

HISTORIC BUILDINGS FEEL THE DRAUGHT

Measures to conserve energy in historic buildings are not always practical, but Richard Oxley suggests an alternative approach

In its manifesto for the General Election, the RICS sought a new impetus for energy efficiency, promoting the use of home energy rating surveys, carried out at minimal cost as an adjunct to a mortgage valuation or building survey. This drive for energy efficiency is commendable, but for the historic building stock, it raises concern.

Contradictions exist between what, at first, appear to be compatible subjects: energy efficiency and building conservation. Building conservation, by its nature, maximises the retention of the historic fabric, thereby protecting the embodied energy in a building; energy efficiency conserves fuel and power in the 'running' of a building – the energy consumption.

SAP ratings

The conflict between energy efficiency and building conservation arises from new demands and expectations being placed on historic buildings, which cannot be met without seriously damaging their performance, appearance and character.

These demands will be initiated by the use of energy efficiency audits using the SAP (the government's Standard Assessment Procedure) method of assessment. Energy ratings calculated under the revised Part L of the Building Regulations (1995) are only applicable to new building work and existing buildings that are being converted and involve building work.

On this basis, the revised Part L of the Building Regulations should not specifically affect existing buildings where there are no building works proposed. This means that there is no current obligation for existing buildings to have a SAP energy rating or implement any recommendations made under an energy rating. SAP energy ratings are being applied to existing buildings, however, as an additional product and/or service to a mortgage valuation, and this puts unnecessary pressure on historic buildings (see 'Problems of mortgage valuers who assess listed buildings', by Martin Higgins, CSM July/August 1996).

A SAP energy rating for a dwelling is based on the calculated energy cost for space and water heating and depends on a range of factors that contribute to energy efficiency such as:

- thermal insulation of the building fabric;
- efficiency and control of the heating system
- ventilation characteristics of the dwelling;
- solar gain characteristics of the dwelling;
- the price of fuels used for space and water heating.

As can be seen, none of the embodied costs of the existing fabric or the replacement materials are taken into account. It is accepted that the energy consumption of existing buildings will be high compared with new buildings; it is irresponsible, however, to advocate the replacement of existing fabric or to change the manner in which a building performs without assessing the consequences of implementing the recommendations of standard assessment procedures to non-standard buildings.

Implementing improvements

The type of 'suggested improvements' recommended to improve the energy rating of an historic building include:

- install/improve loft insulation;

- draught-proof doors and windows;
- insulate wooden floors;
- install condensing boiler; and
- replace windows with double-glazed windows.

The implementation of a recommendation such as 'replace windows with double-glazed windows' (which, it must be emphasised, is not mandatory where there are no material changes) would ruin the building's character, and therefore contravene current legislation. Approved Document L refers to this in material changes in use which states at 2.56f: 'Where windows are to be replaced...This could be inappropriate in conservation work and other situations where the existing window design needs to be retained.' Some flexibility is necessary, therefore, even where building work is being done.

There is a risk that if the owner of a listed building installs replacement windows without consent he will be served with an enforcement notice, the cost of which would be considerable. If the enforcement notice is not acted on this could expose either the owner, surveyor and/or the company issuing the energy rating certificate to potential criminal prosecution under the Planning (Listed Buildings and Conservation Areas) Act 1990.

Implementing the recommendations of an energy efficiency audit without taking all the relevant factors into account will result in:

- the unnecessary loss of sound materials that still have a useful life;
- an increase in embodied energy costs in the production of replacement materials;
- the depletion of natural resources;
- change in the performance of a building, causing:
 - the accelerated deterioration of the existing fabric;
 - the need for increased maintenance and repair;
 - the eventual replacement of existing fabric;
 - increased demand for new materials, the amount of fuel and power used and the further depletion of natural resources;
 - the increased risk of health problems for the occupants from mould growth, mites, and so on; and
- the risk of potential enforcement notices or criminal action.

These examples illustrate the need for the management of existing resources rather than the wholesale adoption of a modern standard that does not take into account the performance of existing buildings, the useful life of existing materials, the full cost in respect of the production of replacement materials, the depletion of natural resources, increased CO² emissions, the sustainability of the materials used, the health of the occupants and the increased costs in repair or replacement both economically and environmentally.

Assessments

On this basis, it is imperative that existing buildings are assessed as follows.

- The viability of improving the energy efficiency of the building must be determined, physically, environmentally, financially and aesthetically.

- The total cost of any improvement should be decided, to include the costs of the existing materials, the production costs of the replacement materials, the life expectancy and payback period of the replacement materials.
- Replacement materials should come from sustainable, well managed and local sources. Great care in the specification of materials needs to be taken, and the total costs on the environment need to be taken into account, including congestion and pollution. For example, it is pointless replacing sound timber windows with pvc windows on environmental grounds as pvc is not sustainable, has high production/embodied costs and is a source of dangerous toxins;
- Work done should be the absolute minimum required.
- The performance of the building should not be adversely affected; the unnecessary accelerated deterioration of the fabric will have its own costs on the building, the occupants and the environment.
- It needs to be established whether the building is listed or in a conservation area, in light of the statutory protection.
- Know the materials to be used and the impact they will have on the environment. The adoption of a 'cradle to grave' approach will ensure the correct choice of material. This can be achieved by assessing whether a material has the following attributes before advocating its use: a breathing product; chlorine (HCFC) free; durable product; energy saver; high 'natural' content; low primary energy; low emissions; low allergy; low toxicity; reclaimed material – with care not to encourage salvage over continued beneficial use; recycled content; renewable power; resource saver; sustainably produced; and zero ozone depletion potential.

These are some of the environmental attributes recognised by GreenPro when identifying how 'green' a product is; that is, a product which has a tangible environmental advantage over similar products aimed at a similar end use. The more environmental attributes a product has, the 'greener' the product. If a greater demand is created for 'greener' products then they will be readily available and affordable (both economically and environmentally).

More needs to be taken into account than just the basic energy consumed by a building. The total cost of improving a building's energy efficiency has to be considered, or the whole basis of improving a building's environmental performance will be based on false economies, which would be to the detriment of both the building and the environment.

The continued beneficial use of the embodied energy in a building with proven durability has obvious environmental benefits which should be encouraged and recognised. Environmental considerations are going to play a more prominent role in the decisions made about buildings; it is therefore essential that any changes take into account the substantial investment of natural resources and workmanship in historic buildings.

Those involved with building conservation and energy efficiency need to be aware of all the issues involved.

Care should thus be taken in promoting the benefits of energy audits without considering all the relevant factors. This could be achieved at 'grass roots' level by all surveyors writing an environmental strategy for their company or practice and then adhering to that strategy.

When energy efficiency improvements cannot be agreed on conservation grounds, other balancing measures could be considered, such as forest sponsorship.