



## ENGLISH HERITAGE

### ALL PARTY PARLIAMENTARY GROUP FOR EXCELLENCE IN THE BUILT ENVIRONMENT

#### INQUIRY INTO SUSTAINABLE CONSTRUCTION AND THE GREEN DEAL

Submission of evidence by English Heritage, December 2012

#### INTRODUCTION

English Heritage is the Government's statutory adviser on all matters relating to the historic environment in England. We are a non-departmental public body established under the National Heritage Act 1983 to help protect England's historic environment and promote awareness, understanding and enjoyment of it. Our evidence refers primarily to sustainable construction in the context of traditional buildings.

English Heritage strongly supports the principle of improving energy efficiency in buildings, and reducing carbon emissions. We are keen to use our practical knowledge and expertise of how older buildings perform and behave to ensure that adaptations made in response to climate change are truly effective, and carried out in a way that sustains the cultural significance of historic buildings. We do this through a variety of activities including:

- Building Regulations - advising DCLG on issues affecting traditional buildings;
- Green Deal - advising DECC on traditional buildings issues; membership of Older Properties Working Group;
- Standards setting and providing guidance through publications (e.g. *Practical Building Conservation* series; *Improving the Energy Performance of Historic Buildings* publications) and the EH *Climate Change and Your Home* website;
- Working with other sector stakeholders to enhance understanding of energy performance of traditional building, the behaviour building fabric in response to environmental loads, and the technical risks associated with energy efficiency measures;
- Advising Local Planning Authorities and applicants on energy efficiency improvements through Listed Building Consent and Planning Permission casework;
- Providing training through *Historic Environment Local Management* (HELM) seminars.

The historic environment is our most accessible cultural resource and has a powerful influence on peoples' sense of identity and civic pride. It contributes significantly to the character and sense of place of rural and urban communities and lies at the heart of sustainable growth and place-making.

#### TRADITIONAL BUILDINGS AND SUSTAINABILITY

Most traditional buildings have survived because they are robust and adaptable; environmentally they often perform better than assumed, and many out-perform modern buildings in terms of energy demand and

comfort<sup>1,2,3</sup>. They should be seen as part of the solution rather than part of the problem.

Traditional buildings are inherently sustainable. They are generally built with renewable, locally sourced materials that are relatively easy to repair and maintain, and can be recycled at the end of their service life. In contrast, replacing a building demands a considerable investment of energy: the energy embodied in the old building will be lost, and further energy will be used in its demolition. To this must be added the energy consumed in producing and transporting materials for the replacement building, along with the energy used in its construction. The government's Performance and Innovation Unit report, *Resource Productivity* (2000), has noted that 'energy is consumed in the production of construction materials such as bricks, cement and metals and in their distribution. Over 90% of non-energy minerals extracted in Great Britain are used to supply the construction industry with materials, yet each year some 70 million tonnes of construction and demolition materials and soil end up as waste'. This accounts for 24% of the total waste generated by the UK.

Therefore, retaining old buildings, and seeking to enhance their energy performance rather than replacing them, is in line not just with heritage conservation, but also with the objectives of sustainable development.

## **DEVELOPING AND PROMOTING BEST PRACTICE**

Building performance – the interrelationship of people, buildings and environment – is complex and still not well understood, even in modern buildings. Holistic approaches to developing energy strategies are needed that encompass not only building design and construction, engineering services and equipment, but also occupational factors, including building management and user behaviour. There are no 'one-size-fits-all' solutions, particularly for traditional buildings, and energy strategies should respond to the specific requirements of individual cases. Over-complicated solutions should be avoided (this is especially important for building management systems). Instead, keep it simple; do it well.

EH has developed a best practice process to assist in devising appropriate 'whole building' energy strategies for heritage assets. This approach allows the optimal balance to be struck between conserving energy /reducing carbon emissions and sustaining heritage values and the significance of heritage assets<sup>4,5</sup>.

When developing best practice models it is important that objectives are clearly defined – reducing energy demand and reducing carbon emissions, although interrelated, are distinct and separate goals. In addition, the life-cycle costs of materials and systems, and wider environmental considerations concerning the exploitation of resources are further considerations for sustainable construction.

When buildings fail to meet the levels of performance they were designed and expected to achieve, it is often because of occupant behaviour and poor management of building services/systems which is frequently attributable to a failure to commission them effectively. More systematic investigation of building performance through post occupancy evaluation, and wider dissemination of the lessons learned, would help develop best practice. (For example, the National Trust's newly formed 'Fit for the Future Network' which provides a forum for practitioners dealing with energy efficiency measures to share knowledge and experience). Improved dialogue with building users throughout the design stages of a project will improve understanding of their requirements and expectations. After occupation it

will enable practitioners to assess levels of satisfaction with building environments created <sup>6</sup>.

Better understanding is needed of the unintended consequences of measures to improve the energy efficiency of buildings – e.g. ‘rebound effect’, and other factors leading to increased energy consumption after enhancements intended to save energy and reduce carbon emissions – and how these might be mitigated. Also, there is the need to understand better the technical risks associated with energy efficiency measures. This is emphasised in the Sustainable Traditional Buildings Alliance’s report *Responsible Retrofit of Traditional Buildings* submitted to DECC in 2012 <sup>7</sup>.

## **THE IMPORTANCE OF THE MAINTENANCE & REPAIR SECTOR**

Buildings perform to optimal levels only if fabric and services are maintained in satisfactory condition. Maintenance and repair is essential for sustaining not [solely only](#) heritage assets, but the built environment in general. Neglecting simple preventive maintenance is wasteful and leads to greater use of resources in the longer term.

Maintenance and repair is a major sector of the construction industry. In 2010 maintenance and repair accounted for approximately one third of construction output in Britain, valued at £34.8 billion. A significant proportion of this will have been generated by pre- 1919 buildings (which make up an estimated fifth of all dwellings in England). Maintenance and repair supported a higher proportion of small and medium size businesses in the construction industry. Approximately one third (32%) of the value of all maintenance and repair work carried out by private contractors was produced by companies employing 13 people or less. The equivalent for new build was 11%.

Maintaining existing buildings creates more skilled jobs than building anew. Every £1 million of output in maintenance and repair of housing involves 55% more direct construction labour input than £1 million of output for new build (both private and public). Maintenance and repair is about twice as labour intensive as new build housing and infrastructure, and three times as labour intensive as new build public non-housing. (Source: Construction Skills Network Research).

Evidence that emphasises the size and value of maintenance sector in UK construction industry is available from *Heritage and Growth* (2011) <sup>8</sup>. It would be highly desirable to promote initiatives (including fiscal incentives) that would raise the profile of maintenance and repair, and actively encourage better standards of asset management, as this is at the heart of sustainable construction.

## **BARRIERS TO SUSTAINABLE CONSTRUCTION**

Truly environmentally sustainable construction is a ‘culture’ that has to be understood and shared equally by client, project team and contractor. A commitment to sustainable construction has to be adhered to from project inception through to completion and commissioning if the outcome is to be successful. It is not a ‘bolt-on’ to conventional construction industry practices. Although the concept of ‘integrated environmental design’ has been around for over 40 years, there is still a tendency for professions to work in their respective silos and, as a result, for solutions to be contrived, over-complicated, and less efficient.

Sustainable construction demands high standards of workmanship to achieve the build quality needed for optimum performance – this applies equally to newbuild and the maintenance, repair and adaptation of existing buildings. At present this is not well understood or taken very seriously by many ‘main-stream’ builders. The cultural change that is required will only be brought about by a long term and consistent investment in up-skilling, and incentives, such as the *Construction Skills Certification Scheme*, to encourage builders to enhance skills.

The higher initial cost of sustainable construction is a further barrier. Many clients start out with high aspirations for ‘green’ development but are discouraged by the sustainable construction ‘premium’. For example, many of the insulation materials likely to be most suitable for traditional buildings are imported and, like organic food, remain something of a niche market. Measures to promote the development, manufacture and wider use of sustainable, eco-friendly materials are needed to bring costs within wider reach.

### **THE GREEN DEAL – IS THE POLICY THE RIGHT ONE?**

A policy that helps to address improvements to the energy efficiency of the existing building stock is to be encouraged. However, it is essential that such work is based on a sound understanding of the technical issues and the use of suitable skilled assessors and installers.

English Heritage has worked closely with DECC over the past year, along with a number of other organisations, to help shape the Green Deal and address potential risks with thermal upgrading of older properties and much has been achieved within in this time. However, we continue to have concerns within the following areas:

- Green Deal Assessor training

One of our most significant concerns is with the extent of training for Green Deal Assessors. The energy performance of traditional buildings can often be a complex interrelationship of fabric, local conditions and use. A holistic approach is needed to fully understand the optimum solution for individual buildings rather than one that simply selects a few measures from a list. We would like to see a greater emphasis on a more comprehensive survey that takes these issues into account by someone who fully understands the technical issues associated with older buildings.

- Green Deal surveys

For traditional buildings to perform well thermally they need to be in good condition and be well maintained. We would like to see the Green Deal take more account of issues to do with the repair and maintenance of building fabric. Currently the Green Deal does not include funding for repairs.

We also consider that too much emphasis may be placed on the renewal rather than the upgrading of traditional windows resulting in widespread window replacement which is likely to be detrimental to the character of many towns and villages.

RdSAP which is the basis for Energy Performance Certificates which in turn informs the selection of Green Deal measures has limitations for the assessment of traditional buildings which needs to be addressed.

- Technical compatibility issues with proposed works

The Green Deal places significant emphasis on the upgrading of building fabric, particularly solid wall insulation. Our concern is the lack of a full understanding of the risks and challenges in implementing this type of work, and current assessment methods that take little account of regional climate variations. More work is required to establish a convention for assessing the moisture performance of traditional buildings and the effects of energy efficiency measures.

- Need for more research and guidance

DECC has responded to a widespread concern with the lack of data and research on retrofitting older buildings. We very much welcomed the commissioning of the Sustainable Traditional Building Alliance's (STBA) report *Responsible Retrofit for Traditional Buildings* which helped to identify significant gaps in research and guidance.

We would like to see DECC commission further work to inform the retrofitting of traditional buildings particularly with regard to solid wall insulation, warm roof installations and the insulation of suspended timber floors.

Finally, although sustainable construction can make a significant contribution to reducing carbon emissions, its potential to do this is limited. Far greater benefits will be obtained from decarbonising primary energy supply, and it is to this end that the main thrust of research and development should be directed.

English Heritage will be glad to provide further detailed evidence to the inquiry, if required.

## REFERENCES

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