

HPH322

Ben Adam-Smith 00:00

This is House Planning Help - episode 322. Hello, I'm Ben Adam-Smith and this is the podcast for you if you're interested in self build or retrofit. 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.

Ben Adam-Smith 00:18

Coming up, Guy Hargreaves returns to the podcast. He was retrofitting his Victorian mid terrace property to Passivhaus standard. We follow construction, because that's where the last podcast left off, just as that was about to begin, all the way through to moving in. And Guy has been fantastic in sharing the journey in our membership community, The Hub. We've been turning around videos of this project for months. We're getting towards the back end of it now, which is quite good to have another complete in-depth video case study, this time of a retrofit. And I've seen it all with my own eyes. So I can't wait to get into today's chat.

Ben Adam-Smith 00:53

Also, Guy's already opened the doors of his property to a local eco group just to show them what he's done in terms of trying to upgrade his house, trying to incorporate renewables. So I thought this might be a good point to mention the International Passivhaus Open Days because it's coming up as we release this podcast. But if you miss it now, twice a year there's this big international event, and there's bound to be a project near you. Or even if there isn't, perhaps it's a good excuse to go and explore either a new build or retrofit, just so you can understand exactly what that means. You're bound to know something about it but I always think if you haven't been into one before you get going on the journey, well this is the perfect opportunity. So we'll put the link in the show notes today to the Passivhaus Open Days.

Ben Adam-Smith 01:43

All right then, let's get into our interview with Guy Hargreaves. And this is a part two. So if you haven't heard part one, it will probably make sense - houseplanninghelp.com/297. Start there. But what we're going to focus on today is the construction stage all the way through to moving in. So they've added space at the back of the property, they moved out for a number of months. And also the basement, yeah, that's quite a key fact they've separated that. It's going to be a standalone apartment that they can then rent out. So Guy and Susan have returned to the house. And that's where we begin this chat. I say to Guy, what does it feel like to be back?

Guy Hargreaves 02:23

It's a mixture of emotions, in a lot of ways, a relief that we've 99.9% of the way through, there's a little bit of numbness about the stress of the process. I'd be lying to say it hasn't taken its emotional toll on me, because it really was unbelievably difficult. So overwhelming relief that we are through, that we've got our airtightness results and that we're on our way to getting certified and in a lot of ways, a feeling

of great pride that we've managed to, you know, pull off such a difficult assignment. And I think we've done a fantastic job on it.

Ben Adam-Smith 03:00

Let's go back. And we're going to pick up where we left the last podcast. And I'll just remind you where that was. Construction was just about to begin. So what happens at the beginning of the process?

Guy Hargreaves 03:16

So the build kicked off in earnest in early February, the first week of February. And the first thing was the knocking down of the section at the rear, the gutting of the place and preparing for putting steels in so that we could pull walls down. And so the first phase was deconstruction. And once we got to the bottom of the deconstruction cycle, it was all uphill from there.

Ben Adam-Smith 03:43

But that was quite a lengthy process, wasn't it? It's not just a week of taking things out because you have to do it slowly. And you had access issues here as well, didn't you?

Guy Hargreaves 03:53

Well, yes, in theory, our access was limited to the front door. But as things went on, we managed to negotiate access through the rear through a private car park owned by a whole series of flats on an adjacent road and we'd negotiated that through the manager of the car park and she was very kind and patient with us, and let a lot of our contractors come through towards the end. And in return, we completely resurfaced the car park and remetalled it and replaced the light and the fence. And the car park is a lot better condition now than when we first arrived. So I think it was a win win.

Ben Adam-Smith 04:37

Was there a measure of how many truckloads or what weight of material came out of the building?

Guy Hargreaves 04:45

Oh it was in the 10s of tons of base that we dug out to make the rear foundations. So the rear foundations consisted of a concrete pour followed by an insulation layer followed by another floating concrete slab. So we had two concrete pours during the job. We had an excavator that dug out the foundations. That was a little digger actually. And it was craned in from the rear car park over probably a 15 metre high apple tree! So there was some very interesting crane lifts on this job, I have to say.

Ben Adam-Smith 05:22

And it was also, it wasn't just that, it's operating in a very tiny, little space, filling up barrow loads that had to, as you say, be taken out at the front door to where the truck was. And just again, a slow process.

Guy Hargreaves 05:37

Those steels then, why were they being brought to site?

Guy Hargreaves 05:37

Yes exactly. So the base that was hauled out was literally hauled out in plastic, they almost look like clothes bins, and they would literally carry it out by hand and put onto a truck at the front, and driven off. So there was a lot of hand excavation, a lot of labour work that was involved with it at the early beginning.

Guy Hargreaves 05:49

We removed two significant walls on the ground floor. To replace them, we had to put some steels the width of the house. The width of the property is around about six metres. So those really were structural steels holding up the first floor to give us the full open plan experience in front of the property.

Ben Adam-Smith 06:23

And as we go down in the building, you had this basement. How are you dealing with insulation there, because you obviously want to go down but we've got to be careful?

Guy Hargreaves 06:33

Well the basement was dug out. On the party wall sides, really we didn't have to do much in terms of insulating. At the external front and rear. We applied the Diathonite Gutex lime plaster insulation build-up that we had also in the main house. And the floor, we ended up digging out because it had around about 75mm screed which actually gave us a little bit of extra room that we hadn't banked on to add insulation and retain some semblance of reasonable ceiling height. You don't usually often get great ceiling height in a basement, and we'd probably ended up with ceiling heights of 2.1 metres or so, certainly not the 2.5 to 2.7 metre ceiling heights we've got in the rest of the house. And obviously the ceiling of the basement is the floor of the main house. And so no insulation was required there. The floor of the basement, we ended up putting in 40mm Celotex as insulation into it. And that seemed to work with the modelling.

Ben Adam-Smith 07:39

It's a historic building and that front facade facing the street couldn't really change. But it wasn't in great condition, was it, and that bay, did they do a survey of it?

Guy Hargreaves 07:52

Well, actually, when we bought the house we had a light survey done, we didn't really do a full survey and a full survey probably would have found that that bay was not particularly well founded. Because all of these properties sit really on an earth foundation, there was no concrete foundations when these things were built in the late 19th century. So that whole front was kind of falling in. And you could tell once you started looking closely at the sandstone surrounding the windows, that there were cracks appearing and whatnot. And it turned out that we needed to strip and rebuild probably half of the bay window. Well, certainly the ground floor half, we didn't need to do the basement half. This was not a massively expensive thing, it really just required dismantling the bay window, which needed a bit of scaffolding, the windows were coming out anyway, and finding new bricks and rebuilding it really. So it wasn't an enormously expensive exercise. And so I was quite relieved about that.

Guy Hargreaves 08:57

Furthermore, though, when we did get down to the basement, and started to look at how we were going to leave the external front part of the basement, we realised at that point that there were no concrete foundations underneath that bay window. And so we ended up underpinning it. And it wasn't a huge thing that was probably four metres of concrete underpinning and in some respects, I'm sort of quite grateful that we got it done in a way because what it effectively does is it keeps the water from going underneath those bricks and giving us a problem internally. And it stabilises that whole front and we're a mid terrace, we have materials either side and all three terraces rely on each other, you know, the party wall to hold themselves together to some extent. And so by doing that, we've probably done some positive things for the neighbours in terms of the stability of the front of their houses.

Ben Adam-Smith 09:49

Yeah. When you get this opportunity, I think you've done the right thing in terms of you want this to be the moment that you get everything in order. Let's move now to the back of the property. So this was where you were extending as well, going from the old building, which is brick into timber frame, does that present any problems with junctions and so forth?

Guy Hargreaves 10:13

Well, I think it probably did present some challenges in terms of the junctions because the old house you're going from double brick, or nine inch brick wall, which you needed to insulate in a way that didn't give you condensation risk. And the new part of the house was largely Larsen truss. So 300mm Larsen truss that were made on site and packed with insulation, and then clad with brick or brick slip depending on where they were. And at the junction they needed to be connected. Internally, I think they probably achieved that connection through things like service voids, and having a consistent material going from the brick to the truss. Externally, there was always a void. And you know, if it was brick slip, it was a cement board brick slip build up, that went on to the brick slip, and then there's a mortar joint between it. So I do expect that over time, some of those mortar joints might come a little loose. We're probably going to have to look at that in time.

Ben Adam-Smith 11:16

And what's the insulation within the timber frame?

Guy Hargreaves 11:20

That was a soft wool insulation. To be honest, the exact name of it escapes me. I'd probably have to look it up. There were quite a few different types of insulation used, depending on where you were. There was the Kingspan if it was a hard insulation, say on a flat roof or on a side external wall. There were some softer wall insulations, and there were some hardier, stronger insulations. And then there was the Gutex wood fibre. With the brick walls, we put a Diathonite parge on, 20mm of parge, which provided your airtightness layer as well as some thermal insulation properties. And then we glued 100mm Gutex wood fibre onto it. And then we finished it with a lime plaster. And that allowed for condensation to be able to flow through that build up but gave you airtightness and your thermal properties needed for modelling.

Ben Adam-Smith 12:19

And we must mention, as well, that there was work going on in that top room where you were adding a dormer.

Guy Hargreaves 12:27

Well actually there was originally a dormer extension done but it was one of those extensions where you had rooflights on both sides and you had your sloping ceiling on both sides. And what we've done is we've kept the sloping ceiling on the north side, on the road side, but we then put a flat roof in to essentially open up that whole side of the room. And then that whole south side we glazed in a rather aggressive and somewhat controversial scheme, that is going to be a work in progress over time because that dormer is the top of the house and the house is rather open plan nowadays. What tends to happen is that the heat in the house tends to rise into the dormer and add to the solar gain in that dormer.

Ben Adam-Smith 13:15

Now, come on, this must have been a discussion in the early days. I can't imagine Alan or anyone at Eco Design Consultants not saying we would reduce glazing size. So this was driven by you, I'm guessing, in terms of wanting a hot room at the top? Is that part of it?

Guy Hargreaves 13:31

I wouldn't say that we wanted a hot room, but we wanted a light, 'open feel' room. That's why we glazed that the way we did. We always knew that it was going to be a warm room. We've got plenty of window ventilation options. And we also have a reverse cycle heat pump, which we can use for cooling. But everyone, Alan, and Rod Williams, my mechanical engineer who just did a fantastic job told us that this was going to be a warm room and you're going to have, you know, you going to have to... and we knew that. We just really felt like we would just start with it and see how warm it was. And then just over time, implementing different strategies to cool it down. So what we're doing right now is we're going to put blinds, blackout blinds on the inside. Now we know that they'll have a certain degree of effectiveness and we'll see what that effectiveness is. But if that room ever really becomes a real problem, the ultimate solution will be to put external blinds in and we can certainly do that. We're going to start with it as it is, very open, over-glazed in the opinion of almost every Passivhaus architect I would imagine.

Ben Adam-Smith 14:48

Fair enough. Yeah.

Guy Hargreaves 14:51

But we haven't done it with our eyes closed. We're well and true...

Ben Adam-Smith 14:55

That is the most important thing.

Guy Hargreaves 14:56

And you know what? Literally that is the only room that overheats. Every other room is absolutely perfect. And so the big future-proofing fear for that room will be when you get these ridiculously high overnight lows. For example, a major city in China recently they had an overnight low of like 34.9

degrees. Well, you know, there's no ventilation strategy that's going to allow you to sleep in a room that starts off at 35 degrees. And you can literally can't cool any less. And at that point, you're going to need your reverse cycle heat pumps and the like.

Ben Adam-Smith 15:33

Well one thing I noticed as we went through this process is you were very involved in it. Now, did you ever feel too involved sometimes? You've obviously got a technical mind, so I know you understand all these things. But I remember certain days I'd come in, and you were looking at particular details, and I was thinking, is that really your concern?

Guy Hargreaves 15:53

Personally, I think I was more involved... I was certainly more involved than my builder wanted me to be! But I really feel like this was an incredibly challenging project, executed at a very challenging time, you know, and I really feel like if my level of involvement wasn't what it was, which was literally daily down here, really all over it, really, really all over airtightness. A big takeaway for me is that your architects and your Passivhaus Designers can specify your insulation strategy and as long as it's executed reasonably effectively, there's never going to be a complaint. But the airtightness is a whole... that's all about like diligence in building, and when you get to a certain point, beyond that point of your build, you're going to take what you get with airtightness. You're not going to be able to get back up into the, you know, underneath the eaves and fix up those holes that they left because they didn't tape two membranes together properly, or that they put 200 screw holes through a membrane, you know, that wasn't secure.

Ben Adam-Smith 17:02

But was this an enjoyment thing? Did you like getting involved? Because if you were taking a step back, you could just say, at the airtightness test, this is your responsibility, you need to fix it. Or was it more that you liked that process of, you know, almost, you took on a lot of project management roles, didn't you?

Guy Hargreaves 17:23

Look, I wouldn't say project management, because I think in the end, I was more like, quality control actually.

Ben Adam-Smith 17:30

Quality control.

Guy Hargreaves 17:31

So it was a combination of my background, I trained as a mechanical engineer. This was going all the way back to my roots. Not that far! I'm not that old. But 30 years ago, I was all over the stuff, you know, heat transfer, HVAC control systems for big buildings, and all sorts of other thermodynamic ideas and learnings. And I loved all that stuff. And sadly, when I got out of the university, the labour market was more conducive to financial engineers than it was to actual mechanical engineers. And nowadays, when you get out of university with a mechanical engineering job, you go off and you work for Elon

Musk redesigning the automobile industry. And so it's far more interesting. So in a little bit of enjoyment on that sense.

Guy Hargreaves 18:17

A little bit of fear, because I knew that we would get the insulation right. But I had absolutely no idea that we would get the airtightness right. And the airtightness it's like a stop go thing. It's like blowing up a balloon. If there's a hole in it you will get found out. You can't avoid that. And so when I saw the structure on the building site, when I felt like it was not conducive to producing consistently strong airtightness results, I was very active about it. There were several points where I had even Robert from SIGA and I had all sorts of people on site with me, and they were maintaining until they were blue in the face that oh no, that little corner, that was fine. And I said, it is not fine. I saw it being put together and that will not be fine. And when we pulled it apart, it was definitely not fine. There were definitely large pieces of membrane that had not been taped properly or taped at all to be honest, and it would have been a fail. It would have been an airtightness fail right there. And it would have been inside a Larsen truss, or on the other side of a Larsen truss that you never would have got to. So that's not to say that I'm pointing the finger or I'm blaming anyone. It was just an unbelievably difficult management process in itself. And you had this really volatile environment where your labourers would be there one day and down the road the next because they were getting paid 30% more. It was just insane.

Ben Adam-Smith 19:42

When we got to the airtightness test, it was a result of something like 3 (ACH @ 50 Pa), was that right? You obviously have airtightness tests and you know you're going to keep on improving but the most important thing is to take your time and work out where the leaks are and keep on dealing with them.

Guy Hargreaves 20:02

Yes, I've learned a lot about how to manage airtightness in developments like this and I would say that airtightness is a little bit like compliance. The people that are responsible for producing the airtightness results should be almost separate to the actual construction people themselves. They should be coming on site every day and working on airtightness matters. And if a part of the build is going ahead and it's obvious that you need to address airtightness before that build part goes ahead, then that person should point that out. Another thing that we learned that was incredibly valuable, was that we had a very good firm doing the airtightness and we probably did two or three interim tests. And that wasn't about trying to get a result three times, four times, whatever. It was really about pressurising the fabric and running around with smoke and working out where you had to focus on improving things. And that made a huge difference. But also when we got up, for example, up to the dormer loft, Faz, the airtightness guy, he was just amazed. He went into that loft and he held his smoke (machine). And he said, I cannot believe how airtight this section is. And that was fantastic because that meant, okay, fine, we don't have to focus on that anymore. We move on from that. Right, here are your problems over here.

Guy Hargreaves 21:26

And so airtightness is really about chasing down your problems. I can't stress highly enough how important it is to have various tests. Because there's this dynamic that happens, I'm sure on a retrofit, where your architect wants the airtightness membrane to effectively be built before anything else

happens. You know, no plaster, no, nothing, you know, and until it's airtight... But on a building site, you just can't schedule things like that. You might end up having a small team focused on the one last part of the shell. And in the meantime, everything else in the house is not moving forward, because we're waiting until this final...

Ben Adam-Smith 22:06

Sequencing. And you had, weren't there material delays and problems with prices?

Guy Hargreaves 22:13

Yeah, I mean, two thirds of the way through our Kingspan ordering phase it went from you could get it in two days to five weeks or something ridiculous. We had a concrete shortage at one stage, because there was a cement, remember, there was a cement shortage?

Ben Adam-Smith 22:31

Well this is the thing.

Ben Adam-Smith 22:32

You probably don't remember. I do!

Ben Adam-Smith 22:33

Well I'm glad you can because that's the hardest thing about doing this is recalling. I remember there were some ups and downs of this journey. But, so how did you bring the airtightness down? Because you mentioned obviously the programme had fallen behind as well. So everyone was just, you were keen as well. You wanted to get back in?

Guy Hargreaves 22:55

Yes, well, that's right. I mean, the programme fell behind, partly because I have my contractors like the windows guys and the like, who go from an eight week delivery to a 14 week delivery in the blink of an eye. And partly because on the other side, the contractor seemed to have problems keeping people on site and getting people when he needed them and etc, etc. So, one of the more valuable things we did, well I did, was to engage with my architect in an administration contract, which included a fortnightly visit on site, and that kept a level of professional focus on what was needed, what was coming up, where the timing was, what was being realistic, etc, etc. Because you get these promises, ah yeah you'll be in by Christmas, but unless they're backed by a Gantt chart, contractors locked in to come on certain dates and no rain and no problems. And you really can't rely on just a feeling that you might be in by this time. You know, it's very difficult.

Ben Adam-Smith 23:58

I think there were lots of factors playing against each other. And we probably can't remember all of them anyway. But yeah, in terms of reducing that airtightness down because there came a point when you realised that this was going to be an EnerPHit project rather than a Passivhaus, which had been the goal from the beginning.

Guy Hargreaves 24:17

Yes, well, the goal was always to get 0.6 air changes per hour (@ 50 Pa). And I held on to that to the grim death, to be honest. I mean, as I said I think we had three interim tests for the main house, and we weren't really doing the basement at that stage, which was a bit insane, because we should have been doing the basement probably at the same time, but that's perhaps another thing to talk about. But every time Faz came, he would leave us with a list of things to do, and those would get done and so he would come back and it would show a lot of improvement. And then finally, we sort of got to a point where we said right, well come along and we'll test the whole thing. And at that point, the main house had finished and we'd moved into it. The basement was really still looking like a building site, frankly. And I was probably not as focused on, you know, because I was living in the house and I was juggling all sorts of other things and I wasn't quite as focused on how that basement was being developed. And so the day they came to do the final testing, we shut up the main house and left the basement open and we got a result of 0.94 (ACH @50Pa). And that was pretty solid, right? And we also identified some other areas where it was leaking. We identified one area where it was leaking, which I thought was going to be pretty much unfixable because it was just too far into the guts of the house, if you like.

Guy Hargreaves 25:40

So then we went down to the basement. We closed up the basement and left the main house open and that was terrible. That was like 3 (ACH @ 50 Pa). So we got another chap in, who actually is somewhat a legend of the airtightness industry. And we identified really a lot of where the air was coming in. Interestingly, there was a definite gap in the Diathonite. So the Diathonite had been done across to one side of a stud wall, and then the stud wall had been put up against the brick, rather than the Diathonite going right across that brick and then the stud wall going up into the Diathonite. And so we pulled that away and patched that up. And we did a whole lot of other recommended patches. And I think they got the basement down to 0.98 (ACH @ 50 Pa). And so what that meant was that the overall house, because it's really just a volumetric average, is about 0.95 (ACH @ 50 Pa). Now, in the interim, we also did the work that we were asked to do or recommended in the main house. So I could have retested the main house, but based on how far we'd come, and the work that we'd done, I really wasn't at all sure whether it was likely we were going to get to 0.6 (ACH @ 50 Pa) in the main house, and we would have had to have got below 0.6 (ACH @ 50 Pa), to drag the overall average because it's about 80% of the volume of air in the main house and 20% of the basement. And so I kind of finished it at the point where I concluded that the EnerPHit standard was going to be perfectly acceptable. And, frankly, in terms of comfort, you know, I'm not sure how noticeable it is really. Is it disappointing we didn't get 0.6 (ACH @ 50 Pa)? I mean, to some extent, yes. But also now knowing how absolutely the Herculean size of getting this four level, 120 year old terrace, with a mix of new and old build, and old bricks and leaking here and there. And getting that down to 0.95 (ACH @ 50 Pa) overall was just an incredible achievement in itself. And it was going to be certified as Passivhaus to the EnerPHit standard. And frankly, that's what the EnerPHit standard is about. It's really about recognising that the almost exponential effort in getting from 1 ACH to 0.6 ACH (@ 50 Pa) in a property that's already built.

Ben Adam-Smith 28:09

There was certainly pressure mounting on moving back in and obviously when it's not habitable, it's clear you're not going to be moving back in. So where was this line then of knowing we should be moving back in, we're going to save money because we're not going to be renting, the house is far

enough down the line that we can... Yeah, I think at one point, didn't you store some items here in one of the rooms because that had been completed? So how did you play that game?

Guy Hargreaves 28:39

Yeah, so when we moved out of our university terrace in Jericho, we were just really by that stage, we were just in suitcases because we're going from hotel to aunt's place to hotel to wherever. So all of the things that we had over there, we brought back to our property. And that was end of January. And it was a good six weeks before we moved back in. Did we move back in... Look, ideally, you move into a fully finished house, there's no doubt about it. But at a certain point, you kind of say, well, it's good enough. The bathrooms are working the kitchen is working, it's warm enough, I can sleep in it. And it's finished to 90%. For example, the laundry wasn't finished. Well you can live without a laundry, you know, I mean people change their laundry and live through the whole process, right? So we haven't lived in this property in any way that many other people wouldn't just live if they were just going to do a room or two rooms or change over a kitchen or something like that. So the reality is that you move in mid March, and it takes you to, you know, mid August to get things done. You didn't move in mid March and you were probably fully in and everything was done in July or, you know, who knows really.

Ben Adam-Smith 29:55

There's a pressure I think you can apply back when you're not moving in, no doubt about it. But yeah, I understand it's just life getting in the way a bit.

Guy Hargreaves 30:03

It is.

Ben Adam-Smith 30:05

Who would have predicted, though, that energy prices would increase to the extent that they have done, so what did that feel like? You had a roller coaster ride, but to be in this house now, knowing that you've not only got the renewables here, but you've got the fabric upgraded, you are ready.

Guy Hargreaves 30:26

That's very comforting. I certainly didn't foresee the email I was going to get from EDF this morning, essentially confirming that compared to this time last year my unit electricity price is three times higher. Now, in an uncapped world, I could be looking at energy bills of 9000 or 10,000. And I would say, I'll be a fifth of that. But I should be a lot lower, obviously, if prices were a lot lower. But the running costs, no doubt, will be lower in this scenario. That said the upfront costs, you know, I've put a lot of money into it. So it's you know...

Ben Adam-Smith 31:05

Is there any payback? That's what people always ask.

Guy Hargreaves 31:09

I heard an interesting comment to the old payback argument the other day, and it's like, you know, someone was asked what the payback on their solar PV was in terms of years. And I think their response was something like, I don't know, what's the payback on your effing kitchen! And so we're

sitting here now in this house, and you know, it's 22 degrees, and it's quite cold outside and the next door room is 22 degrees. And there's only really one hot room in the house! And so what value (is) comfort? I think probably in some respects the people I'm feeling most envious about today are those who have 10 kilowatts of solar PV on their roofs, who barely are going to face a single, you know... Because I've got rid of gas, we're all electricity. But we've got a heat pump, it's a very good efficient heat pump, and it heats and cools the house and also heats the hot water. So that will cost very little to run. We don't have any heating per se in the house. Apart from that, we charge the car. That's probably, I'd say, a third of our energy usage, to be honest, charging the car.

Ben Adam-Smith 32:16

What other benefits have you felt from upgrading your property?

Guy Hargreaves 32:24

I could literally walk around this property in shorts and a t-shirt almost all year!

Ben Adam-Smith 32:29

You've taken me back to the first day when I met you, and all the doors were closed and coming from a Passivhaus where you don't even think about... I was thinking why all these doors closed? But it was a refuge.

Guy Hargreaves 32:39

Yeah exactly. So the comfort levels are just an immense benefit. The quietness of the house is incredible. The stillness of the property because of the lack of draughts and the like in it.

Guy Hargreaves 32:58

I'm going to enjoy the next year because I always anticipated this kind of learning curve, you know, and I've got all these toys if you like. I've got this mechanical ventilation system, and I've got this heating system, and I've got these electric towel rails, and I've got this heat pump, and I've got a control system, and I've got to try and make it work. And I've got to learn how to run this house in different conditions. I think this house will be a different house to run in winter versus summer, because I think we've opened ourselves up to potentially using a lot more solar gain in winter. But that's going to be a learning exercise. And I think that's one thing I'm looking forward to, being on that journey.

Ben Adam-Smith 33:39

What lessons have you learned that we haven't touched on?

Guy Hargreaves 33:43

I've been through building processes before and so a lot of this is almost self reinforcing. I think the importance of having a builder that you can communicate with, trying to have a stable relationship with the builder. Try and avoid the jelly, screamy, ups and downs, because changing your builder is vastly complicated process and it's made even more so when you're halfway through a Passivhaus. And you wouldn't find another builder to want to take it on. So having a strong relationship with the builder is super important. Listen to your experts, they'll guide you through the process. Things always take longer than they're projected. I think that's almost a truism.

Guy Hargreaves 34:28

I mean, what I've learned in the last two, three weeks, is that there is an enormous appetite in Oxford, and I think probably UK wide for all or some or most or half of the things that we've done to our property out there in the community. And I know that because we had an open home two Sundays ago and in four hours we had 76 people through. I just was overwhelmed with the interest and the quality of the questions. And we have these open home weeks and open weeks in Oxford and lots of places around the UK. And often you go to some property to see their triple glazed windows, or you might go to some other property to see their air source heat pump. And you come to our property now to see kind of everything. We haven't got solar PV on the roof. And that was mainly an overt decision by me that really the only roof that was suitable for it was the top roof. And that was only going to give us a couple of watts, or kilowatts of potential solar. And I didn't think that that was worth the trouble, to be honest. But given everything else that we were doing, was just probably the straw that broke the camel's back. But apart from that, we've had a go at everything. And I think that's what attracted people to come and want to have a look around. But you know, my message is much more longer term that. We need to be future proofing our houses for a much less hospitable climate. And I like to think that that's what I've had a decent go at doing.

Ben Adam-Smith 36:01

Well a massive thank you to you for also let us film throughout for our Hub videos. And I have learned a ton as well. Congratulations. And once again thank you.

Guy Hargreaves 36:15

Thanks very much, Ben. It's been a pleasure having you on the site, actually. And I do appreciate the record you've kept of the progress that we've made and the bumps along the way. And I'm looking forward to seeing the remaining videos coming up.

Ben Adam-Smith 36:32

Head online to take a look at the show notes that accompany this session - houseplanninghelp.com/322. You can review the main learning points. Once again, we always give you that summary. Check out some photos as well, so you can get some visuals on what we have just been talking about. And of course, you can go in-depth in The Hub. We'll give you a link to do that too - houseplanninghelp.com/322. And a big thank you to both Eco Design Consultants and Equus for letting us muscle in on the action as well.

Ben Adam-Smith 37:07

My call to action today is to check out our membership community, The Hub, where we just added a new course. This one is on build systems. So what approach are you going to take to your house construction? Do you know them all to begin with? What's interesting is there aren't absolutely 1000s of them. It's really only a handful of approaches and a few very specialist approaches. So we look at that, the pros and cons. Why is masonry cavity wall such a big deal in England, Wales, Northern Ireland, but in Scotland it's all about timber frame? And do you delegate this decision to your architect or is this one you should do yourself? How do you choose? It's in this course. We put it all together. And also, we've got all the regular stuff: the office hour calls if you want to chat with me, the private members-only

forum, our in-depth video case studies that we've been talking about, live trainings as well. We try and make this a continuation of the learning journey inside The Hub - houseplanninghelp.com/join to find out more.

Ben Adam-Smith 38:09

Next time I'm chatting to Nathan Gambling from Beta Talk, the renewable energy and low carbon heating podcast. We're going to be looking specifically at air source heat pumps and it's another of those topics that we've talked about lots but I don't think we've ever actually focused on it, so about time. Thank you so much for listening. The House Planning Help podcast is produced by Regen Media - content that matters.