

Lessons from the UK and North America

Churchill Fellowship 2009

QHC Commercial Heritage Buildings and Sustainability
Forum

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Churchill Fellowship

- The main aims of my fellowship were to investigate:
 - the current thinking and policy positions of key international government and non-government heritage organisations with regard to the relationship between sustainability and heritage conservation
 - the results from a number of projects focusing on energy efficiency and heritage buildings
 - how leading environmental rating tools/systems currently address heritage buildings and how these tools/systems are evolving

- There are many organisations and individuals working on issues pertaining to sustainability and sustainable development, but I chose to visit the following organisations because of their focus on heritage conservation and sustainability.
- English Heritage is providing leadership in undertaking research into the environmental performance of heritage buildings and the impacts of climate change on the historic environment. There is also a growing body of knowledge in this regard in the UK, the USA and Canada.

- Fellowship was undertaken between 21 September and 6 November 2009 (7 weeks)
- I visited a number of government and non-government organisations in Canada, the UK and the USA and attended the following conferences:
 - Heritage Canada Foundation Annual Conference *The Heritage Imperative: Old Buildings in an Age of Environmental Crisis* 24-26 September 2009, Toronto, Canada
 - Association for Preservation Technology International Annual Conference *Preservation in the City Without Limits* 2-6 November 2009, Los Angeles, USA

program

Canada

Victoria, British Columbia

- Heritage Branch, Ministry of Tourism, Culture and Arts, British Columbia
- Planning and Development Department, City of Victoria
- Victoria Civic Heritage Trust

Toronto, Ontario

- Heritage Canada Foundation (annual conference)

Ottawa, Ontario

- Heritage Conservation Directorate, Public Works and Government Services Canada
- National Historic Sites Directorate, Public Works and Government Services Canada



UK

Swindon and London, England

- Conservation Department, English Heritage
- The National Trust

Edinburgh and Glasgow, Scotland

- Technical Conservation Group, Historic Scotland
 - Science Unit, Historic Scotland
 - Edinburgh World Heritage Trust
 - Centre for Research on Indoor Climate and Health, Glasgow Caledonian University
 - Changeworks
 - Rosslyn Chapel Trust
 - National Trust of Scotland
- Swindon and London, England
- The National Trust



USA

Springfield, Illinois

- Preservation Services Division, Illinois Historic Preservation Agency

Boston, Massachusetts

- Goody Clancy Architects

Washington DC

- Technical Preservation Services Branch, National Park Services
- National Trust for Historic Preservation

Los Angeles, California

- Association for Preservation Technology International (annual conference)
- The Getty Conservation Institute



context

- *Queensland Heritage Strategy: a ten-year plan* was launched by the Hon Kate Jones Minister for Climate Change and Sustainability in October 2009
- Developed in consultation with the Queensland Heritage Council
- Queensland's first heritage strategy provides a heritage policy framework for the next ten years
- Includes a number of priorities and actions relating to heritage conservation as a key component of sustainability
- Identifies energy efficiency and environmental performance of heritage buildings as a key strategic area for action



- The sustainable design movement has begun to codify a formal approach for establishing and evaluating what makes a building 'green'. There are many methods that attempt to measure the environmental performance of a building, and some of the major tools include:
 - Green Building Council of Australia Green Star Rating System
 - BRE Environmental Assessment Method (BREEAM) system in the UK
 - Leadership in Energy and Environmental Design (LEED) Green Building Rating Systems in the USA and Canada

- Concerns have been expressed that these standardised tools are lacking in how they address heritage buildings. Specifically, these standards:
 - do not account for the retention of historic material and its cultural value
 - do not effectively consider the performance, longer service lives and embodied energy of historic materials
 - are overly focused on current or future technologies, neglecting how past experience helps to determine sustainable environmental performance

UK

- The UK is subject to a Directive of the European Parliament and of the Council which requires member states to apply minimum requirements regarding the energy performance of new and existing buildings
- The UK is responding to this Directive by tightening regulations
- The UK is also reforming particular aspects of its heritage protection system, and is developing new planning tools to address sustainability and heritage conservation
- There is a strong research focus, particularly on the performance of building materials and building elements, which complements the regulatory review process

UK

- There is a lack of reliable data about the performance of historic buildings, and most assessments of energy use are based on theoretical models
- English Heritage is concerned about the level of assumptions made about U-value measurements (thermal transmittance) used in the calculations, and has responded to the need to gather this data by undertaking research projects

UK

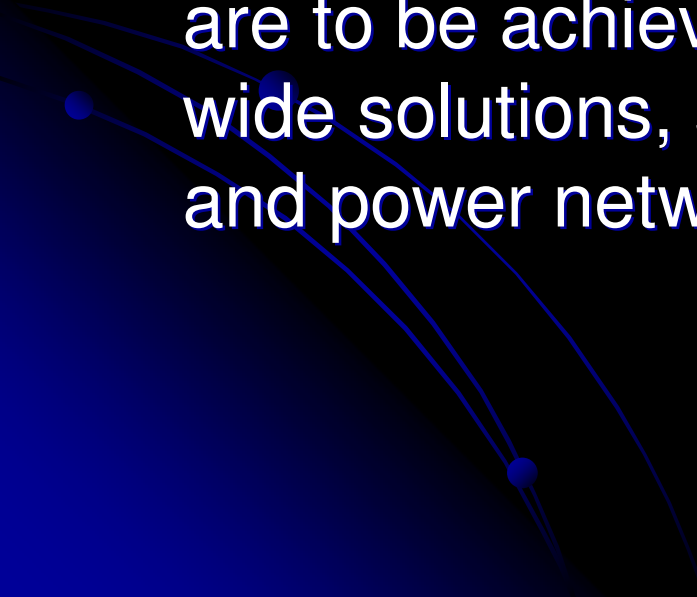
- A recent project undertaken with Historic Scotland and Glasgow Caledonian University, measured the thermal performance of traditional windows
- This study has revealed that properly repaired and maintained windows can satisfy building regulation targets, and the addition of shutters, blinds or curtains further improve thermal performance



UK

- *Hearth + Home* planned to monitor the energy usage of 20 terrace houses, to evaluate the cost-effectiveness of energy saving options and to provide guidance on measures to reduce domestic fuel usage and carbon emissions. This project has now been recast as a broader programme of research, practical advice and policy development
- English Heritage, Historic Scotland and other jurisdictions undertake demonstration projects, and produce a great amount of guidance material
- Organisations like the National Trust lead by example with the management of its properties

UK

- English Heritage has undertaken a pilot study in Soho, London, looking at improving the sustainability of historic core areas
 - A key finding is that an integrated approach to retrofitting is essential, and the greatest benefits are to be achieved by scaling up to community wide solutions, such as a district combined heat and power network
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UK

- Historic Scotland has partnered with Glasgow Caledonian University and Reidvale Housing Association to undertake a study into Victorian tenement housing in Glasgow
- The project involves installing six types of insulation, measuring humidity and thermal transmittance, and verifying manufacturers U-value claims
- The study looks at the tenements prior to being occupied, and then through the heating period while occupied



UK

- Historic Scotland partnered with Edinburgh World Heritage and Changeworks (a charitable trust) to undertake a pilot project at Lauriston Place, a heritage listed tenement
- A guide for improving energy efficiency in traditional homes was produced, and a second stage was undertaken which involved the installation of solar thermal panels. A guide to micro-generation in traditional homes was also produced



UK

- The National Trust has a large and diverse property portfolio and strives to lead by example with respect to energy efficiency and historic buildings
- Renewable energy installations at Trust properties include:
 - solar photovoltaic;
 - solar water heating;
 - wind turbines;
 - hydroelectric systems;
 - biomass, wood pellet, chip and log boilers; and
 - ground and air source heat pumps.
- Central office, Heelis Building, opened in 2005 and features extensive use of photovoltaic panels and timber from the Trust's estates



USA and Canada

- Heritage agencies in the USA and Canada do not have the same research focus as do heritage agencies in the UK
- In both the USA and Canada there is increasing recognition of the importance of the integration of historic preservation and sustainability
- There is increasing dialogue between historic preservation and green building advocates with the aim of defining both the areas of conflict and congruence between the two design approaches

USA and Canada

- In the USA, heritage preservation is guided by the *Secretary of the Interior's Standards*
- There has been a great deal of debate regarding whether the *Standards for Rehabilitation* need to be revised to address sustainability issues in more detail. However the current thinking appears to be that the Standards are 'green friendly' and what is needed is further interpretation and clearer and more comprehensive guidelines to ensure their consistent application

USA and Canada

- In Canada, Public Works and Government Services Canada has provided leadership in the development of heritage conservation and social-cultural sustainability metrics for use in green rating tools, as well as developing guidelines for the application of sustainability principles to historic buildings
- Parks Canada has undertaken a life cycle assessment study of embodied effects for existing historic buildings



USA and Canada

- Much activity surrounding the design of green rating tools and how they represent historic preservation concerns, in particular the incorporation of more social-cultural sustainability metrics
- In the USA, the Sustainable Preservation Coalition is providing leadership in this area and is developing a strategy for making historic preservation a more viable option within green building
- The membership of the Coalition comprises both government and non-government organisations and its activities are coordinated by the National Trust for Historic Preservation
- The Leadership in Energy and Environmental Design (LEED) green building rating system is having the biggest impact in the USA. LEED was developed by the US Green Building Council

USA and Canada

- Preservation advocates are concerned about how the standards are applied to historic buildings, and there has been criticism about the design of green rating tools, and in particular LEED
- Criticisms of LEED and other green rating tools include:
 - highly prescriptive and weak on performance measures (with the exception of energy efficiency)
 - overlook the impact on cultural value
 - do not effectively consider the performance, longer service lives and embodied energy of historic materials

USA and Canada

- credits need to be more weighted according to Life Cycle Analysis Indicators for durability
- few points are given for saving historic building materials
- points are however given for recycling demolished materials, as well as salvaging materials;
- points are not given when historic buildings are inherently energy efficient
- restricting water usage can harm historic landscapes
- rating tools differ in weighting and importance of individual categories
- they have become measures of 'how we consume', rather than asking questions such as 'how much do we consume' or 'should we consume'

USA and Canada

- Recent LEED developments include:
 - a new alternate compliance path is being developed that will benefit existing buildings, entitled 'Life Cycle Assessment of Building Assemblies'. This will be an optional path to use in the materials and resources category based on the durability and embodied energy of existing materials
 - Introduction of the LEED Neighbourhood Development tool, which grants specific points for saving historic buildings

USA and Canada

- The Sustainable Preservation Coalition has suggested a range of performance metrics which would more appropriately address preservation concerns. These include LCA based metrics relating to the:
 - reduced carbon footprint of the construction process—to recognise impacts that are avoided by the reuse of the existing building, such as the preservation of embodied energy, avoidance of waste generation, and reduction in the production, transportation and use of new materials
 - reduced carbon footprint of operations and liveability—to recognise the value of passive climate control
 - durability—to recognise the relatively long service life of traditional materials
 - life cycle flexibility—to recognise the multiple reuses and adaptability of historic building types which extends the life cycle of buildings

USA and Canada

- Much discussion about building envelope performance
- Toronto Mayor's St James Town Tower Renewal Project is looking at sustainability issues associated with tower apartment buildings, and in particular building envelope performance



observations

- My principal observations are that:
 - the environmental merit of retaining and conserving older buildings, including heritage buildings, may seem obvious however it appears to be difficult to prove without access to the appropriate data and tools
 - indicators, measurement and scientific data are important in the sustainability field, and heritage conservation is traditionally weak in scientific data and measurement
 - there are significant gaps in existing green rating tools which do not address social and cultural indicators of sustainability—including the consideration of durability, embodied energy and life cycle analysis. The inclusion of social and cultural metrics would acknowledge heritage conservation as a sustainable action
 - decisions about whether to keep or demolish a building often revolve only around cost considerations without taking account of the environmental implications. There is a need to quantify the avoided environmental impact—the potential environmental gains available with keeping and renovating a building versus demolishing and building new. Environmental impacts can then be brought into the decision making process along with costs and other considerations

links

- Department of Environment and Resource Management
www.derm.qld.gov.au/heritage
- Queensland Heritage Council
www.qldheritage.org.au
- Winston Churchill Memorial Trust
www.churchilltrust.com.au