

SELF BUILD + RENOVATION + CONVERSION + EXTENSION

Build It

Plan,
design &
build your
dream
home

Get the Best out of Your Architect

Find the Right Designer & Achieve
the Bespoke Home You Deserve!

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Amazing Ideas for
Multi-Functional
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Outbuildings



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& Render Systems

Updating Old Floors

Winning Planning
in the Countryside

Create Your

ECO HOME

How to Build Sustainable, Low-Carbon
& Low-Energy Living into Your Project

INSPIRING REAL PROJECTS

An Oak Frame
Forever Home

Glass Link
Extension

Renovating in
the Cotswolds

Stunning Barn
Conversion



ARCHITECT'S VIEW

Founder of RDA Architects, **Richard Dudzicki**, explains why you should consider Passivhaus for your low-energy home

Is Passivhaus design really worth it?

Passivhaus is a system developed by the Passive House Institute in Darmstadt, Germany by physicist Professor Wolfgang Feist. The general idea is that you can use physics to model a building to use less energy and be comfortable to live in. The average property in the British housing stock probably uses around 160 kilowatt-hours (kWh) of energy per m² per annum – a Passivhaus tries to reduce that tenfold down to 15kWh/m². By inputting various bits of data into different spreadsheets and formulas and so forth, we can calculate how much energy a building will use – before any construction begins.

You can apply the principles of this mathematical model to any building and determine how efficient it will be and whether it's economical or not to create a certified Passivhaus.

Key design elements

You should always look to design a new building using Passivhaus principles that consider orientation, shading, the path of the sun etc, as this contributes to a much healthier and more comfortable place to live in. For example, having your glazed elevations facing south or south-west is great for light and warmth, but you need to take into account whether something might cast a shadow on your building and render any large windows or doors useless.

Passivhaus works on an airtightness target of 0.6 air changes per hour, so you need to have a strategy to deal with any moisture that may build up – otherwise you could end up with condensation issues, damp and mould. Mechanical ventilation and heat recovery (MVHR) is one way to deal with this, and also helps ensure you're getting fresh air regularly – so it covers extraction and ventilation. There's a big myth surrounding Passivhaus saying that you can't open the windows – you can! Just close the door to the corridor so you're not making the whole house cold.

Going for a simple building form can be helpful, as it should need fewer junctions and less insulation, so you can reach the desired U-value with thinner walls. Thermal bridging details will be considered in design, but still need to be monitored on site. Look out for any breaks in the envelope – it's key that you don't puncture a hole in your airtightness bubble. Think of it like a tea cosy, where any tears in the fabric will render it much less efficient.

Developing a self build Passivhaus

It's important to decide early on whether you want your new home to gain the full certification. I'd always recommend appointing a designer with experience, who is Passivhaus-certified, as you want someone who knows what they're doing.

Your design will take those interlinked factors (orientation, airtightness, ventilation etc) and examine how they will impact



RDA Architects designed this London mews house – a certified urban Passivhaus. It fits in with the local vernacular, using modern methods and principles to deliver 90% less energy consumption than a typical build

the mathematical modelling. The data is inputted into the PHPP (Passivhaus Planning Package), which balances all the elements and then effectively says whether the build would meet the threshold for Passivhaus certification.

It's critical that you do this process prior to gaining planning permission, as it can become very expensive to change each element's performance retroactively. I would also recommend you bring your certifier on board beforehand as they can offer advice.

The benefits of certification

A low energy home that's not certified cannot be a Passivhaus. Going through the accreditation process shows that you've done your due diligence in creating a house that minimises energy consumption. While there are other ways of getting good energy use out of buildings, they're not as rigorous, nor independently assessed. With so many elements to balance, if you avoid certification, the question is: what are you missing?

I think the cost can sometimes put self builders off, but when we're discussing a project costing hundreds of thousands of pounds, an extra £2,000 to bring an independent certifier in to keep an eye on your project is well worth it, in my view. Full Passivhaus certification can also boost the value of your property, should you decide to sell it on. So, the extra money you spend getting the details right and making it official pays itself back.

Not only that, but a Passivhaus is incredibly comfortable to live in – the internal temperature should stay around 20°C. I live in a Victorian house that I turned into a certified Passivhaus. When the heating broke, the only indication was weeks later, when it felt a little chillier than usual – dropping down to about 19°C.

However, not every building can be a certified Passivhaus. In urban areas, there are a lot more restrictions in terms of planning consent and design, as well as access and therefore the build system you can use. You're also working with limited space, which can make it hard to insulate etc. So, it's worth engaging a certified designer who can run your plans through the PHPP framework early on and determine what's possible for your site and budget.

Richard Dudzicki is founder and director of RDA Architects and a Passivhaus certified specialist. Long before gaining Passivhaus accreditation in 2010, the team was already innovating in the eco-friendly space with sustainable home design. **For more information, call 020 8299 2222 or visit www.rdauk.com**