HOUSE PLANNING HELP

Episode 86

How to Visualise a New House

The show notes: www.houseplanninghelp.com/86

Intro: Dylan Lamar from Green Hammer (in Oregon) is my guest today. I want to find out how we turn ideas into reality and what visual prompts we might have along the way. I'm particularly interested in the role of computer modelling.

We're also going to discuss the design process and what we, as clients, will be expected to do.

I started by asking Dylan how he got into low energy building.

Dylan: I actually kind of stumbled upon the whole Passivhaus movement back in 2003 when I was a grad student in Illinois at the University of Illinois. At that time Katrin Klingenberg, who is now the Director of the Passive House Institute US, was just getting into Passivhaus herself. She had just, was in the process of finishing her own home, built to the Passivhaus standard there in Champaign, Illinois. She taught a term at the university when I was a student there and so we learnt a great deal from her. We learnt to use the PHPP which is the Passive House Planning Package which is the software used to analyse Passivhauses. It analyses the energy performance. So I gobbled it up. I really took to it wildly, and my undergraduate is in civil engineering so I have a strong technical background and I was really eager for something that was a good synthesis of sustainably oriented technical work with the design work of an architect and that was just, it was and has continued to be a perfect marriage for me in terms of my ambitions and such.

Ben: One of the things that I wanted to talk about today was some of the software programmes that you would use at your end, and what we would see as clients, because I'm going to go through this process and I need to engage my own architect. But I'm just really intrigued as to what we see. Let's take it to the beginning of the process when I'm coming, I'm selecting an architect and we've gone ahead. How then do we start to work out what house I need?

Dylan: We start the design process with the client's goals. What are their objectives? And we have a nice interview process for that, a form where people describe what's important to them and everything's

on the table at that point, from mere aesthetics to energy performance goals or other sustainability goals. And it's always the case that people want more than they can afford. That's natural. The real value of what we bring to the table is an ability to synthesise the more general goals that are typical of a house. You know, nice feeling, good daylight, warm, things like that with sustainability goals that tend to be more nuts and bolts, you know analysing the energy performance and that kind of thing. So we do our best to find that middle ground. Yes, so that's where we start, that basic conversation.

Ben: And how long does that go on for? And how does it develop until you go away and start working on it?

Dylan: We usually have one or two interviews and a site visit usually if we have a building site already. We'll talk in detail about the form of the potential building. If it's a retrofit of an existing building then of course it's a little bit different. You've got more to work with there on site so there's more details to talk through and usually your solution is more directed based on what's there. So that might be a period of one or two weeks, something like that.

Then we get to the drawing board and start sketching out some basic ideas. The form that might take could just be hand drawings. I really enjoy doing hand drawings at the early stage, versus going to a computer, just because it allows my ideas to flow more freely. And it might take the form of some computer rendered massing models that you might do in SketchUp for example. We find SketchUp to be a really nice software. I would recommend it to people that are more of a DIY mentality. SketchUp is actually a pretty user friendly programme and there is a free version available, which is of course great.

Ben: Are you saying that SketchUp is something that we can use as clients or it's something that you're going to use to show us some examples of what we might have?

Dylan: Yeah, it's potentially both.

Ben: Hmmm. [Ben laughs.]

Dylan: I'm not going to say that everyone can use it. It does take a certain, you have to have a pretty good mind for geometry and be able to kind of visualise things in three dimensions, but if it's a person that's more or less got that kind of a mind, in a matter of two weeks they can start using it and start building some neat things.

Google at one time bought the SketchUp software and they used it to populate Google Maps with all of these 3D massing models of buildings. When you go through I think Google Earth or Google Maps you can see 3D massing models of buildings that you know, like high schoolers made just for fun. And it's nice because you can put as much detail into it as you want. It can be very rough and just show you the general shape of things or it can, if you're an expert user you can actually render some really detailed things. So it's a nice software that provides that middle ground.

Ben: Is that the programme that I'm likely to have seen before, say for example just a couple of weeks ago when I was out in Sydney I was looking at a new house that was going to be built and you could get a full representation both of inside and outside and you could move around the room. Is that SketchUp?

Dylan: It could have been. I'm not sure though. There are a lot of rendering softwares out there. SketchUp is probably the least sophisticated of them but because it's the least sophisticated it's the most approachable for a novice user. But there are a lot of more highly advanced rendering softwares out there. Revit, which is a common CAD programme that architects use in the US has their own rendering software built in and that kind of thing.

Ben: You mentioned that we might want to do it as, I don't know whether this was more if we thought we were going to build this house with our hands, but why would we want to use it and how would it help us in this whole process?

Dylan: It's good for just basic schematic design. So you can draw floor plans in SketchUp and you can then extrude them and create three dimensional spaces and you can see them on the interior as well as the exterior. So you can really visualise things very nicely that way. You can't create, necessarily, construction drawings from SketchUp. It doesn't have the capacity to really take on something like that unless maybe it's a homeowner building just a small, like one room addition, you might be able to get by with it. But it's more of a visual software and not meant for how you would build.

Ben: I'm guessing there's not one ring to rule them all in this respect, that there's no one programme that does everything, because right at the beginning of this we mentioned PHPP which is all about getting to grips with the energy efficiency and knowing a lot about the fabric of your building. Is that something SketchUp does as well?

Dylan: Well this is interesting because only in the last year or two there's actually a UK organisation affiliated with the Passivhaus Trust that has developed a plugin for SketchUp, called designPH. And this plugin goes into SketchUp and you model the mass of your building, you know the basic shape of the walls, roof, floor etc. and all the windows, all the shading devices on the exterior that are shading windows and all that. And then you run this plugin, designPH, and it basically creates a very simple version of the PHPP analysis within SketchUp. And so it automatically detects shading of windows for example which is a really nice feature that's a big time saver, and it basically gives you some preliminary results. But that's a pretty cursory analysis. It's not highly detailed but what you can then do, and this is the beauty of the programme, is you can then export from SketchUp to the PHPP and it automatically populates the PHPP software with all of the data that came from SketchUp which is a really beautiful thing.

Ben: Just going back to our situation of me coming to you, I'm wanting to build a house, on the whole are people looking at the aesthetics really? How often do they get deep into it? Do you have to guide them for that bit?

Dylan: It ranges all over the board. Our company is called Green Hammer and so we are a design-build company first off. So we both do design and construction and as our name indicates, Green Hammer, we're really focussed on green building so we tend to attract clients that share those values. As far as navigating the aesthetic inclinations of our clients, that's really, it's a skill that comes with time, for an architect to read a client, get a sense of their tastes. Some clients come to the table and they really want you to do all of the design for them and they're just happy to have you do that. Some clients come to the table and they have very specific ideas about what kind of a house they're looking for. I had a client bring me two very thick notebooks of notes he had made about his house over the course of a decade! So he had very particular ideas, so it's always a conversation that's ongoing, and it's different for every project.

Ben: Does it matter to you? How would you define a dream client?

Dylan: A dream client. A dream client would come to the table [Dylan laughs] and tell me he's got unlimited money and he doesn't care what I design!

Ben: [Ben laughs.] So it's the creative scope that you're after there?

Dylan: Yeah yeah. My particular inclinations are a balance between good design and the right thing for the planet. You know, a strong environmental performance. There is always a fixed budget that people come to the table with and for that budget they want particular things, and so the more clarity people can have coming into the process about what's really important to them, the more successful the project's going to be. So, maybe a more realistic dream client is one that comes to the table and has a strong idea of what they're after and is honest about how much money they have.

Ben: I've always wondered about whether I declare how much money I have, because don't architects then build the biggest thing that they can possibly do and it ends up going over budget?

Dylan: [Dylan laughs.] It's always a tricky dance. We are a design-build company so we're sheltered a little bit from that, because very quickly in the process we give a guaranteed maximum price and so it's my company that's going to take the hit. Me as an architect, I have to be a steward of my client's budget so it's actually better that the clients are very honest about what their budget is and usually the budget is a range. Usually someone comes to the table "I'd like to spend this much". We go maybe through the first round of design and will then turn it over to the cost estimator to do the costing and that number usually comes in a little higher than we want it to, that's just the nature of the game.

That's when it really comes down to brass tacks about okay, do we really want this programme, we call it a programme here, I'm not sure what you call it in the UK, in terms of the basic list of the things that people want. You know 3 bedrooms, 2 baths etc. If the cost to build that programme is more than they have then of course you basically have to make a decision, okay do we want to put more money into this or do we want to cut back the programme.

And so because we're an in-house design-build we're not trying to leverage more money out of the client. We're simply, when they come to us and tell us "we want a Passivhaus", some people say "oh you can't do that, Passivhaus adds 10% cost" or something like that. Our approach is to say come to us, tell us your budget. If you want a Passivhaus tell us you want a Passivhaus and we'll design you a Passivhaus to fit that budget. That may mean a reduction in square footage to make that happen but that's the beauty that design-build brings to the process, is that we can integrate across disciplines to deliver design excellence, along with energy performance.

Ben: Okay, just going back a little to when we were talking about coming up with the ideas and doing that, is there always a lead architect? How do you work together as a team?

Dylan: Our company is pretty small so we just have three folks in the design team so there are two of us architects as well as a draughtsperson. And then we also have an interior designer we work closely with on many jobs. So it's pretty straightforward in our company because it's so small one of the two architects will take the lead on the project.

In a bigger firm when you have much bigger projects, if we're talking about large multi-family developments for example, then yeah you might have a number of architects. One is the lead architect, one is the project architect and one is more kind of a project manager type. But for our company, at least on our single family house builds, one of the two architects will take the lead on the job.

Ben: And which programmes will you be using? Just taking you through the whole process, is it very easy that you just stick to SketchUp or PHPP? How many different things are you using and which ones do we see?

Dylan: Interesting. So I often start by hand and it depends a little bit on the basic programme, but I generally start with floor plans that are done by hand because that's very intuitive to me. And it's more approachable for the clients as well. So we'll start there.

Once we have a floor plan that we feel comfortable with I might then put that into SketchUp and render elevations out of it and do a massing model so that we can then fly around the outside of the building.

If we have the budget we might model the interiors in SketchUp as well, but usually it's just the exterior. At that point then we have a floor plan that we feel good about and we have the basic geometry of the thing.

Because we've been doing this a while we have a good sense of the energy performance that we can achieve with that design so at that stage then once the client feels good about that design we'll run the designPH within SketchUp. The client won't see that because it's all technical data. We might show them a snapshot of it just to give them a sense of what we're doing. And then we'll take that into the PHPP and we'll do a very detailed energy analysis.

That's something that's unique, you know that Green Hammer can bring to the table because I am both an architect and a CPHC - a Certified Passive House Consultant. That's getting to be a rather common combination, we can find a lot of those in the US for example. Probably also in the UK.

And so then we run the energy analysis in the PHPP and we'll generate a report from that. And so we'll show the clients maybe a 5 or 6 page report about the energy performance of the house, how much energy is getting lost through windows versus walls etc. And from that we'll make recommendations about okay, do we want to think about changing the window orientation or the size of windows here or there? We always put a big eye to are we at risk of overheating the building. You can very easily overheat a single family Passivhaus if you have too much glazing on the east or west side, so we'll be very mindful of that.

And then once we feel comfortable with the energy numbers and we've kind of gone through an iteration of design changes perhaps, that's pretty much the end of schematic design phase for us. There's usually one or two cycles of that process, you know, you'll go back to the drawing board, design a little different, update the energy model and see how you're doing, that kind of thing.

So then once you arrive at an agreed upon design then that's when we really run a very detailed cost analysis and we look at okay how much is this going to cost to build. Once we get those numbers we basically have a big meeting with the client at that stage. We review the design in detail, the energy performance in detail as well as the cost and then based on where all those things land we'll generally present the client with a few options of how we move forward. For example if it's coming in over budget then here maybe are five items we might recommend about reducing the cost of, or how we might reduce square footage but still maintain the same or even sometimes better design quality, spatial quality of the space. And that's also I think where the magic of an architect can really be valuable, is reducing square footage. It doesn't necessarily mean a reduction in quality of the house. It can often be, with a talented designer, they can do more with less sometimes. And I've found that to be the case on more than one occasion.

Ben: Yes, the number of times I've seen buildings with wasted space where you just think it's counter productive, a huge corridor that you end up walking backwards and forwards or whatever it might be. I'm with you on this. When it gets to site, what are they using to

start building the house? I know you say that you do the whole lot, so they're not taking a computer programme down there?

Dylan: No, no. We print traditional construction drawings that are large sheets of paper and so we have a stack, a drawing set, the builders will build with on site. We are starting to get with the iPad and things like that, some of our construction managers have those on site and they'll be able to pull up a detail more quickly that way. It's a little more portable than lugging around a big drawing set. But for the most part we're still building to a traditional drawing set.

Ben: Do things ever change at that stage, or once you've got those plans out on site that's it?

Dylan: Oh, it never changes! [Dylan and Ben laugh.] Which of course is a lie!

Ben: Or how does it change, maybe that should be my question? How do they change then if you've started on site, what reasons might it change and then how do you do that without messing up everything you've done before?

Dylan: Right. Being a design-build company it's a little more flexible than with a traditional design bid build process. With a traditional process where the architect has a separate entity from the builder, then any time there's a change in the drawings you have to make legal documentation, there has to be a change order if there's a change in price, that kind of thing. It's a more onerous process. With us being in-house design build it's a little more fluid in terms of, well for one we have the builder at the table during the design phase.

So at each stage of design we bring in the construction manager that's going to manage the job and he lends his input on constructability issues and he just has a great mind for what things are going to be costly, areas where we might be able to save some money without compromising the design or energy performance.

So that's in the back end, and really that's probably the most valuable part of a design-build company, is that integration of design and construction management at the early design phase. Because nobody knows it all. Buildings are incredibly complex things and everyone has a different encyclopaedia of information in their head, based on what they've done before. And so the more of those encyclopaedias so to speak you can bring to the design table, the better off the design is. Of course it takes good

communication skills and whatnot, but that's what we're really good at.

So once it gets up to the construction site then all the details have already been vetted by the construction manager. He's already seen everything, he's been a part of developing them so he already knows what's in that set. He knows it through and through, so when we make changes on site it's either something that's requested by the client, you know they change their mind, they want to add a bathroom here or add a tub or something like that.

Ben: How convenient! [Ben laughs.]

Dylan: Yeah, exactly, exactly.

Ben: What? Why now?! We've had all that pre-stage?

Dylan: Yeah. [Dylan laughs.] Other reasons are we get a sub-contractor out there that has a better idea basically. He's like "well okay we could do it that way but here's a better way we could do it." And that's where you have to be careful to make sure they're not just trying to cheapen the design. So you don't want to take their input without really qualifying it. But more often than not we have a very strong relationship with our sub-contractors and they know the kind of quality we expect from them and so when they bring an idea forward it's usually a good one.

So on this last job we're finishing up right now, the Ankeny Row project here in Portland, it's a seven town-house Passivhaus development, we have some steel railings that we had a number of meetings with the architect, the structural engineer, the build manager, and we designed the details of how this steel railing was going to get attached and all that and then once we get on site and once we had a sub-contractor that had bid the job and won it, he came to the table and he said "well you know that works but we could do it a little differently. We could do it this way, it'll be easier and cheaper and maintain the same design quality." So we ended up doing that. Basically we're changing the details with him there at the table and so that's probably the other big reason why we might change something in the field. And of course the other is just you run into unexpected issues on a site, usually involved with the ground. Once you start digging you find things and so you have to adapt.

Ben: We're just getting towards the end of our time but I know that we talked about different bits of software that you might be using. I've

heard BIM mentioned a few times, is this relevant to clients at all, or why would that be used?

Dylan: BIM, meaning Building Information Modelling, is a pretty advanced software that architects use. ArchiCAD is common in Europe I believe and Revit is common in the US, those are the main BIM platforms. That's not going to be something the DIY user is going to be able to use. Those are advanced softwares that take a long time to learn, and they're very expensive as well. So they're more relevant to people that are going to hire an architect, but those programmes are basically, they do what SketchUp does and so much more. They basically for every stick in the building they have a data point on it, they have it modelled visually as well as quantifiably in a schedule that you can print out and send to your lumber supplier, so they're a very detailed software.

Ben: Well Dylan I've really enjoyed our chat today, so thank you so much for coming on to the podcast.

Dylan: Okay, well thank you Ben.