HPH324

Ben Adam-Smith 00:00
This is House Planning Help episode 324. 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 00:19
Coming up in this session my guest is Alan Budden from Eco Design Consultants. I've known Alan for a number of years and he's always been at the forefront of Passivhaus in the UK. But his practice has probably carried out more domestic retrofits - I'm talking deep retrofits - than any other I know. And so that's why it's quite interesting to know that he's been at work on his own house, hoping to bring it to EnerPHit standard eventually. And this has all been part of a staged process. So it's over halfway now. And we check in with Alan in a moment.

Ben Adam-Smith 00:53
So I like to start the podcast with a resource when I have one to share. And I don't think I've ever done this before... but I decided to make that resource, my own podcast. What a good idea this is! But particularly an episode that Alan was involved in, going right back into the archive. And this is why I bring it up, because it's a long time ago but the topic was so good, so important, so relevant. The title of the episode was 'how simple design decisions can impact on energy performance' and I'll tease a couple of bits within that podcast. We talk about the shape of the building and how that can make a difference. Alan goes on to compare a few different shapes of building. And ultimately, what this is adding up to is your building costs - it's going to increase with more complexity. And then the other topic was around windows and why it makes sense to minimise the amount of framing that you use. So he goes into all of that, a really good episode, houseplanninghelp.com/65, to go back in time. But we'll also link that into today's show notes.

Ben Adam-Smith 02:00
Let's get to our featured interview today with Alan. And there's something satisfying about seeing people practice what they preach. Alan is midway through a phased retrofit of his own home. But I was interested to hear that more of his clients were also going down this staged route.

Alan Budden 02:19
The clients' age group is changing a little bit now. A lot of it were early retirees or about to retire, that sort of age, the baby boomers, now it's becoming much younger families. But unfortunately, they've got less budget, which is understandable. And now we're looking much more into doing retrofit by stages, so that we make sure we've got the whole house plan for the whole house considered. So you know, everything's going to be spot on in terms of the retrofit. And this isn't going to cause any issues. And you also, you're optimising each of those areas, but maybe not doing it all in one go, so maybe like I'm

doing here to be honest, I mean, very same reasons, didn't have the money so had to do the first floor, in the first go then later on moved downstairs, we're just about to start downstairs, doing the lower floor.

Ben Adam-Smith 03:08
Maybe you could run through the pros and cons of just doing the whole thing all in one go versus this staged business. Why is it different?

Alan Budden 03:18
Doing it in one go would be way easier and cheaper overall, to be honest. There's lots of junctions you have to consider in terms of how it's going to be weathered and work during that stage, if it could be six months, it could be 10 years between stages. So that's one of the issues. So you end up detailing things, the final construction detailing it back, and then you've got trades so an electrician is going to be much more expensive if he has to come back three times rather than maybe can do it all in two days. So there's lots of bits like that, and disruption and everything else. It's just there's more of it and longer.

Ben Adam-Smith 03:53
So you don't really choose to do a staged retrofit. It's making progress with the money that you have.

Alan Budden 04:00
It is. I think that's the only reason really, you would do that. The other thing with stage retrofit, you could potentially move around the house a little bit more. So you could potentially stay in place a little bit and move from one area to another if you've got a big enough house as well. Sometimes it's just not possible.

Ben Adam-Smith 04:15
When did you decide that you wanted to do a retrofit?

Alan Budden 04:19
I think not long after I moved in the house about 18 years ago! At that stage, we did have single... Well, we still have downstairs single-glazed windows and I did to replace them and it was very much, I don't just want to go for double-glazed I want to go to triple. So let's start saving and it's gone from there really.

Ben Adam-Smith 04:38
And when did it get serious then because you being in the business and specialising in this, did you have plans right in the early days of what you would like to do?

Alan Budden 04:48
I put a planning application in to do the changes, how long ago would that be? Well I had to renew the planning once and the second one was then extended because of COVID and then we just felt we had to get on with it. And to be honest, it was held up partly because I wanted to do the drawings myself rather than put it through the company. So I thought that was the best ethical way of doing it and wanted to do... So evenings and weekends were short, so I didn't have much time to do the detailing and stuff. So it took longer. So that was what, five years, six years?

Ben Adam-Smith 05:20
You mentioned planning as well. Have you changed the house a lot or would you always need planning regardless?

Alan Budden 05:26
We have. I mean, that was one of the decisions early on, was that though we're going to retrofit the house and do lovely insulation and stuff, I wanted at that stage to make the house a little bit different to the ones in the street, just so that an estate agent would look at it and say, yeah, it's bigger, it is worth more. So I could add a bit of value at the same time. And also we added a dressing room and extended the ensuite and stuff upstairs, where the first floor was slightly smaller than the ground floor. And so we took over a loft area above our utility room and squared up the building. So the form factor got better. So the Passivhaus is better. So that was where we added some space. We also added a mezzanine in my son's bedroom. That was partly through the use of some innovative roof panels, which we'll maybe talk about a bit later. That meant that we could take out the roof trusses in that room and gain a bit of space there as well.

Ben Adam-Smith 06:22
So the early stages then, before we come to the roof, I know that that again, that's another opportunity that you had. But what do you need to do? What are those first steps of the retrofit?

Alan Budden 06:35
The first step really is to plan what you want to do as the end goal. So the architectural layout, and so forth. So like I said, trying to simplify the shape, if you can, looking at the future, seeing how you might want to live in the house. Because to be honest doing this work, this is now a house for life. We don't think we'll be moving, but who knows.

Alan Budden 06:54
The second step is then the PHPP, working up what standard, how we're going to get there - to the EnerPHit standard - what that means in terms of insulation, windows, and all the areas. So a lot of time doing that. I then spent a fair bit of time optimising it and looking at the costs of various materials, and trying to optimise that and looking at the embodied carbon as well to try and see which insulations will be better where. So I looked at some interesting things with the external wall upstairs, which is on a... timber frame work projects off the wall with GRP brackets with just ordinary cavity wall insulation inside. So I've looked at the DriTherm 32, the DriTherm 36 and a couple of others, so it's different types of mineral wool. And as it was less... the thermal conductivity was worse, the density was less, and the embodied carbon was less and the cost was less. So trying to optimise how thick the insulation was, and which ones I used was quite interesting. And depending on what sort of brackets I could get as well for the timber frame. So it was quite a complex lot of options I looked through to try and do that.

Alan Budden 08:00
And all of this in your spare time, did you say?

Alan Budden 08:02

It was. Yes

Ben Adam-Smith 08:03
That's your weekend project!

Alan Budden 08:05
Weekends and evenings, yes.

Ben Adam-Smith 08:06
Just to continue from work with something completely different!

Alan Budden 08:09
Yes.

Ben Adam-Smith 08:10
So how long did that take you then to get a comprehensive plan? Or can you do it piecemeal?

Alan Budden 08:16
It took several years, I think! That was the reason why the planning kept getting extended, because it was just trying to find the time to do that. And life gets in the way.

Ben Adam-Smith 08:27
That's it as well because am I right in saying you stayed put? Or is there any part that you did move out?

Alan Budden 08:33
No, no, we've stayed put throughout. Most of the works in the first phase were external anyway, so we could stay within the house. There was a bit with the roof that was a bit cold and wet. But that was okay.

Ben Adam-Smith 08:45
I've been here a couple of times when different things have been done. But what were the first things and then logically, when we get to our roof panels, we can dig into that a bit.

Alan Budden 08:55
The first thing really upstairs was sorting out the extension. So we took the roof off the utility room and extended up. So extending up the walls, stripping back the roof, membrane over the top of the roof. Then it was the windows. So we replaced the windows on the first floor. We then did an airtightness membrane around the first floor. Now that was the Siga Majpell 500. So it's a stick-on airtightness membrane, which was I think one the first times it had been in the UK. It's been used a lot in America. It's in feet unfortunately so it's a bit more difficult to measure. But anyway it worked quite nicely.

Ben Adam-Smith 09:30
And you're getting involved in some of this?

Alan Budden 09:32
Yes, well to be honest, we did a lot of that ourselves. I took opportunities where we thought, okay, that's something that we can do as a family. And also that's going to save us some money so we can stretch the budget a bit further and we can hopefully go a little bit further in terms of the retrofit, Maybe also because of the delays on the roof there was going to be a delay in the programme anyway. So we put on the membrane on the outside ourselves over the weekends from the scaffolding. And the builders then came and put the brackets on and the timber framework. And then we filled it with insulation. And then we did the membranes on the outside of that.

Ben Adam-Smith 10:11
Going between you and the builder, does that all just fall together nicely? Or was it slightly confusing?

Alan Budden 10:16
It did. It was difficult because... We had a good builder and he was happy to slow things down, and a lot of time we just had one person on site doing stuff, which maybe wasn't great for him in terms of economics and stuff but it worked for us. And that was mainly because of the roof being delayed. And so we could continue on things slowly. But it meant paying a lot of money on scaffolding. We had scaffolding for over a year, which the scaffolder taking it down wasn't happy because it was all rusted!

Ben Adam-Smith 10:45
Rusted on? Is that one of the downsides? That must be part of the scaffolding trade, though.

Alan Budden 10:52
Yeah, I think it is. But I think it was a scaffolder complaining that it was going to take longer and then a bit more hard work to get them off, I think.

Ben Adam-Smith 10:59
So this roof then, tell us about this idea and your involvement?

Alan Budden 11:03
Yeah, this is something that I've been working on a long time to be honest with a group of other colleagues and companies. [It was an] Innovate UK project, developing a structural roof panel that includes PV and some solar thermal, using that to heat the house and do other bits and pieces. So we've done some early experimental stuff. And that went fairly well. And then we got a second round of funding to do some test panels. And that was being developed and kind of halfway through, I put my hand up and said, yeah, okay, I'll have the test panels. And you can use my house as the first test house, because I was looking to do very similar things to my house anyway. So it meant that I could have the roof panels, and that helped with the economy of things. But also, it meant that we could trial it and I could really find out if this thing works, how it works, and not risk it on a client's house.

Alan Budden 11:51
There was a few issues with the panels that meant that it was delayed, partly COVID. So there was issues with COVID stretching things out, and also issues about some of the technology underneath it to

cool the panels that didn't work as we'd planned. And we tried various other ways. And the cooling bit isn't working at the moment. And I'm hoping - we're making some new panels shortly - to lift two of the panels off and replace them in the new year. So we can get that plumbed in, and we can see how much energy that's also reaping from the roof and how that's helping to improve the performance of the PV.

Ben Adam-Smith 12:26
So why is it a good idea to have all these things together? That must have been part of the idea of combining them?

Alan Budden 12:32
Yeah, I mean, the great thing was... I think you here, Ben, when we put them on...

Ben Adam-Smith 12:36
I'm just asking, just to recap. I know the answer!

Alan Budden 12:39
I mean, we got the panels on in a day, which is fantastic. And it means that if these panels are being lifted on with a crane, all in a day, there's reduced health and safety issues. There's not people working at height for any length of time. It means that it's all carefully manufactured and made properly. And it means that hopefully we can retrofit houses quickly and easily without disruption moving forward. But also combining together just helps bring some of that economy of scale, we're hoping, in terms of parts of the element doing more than one job. So it's the structure and it's doing the PV and other things all in one go.

Ben Adam-Smith 13:16
And are things moving that way to more off site? Or does cost then mean that people are just out in the elements trying to save money? You know, where's the balance there?

Alan Budden 13:26
It is incredibly difficult, because yes, the quality is up, it should be quicker to build and all those things. But you start looking at some of the companies now who are doing a lot of off site manufacture, and a lot of them are failing and going under. And you kind of wonder why? Because you think it would make so much sense. But in some ways building on site is cheapest, no overhead, little overheads. There's no storage and delays of big containers being needed later. And some of those things that make it difficult. It's a shame because I think it is the way forward. And I think that's what we need to be doing. But there's possibly a middle ground.

Ben Adam-Smith 14:06
Yeah, there are pros and cons with everything, aren't there. So, the panels go on. You have to support them along the ridge so you can lift them on quickly. You made a few adjustments, didn't you?

Alan Budden 14:17
Yeah, in terms of the house, most of the panels could just sit on top of the existing trusses. So it's the same weight as the tiles, so there's no additional weight so they can just sit on the existing trusses.

Before we fitted it we put an airtightness membrane over to keep it waterproof and airtight. And a batten just below the ridge, which allowed the panel to sit on to when it was lowered in place before it was bolted in place.

Ben Adam-Smith 14:39
Maybe I'll come in with another question there on this airtightness membrane. So it can be exposed to the elements for a while? Is that is that correct? Because I've actually come across another... Even this weekend, I've been talking to someone who's done something very similar and I thought, Alan, you're crazy doing this but is this quite common? Or not common, but...

Alan Budden 15:02
No! Genuinely the manufacturers would suggest it was done within a month, up to three months at a push. My roof was left exposed for just over six, including the winter, which is not the best of times, which meant that I was getting condensation forming on the inside because the insulation was planned to be put on the outside and I had some insulation left in the loft to keep us a little bit warm in the winter. So I was having to mop it down, which shows you really, the amount of water I was taking off was quite considerable. At the worst times, I almost had a bucket full of water. I was at the end of it with my mop! And it does show you how much moisture you're putting out as a family. And if that's going to condense somewhere that could cause all sorts of problems. Luckily I could see it, I could deal with it. And now obviously that's gone away. But the membrane did survive, including the big storm. I know when the Millennium Dome blew off. The panels were coming the following week. My wife, we both worked from home that day, for obvious reasons. And my wife said the roof's gone, the roof's gone! And she went to have a look and it had blown up and down a little bit. But it was still all in one piece attached at the edges, although this bit had come up. And that was basically stuck on with double-sided sticky tape from Siga, which is fantastic stuff! It really shows how it worked.

Ben Adam-Smith 16:20
In terms of speeding that up, so you were just waiting for your panels? Was that it?

Alan Budden 16:24
That was it really, because of the issues we had with COVID. It just got longer and longer. So yes, we were about six months late on those panels, which is why the whole thing took longer.

Ben Adam-Smith 16:33
And do you think the airtightness membrane deteriorated at all? You're obviously someone who's got good knowledge. Can you tell by looking at it or not really?

Alan Budden 16:42
The colour of it changed slightly. We could see that the lettering was less red. There was a little bit of mould growth as well, from the condensation problem we had inside. That's pretty much gone now. There's still a little bit showing but it's all nice and warm and dry now. So that's not doing anything. So yeah, I'm pretty confident it's okay.

Ben Adam-Smith 17:00

We move on in the retrofit and once you've got that on, is it just a case of externally tidying things up? What else was left to do? Because you've done all the insulation, hadn't you on the outside?

Alan Budden 17:11
Yeah, so we've done the insulation, we've got the membrane on, roof cassettes went on, we then got all that plumbed in and tried all the magic things with that, then insulated at the eaves and the ridge, got the cappings on and those things, got the cladding finished off around it. And that was most of what we did externally. Then after that we did a bay window on the ground floor. So we couldn't do that till the scaffolding was down because it was getting in the way. So that was the next project and then putting the roof back on the garage and things like that where the scaffolding had to go through. So that was quite a weird garage where you could... half roof and half open!

Ben Adam-Smith 17:46
What about ventilation and switching on the MVHR? Was there a logical time for that to be switched on?

Alan Budden 17:54
Yes, I think you want to do it relatively soon after you've made the house airtight and you've got the windows in because there is that build-up of extra moisture and stuff, and also getting the CO□ down. And one of the good things about the roof panels and stuff, we've got lots of monitoring in. So each room, we've got a CO□ monitor and a temperature monitor. So that's been quite interesting to watch how those things have been building up in various rooms. And again, with my roof, because it's moisture happening there. So having the ventilation system early is, I think, really important. The downside of that is you do need to go through more filters because the filters will clog up with the dust and the dirt from both the outside and the inside. So we were then switching it off if the builders were doing anything particularly dusty and dirty. So if they were cutting the cladding or anything in the garage we'd turn the MVHR off for a while while they were doing that.

Ben Adam-Smith 18:47
What about these sensors then? Have you been able to draw any useful information from them yet about the house? Because your strategy, you've still got a few windows, for example that need to be swapped out?

Alan Budden 19:02
Yeah, yeah. So basically all the windows upstairs have been changed because they went within the external insulation so they're opening inwards. On the ground floor we're doing internal insulation because I want to keep some of the brickwork to match some of the other houses in the estate. So those windows can open outward so we can maximise the insulation onto the frames on the insides. So there's a number of windows downstairs still to be done. I did, we did take a few opportunities to insulate some of the windows on the ground floor, for instance outside our small little TV room snug and the downstairs toilet because there's some external cladding there with some vertical battens instead of horizontal just to emphasise... a bit of architecture! And also squeeze in a bit more external insulation. So yeah, there's a number of windows to come.

Alan Budden 19:43
And we split it mainly because there's two different types of windows and they were coming from different factories, and were having different delivery charges so it didn't make sense to necessarily order them the same time. So they were delayed. In fact, by delaying it, it does mean that I've got slightly better windows now for the ground floor. This is the Green Building Store Ultras. Now they've got a new range of slightly slimmer profiles and better performing. We should be getting those in January. One of the things that's happened because of the extended programme is that we've been able to keep going. We weren't necessarily expecting to do the ground floor stuff straightaway but it's kind of carrying on now! And to be honest, because upstairs is so much warmer than downstairs, it's really given us an emphasis to say we need to get this done. You realise the difference. Generally upstairs has been about three to four degrees warmer than downstairs. And that shows all the Passivhaus physics that air moves when there's three to four degrees difference. That's exactly what's been happening.

Ben Adam-Smith 20:43
Can I just go back to the insulation? So you're insulating internally downstairs? Now, I know, generally, you would want to insulate outside unless you have to go internally. So how are you avoiding risk? And you obviously are not concerned for your own house. You've done this enough times now to have a bit of confidence in the insulation strategy and just making sure that moisture is managed.

Alan Budden 21:10
Yeah, that's correct. So in terms of thermal stuff, the cladding on the first floor does go down to window head height, so below the ceiling, so we can have an overlap. So the insulation downstairs will go up into the floor zone. So there's going to be about 600 to a metre overlap, so that's good. With the internal insulation, you need to be quite careful about interstitial condensation, about the moisture moving through the wall. Normally, you're fairly limited on what you can do. In my original calculations, I was only allowing 140 millimetres of insulation, mineral wool between timber studs. As time has gone on new membranes and technologies come around. So we're using the Siga Majrex membrane, which is a new single directional membrane. It works similar to a cactus. First thing the morning there's dew. It will absorb the moisture, and then it will hang on to it for dear life during the day, when it's really sunny. So it's using that type of technology to make sure that moisture can only dry out of the wall and it can't go in. It's been developed for flat roofs and we've used on flat roofs a few times now where we can increase the amount of insulation between the joists, keep it nice and skinny and make it really quite robust. So what that's meant is that we can actually put up to 200 millimetres of insulation internally. I've done my calculations and I think I'm going to do 175, just to give it a bit more space. So I've optimised it a bit there. We're going to do that and trial that. I think my wife hadn't quite realised, when we had the open days and I was saying that we're trialing this on our house, she hadn't realised quite how much experiments I'm doing. But all is good. She's happy.

Ben Adam-Smith 22:43
So what is left then to do because you've done all the major building work now, haven't you? Although I suppose, would you say changing a couple of windows, is that still major building work?

Alan Budden 22:54

Yeah, I think it's almost now over to us to do bits and pieces, weekends and evenings and things. Whereas the windows definitely I want to get some builders in to do that because you want it to be done nice and quickly, and you don't want the wind and everything else getting in. So that's the next major bit of building work to happen. And then basically as a family, we're going to tackle room by room to do internally. So we'll put some studwork up, insulate it, membrane it, re-plasterboard and finish it off. And also on the ground floor, what was going to be phase three that I think might happen at the same time is the floor insulation. The plan is to dig up the screed, put down a phenolic insulation and the board on top. My original calculations show it will be 50mm is needed, 50mm of insulation, and where I measured it in the corners of the living room that was okay. Unfortunately when we went to the bay window and had to dig up some of the screen to strap it down, it was a bit thinner there. So at some point when we do it we'll have to see how much is left and how drastic that might be in terms of digging out more concrete or how that's going to work because I need... the windows have been designed to fit nicely up into the soffit of the first floor and to be nice and flush at ground floor so there's no wriggle room really to move that insulation up or down. Then if it goes up too far the stairs don't work and doors don't work and all sorts of other things. So yeah, that's gonna be fun.

Ben Adam-Smith 24:16
You opened your doors for the Passivhaus open days so what comments were you getting? What were people interested about?

Alan Budden 24:24
All sorts of things from what it's like to be in the house. I mean a lot of people commented on how nice the air quality was, which is through the ventilation and the comfort levels, which I think is the same with all Passivhauses to be honest. Till you go and visit, and so I would highly encourage anyone to go and visit. They really liked the bay window on the outside. I quite liked going around the house and you show them round the back and they say oh this is really nice and you go around the corner and ooooh, this is nice! And again, as we went upstairs, and we looked into my son's bedroom and then to the mezzanine again that was another nice surprise.

Ben Adam-Smith 24:56
Yeah. How would you describe the look on the outside then. How have you updated it architecturally?

Alan Budden 25:02
Our house was brick with a tiled roof. It had two projecting bits, one at the front, one at the back, one round the stair core and one a little projected study bedroom area on the rear that were timber clad with horizontal timber boarding. Some of the other houses in the estate are timber clad on the whole top floor. So, aesthetically, I thought, okay, I can do the whole of the top floor with timber cladding. So it looks like the other houses, but I'll make it a little bit more modern, a little bit more crisp. So we've used black Hardie Plank. So that looks really quite sharp, whereas the other houses were dark brown. And then instead of the tiles on the roof, we've gone for a anthracite grey metal, standing seam roof, which has the PV, thin film PV stuck to it. So again, that looks quite crisp and neat. So on the outside... I've shown people that they think it's a new house. So that's quite nice, I think.

Ben Adam-Smith 25:57

Yeah I think you've done a good job because it doesn't look completely out of place. Yet it's very stylish and you can tell compared to the other ones that it's something modern. So I think that's a great job you've done there.

Ben Adam-Smith 26:10
Okay, let's talk about some of the general themes then for retrofit and cost is one of the ones that I get confused by because you want to do a whole house retrofit, don't you? You can't just do bits, it doesn't really add up to the same thing.

Alan Budden 26:25
That's right. What do you do? Do you maybe not do... I've gone 200mm of external insulation here, do I just do 100? So if I did that, how much would that save me? Okay, that would save me, maybe 1000 pounds on the insulation, maybe a little bit on labour, well that was me to be honest so nothing. So it's not gonna save that much money in terms of the way it's done. So I would do each bit well, and maybe do less of it, which is kind of where we phase it.

Alan Budden 26:52
The other thing that I think in terms of costings and how you look at the overall cost, do think about the add-on costs. So there's maintenance costs that you should be doing anyway. And to be honest, the timber cladding on the house was... I've painted it a couple of times since we've been here but it was shot, it needed replacing. Windows - single glazed, needed doing. So adding insulation at those points makes perfect sense. So you can look at it in terms of the maintenance cycles, and also the benefits, the health benefits and stuff, I'm sure they're going to be much better now we've got a nice, healthy, warm house going forward, that's going to make a huge additional benefit to the cost of it. And what people talk about the payback period, which I think is a questionable thing, isn't it?

Ben Adam-Smith 27:34
Any other tips for good, solid retrofit or maybe learnings from your own projects, because it's different when you do it yourself?

Alan Budden 27:44
It is. Yeah, I think, get a plan and stick to it. One of the bits I'm not enjoying quite so much is in our utility room and kitchen, I had already insulated some of the wall there with 50mm of polystyrene, mainly because at that stage, I was worried about the interstitial condensation. So I was limiting it to what I could do. But because now I'm insulating some on the garage side as well, I can increase the thickness of insulation internally. So I'm having to take out some insulation to put different stuff back in, which is a little bit frustrating to be honest. So get the whole plan done, make sure that works, and then do bits towards it, because that way you're not going to be replacing those bits. So that's definitely something I would say I have learnt from the plan.

Alan Budden 28:24
Look to see what your skills are and what you can do. So airtightness taping and things like that is relatively straightforward. I was also fortunate that our offices are very close and I was working from

home a lot. So I could be here for when the builders had the question. So they'd come and tap on the window and I'd come out and help.

Ben Adam-Smith 28:41
When do you do your airtightness test then when you're doing it like this?

Alan Budden 28:46
Yeah. It's a really difficult one because there's no real time to do it. So I was looking to do this step by step and go to EuroPHit, which is a step by step certification. I'm not sure we are now, partly because it's going to take more time for doing the PHPP and other things, which I'm kind of getting on the build instead. And it's progressing on quicker. So we did an air pressure test as we were working through the first stage so before we put the roof panels on, we did have Paul Jennings come and do a test, partly just to see if we could find any holes that we'd missed and we could put right. It wasn't necessarily about getting a number, though we did tape up some of the windows downstairs with some masking tape and stuff and try and hold those holes and got down to 1.7 which was okay. I was kind of hoping a little bit more than that to be honest. I was hoping it was almost enough to say that the external brickwork was airtight and we were pretty much there. But yeah, so we got down to 1.7. And it did highlight a few bits. We've put those right. So then with the roof panels and everything else on top, I'm hoping it's even better than that now. I'm quite tempted to get him back to do another one, I must admit, but now when we're getting the windows coming from the ground floor, I'm tempted to wait until we've got those windows in then doing it. Most of the airtightness should it be sorted by that point.

Ben Adam-Smith 29:59
And this brings into focus that moment then of what can you do if it was still 1.7 the next time he comes? What can you do? Or have you missed the boat a little bit?

Alan Budden 30:10
I think probably missed the boat most places, which is the issue. That's the same thing as Kinver in terms of programming stuff. That is the biggest risk, and so it is a real attention to detail to make sure you've done stuff where you can.

Ben Adam-Smith 30:22
And more of a risk on phased retrofit?

Alan Budden 30:24
Oh hugely, hugely. That is, by far the biggest, biggest risk. But I did buy a blower door to try and do this stuff. It hasn't been out of the box as much as it should be. One of my regrets, I think, I should have made time and made sure we did it. And then we could see how things were progressing.

Ben Adam-Smith 30:40
But was part of that thinking, I know how to tape and I'm doing this and I can't see any problems. Is that it? Because I mean, you must see enough of this stuff to get a feel for it! I know Paul will never say he can tell by looking at a building what the numbers are going to be.

Alan Budden 30:52
Yeah, there probably was a bit of that and a bit of over-taping and other things. So with the roof being off for so long, I was up there quite a lot taping stuff up and I knew it was right because the water wasn't coming in as well. So there was areas where the water was starting... So I have been over and taped. We've got through rolls and rolls of tape. My son has been doing a lot of taping with me, which is great, but he's a bit sick of it now!

Ben Adam-Smith 31:18
Well, as we wrap this up then, is there any parting thought that could be useful or more tips on retrofit?

Alan Budden 31:27
I'd probably say just make sure you plan it out. I think that's the key thing. So get it all sorted early. And then you can work your way through, look at the phasing as well. So in terms of airtightness, and how membranes and water work together and how that works, and moisture coming through the walls. Just think about all those things. I'd also say, it's probably going to be a house for life if you're doing this. So think about how life might change and maybe think about how the layout of the building might need to adapt in the future. So you do these, you build that in as you go along.

Ben Adam-Smith 32:03
Alan, thank you very much.

Alan Budden 32:04
Thank you, Ben. It's been nice to see you again.

Ben Adam-Smith 32:06
Get more in our show notes, which you can find at houseplanninghelp.com/324. You can review the main information in the summary we provide, also some photos of the work that's being carried out, including those innovative roof panels being put on. If you've got a comment or you'd like to ask a question, you can do that within the show notes. And of course, a link to Eco Design Consultants. So interesting him saying that, in some ways, you've got to think about this deep retrofit as a home for life. That made a lot of sense when he said that. I just thought there's so much work that goes into this, that it's the same as building a house for yourself, you want to appreciate it afterwards. So definitely bear that in mind to houseplanninghelp.com/324.

Ben Adam-Smith 32:55
My call to action is to check out The Hub, which is our membership community. We're always aiming to simplify the self build journey. And we've got a new video that we've put in of our Kinver retrofit. So Alan's practice Eco Design Consultants is behind this as the architects who've been advising. This one sees the big windows go in, so right up at the top of the house. We'll also link in our episode with Guy that we did recently. They're putting in these probably overly large windows, but it's going to look fantastic, out onto all the garden space of these Victorian terraces. That is one great thing about the Victorian terraces, they generally have this, don't they, that the back gardens back onto other gardens. You get this beautiful green space. And that's also on the south side. So at the top of the house, there's no doubt it's going to look spectacular. But how do you do that? These windows are not light. Cue bring

in one of only three cranes in the UK that is capable for the job. And it just makes a really interesting episode to see the work that goes in, all the safety stuff that is paramount on this. Everyone has to disappear away from site when they're lifting these windows in and then making sure that you've secured it one side before you release. So all of that in our latest episode in The Hub - houseplanninghelp.com/join if you want to find out more, including all the courses, the forum and the office hour if you want to have a chat with me.

Ben Adam-Smith 34:18
That's it for today. Next time architect Mark Siddall returns to the podcast and we're going to be looking at some of the impacts of air movement around insulation. This will be why we want to put the insulation in properly! Thank you so much for listening. The House Planning Help podcast is produced by Regen Media - content that matters