

## Episode 125

# How to create beautiful designs through constraints – with Andrew Michler

The show notes: [www.houseplanninghelp.com/125](http://www.houseplanninghelp.com/125)

Intro: My guest today is author of the book 'Hyperlocalization of Architecture'. Every so often we talk about constraints on a project, and today we're going to make that a focus.

I started by asking Andrew to tell me a little bit about his background.

Andrew: Sure, I live in the Colorado Rocky Mountains. I've lived here for over 20 years off grid and for most of that time I was a builder and did some design work. And then I got into sustainable design early on and ended up writing about that quite a bit for blogs and just completed a book as well as a Passivhaus. So it's the first international certified Passivhaus in Colorado.

Ben: Was it a choice to go off grid or was it just because of where you're located?

Andrew: We live maybe a mile, or a kilometre and a half from the power lines and it made sense financially and technically it was very early in the game so I thought it was an interesting challenge to take on.

Ben: What did you learn when you did it?

Andrew: Energy efficiency is king. That was the lesson. Is that making energy is not so hard but storing it is really hard, and then learning to consume it when you need it is the most vital design part.

Ben: And we're probably going to come back round to your own project because I know that you're either building a second time, in fact you must be if you live in an off-grid house. Where is your location? Have you moved?

Andrew: It's actually the two places are right next to each other. It's really a guest house. The Passivhaus is a guest house even though it's slightly larger than my other house.

Ben: As I say I want to get to that in a little bit, but there's so much here that we can talk about today because we've called this episode 'How to create beautiful design through restraints', but it comes on some of that interesting research from both your book.

So what about the trip? Tell me about some of these places that you went to see.

Andrew: So I travelled to about 6 regions around the world. I went to Japan, Spain, Australia, Seattle area as well and Germany. And I was looking for the way that we're designing contemporary architecture around very deep sustainable goals and different places that did it very well.

So if you can think about in Japan the tiny house movement that's kind of a worldwide phenomenon, the Japanese have done an incredible job of integrating small house design into a genuine lifestyle.

Ben: Did you get an invite to go to a certain place or had you been hunting this down on the internet?

Andrew: This came from a number of years of doing research work and writing, and after a time I could recognise different types of designs. I could recognise the place they were in almost by their design. Even if it was contemporary and very cutting edge, so I thought there was something to that. So the book was really an investigation of that phenomenon.

Ben: Tiny houses – I'm a big fan of them, but what are your thoughts and what you saw in Japan and how they might compare to back in the States?

Andrew: Yeah, they're actually two different things and I think what we call tiny houses here I actually call micro houses because they're smaller. They're usually on wheels here. They're made to be put in back yards often for people who want to live like me – buy a piece of land out in the middle of nowhere and be off the grid.

But what I found out the reason why these Japanese houses are so successful is not only because of the really brilliant design strategies, it's also that they're deeply connected to

neighbourhoods. So functionally just like in any city the neighbourhood becomes the living room so to speak for these families.

Ben: I've always wondered that about tiny houses, because you think that really if you have a tiny house you're probably not going to want to spend as much time in that as if you had a bigger house?

Andrew: You know that's actually true. But if you think about what you actually do in a house you may actually not, especially out here in the US, our houses can be phenomenally large for what we use them for, so much of these houses are under-utilised in the first place, so in Japan or in cities you're just using the commons as part of that space.

Also there's other principles. How people live together changes of course in a tiny house. How do you fit a family of four in say 80m<sup>2</sup>. So privacy becomes different. That's partially cultural and just how we learn to live changes.

Ben: You obviously enjoyed Japan. Was that the highlight or did you take some other lessons from those other regions that you looked at?

Andrew: Australia was actually my highlight simply because of the radical approaches they take towards architecture. They're certainly much more progressive or risk taking, especially in Melbourne. I just got back from Melbourne from the Passivhaus Conference down there and it was just really exciting to see how adaptive they are from a design point of view at trying new ideas constantly. Approaching the same old boring problems in very unique, vivid ways.

Ben: Now you probably can't say all of Australia there. I don't know how much you got out of Melbourne because I'm sure having been to Melbourne I know that it's a very diverse city, but did you get to the Outback?

Andrew: I didn't get to the Outback but Australia is a really big place man!

Ben: Yes, yes. It's probably a bit like the States and North America and yeah, you've got a lot of ground to cover haven't you, so fair play.

Andrew: I do have an Outback house in the book though which is just the sweetest little thing. It's a little cabin called Permanent Camping and it's so tiny that it's really designed to be very lightly sitting on the land and it catches the water and it changes. I called the

chapter Unfolds. Australia Unfolds. And it's how kinetic architecture affects, how you can use kinetic gestures in buildings and that building opens and closes during the season or if there's a brush fire coming through, so there's definitely some beautiful ideas about living out in the wilderness that we can look at.

Ben: Of course Australia have the great landscapes and very different climates as well.

Does good architecture actually change almost as when you go round the world?

Andrew: Good architecture, you know I say that there is no perfect building. That really the best that we can expect is a really good response to the conditions that the building is in. So those conditions can vary both culturally, topologies and of course climate and the use of the building. So every building is very unique in its own way, just depending on what its needs are. So there's great solutions everywhere, but there's also places where there's pockets of many, many great solutions together and that people are learning very quickly from each other.

Ben: I never forget when I first started out on my journey at House Planning Help and doing research I was thinking to myself what I'm going to do is discover the ultimate house and then mass produce that. Because of course that will be brilliant won't it and looking back on it now that was the stupidest thing ever and it just wouldn't work. But I guess in a way that sometimes the challenge that volume house builders, if they ever had enough money to play with, I know they're always trying to extract money out of the projects but that would be what their challenge is I guess.

Andrew: Yeah, their challenge has been of course, well to them it's not really a challenge. They just ignore it.

Ben: Something to sell!

Andrew: Yeah, exactly and they expect you to live within their very prescribed and generic conditions. And especially if you're building your own house, that's the perfect opportunity to go outside of those pre-prescribed ideas of what a house is and explore different ideas that fit your idea of living.

Ben: I know that when we were chatting before, I'm probably going to phrase this really badly, but you said something really interesting to me about a good architect when they approach a building, almost

three quarters of it is designed straight away. How did I do first of all, is that nonsense or is that a good paraphrase?

Andrew: I think it's close to the paraphrase and what I like to think of is that three quarters of, since you're dealing with so many conditions that are existing, that the solution is already three quarters there. You're already dealing with aspects of how the building is sitting on the land, especially in urban where you have design constraints where the street is, or where the sunshine is, or the scale of the house, or the budget of the house. All of these design constraints are already there so what a good designer is somebody who is very adept at creating good housing or buildings in general, basically synthesises those constraints and so that's what that means.

Ben: How did you get to that number of three quarters? Is that just a rough guess?

Andrew: Yeah, I took a scientific survey of course! No, it's totally made up! But it can be between 90% to 50%. Like if I'm out in the wilderness I may have less design constraints than in an urban area, but at the same time if I add design constraints like Passivhaus or materiality or things like that, then I'm adding to that design constraint pile so to speak. At least for me for talking with so many architects in the book that they flourish in those conditions. That that's where, just like many artists or other creative types, they work best under constraints.

Ben: How do they identify these constraints, or is this simple, is this difficult, does it take years of experience?

Andrew: I don't know. I think it's a very personal process. I think it's a process of adapting and bringing both your own personality into the process as well of being very aware of your conditions surrounding you. So in that way that's why you can't just copy one building from one place to another, because you also have different people who have different insights. But in the end it's still about sensitivity and problem solving. So even though you might have two the same conditions and two different people designing it, and they come up with very different solutions, those solutions are still can be just as adept at being viable places to live.

Ben: So that's interesting. Are you saying to me that, let's say this three quarters designed but two different architects would come up with something completely different.

Andrew: Yeah that's right and so you can look at the underlying factors like if I said I want a certified Passivhaus and I want it to fit this type of programme, the buildings themselves on the surface can look very different and even have different ways you use the building, but underneath they still are solving the same problems. So it's sort of like you have a pallet of paints, it's just how you combine those colours for instance, to put it roughly.

Ben: Let's talk about some of the other aspects then, because I know expectations is one that can muddy the water isn't it?

Andrew: I think it always becomes a partnership. The client, that relationship is the beginning of that integrative design process. So everybody wants to be happy in the end. And when I was thinking about this I was understanding that what really works well is when you have a client who has a big idea, rather than lots of little ideas. Because it's those little ideas can contradict each other really quickly and it becomes very expensive and convoluted but a couple of good, clear, big ideas really guides the process. And often that's from the client coming in, not so much the architect, who provides that.

Ben: Can you give me an example then? I don't know whether you can draw anything from the book just off the top of your head?

Andrew: Sure, I'd say like materiality. For me personally and like for my Passivhaus, this is not the book but I can get to how it works in the book. I decided to have no foam in my building, just as a design constraint and that really guided so many other decisions going down the path. And in the book I go up to the Cascadia region which is northern Pacific Northwest, and look at materiality through timber and heavy timber and how that guides design there, especially for larger projects that are popping up all over the place. And that becomes really a core, just the fabric of the building becomes the core driving design element for so many other things to happen inside the building, from finishes to structural to safety to you name it.

Ben: I actually find it quite a difficult area to understand materials. I'm hoping when my own project finally gets there I'll have more of a sense of it, but it really does seem difficult to know if you want something that is sustainable, you don't want your foam or anything like that. There's a lot of marketing blurb to get through and you're never really sure whether one product is that much better than another.

Andrew: Yeah I find materiality really interesting too, because when I first started this path I thought sustainability was about materials for the longest time. So going to the trade shows and everything was all about materials, materials, materials. And then somehow that kind of disappeared for a number of years in my mind.

And then materials is coming back in a big way and the way looking at how design works, and it is so many options out there that it becomes overwhelming, and there's so many contradictions because you know you're right at the front edge of a big sales push so how do you know what works or not.

And I think you have to really, that's experience but it's also something that's very tactile which is very rich. So going and just experiencing and looking at materials and how they're used and utilised is a lot of fun as well. So I think for owners it's a good opportunity to learn.

Ben: You started talking about your project and then I pulled you away from that a little bit. So let's go back. You've got your original, did you build that first one that you went off grid or were you just going off grid in the building that was already there?

Andrew: It was a funky little cabin. It was kind of the edge of the tiny house thing. I think it was about 40m<sup>2</sup> and it was off grid and when I first moved in I was just reminiscing that the first thing that happened was the plumbing froze because I'm in Colorado, and then the homemade compost toilet backed up. And then what else happened, the solar system failed so we started kind of from scratch at that point. So that's where I started really having to learn how to build.

Ben: That's another aspect I think of Passivhaus, that simplicity that you're hoping that the only possible thing that could not work would be the MVHR and then it would be just the very simple fan to fix.

Andrew: It might be really ingrained in me to have so many systems fail so quickly, that yeah the complexity and kind of doing a lot of things not very well was not a really good way. When I started from scratch in the same plot of land which I knew very well at this point, was to really take a completely opposite track and Passivhaus was certainly that.

Ben: That was a guiding principle of this that was going to, like you were saying before, you pick a couple of very core elements of what you want your project to be.

Andrew: Yeah, that's right, that's right. And then also because I'd lived out here for a while, I also had a sense of the land and then tried to integrate a building really elegantly into the space was a wonderful challenge and I learned a lot from the process of research from the book on how to approach that problem.

Ben: I'm thinking that having lived there for such a long time, will that give you an ultimate edge, almost over an architect, because it must be very difficult for them, they just have to interpret the situation looking at it, whereas living on the site. I've wondered about doing that almost as a way to help ease the finances too, just get the lot that I'm looking at and then stay there for a while and then move on with the build. But you must have taken in entirely how the sun comes up, all of these sorts of things, how things go on there?

Andrew: You know, true but at the same time I think an architect who does this all the time for a living. Being a non-professional designer obviously I have a lot of background in it, but at the same time the solution for me was time. Absolutely, that through the a) living in the space and taking my time and building and designing the space as I went along, it's very bespoke so gave me opportunities to do kind of a richer pallet of materials and design decisions.

And I'm fairly happy with how it went but the key was because I had a lot of time to make those decisions. And when I see these really top notch architects go in and develop projects I'm fascinated at how rich and how detailed they are in a relatively short amount of time. So that's really the biggest difference between I think a non-professional and a professional is that time element. And keeping your mind open.

Ben: So fill in some of the details here, we're thinking about your house, we know that it's nearly complete now. So how did that whole journey go, how long have you been at it?

Andrew: Yeah I think we started about 4 years ago on the design phase. And it's just a guest house for family from round the country and my sister has two children, they live abroad so it's a place for them to stay.

So programmically, a friend of mine's child also has MS so I was thinking about how do you bring a wheelchair down to this space for instance. Or as my parents gets older, how do they use the



space. So I want to make it based on more universal design principles.

Certainly I talked about the no foam deal so that certainly became, living in the mountains I just couldn't imagine bringing up truckloads of plastics for instance. That just was counter intuitive to me, and you talked with Bjørn Kierulf about that in one of your podcasts and how he was influenced by cradle to cradle as I was.

Ben: Can you explain a little bit more about that? I know that that one we were really interested in the natural materials, but cradle to cradle, I don't recognise that phrase. I must have forgotten that in between this and when I did the interview.

Andrew: So yeah, your homework assignment after this is to buy the book Cradle to Cradle by William McDonough and Michael Braungart! I've probably mispronounced his name.

And it's really the seminal book on materiality. And he's an architect so they start a lot with building design but also fabrics and all of the things that we consume is usually based on a cradle to grave model, where we take it from the environment, we synthesise it, we consume it and then we throw it away, into usually a landfill or burn it or something like that. And chemically speaking that's a dead end.

But their concept is that you take a material from its raw form and then you use it, and he calls it a use cycle rather than a life cycle because what happens is that it can be reclaimed into two forms. It can be reclaimed, if it's a natural material it can be reinserted into the environment again or if it's what he calls a technical nutrient say plastics or metals or other synthetic materials, that you're able to fully reclaim it and recycle it and turn it into a new product. In fact they go a little bit further in their second book and they call it upcycling where you're constantly improving the nature of the materials each time you reuse them. So it's a multigenerational mind-set.

Ben: I think it's a whole economy thing as well though. When you started talking through that I was going yes. Yes, this just has to happen doesn't it. It's a logical conclusion.

Andrew: It's true and just across the water from you the Dutch are really working on circular economy concepts.

Ben: Yeah, that's another really, there's a podcast in there and all sorts.

Okay, let's get back to the project. How far through, we got a bit of a brief from you, so how did you go on from there?

Andrew: So what we did was, the existing conditions I had a slope, I had some good solar potential so what I did was the first thing was, I didn't want a box so I actually took a shed type roof and then sliced the front about 10 degrees which gave me better solar access. It also gave an interesting shape to the building, so that was fun.

But what I was really inspired by was that I was sitting at a Japanese spa strangely enough in Santa Fe, New Mexico, and I was looking at the buildings and I noticed that the buildings were built around the trees. I thought that's brilliant, I have all these trees right there on the lot so why don't I just make the house kind of sneak in between the trees and then I can use the trees in the front of the building as my shading for the Passivhaus. So that also really informed the shape of the space. Informed of course how the Passivhaus model works but also made it feel that it was much more integrated into the landscape rather than shaping the landscape to fill for the needs of the building itself.

Ben: This whole episode has been on restraints, so I guess we should identify them on your project so we can see how this has all pieced together.

Andrew: Yeah.

Ben: So that might have been one of them but are there any others?

Andrew: There's other things that inspire me besides restraints. By restraints I mean...

Ben: Okay, here's a good question then, restraints versus inspiration. Where do you sort of meet in the middle?

Andrew: I think they start becoming the same thing after a while. They start mixing together and that's when you really are hitting it. I was talking with... I'm starting a podcast series called Arch Change with an architect down in Santa Fe and we were talking about how sometimes you're pushing and you're pushing and you can't quite make it happen. The design feels off, that you're kind of making the design, you're pushing the design to places where it doesn't seem to naturally go and that's when you're finding out that your restraints aren't working for you. And then when you go back, and he was talking about when you go back and you look at the original

intention and then just start looking at how things are going together in a different way you can find flow where those restraints actually have pointed you to what the opportunities of the building are going to be and what they have to be. So those restraints are actually the way of signalling to you if the building is being properly designed or not.

Ben: Quick podcast question while you've mentioned it there, I listened to that first one and you were out and about a lot. I quite like that. So do you look at a lot of buildings on this podcast? I know it's obviously audio, but?

Andrew: You know we're just shaping it out. This is our first thing when we're forming out the idea with the podcast. I grabbed a mic and we went over to outside Santa Fe to talk about the design of this contemporary space that this famous architecture firm is working on, and we're going to see where it's going to go.

There's a lot of lessons learned. I think that's going to be the biggest principle and a lot of those lessons learned are about how incorporating Passivhaus into design and both from a technical aesthetic, functional point of views because we both obviously have experience from that. So we want to delve into that and then I think I want to bring in some of the larger aspects of building design in general and Jonah's very interested in that as well. So it's going to be evolving and I think we'd love to hear what people also want to know more of and start researching and responding to that.

Ben: I think an evolving podcast is the way forward, because it's an odd thing when you set up a podcast that you don't normally, unless you run it in seasons, you don't normally have an end. So you set up a podcast and it goes on forever! So you need it to evolve!

Andrew: You do! And I think you did the magic thing is that focus but still a massive topic that you can touch on anything.

Ben: I feel that I'm never going to run out of material, and I imagine it's the same for you. Also if you're passionate on a subject you just know. And particularly when there are so many people who are choosing the cheapest route or are just making money out of buildings and stuff, there's the world to put to rights too.

Andrew: Well Ben, you also have a great voice for podcasting so that also helps.

Ben: Thank you. You've got a pretty good voice here, let's pat each others back while we're at it.

Look, we're going to run out of time if we're not careful here, so just a couple more questions on the building and what have you learnt going through it? I suppose we haven't even really talked about, I'm assuming it's timber frame is it?

Andrew: Yeah, it's a timber frame building. It's timber frame, cellulose insulation and mineral wool insulation. The secret was to put the foundations using a crawl space so I didn't have to have any foams down there. Pretty basic house in a lot of ways.

The form factor is still fairly simple but it's interesting just because of playing around with the wedge shape, and also the wedge shape was based on playing with the idea of cabins and we also have very unique mountains out here called Hogbacks which are very architectural shaped spaces so the building plays with form quite a bit while keeping it simple. So for the design constraint Passivhaus it actually really helped guide the process of designing that.

Ben: And you have to live next door to this now?

Andrew: Yeah, I wrote my book in it. It was a fantastic space. And I don't even have a functioning heating system in it yet. In the middle of winter it was a hell of a test.

Ben: How close to the end are you then?

Andrew: We're just finishing up the kitchen now and I should be done hopefully in a month or so.

Ben: Now I don't know whether it's a much smaller property because you said the other one was a cabin, but you're not tempted to do a switch so that you come in here and your guests can go and stay in the old house?

Andrew: It might just be like the podcasts, you never know how you're going to go with it, so yeah.

Ben: Well Andrew, I've really enjoyed having a chat with you today. Thank you very much for coming on and I know that you've got loads more to share. Perhaps catch up another time if you fancy it?

Andrew: Yeah, that'd be great fun. I loved listening to your podcast, especially Harold Orr's conversation, so yeah, thanks for putting building science up front and centre like this.

Ben: He is a legend. It's always easy in podcasts like that because when someone's achieved so much and I was just pleased that he was able to talk to me. And it was one of those things that it happened very quickly. I wasn't thinking about doing it and I got the opportunity so that was just a pure pleasure.

Andrew, thank you very much.

Andrew: Great, cheers. Thank you.