‘Eco-retrofitting’

by Clive Fewins

– the new buzz-word for listed property owners

How do you go about making your listed house more energy efficient without ruining the look of it and without reducing its character?

It is a tricky issue and one that should be the concern of all listed property owners.

A new book on the subject, *The Old House Eco Handbook,* is written by two specialists from SPAB – the Society for the Protection Ancient Buildings – chartered surveyor, TV presenter and author Marianne Suhr (whose own listed house restoration was featured in Listed Heritage issue 72 in 2010) and writer and lecturer Roger Hunt.

The Old House Eco Handbook is a follow-up to *The Old House Handbook,* published in 2008. Like the new volume, it is published in association with SPAB

“Making buildings more energy-efficient and sustainable through retrofitting should be seen as an integral part of repair and maintenance. The danger is that, in the rush to be ‘eco’, it’s easy to fall into the trap of failing to ensure compatibility between traditional buildings and modern technologies,” Roger Hunt warns.

“This can have far-reaching consequences and the knock-on effects of each action must be considered, from improved airtightness and thermal insulation to the installation of solar panels.”

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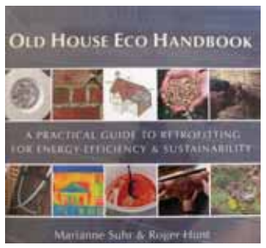


A historic timber-framed house with four inch (102mm) thick wattle and daub panels. Panels like this are notoriously thermally inefficient but there are several ways in which this can be rectified. The author used Hempcrete (see article)

Natural insulation materials – this one is a wood waste product – have many advantages over synthetic products

All this has to be approached with great care, because otherwise permanent damage to the historic structure can result, and reversal is a time-consuming and costly process. And not always possible either.

'Eco-retrofitting' is a phrase that is increasingly likely to enter the vocabulary of people owning listed houses as both energy prices and pressure from the government to add additional insulation to older houses continue to rise.

Most listed house owners faced with this problem look first at their walls. Apart from the obvious fear of ruining the look of the house if you follow the wrong course, it is important to understand the way the house was originally designed to keep the damp at bay.

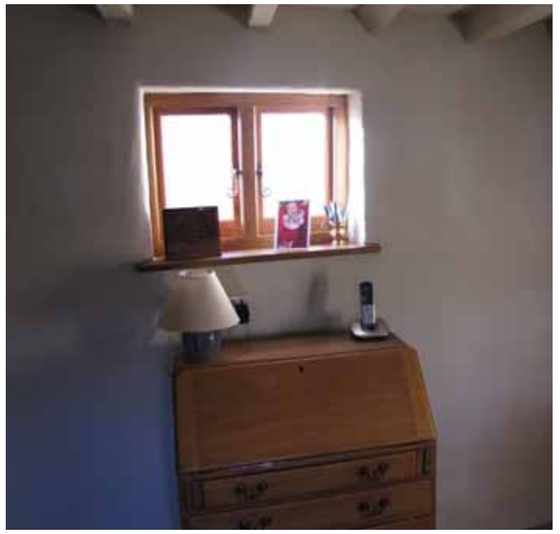
If the building has solid walls there is no point in using modern materials designed for cavity wall systems that are essentially aimed at repelling water, so it is vital to find a solution that is compatible with their breathable characteristics. Houses with solid walls, which basically absorb and repel damp, still constitute one out of every five houses in the UK, the book tells us. In old solid-walled buildings the bricks and stones were traditionally bonded with weak and porous mortars made of lime and sand, or sometimes just earth or clay. When external walls constructed with these materials were rendered, lime render was used and this was often limewashed. This means the structure was able to 'breathe'. When it rained moisture was absorbed a few millimetres into the external surface but was able to evaporate when the rain stopped, helped by the drying effects of sun and wind.

Because of the huge variety of local materials – the colour of sands and aggregates are a typical example – no two historic properties are the same. Individuality is one of the great joys of living in an old house and it is this that should be preserved at all times when considering means of eco retro-fitting.

A thatched timber-frame house with an exposed frame. With a house like this it is important to remember the 'like for like' principal when repairing the panels. Always use a lime render and remember that houses like this with with solid walls, which basically absorb and repel damp, need to be allowed to 'breathe'

It is useful to remember that detached houses with a large exposed external area benefit most from thermal efficiency. Smaller attached buildings benefit more from the introduction of renewable energy. This is because smaller houses – terrace homes in particular – have less area to insulate.

If it is the inside of your walls you are thinking of insulating you are unlikely to gain listed building consent if the proposed course of action is likely to lead to the loss of valuable



A finished Hempcrete and lime render interior wall. This is the author's cottage, in which a 250mm layer of solid Hempcrete on the inside downstairs wattle and daub panelled wall (ses LH issue 71, July/Aug 2010) has hugely improved the thermal quality of the wall

Laying limecrete. It is similar to laying a concrete floor except that, rather than using a mixture of cement and aggregate like concrete, limecrete comprises hydraulic lime and aggregate. It can therefore be used to construct a structural floor slab that is vapour-permeable.

For undulating roof structures reed board is a good substitute for traditional lath and plaster. It can be used to repair patches or for wholesale replacement when the original ceiling has failed

period features. You have therefore to think very carefully of which walls – upstairs and downstairs – to tackle.

There is a variety of different methods. In an article in Listed Heritage 71 in 2010 I explained how I insulated a downstairs north wall in our 17th century timber-framed thatched cottage using a breathable material called Hempcrete.

Using the material, which consists of a mix of industrial hemp and lime that is mixed with water and applied to the wall using shuttering was a lengthy, messy process, but worthwhile. Marianne and Roger say in the book that adding 100mm of cover of insulation over the frame of a house like ours will double the thermal insulation of the wall. My wife and I can vouch for that. It has been highly successful and we should like to repeat the process on other walls.

Another area that the authors look at in detail is insulating old roofs. This can be quite complex and I found the explanation in the book the clearest I have yet seen of the difference between a 'warm' and a 'cold' roof – something I have always found difficult to understand.

Insulating floors is another area dealt with in depth. Floors have a big impact on comfort levels in our homes. Depending on the type of construction it may be possible to upgrade the thermal efficiency of a floor through simple measures without upsetting the moisture equilibrium of the house or destroying the historic character.

The authors also warn against the practice of trying to stop damp coming through old floors by laying concrete slab floors and a damp-proof membrane.

This can have the effect of simply increasing the problem by pushing the damp up the walls, resulting in rising damp. "The damp has to go somewhere," Marianne explained when I spoke to her. If you have porous walls and a high water table installing a concrete slab floor will more than likely result in rising damp at the base of the walls."

A solution more in tune with the breathing structure of old houses is to use Limecrete. This is similar to concrete, but rather than a mix of cement and aggregate it consists of hydraulic lime and aggregate, and can be used to make a structural floor slab that is vapour-permeable. It is possible to install underfloor heating when using this material.

The book covers a multitude of other topics of interest to the owner of a listed house. After 36 years in my listed house I still found much that I did not know. The authors also stress that this is a field that is changing and progressing all the time.

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These old bricks have been cleaned up and attractively reused in a garden wall. This illustration from the book appears in the section on reclaimed materials

One of the keys to their thinking is what they call a holistic approach. This means having a master plan which focuses on how all the various measures you take will ultimately work effectively together.

"You do need to think ahead," Roger said when I spoke to him. "For example there is no point installing a new heating system boiler and tank if a few years later you find it is incompatible with the solar thermal panels you wish to install."

He also has some very sound advice on payback – the time it takes to recoup your investment in energy-saving measures through the savings you make on your fuel bills.

And, thinking of the many tradesmen my wife and I have used and their unwillingness to use other than a handful of materials his advice was "Don't use the same insulation materials throughout the house. There may be a case for mixing traditional and modern insulation materials." In the words of that famous old phrase: it's horses for courses.
And when it comes to thatch Marianne confirmed what I have always felt after living under thatch for 36 years: the material is known to be a wonderful insulator: sleep in a haystack and you will never be cold. But due to its organic nature thatch needs to breathe. This usually happens naturally because of draughts coming in at junctions and abutments and particularly at the eaves where draughts are commonplace. Vapour-permeable materials such as lime mortar and tightly compacted natural quilts using hemp, sheeps' wool, cotton or wood waste – all materials that are hygroscopic or water absorbing – can be used to plug draughts without fear of trapping water and causing rot.

In short, if you are (like me) an owner of a listed building who has lovingly cared for it for many years and taken great care to improve its energy performance without damaging the historic fabric then this is an extremely useful volume to keep on your bookshelf and to consult whenever you about to undertake a fresh project.

Above all, as I have written many times in this magazine, do your best constantly to acquire knowledge about listed buildings and how they perform. Understanding your home, its materials, structure and history – and if possible surroundings as well – can greatly add to the fun of owning a listed property.

As designer, writer and TV presenter Kevin McCloud points out in his foreword to Old House Eco Handbook, "There are some 26 million homes in Britain, most of them as well insulated as a rabbit hutch, most of which will still be in existence in 2050. Half a million of them are listed; countless numbers sit in conservation areas and, very roughly, one fifth of our dwellings were built before 1919. Collectively, the buildings we live in are responsible for more or less 26 per cent of Britain's carbon emissions."

Quite a thought for any listed house owner!

The Old House Eco Handbook is published by Frances Lincoln price £30. There is a special price of £24 for SPAB members.