DISEG SEMINAR SERIES

Wednesday, February 14th, 9.30 am

Aula Albenga

Structural performance of concrete materials and members incorporating recycled rubber

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Abstract: The presentation will start by an introduction to structural engineering research at Imperial College London, with focus on the performance of structures under extreme loading conditions. It will then provide an overview of a recent research project on the behaviour of structural members incorporating concrete materials in which mineral aggregates are partly replaced by recycled rubber particles. Based on extensive tests, the main characteristics of rubberized concrete materials are firstly described and representative relationships for determining the compressive, splitting, bond and shear strength, as well as the elastic modulus, are outlined. Subsequently, an experimental study on large scale circular reinforced concrete members, subjected to lateral cyclic displacements and co-exiting axial loads, is described. The tests enable direct assessment of the strength and ductility characteristics, including an evaluation of the comparative performance of specimens with and without rubber replacement, as well as the influence of external confinement. In comparison with conventional reinforced concrete members, it is shown that structural elements incorporating a significant proportion of aggregate replacement can offer a good balance between bending capacity and ductility, particularly for modest levels of co-existing axial loads. For column members required to sustain substantial gravity loads, favourable performance can be achieved in rubberised concrete members by means of strength enhancement through external confinement.

Bio: Professor Ahmed Elghazouli, FREng, is Head of the Structural Engineering Section, and Director of the MSc programme in Earthquake Engineering, at Imperial College London. He has more than 25 years of experience in research and specialist consulting work worldwide. His main research interests are related to the response of structures to extreme loading, focusing on the areas of earthquake engineering, fire engineering, blast assessment and structural robustness. He has produced over 250 publications in related areas and has contributed to Eurocode development activities. He is a Fellow of the Royal Academy of Engineering as well as the Institutions of Civil and Structural Engineers, and chairs the BSI committee on seismic design. He is also past Chairman of the Society for Earthquake and Civil Engineering Dynamics as well as UK National Delegate to the International and European Associations for Earthquake Engineering.

Coordinators: M. Corrado, G. Musso, F. Tondolo and M. Zerbinatti