

Episode 286

What is the Living Building Challenge? – with Martin Brown

The show notes: www.houseplanninghelp.com/286

Martin: Okay, I'm Martin Brown, a career in construction. I started in construction back in the Seventies.

The early part of my career was in site engineering and project management then moving into business improvement, ended up as a business improvement director with the Mowlem group before they sadly demised. Then since 2000 I've been a sustainability and business improvement consultant.

Probably three or four years ago I was doing a TEDx type of show, gave my title as a sustainability consultant, and I was told that would just not cut it and I had to have a sexier, more dynamic title. We ended up with a provocateur.

So, I now use the title of sustainability provocateur which enables me to knock on different doors and ask different questions. It doesn't work all the time but it's actually quite a useful tag.

Ben: We're going to be talking about the Living Building Challenge today. When did this first cross your path?

Martin: This is an interesting story. I've always loved social media and played with social media in various forms. I was an early Twitter adopter.

So, eleven years or so ago I stumbled across a Twitter feed from the ILFI, the Institute for Living Futures in Seattle. They were holding their own conference and suddenly here was a group of people who were discussing the same sorts of things that I was discussing in the world of sustainability. I alerted a few friends who were also on Twitter and we all tuned into it. It was a two or three day event. Between us then, we pledged to do something in the UK and bring the Living Building Challenge and the other programmes into the UK.

We then formed the UK Living Building Challenge Collaborative which was kindly hosted by Leeds Beckett University. We had guest speakers from the States who gave us discussions and webinars via Skype, and slowly we gained a bit of traction here in the UK.

Ben: What was it that you liked about it? Why that in particular?

Martin: It was a breath of fresh air. We probably need that more than ever at the moment but back then, ten, eleven years ago, I think sustainability was getting a little stale. It was more or less focused on energy and waste and I think we could see something much bigger though. We probably didn't call it as such then, but now we would call it regenerative i.e., doing more good than just striving to reduce impact.

So, I guess it was that different thinking. There was also a nice connectivity with nature. The Living Building Challenge uses flowers as a metaphor and takes lots of its messages from nature. So, that was nice.

At the time we were presenting at an organisation based in Leeds Beckett called Green Vision. We had a series running for a year or so called Healing the Future, looking forward and doing different things for sustainability. So, it just hit a number of topics and resonated with what we were doing at the time.

Ben: Maybe you can explain those petals then. Those are really the categories that they focus on, aren't they?

Martin: Yes, indeed. The Living Building Challenge, as I say, it uses the metaphor of a flower. It takes seven elements, known as petals, which describe a regenerative building.

So, we're looking at place, how a building is aligned to its place, bioclimatic and ground conditions etc.

It looks at energy and the requirement for a building to generate one-hundred-and-five percent of its own energy on a net energy basis without using any combustion.

It looks at water, and again a building should be independent, harvesting and cleaning its own water before it goes back into the ground, very much like a tree would function.

It looks at health and happiness, having a civilised, healthy, just environment.

It looks at materials, and the materials petal is probably one of the ones which gives projects the hardest time because it ensures that there are no toxic materials that go into the building and is founded on the Red List of twenty or so prohibited materials.

Then we have the Equity petal which really seeks for buildings and those working on the buildings, the project partners, to be just in their approach. So, it's like corporate social responsibility for buildings and for organisations.

The final petal being Beauty and Spirit, the concepts of biophilia – biophilic design workshops are mandatory – but also inspiration and education. So, each building should really inspire the next generation and educate the next generation, and indeed the next project.

Ben: I've got a few questions off the back of that. Let's start with the regenerative side of things. How does it quantify that we've had a success and it has regenerated the area, added more to it rather than taken away?

Martin: Good question. One of the unique things about the Living Building Challenge is its post-construction performance criteria.

A building has to demonstrate its design intent for twelve continuous months post-occupation, particularly on water and energy. So, the quantifiable elements are monitoring those elements for twelve continuous months, demonstrating that the building is generating more energy than it uses by one-hundred-and-five percent and indeed it has a responsible approach to water, that it's taking just what it needs, cleaning what it needs, and putting it back into the ground.

Ben: So, autonomy is important?

Martin: Yes. Again, it's another attractive thing about the Living Building Challenge. It's very tough and it's one of the most rigorous but it doesn't tell you what to do. It enables teams to come up with their own solutions to meet the petals and the imperatives.

So, the imperative for energy, for example, is to generate one-hundred-and-five percent of its own energy without combustion, but the means of doing that largely are down to the innovative and inspirational approaches by project teams.

Ben: You've had a chance to put this into practice along with Barbara Jones and various other people at – well, you tell us a little bit about the project.

Martin: Yes, you're referring to the Cuerden Valley Visitor Centre.

So this was the first project to be designed and constructed to the Living Building Challenge. The project came about by Barbara Jones being part of the collaborative that I mentioned earlier, based in Leeds.

Barbara had already had this project partially designed or nearly completely designed for the trust at Cuerden Valley. So, along with the client, Barbara, and a few other consultants, we held things like biophilic design workshops which brought the design and then the construction into the imperatives of the LBC.

Ben: Explain that a bit more because we might have mentioned biophilic in the past, but I've never really learnt much more about it.

Martin: Biophilic design is a bit of a zeitgeist at the moment. If you were to organise a workshop on biophilia, you'd be guaranteed to fill seats. So, it's very popular.

Biophilia itself has been around for quite a while. It was probably brought to fame by E.O. Wilson, one of the eminent ecologists. Biophilia is effectively a love for nature. Wilson theorised that we have an innate love for nature and the more we shut ourselves away from nature, the more problems we pick up be they health problems, mental health problems, social problems etc.

The discussion is now moving into how we can make the whole biophilia thing beneficial for us as humans but for nature in terms of conservation, rewilding, and improving our local environments.

Ben: How do you do that within a building then?

Martin: That's a very good question and there are lots of options people can take.

There are a number of frameworks. The one I prefer to use is the Fourteen Patterns of Biophilic Design produced by Terrapin Bright Green, a consultancy based in New York. The Fourteen Patterns would take you through literally fourteen areas which you can use to improve your building and those range from putting a plant in the corner from which you will get minimal impact, all the way through to a building which has a forest internally, has open light, has views to distant landscapes, it's full of good natural pathogens, occupants within the building would be able to sense changes in the daylight outside, changes in the seasons.

So, there are numerous approaches designers can take to open up our buildings.

Ben: It's quite interesting walking around that building. I've experienced this in other strawbale buildings, but it just has a certain feeling, doesn't it? Are you able to pinpoint what I mean more than I am? Because I don't really know how to describe it.

Martin: I think that's a good description. It has that certain feeling. It's something that everyone comments on when they enter the building, more so before the building came into use. You could really sense that difference.

Yes, strawbale construction itself is a breathable construction so, you have that fresher, cleaner air internally than you would in a normal building. And I think when the building was freshly constructed, there was none of that chemical smell. There was none of the drying cement smell that you associate with new buildings. Largely, that's down to the Cuerden Valley project contains no cement and no concrete, but I think more importantly it contains no real toxic chemicals, no formaldehydes, no prohibited adhesives. So, you get that really nice, fresh smell.

That's one of the senses of biophilic design in many ways.

Ben: How do you do that then? I know it's one thing to say you just build a building without those materials in, but that is a huge undertaking. I remember Barbara telling me a bit about even down to the wiring, okay, you might not be able to eliminate things completely, but they were very particular about the type of wiring they chose.

Martin: Absolutely. What I recommend to project teams – and we now have two projects here in the UK – is you just become very pedantic, and there are various tracking devices that you can use.

The best way is to make sure that the specification up front doesn't contain any of the so-called red list materials and then to check as those materials are procured and incorporated into the building.

Ben: How is that red list put together?

Martin: The red list originated from the ILFI – the Institute of Living Futures.

It's identified, I think, the twenty-one red list products or elements, chemicals that we should not be using in buildings, each one having some form of impact on our health whether that impact is in the production or extraction of the material and the production of the

product or in its installation through the building process and then through the life of the building itself.

Ben: And another interesting aspect of this building is that it was constructed by the volunteers which to me, for such an important project, you'd almost think you wouldn't want to go down that route. But how did that go?

Martin: That went very well in terms of getting people involved and people picking up new skills. Interestingly, it's part of that inspiration of the next generation. So, it meets the education and inspiration part.

One of the downsides of self-build is you're very dependent on people turning up when it's raining. So, the actual construction time took far longer than one would anticipate for a building of that size.

Ben: So, you just need to go at the pace of skilling people up and where you're at. How is that sort of thing managed? I don't know whether this is moving off your territory, but you obviously still need some strong management.

Martin: Yes. The project had a project manager which was the client from the Cuerden Valley Trust. The actual strawbale construction which was done under a training school was very well managed. That was done as a two or three week training module organised by Barbara at Straw Works.

But we had a wonderful small gang of carpenters who worked on it for a number of months and then the volunteers who put the render to the walls etc. If it was a nice sunny day, there would be a good number of volunteers there. If it was a wet period, well, probably better things to do at home than going to stand in the wet and render a straw wall.

Ben: Can you describe the entire construction from ground up, just so we get an idea of all these materials that are going in and what it looks like?

Martin: Indeed. The foundations are based on Barbara Jones' innovative approach not to use cement and concrete. So, the foundations themselves are made from discarded rubber tyres. Interestingly, one of the requirements of the Living Building Challenge is to incorporate waste or recycled materials. So, we were hitting another element there.

So, the foundations are tyres with round stone which take a holding down bolt, which then take the timber posts. So, the whole structure is a timber frame. Many of the timbers were harvested on site. In

fact, Cuerden Valley did have an FSC certification at one stage. We had to import some of the roof shingles and some of the structural timbers but many of the decorative timbers that you saw would have been harvested on site. Then the in-fill in the timber frame is the strawbale wall construction.

An interesting and innovative approach, again which Barbara uses, is to construct the roof first. So, we then had a dry interior space on which to construct the strawbale. Once the strawbale was in place, shims were taken away from the top of the roof posts and the roof basically dropped down on to the strawbale to make a semi load bearing strawbale construction.

Then the walls were rendered with a lime render and internal works commenced.

Ben: I know Barbara mentioned lead was actually a material that she had used fairly often. So, the timber shingles were just taking over from where she might have used lead?

Martin: Well, lead or rather added lead is a prohibited material under the red list. So, we had interesting debates on the use of lead flashing and in the end, we sought an alternative rather than bring in lead to the project.

I do agree to some degree that lead is a very effective material as long as it's reused and produced in a humane fashion. But it's the added lead which is the prohibited element within the red list.

One of the fascinating things about the red list is it really fosters innovative thinking. Whereas before we would have just gone away and used, say, lead in this case, it really gave a lot of thought about what the alternatives are, what the problems with lead are, what are the problems with stripping lead off the building at a later date, where it would go and how we could ensure it would be reused and recycled.

Ben: Let's look at the circular economy. So, were this building to come to the end of its life, how would we move it on to the next generation.

Martin: Absolutely. Isn't that fascinating? We've done some very basic research by looking at all the key components used throughout the building – and probably more than fifty percent are natural, and the rest are reusable.

So, if you think about the circular economy butterfly diagram from the Ellen MacArthur Foundation, we think that the whole building could be taken apart, more than fifty percent of it being natural

materials could be composted – ideally you'd reuse them again but if they were not reusable they could be composted, so go through a natural recycling process – and the remainder are really modular components which could be used again. The curved glazing that you saw to the front of the café and some of the electrical components could be reused on future projects.

So, on demolition, there would be zero waste.

Ben: What about the tank to hold the water? What's that made of?

Martin: It's an interesting one when you start looking. Again, based on the red list and the need to harvest and store water, the go-to tank would be a PVC tank. But what we've used in this case is HDPE which is permissible under the red list.

Ben: How has the building gone down? It's completed – how long has it been in operation?

Martin: It's been in operation for eighteen months, and talking to the client, the footfall to the park has increased four-fold. Various surveys and questions etc. to the visitors there, they are going because of the café. So, the impact on the café in terms of the local economy and the economy for the Trust is incredible.

Bear in mind there was no café there in the first place so, anything would have been better. But they have up-to two-hundred people a day.

And of course, the purpose of the café is to celebrate the Cuerden Valley Park, to get people to understand nature, to respect nature, to spend time within nature.

Ben: What have you learnt from this? Have there been any takeaways? Anything you'd do differently?

Martin: A lot. Where to start?

We also have another project I'm supporting down in Devon known as the Nature Barn. So, I've taken lessons from one to the other and also taken lessons from Cuerden Valley into a number of projects which are at design stage and are looking at the Living Building Challenge as a potential route for certification and guidance.

But what to take away? I guess it's around materials for one. I think we have a poor handle on the health aspects of materials that we do put into buildings. We are getting better but it's so easy to slip

into this is available, let's put it in and move on, rather than really questioning what the health aspects are.

One of the guiding remits, I guess, of the materials is known as the precautionary principle. If there's any impact on health, then we should take the precautionary route and not necessarily use that material.

So, I think being stricter on what materials we put into buildings. One of the aspects of the LBC that we haven't discussed is the Declare Label. It is literally a label which could hang on a product which tells you about the product insomuch as the food label on a pot of yoghurt would tell you the ingredients and components etc. It's not necessarily if it's good or bad but it's just giving you that guidance as to what's in the product.

We approached a number of our suppliers and asked them whether their product met the red list criteria and we got a number of replies saying, 'sorry, we don't know. Trust this is useful. Yours sincerely'. So, there was a lot of effort put into just trying to get those materials there.

Ben: It's an evolving thing, isn't it? Because I imagine if you've any concerns over your products not making the grade, you probably just don't even answer the question at that point, do you?

Martin: Very much so. It's interesting. Now people who are aware of the Living Building Challenge, those involved in the collaboratives around the UK, I think have great delight in asking these questions at trade shows. 'What's in your product? Does it contain any formaldehyde?' Unfortunately, when you're speaking to these people over the desk at Future Build or wherever, they just don't know. 'We'll get back to you on that, sir'.

The other lessons I would take – we talked about biophilia and the Biophilic Design Workshop up front. Absolutely essential. It is mandatory under the LBC. I think it should be more widely used. And not just going through the elements of biophilia but getting people into that right mindset when you start to design. Not necessarily bringing all the baggage from other buildings which haven't worked so well. Just taking a fresh approach of, 'how can we get this build more related to the local nature environment and in doing so improve the health of the occupants?'

Ben: How have they found running the building? I know when you're looking after your own water supply and you haven't done that before – are there any challenges there?

Martin: Yes. The team down at Cuerden Valley are regularly checking their energy. Energy is supplied by solar power and ground source heating. So, they're regularly checking that against usage.

This is probably related to the whole climate change agenda. Last summer we had incredibly high temperatures up here in Lancashire which in a café producing food all day long sent the internal temperatures quite high which put additional pressure on the fridges and things. So, being able to manage that, incredibly high temperatures, a lot of people – four times the anticipated footfall – was a challenge. And I think at some point the project team will say, 'let's just see what happens. Let's see what this actually does on our energy supply and demand and use'.

Ben: Is there anything else we should know about the Living Building Challenge?

Martin: How long do we have? There's so much there.

It's interesting that the Living Building Challenge seems to be one of the few, if not the only standard, which will meet the RIBA's 2020 plan of work for sustainable outcomes. If you picked up a copy of their sustainability outcomes guidance, it lists the current building standards and how they can meet what RIBA see as the things we need to be doing to meet their 2030 challenge.

The Living Building Challenge is the only one which meets them all without additional options added on, in comparison to LEED and to BREEAM.

I veer away from making that direct comparison between all of the standards because they're all different for different purposes. But I think the Living Building Challenge and its associated programmes really is the regenerative solution for addressing the climate and ecological emergency that we've all made declarations on.

Ben: We'll link in the websites and so forth so that people can read some more. Martin, thank you very much.

Martin: Thank you, Ben. Interesting and enjoyable to discuss this with you.