

Episode 249

How to create a light and airy contemporary home – with Danny Luhde-Thompson

The show notes: www.houseplanninghelp.com/249

Danny: Well I was actually looking to move back to Wales, this is years and years ago now. I originally come from Wales and it was a very old stone farmhouse with the ice on the inside of the windows.

So one of my first concerns was obviously having lots of insulation and not being cold again. And then when I started looking into it you realise that it's not just the insulation, it's the airtightness, it's the thermal bridging. It's having the windows in the right places and all that sort of thing.

And then the obvious standard that popped up was obviously Passivhaus. And back at that time there were none in this country that I'm aware of, and none of the builders knew anything about it. So obviously if you were going to do it, you had to learn a lot about it yourself.

So I think I bought the Excel spreadsheet, had a quick play and quickly realised it was pretty daunting. Then as things transpired in the end, we decided, with my job in London, we decided to stay here and redevelop our existing house instead.

And part of the reason behind that was I'd spent years trying to make the house perform better, so you put insulation in the loft, that made a huge difference. But then you realised that the concrete floors are just on the earth and they're never going to be warm. And there are so many draughty bits that you just couldn't fix, and in particular I think there was one flat roof section which was a ventilated flat roof which you couldn't actually insulate, and it was just cold and there was absolutely nothing you could do about it. So obviously the idea came about to redevelop the house we have here in Harpenden as a Passivhaus.

Ben: Can you describe the old house?

Danny: It was a sixties bungalow, so it was quite large but sort of very spread out with quite a lot of little rooms and we wanted a more open family space.

Ben: Was this a renovation, or starting again?

Danny: When we originally moved into the house, we did redecorate it and we did renovate it a fair bit. And it's when you do that you realise there's all the compromises that have been made in the building. There's lots of things you can try and fix but fundamentally, like I was saying, the wall to floor junction there's really not a lot you can do about it, bar dig it all out.

So I think at the point where I realised we were going to rebuild it we obviously stopped doing any of the renovation work and put all our efforts into planning a new house. So I think we spent, it must have been five or six years on planning the house that we were going to be in. And we found an architect who we liked the look of their work, very contemporary design. And yeah, that was it!

Ben: How about actually knowing that you're going to be able to do this, because can you just knock down a house and rebuild it?

Danny: Yes, so I'd bought this farmhouse in Wales which I'd originally planned to redevelop and even though it came with planning permission it probably shouldn't really have had a planning permission because nobody had lived there for fifteen years or something. So we already had a big battle with the planning department and it ended up going to full planning committee and we put years of effort and we eventually got our planning permission, then decided we weren't going to move there after all!

So we already knew that building a contemporary home in this area was going to be a bit of a challenge. So the first thing we did was to find a planning consultant who went through the Local Development Plan (LDP) and basically made sure that our house fully complied with their criteria in terms of distances from all the different boundaries, and actually how the house looks is not actually specified in the plan at all. People can object to it...

Ben: Of course it's not! Planning is just eugh...!

Danny: (Laughs) So it was good to submit our planning application knowing that there was no real ground on which it could be refused. And actually, ironically, the local council wanted to refuse it because they said it was a low quality design. And obviously being a

Passivhaus, from my perspective it was the highest possible quality design you could have, in terms of you're supposed to have PV and all this sort of stuff, but in the end if you don't actually need heating it doesn't get any better than that. So I was a bit annoyed that they called it a low quality design, but in the end that didn't matter and it passed first time. But I was very glad to have got a planning consultant involved.

Ben: What was the process then with a planning consultant? Did you just say to them this is what we're trying to do, and then they went away? Or what information did they need from you?

Danny: No, they collaborated with the architect quite closely. So the architect, that was Nicholas Tye at the time, they took on board all the concerns from the planner and moved things around to make sure that it would all fit.

So actually the original house was much further into the garden. So we actually had to bring the house closer towards the road. Actually that was because of the site line with the next door house, and that's because next door's house was actually built in the wrong place. So ironically because we were rebuilding our house we had to move our house to fit in line with their house. So it did make the front of the house a bit compressed in terms of space to park cars and what have you, but we got more garden, so in the end it worked out.

Ben: And the garden is fantastic. We'll maybe talk about that in a second.

So you're also increasing the space, so was it a case that lots of your neighbours were redeveloping their houses so going out wasn't such an issue?

Danny: The house opposite was two storeys and the street next to us, we're at the end of our street, is also two storeys, and actually the adjoining house is one of the two storey houses. So the main thing we had to keep in mind was how tall the house was. It had to be below six and a half metres which is our neighbour's house. Well that's kind of what we aimed at. I don't think there was actually a rule about it but obviously something we wanted to stay below.

And having moved houses a few times before I don't think the Marie Kondo book had come out quite then, but certainly we had got into clearing a lot of stuff from the loft and realising actually we don't use very much of this stuff. So we took the opportunity to say

well actually we don't even need a loft, which means we don't need a pitched roof and what we really wanted was that feeling of space and having the nice tall ceilings, and by having a flat roof we could fit that all in. So I think in the original plan we had I think 2.9 metre downstairs ceiling heights and a little bit less upstairs but that's something that we really wanted.

Ben: And there's certainly a lot of wow factor in the design from just coming in through the front door, being able to see all the way through the house, those tall ceilings. What did you want then, from this contemporary design? What was on the brief?

Danny: Gosh.

Ben: If you can remember!

Danny: (Laughs) I was very involved in the technical aspects of the design. Obviously things like the view all the way through, the welcoming entrance area, but with the bedroom off to the side that you can stick all your coats and things in. So we wanted a very uncluttered sort of very contemporary, simple approach to the house.

And I guess we were trying to minimise the number of materials, so we've got ash floors, we've got some ash cladding and then some colour just to break it up.

We wanted that contemporary, simple feeling, but still be warm and welcoming and able to be lived in by a family. So not too clean or have surfaces which would horribly show fingerprints straight away.

But fortunately my wife and I did a good job of splitting up parts of the brief. So I worked on the fabric and the Passivhaus and the services, and my wife did most of the interior design. I mean along with the architect but she took care of all the finishes and all the things that we were going to put in the house.

Ben: It's always interesting how couples work together. I wasn't sure how I was going to do it with my wife and it all worked very nicely. Were there any moments or would you say once you'd allocated different responsibilities?

Danny: Fortunately I can't remember anything that we had a particular conflict about. I mean maybe the size of the garage! But overall, no it worked out very well.

Ben: Take us through how you decided to build this house then, choose the system that you're going to go with, and some of those choices.

Danny: So I guess we got, once you have planning permission you need to move on to think about, I mean apart from obviously working out how you're going to finance it, moving on to the next stage of the detailed design.

And I think at that point we realised that we needed an architect which had actual experience of doing detailed design of a Passivhaus, and ideally with a certified Passivhaus technician in-house. We had BRE as an external consultant but they're really geared towards much bigger developments, not really single residential houses. But the problem is again when I first started to look at the house in Wales, BRE were the only certifiers in the whole country. That just shows how much it's changed now! Now there must be hundreds and hundreds.

So at the detailed design stage the project moved to Gresford Architects, and then I worked with Fran, their Passivhaus designer, on detailing all of the design. And in fact it was our project manager who recommended Gresford. So we found Mike Jacob and he recommended Gresford as having just built another Passivhaus and they were using the Irish timber frame manufacturers MBC. I loved the simplicity that they could supply, the passive foundation system, and they could deliver the airtight timber frame shell before they got paid. And obviously because they do it all the time they're not even worried about passing. And when I'd first looked at Passivhaus, to me, and having worked on building sites as a child, I could imagine it would be impossible to have an airtight house with traditional builders, just the way they go about things.

Ben: Now, one of the things when you want to go Passivhaus is often those technical details you want to know from the beginning, so did anything have to change with the designs that you had, those initial outline designs?

Danny: Actually the main thing that changed was there was originally a lot of glazing on the south side. So actually the glazing had to be reduced by about 50 percent.

Ben: What? Because you wouldn't know! You wouldn't go in there and feel this house does not have any windows!

Danny: Well the architect to be fair was very clever about making that work. So they took advantage of breaking up, because we had a ten

metre span of glass originally. And they broke it up into two sections. And it makes the spaces feel more distinct. And you know I think they did a very good job of that. And I think the upper level window in the double height space is actually not as tall as the other one. And they all have external blind systems to help with the overheating.

Ben: So how is that controlled then? Is that just when you feel you need to use them, or is it automated?

Danny: They should be automated, so they're connected into a BMS system which I keep meaning to write the programmes for! There are manual override switches, but otherwise it can all be done under computer control. I mean the idea was that the system would know that it's a sunny day the next day and put them down before the sun comes up and then raise them when the sun goes away again. It's very easy to look at a weather forecast and figure out all these things these days.

But actually the house has got so much thermal inertia, or the temperature of the house changes pretty slowly. If it's really sunny you need to get the blinds down, but apart from that it stays pretty constant.

Ben: What other challenges did you have on the build and the specification?

Danny: We originally had a typical M&E contractor to do the heating system, but they'd never done a Passivhaus before and the certifier looked at it and they were very unhappy with it. I think it had a constant hot water loop and they just said that's a no-no in a house like this, because the heat loss from that alone will overheat the house. And so that was maybe the only contractor who wasn't really aware of how you need to go about things differently for a Passivhaus. So in the end I actually did the plumbing design myself. It was a bit of a learning exercise!

Ben: What skills do you bring to the table? You've obviously mentioned writing programmes, and now you're doing the plumbing!

Danny: I'm a programmer by trade, but in terms of plumbing a lot of it comes down to flow and pipe sizes and having a single manifold and then just sizing all the pipes properly, specifying the right levels of insulation. I was keen on actually getting involved and doing some of that myself. So I put on a lot of the insulation, procured a lot of the things. The heat store. One of the things that we wanted

in the house that we had in our old house was actually the log burning stove. That was certainly a bit of a challenge to get working in a Passivhaus.

Ben: So go on then, take me through the process. My wife was quite adamant that we should have something like this and I was definitely reluctant. So what has to happen and how do you look at it now?

Danny: Fortunately there was a Passivhaus certified chimney system, I think it's Schiedel from Germany, so we knew it could be done. But the main problem with having, if you're familiar with having a wood-burning stove in an insulated room, you quickly realise that it will overheat very quickly. So I was looking for a stove that had very little heat output. But the problem is every burning log is a couple of kilowatts so you need two or three burning logs for the fire to keep going so you know the minimum sort of heat output for the stove is around eight kilowatts. And I didn't want any more than two which would be the peak heating load for this house. And the way you get around that is by dumping all the rest of the heat into the water. So we basically went for heat store design, which lets us run the stove for eight or nine hours or so before it all gets too hot. And that actually lets you neatly link in a solar water heating array and then an emergency gas boiler. And it was good fun designing all of that in.

Ben: And how many times have you used it?

Danny: (Laughs) The wood stove, we use in the winter when we're in the house. We use it a few times a week maybe.

Ben: That's pretty good! That's not bad.

Danny: And the gas boiler is basically only used in emergencies, so if it's been dull weather for three days and everyone's had a shower then yes, we put it on for half an hour. But I think we've spent maybe £20 on gas so far this year for example, so it is pretty minimal. I mean in hindsight maybe you would just have an immersion heater and save paying the gas standing charge. But then we're on mains gas so it did seem the sensible thing to have a cheap gas boiler.

Ben: Did you connect to mains gas, or continue the connection just thinking of a future buyer, or something for the house? Were you ever tempted to sever that?

Danny: I think now I'd almost be tempted to say you could get away with a gas bottle, but that's only because I object to paying £10 a month for the standing charge! No. I think looking at the problems you have in the countryside with your LPG tank or oil tanks, things like that. And given the gas mains is only four metres away in the pavement it seems sensible to connect it up. Because there weren't any other Passivhauses that I could go and visit, they didn't really exist. We were very conservative, so for example, I think MBC wanted an extra £1000 to install an underfloor heating system in the concrete slab, which we didn't think we'd need but we did anyway, just in case I got my sums wrong and we'd be in a cold house and I'd be in a lot of trouble with my family.

Ben: How do you use that?

Danny: I think there are twelve zones downstairs and we do use it occasionally in my wife's study, because if you're sitting there working all day it's nice to have that room a little bit warmer. So yes, occasionally but if you ever come to sell the house or whatever, maybe it makes people feel a bit more comfortable with it.

Ben: On our tour around we saw a cat flap, which looked quite a feat of engineering. So if you're doing this back in the day, was it the only cat flap available?

Danny: I was actually quite glad that I found this cat flap because we had several cats and there was absolutely no way that my family were going to give up the cats just to move into an airtight house. There was an American one with lots of magnets that looked like it would be fairly airtight, but when I found the proper one then I knew I had to have it. And in fact I'd bought that pretty much when I found it and we got the cats to play with it while we were staying in our rental house, learning how it worked and seeing if it detected their microchip properly. So that was good fun for the cats!

Ben: And is it exactly the same as a window, that it just all has to be taped in?

Danny: Yes, it comes with its own seals, so you basically cut a hole in the door and then with the right seals and screws, and it's got a massive external bit of insulation and its own triple seal system. It's pretty straight forward to install. Needs to be powered obviously because it's got a motor and a secure locking mechanism, so it's just more of a detailing issue of how you try and hide all the wires

and everything, but I think our electrician did a very good job of that.

Ben: Thinking about a couple of the details, you've got a very compact form I will say in places, but then you come out of your thermal envelope in the garage and also you've got a balcony area upstairs. So what extra work did that give you and what did you learn? Would you have rather had a simple tube form or was it worth all that? You do need your garage I know!

Danny: (Laughs) I mean the cube form, externally it looks very simple and very contemporary, but actually from a thermal point of view it makes it quite complicated, keeping the steels away from the edges, and making all of the insulation detailing work. I mean I know it was a bit of a headache for MBC to figure it all out, but worth persevering and that's one case where I could stand back and let the Passivhaus consultant and the timber frame manufacturer just sort it all out. But yeah, it did take them a few weeks of arguing about it.

Ben: And how has the garden developed, because again it's very impressive. Just lots of hours, as I'm finding with mine.

Danny: Yes, my wife is a garden designer by trade, though obviously so much of her occupation had been spent on the interior of the house that by the time the hard landscaping people came along there was a bit of a rush to actually finalise the design. But no, it was great fun for her to be able to design her own garden and integrate it with the house and the patio and have the sight lines all work.

Ben: Kitchen - I don't know whether this falls under her interior design, but I mean you're going to be living in here as a family so you've got to have your input even if she's guiding a lot of the interior design. You've got concrete worktops.

Danny: Yes, well we both like the Barbican and there was a particular house which we stole quite a lot of details from; an Australian house. The staircase in fact, we went to our architect in fact and said we want our staircase to look exactly like that, and we found a staircase manufacturer and they delivered it exactly like that. So the concrete work surfaces were a way of having that material in our house and in a way that you could touch and feel and use every day.

My brother builds kitchens and my father had actually built the kitchen for our previous bungalow many years ago, which we felt

guilty about ripping out, but we did manage to eBay it, and it lives another day in another house. So my brother normally does very traditional, Welsh farmhouse kitchens, and so it was a bit of fun to come up with a contemporary design to fit in this house.

But yes, we actually mocked it all up chipboard, walked around it a lot to work out the final dimensions and the gaps between all the surfaces, which was actually very, very helpful, before actually casting it.

Ben: Well it sounds like this has all gone swimmingly well. Were there any challenges along the way, or any learnings or anything?

Danny: The electrician had worked on Passivhauses previously, but the plumber and the heating engineer hadn't. But everyone was very collaborative in terms of learning skills with taping things up and what you need to watch, and if anything goes wrong you fix it before you cover it up.

But I think because we spent so much time on the design up front and the architect obviously made sure that we didn't make any egregious mistakes with the spaces. But also with the attention to details from the electrician, it's usually the thing about having all the sockets in the right places, but he was extremely fastidious in making sure that there were enough and that it all worked for us. So I'm actually glad to say that if you do put in the effort up front it can all work out very well.

Ben: And in a couple of places as well, you've been forthright in thinking we don't have to make the final decision now. You were mentioning upstairs in that bathroom for example, maybe you could just outline the changes that you made fairly late on but because you saw something.

Danny: Yeah, I suppose there's two examples of that which I often forget now. The window in my wife's study, when the timber frame went up we actually decided that it wasn't actually vertically tall enough. So I think almost literally someone got out the chainsaw and modified the timber frame in place and we ordered a different sized window to fit it.

Ben: You make that sound so easy! "Got out the chainsaw".

Danny: (Laughs) Literally it was 20 minutes or something!

Ben: And you keep all the airtightness?

Danny: That was probably after the first airtightness test, but obviously we've had several airtightness tests and as I'm sure most people who've done this will have had issues with their airtightness. The first test, you know, you find lots of leaks, and some of them do come back, but it's good fun running around with the depressurisation test isn't it. And then you can hear all the air come hissing in.

There was another example in our bathroom where we had the stud wall up and there's actually a really lovely view to the garden and that was an example of a very late change where we thought oh, we can actually have an interior window in our bathroom, so you can sit on the loo and look all the way out of the bathroom to the garden! And that's worked fantastically well. It's brought more light into that room. The architect spent hours making sure that the sight lines worked to preserve dignity.

Ben: And that big double height space, we might have mentioned it in passing, it's incredibly impressive. Is there anything that you need to think about when you have a space like that?

Danny: In our case there was enough floor area and we made sure that we had all the rooms that worked as we wanted them too. And we did have a sort of one and a half height space in our previous house, which we really liked the different feeling of having that. So that's something that we wanted to keep in the design. And I think as a child, I lived in an army hut and my parents put in a mezzanine floor for the kids to sleep on, so I always remember hanging down from the balcony over the double height space, so for me it was sort of harking back to my childhood a little bit as well.

Ben: What tips would you give to someone coming into this? They're just starting, going out on that research stage. What would you like to say to them?

Danny: Gosh. I mean don't rush into building your house. It does pay to go and visit houses. Go and visit a Passivhaus if you haven't already. See what it feels like. People will be very happy to give you advice and I would say listen to it. I've given advice to people and seen that they haven't taken it, but there's a lot to take in as well. Don't rush, and have a good architect.

Ben: How does it feel at the end of this? How long have you been in?

Danny: I think we've been here for two years now I think. It feels like longer than that. It felt like home very, very quickly. The kids are running around, shouting. We've bashed holes in various things and we're not at the stage of being precious about everything anymore. It's just a lovely house to be in. You can sit in any part of the house, the cats will sit in any part of the house. Even in the winter when there's snow outside on the patio, they'll be curled up just beside the glass window, so they can't feel that cold outside. They're very happy.

Ben: Danny, really appreciated chatting to you today. Thank you very much.

Danny: Thank you very much.