

Short Term Scientific Mission, COST C23 | Scientific Report

Reference

Beneficiary: Mr João Cortesão, Faculty of Engineering of Porto University

Host: Joanne Patterson, Welsh School of Architecture - Cardiff University

Period: from 07/05/2009 to 29/05/2009 Place: Cardiff (UK)

Reference code: COST-STSM-C23-04647

Purpose of the visit

The aim of this Short-term Scientific Mission was to establish a second contact with the Welsh School of Architecture (considering that the first contact was made in March 2008) in order to assess my PhD research's development towards its theme and the COST 23's aims and methods; to have new contributions and potential new research paths; to have new references on present research; and to contact some researchers that have been undertaking relevant work on the same research field.

Furthermore, this second visit to the Welsh School of Architecture allowed me to have a direct contact with my work's co-supervisor and, together, to evaluate the work's progress since the last visit and to compare the work carried out at my home institution's research unit with the procedures, knowledge and instruments of my host institution's research unit.

Description of the work carried out during the visit and its major achievements

The work carried out during the visit to Cardiff followed generally the main topics of the Work Plan presented to the STSM Grant candidacy. Bearing this in mind, one can point out very briefly the following topics:

- 1. Assessment of the research's aim and work plan.** The works' structure, methodology and case studies as presented and discussed at the moment were considered to be well structured and justified despite, obviously, many refinements that still ought to be done during the research's development. Many topics at this level were suggested, thought and discussed. Moreover, it was possible to understand that the work is now closer to the research activity undertaken by its co-supervisor.
- 2. Access to new bibliographic and projectual references.** During the STSM it was possible to access many bibliographic references of absolute importance to the research. Some accesses were held at the Welsh School of Architecture's Library (consultation and copying only), where amongst many references one could outstand the *2005 ASHRAE Handbook of Fundamentals*, and other at several bookshops in London (acquisition), where amongst some references one outstands the T.R. Oke's *Boundary Layer Climate* (considered as one of the most important books in the urban climatology field). In what concerns to projectual references, under suggestion of one of the researchers contacted in Cardiff, it was possible to be aware of a space in Bristol: *The Centre Promenade*. This project will work as a reference case to be compared with the study cases in Portugal, as an example of an urban renewal intervention towards a more pedestrian space endowed of climatic amenities such as vegetation, water features or wind breaks. It is therefore a project concerned in providing a more pleasant place for people also from the thermal point of view.

3. **Potential development of a particular aspect of the research theme.** During this STSM period, it was possible to develop especially the methodology and tools for the analysis of the case studies, namely in what concerns to a questionnaire, a morphological and climatic analysis table and an analysis synthesis table. Amongst these tools, the development of the questionnaire was especially focused for it will constitute the most complex analysis tool to be used as it relates with both objective and subjective human parameters. The development of this tool was carried out during all the period of the STSM mainly through the reading of certain bibliographic references and, above all, the contributions of researchers that have undertaken field surveys on either outdoors thermal comfort or other parallel areas, such as Joanne Patterson (Cardiff University) or Marialena Nikolopoulou (Bath University). The questionnaire (and also the morphological analysis table) was also made a pilot test in Bristol, at the abovementioned reference case. This test allowed understanding which aspects of the questionnaire would have to be improved in terms of structure, sequence, relation to the theme and English grammar as well. This work has not produced directly any thesis chapter, journal article or conference paper, but allowed to prepare the methodology and tools of analysis for the development of either the thesis, either one journal article and one conference paper presently in preparation.
4. **Conference SCALA/SCEME/CLAW Study Day /Diwrnod Astudio.** Participation in the conference held at the Welsh School of Architecture in the area of low carbon environments. On the 14th May the Welsh Assembly Building in Cardiff Bay and the Environmental Discovery Centre in Margam Park were visited whilst on the 15th, one attended to the conference itself. These two contributions were important to be aware of built, to be built or policy-making projects on the wider area of sustainable development and low carbon environments.
5. **Vertical Studio 2009 - Final Review Event.** Participation in the Vertical Studio 2009 held at the Welsh School of Architecture, as part of the final evaluation team for the workshops '2020 Vision' and 'Territory Roadside'. This experience although tangential to the research, was extremely important to understand how sustainable development and low carbon technologies are being introduced in academic projects and as well to remember basic urban design issues. The student's simple language, thought and proposals allowed me to re-discover certain crucial urban design issues "forgotten" during the deepening of the research.
6. **RIBA Summer Talks Programme 2009 - International Dialogues: Architecture and Climate Change. Denmark: Designing for Climate Change, Talk 2. CEBRA and COBE.** Attendance to the conference at the Royal Institute of British Architects (RIBA) headquarters, in London. Although not particularizing thermal comfort and public spaces issues, this conference was important to be aware of how sustainable development and energetic efficiency can be (and are being) implemented in architecture projects, in this case from two Danish architecture offices.

Future collaboration with host institution

Not applicable.

Projected publications/articles resulting or to result from the STSM

There is one journal article and one conference paper to result from the STSM:

- Journal article for the ISOCARP Review 05, entitled *Investigation of potential bioclimatic interventions for a Portuguese city*. Authors: F. Brandão Alves, João Granadeiro Cortesão, Joanne Patterson and Joaquim Góis.

- Paper to the 45th ISOCARP International Congress, on Low Carbon Cities (to be held at Porto from 18th to 22nd October 2009), entitled *A Method for the Bioclimatic Intervention in Portugal*. Authors: João Granadeiro Cortesão, F. Brandão Alves, Joanne Patterson, Ana Monteiro and Helena Madureira.

STSM major achievements – COST C23's goals

Firstly, the results obtained from this STSM can help to achieve the goals of the COST 23 Action basically by ensuring that my research is coherently orientated towards both the above mentioned Portuguese and Welsh institutions' research experiences. The former through the supervising of Professor Fernando Brandão Alves (member of COST 23 Working Groups 2 and 3) and, the latter, through the co-supervising of Senior Research Associate Joanne Patterson (Coordinator of COST and member of COST 23's Working Groups 2 and 3). Thus, this research work and more precisely this STSM might be able to act as a scientific link between both institutions, reinforcing their common research aims, namely those of the COST 23's Action.

Secondly, because this research relates to the establishment of low carbon technologies on urban projects, namely in what concerns to people's outdoors thermal comfort. Basically, external thermal conditions have a direct impact indoors. So, if the thermal conditions of an urban public space are improved, so will the indoors conditions be improved as well. As a consequence of this, there will be less necessity of using mechanical devices to control indoors temperature, which means a more effective reduction on carbon emissions related to warming up or cooling down mechanisms.

Therefore, the undertaken STSM has contributed either to enrich my PhD research, either to develop the COST 23's scientific aims. All the results achieved with this STSM enabled the research to become more straightforward and coherent with its aims, defining therefore the methods, tools and structure of a research that is concerned on providing part of the conditions to reduce the use of mechanical devices of controlling indoors air temperature. This will help the COST 23 Action to achieve its goals by providing one more approach to its research field, in this case focused on taking microclimatic control measures forward to the urban design practice.