

HPH311

Ben Adam-Smith 00:00

This is House Planning Help episode 311. Hello, I'm Ben Adam-Smith. And this is the podcast for you if you're interested in self build, because I'm exploring what houses we should be building in the 21st century, and trying to break down the major roadblocks that may get in our way. Coming up in this session, my guest is Richard Hawkes from Hawkes Architecture. And we're going to be questioning why award ceremonies often celebrate projects that don't actually perform very well.

Ben Adam-Smith 00:31

First though, every so often we have this part time feature, which is all about when low energy or sustainable building breaks into the mainstream. It must be in a significant or entertaining way. I think definitely we're underlining entertaining today. I must thank Nigel Dutt for flagging this one up. He's been on the podcast before. In fact, we'll probably link it into the show notes again, because he's going to feature in this episode, actually being part of House of the Year awards that we will be talking about shortly. Anyway, getting back to this, he said, "Did you see the episode of Silent Witness called Reputations?" And so I checked it out. Silent Witness, by the way, it's a long running drama, which focuses on a team of forensic pathologists and their investigations into various crimes. So this particular episode, I'll describe what's happening as we join it. They're trying to find out what's happened to Dr. Braithwaite so they descend on her house.

Clip from TV show Silent Witness 01:37

Car's here. Looks like she's in. No letterbox.

Ben Adam-Smith 01:43

So they're trying to establish where she is. And of course the first thing they say is 'no letterbox'. Anyone would think that could be a massive clue! So they discovered there's a body inside, no signs at all how she has died. The next scene we're at the post mortem. They've mulled over various scenarios. But guess what we come back to?

Clip from TV show Silent Witness 02:11

How come she didn't have a letterbox? Passivhaus. So well insulated, doesn't need heating. You heat it up just by living in it, but it has to be really airtight. It's like living in a bubble. All the air goes in and out through a single ventilation system. But why would the boiler lockout? What if it was faulty and produced a lot of carbon monoxide? No carbon monoxide in the toxicology. She's a suspect in the murder case, she conveniently dies... what if others were involved.

Ben Adam-Smith 02:43

Ah so gradually they unravel the mystery and discover that the evil genius had tampered with the MVHR system and pumped in a deadly gas. Very creative. But of course, he left a couple of broken plant pots right outside the vents as a big clue. We love drama. So if you spot anything like this, that

you think could be worth a laugh or just is very significant because low energy building, sustainable building has broken into the mainstream, give me a shout please and maybe we'll feature it.

Ben Adam-Smith 03:15

Let's get to our interview with Richard Hawkes from Hawkes Architecture. He's been on the podcast before because his firm is a specialist in building in open countryside. And there's a clause of the National Planning Policy Framework that makes it possible but only in exceptional circumstances. However, this time, something completely different. We're looking at architecture that we celebrate. And Richard's been reviewing the Energy Performance Certificates of RIBA's House of the Year longlist over the last few years. Hi Richard, how are you doing?

Richard Hawkes 03:49

Hi Ben, lovely to see you back at Crossway, the Passivhaus, which I designed when I started Hawkes Architecture back in 2008. Back then, in 2008, when we were designing this house, Passivhauses weren't known, there weren't any in this country. EPC certificates had only just been introduced at that point. It seemed like a really good idea but nobody really paid any attention to what they meant. There's lots of things to unwrap in what you do to measure a house etc. But we've been obviously measuring this house ever since we moved in. And houses we built since then, lots of interesting things about how you measure houses. Some people are measuring apples on one house, some people are measuring pears on another house and somebody else's measuring oranges, and each one of them might say, "Oh my house is doing really well." But it's difficult to find the data to compare one with another. So we've been working with another company that have developed a way of measuring one house to another and comparing them in a way that's relative. Of course, EPCs are trying to do that, but it's not the best tool ever.

Ben Adam-Smith 04:49

Maybe first you could just explain about what have you monitored on your own house and how have you done it?

Richard Hawkes 04:57

Well when we put the monitoring in here we actually were working with Cambridge University. They gave us some funding, and it was the engineering department, and they were interested in fundamentally learning about two aspects of things: building physics was one aspect, and lifestyle. So in terms of building physics, we put sensors on the outside of the building, we put sensors on the outside of the thermal envelope part, the breather membrane layer, and sensors within the insulation, sensors on the inside of the thermal envelope, air temperature sensors. And we did that on some places on the south side of the house, north side of the house, behind different finishes as well, to get a sense of how the building envelope was working differently, obviously, at different times of the year, but on different orientations and relative humidity as well. And then lifestyle things we literally have gone through studies, we've had systems in like the OWL Monitor and Current Cost Monitors, quite early ones that worked okay for a little while, but not for very long. We had other sensors built in and management systems that didn't work very well. We've also just had little plug-in things that measure wattage and time. And then like, you have your iPhone charger in the wall for three months. And then

see how much you accumulate over a long period. And then extrapolate it out... electric toothbrush, the cooker, the light fittings, everything.

Ben Adam-Smith 06:20

That's a lot of data! So how have you used that?

Richard Hawkes 06:23

Well, it's been very helpful. Actually, I used to have, still have this like quiz thing to educate people about energy use, because if you ask the average person how much does it cost to charge your mobile phone per year, it's staggering how far out people's estimates are. If you want to know I can tell you.

Ben Adam-Smith 06:42

What am I guessing?

Richard Hawkes 06:44

So I plug my mobile phone in when I go to bed, half past 10 at night, and then it just stays plugged in through the night, I unplug it when I get up in the morning. When we did that for three months, extrapolated it over a year, it worked out at 35 pence a year to charge your mobile phone.

Ben Adam-Smith 07:01

Well that doesn't sound much.

Richard Hawkes 07:02

It's not very much, is it? But I've literally had answers of 50 pounds, 200 pounds. And the reason I use a mobile phone is it's something that consumes energy that we all have a daily relationship, intimate relationship with. If you've been on the phone all day, you know your phone's low. There aren't many appliances in the house that you actually have such a close and intimate relationship with energy. Another example I use is a broadband router. Pretty much everyone's going to have a broadband router in the house, usually sitting on a wardrobe or in a cupboard somewhere. It's doing it 24/7. You don't pay much attention to it. It's quiet. You don't even know it's there. How much do you think it costs to run a broadband router per year?

Ben Adam-Smith 07:43

Shall I have a go? What about two pounds?

Richard Hawkes 07:45

11 pounds 40, I think it was the last time I checked. It's about nine Watts running 24/7. It's a small amount of wattage but 24/7. So it creates a bigger number. So I think it's 79 kilowatt hours a year. Back when I first did this study, when I first built the house, one kilowatt hour of energy off the National Grid was over half a kilogram of CO₂. So back then I used to translate that back into Carbon and say, "Well, how far do you think you could drive a car?" And the car I had at the time was Land Rover Discovery 2, two and a half litre diesel, gas-guzzler, you know. And so how far do you think I could drive this gas guzzling monster for it to generate the same amount of CO₂ as the broadband router that sits in your

cupboard? And of course, some people say when you turn the key, when you get to the end of the driveway, whatever, but it was actually 200 miles.

Ben Adam-Smith 08:35

You see, we are clueless in that respect, aren't we. And that's why data and you mentioned earlier in the conversation, just having that reliable set to constantly look at and this is - we've talked about EPCs - this is where I have slight misgivings because I know there's a lot of criticism on EPCs. So maybe we could veer back in that direction and you could explain what they are, first of all.

Richard Hawkes 09:02

So Energy Performance Certificate, EPC, as part of the assessment process of any house. So if you've built a house, to get final sign-off from Building Control, you've got to get an EPC or you're supposed to have an EPC. We'll get onto that. And that was brought in in August 2008, I think it was. Estate agents started selling houses and needing to show an EPC rating when they're showing people houses. And I remember back then people not really paying much attention to it. I mean, obviously it's a way of looking at how efficient a house is. So how much heat energy's going into the house and what are the walls made of, what are the windows made of, what type of lighting has it got? And then it can work out what the energy load's likely to be. It works out differently if it's an existing house that's been there a long time. But if you're doing a new house, there's more data you can put in. If you've got an old house then you'd use RdSAP, Reduced Data SAP because there's less information. There's a different process for working it out. If you've got a new house, you put in what the airtightness level of it is, what the U value of the walls, windows, floor is, it works out the energy load.

Ben Adam-Smith 10:13

But you've got a Passivhaus and you will have used probably PHPP, which gets even more detail in there. So I suppose my question about EPCs would be, why haven't they developed to incorporate more of this as we move on? We're just more and more of a data-driven society.

Richard Hawkes 10:33

Yeah, well, I think now that the EPCs have been around for more than 10 years, you're starting to get houses that were built under original SAP and EPC. So, this house, the original EPC certificate we got, it's got all the U values, the airtightness and things like that. Now, our original EPC has expired. So literally just last week, we've had a guy come round to renew it. But we've now got to use the RdSAP Reduced Data SAP. And Reduced Data SAP, it doesn't have any allowance in it, as I understand it, it doesn't have any allowance in it for MVHR, for heat recovery ventilation systems. You go what?! What other things did it not have?

Ben Adam-Smith 11:18

They haven't been invented yet, though!

Richard Hawkes 11:19

Yeah, exactly. But the weird thing is, so again, I'm going to treat this as a journey of change, right. But the interesting thing about re-measuring houses that were originally built under SAP, is we're now seeing the cracks in SAP from the point of view of, hang on, I've built a Passivhaus. But this tool that

we now measure our building with, Reduced Data SAP, which is, you know, that's used to measure houses that have been around for a long time. And of course, there's not much data on those houses. Unless you've got very clever software to work out what the actual U value is, or do air tests on every single house, then it's going to be more difficult to actually find these things out. But on houses that did have this stuff done within the time that SAP has been around, why does Reduced Data SAP not allow you to use that material? That's bonkers, isn't it! But anyway, I think that that will evolve. But it will take people like us redoing our SAPs, challenging the system, that going back to places like Elmhurst, and Elmhurst taking this feedback on board and letting it evolve and improve the way we do SAP.

Ben Adam-Smith 12:27

Well I like the idea for consumers. You live in a house, perhaps you don't know too much. And you have this scale of A to F, I think it is. And you get an idea from that. And you want to be near the top and there's a drive to do that. So if we put the misgivings to one side, does it still represent anything useful?

Richard Hawkes 12:49

I think it does. I mean, yeah, we could talk about the failings of it as a system, but it is the tool that we have. And it is a way of comparing one house with another house. And it doesn't just sort of give you an A or a B or C down to G, I think it is, rating, there's a SAP score that goes alongside that. But it doesn't just have that information, it will also have information on what your CO₂ emissions are, if there's an airtightness test being done on the house or not.

Richard Hawkes 13:17

Now, what we did recently was just a study. We obviously have a library of our own buildings and EPC certificates. But we were quite interested to see how that might compare to say, and this is where it started, with the houses longlisted for the House of the Year. So we found those houses, we went on the EPC register, we found their EPC certificates and we just did a little table and put it out on a tweet. It got something like 25,000 hits in 12 hours. It was kinda like, oh, this is interesting. And then it's gathered some quite interesting momentum and comment. But I was interested to take the research back to see if there's been any trend and improvement of houses that we give awards to, that we treat as being the upper echelon of design excellence, and architectural excellence. And I believe architectural excellence ought to have a technical requirement to it.

Ben Adam-Smith 14:13

Let's play devil's advocate here, though, is architecture about performance?

Richard Hawkes 14:19

I believe it's a component of it. Yeah, there's no doubting the architectural quality of beauty and detail and spatial arrangement. And sometimes the way a building responds to a setting, that's a given, but excluding performance, I don't believe is correct. And I know that in these awards, there is a requirement to submit details about energy performance, but the fact that the house that won doesn't actually have an up-to-date EPC certificate, doesn't have an EPC certificate that represents the building with that development. And I find that problematic from the point of view, is that correct? In this day and age, we've just had COP 26. Every Council around the country, pretty much, declaring climate

emergency. Yet the RIBA feel it appropriate to be able to award a prize like the House of the Year, at this time, to something that doesn't actually have one.

Ben Adam-Smith 15:14

Why are they not thinking we need to change how we see architecture and what is considered good architecture?

Richard Hawkes 15:24

Well, I think part of the answer to that is that the focus has been in a different direction. There hasn't been the pressure. Building regulations has been improving. If you design a house now it's better than a house you would have built 10, 12 years ago. But when...

Ben Adam-Smith 15:39

Again, building regulations, I don't know the true ins and outs of it. But there was quite a bit of criticism of the last time that they reassessed it, and concern that just in a couple of minor points, that it actually could end up worse again, which is ludicrous.

Richard Hawkes 15:54

But for example, take Part L. At least U values for building fabric are getting better, airtightness values are getting better, because they needed to be but they're just doing it so slowly. Bear in mind, when we built this house, Code for Sustainable Homes came out. And by the time it got to 2016, all houses were supposed to be built to zero carbon. 2016! 6 years ago now. All that happened was it just got binned. And then all the schemes that were supposed to deliver to Code 4 or Code 6, all of a sudden, they've got no requirements to do anything more than meet building regulations.

Ben Adam-Smith 16:27

Richard, I'm coming back to why again?

Richard Hawkes 16:29

Well, why why?

Ben Adam-Smith 16:31

I'm not expecting you to have the answers necessarily but I feel I just need to...

Richard Hawkes 16:34

I think it's really important that our buildings are responsible with the way they consume resources. And I don't believe that they are judged in that way, either in what they used in their operational life, in energy terms, or the energy that goes into making them, disposing of them. I don't believe that's looked at with enough detail. It's becoming more prevalent. We've got the RIBA 2030 Challenge.

Ben Adam-Smith 17:03

Well that's another weird thing because that, to me, is very forward thinking. It's quite hard, isn't it?

Richard Hawkes 17:10

We've got buildings, obviously, in London now. There's a very different cultural change. You can't just look at a building and say... I mean, I worked in London years ago, and it was pretty much a mindset of well that building doesn't... It's easy to create an excuse as to why a building had to come down for a new building to go in its place. It didn't feel to me that there needed to be much justification, it's kind of operationally it doesn't work, the office spaces don't work for a modern working environment, blah, blah, blah. That was enough justification. New building! Whereas now, obviously, with the embodied energy disposal, and everything. I don't work in that sector anymore. But there is a lot more justification needing to be made to replace that. And the footprint of the building you're taking away becomes part of the footprint of what you're having to deal with, as any new development. I think that's forward thinking. Absolutely. But that doesn't exist in housing.

Ben Adam-Smith 18:01

Part of the problem as well, as I see it, is that if we're accepting climate emergency, and the natural boundaries that we're coming up as a world, we're just hitting all these things, and biodiversity is sinking. Well we've got to look at it almost like a super architecture, so many different elements. For example, you and I, we live in houses that are bigger than what we could be living in.

Richard Hawkes 18:28

Yeah, yeah, absolutely. There's a massive variety of the size of houses we live in. I don't know whether we want to get to a place where we only allow certain number of square metres per person.

Ben Adam-Smith 18:36

I don't know either. Also what you build out of, you've got some natural materials here, perhaps mine is not so good. You know, it's swings and roundabouts everywhere. And it's very hard, like you said at the beginning, you're comparing apples and oranges.

Richard Hawkes 18:51

But you've got a building industry out there that are knocking up houses one way that they've been doing for so long. And there's a lot of lobbying, a lot of pressure to carry on using materials that aren't hygroscopic, that don't lead to very airtight buildings, that are just embodied energy hungry. That's all the wrong direction. But there is an increasing movement, because of the stress that building regulations imposes it helps to shift things. It just does it so slowly.

Richard Hawkes 19:19

But in terms of judging the upper echelon of what is considered to be the best in this day and age, I just think it's outrageous for that not to be setting an aspirational standard, not just architecturally and in joy and intellectual integrity of a building but its performance as well. So if I'm choosing glazing, I can choose between different products and I will take a slightly thicker window mullion to ensure that the triple glazing that I'm putting in is airtight and sealed properly and is not going to, when the wind blows, it is going to be leaking like a sieve or when the sun's shining that it's going to be taking in so much solar gain that I've got to somehow deal with that with other mechanical, environmental controls. That's foolish.

Ben Adam-Smith 20:08

Maybe we should go back to the information that you've compiled together, because I'd love to put some of these in the show notes. So can you talk us through? We're using the EPCs now. We've accepted that hopefully they will improve one day. What have you found?

Richard Hawkes 20:21

Yeah, so we looked at the House of the Year longlist, that's where it started. We found that only one of the houses on the longlist of, whatever it was, 15 projects. So each one of the houses on the longlist will have won a regional RIBA award, they're already award winning houses. That then puts them in the pool of potentially being able to be the House of the Year. Only one of them on the longlist was an A-rated house, the Devon Passivhaus by McLean Quinlan, beautiful house. I was surprised by that. There was a house in 2017, Caring Wood that was an A-rated house that won. A couple of years before that there was a house by Strom, I believe, that achieved an A-rating. Just two houses have won, that were A-rated houses, have won the House of the Year. But actually in the last three or four years, there's actually been a downward trend. And this year, the house that's won it has not actually got an up-to-date EPC rating. There is an EPC rating for that address, but it's for the house prior to the work being done. Now, my question or criticism is not with the architects it's actually that the RIBA have felt it appropriate to give such a prestigious award to a scheme that hasn't actually even got an up-to-date EPC certificate so we're just seeing year on year, time and time again, it just feels to me like there's just not enough attention going to energy conservation.

Ben Adam-Smith 21:49

And your projects have done much better. So it does show that there's something in EPCs. You've got a green map!

Richard Hawkes 21:58

Yeah, so we started looking at the House of the Year this year. We've then wound that back to 2010 to get a bigger picture, 250 houses in there now. We've got our own list, and there's 17 projects to date of ours that we've got, either built or in the process of building that we've got EPCs for, and every single one of our projects is an A-rated house. And the average EPC score across our projects is 102.1. So the threshold to get into A is 92. Our average score is over 102. The highest ever score of any project that's been long or shortlisted by the RIBA is 101. So we were out there doing what we say we were planning on doing. And it's a marked difference than what we see of 250 award-winning projects built over the last decade or so.

Ben Adam-Smith 22:46

And you also showed me the airtightness ratings that they had got on these various projects with one of them below four... or above four I should say!

Richard Hawkes 22:56

Yeah, across our library of award-winning projects, the average airtightness is 4.1 which is... Yeah, your face says it all!

Ben Adam-Smith 23:06

Not so good for the podcast! [Audible gasp.]

Richard Hawkes 23:12

As I understand it, you know, if you're going to use a heat recovery ventilation system, you want a decent level of airtightness in your building. And when you start getting to above 4 metres cubed per meter square per hour at 50 Pascals then it starts to not be worthwhile, there's too much air leaking out of the building envelope for it to be worth having heat recovery ventilation. We know how good heat recovery ventilation is at helping to reduce the heat requirement for a building, in maintaining air health and CO₂ levels, relative humidity. But for the average, across all of those buildings built just in the last decade, to be that high I think it's really quite shocking. The average airtightness of our projects is around 2. You know, my house achieved Passivhaus certification. But what all of them want is what our buildings are delivering. And we are measuring it and they see the houses, they visit them, they speak to the clients, and they all talk about how comfortable they are, how resilient they are to whatever's going on with the weather outside, how cheap they are to run.

Richard Hawkes 23:14

It's back to measurement. And then if we say back to measurement, it's a metric. What metric are we saying is the one that RIBA should be looking at when they examine all these projects or set the bar for all these projects?

Ben Adam-Smith 24:06

Well comfort, running costs, how resilient it is to the weather.

Ben Adam-Smith 24:29

Running costs is quite a good one, isn't it?

Richard Hawkes 24:34

Yeah I think running costs is a fantastic one. Now there are projects where for example, we've just finished building a house and it's set within 40 acres in an AONB, Area of Outstanding Natural Beauty. And there are lots of trees, lots of woodland needs managing. The client has always done that. They used to chop down a lot of trees and things to run their old farmhouse that consumed 15 cubic metres of wood a year. But we've built a house and we've put a combined log and pellet boiler in that building. Now, in terms of CO₂ emissions, logs and pellet boilers don't actually perform very well. But if you've got 40 acres and you're in an AONB, and you have to manage woodland, and you don't burn anything until you've got the moisture content down below 20%, it makes absolute sense to run your house for the small period of time when, bearing in mind we've designed a house that's got at least 300mm of insulation, it's super airtight. Actually the house I'm talking about got 109 on its EPC. And we've just finished it last year, and they literally once a week, they'll go in, they'll load the log boiler and when the heat store calls for heat, it'll burn all the logs in one go, heat up the heat store and then...

Ben Adam-Smith 25:42

So is this in the house or outside the house?

Richard Hawkes 25:44

It's actually outside the thermal envelope and the heat store, but immediately next to it. And the low temperature hot water in the tank will run under floor heating, ground floor only, no heating upstairs, there's no need for it. The heat recovery ventilation basically stirs heat around. We can design houses like this. I don't think there's enough... going back to why aren't we doing this more on all houses, I just don't think people are putting it high enough up their own agenda. Maybe other clients aren't so interested in it, maybe they haven't seen them. They haven't been educated about it. And maybe they don't think it's possible. Or they think that having a house that's a Passivhaus means it's going to be ugly, or it's not going to be able to achieve an architectural outcome that they would like, but I don't think they're incompatible. It has been done. There are houses out there that do it. There are other architects doing wonderful things, just not many of them. And also, it's just not being recognised in awards. And I think it should be.

Richard Hawkes 26:40

I think the RIBA should be setting that type of... sort of saying, you're not allowed to enter the awards, or it won't be considered if it's any rating less than B or an A. Why not.

Ben Adam-Smith 26:51

Well, I think that's a very good point to bow out here. Richard, good to catch up again. Thank you very much.

Richard Hawkes 26:56

Pleasure, thank you.

Ben Adam-Smith 26:58

Head online to take a look at the show notes that accompany this session - houseplanninghelp.com/311. Check out the EPC research that we've been talking about. We'll also link you to that episode that we did with Nigel Dutt, one of the much better performing projects in the House of the Year. In fact, we'll put in RIBA's House of the Year website so you can see some of the longlist, the shortlist, the winners as well. And of course we'll link you to Hawkes Architecture - houseplanninghelp.com/311.

Ben Adam-Smith 27:30

And I'm making a little note here that we must return to EPCs again in another episode and dig into some of the assumptions that they make and look at what might make them better, particularly in this era, when we do have so much data and there's so much monitoring going on as well.

Ben Adam-Smith 27:49

Let's finish up on a Hub update today. This is the membership community that I run alongside House Planning Help. We want to simplify the self build journey. And a lot of that is to do with just getting to understand the whole process, seeing it a few times, being amongst people who are all doing the same thing. So we've added a new chapter to our Kinver story. We have these in-depth video case studies where we follow entire builds all the way through, trying to shine a light on the decisions that are being made. In this particular episode, it's all about the heating and ventilation design. So we're looking at things like how does the process differ because this is a retrofit project. Also, how are we going to make

it a quiet system? Why is this project going to incorporate some cooling? That's slightly unusual in very high performance buildings, but we'll find out why, how's it going to be achieved and so on. We've got our courses as well which break down different parts of the process of building a house, our members only forum, the live training from guest experts. And of course, if you want to chat with me, every week, I do an office hour call and you can just join in there and let me know what the issue is. I'll help as much as I can or refer you to people who I think you should talk to. Houseplanninghelp.com/join to find out more.

Ben Adam-Smith 29:05

Next time Jeffrey Hart from the Building Sustainability Podcast is my guest. He's going to be sharing his tiny house journey. Looking forward to that one. The House Planning Help Podcast is produced by Regen Media - content that matters.