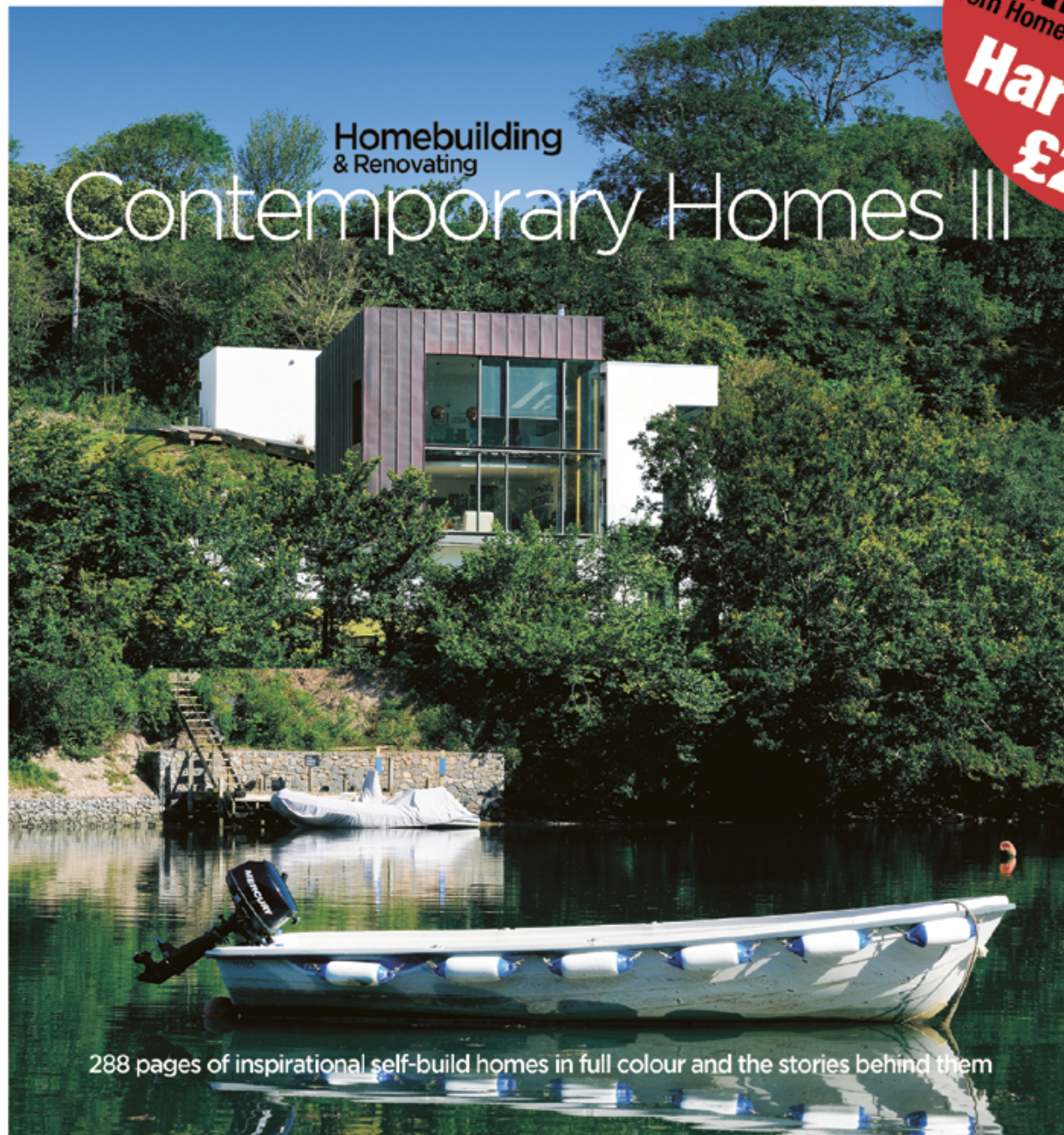
Limits to circuit loading are capped by the size of the cable that we put in. For example, a lighting cable is smaller than a power cable and requires a smaller MCB. To explain this in a little more detail, a cable for lighting might be rated at 16 amps (A) and we'll put a maximum 6-10A MCB on it. If you were to put a 32A MCB on that cable — rather than a 6-10A MCB — it becomes a fire hazard because the MCB won't break the circuit before you need it to, and the cable could potentially cause a fire. The same applies to a power cable being used for a cooker or shower circuit.

NEXT MONTH:

- Three-phase electrics
- Planning electrics in bathrooms
- ...and more

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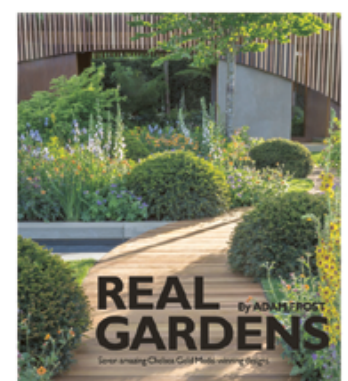
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ADRIAN PARGETER

Adrian is Head of Marketing and Product Development at Kingspan Insulation and is one of the UK's leading experts on insulation

The advantages of effectively insulating a home are pretty clear — not only does it help to create a warmer, cosier environment, it can also make a big difference to heating costs. However, if you're working with a particularly tight plot, or an area of your home where there really isn't much room to lose internal wall space, installing high levels of insulation can pose a problem. That's where vacuum insulated panels (VIPs) come in — providing a radically different insulation approach which can significantly cut down build-up thicknesses.

What Exactly is a VIP?

When looking at a VIP, it's immediately obvious that they are a little different to traditional insulation. Unlike the foam or fibre of traditional insulation materials, VIPs comprise a microporous core from which the air is removed, before it is encased and sealed within a gas-tight multi-layer foil envelope.

As anyone who's ever used a vacuum flask on a windy hill side will know, this vacuum approach is a highly effective way of keeping heat in. In fact, with a typical aged thermal conductivity of 0.007kW/m, VIPs provide an insulating performance that is up to five times better than other common materials.

As the vacuum must be maintained in order for VIPs to function effectively, the panels must not be cut. To combat this, they're typically supplied in systems with high or premium ➤➤

**Typical VIP insulation thicknesses
might be 20-30mm**

THE QUICK READ

➤➤ Vacuum insulation panels (VIPs) can match the thermal performance of other insulation materials at a fraction of the thickness

➤➤ They can provide a useful solution in areas of the home where lack of space has previously made it difficult to insulate

➤➤ They're suitable for walls, roofs and floors, where thickness is a particular issue



KINGSPAN

Above: Because vacuum insulated panels rely on the vacuum for their performance, they cannot be cut in the way that insulation usually can. They instead rely on additional infill strips to provide flexibility

THE WARMER HOME VIPS



Left: Build-up

Kingspan's vacuum insulation panels used in a floor build-up. Thicknesses would be between 40-60mm to achieve U values in the region of 0.15-0.2

performance infill strips of the same thickness. These strips can be cut to the shape of any unusual areas or to allow for penetrations through the insulated surface (such as pipework).

Where Should They be Used?

VIPs are highly adaptable and, when installed with due care and attention, can be used in most areas of the building envelope. In addition to the dormer window, rooftop terrace and balcony applications discussed in the July and September 2015 issues of *Homebuilding & Renovating*, VIPs are also particularly suited for floors, flat roofs and in wall applications.

In many cases, VIPs are used to solve a particular problem area within a property. Take, for instance, an insulation refurbishment on a solid floored property. In order to accommodate the required thickness of traditional insulation, it is often necessary to manually dig out and remove a large volume of material, leading to increases in project times and cost. For example, the minimum U value (thermal performance) target for refurbished floors under the Building Regulations in England is 0.25. To achieve this in a typical Victorian terrace with a

36m² (perimeter/area ratio of 0.3) floor area, where the existing floor is being replaced, 60mm of expanded polystyrene insulation is needed. This requires 2.16m³ of ground material to be excavated by hand and removed from the site, greatly extending the construction programme.

In contrast, a VIP system including 15 per cent infill strips can achieve the required thermal performance with a thickness of just 26mm, meaning less than one cubic metre of soil needs to be removed. This speeds up the installation time and helps to minimise disruption for the homeowners while reducing construction costs. A further thickness of rigid thermoset infills should also be installed vertically around the floor edge to help limit thermal bridging.

VIPs solve particular problems: for example adding insulation to existing solid floors

The alternative for refurbishment projects is to raise the existing floor level. However, this will reduce the floor to ceiling height within the room and requires fixtures and services such as plug sockets, door lintels and radiators to be raised in line with the floor level, creating yet more remedial work and again increasing the time and cost involved. VIPs provide a slim-line solution, helping to keep projects on track without compromising head height. 

For further information and technical support contact:
01544 388601; kingspaninsulation.co.uk

INSTALLATION

While VIPs have only recently started to gain in popularity in the UK, they've been used successfully for many years on the Continent, particularly in Scandinavia, Germany and Switzerland.

Manufacturers will typically provide installers with clear instructions on how the product should be handled and installed to maximise its lifespan. In addition, to ensure the target thermal performance is met with the thinnest possible system thickness, free technical design services are offered by some manufacturers. The designers draw up VIP system layouts for each specific application, ensuring the best possible ratio of VIPs to infill strips.





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DISCOVER MORE ONLINE:

How to Project Manage Subbies Successfully

David Snell, who's spent 50 years in the industry, reveals how to get the best from subcontractors during a self-build or renovation project — and what to pay



DAVID SNELL

A 13-time self-builder, David has been building homes for 50 years and is the author of *Building Your Own Home*

By choosing to build with subcontractors/direct labour/tradespeople, the self-builder or renovator effectively becomes the builder — responsible for all matters on site and required to make sure that all materials, services and labour are on site at the correct time and in the correct quantities. Managing subcontractors properly is a particular skill. There is a quote which springs to mind: "Subcontractors never work for you. They do you a favour and you pay them for it." Those hearing this for the first time may scoff. Those who have been through the process will raise a wry and knowing smile.

How to Ensure Quality

One of the first questions a self-builder or renovator will often ask themselves is how will they know whether what the subcontractors are doing is right and that the quality of their work is good enough. Understandably it's a perennial question among those who are new to the building business.

The answer is twofold. Firstly, while many feel that they don't understand the intricacies of the building process, most can see whether bricks are being laid sloppily, whether architraves don't meet up in the corners, doors don't hang properly and do not feature even spacings to the lining, and plaster is smooth and even. All of that is cosmetic but, nevertheless, gives a clue as to the underlying and sometimes hidden intricacies of the work.

But the second and perhaps most important way of analysing the quality of work is to make prior investigations. Before employing anybody on site, look at their previous work and talk to their previous clients. Find out if faults came to light after they'd finished. Talk to building/warranty

inspectors about your proposed choices; their response may give a clue as to whether you're picking the right person.

Paying Subcontractors

There are two types of subcontractor: labour only, and supply-and-fix, with perhaps a third as a hybrid of the two. Labour-only subcontractors will, almost always, expect to be paid in cash at the end of each week. Those new to the industry might feel that somehow they are doing something wrong, but the plain fact of the matter is that the individual self-builder or renovator has no obligation to ensure that those they employ on site pay their due taxes. And, with new build, VAT does not come into the equation because labour-only contracts and supply-and-fix contracts are zero-rated and, therefore, exempt.

Supply-and-fix contractors, such as plumbers and electricians, are a slightly different matter in that they will usually accept cheques against a written invoice, often given in two stages covering first and second fix.

Above all, never pay in advance. With labour-only contracts, make sure that the payments are spaced out through the estimated duration of the contract, with a little bit held back as an incentive to finish. With supply-and-fix contractors, pay in the two stages. If special purchases have to be made, buy these items yourself in order that you retain the title.

When to Get Involved in the Build

There is often a desire to get involved in one or more of the trades, either to fulfil a desire to have a physical input into the new home, or to try to save money. The truth of the matter is that, in all probability, however much you pitch in and help, it's unlikely that you'll save directly. The trades may welcome your assistance, but they may also resent your clumsy efforts to help, and feel that you are somehow slowing them down. They are very rarely likely to accept that your efforts should impact on their take home pay.

That doesn't mean that there aren't things that you can do. Going off on a Friday lunchtime to fetch fish and chips will mean that the labourer can keep at his job, saving time when they start up again. Offering bacon sandwiches will engender a sense of goodwill on site. (It may become a millstone.) Certainly, clearing up and mak-

"Grey areas between the trades need addressing"



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ing sure that materials that are delivered are carried into site and stacked where they are needed will save on day rates and the inevitable slowing down of the job.

Unless you're an expert in any one of the trades, it is never really a good idea to undertake them, except perhaps one of the finishing trades such as decoration and ceramic tiling, which are unlikely to hold other people up.

Co-ordinating Between the Trades

Tradespeople have to mesh in with each other, sometimes within the day, sometimes within the hour. It's vital that you make yourselves aware of the sequences within a self-build or renovation project and that you learn to constantly think ahead as to requirements for up and coming labour.

A helpful tradesperson will want to let you know that they will be requiring a follow-on or partnership trade, not least because they won't want to be held up by their non-appearance. And, in truth, many good tradespeople work in laissez-faire groupings who keep in touch with each other and let one another know when they will be wanted. But you can't just rely on that and in the end, it will always be your responsibility.

Finding Good Subcontractors

There are several websites dedicated to finding suitable subcontractors with appropriate recommendations, but none negate the need for the self-builder or renovator to make their own checks, to see their previous work and to talk to their previous clients. After all, the only people who can really tell you what a prospective subcontractor is really like, are those who have direct experience.

If there's a self-build site anywhere in your vicinity, visit it and chat to owners. They'll tell you which bricklayer turned up on a Monday and then didn't show up for weeks afterwards. They will also inform you as to which carpenter should have been called a 'wood butcher'. Plus, just as importantly, they will let you know which ones were great.

Once you've got one good tradesperson on board, they will often lead you to other good tradespeople with whom they regularly work. After all, a good tradesperson doesn't want to have to follow a bad one.

Visiting smaller sites and asking those working there whether they'll quote may also produce results. Reading the advertisements in your local press will give you names. But, once again, these are only the starting point for you to commence making your own enquiries as to their worth.

Getting the Best from Your Subcontractors

It's essential to build up a good relationship with those who are working for you on site. If bad blood occurs between you and the subcontractors it will only backfire and it's perhaps a good idea if that happens to cut your losses and move to another tradesperson. If trades fall out with each other, then you may have to take sides and dispense with the services of at least one, because the end result could be that one endeavours to frustrate the work of the other, to your disadvantage.

Starting off on the right foot, with a clear understanding of what you are expecting them to do and how much you are

going to be paying them, is always the best way to ensure that you get the best out of trades. Do not expect to form a partnership. There are unequal expectations between you and anybody working on your site. You may form enduring friendships but, in the end, on site, you are building your own home with the expectation of increased equity and they are simply undertaking their day job.

Addressing the Areas Which Fall Between Trades

Most misunderstandings and arguments that occur on site between client (you) and tradesperson result from unclear or imprecise arrangements and expectations before the job commences. Plans must be clear and unambiguous. Your list of what you expect may be fully detailed in many cases but, in others, it is perhaps best to simply include the whole trade in your description of what you are expecting or requiring. For instance, if the quotation is for the carpentry roof work complete, then any argument that the binders or the bracings are not included, won't hold water.

Again, leadwork is often within the plumber's remit and, certainly the on-site manufacture of flashings and trays will fall to this trade. However, the important thing is to make sure at the very outset that you make it clear who is going to be responsible for what. For example, the fitting of leadwork, where the roofers may have to interleave flashings with the tiles or slates and that the bricklayers may be expected to point in the flashings when they come back to fill putlog holes.

Another grey area between trades concerns cleaning up. Many good tradespeople will clean up after their work, but it's by no means a given. It's not at all uncommon to find a painter and decorator trying desperately to paint skirting boards while other tradespeople are working in the vicinity or walking past disturbing dust and debris that has been crudely cleared away. But whose responsibility is it? The painter has no particular responsibility to clear up after others. The carpenter making the mess has no normal remit to clear up afterwards. Either or both could have the responsibility built into their contract as an extra. But the reality is that this normally falls to the builder, who would employ an unskilled labourer to do the work. In the absence of a builder, it devolves to the self-builder or renovator. There is no doubt about it, a tidy site is more likely to result in a build which comes in on time and on budget.

The Importance of Forward-Thinking

A successful project is all about making plans and then thinking ahead to make sure that those plans come to fruition. The labour may help coordinate each other, but that assistance counts for nothing if the correct materials aren't on site in the right quantity at the right time.

It behoves the self-builder or renovator, at all times, to constantly think ahead; to think about what comes next and what comes later on down the line. Some materials are off-the-shelf. Some have extremely long lead times and need ordering well in advance, which might mean having to think about finishes at the same time as being involved in preliminary site works. Failure to think ahead will always lead to breaks in the timeline and that will, inevitably, lead to increases in costs.



Subbies: What They Do and What to Pay

Groundworker



- Create entry and clear site
- Lay hardcore base for access, deliveries and storage
- Strip topsoil and store for reuse
- Set out house and set to profiles (this may however be done by a surveyor)
- Mark out lines of dig on the ground
- Excavate foundation

trenches, load spoil into tipper lorries for off-site disposal or into dumpers for on-site storage and reuse

- Clean and crumb out the trenches
- Set level pegs for the top of the concrete
- Pour and lay foundation concrete
- Lay foundation blockwork to DPC (damp-proof course) level, put in cranked ventilators, all necessary drainage exit lintels and sleeving for services; this may also be undertaken by the bricklayers
- Level out subsoil within the oversite
- Backfill trenches outside the building
- Fill cavities with lean-mix concrete
- Position ground floor beams
- Lay infill blocks and brush grout
- Lay damp-proof membrane and/or gas membrane
- Position and lay first floor beams and infill and brush grout, unless the bricklayers are doing it
- Excavate service trenches
- Excavate trenches for foul and surface water drainage
- Lay drainage runs on pea shingle and bring upstands into oversite
- Haunch over drains with pea shingle
- Fit proprietary manholes, gullies, etc.
- Connect the foul water drains to the on-site mains sewer run, septic tank or sewage treatment plant, or take sewer run to the boundary for road connection by Highways approved contractor
- Construct soakaways and connect surface water drains
- Backfill all drainage and service trenches
- Carry out specified and agreed hard and soft landscaping, including driveways, pathways and patios

The typical day rate for a groundworker is approximately: £130; A general labourer: £90; Semi-skilled labourer: £100

Bricklayer

- Lay blockwork to DPC level including installing ventilators, drainage exit lintels and sleeving, unless the groundworkers undertake this task
- Lay ground floor beams, infill blocks and brush grout, unless the groundworkers undertake this task
- Bed DPC, marrying this to any damp or gas membrane or cavity trays
- Build superstructure in brickwork and blockwork
- Install cavity insulation as work progresses
- Install cavity closers
- Fit timber windows or build in profiles
- Build in meter boxes
- Position and bed lintels, padstones and steel joists
- Lay first floor beams, infill with blocks and brush grout, if the groundworkers don't undertake this role
- Install cavity trays where necessary
- Bed wallplate
- Build up gable ends
- Build chimney through roof
- Build internal brick features and fireplaces
- Point up flashings and trays
- Fill putlog holes
- Build any feature walls or brickwork in garden as specified and agreed

**The typical day rate for a bricklayer is: £160
(The typical day rate for a stonemason is: £185)**





Carpenter

FIRST FIX

- Making up and fixing templates for openings, where appropriate
- Fitting door linings
- Making up studwork partitioning, including to fitted cupboards, where necessary
- Fix underfloor plasterboard battening using proprietary batten clips
- Install insulation

to studwork partitioning

- Install insulation within ceiling and floor zones and to roof void
- Fix window boards
- Fix staircase flights
- Make up and fix garage door frames
- Nog out for plasterboard
- Hang temporary external doors, where appropriate
- Board out loft, where appropriate
- Create and fix loft entrance and fit loft ladder

ROOF

- Erect and complete roof using prefabricated trusses and lumber, to include gable ladders, valleys, hips and construction of dormers, porches and bay window roofs
- Fit rooflights where required
- Lay sarking boarding where appropriate
- Fix fascias and soffits, including ventilators, where necessary
- Fix bargeboards, where appropriate

SECOND FIX

- Box in pipework and vent pipes
- Lay insulation and timber decking to floors, where appropriate and unless carried out by other specialist suppliers
- Assemble and fit staircase newels, balustrading, aprons and handrails, etc.
- Hang all internal doors including cupboard doors and fitted wardrobes
- Fit slatted shelving to linen cupboards
- Final fit of loft traps
- Assemble and fix fitted units to kitchen, utility room, bedrooms and bathrooms, unless carried out by specialist manufacturers or suppliers

The typical day rate for a carpenter is: **£160**



Electrician

- Fit temporary consumer unit to building supply
- Install and connect domestic earth rod
- Lay and fix all carcassing wiring
- Fix backplates to outlets and controls
- Fix proprietary sheathing to wiring
- Fix and wire up faceplates, pendants, wall lights and controls
- Fit and wire up external power points and lighting
- Fix and wire up extractor fans and cooker hoods
- Cross bond and earth all pipework and sanitaryware
- Fit and wire up consumer unit
- Wire up thermostats, controls and programmers
- Attend plumber for firing up and testing boiler and central heating, if and when required
- Test installation

The typical day rate for an electrician is approximately: **£175**

Rofer

- Cover roof with underlay and rough batten
- Fix GRP valleys or attend plumber for fixing lead valleys
- Bed and fix undercloak to verges
- Fix counter battens if necessary
- Gauge and fix tiling/slating battens
- Load out tiles or slates
- Lay tiles or slates, nailing as required and appropriate
- Lay valley tiles, if required
- Fix verge slates/tiles
- Interleave upstand and cover flashings and soakers
- Attend plumber for vent pipe skirtings
- Fix or bed ridge/hip tiles or ridge/hip system
- Point up ridge/hip tiles and verges

The typical day rate for a roofer is approximately: **£150**

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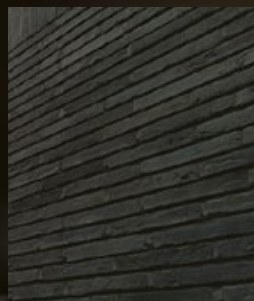
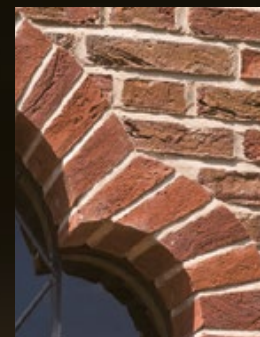
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Plumber

- Install water standpipe for building supply
- Lay first fix carcassing pipework
- Run any gas pipework
- Make up lead flashings, soakers and vent pipe skirts as appropriate
- Fix vent pipes to drainage upstands and take to stub stacks or through roof
- Fix skirts to vent pipes with roofer
- Fix guttering and downpipes
- Position hot water cylinder
- Lay underfloor insulation, taping joints and cover with membrane
- Lay underfloor central heating loops to manifold position
- Connect underfloor heating loops to manifold and put on test, once screed is laid
- Fit the boiler and connect to system
- Attend to chimney flues and liners
- Connect boiler to LPG, oil or mains gas supply
- Fit sanitaryware and connect to domestic plumbing and wastes
- Mastic seal around baths and washbasins
- Plumb in washing machines, water softeners etc., as appropriate
- Lag all exposed or vulnerable pipework
- Fire up boiler and test system
- Balance and commission system
- Switch underfloor heating off 'test' and to 'run' once test period is over

Typical labour day for a roofer is approximately: £180

Plasterer

- Screed floors as soon as underfloor central heating loops are laid, unless left to specialist suppliers and installers using pumped self-leveling material
- Tack ceilings with plasterboard
- Fix all beadings and lathing
- Float and set all masonry walls, or dryline walls with plasterboard
- Fit mouldings and coving
- Tape and joint all boards and skim coat with plaster finish
- Render external walls, where appropriate



The typical day rate for a plaster is approximately: £150



Decorator

- Snag and make good all walls prior to decorating
- Fill all holes and gaps
- Apply mastic around all external joinery
- Rub down and fill all joinery
- Knot any timber to be painted
- Prime and undercoat all internal and external joinery or timber to be painted
- Gloss coat or stain internal joinery or timber
- Paint all internal walls and ceilings with mist coat plus two coats of emulsion
- Paint external render with two coats of proprietary finish

Typical labour day for a roofer is approximately: £130 ⓘ

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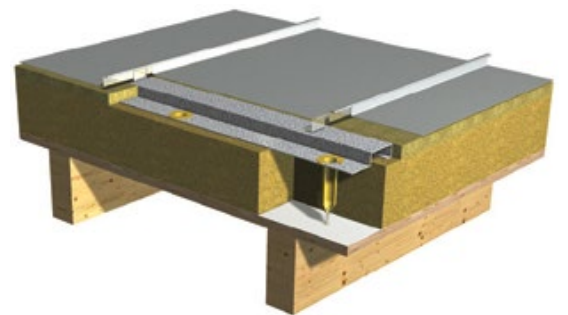
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SELF BUILD LIVE

PART 2

Forming a complete step-by-step guide to building a home, we follow leading package company Potton as they start work on a brand new Passivhaus home



156 **Passivhaus: A Myth-Busting Guide**

Architect Rory Bergin of HTA – the practice behind the design of Potton's latest showhome – answers your top questions

159 **Constructing a Passivhaus**

From masonry to timber frame, there is no one way of constructing a Passivhaus home. Potton's Self-build Director Dr Paul Newman explains the detail behind using a timber-based system

160 **A Step-by-Step Guide to Building the Superstructure**

Attention to detail is key to the success of a Passivhaus superstructure – as Project Manager Brent Ackerman explains

In a UK industry first, self-build specialist Potton is giving aspiring self-builders an opportunity to watch, stage-by-stage, the construction of its fifth and most contemporary showhome.

Self Build Live is a series of events – held at Potton's Self Build Show Centre in St Neots, Cambridgeshire – designed to offer potential self-builders an 'access all areas' insight into the construction of a fully certified Passivhaus and learn first-hand how to build their own home – the highlights of which are showcased over the following pages.

Potton, together with its build partners, will host 16 Self Build Live events at key stages of the build – from laying the slab, installing insulation and skimming the walls to fitting the bathrooms, interior design and decoration. Each event will provide essential self-build information and an unprecedented insight into building a Potton home.

For course dates, videos of the build and more information, visit selfbuildlive.com



A MYTH-BUSTING GUIDE TO PASSIVHAUS HOMES

Can I open the windows? Will the architectural design be compromised? Architect Rory Bergin dispels the myths surrounding this energy-efficiency standard



RORY BERGIN
Architect Rory Bergin is partner of HTA Design and head of their Sustainable Futures unit

How significant is Passivhaus in delivering sustainable housing?

Passivhaus is a standard that focuses almost entirely on the energy used by buildings. It has been very successful in demonstrating that livable and comfortable houses can be built using this standard in a variety of European countries and further afield. It has had a major influence on the direction of policy in many countries, with some even adopting the standard as optional or mandatory for use in new construction. This is all positive as it helps to drive development of new products and skills in the construction industry, with the aim of creating even more highly energy-efficient buildings.

Where the standard is less ambitious is in other areas of sustainable design, such as water use, biodiversity, transport, waste and other factors that affect the sustainability of the home that is constructed. It is entirely possible to build a Passivhaus in a location where the residents have to drive to buy a pint of milk, but this perhaps defeats the purpose somewhat.

Does building a Passivhaus home have to result in architectural compromise?

The design standard does have an impact on

design to some degree, in the same way that almost all energy-efficiency standards have an impact. Simple volumes and shapes tend to work better than complex ones, the design of the building fabric needs to be carefully considered from the outset to ensure that the fabric performs very well, and the size and orientation of windows is important to manage solar gains as well as heat losses. None of this means that designing to the standard is very difficult, and our project with Potton demonstrates that a relatively complex design which is architecturally interesting can meet the standard.

The challenge is to merge both the design considerations and the energy-efficiency considerations from the outset. Highly energy-efficient buildings need to be designed to perform well from the beginning. It is not cost-effective or even likely to be successful if a design is created and then is manipulated to be more efficient. At HTA we include designers and energy-efficiency specialists in our staff, so we can ensure that the design is headed in the right direction from the beginning. We use computer simulation tools to assess the designs at regular intervals to ensure that we are meeting the required standard. There are always trade-offs and judgements to be made between designer, client and sustainability expert. It is important that all three voices are heard from the beginning of the design.

We tested three designs, but chose to continue with the design that we knew would be the most complex to build from an energy-efficiency perspective. We did this because it offered the most potential to deliver an exciting design, and we didn't

think that the difficulties of achieving the Passivhaus standard were insurmountable. The design is based around a small internal courtyard which acts as the central focus to the dwelling. This courtyard is surrounded by the staircase, the living room and the kitchen, and has a rooflight that brings daylight into the heart of the home. The design features more accommodation on the ground floor than on the first floor, and this means that different versions of the house can be built which have a larger number of bedrooms than the one we have designed. We liked the idea that there could be many different versions of the home that would suit different lifestyles.

There are some common myths about Passivhaus — and energy-efficient design generally. Many think they have to be 'box-like' in design, but Potton wanted to dispel this myth in creating something different but which still meets the required standards.

How sustainable will a completed Passivhaus home be?

Sustainability is not just about what kind of home we live in, but also where we live and how we travel. The Potton Passivhaus, if constructed close to services, transport, shops and amenities, can be highly sustainable. It offers residents the opportunity to live in a home that uses a fraction of the energy that an old home uses and which even uses much less energy than a home constructed to current UK Building Regulations standards.

However, the resident will need to participate in this effort — a Passivhaus home cannot do everything on its own. So it will

"The resident will need to participate — a Passivhaus home cannot do everything on its own"



A Home for the 21st Century

Defying perceptions of Passivhaus buildings being box-like in form, Potton's latest showhome will cut a dynamic shape when built. Designed by HTA Design, the Potton build features a butterfly roof and has been exactly designed to welcome in natural light and solar gain without the interiors overheating

be important that doors and windows are kept closed in cold weather to allow the systems to maintain a good indoor level of comfort. The experience of residents in completed Passivhaus homes is generally positive with regards to how comfortable they are to live in. A secondary benefit of such a high-performing building fabric is that they are quiet and keep out noise.

Is it true that you cannot open the windows in a Passivhaus?

This is a myth. The energy efficiency in the coldest part of the winter relies on the windows being closed, but that doesn't mean

that you cannot open them if you want to. The house will simply get cold, and it will take a while to warm up as the heating system is small. This is because the design is intended to require very little heating, and it makes no sense to install a standard heating system in a building that shouldn't need it. (This also helps to save money in the long term, as there is no boiler or radiators to maintain or replace.)

Can I add renewable energy systems?

Yes you can. While we have not added renewables to the showhome, there is plenty of roof space to accommodate solar thermal

or PV (photovoltaic) systems. If you have a family with young children or teenagers, then solar thermal may offer the greatest savings as it can provide over half your annual hot water requirement.

Adding PV panels also helps reduce National Grid energy consumption. Grid energy is not 'clean' energy, as we still use a lot of coal and gas in the UK. Using PV panels can aid to reduce the energy used in a Passivhaus to nearly zero over the course of a year, or even to generate a small income (via the Feed-in Tariffs) if there is sufficient PV cells and the energy use is well-managed by the occupier.  ➔

Passivhaus by Kingspan



The new Kingspan Passivhaus has been designed to defy the stereotype that Passivhaus will not work with generous openings and a form that deviates from the typical boxy design with small windows.

The project will use the *Kingspan Kooltherm*® K-range of phenolic insulation and the *Kingspan TEK*® Building System of SIPs to ensure the stringent Passivhaus requirements are met.

Visit www.kingspaninsulation.co.uk/passivhaus



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PASSIVHAUS: THE DETAIL BEHIND THE BUILD

There is no one way of constructing a Passivhaus home. Potton's Dr Paul Newman explains the finer details of using SIPs (structural insulated panels)



DR PAUL NEWMAN
Self-build Director Dr Paul Newman has worked within timber-based construction industries for over 18 years

Passivhaus standard does not require one to build using any particular construction method. All it's really interested in is whether the performance criteria has been met. As a result, around the world there are Passivhaus buildings constructed using all manner of methods, systems and materials.

Potton are specialists in the provision of high-performance building envelopes using timber-based systems and accordingly a timber system was an obvious choice for the superstructure of the showhome. We chose the Kingspan TEK® Building System (more on this later), because we have used it to construct literally hundreds of low-energy buildings and understand, in some detail, its performance characteristics. The System is ideal for use in projects which require low U values, low and defined thermal bridging characteristics and excellent airtightness. It's also certified by the Passivhaus Institute which, if nothing else, provides some comfort.

When developing the structure of a Passivhaus, the main challenges are firstly to ensure that structurally it performs like any other property (i.e. it meets Building Regulations), and secondly to ensure that the structural design is both able to achieve the thermal and airtightness performance targets and makes achieving them as simple as possible (primarily because they're pretty onerous in the first place).

Like any property, work starts in the ground. Many or most Passivhaus buildings are constructed using a solid reinforced concrete raft that sits or floats on a bed of insulation. The Potton Passivhaus is no different in this regard: a 225mm thick reinforced concrete raft sits or 'floats' on a 250mm thick bed of insulation. One of the challenges for our structural engineer was to ensure, for the simplicity of construction, that the raft was one thickness throughout and still able to resist the loads applied by the posts, frames and walls required. We are pleased with the end result because, at one stage of the design, it looked as though we might need to have a thickened band around the perimeter of the raft.

One of unusual things about the Potton Passivhaus is that it uses masonry cladding, in the form of Terca Megaline bricks from Wienerberger; the long, narrow format provides a contemporary appearance, but is also a nod to traditional brickwork elevations of the vernacular. Most Passivhaus builds exclusively use lightweight cladding systems which are carried by or fixed back to the building structure. To use the masonry cladding and not introduce any thermal bridging meant that we needed to construct a separate foundation just to carry the brickwork façade — this was a simple strip foundation which is completely isolated from the main insulated raft.

Having sorted out the foundations and ground floor construction we turned our attention to the superstructure. The Kingspan TEK® Building System consists of 142mm or 172mm thick SIPs (structural insulated panels) connected with a unique jointing system. The System is typically used for the external walls and roof structure of buildings. We have combined the SIPs external walls and roof with open metal web floor joists and timber frame internal load-bearing and non load-bearing walls.

Our walls are constructed using TEK 142mm panels with an external layer of Kingspan Kooltherm insulation to help achieve the required U value — there is also a 40mm service zone on the inside of the panel. The roof is constructed using TEK 172mm panels, this time with an internal layer of Kingspan Kooltherm insulation. We have used the thicker panels for the roof because they are capable of spanning further without requiring additional support. We have wrapped the entire structure externally using A Proctor Group's Wraptite System; a self-adhesive, high-performance breathable membrane and air barrier combined in one.

The Kingspan TEK® Building System panels are manufactured using an almost unique continuous casting process whereby the two sheets of 15mm oriented strand board (OSB), that form the skins of the panel, are suspended apart from each other on a slow moving production line. The liquid mix for the rigid insulation core is introduced into the gap between the boards, filling the space between. The whole panel then goes through a press that controls the thickness of the finished product and therefore its density, thermal and structural properties. The large panels are then typically further processed, using a CNC router to create the shapes required by the design of the building.

As with all Potton projects we design and build using the Kingspan TEK® Building System, the construction and manufacturing drawings for our Passivhaus have been developed using specialist 3D CAD software. This starts with the structural concept, checking the design will work within a Passivhaus environment and then moving on to developing the detailed manufacturing design; these checks provide a useful opportunity to spot any last-minute niggles and ensure that we end up with a structure that is as easy to build as possible. [H](#)

THE SUBSTRUCTURE: A STEP-BY-STEP GUIDE

Creating an airtight building envelope for a Passivhaus home involves attention to detail. Project Manager Brent Ackerman shares his advice from Potton's latest build



BRENT ACKERMAN

Brent Ackerman is a regular presenter of the Self Build Academy and Project Manager for Potton's Passivhaus build

1 Levelling the Sole Plates

The first pieces of timber to get fitted on every project are never the most glamorous but arguably the most important. The sole plate is a single strip of solid timber that runs around the top of the foundations, fitted to the top of the 'kicker brick' course (see 1, right); the last element of the foundations. It's essential that the sole plates are level and set out accurately in accordance with the setting out drawings. Mistakes incorporated at this stage of the build invariably cause much bigger problems further down the line and so the job has to be done correctly. If there are any errors with the foundation construction then these should be addressed before work proceeds.

3 Installing the ground floor panels

Once the sole plates are set then the ground floor internal and external Kingspan TEK® Building System wall panels can be delivered and erected. The panels are fabricated in elevation or part elevation form, depending upon access conditions on site, so that the number of joints requiring attention are minimised. The ground floor panels are nailed first to the sole plate and then fixed to each other. The erectors brace the panels to ensure that they are vertical. Panel junctions are sealed with an insulating foam and sealant to help ensure that they are airtight.

Corner junctions on the ground floor need particular attention as they must be set square. Internal wall panels, which can

be load-bearing, non load-bearing or contribute to the overall building stability normally, get added into the structure as the build progresses.

4 Fitting the post and beam members

This Passivhaus is not simple: it has large open plan spaces on the ground floor, a central courtyard area and a spectacular feature window measuring approximately 8x3m. The courtyard is framed with four posts and the large openings are constructed using portal frames (4, far right) to provide stability to the structure. These large post and beam members are fitted as the ground floor build progresses and care must be taken again to ensure that they are accurately located and aligned.

Large members are typically fixed using resin anchors and shimmed (wedged using shims) into position with steel strips (4, right centre). It's essential that once the resin fixings have set, and before the ground floor is screeded, the shims are grouted using a structural non-shrinking grout.

5 Constructing the first floor

We elected to construct our first floor using open metal web joists with Norbord Cabershiel floor decking. We use open metal web joists (MiTek Posi-Joists) on all our projects — they're great because they really do simplify the installation of the services, particularly the large ducts required by MVHR (mechanical ventilation with heat recovery) systems. They can also be manufactured to a variety of depths and widths so that a range of span and load conditions can be accommodated.

The Cabershiel chipboard is a new product for us — a departure from traditional plywood. It has a permanent protective coating that protects the product from moisture during construction; we now know that it works very well. In this build

the Posi-Joists are hung off of the external Kingspan TEK® Building System walls using metal hangers to help reduce thermal bridging. The Cabershiel floor deck is then glued and screwed, using a special gap-filling adhesive to the top of the Posi-Joists. The adhesive helps prevent squeaks and creaks in service and contributes to the moisture protection performance of the system during construction.

6 Raising the roof

The Kingspan TEK® Building System 172mm panels used for the roof are capable of spanning over 3m without requiring any additional support. Where spans are longer than 3m then the panels are either sat on a load-bearing wall, supported by a purlin running underneath, or have rafters incorporated into them. While our overall build is somewhat complex, the roof itself is relatively straightforward so we were able to design and deliver some large-format panels to simplify the build and reduce the time spent working at height. Once the large panels are laid on to the supporting structure, they can be nailed together and fixed through on to their supports.

7 Sealing the structure

Being a Passivhaus, the building has to be very airtight. All of the panels are prefitted in the factory with a Wraptite System membrane, so once the superstructure is complete the final job is to seal up all of the panel junctions with a narrow sealing strip to provide continuity of performance. The next step is fitting the Vieo standing seam roof from Euroclad, and installing the roof-light and the Kloeber windows. 

MORE ADVICE ONLINE

➔ **Read Self Build Live Part 1**

Visit homebuilding.co.uk/self-build-live-building-a-passivhaus



1



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4



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Ideas Gallery

1 A recent survey by ventilation manufacturer EnviroVent found that condensation/mould is one of the top three concerns facing homeowners in the winter months. To treat condensation and mould growth, humidity needs to be reduced to prevent condensation from forming. The way to do this is by having an effective ventilation system installed. There are lots of options available – from a whole house condensation control unit such as the Mr Venty® ECO2 to fitting low energy usage extractor fans, such as Cyclone 7. www.envirovent.com

2 Traditional-style timber windows and doors from the Conservation™ range by Mumford & Wood have been specified for an impressive new-build property in Essex. A dual colour option was chosen by the homeowners - RAL 7038 Agate Grey externally and Mumford & Wood 9003 Signal White internally. Products are manufactured entirely in Britain from clear grade, FSC certified engineered timber. www.mumfordwood.com

3 Love drying your laundry with the new Laundry Ladder by Julu. British designed - cleverly keeping your washing off the floor and out of the way, this attractive clothes airer hangs on your wall ready to be used, while the simple pulley system lowers and raises the front frame, allowing easy access past. Prices start from £174. Tel: **033022 32855** www.juluhome.co.uk

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5 KBB Replacement Doors has added three critical finishes to its Bellissimo Pisa range, as the perfect complement to the existing five woodgrains. White, Cashmere and Cream are the on-trend solid colours. Pisa is made in the innovative new PVC-edged MFC with almost invisible laser edging. There are bespoke sizes and a curved option. www.kitchenbedroomdoors.com

6 At Handrail Solutions (UK) Ltd, we pride ourselves on supplying and delivering quality, bespoke handrail & balustrade systems. Our professional, innovative design service ensures our customers achieve the integrity and aesthetically appealing structures to their requirements. www.handrailsolutions.com

7 First launched 23 years ago, demista™ heated mirror pads have been sold to hotels, specifiers, architects, house builders, and supplied through electrical wholesalers and bathroom retailers. The self-adhesive pads are slimline and easy to install, simply fix in position and wire in to the electrical system either through the lighting or a separate switch. www.demista.co.uk

8 **weber.therm XM** External Wall Insulation (EWI) by Saint-Gobain Weber has transformed the appearance and thermal performance of a 1960s end of terrace in Bristol of solid wall construction. Available in a palette of colours, **weber.therm XM** EWI is capable of substantially improving the U-value of a property in a retrofit project reducing energy consumption, and produces exceptional levels of energy efficiency on new builds. www.netweber.co.uk





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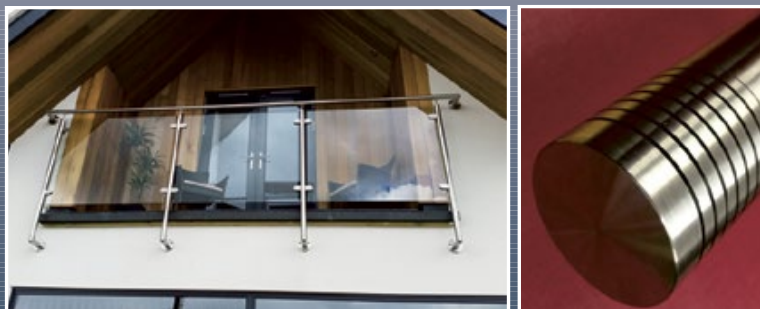
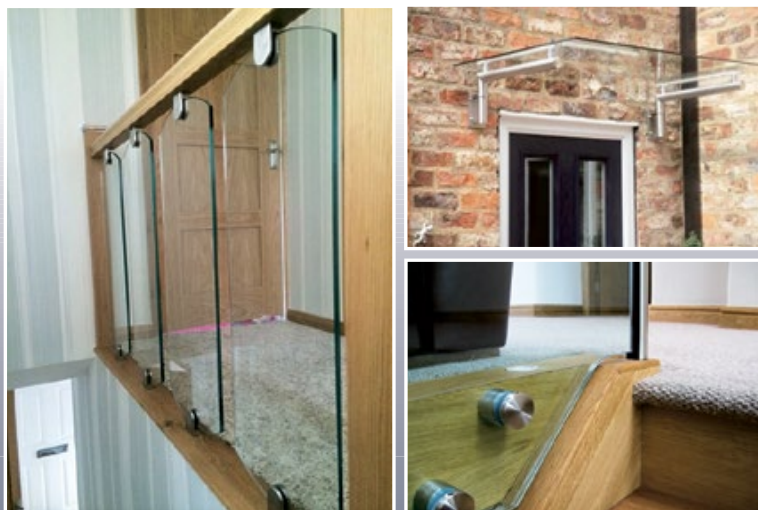
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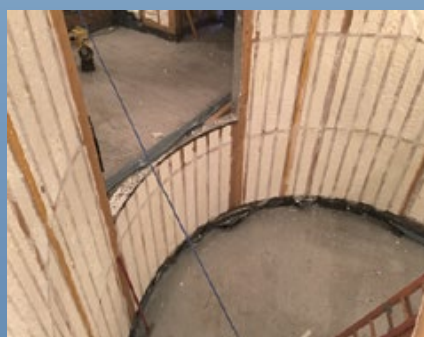
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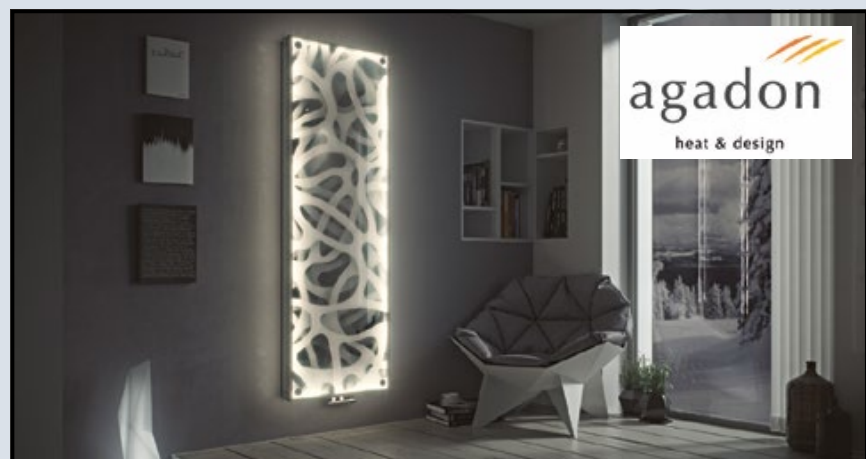
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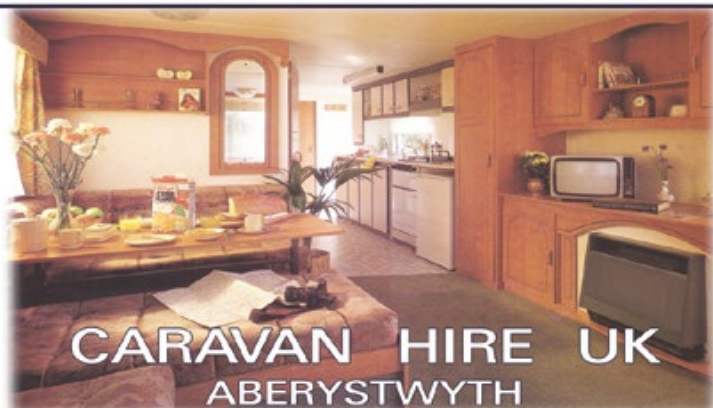


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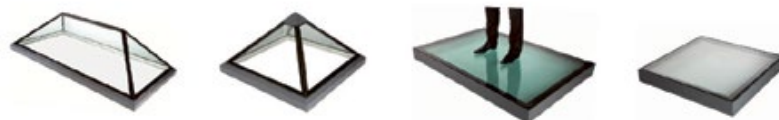
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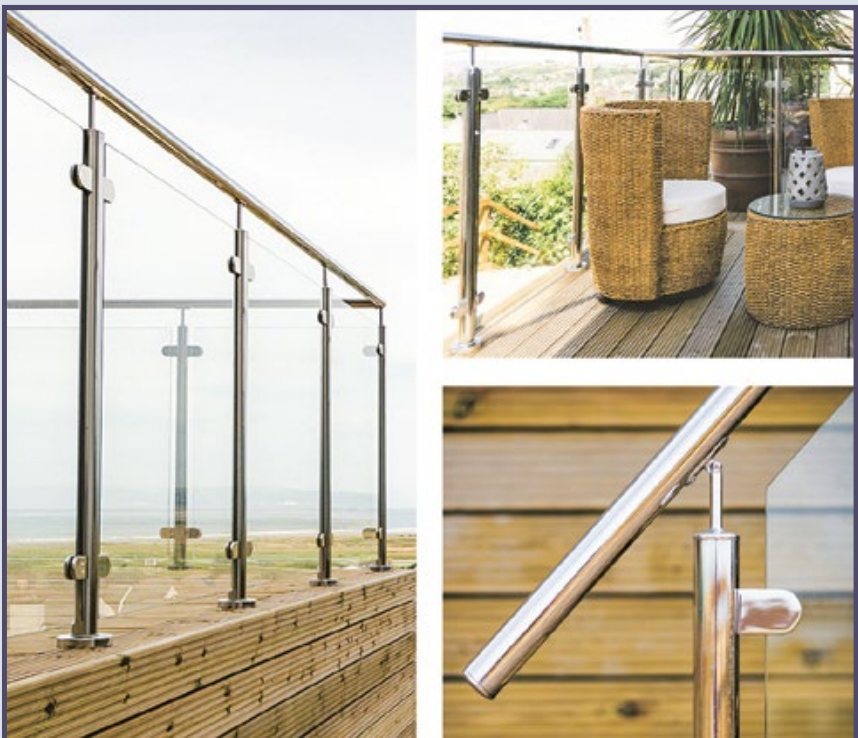
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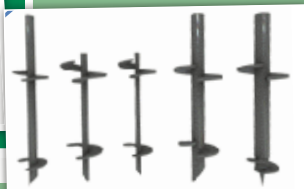
1 DESIGN

We create a design to your specification and, once planning permission is approved, we create detailed drawings for building regulations and produce a 3D drawing. Finally, the whole building package is collated and presented to Building Control.



2 FOUNDATIONS AND UNDERFRAME MANUFACTURE

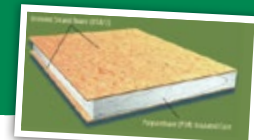
The foundation is done by using screw piles to ensure the building stands off the ground. This system minimizes the embodied energy of any foundation whilst lasting as long as conventional foundations. A metal underframe is manufactured and is fastened to the screw piles.



3 SIPs

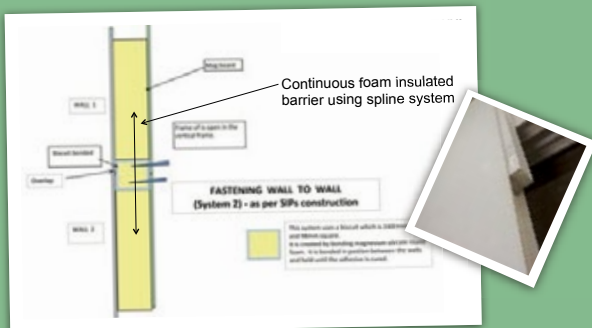
SIPs (Structural Insulated Panels) are used for the loadbearing walls, floors and roof panels. They fit to the steel frame and avoid thermal bridging*. Walls and floors are joined together to avoid air leaks using special sealants and tapes. This enhances thermal efficiency and ensures air tightness - making them stronger than brick and even bullet proof!

* If thermal bridging does not occur, you do not need to worry about cold or damp spots. Heat and energy is saved at this point.



4 SIP JOINTS

All wall joints are protected from thermal bridging by using a continuous foam insulated barrier/spline system.



5 WINDOWS AND DOORS

We recommend triple glazed windows to give the best insulation properties and maximum solar gain. We install a flexible weatherseal air tight gasket. Thermal bridging is eliminated by using Aerogel (a gel with low thermal conductivity).

Aerogel prevents thermal bridging through the frame.

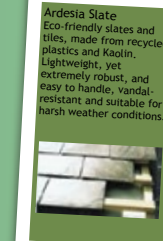


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6 ROOF

The roof surface can be made from a choice of materials. We always try and fit the most sustainable and lightest roof. The internal roof structure does not need trusses and gives you a high ceiling 'look', which is warm and enhances the living space.



7 HEATING

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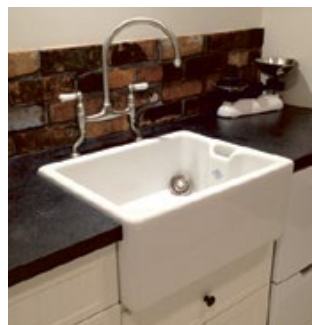


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Photography: **Simon Maxwell**

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What's more, the project, which involved the replacement of Jean and Ian's original home, ended up on time and on budget. **H**



PROJECT NOTES

Location:

Cambridgeshire

Build time:

Jan 2013
– Apr 2014

Build cost:

£800,000

Size: 520m²

Architect: Snell

David Architects
(snell-david.co.uk)

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