

Transcription of House Planning Help episode 304

Ben Adam-Smith 00:00

This is House Planning Help Episode 304. Hello, I'm Ben Adam-Smith. And this is the podcast for you if you're interested in self build, because I'm exploring what houses we should be building in the 21st century and trying to break down the major roadblocks that may get in our way. Coming up in this session, my guest is Bruce Bell from Facit Homes, we're going to be discussing digital fabrication.

Ben Adam-Smith 00:26

This podcast is all about building homes. And I hope one day you know, if you're in the early parts of your journey that you will get there. And you may encounter this that you're proud of what you've built, and some friends are coming round. And of course, you've got to tidy up. It's just it's what you need to do each time you discover there's this little it depends who it is some people just oh, well, maybe not as tidy as others. But we've just gone through the most all mighty tidy up, stroke, oh my goodness the garden is going to take 10 years 'how can we make it look mainly finished' process. And the reason being, because we're going to be featured in a magazine, which is all quite exciting. This is almost part of the whole process of building a house. It's a nice conclusion to think that chapter is done. So the photo shoot itself was really good fun. It's pretty much what you expect. I think the one thing that stood out for me was how many things they moved, I just thought that it would be we tidy up there we go. This is our house. But there's a bit of depersonalization that goes on, the odd plant is moved around. And we've seen the finished product, very happy with that. So I look forward to telling you more about that in due course. But yeah, just an exciting thing that if you build a house to get this opportunity, and I'm very grateful for it.

Ben Adam-Smith 01:48

Now let's get on to today's featured interview. It's with Bruce Bell from Facit Homes. And much of what goes on in the construction industry is - if we're totally honest - pretty backwards. So this is an important topic. We've talked about it before. But we're now returning to embracing modern digital manufacturing techniques. And Bruce is just the man to tell us all about it, particularly, because so much of what he does really is just refining and thinking what's working, what's not, and how can we improve the process for next time, because it should be a better service all round, and give a bit of certainty. That's one of the big benefits of going down this route. So I started by asking Bruce to tell me a little bit about his background.

Bruce Bell 02:31

I originally studied industrial design, that was my first degree and I'm very much an industrial designer at heart. And then from studying industrial design, I went to work in architecture. So I actually got a job at Norman Foster's architecture practice in London. So I was working there in the early 2000s for a few years and got very interested in the kind of digital side of construction and architecture. And there were a few projects that I was working on there that gave me glimpses of what the possibilities are. And I started to become interested more in digital fabrication. And at that point, I went and did my master's degree at the Royal College of Art in London. And I very much focused on digital fabrication. And then

from there, I actually started up a fairly traditional small architecture practice with two architects who I'd met at Norman Foster's architects. And we started doing very traditional projects, you know, extensions and refurbishments. And, and then moving on to new build houses, all for private clients. And at that point, I thought there must be an opportunity to take what I'd learned about digital fabrication and apply it to the making of homes. So we started to get some funding from what was then the Greater London Authority had innovation funding programme. And we got some small grants to develop our first proof of concept ideas back in 2006, and 2007. And that culminated in us building our first full size prototype at the Architecture Foundation in London in 2007, where we built a two story section of a building.

Bruce Bell 04:19

So I was still running the architecture practice with my colleagues day to day. And at that point, I'd made a decision that if we wanted to do this, I would have to move on from the architecture practice and just solely focus on what then became Facit Homes. So in 2008, we've established Facit Homes as a kind of entity and I left my architectural practice and decided to solely focus on getting Facit Homes off the ground, if you like.

Ben Adam-Smith 04:48

You've mentioned all sorts of interesting things in there. Let's just rewind to digital. First of all, what does that actually encompass? I know noughts and ones on a basic level, but as we come into construction, are you suggesting a lot of what we do is still analogue?

Bruce Bell 05:03

Construction is overwhelmingly analogue. And there's very few projects, or relatively few projects that I would classify as being digital. And when I talk about digital, I don't just mean that the building has been designed on a computer, because most buildings have been designed on computer for many, many years. Really what digital fabrication is about is using that digital information to directly make components or parts or assemblies. So that direct translation from the 3D computer model into physical parts by computers or computer controlled machines. So that's, again, quite different from ideas around prefabrication, which prefabrication could mean, just things be made by hand in a factory. Really what excites me as an industrial designer is using these techniques, which have been commonplace for probably about 40 years, most consumer products that we buy, have been created from a computer model, where there might be some hand assembly, but the actual formation of the components themselves is direct from computer controlled models, molds or other digital fabrication techniques. So I wanted to apply this existing technology that's found in the manufacturing and industrial manufacturing industry to the making of homes in one way or another.

Ben Adam-Smith 06:29

Does that mean removing people as much as possible? Is that part of it, that we can rely on the computers?

Bruce Bell 06:37

It's different, I think the answer is. It's not about removing people, it's moving people into a different position. So one of the things that the construction industry suffers from is a skill shortage. There's a lack of people who want to be doing very physical, manual tasks. More and more people are educated

these days. And we're as a society becoming a more professional group of people. And you need to create the jobs that are suitable for those people. So the skills shortage is very much a product of the fact that our buildings are still built in a very traditional way. Whereas people want to be educated and professional. So in a way, it's not about removing people, it's about creating jobs that people want to do.

Ben Adam-Smith 07:20

So that does also make life easier if people want to do the work in the first place. Now, I believe you bring this whole process in house, so why?

Bruce Bell 07:32

So one of the things that struck me about working, when I was running the architecture practice, was just the fragmented nature of construction. So we were a small design practice. And then we would have consultants, engineers, various different people on the design team, M & E, all with their own individual interests, then we would have contractor and we'd have other specialist suppliers, and then obviously, we'd have the customer. And in this kind of arrangement, you say, well, who's in charge here? Who's really controlling the situation? And it could be very much influenced by any one party's interests. So you know, maybe the contractor has issues or maybe the client wants to take control too much, or maybe the architect is trying to push themselves around, you know, there was no, it's not a very solid structure. Whereas if you compare it to manufacturing, I like to give the example of aeroplanes is quite a useful one, or even bicycles, where, you know, if you're going to buy a bicycle, you're essentially buying it from the manufacturer. Now, that manufacturer may have only made the frame of the bicycle. And there might be loads of components made by different people on that bicycle, but the manufacturer has got their name on it, and they make sure that it all works as one, and they guarantee the product is going to work to the customer. And so there's a trust and relationship built up between customers and the brand.

Bruce Bell 08:58

So part of my idea was not just about digital fabrication, but about also modeling the business on a more commonplace industrial manufacturing setup, where we would take charge of everything, whether or not we're doing everything ourselves is not quite the case. It's really about one party, managing all of these things for the customer and delivering a kind of guarantee that things are gonna work.

Ben Adam-Smith 09:26

The big difference that you have really is the bespoke nature of all houses. So how has that fit into the equation? Can you find any parallels in industrial manufacture?

Bruce Bell 09:38

Well, that's an interesting question. So this is really a conversation about the difference between prefabrication and digital manufacturing. So the opportunity that I saw was that digital manufacturing is very flexible. It's based on digital tooling as opposed to physical tooling. And when I say physical tooling prefabrication generally relies on a physical space, an assembly line. So you might have wall modules being put together, or roof modules or maybe even whole rooms. And they're very reliant on the physical setup that allows you to make it. And that means they're very standardized. So really the only

people who are the only companies who are producing offsite or modular construction, volumetric construction, have a very standardized product, really due to the requirements of the factory. And what I saw is that the market really wants a lot of differentiation, you know. It's particularly in a country like the UK, where there's a lot of small sites, tricky sites, difficult access, it tends to end up with a lot of differentiation in the market, a lot of different designs and products that are required to satisfy the customers. So prefabrication is always going to have limited appeal to certain customers, whereas digital manufacturing is much more flexible, and will allow us to deliver the requirements of the customer, no matter what the conditions.

Ben Adam-Smith 11:09

Let's go back to the story. You've just set up Facit Homes. How does it evolve from that point? You've got these ideas and, I know, I can tell you're an innovative guy. And I think you have to be in this, the way that you're approaching things. So how did you start off? And what are some of the revelations you've had along the way?

Bruce Bell 11:28

Well, it's been a long journey. So the ideas formulated in 2005, 2006, and then prototyping in 2007, 2008. So at that point, it was like, okay, there's definitely something here, what do we do with it? The development of the company is being staged. So the first projects were really focused around the chassis, the timber frame and the manufacturing side of it. So that was featured on the Grand Designs show back in 2012, it was filmed in 2011. And we were really just trying to show that we could do this at a commercial level, produce one home, and create a business from it. So from that we were able to say, right, actually, we can definitely do this, there's a viable business here. But now we have the confidence to say, let's try and take on the contract as a whole. Because we realized that the manufacturing techniques, and the design techniques that we've developed really add value to the contract as a whole. So they actually give certainty and they give us the confidence to go and take on the whole contract and deliver the whole package for the customer.

Bruce Bell 12:36

So the next projects that we had in 2013 were what you call a turnkey project where we were doing everything from the concept, design, planning, manufacturing, construction, construction management, all the way through to handover to the customer. That was probably the biggest change. We've really honed our business in terms of product development. So we now have a suite of core products, which are the same across the board. So every house has the same heating system, one of two different foundation systems, the same timber frame chassis, same roofing detail, same window system. So we've got the consistency of products throughout each property, which allow us to deliver the projects consistently for a fixed price, but also on time, and things that the customer requires. And during this time of developing these core products, we've also spent a lot of time building up our internal processes in the company so that we can deliver projects. So we spend a lot of time figuring out how we communicate with site, how we transfer information, how we record and cost things. So there are all sorts of other technologies that we've developed, which you would never see from the outside.

Ben Adam-Smith 13:54

What does the customer journey look like then?

Bruce Bell 13:58

At the very beginning we do our site appraisal and customer appraisal, so look at the constraints of the site, look at the customer's brief, and try and marry those things together. Not too dissimilar to what you might find from a traditional architecture practice. But at that point, we're bringing in costing as well. So we have some data-sets and tools that allow us to establish costs at a very, very early stage so that we can develop the brief with the customer and we can make sure that the house is the right size, and it's something that they can afford and that we've assessed all the different attributes that they might want in the building so that we can make sure that we're the right company for them and that they want to go forward. You know, we as a business, we only make money through construction. So there's no point in going through a design process only to find out that we get planning permission and the customer can't afford it. It's very much in our interest to make sure things are clear from the start.

Bruce Bell 14:56

So once we've established a broad budget and the brief with customer, we start designing. So we have a number of architects who work in the business. And this point becomes not too dissimilar to what any good architect will do, looking at the brief understanding the light and the access and the customer requirements, and the views, and all of those things that make a great house. So we develop the design through with the customer's participation. So the idea is that we try not to get ahead of the customer, we try not to assume what they're going to like. So we stage it. And so each step of the way, from concept to working out the layouts in more detail, they get reviewed with the customer. And we build up the project slowly from its strategic layout. And then we end up talking to them about materials and details, and looking at the project in 3D on the computer. That's probably one of the most powerful tools that we have. Because we build everything in 3D, naturally as part of our design process, we have a real time rendering application, which allows us to walk through with light and shade and sunshine and materials, and understand how the building will look and feel. And that's great for both us, the design team and obviously also for the customer. So they really understand what it is they're getting.

Ben Adam-Smith 16:18

Yeah, I have to say I love any visualization techniques, because so often as a client, particularly if it's 2D, it's really hard to completely understand, you get an idea, but to completely understand something and I do remember one change that we made in our kitchen. And the reason that we made that change was because we gone to the kitchen company, and the first thing they do is give you a 3D visualization. And we thought, Oh, hold on, we haven't actually got the space that we thought we had. So I like all of that. Now, because you're fairly innovative in what you do, do you ever have a challenge in convincing people to go down this route? I don't know whether it's insurance or what it might be. But I've heard that a few times of sort of, don't do the new routes, you know, expect trouble if you go down the new route.

Bruce Bell 17:05

I think we did have a lot of that at the beginning. We had a lot of people saying, oh, this doesn't work, it's you know, you don't know what you're doing. But we're 10 years down the line now. And we are 22 buildings, 22 homes that we've built. And all of that stuff kind of washes away when you can say, it does work. And we've got incredibly good engineers, and an incredibly rigorous process in terms of our design approval process. So we are very risk averse as a business because building is risky. And we

don't want to be doing anything, we don't want to be building homes, that customers come back and say they leak or windows don't work or whatever it happens to be. So from a very technical perspective, in terms of building insurances and warranties, and all of that stuff, it's very much buttoned down. We don't have problems with that. And also from a customer's perspective in terms of trust, I think people come to us and they're excited about what we do. And they naturally trust us because we've got a track record. And we can say, well, we've done this and go and speak to our previous customers and see what they think about us. So it's not really a problem for us, I'd have to say.

Ben Adam-Smith 18:14

Is it classed as a timber frame building? You know, when it comes to insurance and things like that, how is it... Maybe you could describe a few more details around the construction?

Bruce Bell 18:24

Yeah, from a technical perspective, actually what we do is not revolutionary. You know, we're using very tried and tested methodologies for things like breather membranes and ventilated cladding, and the structural principles of how the house stands up, you know, all of this stuff is quite traditional. There's nothing in it, that's particularly revolutionary. The way that we change things is the design and digitization process, rather than the technical application of how the building works. So from that perspective, it's fairly straightforward.

Ben Adam-Smith 18:59

Yeah, visually, in my mind, again this is where a diagram would be quite good. But we can link some things into the show notes so people can have a look. I know that you've got some nice videos, and you mentioned the Grand Designs one. That is actually a house that we visited back in the early days of House Planning Help, and I went to interview Diana, lovely house really nice. And what I always love is when you get a beautiful piece of architecture like that, and then you look around at the neighbours and some interesting houses down that street.

Ben Adam-Smith 19:26

When we're talking about sustainability then, can you quantify the kilowatt hours per metre squared? And how are you driving that forwards, all that sort of thing?

Bruce Bell 19:37

So our environmental approach is quite holistic. So we look at all aspects of sustainability - and we always have done - right from the outset that was a real key factor in the business and how we would approach things. So we have looked at everything from embodied energy to the manufacturing process, transport, as well as the operational energy use of the property. So in terms of those things, from the materials perspective, we choose materials that have a low embodied energy. So materials that have not used a lot of energy in their creation.

Bruce Bell 20:13

But things like insulation, if you go look at insulation, and you look at the embodied energy, there's a huge discrepancy between, actually what the choice came down to for us was between polyurethane insulation, and polystyrene insulation. So polystyrene insulation uses only about 5% of the energy that

polyurethane insulation uses in its creation. So that really helped inform the choices for all of the products that we use.

Ben Adam-Smith 20:42

But that's oil-based, is that correct?

Bruce Bell 20:45

Yeah, they're both oil based. And we had to move from a cellulose fibre insulation, which we used in our first project.

Ben Adam-Smith 20:53

Oh interesting.

Bruce Bell 20:54

And because we couldn't get the consistency in the installation. So we were having trouble just getting this physical stuff into the walls, because it's quite clumpy - a technical term! - and the cellulose fibre, you have to blow it in, and it's a bit like cotton wool or something, it's quite dense. And if it clumps when you're trying to blow it in, you don't necessarily fill the cavity. So if you're not guaranteeing that you're filling the cavities that you're doing, and they're also prone to a bit of settlement as well, a few years down the line you might not get the full performance. So you've got to look at the whole and say, well, it's all very well using a slightly more sustainable material in its source but the operational use, in terms of how much energy we could save, far outweighs it. So you've got to weigh both things up. And it was quite a hard choice, probably that one to move from cellulose fibre. But the next best thing we could find on the market was eco bead, which is a graphite treated polystyrene bead. It's got a much better flow rate. So it installs more consistency, it fills volumes better. And it's got a slightly improved thermal performance. But it's only got 5% of the embodied energy of polyurethane insulation. So those are the kind of complexities of things that we have to weigh up. It's not that straightforward. And quite often we find the products, which say that they're environmentally friendly, once you scrutinize it, do a little bit of maths on it, it doesn't always hold up. So we very much approach things from a kind of data driven direction.

Bruce Bell 22:29

And then for the house itself, we take an approach, which is what we call environmentally optimized. So we take aspects from Passivhaus, but we're not going for full Passivhaus certification. So that means that we've got a super insulated envelope, which is to Passivhaus standard, which is a fairly simple thing to do. Whereas the airtightness, we get a very good airtightness score between 1.2 and 2.2, as opposed to the building regulations, which is about 10. But we're not down to Passivhaus standard 0.6 because the additional cost to the customer to achieve that level, the difference in energy usage and how much cost they will save over time is negligible. So we try and balance these things out. Plus, the certification for Passivhaus just doesn't always work, depending on the design of the building. To get full Passivhaus certification, you very much have to be designing your home as a Passivhaus from the start. And it really affects the way that the building is orientated and the size of the openings and all sorts of things. And quite frankly our buildings already have enough constraints. They are quite often in

urban situations where we're responding to all sorts of different design parameters. So it's just not realistic, I don't think.

Ben Adam-Smith 23:51

So when you plan for the future, what does it look like increasing your sustainability credentials?

Bruce Bell 23:59

We keep assessing the best products on the market. So at the moment, there's a big move to air source heat pumps. So we've installed a few of them on our recent projects, as opposed to gas. Photovoltaic panels, we're looking at again at the moment. You're not really getting any feed-in tariffs on the photovoltaic panels, you have to look at it really carefully to make sure you're going to be able to use the energy. I think that the one thing we're waiting for is the battery technology, the home battery technology to just come to market properly. That will change how we can use and create energy. At the moment if you've got PV panels on your property, you're quite often creating energy during the day and most of it is in the summertime. And if you've got no real use for it, you know, it's just going back into the grid, you're not getting much money for it, you're not really changing much. But if you've got the ability to store it in the battery in your home, then you can really make use of that power that you've generated over a longer period. So I think for us the technology is not quite there yet. But again, so we review all of these things. And we're working with a small developer at the moment. And we're looking at direct electric, actually, and how that meets our requirements for the environmental requirements, and also the technical requirements for the Standard Assessment Procedure.

Ben Adam-Smith 25:19

Do you ever do post occupancy evaluation?

Bruce Bell 25:23

We try and get information from our customers in terms of their annual bills. So just a very straightforward, what have you been spending over the last few years? So yeah, yeah, we do try and collate that information. It's not super high tech. But we do do that.

Ben Adam-Smith 25:37

So as time goes on then, what do you find yourself doing? Your head into the office today, is it more of a day-to-day stuff? Or are you looking ahead?

Bruce Bell 25:45

I do a mixture of all sorts of things. Being the head of the business, it really depends on the day. So I still head up all of the research and development in the company. And that goes from product development to technical systems based development. So at the moment, we are working on a new internal wall design with the engineer, we're working on revised window components, as well as our kind of management systems for how we deal with our stage four design tracking, also client decision making, we're building some tools for better tracking of that, like online tools. So I spend a lot of time going through that. But then also I do creative design reviews. So we've got a senior architect who does all of our initial design with the client, but I also I have to review that and make sure that I'm happy that it meets our general standards. I could spend a bit of time doing costing, going through cost plans with

our contracts manager, all sorts of things, recruitment. Every day is different for me. Site visits, client issues, all sorts of things.

Ben Adam-Smith 26:53

And how have you found... When you started this business, have you ended up where you want to be? Or does it look different in another 10 years time?

Bruce Bell 27:05

I think we are ending up where we want to be, finally actually. Interestingly, the last six to seven months have been a real change for us in terms of the growth of the business. We've got a lot more projects coming through on a regular basis that are viable. That's always been the biggest issue for us, it's just getting customers. And that's really down to was making a real concerted effort to change the way we communicate. So we took on a marketing manager, and we spent a lot more time writing good, informative stories, creating information to tell people more about us, using social media. And I think that's really gaining some traction.

Bruce Bell 27:39

So as a business, we're growing, which is great. And we've got some really interesting projects. So I think the business from that perspective is definitely becoming what I always wanted it to be, which is the best possible house builder in the UK, doing really interesting projects, and also continuing to be innovative. So I think we're only really just finally getting to where I wanted to be as a business.

Bruce Bell 28:05

But then on the other hand, I'm still developing ideas for larger application of our manufacturing techniques. I know there's a large potential out there for the way that we operate, especially with the changes in the construction industry. I think we've always been a bit ahead of the curve. So I'm making plans and doing little bits of research for how we might apply what we do to a larger market, be that small developments or larger developments. But I'm doing that in my own time. There's no rush to do that. Because I still think the construction industry as a whole is probably not quite ready for the techniques and the way that we work. But I think it will be in the next probably four years.

Ben Adam-Smith 28:49

And when you innovated and got all these things to work together, are you buying in bits? You've talked a couple of times about developing stuff, but are you actually creating all this stuff yourself? You know what exists on the market versus what do you have to make?

Bruce Bell 29:04

That's a good question. It's a mixture really. So some stuff we create from scratch. So our kind of product catalogue, particularly for the chassis is entirely our own design. The way that we managed to do that uses all sorts of existing bits of software, and also stuff that we have to create ourselves. So we look for products, software products that are on the market, which are quite broad based, which are quite flexible, and that we can manipulate if you like. So if you look at our main software product, which is Autodesk Revit, which is like the next generation of CAD software. It's such a vast program. I mean, you can you could do anything you could build a house like we do, or you could build a billion pound

construction project with it. There's so many different ways that you can use that. So we've basically created from scratch a whole suite of things, of tools, of components of what you call families, standards, methodologies, all sorts of things which exist within this software environment.

Bruce Bell 30:04

So we've not created the software. But we certainly have created a lot of our own content, which we use within that. And I would say that's quite similar across the board. So if you look at our online tools, we use a particular product, which I love, which is Airtable. It's like an online database manipulation program. And you can just do anything with it. We use it for product catalogues, for reporting to site, for all of our financial planning. But you have to create it, you know, you have to actually spend the time creating the tables and links and content and cells and all of that stuff. So that's kind of how we operate. We like these bits of software, that are broad-based that allow us to build systems within them rather than, you know, there's quite a few bits of software out there for contractors that say they do everything from order management to financial planning. I find that those programs are too specific for us. And they're not flexible enough. So we like to build stuff ourselves from scratch.

Ben Adam-Smith 30:21

And then maybe finally, you've obviously committed yourself on a path of digital fabrication. Are there any other aspects of digital that construction can embrace? Or would it follow a similar pattern and path that you've gone down?

Bruce Bell 31:26

Yeah, so I think there are some big questions there. The construction industry as a whole, as I said, is very fragmented. There are certain things that we see need to happen in the industry to overcome this, particularly the connectivity. Building information modeling has become a fairly standard tool in the architecture construction industry, where you can build these amazing, super complicated, super intelligent information based models. Yet, what you can do with that in terms of connecting it to your supply chain is non-existent. I mean, there literally is zero, nothing out there. So for us, we had to create it ourselves. So we've had to create all of our own content. For example, a window, there are window manufacturers components on the internet, and you can go and download them. But they're not built very well, they are inconsistent, they don't really have the manufacturers, all the design options. So you have to rebuild it from scratch with all the information, all the parameters that you need. And then we've built the systems so that we can exchange data with a window manufacturer. So we've had to build that from scratch, that doesn't exist. So for the wider industry to adopt these kind of techniques, that gap needs to be filled. Or alternatively, you're going to see companies who are disruptors, like us, who do everything themselves and create their entire own system and their own framework.

Bruce Bell 32:54

One of the things that Facit Homes does is focus on digital as opposed to prefabrication. And that ends up with some very interesting things happening. So we spend a lot of time looking at the construction site and say, what are the advantages of the construction site? How can we make them better? And how can we digitize them? How can we use digital technology to change the methodologies, communication tools? How we put things together? Everything? How can we change the construction site, rather than saying, we're going to move the construction site into a factory, we say no, how can we

apply technology to the construction site? I think you're gonna see that being widely adopted. And there's some very interesting products that I'm following that are being developed for this kind of connectivity between building information modeling and comparing it against what you're building on site. Also, for us, that's led us - this approach of thinking about digital as opposed to prefab - to look at the manufacturing on site. So we have, as shown in our Grand Designs programme back in 2012, we have our own digital manufacturing CNC machine, which we bring to the construction site, and we feed it digital files, and we do the manufacturing there. And then that is turning everything on its head because it's not really prefabrication because it's not you know, it's made on site. That's not really prefabrication. But it is intelligent, it is digital, it is overcoming a lot of the issues that we have in traditional construction. So we've spent a while actually being off site, doing manufacturing in a factory, and we've come full circle, we're now heavily investing again in bringing that machinery back on site, because we really have seen both ends of how it works and really understand the advantages of both, the pros and cons of being on site and off site. So for us that digital approach, I think you will see being more widely adopted across the industry. You can see people or companies who are heavily investing in modular off site construction, which will grow, but it still will only ever end up being maybe 10% of the market at most, and the still the other 90% of the market who are building things on site. And for me, that's a really exciting area because it's unexplored, you know, nobody's ever really said. What can we do with this? So for me, that's the most interesting bit is traditional construction, how we can change it.

Ben Adam-Smith 35:26

Well keep innovating. It's a fast moving world, full stop, isn't it? So thank you very much for your time today, Bruce.

Bruce Bell 35:33

No problem. Thank you.

Ben Adam-Smith 35:35

Head online to take a look at the show notes that accompany this session houseplanninghelp.com/304 where you can review the key points from our conversation. There are also a few photos to check out so you can see the process for yourself and some completed homes. If you've got a comment, or you'd like to ask a question, you can do that within the show notes or on social media, whatever is your preference. We'll link you to Facit Homes as well. All of this at houseplanninghelp.com/304.

Ben Adam-Smith 36:07

My call to action is to check out The Hub. This is our membership community for people looking to build high performance homes. And it really continues the learning that we're already doing here on the podcast. And we're always adding new bits and pieces as well. So there's a live training from Alan Budden from Eco Design Consultants. And this looks at a retrofit project. It's an EnerPHit Plus. So very high performance, but what has it taken to get there? What are the costs? What are some of the challenges, we look at all of that in the latest live training. And we've now launched our brand new in depth video case study. So what this is, each month we add a new chapter to it. And eventually as we add up all of those chapters, it will go the entire way through the build, so we just look at various different aspects. This first installment we get a tour of the existing property, because this is going to be a retrofit project. It's a Victorian terraced house. So how on earth will we manage that, to upgrade it to

modern performance? We'll take a look at the plans as well - houseplanninghelp.com/join to check out The Hub. We also have our office our calls if there's anything you want to chat through with me. We've got the courses, we've got the forum where you can interact with other like-minded individuals - houseplanninghelp.com/join to find out more.

Ben Adam-Smith 37:29

Next time self-builder Mick Woolley is my guest and we're going to be finding out about his award-winning home Larch Corner, that to come. Thank you so much for listening. The House Planning Help podcast is produced by Regen Media - content that matters.