

CASE STUDY

# TACKLING ALL OBSTACLES

Two former rugby team-mates decided to pool their talents as project manager and architect to build a pair of semi-detached, thermally-efficient homes in Surrey. However a series of challenges tested their resolve, as *Selfbuilder + Homemaker* reports

TEXT TOM BODDY IMAGES ARC8 PROJECTS



Down a quiet semi-rural road in Surrey, sits a pair of new semi-detached houses constructed in insulated concrete formwork (ICF) and designed to near-Passivhaus standards. Although not technically a 'self-build' per se, being initially developed to sell, a two-man team of architect Rik Hall and project manager Matt Johnson were faced with a host of unexpected challenges that any self-builder could come across. The learnings Richard and Matt took away are useful for anyone tackling similar builds.

Ever since they were rugby team-mates, and subsequently worked together on projects in east London, the pair have discussed teaming up and taking on a new build together.

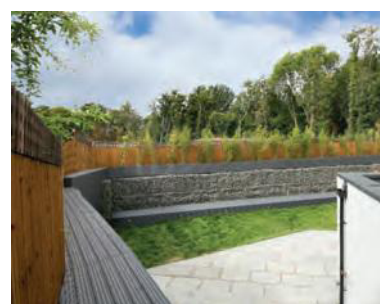
However, it wasn't until Matt presented a very promising site to Rik that things really got going on their build. Matt passed it every day on his way to work, and was intrigued by its sloping typography and unusual combination of seclusion and convenience. It contrasts strongly with the nearby London suburb of New Malden. "It feels like you're in the middle of the countryside but you're actually two minutes from the A3 and into town," says Rik.

The building then sitting on the site was a dilapidated Victorian cottage. Rik describes it as having "no real architectural merit," and being a "house a child would draw." Before purchasing the site, they knew it was going to be a case of knocking down and building new.



AFTER

BEFORE



## CONTAMINATED LAND

It wasn't long after purchasing the site that Rik and Matt discovered a major issue with the land. Just down the road there had been an old gunpowder factory. Built during the 1600s and still in production during the first world war, the factory's pollution had infiltrated into the soil and caused significant contamination over the years. Finding this out early on was "stressful," says Rik, "but instead of panicking, you've got to sit down and work out how to resolve it."

They submitted this to the local contaminated land officer, "who was nice, but overly pessimistic about the contamination." He gave them two choices – either install a membrane throughout the site, or the more drastic measure of stripping back the ground down to the virgin clay. While this option meant pushing back their schedule as well as adding costs, they decided it was something they had to do. "If this was going to be me living there with my family I wouldn't want there to be any possibility of soil contamination, it's enough to put anyone off," says Rik. So they proceeded to remove all the contaminated soil, replacing it with clean subsoil.

## PLANNING

Rik and Matt's goal was to create two "generously-sized," desirable family homes, ones which Rik says, "I would be very happy to live in myself." He adds: "I wanted to avoid it being just a 12-metre box for five people. A

home should be a bonus in life, not just a place to live in."

Rik used his architectural expertise, with help from Matt, to draw up their first submitted plan. This was supported by both the planning officer and the head of planning. However, as a tree protection order (TPO) was in force on the neighbouring site, the design had to be checked by a tree preservation officer which again slowed the project down.

Although Rik believed he had addressed the TPO in the initial plan, the officer wasn't happy with it as it stood, and at one point was going to refuse completely based on the root protection area required. Despite the pair's efforts to prove their design would not contravene the restrictions, the officer insisted the plans were redrawn.

They worked alongside the officer on the redesign however, and eventually both parties were satisfied. As a result, one of the homes is smaller than the other as a 'setback' was required in the rear extension. "We had to take this on the chin and move forward," says Rik.

He advises anyone embarking on a new build to "get in touch with planners as early on as possible" to tackle such problems collaboratively. He adds: "It's about having dialogue with them, working with them as much as possible. You've got to take a pragmatic view, and submit something that any rational person can look at and go 'yes I can see that if we can

## LOW POINT

"There wasn't a low point as such, the fire was concerning, as you just think 'I hope no one's hurt,' but there was no real material loss."



## HIGH POINT

"When I showed my wife around at the end – she hadn't seen it in a long time and she just loved it. That was kind of like self-affirmation. For someone to come in with a fresh eye and say it's good – you just get a warm fuzzy feeling like 'I've done something really cool here.'"

make a few changes here, I'll be happy with it."

### FIRE

With plans finally approved and demolition about to start, yet another challenge confronted the pair.

Rik received an agitated midnight phone call from the neighbours, who yelled "your house is on fire!" The Victorian cottage was somehow ablaze and the flames had spread to the neighbours' site and damaged their shed. Thankfully, no-one was hurt.

At this point, Rik couldn't help but feel that the project may be jinxed. Fortunately however, as the structure was being knocked down anyway, the damage they would need to cover was minimal. "We got a small claim, but nothing like the value of the house, and rightly so," explains Rik.

How the fire started remains a mystery. At first it was thought to be arson, with various cases of arson having occurred nearby. A second theory was "a freak accident," says Rik. There's a small potting shed next to the cottage, and the Fire Service suggested that with it being a particularly hot summer compost could have self-ignited. Richard is sceptical about this idea however.

Another positive outcome was that the team managed to salvage all the bricks from the cottage and sell them to a local merchant. "Where we could, we reused and recycled any materials that were on site," explains Rik.

*"It feels like you're in the middle of the countryside but you're actually two minutes from the A3"*

### CONSTRUCTION

After overcoming all the challenges, the build finally got underway in April 2018.

The project's construction is unusual, with its envelope being built using ICF. Classed as a 'modern method of construction,' hollow expanded polystyrene (EPS) blocks are stacked on site, and reinforced with steel beams that lock them into position. Concrete is then poured into the structure, creating walls that provide high thermal performance.

Thermohouse UK was selected as ICF supplier and installer, as Rik says that he "just couldn't fault the product." Due to the "one-stop shop" nature of the method, it wasn't long after they arrived on site that the shell was complete, taking only eight weeks. "All we had to do was pop in the windows and get the roof up."



## RIK'S ADVICE

"Get in a good architect and take time on the design, think every little detail through."

"Once you're planning, make sure you choose a good Building Control officer, (local authority or private), get them on site early, check through all the drawings, make sure you're ticking off all the boxes as you go along."

"There will always be issues and 'surprises' on any project - you just have to find pragmatic solutions. You can't sit there crying over your problems, you've got to get on with it, and turn a new page."



Rik explains why ICF works for self-builds: "You can get the structure up, and then tender out the various pieces of work. For a self-builder it's a lot more manageable."

### GETTING NEAR PASSIVHAUS

The plan in creating a very thermally efficient and airtight build, assisted by the ICF, was "never to aim for Passivhaus standards," says Rik, "but to get as near as possible." Although the goal was to create a pair of sustainable homes, true passive design was not within their budget, and an MVHR ventilation system, which would have been required to meet Passivhaus air-tightness standards, wasn't feasible. Rik comments: "In an ideal world, we would have met all standards, but sadly in this case it was a bridge too far on the cost side."

Instead, the design uses trickle vents within a whole-house ventilation system whereby in moisture- or heat-heavy rooms such as kitchen and bathrooms, a sensor activates so that the air is removed and replaced as needed.

As well as rooflights, solar PVs have been included on the flat roofs to the rear. The panels are currently making enough electricity to export some back to the grid. "Not a huge amount," admits Rik, "but it helps, and everyone should have panels at the end of the day." He believes that the PVs would have paid for themselves in about six or seven years.

While not scaling the absolute heights of Passivhaus, the building has achieved a commendable Energy Performance Certificate (EPC) rating of 88 per cent – three points off





## CONTACTS/ SUPPLIERS

**GROUNDWORKS**  
Octopus Building Ltd

**SHELL**  
Thermohouse UK Ltd

**ENGINEER**  
Paudie O'Connor  
Thermohouse UK Ltd

**ROOF TILES**  
Tapco Tiles

**WINDOWS AND DOORS**  
Dworks Ltd

**ARCHITECT**  
Arc8 Projects Ltd



scoring an A. To help achieve the air-tightness standards they wanted to get to this high rating, they hired a specialist consultant. Rik comments: "Using ICF gives excellent results, but the crux of the performance relies on the penetrations of the envelope being properly sealed. This is most crucial where drainage and services come into the building."

### DESIGN & LAYOUT

Considering the design's strong focus on energy efficiency, the houses' look doesn't scream 'typical eco-houses.' In fact, their design incorporates some traditional elements, proportions and well considered detailing which all help to create an attractive result.

As Matt and Rik wanted their build to fit within

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the "street scene," they've taken design cues from neighbouring dwellings, in terms of both size and style. The pair of semis have similar ridge heights, and have also replicated the square Edwardian windows of their nearby counterparts. Rik explains the approach: "It is a really well-considered Edwardian aesthetic, without the bricks!" He adds: "If you're going to do something completely out of character, you will be up against it from day one and have to go the extra mile to ensure the final product is aesthetically pleasing and considered."

To create a functional space for a family, the homes' interiors have been divided into two living zones. The upstairs – which Rik describes as a "more formal" area – includes the generously sized bedrooms, a study, and a spare



## *“It has been a huge learning curve”*

room that can either be a children's bedroom or a home office – a useful alternative in the current climate. The interior detailing has also incorporated some traditional aspects, as well as being fairly neutral – with simple greys, white painted spindles, mahogany handrails, and carpet runners up the stairs. “With the interior, we weren't trying to break the mould because everyone has different tastes,” says Rik.

The downstairs, which is essentially the basement due to the gradient, is where the design turns more contemporary. It's a large open-plan space with the kitchen at the front,

dining in the middle, and a living area at the rear with bi-folding doors leading out into the garden. Rik explains that “the family could all be downstairs watching TV, having dinner, playing in the garden, but upstairs is a bit more formal.”

With the downstairs being at ‘basement’ level, the design needed to allow as much natural light into the homes as possible. This was achieved by including basement-level lightwells at the front of the homes facing east. This allows the morning sun to pass through into the kitchen, lighting up the downstairs. As the sun passes over, the large rooflights in the houses' kitchens and the bi-folding doors at the west-facing rear, capture the midday and evening sun, creating a downstairs area filled with natural light throughout the day.

The way the houses are built into the slope has been noticed by the local council, who have asked if they could use the site as an example of good design on a sloping topography. This is just one validation of the project's success for the pair.

Although the project faced a litany of problems, Matt and Rik have taken many positives from it. “It has been a huge learning curve,” says Rik. “On a project that had so many issues the way we've dealt with the problems and come out on top, I think for me it's a big success.”

The twist in the tale is that while the homes are currently on the market, Rik explains that his family may end up moving into one of them as their house is currently for sale, “so it may well end up being a self-build after all!” ■