

Short Term Scientific Mission, COST C23 | Scientific Report

Reference

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

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

Period: from 3/03/2008 to 17/03/2008 Place: Cardiff CF10 3NB (GB)

Reference code: COST-STSM-C23-03501

Purpose of the visit

The STSM carried out has constituted an important part of a PhD research work and, therefore, was a crucial step to develop it. Regarding this, the aim of this STSM project was to take contact with the Environmental Laboratory of the Welsh School of Architecture, in order to:

- a. Test the work structure and the case studies focused in my PhD thesis;
- b. Ensure that the research work will be precisely orientated, in a coherent way, considering the opportunities offered by the instruments of the laboratory and the COST 23 procedures.

Description of the work carried out during the visit

Globally, the work carried out during the visit can be described as divided in two main parts: methodological learning and instrumental learning, as pointed in the Detailed Work Plan presented to the STSM Grant candidacy. In what concerns to the first one [were aspects related to more theoretical, conceptual, structural issues where approached], the work was carried out basically through:

- Meetings with the PhD research work's Co-supervisor as well as with other research associates, senior staff members and lecturers, who had been undertaking research on climate and comfort, therefore in issues closely related to the background of the research work;
- Bibliographic research at the Welsh School of Architecture's library (thesis, journals, books...) and informal discussions of the research theme and aims with other PhD students.

Relatively to the instrumental learning [were aspects related to more practical issues were approached], the work was carried out basically through the:

- Contact with the Environmental Laboratory's facilities, were it was possible to assist to a practical demonstration of the wind tunnel on a test carried through a PhD student; to understand how to work with the software required to use the wind tunnel; and to have a practical demonstration of the Ski Dome | Artificial Sky;
- Visit to the reference cases: BedZed and Greenwich Millenium Village - London;
- Case studies choice.

Description of the main results obtained

Finished the STSM it was possible to accomplish the purpose of the visit to the Welsh School of Architecture [WSA]. Considering all the influences obtained from the work carried out during the STSM, as described on the previous topic, it was possible to achieve some results/conclusions that had enabled to some new paths on the research development.

Relatively to the first purpose of this visit [to test the work structure and the case studies focused in my PhD thesis], it was possible to:

- Redefine the **work structure**, objectives, study factors and methodology. This redefinition allowed me to better position my research work in its scientific area [microclimatic thermal comfort]; to clarify concepts; to clarify which path to follow towards its main objectives and to think on which would be the best methodological approach to reach them.
- To define the **case studies** [Greyfriars Road area | Cardiff and Praça do Bom Sucesso | Porto] as well as their approach methodology, regarding the research background and aims [to interpretate them - to propose a different solution - to test that solution].

In what concerns to the second purpose of this visit [to ensure that the research work will be precisely orientated, in a coherent way, considering the opportunities offered by the instruments of the laboratory and the COST 23 procedures], it was possible to:

- Understand that the research will be orientated towards the use of the software Ecotect or Townscope [still in stage of decision], to air temperature measurements, and the wind tunnel, to air velocity measurements and how to do it.
- Have some notions of the COST 23 procedures through several means [reunions, books, etc] that informed the research as references to redefine some of its concepts and notions. The most evident one was to understand that the research could not focus thermal comfort only on air temperature but also on air velocity, because the way how these two factors are related will determine the necessity of mechanical devices of controlling temperature, thus major or minor CO2 emissions.

Obviously, as this research is in an early stage, many questions are still needed of a much clear and defined approach; many of them are still waiting for a way to be formalized. However, this STSM allowed the most important thing in this research stage: to clarify where my research might fit in, where it aims to reach and specially how to get there.

Future collaboration with host institution

Not applicable.

Projected publications/articles resulting or to result from the STSM (if applicable)

Not applicable.

Confirmation by the host institute of the successful execution of the mission

Confirmed. The visit was a success.

Other comments

The results obtained from this STSM can help to achieve the goals of the COST 23 Action basically by informing my research on what microclimatic thermal comfort really is and which factors are really in stake to its improvement. In other words, this means that by giving me guidelines on how to develop my research work on this issue, also gave me the notion of what this phenomenon really is. And to understand it better is to insure a more coherant and precise approach to it, which is extremely important when one talks about understanding how the relationship between buildings and pavements facing materials and vegetation, working together, can improve microclimatic thermal comfort in order to reduce CO2 emissions associated to mechanical devises of controlling temperature outdoors and indoors.