How do I manage my project effectively?

The Self-Build Series by Chris Brookman (August 2015)

This is the third in a series of brief guides designed to help first time self-builders navigate through the enormous amount of information available and help them achieve their goals for sustainable construction. Our aim is to answer some of the questions that are not often answered by the main sites and forums covering sustainability.

These guides are for those new to construction, embarking on a sustainable building project. It's based on my personal experience of building a certified Passivhaus family home and 14 years of being a running Back To Earth, an eco building company.

Overview:

This guide has been put together for a single purpose; to give you an understanding of how best to manage your sustainable building project.

The following questions are covered:

1. Should I use a contractor?
2. How do I stay within budget when building a sustainable home?
3. How do I save time on my build?
4. When should I use a builders' merchant?
5. Why should I pay attention to the airtightness of my home?
6. How do I get my house airtight?

Should I use a contractor?

This depends on your abilities as a builder. If this is something you've done before and you can afford to take most of a year off to get your home complete then its a very satisfying project to complete. The great thing about many sustainable systems is that their simplicity means that self-builder's with only modest experience can install them and it may only be specialist areas such as plastering/rendering that you need a contractor for.

If you're abilities and experience of construction are limited then it may be best to use contractors for some or all of the project. This is likely to save time and money and usually stress.

If you're going to use a contractor, choose them carefully. Find one that is either familiar with the systems you've chosen or one that understands what you're trying to achieve and is willing to learn about new systems. Try and steer clear of those who are used to 'traditional' methods of construction and struggle to understand why you are not using them to build your new home.

How do I stay within budget when building a sustainable home?

Simplicity is the key to cost effective design. Simple, solid walled structures (timber or masonry), without cavities are easier to build and are likely to be built to a higher standard because of this. Wood fibre insulation systems and insulated clay block systems such as Porotherm, give rise to some of the most simple but effective structures possible. Because of their unique properties many of the layers, cavities and membranes are removed from the design making walls more slender and the insulation more effective.

Before even drawing up a design it is worth deciding on your building systems and materials. There will be many details and design quirks which are specific to the systems you choose which will need designing in. If your architect and builder know this from the start then you won't waste time and money on redesigning as the build proceeds.

Stick to your design and construction method. The best way to waste money and create potential problems is to change the design as construction proceeds. This is not to say that any design errors shouldn't be rectified but try to iron problems out before the project goes to site. You should also make an allowance for errors and changes.

How do I save time on my build?

Saving time in some ways is the same as saving money and so many of the points above also apply. Simplicity of design is key to fast, effective construction. The other, out of most people's control, is the weather.

If you plan to start when traditionally you're likely to get heavy rain (essentially any time of the year in the UK) then consider starting at a different time or cover the site with a scaffold cover. If the weather turns out to be good you'll have wasted some money. If the weather turns out to be bad (which it normally does when you start building) it will be the best investment you've ever made. This way, come what may, everyone can carry on working and get the outside of the building finished and you've got somewhere dry to store your materials.

In addition to careful preparation and design, sticking to your design and choosing a good contractor is to let a professional project manage for you. This is a lot like blaspheming to many but unless you have experience of running building projects, a lack of understanding, construction knowledge and good contacts will slow the project, making it more costly and vastly more stressful.

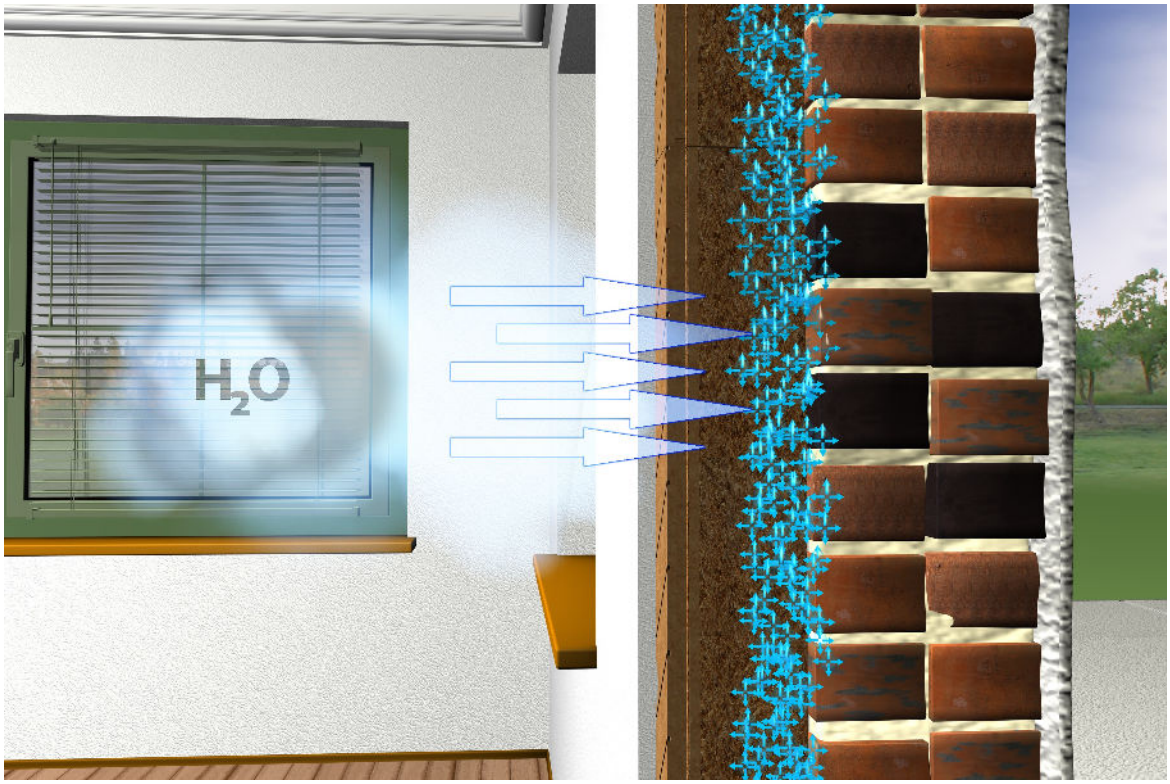
The final point is to think of contingencies for the critical areas of the build. If there are elements that you are not sure of, try and create alternatives in advance so as not to delay work on site if the worst happens. In addition to this have budgetary contingencies. This will enable you to quickly make decisions without the need to re-budget the build each time there is an issue.

When should I use a builders' merchant?

Ordinary Builder's Merchants are fine for the basics but don't expect to get much technical help from them, they tend to leave that to manufacturers. They can be useful to help with cash flow as you can normally set up an account with them with 30 days credit.

There are various specialist merchants who deal with fewer products, such as insulation or windows, but can offer the kind of technical and practical support that you need for your individual project. These companies are often very valuable as they have experience and insight that you don't get from installation manuals so make contact with them early on. This will help ensure they have all the materials you need when you need them and also give you a chance to glean any practical tips for installing their systems.

Why should I pay attention to the airtightness of my home?



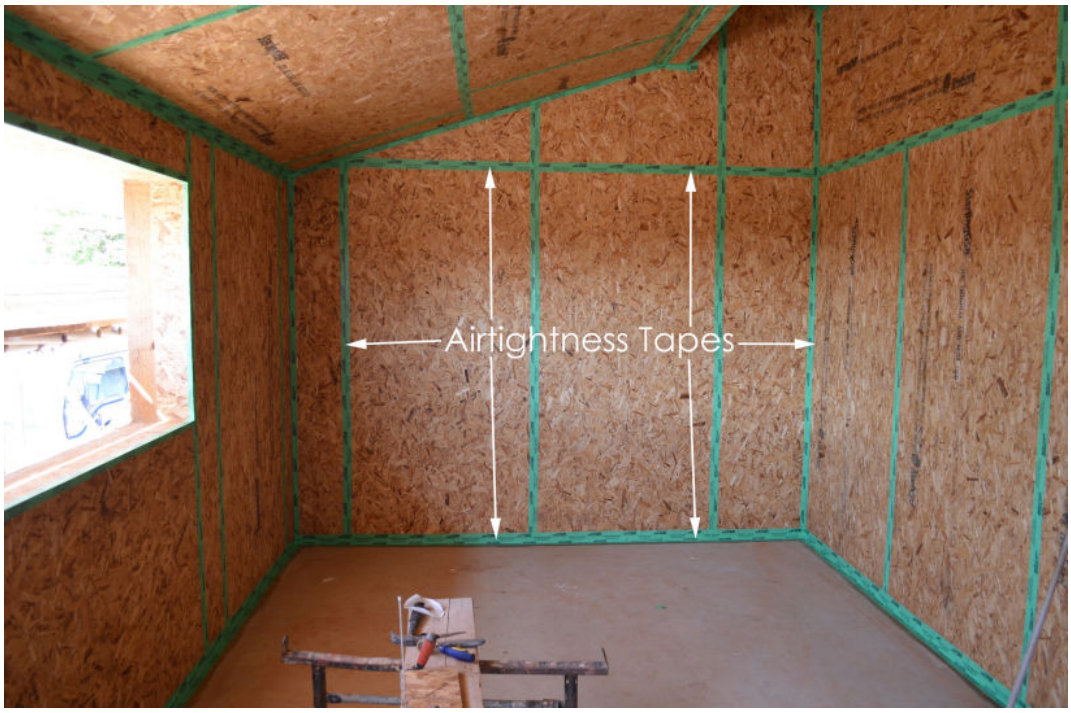
In the average UK home around 15% of the total heat produced is lost through drafts. This represents an enormous amount of heat but for a well insulated home these losses represent a much larger portion of the heat lost. Airtightness is a critical aspect to consider when building low energy buildings as the effectiveness of insulation is massively reduced by poor airtightness.

The other consideration is that as buildings become better insulated any air leakage has more of a chance of condensing within the walls during the winter and causing issues with moisture. This can affect both timber framed buildings and masonry buildings alike as it not only reduces the effectiveness of the insulation but it can also cause timber to decay.

A good target to aim for would be a blower door test result of around 1 air change per hour or 1 cubic metre per square meter of wall area, depending on which way you're measuring it. If you're aiming for Passivhaus standard this will need to be 0.6 air changes per hour or less.

If you're worried the house might get stuffy at this level of airtightness, don't. Air leakage from draughts has been shown many times not to improve air quality and you always have the option to simply open the window!!

How do I get my house airtight?



Good design, careful construction and lots of air tightness tape is the simple answer.

Good designs are ones in which you can clearly identify where the airtightness layer will be, how each one relates to the adjacent layer and also how it will work around any penetrations. These would be windows, doors, internal floors, beams, joists, etc. The simple rule of thumb is that you should be able to take a sectional drawing of the building at any point and follow the airtightness layer with a pencil all the way around the inside of the building without the pencil leaving the paper.

Careful construction takes a lot of planning when it comes to airtightness. Each new section of the building has to be made airtight (or able to be made airtight at a later date) as it goes up. In the case of timber frame this means taping joints in membranes or OSB before the next wall panel goes up and obscures any joints. For masonry it involves making sure mortar joints are well filled and if there are penetrations to the masonry they are well sealed around. Try and visualise how each and every junction will be built and how it will be made airtight.

This might sound like overkill but the energy saving from removing draughts is enormous.

Finally, sealing of all joints and junctions with the appropriate materials is critical. Airtightness layers can be made from OSB, airtightness membranes or from simple plaster but what ever is used it should be continuous (with no holes in it) and long lasting. Duct tape works really well for a few weeks but is likely to detach after that so the proper airtightness tapes are well worth using!!

What's next?

Did you find the guide useful? If so and you'd like to stay up-to-date with Chris' latest resources and the next guide in this Self-Build Series, check out the Back To Earth Supplies website and signup to receive updates.