

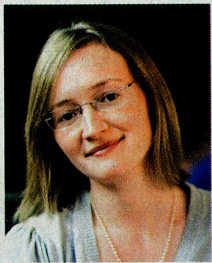
Can you tell me the golden rules of sustainable building?

It is important to have a holistic approach to your project. Try to view the whole external envelope of the building as one element that must be wrapped in a warm insulating layer. This layer includes the windows and external doors, so these need to be triple glazed with insulated frames. If you can get this right it will minimise heat loss to the outside. The next thing to do is to eliminate draughts, so you also need to integrate an airtight layer. While it is important to upgrade the fabric of the building, it is vital to get all the tricky corners and details right to prevent cold bridging. You don't want to spend time and money on upgrading the fabric for the cold to find a path in from the outside.'

HOW DO YOU MAKE AN OLDER PROPERTY MORE SUSTAINABLE?

'Sustainable methods can be applied to all buildings, new and old. The main update to focus on is insulation – reducing heat loss will dramatically improve the building's comfort and energy efficiency. Planning restrictions can make the process more complex for historic properties as the planners may require, for example, special windows or internal insulation. It is even possible to apply passive-house principles to a period property.'

Bere Architects has recently completed a retrofit of a Victorian home in north London (right), installing both internal and external insulation. The predicted energy savings for the project are around 80-85 per cent.'



ASK AN

Must-read advice from Sarah Lewis, director at passive-house specialist Bere Architects

eco expert

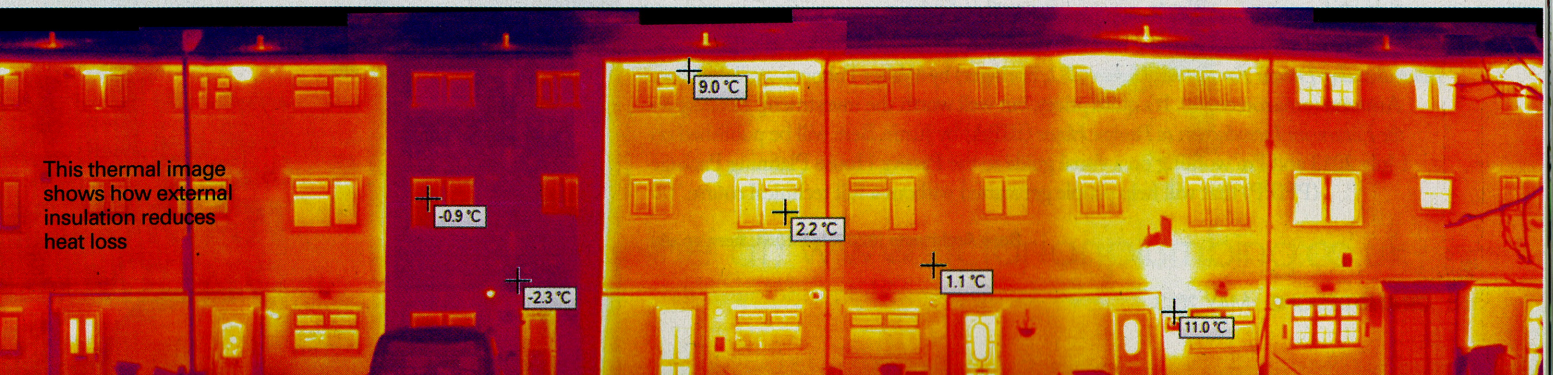
What about planning permission for a contemporary sustainable design?

'Sustainable projects do not have to be contemporary in appearance; passive-house methods can be applied to any style of architecture. However, if you are interested in a contemporary look then the ecological aspects of the project should aid your case. Planners are now more familiar with eco ideas and are often keen to support these principles. Include a report in your planning application covering all the ecological benefits of your project. Local support is very persuasive, so try to get local councillors and neighbours on board.'

WHAT DOES THE TERM PASSIVE HOUSE MEAN?

'Passive house is a building standard that is energy efficient, comfortable, affordable and ecological. Passive houses are low-energy buildings with high thermal comfort, achieved through insulation, heat recovery, passive use of solar energy and internal heat sources. Their design creates a perfect internal environment. Heat-recovery ventilation provides 24-hour fresh air, which creates a healthy atmosphere, particularly for asthma sufferers.' →

This thermal image shows how external insulation reduces heat loss



Bere Architects' Larch social-housing prototype in Ebbw Vale, Wales, is a truly zero-carbon home



Are there any particular sustainable materials that you would recommend?

'Triple-glazed and draught-free windows are vital for preventing heat loss. Once you've got rid of the draughts, heat-recovery ventilation is essential for creating the perfect internal conditions. Try Paul (paul-hueftung.net) and Drexel und Weiss (drexel-weiss.com) – both European brands with UK distributors. Vapour permeable insulation materials are widely available, and finally, there are some really innovative membranes and tapes on the market for achieving a draught-free envelope; try Siga (siga.ch) or ProClima (proclima.com).'

Where can I source materials and suppliers?

'Many sustainable products can be found in local builders' merchants. There are also specialist supply companies that can provide expert advice on the building physics of the various materials. We often work with Ecological Building Systems (+353 46 943 2104; ecologicalbuildingsystems.com), Natural Building Technologies (01844 338 338; natural-building.co.uk) and the Green Building Store (01484 461 705; greenbuildingstore.co.uk) all of which have technical experts on hand to answer queries. However, these are just three of a growing number of excellent specialist suppliers across the country, so do a little research to find one close to you.'

What are the most common design mistakes?

'Not understanding what makes a building truly sustainable. Often you see designs that use ecological materials, but which don't have the detailing to back this up. A sustainable home should be super energy efficient and provide high-comfort standards for an affordable cost, while maintaining a responsible ecological footprint.'

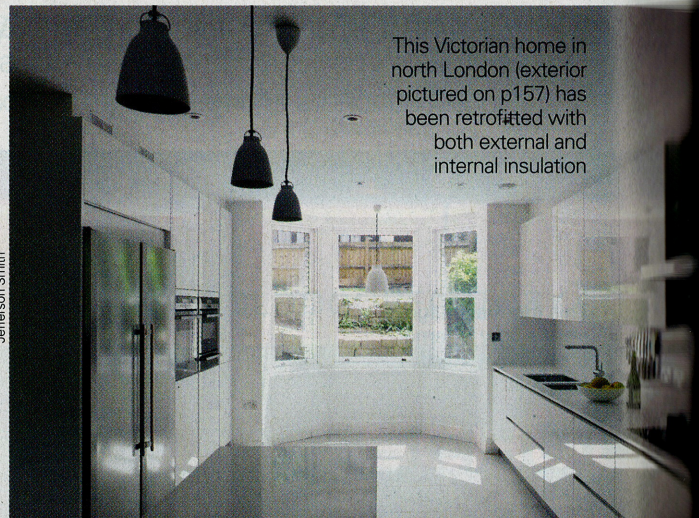
WILL IT COST ME MORE TO BUILD TO PASSIVE-HOUSE STANDARDS?

'The International Passive House Association has shown that the additional upfront cost of a passive house can be as little as 3-8 per cent more than a standard build. The running costs are more complex to calculate as it is hard to predict future changes in energy prices. However, it is easy to see how the savings of living in a passive house could stack up very quickly, since operating costs are significantly lower than for standard builds.'

Can you recommend any books or websites where I can learn about passive house design?

'A good starting point is the International Passive House Association's booklet *The Passive House*, which can be downloaded free at passivehouse-international.org. If you want to know more about these design principles, the website passipedia.org has masses of information, from the basics to cutting-edge research. I often use *Passivhaus-Bauteilkatalog/Details For Passive Houses* (£82, Springer) by Walter Pokorny, available from Amazon (amazon.co.uk). It's quite pricey, but well worth the investment. *Building for the Future: an Introduction to Passive House* (RIBA) by Justin Bere will be published on 1 July 2013 and I'm working on a visual guide to the Passive House Planning Package (PHPP) that will help people get started without a full technical course.' **GD**

Bere Architects (020 7241 1064; bere.co.uk)



This Victorian home in north London (exterior pictured on p157) has been retrofitted with both external and internal insulation

Jefferson Smith