Episode 10

Can You Damage an Old House When Making it Energy Efficient?

The show notes: www.houseplanninghelp.com/10

Ben: Roger Hunt is my guest for this session. Hello.

Roger: Hello.

Ben: And today we're going to be talking about energy efficiency, particularly in old buildings. You have written about this, but I'm particularly interested because you wrote The Old House Handbook, co-authored that, and you're coming up with a new book in the New Year called the Old House Eco Handbook. So I suppose my first question is how have we moved from the first book to the second book? Why did you feel it was necessary to write it?

Roger: Well, I wrote the first book in 2008 and incredibly eco things weren't that high on the agenda at that point in time. In those years that have passed since, it has really risen up and become something that's very, very important. People want to save money now on energy and we felt that the time is right to start really thinking how you can make old buildings more energy efficient.

There's a lot you have to think about with an old building. It's not just a matter of putting insulation up on the walls and putting solar panels on the roof and so on. You actually need to think how you can do that in a way that's not going to damage the building and cause problems for you in the future. There's a terrible fear, I think, that down the road in 10 or 15 years time we might be ripping things out because they're actually causing damage to the building.

Ben: What do we need to understand . . . I suppose perhaps we need to narrow it down when we're talking about an old building. Is it from a particular era? Is there a different school of thought for every building? Is it quite confusing?

Roger: Old buildings in the sense that I think of them, and the Society for the Protection of Ancient Buildings who the book is in association with, are really solid wall buildings. That can be anything from

medieval, you can have a lovely timber-framed house, right through to the Edwardian period when building technology started to change and we moved away from solid wall buildings. We started having cavity wall buildings, although there were cavity walls before that in Victorian times and also the actual construction, the materials used. We moved from lime-based materials to a new era of cement-based materials and the two work in a fundamentally different way.

With a solid wall, built using lime mortars, lime renders, lime plasters, it's not about keeping the water out. The water will penetrate that wall. As the rain comes down it strikes the outside of the wall and it soaks into that wall a few millimetres. Then the sun comes out and the wind blows and it draws the moisture out of the wall. The same thing's happening on the inside of the building as well. The moisture will soak into the walls, the moisture from washing and bathing and those sorts of activities but the open fires of the past and the draughty houses would then mean that moisture would then evaporate out of the walls.

What happens with cement and modern construction is it's all about keeping the water out of the building, it's about impermeable layers and the problem is when you mix the two technologies, which sadly a lot of people do, not through any fault of their own but they're trying to find the best solution. They will re-point a building with cement mortar or they'll put a cement render on the outside and they'll use hard products on the inside as well. That stops the wall working as it used to work so you end up with moisture being trapped in the building and that is really the fundamental difference.

So if you've got a building pre-Edwardian or maybe slightly later you've got an old building that needs to be treated as an old building and respected as an old building.

Ben: Are we trying to preserve these buildings for historical, museum pieces nearly, or are they still practical to live in?

Roger: I think this opens up the whole sustainability debate, which is a much wider question really. Old buildings are part of our landscape. They're part of our communities. If you start getting rid of old buildings you destroy communities and you destroy landscapes.

If you think about the average village or town, it's grown over the years with little accretions and additions where bits have been added on onto buildings and other buildings have been built in a street. So you get this lovely wibbly wobbly street scene, if you like.

To take that down and put new buildings up in their place really would destroy everything.

I think we have to be very careful about what we do to old buildings. First of all we're destroying a lot of the materials and carbon that's been embodied in those buildings and we're losing all that, which isn't a good thing in environmental terms, but we're also going to lose all those communities and lose what we love about the environment around us which is all the fine detailing you get with old buildings and the little quirks of old buildings.

Ben: America, I think, has taken a very different approach and – I know because have a house out there, you can tell me more about this – but I think they through the years have done what you said, taken down the buildings and just built to purpose. So are we quite unusual in Europe that, firstly we have this history to deal with and secondly that we're very keen on preserving it or finding the best way forward?

Roger: I think the UK is probably more unique than maybe the rest of Europe in its sense of history and old buildings, and I think we are probably as a race more conscious of our old buildings and the need to preserve them but I think we have the right approach and I think there is a danger that we are getting sucked into this new era of having to make our buildings energy efficient without really understanding the consequences.

I think it's also important to understand that you can make older buildings energy efficient without ruining their appearance and without ruining the way they work but it requires care to do that.

Ben: Maybe you could lead us through that process?

Roger: Well, it's a big process! Really, the first thing to do when you start to think about energy efficiency is not to do what a lot of people do, and rush out and buy solar panels, and stick them on your roof because you've got to think about an old building holistically. You've got to view it as a whole. You can't just do one thing in isolation. You have to think about all the different things you're wanting to do and the best way of making the building warm through insulation and so on, and also by stopping draughts which can make you feel much colder than the building actually is sometimes. So, it's about comfort as much as anything. So simple things like putting loft insulation in will make a huge difference to the feel of the building and it's a relatively easy project, it's something you can do yourself.

Also think about dealing with draughts. We all have windows that are draughty and rattling, and we have draughts coming up through the floorboards and under doors and so on. So you want to deal with those issues.

Windows are maybe one of the first things to think about. You don't necessarily need to rush out and get new windows. Whatever you do, if you've got original timber windows you want to try and keep those windows. It's important just to understand the importance of windows.

If you had a Georgian or even an Edwardian chair, you wouldn't throw it on the skip just because it had a slightly damaged leg. You'd make a repair. You'd take it to a restorer and get it repaired.

The same thing actually applies to a window. You want to try and keep those original windows, some of them 200-year-old windows. You're not going to throw – or you shouldn't – be thinking of throwing them on the skip because they are original. The timber in those windows is much better than any timber you can get today so try and keep your windows.

These days there are plenty of companies offering window renovation services in which they not only repair the window – they might cut out a bottom rail that's rotten and replace it – but they will make a repair rather than replacing the whole window. They will also at the same time draught-proof the window and make it perform much better. You don't need to put in double-glazing and overhaul the window to that extent.

You can do those simple measures and then use things like curtains and blinds at night to make the room much warmer. The same applies to doors. Think about the letterbox. Put a wooden flap over the letterbox to stop the draught coming through. Make sure the spring on the letter plate is working – to keep the air out. Draught-proof around the door. Have a sausage, one of those fabric sausages stuffed with fabric or whatever to stop the draught coming under the door.

Then think about the gaps between the floorboards. You can fill those gaps to stop the draughts coming up. So there are all sorts of fairly simple things you can do to make your house perform much better before you get into things that are going to be much more invasive and much more costly, and also things we don't know the long-term effects of down the road.

Ben: It's quite interesting that over the last few episodes I've done research into the Passivhaus standard that seems to be very energy efficient. I suppose I have an issue with how much energy we'll need to save in the future because not only are we getting new buildings but it's the old buildings where we'll have the big savings. So, is this going to do enough?

Roger: I think it will. It has to be a balance of all things. To knock down houses to create new communities is really not the way to do because we'll lose the communities by doing that. We obviously need to build new houses and I'm a great believer in Passivhaus, because I think Passivhaus is an excellent standard and it can work very very well, and it really does give us high performing houses. So, I'm all in favour of new houses being built to those very high standards.

With old houses we can reach very good energy efficiency standards. We've discovered, the Society for the Protection of Ancient Buildings have discovered through researching buildings and doing testing that old walls actually perform very very well. They're performing much better than some of the computer modelling had predicted. So we're starting with something that is actually quite good and we can – by doing simple measures and sometimes more complicated measures – make those buildings efficient.

Ben: What is it that actually constitutes the history of the building, because over the last couple of episodes I was in a Victorian house that had been brought up to the Passivhaus standard. It was a bit of an experiment but what elements would you be concerned about? To me, not much had changed visually. What I was very impressed about was how well it had been done and how much thought and planning had gone in to making sure, but in your mind, is that something we should do or something we should avoid?

Roger: To bring an old house up to Passivhaus standard is quite an invasive process and like you I've been to Passivhaus retrofits and I've seen what has been done. It's been done very well in terms of making the building energy efficient. I think the problem is you lose the character and historic detail of the building. Those are the things that we buy old buildings for, because we love those features.

To create a Passivhaus retrofit means losing a lot of the original fabric and when you balance the carbon and all those sorts of

things, what you're stripping out to create a Passivhaus retrofit, I'm not sure it really adds up because you're having to cut joists out of walls so that joists don't penetrate into the walls, so you can create a complete seal basically round the inside of the building. So, you're losing all those flaws, you're losing internal walls and so on to create that. All that is going on the skip.

I'm not convinced that's the best way, not just from the carbon point of view but also the loss of fabric. Historic fabric is hugely important. It's what makes an old building special. It's the reason that people go into a building with their estate agent and fall in love with it. It's all those quirks. It's the irregular lines and so on that make old buildings attractive to people. Some of those materials are really irreplaceable if you start pulling them out.

So, I'm not convinced about the Passivhaus approach in retrofit but I do think you can do an awful lot to get quite close to Passivhaus if you really think about it.

Ben: Are you talking about the piecemeal approach from before, starting looking at your loft insulation and all of these little tricks?

Roger: Yes, I think it is a holistic approach and the holistic approach is about insulation, it's about finding the right energy generation methods that suit your building. For instance, if you're in a very old leaky building in the countryside a biomass boiler might be the answer. If you're in a town, maybe an air source heat pump might be the answer. Every building is different. We try and find a solution that is going to work with all buildings but actually there isn't a solution that works with all buildings.

Even in a terrace, the end of terrace house is going to be different to the mid terraced house, so you can't treat them in the same way, in the way you insulate them and you do all these other things. That's a vital lesson to learn and to explain that with an end of terrace house you've got usually a big flank wall that it may be worth insulating that flank wall, either internally or externally. A mid terraced house actually is losing very little heat through the walls because the glazing actually takes up a good proportion of the front façade, certainly, and sometimes the back façade as well. So you've only really got heat leaking out of the roof and the floor.

That's the sort of difference I'm talking about there that you do need to think about your individual home and how it behaves. There's an awful lot of detailing when it comes to insulation that you need to think very carefully about, certainly with wall insulation. Otherwise

you can create all sorts of problems for yourself and for the building.

Ben: Now the one thing that I might disagree with a little bit is that when we looked at this Victorian house that had been retrofitted, I don't think you could tell too much, but you still think that because what is in the walls has changed that is a core difference? If that makes sense?

Roger: I suppose it depends what the building was like at the beginning. If you've got a building where in the past all the details have been stripped out, you've lost a lot of the value of the building, well maybe there is a case for a Passivhaus retrofit. If you've lost all the original walls already, maybe good quality windows that meet Passivhaus standard are the answer. If you're going to put new windows in anyway you may as well bring them up to that standard. If the floors are rotten, maybe you should replace the floors and you should do the whole project to Passivhaus standard.

I'm not saying that in the right circumstances you shouldn't do Passivhaus and as I say I'm a great believer in it, but it's when you've got original dado rails, you've got original skirting boards, cornices, original windows and all those sort of features, you are going to lose all those features if you try to do a Passivhaus retrofit.

Ben: Let's take a look at your book that's going to be out next year, hopefully in time for Ecobuild. We'll certainly mention that on the podcast. Perhaps if you're listening at the moment, it might already be available if you're listening in the future, but the Old House Eco Handbook, how did you set about writing this?

Roger: Well, it came about because we realised there was a gap in the market, that no one had written a book looking at how old houses could be retrofitted to make them energy efficient and sustainable. It's been a hugely difficult task because retrofitting old houses is something we're still learning about. It's not something that is set in stone and a lot of people have different ideas about how it should be done, so we've had to do an awful lot of research and we've talked to an awful lot of people to discover the current thinking.

I do think that that thinking is going to change over the years because we're going to discover better ways of doing things and we're also going to discover the things that don't work and the things that are going to cause problems. I do have a terrible fear that what is being done to many buildings now is going to have to be ripped out in 10 or 15 years because it's causing damp

problems or whatever. Especially, I'm thinking of wall insulation that we don't really understand the science of wall insulation and it's going to be terribly wasteful if in 10 or 15 years, 20 years time we're ripping it all out. That's not where we should be going with the environment at all. So we need to think very carefully about those things.

I think in the book, although we're offering solutions we're also saying in a lot of cases don't do things because you really need to understand the science, not just you but the wider community needs to understand the science before we leap in and do things. It's very important to not just go to your DIY superstore and buy some wall insulation and slap it on your wall. You need to really understand what you're doing and the best way of doing it.

Ben: And how can you make sure that you are choosing that best way? If you're starting out on that research now you're probably even more confused than when you started.

Roger: Well, exactly. I think in a lot of cases with wall insulation I'm saying you maybe shouldn't do it. You should do all the other measures about making your house warm, airtight and energy efficient but maybe leave the wall insulation and think about it in the future. It could be a future project. Maybe try and whatever you do make it so that you can add wall insulation later, although adding wall insulation is quite an invasive process. So, it's a difficult one and I think you have to balance the cost, you have to balance the gains you're actually going to make. Are you really going to make the energy savings that make adding wall insulation worthwhile with the potential risks that it involves in trapping moisture in the wall of the building?

I think it's worth just reflecting and understanding some of the issues with wall insulation. The best way of insulating a building is generally believed to be to insulate it on the outside. Well, obviously if you've got an older building if you insulate it on the outside you're destroying all the features on the outside of the building, unless it's a rendered building that you can put insulating render on the outside.

Most people are probably going to think about insulating on the inside of an older building because it's going to have less aesthetic impact, but there again as I've mentioned you are going to be losing features. You are going to have to deal with cornices, dado rails and picture rails and skirting boards because the insulation obviously has to go where they are. The problem with insulating on

the outside you can end up with dampness in the wall. It's interstitial condensation. We don't really understand the true science of this yet. A lot of people are very worried about timber that is in the wall becoming rotten, joist ends and so on. So we need to really understand what we're doing and if we are going to do wall insulation we need to think about using materials that can allow for breathability and so on. Natural materials tend to be favoured at the moment. Things like wood fibre and hemp fibre. Those sort of insulation materials let moisture pass through the insulation material and using lime products in association with them.

People that are doing test projects for wall insulation are even putting moisture sensors in the ends of joists, wireless sensors, so that they can in the future monitor what's going on in the ends of those joists to see whether there really are problems. That's how seriously it's being taken. People in the know are concerned, so until we get that sort of feedback we're not really going to know whether it's a problem or not. And it might not be a problem. We might all be worrying unnecessarily and we can carry on and insulate our walls quite happily but even if we haven't got those technical problems we've still got the aesthetic problems and the loss of detail and character.

Ben: As I look and research more into the Passivhaus standard and buildings that are designed with PHPP, it seems that simple designs are what is needed or are going to be the cheapest or the easiest way. Does that pose any difference to the way that we live?

Roger: Well, I think that obviously square boxes are much more energy efficient than boxes that have lots of accretions on them so that is why a Passivhaus tends to be a block rather than an oddly shaped building.

What has made us love our environment, our older environment, is the unevenness of it, I suppose, and I think there is a great danger of building lots of boxes which are hugely energy efficient that we can lose some of the things that make us actually love the place we live in. So, you have to look at it in a wider context.

Someone was telling me about how houses should be clustered in groups of 12 because then you tend to know all your neighbours and so on. You've got to think of it in those wider terms if you're building a house. You've got to think about the neighbourhood as well as the nuts and bolts of the house itself. Things like having a

porch that you can stand in and chat to your neighbour if you've got a terraced house next door, having seats in the garden and seats by the road where you can talk to people, low garden fences so you can talk to your neighbours. If you're building clusters of buildings you generally try and . . . A good architect would generally try and design them so that you had to walk past your neighbours houses to get to your car or your rubbish bins or whatever. It's all those sorts of things that make for sustainable development as well as the energy efficiency of the actual house that you live in.

We also need to think about the palette of materials that we use. All too often we tend to think of a modern house being a white rendered cube. Well, I quite like rendered cubes but I think if we had rendered cubes everywhere it would become a bit boring. What has given our streetscapes and townscapes, villages and so on, their character is the different materials that we see there.

Of course going right back in history, buildings developed because of the geology underneath them. Timber framed houses grew up because they were built from the trees that were cut down locally and the thatch was put on the roof that had been cut in the fields locally and when brick making came about, the bricks were made locally and so on, and stone was quarried locally. That is what makes it possible to be dropped in virtually any part of the country to know where you are because of the building materials. So there is a danger of losing that regional identity by going the rendered cube route.

I think we have to find a compromise, actually. I think we have to look at having good modern design and I'm a great believer in modern design but somehow adapting it so that it still reflects the region and the people that it's built for and in, because if you lose that we're going to lose our identity.

Ben: If we look into the future and we decide that we're not going to make any changes to our buildings and let's say that energy is very hard to come by now, what does that mean for the owners of period properties?

Roger: I don't think we can accept a situation where we don't make changes. We have to improve the energy efficiency of our buildings. There is absolutely no doubt about that. It is vital that we do it. What we have to think is about how we do it and as I've already said it's standing back and taking a moment before you dive in and do the quick fix, really. I think there's a great danger that what we're going to see is a load of white vans turning up at the

end of the street and all those buildings being externally insulated or internally insulated or have other measures put in without really considering what we're doing.

I think there are two things that are going to happen in the future, one is that we might regret some of the things we've done and the other is that we might wish we'd done much better. So, it's just getting the balance right, really. I think also, we maybe have to take what some people would see as a radical decision where some of the most precious buildings that we have, and I'm talking about Grade 1 and Grade 2* buildings, you know maybe we have to accept that they're actually really hard to deal with. It's the mass of houses that are the ones we really need to focus on.

It was interesting, because one of the pictures that opens the first chapter in Old House Eco Handbook, it's actually of an old Georgian terraced house and it's got a Morris Minor parked in front of it. Now if you look at cars, cars have moved on hugely in terms of energy efficiency and so on, but we do have lovely old cars still on the road and in garages all over the place. I think it would be a great shame if we couldn't see a Morris Minor driving along the road occasionally and maybe get frustrated because we're stuck behind it.

The same thing applies to buildings. We've got to improve the majority. I think we can still do that without wrecking them, but there are some classic old buildings – some of our best loved buildings – that we maybe should just stand back and do the best that we can but think that we actually need something left for future generations to enjoy. All houses we need to think about for the future.

We are guardians, we're not owners of our houses, really, and we do need to pass on something that future generations are going to love so it's getting the balance right and future generations are going to love us for having made them more energy efficient but they're also going to hate us if we destroy everything that we love about our buildings. So it's a balance and I think it's a very difficult balance but it's one that we do have to get right and that's why I urge everyone to think before they act.

Ben: Roger, thank you very much.

Roger: Okay, thank you very much.