

Episode 157

A contemporary eco home case study

The show notes: www.houseplanninghelp.com/157

Intro: James Galpin from HazleMcCormackYoung architects is my guest today. We've got a case study of Mayfield Passivhaus, a timber clad contemporary home in a beautiful part of Sussex.

First though, I asked James to tell me a little bit about his background.

James: I'm an architect. I've been an architect since 1999. My practice, HazleMcCormackYoung, is based in Canterbury and Tunbridge Wells.

We primarily work on school design but with a good tranche of new build houses as a secondary element. And office fit-outs but they're few and far between since 2000 or so.

We specialise in low energy design which is part of our ethos in design and we bring that to every project we can, which is where Passivhaus has become a strong link for us. We work mainly on Passivhaus houses but we're now trying to introduce that same technology into school design. It's a lot harder to get that through the process but that's our current goal.

Ben: We're going to be looking at Mayfield Passivhaus today. Maybe you could tell us about the plot and the brief as that came about and how you responded to it?

James: We were appointed a long time ago now for this project. It was 2009 and the client undertook a limited competition locally. I think there were six architects interviewed.

We came away with that project and the brief really revolved around the site. It's a six or seven acre site in Mayfield, a landscape garden originally designed by Percy Crane and it's a beautiful site. Very formally structured limestone terraces, long vistas of lavender and a rolling hill down to the Weald of Mayfield and Ticehurst and

Wadhurst and all of those areas that you're just looking out on to open countryside.

So, the client wanted something that would replace the original building, an old bungalow with a converted roof. He wanted something that would be relatively timeless in its design, modern in its layout but primarily connected with the garden. So, every space inside, you're feeling a connection with the historic structure of the Crane landscape garden.

Ben: How did you start to develop this and respond to the brief?

James: The hardest part, I suppose, was imagining how the site would be without the bungalow in its place.

The Council were quite keen, even from an early pre-app stage, to keep the footprint of the new building on the location of the previous one, which I disagreed with. I think it was in the wrong place. It was an easy argument to make really because the structure was so formal in its layout and the original building was so clearly in the wrong place that we stepped aside from that restraint from the Council.

It became about understanding the structure of the garden, understanding the vistas and the formal lines of the layout and then superimposing the client's brief onto the garden.

So, there were long axes from the entrance of the site through to a beautiful cedar tree at the far end of the gardens which formed the backbone of the whole thing. Then the Percy Crane terraces formed external rooms and it was then a case of making a collage of rooms for the inside of the house as well as the rooms for the outside, the Crane landscape garden.

Ben: The process of honing the designs, did you go backwards and forwards quite a bit or was the client happy fairly soon after you'd shared those first images and ideas?

James: The footprint was quite quick to establish. The house is essentially a three-dimensional Venn diagram because there are two accommodation wings, both with symmetrical pitched roofs. Where the wings overlap is the entrance to the house.

So, the shared area of the Venn diagram is a large glass roof light over the top of the staircase which is in the main entrance hall. So, that staircase and the roof light and the glazing on the axis between the entrance and the cedar tree sets up a very strong structure

which the client loved. So, that was fixed and established quite quickly.

The parts that took longer was actually the client working out how they wanted to live. It's a south facing house so the majority of the accommodation is facing the main body of the landscape, down the terraces. But the normal reaction would be to put the main living spaces on that area and by that, I mean the living room. The client wanted that to begin with but then realised that actually, the way the family lives is that they spend all their time in the kitchen and the dining room and that's what's become the modern living space. And he's a passionate chef. He likes to have the family around him while he's cooking.

So, all of those functions then moved to the south of the building and the living room has less connection with the terraces. But because of the way the building is stepped along the line of the axis, it shares smaller areas of terrace but also pokes out to become south facing.

The way they imagined themselves to live played a strong part in the final layout of the rooms.

Ben: A man after my own heart. Definitely the kitchen will be the way to go for us in our project.

Thinking about constraints, have we mentioned all of the constraints or is this actually quite an open plot where anything could've happened?

James: It's quite open in topography terms. It's a sloping site but it sits on a table of flat landscape and that was absolutely the best place for the house because of the entrance route and that access.

One of the constraints, I think, was the planning department and their first reaction about what they would expect to have on the site. That was quite a traditional Wealden type house.

It took me a little while to find the right officer to work with at the planning department because there are forward thinking planners, thankfully, in the area. Once we'd got a good working relationship with that planner, we were on to a more progressive route which everyone would be happy with.

Ben: It's a funny one, isn't it? Planning is still, I would say, largely a mystery to me. And I understand this because we're talking about an area where I grew up and I love this area but I think since I've started doing this podcast, I've also realised that if we just always

kept on building the same things – it's weird. Why would we do that?

James: Absolutely. And the planners are coming around to that way of thinking, slowly, but they are doing that.

I've got planning recently on a site just a few miles away from the Mayfield Passivhaus, for a pair of houses where people have been trying for about fifteen years to get planning on it. Design after design has been Wealden. It's within a walled garden site so some designs were showing a Wealden design, others were showing very low buildings that would sit below the level of the garden wall, hiding themselves from the public.

The two houses that I've designed there are proudly tall, brutally modern and uncompromising in every aspect. And the planners loved it because they're getting bored of plain tiles and the more traditional layouts.

Ben: I often think when you actually visit these buildings, it's very different to what you might think looking at a picture or a plan.

James: Of the more modern ones? Yes.

I think in the modern school of design, everything is about the building working. It is that machine for living in. Which is what makes Passivhaus so fantastic because it is a technology that's applied to a building that gives it everything it needs to perform well as a shelter.

I think the designs, if they're done well, they're thinking about the connection with the garden, they're thinking about light, thinking about the ergonomics of the space. When it's done right, it feels comfortable because it's the right size, it's using topography correctly, it's getting good views.

There's a safety in traditional design and some traditional design is fantastic, obviously. It would never have stuck if it wasn't. But there are many clients where you ask them if they want modern or traditional, they'll say traditional and then during the course of the design, every choice you offer them, they're choosing the modern choice without realising that it's modern.

So, it's making something natural, making something feel right, that sets itself aside from any particular styling, I think.

Ben: Do buildings develop from the inside out almost?

James: Well, they should do. You spend eighteen hours a day inside one, if it's a live-work unit or something, and you spend five minutes approaching it. So, the way the shelter works inside is essential.

You see a lot of roof conversions and things done and you look at them and think 'I don't know how someone could have thought to do that. How can that be allowed?' But of course, as a client, they're saying 'what do I want for the space?' And they're designing the space as they need the room to work. Then whatever happens on the roof just happens.

It's a terrible shame but I suspect it's really architects that get worried by that more than anyone else.

Ben: Let's focus on the way that this was built. Was that an easy choice? What system and method are we talking about?

James: We knew we had a big challenge in terms of costs with the project. Whenever I design a building, I always ask the client their budget and then I ask them what they need for each room.

We design proportions room by room as an abstract graphic and then I feed that back into a square meterage and say 'actually, this goes beyond your budget' – sometimes it doesn't but usually it does. I say to them 'what can you compromise on because I don't think we'll build that for the money that you're setting aside for the project.'

This project was no different to that. The requirements were exceeding the budget and there were elements of the design that I wanted to work in the way they do, which aren't necessarily the most space effective.

So, the square meterage was quite high for the building and the budget was restrictive. So, we were challenged with delivering for around about seventeen fifty a square metre, which is quite keen. That doesn't include landscape.

Ben: What does that include exactly in the build cost? I always get confused with this. Or does it change?

James: It includes removing the old building, flattening the site, making changes to the services below the ground to feed the new building and then everything upwards from that. But not beyond it.

So, landscape really was the only element that wasn't included other than professional fees, planning fees, building control and things.

Ben: How much inside, fitted or kitted out?

James: That was everything other than furniture really. There was a built-in bar in the living room, built-in kitchens obviously, the built-in bathrooms. Everything is ready to move in to.

Ben: And that's included in the build cost in this case?

James: Yes.

So, to deliver for that cost, eBay was included, there were visits to 'Dodgy Dave' in Bermondsey, I think, that happened to have a couple of bathroom suites in his garage.

Ben: That sounds very resourceful. I like this.

James: Well, you have to do what you need to do really.

Ben: Who did that? Was that the client or you?

James: That was the contractor. Really, the choice of construction, which was the original question, was really working with the contractor to work out how we could deliver this building for the cost that the client wanted to spend.

The contractor was Richardson and Peat who I'd worked with previously on school projects. They're a specialist timber frame construction company. I went to Martin Peat originally in the project and said 'I've got this project and we want it to be a Passivhaus. I know that's something that you're keen to work on. Can we work together to make sure that where we're spending money is a responsible spend and not wasteful, to get the building for as low as possible?'

So, Martin brought along his construction method of timber frame with the engineer joists. He fed in with elements that would make it as cost effective as possible and he was ultra-keen to make it cost effective because he wanted a certified Passivhaus on his marketing, which he was quite open about from the start. It was something that he wanted to deliver. So, he made sure it worked in many areas and it was a great experience working with him. A good team.

Ben: You've worked on lots of low energy buildings before. Was this just almost a tiny step further because you were operating in this region already? Because this was your first Passivhaus too.

James: It was, yes. It is a step forward, a step up in terms of attention to detail, certainly.

The theories are all very sensible. There's nothing there where you think 'why would I do that? That doesn't make sense.' Everything is making use of the solar azimuth, for example, of bringing warmth in when you want it and keeping it out when you don't. These are all good, common sense elements that we're taught from as young as we can put a baseball cap on. That's why you do it.

But moving forward in terms of the airtightness detailing, the mechanical vent systems, that was all new knowledge and research that had to be done for that project. But it was similar to Richardson and Peat, something that I wanted to do.

When the client talked to me about the way they would use the building, it became clear that they have a London house and they were undecided whether they would be living full-time at the Mayfield house or not and there was a chance that they would only use it for the weekends. So, that seemed a very good opportunity to say to them that 'there is a way that we can deliver you this house that you'll arrive on a Friday night and it will be warm.' That was the beginning of the conversation really about Passivhaus.

If I'm totally honest, I think that I probably brought Passivhaus to the party when the client may not have ever thought to do it. But it was done for two reasons, the main reason that it was right for the site, but also that I wanted to move into Passivhaus design.

The house went from being a bungalow that took most of the weekend to warm up, to a house that has very low heating bills – almost no heating bills – that you arrive on that Friday night and it's warm. The client couldn't be more delighted with that as it's delivered.

Ben: What was the biggest challenge on this whole project?

James: I would say cost was the biggest challenge. We had to be very careful with the spend.

It was an unusual process that was so inclusive of the contractor from an early stage. We got planning for the job and that was based upon my ideas of what would work as a Passivhaus but no early pass PHPP calculations done. It was based upon what I felt would work.

The budget was set from planning stage onwards and so, I'd set myself a challenge of needing to deliver the Passivhaus, needing to

deliver for the cost. At the time of moving forward to construction, that wasn't the cheapest way of building a project but it was the right way and it was the right thing for the client.

So, important to stretch things beyond the norm and just try that bit harder.

Ben: I'm very interested in budgets because I don't fully understand how to get them as crystal clear as they can be. Is there any information you can give us on how you screwed down that budget, how you knew this bit was for that, and this, and this?

James: Really, keeping things within the realm of what was normal for the contractor. They were well-versed in timber frame, they'd built timber frame buildings all over Bedford and the Midlands and it's something that they can put together very quickly and cost effectively. Working with the same contractor, if I was working down the line of brickwork and things then that would be something that would blow the budget.

So, as soon as you know who you're going to work with, then you can start making choices based upon how you're going to deliver that best value.

If you're not working with a contractor, then there are cost indices that you can use to calculate those prices.

But the normal route for me is to design a building that I enjoy, that I think meets the client's brief well and that I think will be beautiful. And so, there are choices that I make that aren't always based on cost. I think that's also correct to do.

You've got to pick your battles really and this one, there was a sweet spot of working with timber, working with this house, working with the contractor and we were able to deliver that concept for the price. Which was good news.

Ben: Timber frame we know about. Maybe you could talk about the other aspects. Were the foundations quite easy? It was a slightly sloping site.

James: It was a raft foundation, the ISOQUICK system. That was really a case of just flattening everything, levelling it, putting the hardcore down and then getting the polystyrene down.

It was the first time I'd used that type of footing. At first it was a bit nerve-wrecking because the wise man built his house upon the stone, not the polystyrene or the sand. But it works really well. It's a

three-hundred millimetre slab that sits on the concrete, effectively sitting then on a shingle bed. And the mass and the solidity of it holds everything down, which works well.

The worry about that one was when we had an oil pipe leak which was a bit alarming because you don't really want oil anywhere near polystyrene. But that turned out to be fine. We contained it.

Ben: Was this oil that was used once upon a time or is there still oil for the property?

James: There still is oil. There's no gas on the site. The original boiler was oil fired and the new boiler, which is much smaller than the original property, is still oil fired.

And testament to the performance of the Passivhaus, the client phoned me after they'd been in the property for the summer and they'd been in – I think it was around late November – they phoned me to say there was something wrong with the heating system. There must be because they'd run out of oil already. But the oil tank hadn't been filled up yet. They hadn't had their first delivery. So, the heating hadn't been on.

Ben: That's a good one! I like that story.

What about finishing off the building then, the cladding that's on there? Any stories arising from that part?

James: That was a bit of a hassle for the contractor, I think.

His pricing hadn't allowed for how rigid I would be with where the batons would need to go. I wanted the fixings of the timber to create a secondary structure, if you like, on the façade, and wanted the fixings to be exposed so that you felt those lines of the fixing. But of course, if you're going to expose the fixings then the batons need to be in a certain place because that's what you're fixing to.

So, there were a few attempts at getting those batons right and a few times I explained about why the batons were where they were. It's all about communication. Once they understood the reasons for it, I think they were fully behind it too.

The detailing is getting the reveals of the windows right. It's key with that kind of fit. So, it's a hit and miss timber cladding. There's a layer of vertical timber fixed to the batons and then a second layer of vertical timber fixed on the outside of those timbers, so you get a kind of crenelated vertical effect of the timber. So, every time you get a break in that, it's important to get the vertical aligning with the

window jambs so that you read the structure properly and you don't get half a piece of cladding that starts at a window position.

So, every window was detailed in elevation with the eighteen millimetre timbers set out so that we knew they'd be in the right places.

There was a lot of juggling to do on that and it had to be quite tightly coordinated. But the result's worth it. So, that's good.

Ben: Any lessons learnt on this one?

James: Yeah. Loads.

The whole Passivhaus lesson was enormous. The design for the PHPP was done by Phil Neve at Aaben.

The communication was great but there were elements of the design that I was thinking would work. Things like that big rooflight in the centre. That was a big challenge because the way I imagined it would work was that the rooflight would be a radiator for the house and there'd be extra extract vents taken from next to the glass of the rooflight that would feed in. So, if the sun was out, even on a really cold winter's day, then the whole house would be warm.

We hadn't coordinated and communicated that between us. So, those extract vents were put in later on. There are ducts and everything allowing for it so, it wasn't a problem. But it was learning hand in hand. I think we were both learning through that process.

So, even after so many years in practice, it was a lesson for me to communicate properly, to explain the ideas, the concepts, even to somebody that is a specialist in the area. Because they don't know why you're doing certain things and they'll engineer ways around it, which is their job. That's how they do it. But if you don't communicate your ideas completely, then you miss a trick as a whole team.

I think we all learnt quite a lot from the project, which was great.

Ben: You've mentioned to me that you're trying to do a few more Passivhaus projects now. So, clearly good for business. But some of them you're concerned might not get there. Why?

James: The houses within the walled garden that I mentioned were a Passivhaus design. But they're a self-build developer. So, they'll be built and then sold on. One of the houses is now going to be lived in by the builder because he's fallen in love with it during the process.

But during the delivery, the questions came of 'why have I got three-hundred and fifty mill studs on the walls? I can do this with a hundred and forty.' Not with Passivhaus you can't. You need a higher level of thermal performance and you need that insulation to sit within a structural zone. So, the timber frame costs would've been a lot more and it was deliverable with a much smaller timber frame.

So, in that instance, the contractor said they didn't want to spend the money and said goodbye to Passivhaus at that point, which was a great shame. There's only so much arguing for the cause that you can do. If it goes beyond what the client's willing to spend then it's very difficult to achieve.

I think for that one, it was clear early on. The first choice of timber frame, there was a cost saving made. We would never have made it all the way through Passivhaus. There's a thousand choices to make and it's important you make the right choice on every one of those choices or you don't get your certification.

We got a job similar to the Mayfield Passivhaus, this one a bit bigger, over in Buxted. With that one, the design for the living room space is a double-height glass living room. The shading and the heat gain in the double-height space may be too difficult to deliver in Passivhaus. We're working on that at the moment. But if it is, the client will keep the glass and he'll end up with a ventilated house that has heat recovery and is very well insulated but won't be certified because it won't quite reach the standard.

There's a holy grail, I think, of the certified Passivhaus and it's absolutely worth following. But the technology that we're working with, having that technology employed is great and buildings get better because of it but you have to be very careful of overheating which is a particular problem in some low energy houses. Not in Passivhauses but in some low energy buildings.

Ben: You led your clients down this road. How have they reacted? How long have they been in?

James: They've been in about eighteen months now and we've just finished all of the end of defects work. So, the final retentions have been released.

They've loved it. I've got them on film saying that it's the first house they've lived in where every space you go into is equally comfortable. Every corner of every room is the same as the others. It's fresh but warm and comfortable.

They love the way the house connects with the garden which I'm pleased about because that was obviously the first part of the brief.

But the way the house is so comfortable, I think, has really taken them aback. Because they took quite a leap of faith. They said they didn't want to be guinea pigs and we had to remind them that this has been done for the last twenty years, just not so much in England.

They're delighted with the house and they love living there and I think they're now moving down there more permanently. It's the house they want to be in. Which is good.

Ben: Finally, we all hope to build a house in the future. This doesn't necessarily have to be anything to do with Passivhaus but just some tips for self-builders, things that you might have observed through numerous clients, things that might help us coming into this process?

James: I think building a collection of ideas of things that make you feel at home is important. It's the first question I always ask a client. 'What's your definition of home? What do you feel is home?'

The answers to that range quite wildly from that connection with the garden and feeling the landscape, through to it must have good Wi-Fi. Everyone has different goals.

But if you see spaces that you particularly feel comfortable in, it's important to sit and think about the space and work out what it is about that space that makes you feel comfortable. It might be a solid wall behind you while you've got a good vision out into the garden. It might be the soft furnishings.

Whatever it is, if you can analyse what that critical aspect is, then that's got to be your starting point for whatever you end up building. Because it's a long process and you've got to get to the end of the process and feel like you're in the space that you hoped for, even if the actual detail is different when you get there. It's got to function as your shelter.

Ben: James, thank you very much.