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INTERNATIONAL COUNCIL ON MONUMENTS AND SITES

1st Meeting of the National Scientific Committee on Energy and Sustainability (NSCES)
10th March 2015, 5.45pm for 6pm start
Australian Institute of Architects, Tusculum, 3 Manning Street, Potts Point

9.1.2 Energy Efficiency in Historic Buildings, Madrid update

International Conference on Energy Efficiency in Historic Buildings: Experiences & Solutions - How to improve the energy efficiency of historic buildings while preserving their historic character, values and historical integrity - 29 & 30 September 2014


Conference location; Escuela Técnica Superior de Ingenieros Industriales, Madrid

The conference was an international forum that aimed to give visibility to groups working on the generation and transfer of knowledge on energy efficiency applied to historic buildings. Sponsors and collaborators included: Spanish Ministry for Economy, Spanish Foundation for Science and Technology, Edinburgh World Heritage and the Austrian Ministry for Transport, Innovation and Technology.

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The themes of the conference were:

- Traditional and technical knowledge: concepts, techniques, practices, uses, materials, methodologies
- Governance, management, participation and mediation
- Legal and technical regulation and historic buildings
- Funding mechanisms

Over 170 people from 18 counties participated in the conference, sharing research and case studies. Whilst the focus was on ideas to assist property owners in meeting European Union and European

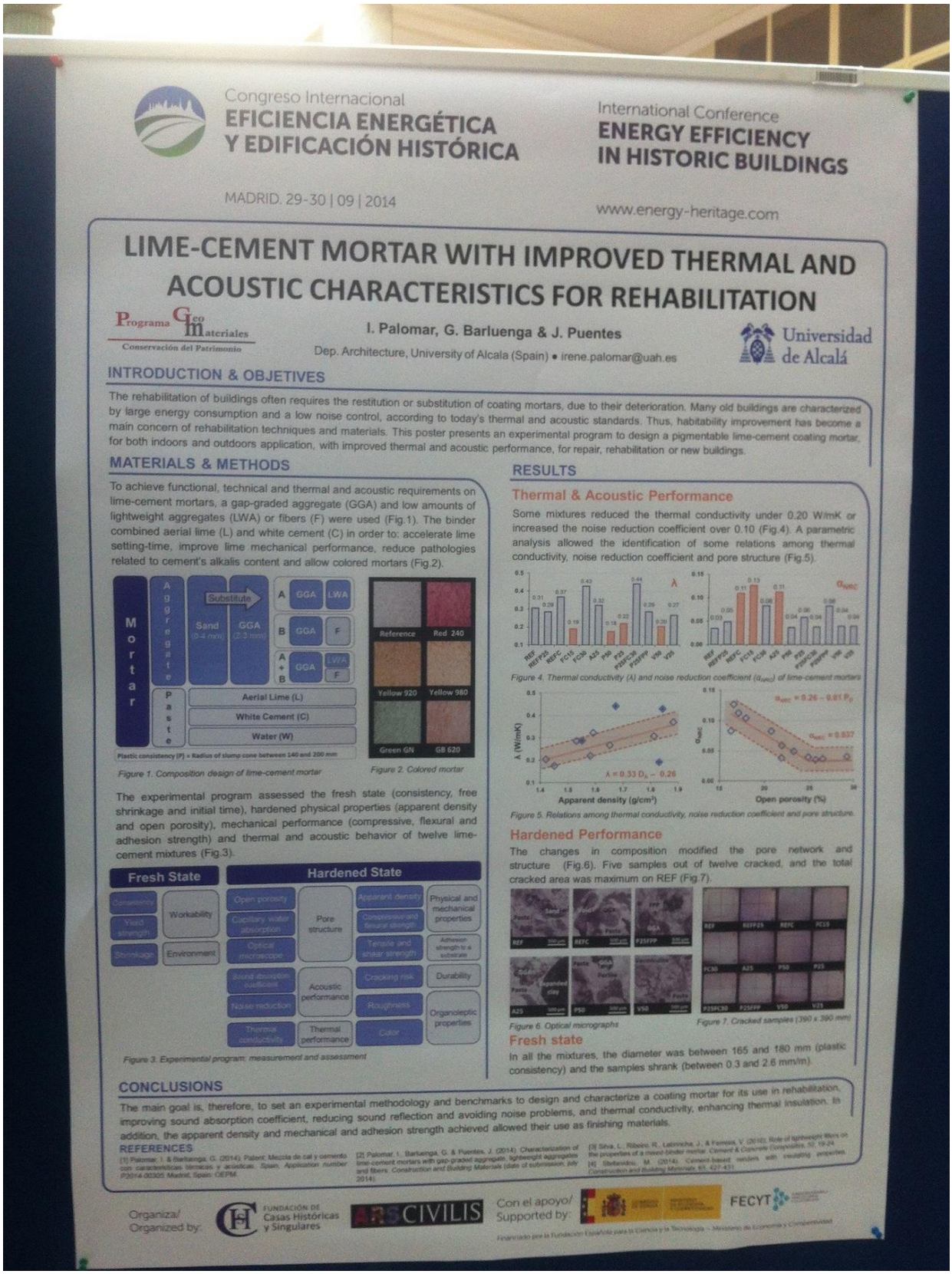
Community targets for energy use and efficiency, case studies and research from across the world was presented at the conference. Papers ranged from case studies of towns, e.g. Porto, Portugal with an historic centre largely in the ownership of non-wealthy citizens through to studies modelling embodied energy, the use of photovoltaics in villages along the Camino de Santiago de Compostella and issues in providing comfort for infrequent (once a week) but loyal and devoted congregations of churches. All proceedings and papers were captured by the conference organisers and can be found at https://energyheritage.files.wordpress.com/2014/12/actas-proceedings-energy-efficiency-and-historic-buldings1.pdf

Members of NSCES may be familiar with many of the challenges and ideas canvassed at the conference but I was particularly struck by the complexity of the issues faced by EU member states to meet common legislative requirements and energy use targets within their own cultural and political environments. I was also interested in the work being done by the Sustainable Buildings Network UK, a collaboration of not-for-profit organisations that aims to promote and deliver a more sustainable traditional built environment in the UK http://stbauk.org who have a terrific tool http://responsible-retrofit.org/wheel/ which though very much geared towards the UK's heritage/conservation system provides an interesting idea for a tool that could be adapted for Australian use.

I presented a recent boiler replacement project at Old Parliament House Canberra and explored the Australian Government imperatives to meet energy efficiency targets, described the varied technical, conservation and regulatory challenges of the project and finished with some data that is showing that the innovative solution is already demonstrating energy savings. At the end of the project we have emerged with values intact and a heating system that will ensure the heritage site has a sustainable future.

Edwina Jans
Member, NSCES (National Scientific Committee for Energy and Sustainability, Australia)

(See following pages for Samples of poster presentations at conference)



Sample of poster presentations at conference

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Congreso Internacional
EFICIENCIA ENERGÉTICA Y EDIFICACIÓN HISTÓRICA

International Conference
ENERGY EFFICIENCY IN HISTORIC BUILDINGS

MADRID. 29-30 | 09 | 2014

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TECHNICAL SYSTEM HISTORY AND HERITAGE: A CASE STUDY OF A THERMAL POWER STATION IN ITALY

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INTRODUCTION

Energy efficiency and sustainability in Heritage Buildings (HB) are closely related to the history of buildings.

i)the study of *Historic Indoor Microclimate (HIM)*, defined as the non-material part of a building, or, in other words, the "*Environmental Building*" (EB).

ii) a study of technical systems - hydraulic, wiring, HVAC, etc. – whose main role is to guarantee and to satisfy the above indoor comfort set-points.

The study of the technical system framework presents four items:

a) **historical items**, in order to find out if existing systems have an historic relevance for specific building history and/or History of technology;

b) ***technical systems surveying***, in terms of both building surveys in order to know their network system (e.g. air-conducts, pipelines, etc.), front-end emission (e.g. radiator, light, fan-coil, etc.)

c) ***effectiveness*** of operation of historic technical plant, that depends on a specific technical plant, in spite of a wide variety of technical systems;

d) the ***heritage preservation*** of technical system as documents, and/or technical system integration in order to guarantee modern-day comfort set-point conditions.

THE CASE STUDY: THERMAL POWER STATION

The Thermal Power Station of ITIS Giovanni Marconi (Secondary Technical School) located in Forlì in the center-north of Italy. The Thermal power station was built in 1938 and is the same age of building.

The Historic Thermal Power Station - a museum in itself – is a small Rankine Cycle, with a boiler with a horizontal Babcock-&-Wilcox water-duct, produced by Officine Breda Elettromeccanica e Locomotive spa, an industry with a major role in the Italian industrial history during the XIX and XX centuries.

Boiler with horizontal Babcock-&-Wilcox water-duct

Turbine (left) and Alternator (right)

Condenser (under turbine)

In our point of view, if during restoration an architect understands the above four items of the conceptual framework, he should propose a better way to improve energy efficiency in the heritage building.

This little piece of Industrial Archeology is fascinating, for these reasons:

- it is a document of a Rankine Cycle and Babcock-&-Wilcox technologies in Italy.;

- the educational role for Technical Institute students, they in turn would perhaps have been able to construct or to manage similar power stations;

- the independent decision, from WWII to today, to preserve the Thermal Power Station as a document, as a teaching example

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Sample of poster presentations at conference