

FACT FILE

NAME Susanna Geoghegan
OCCUPATION Book publisher
LOCATION Hampshire
TYPE OF PROJECT Self build
STYLE Traditional chalet bungalow
CONSTRUCTION METHOD
 Timber frame
PROJECT ROUTE
 Architect designed, homeowner
 project manager & hired main
 contractor, plus individual trades
PROPERTY COST £445,000
BOUGHT 2015
HOUSE SIZE 201m²
PROJECT COST £453,000
PROJECT COST PER M²
 £2,254
TOTAL COST £898,000
BUILDING WORK COMMENCED
 April 2017
BUILDING WORK TOOK
 Nine months
CURRENT VALUE £900,000



A fortuitous conversation with a sustainability expert encouraged **Susanna Geoghegan** to go back to the drawing board on her build. The result is a Passivhaus with a pleasing traditional look WORDS JANE CRITTENDEN PHOTOS ALISTAIR NICHOLLS



The high-performance Internorm triple-glazed windows are inward opening, tilt-and-turn units with insulated low-maintenance aluminium frames



LUCKY MOVE

Susanna Geoghegan spent 20 years determinedly making her way through a variety of renovation projects until she could afford to create her own home from scratch. So, when the moment finally arrived and she had planning permission for a self build in her hand, Susanna surprised herself by totally re-evaluating her style aspirations for the new abode.

"A sustainable design consultant, David Strong, purchased the bungalow next door to me and had plans to build an energy efficient property there, with excellent eco credentials," says Susanna. "We spoke at length and what he said made great sense. I soon decided that this was the kind of project I wanted to do, too."

Sustainable aspirations

Susanna put the brakes on her scheme. The concept of living in an ultra energy efficient home was a good fit with her long-term retirement plan, plus her objective to build a future-proof forever property, designed for any medical or ageing eventuality. "I'm an only child and don't have children of my own, so I needed a house that would be able to accommodate live-in carers, should I require them," she says. "I also wanted it to be wheelchair-friendly. And the idea of having low, or virtually no, energy bills really appealed to me."

At the start of her self build journey, Susanna had been very methodical in her search for a plot. She looked throughout the whole of southern England for a town with pretty, rural outskirts and accessible amenities so that she wouldn't have to rely on using a car. Eventually she settled on two potential locations: Wendover, close to where she lived, and another village near Winchester. "I

spent a year looking in both places," she says. "I wanted a site with beautiful views to the front and back, plus a modest garden that I could manage as I got older." Eventually Susanna came across an extended 1960s bungalow in Wendover. "It had zero charm but its location on the edge of town sold it to me."

Design goals

Initially, Susanna decided to rent the house out, thinking of the property as a 60th birthday present to herself. During this period she got started with the design process, working alongside an architectural consultant she'd employed before.

The dwelling sat on a tight site between two other bungalows, with an outlook over fields. The garden sloped steeply down to a tree-lined stream. Susanna was keen to knock the existing property down and build a new abode in its place, but was unsure whether she'd get planning permission for a two-storey structure. "At that stage, my focus was to maximise the square footage of the small site by constructing a basement," she explains. "I wanted a big, wheelchair-accessible ground floor and four ensuite bedrooms that would work should I ever need live-in carers," she says.

Susanna's first set of plans was approved in September 2015, for a single-storey Arts and Crafts-style property with a basement. It was around this time that she met David Strong, who explained the eco philosophy of his house design. He suggested that they collaborate on their projects for better economies of scale. "Meeting David was such a useful encounter as he completely changed my way of thinking," says Susanna. "I came to understand that Passivhaus



The L-shaped kitchen-diner gives Susanna the space she might need to turn her house into a wheelchair user's dream.



The durable stainless-steel kitchen is from Ikea, with a matching worktop from JD Metal Fabrications. Susanna chose this material for longevity.

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was the highest standard for low energy design. As a result, I soon decided that was what I wanted to aim for."

In the end, David had a change of plan and sold his property, so Susanna continued the journey alone and set about finding a new designer to take the scheme forward. She came across Passivhaus specialists, Eco Design Consultants, and met with the director, Alan Budden, who was appointed to handle the plans for her new home.

Susanna requested the firm convert her planning-approved proposal into a Passivhaus, without losing the traditional aesthetic. The designers used the Passive House Planning Package (PHPP) software to modify the specifications to meet the high performance standards. One goal was to improve the form factor (the ratio of external surface to usable floor space), which saw the porch and garage relocated to make the shape of the structure more compact.

However, soil tests to check the design of foundations for a raised terrace on the sloping site revealed solid chalk just 460mm below surface. It soon became evident that a basement would be extremely expensive – and virtually impossible – to excavate. "I felt a bit naive and it made me question everything I was doing," says Susanna. "In the end, the house was too important for me to get wrong and I decided to start afresh with a completely new design."

Susanna went back to Alan with an open brief, but pressing home her desire for a traditional look. He suggested raising the roof of the approved design by 350mm to create living space on an upper storey, compensating for the loss of the basement.

Some echoes of the original Arts and Crafts property were retained, including the aesthetic of the hipped roof, wide soffits and styling around the entrance. "I really liked the way Alan increased the size of the entrance hall and put in two rooflights," says Susanna.



"It gives the house presence. Now, all the visitors who come here comment on what a lovely hallway the property has."

Forging ahead

A new planning application was submitted in October 2016, and approval came through in January 2017, with changes that required further design work to correct the heat loss. The planners wanted the roof ridge lowered by 300mm (Susanna has managed to retain loft rooms) and the front gable reduced and moved over by 225mm to make it appear subservient to the overall form of the house.

By now, Susanna had spoken to numerous contractors regarding the groundworks, foundations, timber frame and construction

"Going through the different designs was part of my journey"

work. With years of renovation experience behind her, she felt confident enough to run the scheme and soon had the necessary trades lined up. "Some self-builders hire a project manager for the security, but I felt the reverse," says Susanna. "I believed that it was another chain of communication that could complicate things, as ultimately all the questions would come back to me. I knew enough and wasn't embarrassed to say when I didn't know the answer or to ask a contractor to explain something better or differently."

During the construction phase, Susanna stayed put in her previous property, running her book publishing business from home. The old bungalow was demolished in April 2017 by Putman & Sons, who also flattened and levelled the site. A thermal foundation slab system was constructed by Advanced



The living room projects out into the garden and the double-height ceiling makes for a pleasing design feature.

WE LEARNED...

PROJECT MANAGING myself resulted in a better outcome. I was available 24/7 so I could get back to trades quickly and directly.

DESIGNING YOUR HOUSE from scratch is not something to be afraid of. But building a home is a big emotional and financial commitment, so the plans and layout need to be absolutely right.

SET A REALISTIC BUDGET for the electrics. Often the initial plans are provisional, and it's not until you're physically in the house that you see where extra light switches and sockets would be useful.

BUY LOCAL. Online suppliers couldn't match the prices, knowledge and service I got from nearby independent retailers.

Foundation Technology and the timber frame was then erected by Touchwood Homes. The build progressed quickly and smoothly and in autumn, Touchwood handed over the project to main contractor, Paul Meichtry of Self Build Solutions, who had been recommended by David Strong. "David had been a consultant on another eco project and was very impressed with Paul's work," says Susanna. "Paul was great – very precise, completely transparent on costs and he resolved issues before they became bigger problems."

Overcoming challenges

Paul's team worked swiftly to get the house weathertight, and by the end of October work had begun inside. To create an airtight finish, all the gaps in the building were sealed with Segal tapes and membranes. A mechanical ventilation and heat recovery (MVHR) system extracts heat from stale air before expelling it from the

The ground floor bedroom has easy access into the garden and is ideal for Susanna from a future-proofing perspective



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house and delivering a fresh supply. Susanna bought the electric panels, kitchen and bathrooms directly, and Paul and Design Consultants were involved throughout the whole process. "I paid them a monthly management fee so they could answer Paul's questions, come up with more information or design detail," she says. "It was the only way to be sure the house was constructed exactly to Passivhaus specifications."

The property underwent two air pressure tests during the build to check for leaks – the target was to achieve a rate of 0.6 air changes per hour or less. The first was a preliminary procedure to see how the whole process was faring once the doors and windows had gone in. It transpired that a hole where the porch timber entered the house had not been taped. After this was corrected, the result came back below 0.6.

However, the results of final assessment, carried out soon after the house was finished, weren't so favourable. "Thermal imaging equipment highlighted where air was coming in and going out," says Susanna. "The leaks were tiny, about the thickness of a coin, mainly around the doors, windows and locks. Dust was removed from the window seals and the gaps filled to ensure a tight fit and we were able to achieve our target."

Susanna had calculated an initial budget of £375,000, which she suspects was around 15%-20% more than if she'd built a conventional house. In the end, the total cost crept up to £453,000. However, nothing came in unexpectedly over the mark, as Paul was very clear about when a change in specification would result in a greater outlay. "I decided to go for the most durable finishes rather than having to buy again in 10 years' time," she explains. "The electricians caught me out, though. I only had basic provisions

The master bedroom suite on the first floor is large enough to accommodate a sitting area and bathroom, and could be used for carer's accommodation in the future



Each of the upstairs bedrooms has its own ensuite shower, with sanitaryware supplied by Grant & Stone

on the drawings, but by the time I'd given Paul a more accurate brief for this, the bill tripled to around £12,000."

Susanna is pleased with how her home has turned out, designed exactly for what she needs now and for any eventuality in the future. She's looking forward to experiencing the benefits of the Passivhaus construction once she's lived through her first winter here.

"I've enjoyed the whole self build experience. In lots of ways there was far less stress than some of the other projects I've worked on, because there are fewer unknowns in a new build," she says. "Going through the different designs was part of my journey and there's nothing I would change, which is a sign of satisfaction. This is my forever home and no other property could be better suited to me."

Useful contacts

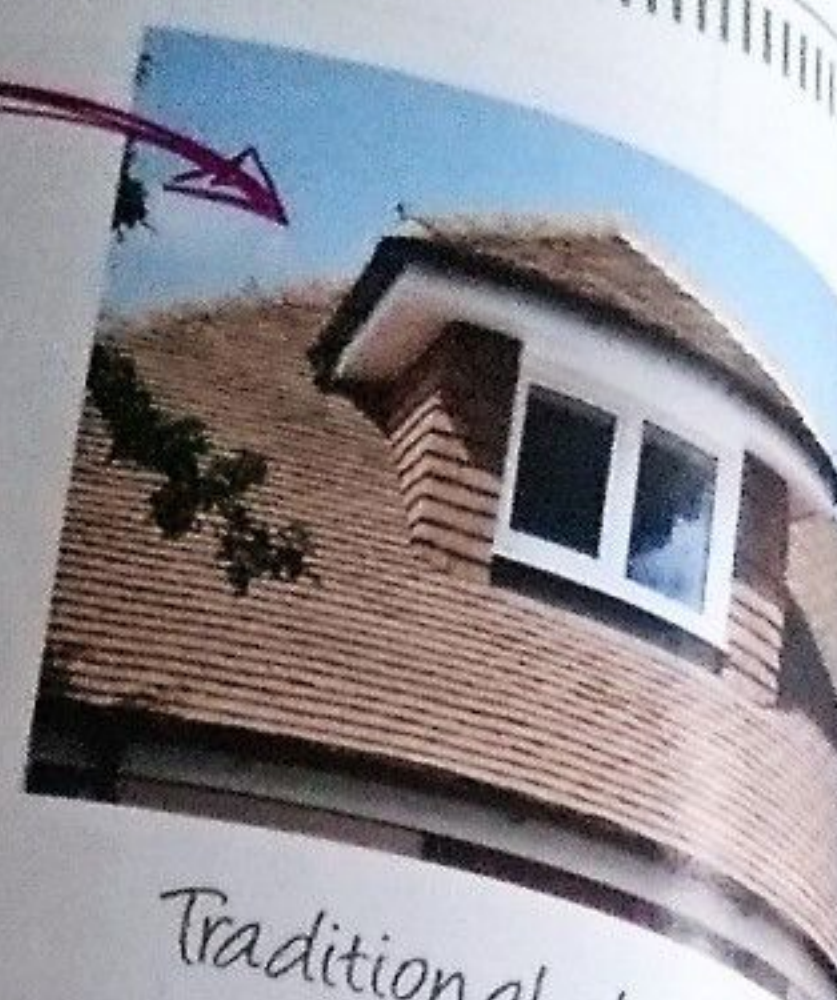
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closer look

Balancing design & performance...

The house design came with conflicting challenges. The first was to maximise space but keep the ridge height low. The second was to retain the traditional aesthetic and still meet Passivhaus standards. The Arts & Crafts look features a complex roof structure, and the exposed cheeks on Susanna's dormers had to be as slim as possible, with high amounts of insulation.

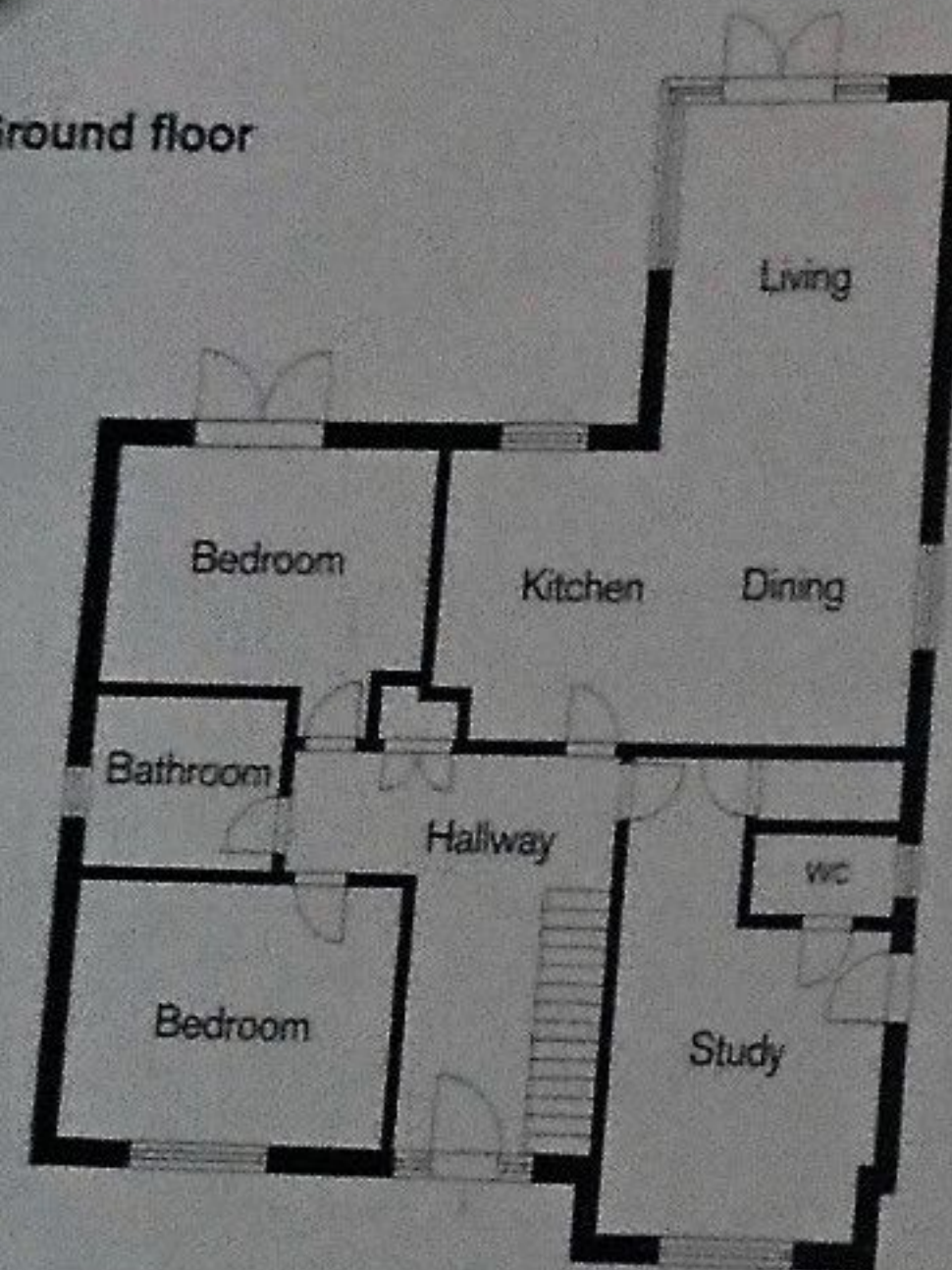
Siga airtightness membranes were therefore used inside the dormer windows where they connected to the timber frame roof. To compensate, the roof profile required 100mm more Warmcell (recycled newspaper) insulation than a contemporary, compact Passivhaus. "When Susanna asked us to design her house from scratch we were able to deliver a far better outcome," says architect Alan. "With a blank canvas, we worked to improve the form factor and reduce the surface area of the external walls. This greatly reduces heat loss from the building."



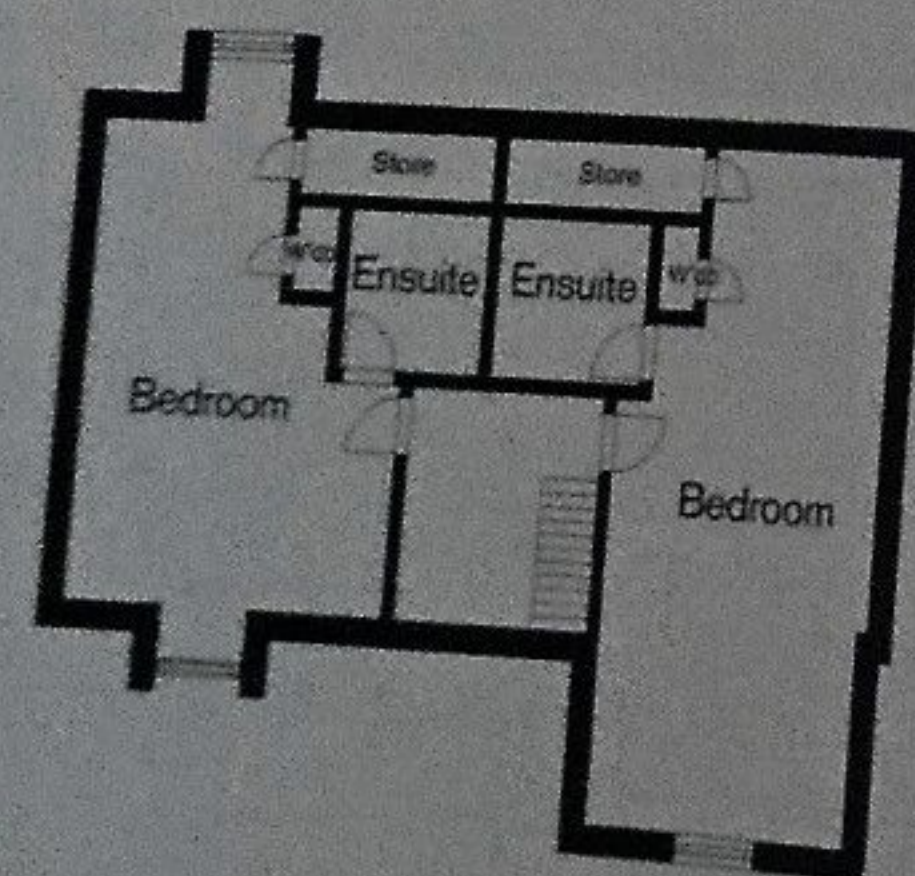
Traditional details

Floor plans

Ground floor



First floor



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House plans re-created using
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£ TOTAL BUILD COST BREAKDOWN

Elements	Cost m ²	Cost %	Total cost
Professional fees	£189	8%	£38,000
Site preparation (incl. demolition & services)	£109	5%	£22,000
Foundations (incl. underfloor heating)	£224	10%	£45,000
Timber frame (incl. MVHR system)	£498	22%	£100,000
External finish & retaining wall	£139	6%	£28,000
Windows & doors	£109	5%	£22,000
Roof structure, tiles & guttering	£159	7%	£32,000
PV panels	£30	1%	£6,000
Internal walls (incl. insulation)	£124	6%	£25,000
Plumbing	£100	4%	£20,000
Joinery & fittings	£139	6%	£28,000
Floor & wall finishes	£80	4%	£16,000
Kitchen	£40	2%	£8,000
Bathrooms	£65	3%	£13,000
Electrics/lighting & sound system	£124	5%	£25,000
Decorating (internal & external)	£35	2%	£7,000
External work	£90	4%	£18,000
Grand total			£453,000

Note: The costs shown here reflect the original prices for materials, labour and services at the time this project was undertaken. As a general guide, inflation in the construction market runs at about 3%-4% per annum.

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