

Episode 239

3 great eco developments in New Zealand – with Matthew Cutler-Welsh

The show notes: www.houseplanninghelp.com/239

Matthew: I'm doing well. I don't know if I was on the board of the Passive House Institute New Zealand last time we spoke, but I've been involved with that for about the last two years.

It's interesting. I think when we first met, neither of us knew much about Passivhaus. We were hearing about it, it was this thing that was being talked about, and here we are you've just built a passivhaus and I'm a board member of the Passive House Institute.

I'm talking more and more about it; I've been to a few conferences, and I'm fascinated by the whole concept.

Unlike you, I don't live in a Passivhaus, far from it. But I do talk to a lot of people about Passivhaus.

Ben: I always think that is one of the difficult things, that you don't want to promote something too much until you've experienced it yourself. Which is one of the reasons I was very keen to make sure, certified Passivhaus, live in it, get a bit of experience. We've been through the winter, we can see it's all working, now just go through the summer.

But it's funny you mention that we've got into it more and more. Even this morning I found a distant relative of mine who I don't come into contact with a massive amount – they're based in Canada – and they're building a Passivhaus. I thought wow, what are the chances? I'm sure they know nothing about what I'm doing.

It obviously is starting to pick up a little bit of momentum.

Work wise as well, you've changed career a little bit, haven't you?

Matthew: Yes. I was working at the Green Building Council here in New Zealand. I was doing Homestar which is sort of our equivalent of LEED or the Code for Sustainable Homes. It was based on those sorts of concepts. So, it was a holistic sustainability tool for the

residential sector where energy efficiency, health and comfort were a part of that, but it also looked at water, waste, the internal environment, all those other aspects as well. So, it was a very broad tool and that's gaining more and more traction in the marketplace here.

Since then, I've done a little bit of building surveying and that taught me about building science. I came across building science as a thing in the last three or four years and I think New Zealand in general is coming across building science as being a thing as well. Which is a really positive step forward for the industry to bring that technical expertise into the architecture world and also the construction and building world.

Because what I've realised is that buildings are complex systems and they're a system of systems, and the more we make them controlled environments on the inside then the more we have to understand how the various aspects of physics, basically, how they all interrelate to each other.

When you get down to things like vapour pressure, relative humidity versus absolute humidity and the changes in temperature on two different sides of different mediums, it actually gets quite complicated. It can be very cool; it's quite exciting. But it's not simply a matter now of throwing some sticks together, putting some windows in, chucking a door on and there's your house. We have to get more detailed into the actual science behind what's going on both inside and outside.

That's led me a little bit to where I am now which is working with Pro Clima, but primarily in a role that is based on education and helping to support both the design industry and also the building industry to understand some of those fundamentals of building science.

Ben: I always find it a little bit upsetting when architectural projects win prizes and you can just tell it's almost entirely aesthetic-driven. To me, it doesn't make any sense. How can you give a building an award? Yes, of course, aesthetics come into it, but I do feel things like having it modelled in PHPP – every building should be modelled in there just so you know what it's doing. That's the missing part, the physics.

And as you say, I don't pretend to understand all of the physics that goes on within a building, but I think you're right. It's just an essential part of what we need to do.

I know today as well, you've brought with you a few examples. Because having made a lot of podcasts with people in the UK, I just thought now is the perfect time, I've finished my project, I can lean back, and we can just see what else is going on around the world.

Do you want to tell us about your first pick, so to speak?

Matthew: Yes, my first pick is called The Living House. This is a friend of mine, Rochelle – I'm sure she won't mind me talking about her house because she is promoting this, as a lot of these houses do, putting them online so they can share the experience with others.

The Living House is unique because Joel and Rochelle are building this house with their own hands – literally. I've seen Joel out on site doing the rammed earth himself. But not only are they going for Passivhaus which is a challenge in itself, they're also doing a Living Building Challenge. They're doing Homestar, which as I mentioned is our equivalent of the Code for Sustainable Homes or LEED and doing any one of those systems is a challenge in itself but doing all of them together is a mammoth task.

But the thing about Rochelle is that she is an engineer by training and she's very detail-oriented and she will chase down products and details to find out everything there is to know about them.

So, this is going to be an amazing home but it's also going to be a great resource for the whole industry. She's already making waves and pushing the boundaries of consenting because it's such a unique house that it is challenging the Council in some aspects. I think it's projects like that, that really do lead the way for others to follow.

Ben: I have to ask – challenging the Council? In what way? Surely, they are just thrilled about what's going on here.

Matthew: You'd hope so. The interesting thing, what I've realised is that anyone who's trying to do a house that is going to perform better, they have an uphill battle usually because it's much easier just to comply with the stock standard way of doing things because it's the path most travelled and it's the path of least resistance for getting permission to do anything.

If you're trying to use a system that isn't common, then all of the responsibility comes back to you as the designer or the home owner to prove to the council that what you're going to do works. The council isn't necessarily going to take PHPP as evidence for that because that's not necessarily what they're concerned about. They're worried about things like are the windows going to leak? Is

water going to get in? Basically, they want to avoid getting sued if something goes wrong. They can do that with acceptable solutions which means the way things are typically done.

So, if you're doing something that falls outside of that because you want to have a house that actually performs really, really well, then you have to put in quite a lot of effort to prove to the Council that the products, systems and how everything fits together is not going to cause them any problems down the track.

But the real way that Rochelle and Joel are rattling a few cages is because of the uber-sustainability of this project, they've made a bit of a case to say, 'look Council, you charge a set fee for things like the supply of water and you also charge people a set fee for the disposal of surface water and drainage from a building site. Because we're doing a Living Building Challenge, if this house has any water that comes off the site, it will actually be cleaner than the water that falls on the site in the first place. The whole thing will be self-sustaining so, it doesn't actually require any of the council utilities that would otherwise be there.' So, they're making a case of why should they have to pay these contribution fees to council utilities that they're not actually going to need because their house is so sustainable.

Ben: I half wanted to ask that, half didn't want to. Anyway, we've gone there and done it.

Let's look at the design then. Quite contemporary – obviously, we'll put a picture in the show notes – however, contemporary with rammed earth. I don't think we've ever looked at a rammed earth project on the podcast before, two-hundred-and-nearly-fifty-odd episodes. Tell me about rammed earth.

Matthew: I can't say that I'm an expert, except that there are some very passionate people and we do have an Association here – I've interviewed them on my podcast a few years back – and there is a building standard for mud bricks here in New Zealand. It goes into quite a lot of detail as to the testing that you require on site to ensure that any bricks that you make, you have to test and they have to be a certain strength.

That's mud bricks. As for rammed earth, I'd have to check with the association that covers that. I think they have similar standards.

It's very sustainable because you're using as much material that's pretty locally sourced and it's a great way to put a lot of your own blood, sweat and tears into a project because it is quite hard work,

but it does mean that you can do it and Joel is actually doing a lot of that himself.

The other key benefit really is the thermal performance of earth walls. You can get an amazing aesthetic and you can get some pretty impressive thermal performance as well.

It's not for everyone in terms of the look and the time required, but it certainly produces a very unique product.

The thing that surprised me when I looked into both mud brick, rammed earth and also some of the modern clay systems as well, is just how resilient they are and how good they are at dealing with humidity. I just thought that they would melt away the first time that they got rained on, but they actually can be a very resilient way of building.

Ben: What about the Living Building Challenge then? That's another area that I don't know very much about. I keep meaning to maybe dig into whoever organises that. How do you get involved in it?

Matthew: It's an international organisation and there are a few buildings now – well, the first one here certified in New Zealand a few years ago which was a Maori whare meeting house – and that was a landmark project because it was the first Living Building Challenge here in New Zealand.

The thing about the Living Building Challenge is that it goes beyond sustainability. That's the way I typically describe it. Sustainable basically is just flat line. It means that you're doing less bad. The philosophy behind the Living Building Challenge is thinking about how can I actually improve the environment by this building being here. So, the building becomes an asset to the ecology and the environment around it. Rather than just taking it as how do I make this building and do less bad to the environment, how can I actually use this building as an integral part of the ecosystem.

I mentioned before about water. One of the typical examples is you try and have the building systems actually cleaning the water so that any run-off from the site is cleaner than the water that comes on to the site in the first place. You can do that by having natural filtration systems and rain gardens and things like that. And then it has these petals so, it deals with energy, it deals with water, it deals with waste, it deals with beauty as well – the aesthetic has also got to be part of the Living Building Challenge.

They also give quite a lot of guidance on the use of the products and materials which is one of the big challenges, particularly for a

little island quite isolated down in the South Pacific like New Zealand, because they encourage you to use as many local materials as possible and they also don't let you use certain materials that are particularly bad for the environment – things like some foams and some polystyrenes they red-list because of the toxicity of the chemicals used in the manufacture of those products.

So, there are some things you have to avoid if you want to have Living Building Challenge certification. I think it's one of the toughest and most rigorous of the certifications to achieve.

Ben: We ought to move on to the next project, but I could ask a lot more on this. Maybe my final question on it will be, how do you coordinate wanting to do Living Building Challenge, Homestar, Passivhaus? I'm assuming it's a bit like a Venn diagram that there are bits that overlap, but how do you do it?

Matthew: Absolutely. That's a good way of describing it. There is overlap. I think the real way is just having an absolute passion and dedication to the cause which is what Rochelle and Joel both have.

Ben: We'll leave it there.

Next project then?

Matthew: There's a house in the Waikato, which is a region in the central North Island, south of Auckland, built by a builder who works for eHaus which is a national brand of Passivhaus building in New Zealand.

The thing that really struck me about this particular licensee of eHaus is something that I've seen a few times now, which is pride. The pride of a builder who's been building for a few years, maybe starting to get a bit tired of building, it's lost its kind of gloss that it had when they started out as an apprentice and a young, keen builder, and then they come across this thing called Passivhaus for some reason – whether it's a client or they hear about it - and they get the chance to build a Passivhaus. And suddenly, it's like they've lit up again.

Like I say, I've seen this a couple of times now where you get these builders who are just re-inspired because suddenly, they've been given the opportunity either by someone or by themselves to go back to the reason why they became a builder in the first place. That's to step back at the end of a project and say, 'I'm proud because I built this. Look, here it is. Come and have a look at it. Come and feel it.'

I went to a presentation by this builder and like a lot of builders, they're a bit bashful, a bit shy. I don't think he even had a PowerPoint presentation; I think he just had a couple of pictures. But that didn't matter because you could see that he was just so proud of this house that he had built, which was just a really beautiful thing.

The house itself is quite stunning. It's a beautiful design. It doesn't look like a passivhaus in that it's just a nice, contemporary house out in some green pastures and farmland in the middle of the North Island. But it was really that passion from the builder, the pride and the beauty of the simplicity of this house that really struck me. That's why I chose that one as well.

Ben: Who is responsible then for not giving these builders any challenges really? That's why they get stuck in a way of doing it, they get given a project – how can we enrich what they do?

Matthew: I think it's a little bit like ripples spreading out in that it grows as more and more people come across Passivhaus – it doesn't even have to be a full certified Passivhaus. It could just be going into a house that's actually working properly and then someone having the confidence to challenge the status quo and say, 'no, I don't want that. I want a house that actually is going to be healthy for my family and it's going to perform well and I'm not going to have to just suck it up and put another jersey on when it's winter time. I'm not going to settle for that. I want something that's actually going to work.' I think the more that happens, the more that will become the expectation.

It's a tough question and it's something that I battle with all the time because I am frustrated and it's easy to get a little bit disheartened by seeing a lot of standard development going on in big subdivisions where it is just stock standard, the cheapest possible build, just get them up.

And it is a bit of a conflicted market as well. All you hear about in the press everywhere is around housing affordability, which is construed to mean how can we get a lot of houses built really cheaply, very quickly. That's what we're up against, stepping back from that and saying what is the purpose of housing and we should be looking at the housing, not just houses. The reason that we need houses is to look after people, so they don't get sick, and ideally that we're looking after the environment as well.

Ben: I find too with what I've done, is that you've got to learn a bit and then implement and find best ways, and then go back to learning.

But I find that hard for a builder who perhaps sometimes might be forced into doing things that he doesn't want to do.

Anyway, we'll leave that there. Did you say that the builder himself had tackled this project, or is there a client as well?

Matthew: This particular one, they've built it and they will run it now as their office, as their show-home. So, it's a self-build in a way but Brown Construction, he's a licensee of eHaus and he has built it. Eventually, they may spend some time in there but they're going to use it as a show-home.

What we're seeing now, there are a few houses that are being built – not necessarily this one – where builders are offering a house that people can kind of try before you buy. Airbnb has made this a little bit easier where you can have a show-home that you don't just go and visit for half an hour, but you can actually spend a night in. I think that's a fantastic idea because I remember when I was looking at cars, they let you have a car for a weekend to try it out. It's kind of ridiculous that we purchase a house based on a half-hour visit.

I think that's a really good step forward as well, for people to be able to go and experience a house and actually try out what it feels like. Because you need at least a twenty-four hour cycle of seeing where the sun is and what happens when it gets cold at night, to see how a house works properly.

Ben: That's always something I've wanted to do, to find a group of people who are happy to live in different places for a few months and then just take them on a tour of some different houses, staying for a month. Get them to note down anything that they feel about it. But you're going to get a much greater sense of what makes a good house.

Anyway, just off the top of my head. I think it might be time to move on. What's your last pick then?

Matthew: The last pick is a project that has been in process since 2013 when they formed their co-housing group. It's down in Dunedin. It's an exciting project in lots of respects, not least of which because it is a co-housing project which means that a group of people have come together that want to share some of the resources. You can create some nice shared green space, you can make use of an area much more efficiently and effectively. But of course, it does present some challenges. In this case, they're looking at building between twenty and twenty-five houses on a five-thousand square metre site which

formerly was a high school. But I think the potential benefits outweigh those challenges.

They're still working through that but they're making really good progress and they've got over some of the big hurdles, particularly the financial ones, got some quite nice design of a series of terraced housing.

I'm just really excited about projects like that, that are not just doing Passivhaus, which is great, but they're also looking at different ways of addressing the affordability issue. The great thing about co-housing in this modern context is the community. I come back to the housing versus houses. Co-housing projects like this really open up the opportunities for creating community and creating housing that works for people. So, I think it's just a really exciting project that could pave the way for other similar projects around the country.

Ben: This has obviously been going for a while, as I think many co-housing projects find themselves. So, is there anything they could do to speed it up? When I talk about co-housing, I always think – because we all know, having gone through projects, even just doing a single house, it can be draining. I'm imagining if you're one of those people who was there on day one in – what did you say, 2012?

Matthew: 2013, yes. I know that in the intervening time there have been a few people who have come and gone on that project.

Ben: It happens, doesn't it?

Matthew: It does.

So, a couple of things. One is that if you are doing a co-housing project then you're not the first, and that's a good thing. There's a global community and I know that a lot of the people who have done projects successfully are really keen to help other projects. That would be the first thing to speed up, to connect with other successful projects from around the world because they're all quite similar. And having been to a few Passivhaus conferences, I know that there are very successful co-housing Passivhaus projects from around the world.

The second part of that is that it doesn't need to speed up necessarily just for the sake of speed. A lot of people go into this knowing that it's going to take time and that's part of ...

Ben: It is sensible. I only say that because it would be lovely to see more of these developments. I know the timing, if you said to a developer,

'here's a piece of land. Let's do a co-housing project there,' they'd probably think, 'no, I can get something up in a year's time and I'll make my money that way.' It would just be lovely to think of them as, 'actually, that's a good decision. Let's have co-housing here.'

Matthew: Yes. Typically, there isn't a developer and that's one of the big differences that's driven by a group who work on the design together. They also figure out the funding themselves. So, you don't have that time pressure from a developer who just wants to get in and get their money out as soon as they can. But I think one of the key things is that it's so much about the process, not just the end product. A lot of people who are interested in co-housing yes, they obviously want to get it built so they can start enjoying it, but good things do take time. So, it doesn't have to be super, super quick just for the sake of being quick.

But I think you raise an important issue, and we are very guilty of this in New Zealand, which is re-inventing the wheel. I think it's really important that more and more we have so much more in common around the world. I mean, we're talking to each other and you and me pretty much can't get further apart geographically. We're on the opposite sides of the ...

Ben: And time wise. I need to let you get to bed. I'm about to go and have my mid-morning coffee.

Matthew: Yes. But I think that's such an important thing to note, that we can learn a lot from what's happening around the world and what's already being done, and that we don't waste time by re-inventing the wheel unnecessarily.

Ben: Tell me about what build system they're using here, if they've got to that stage.

Matthew: There's a lot of prefabrication going on. I think they looked at SIPs.

There's more and more of that available in New Zealand now including some plants that have been setup down in the South Island that are looking at locally produced SIP panels. We're struggling a little bit to get to the scale that we need to in order to really see the benefits of true manufacturing scale here but I'm quietly confident that we will get there; it'll just take a little bit of time and some of these projects to do it successfully with prefabrication.

Ben: Well, I think we'll leave things there. As I mentioned, bed time awaits for you. It's been really fun to look at some projects together and have a chat about them. I think what I've realised in this is



actually you can have a lot more questions up your sleeves here. That first project looks incredible.

We'll link to all of those in today's show notes and hopefully catch up with you again in the not too distant future. It was a good few years since we last had you on the podcast.

Matthew: It has been, yes. We should do it again.

Ben: Good stuff, Matthew. Catch up soon.

Matthew: Thanks Ben.