

## **Short Term Scientific Mission, COST Action TU0904 – Scientific Report**

Reference code: COST-STSM-ECOST-STSM-TU0904-080512-017485

Beneficiary: Bilotta Antonio, University of Naples - Federico II - D.I.ST. - Department of Structural Engineering (Napoli, Italy)

Host: Rein Guillermo, University of Edinburgh

Period: from 08/05/2012 to 17/05/2012 Place: Edinburgh (United Kingdom)

The STSM was aimed to establish a fruitful partnership between the Department of Structural Engineering (DIST) of the University of Naples Federico II, which the applicant is affiliated to, and the School of Engineering of the University of Edinburgh.

The collaboration concerns the study of fire behaviour of concrete members reinforced with FRP bars. The activity consists in both experimental tests, carried out at the Laboratories of the University of Edinburgh (BRE center for Fire Safety Engineering), and numerical simulations. Experimental and numerical results will contribute to increase the confidence in the use of FRP-RC members also in civil structures for which fire is an event that cannot be ignored, as well as parking lots and industrial structures. Moreover, they allow a scientific background to be created, in order to update the international codes concerning the design of concrete structures reinforced with FRP bars in place of traditional steel reinforcement (e.g. Italian, Canadian and American Standards).

The applicant has been working with the research group of Edinburgh to contribute the planning of (a) fire tests on three-span continuous FRP reinforced concrete slabs, (b) pull out tests a high temperature, and (c) tensile test for FRP bars at high temperature. The applicant made available the experience matured in participating in some fire tests on concrete slabs reinforced with internal GFRP bars, previously carried out in Italy within a research project of the University of Naples (scientific team leaders, prof. Gaetano Manfredi and prof. Emidio Nigro)



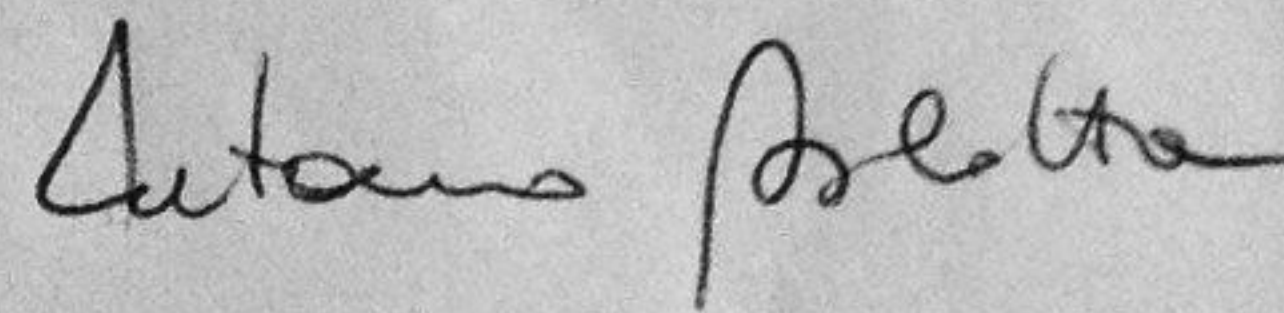
The planning phase of experimental work has been completed. Relevant phases for the preparation of specimens and the execution of tests were defined.

The applicant has come to agreements for a future collaboration with host institution, to continue the evaluation of the thermo-mechanical behavior of FRP-RC members in fire situation. In particular, experimental results will be compared with the predictions of a calculation incremental-iterative procedure based on the FE solution of the thermal problem and on the assessment of the moment-curvature law of the cross-section at high temperatures in order to define reliable assessment design procedure for FRP-RC members in fire situation.

The results will be finally published on international peer reviewed journals, in full agreement with the dissemination purpose of the COST action.

Napoli, 28.05.2012

Antonio Bilotta

A handwritten signature in black ink, appearing to read 'Antonio Bilotta', written in a cursive style.