

STRUCTURES IN FIRE FORUM – 10th December 2018

School of Engineering, Warwick University,
Coventry, CV4 7AL



STRUCTURES IN FIRE FORUM

Provisional Agenda:

10.30 – 11.00 Coffee

“Progressive collapse analysis of composite steel frames subject to fire following earthquake”

Riza Hakim, University of Manchester

Three-dimensional progressive collapse analysis of composite steel frames exposed to fire following earthquake are presented. The scenarios of heating columns located in various different fire compartments are first studied to investigate load redistribution paths and members’ interactions within the composite frame. Then, the 3D model is adopted to investigate the effect of earthquake damages on the progressive collapse behaviour of the composite building.

“Modelling the thermal response of structural steel cables in fire”

Francesca Lugaresi, HazeLab, Imperial College London

There is a significant hazard of major fires developing on cable bridges. The vulnerability of structural cables has been acknowledged, however, the fire performance of cables is still relatively unexplored. The work presented focuses on the problem of heat transfer from a fire to and across a cable assembly. A recently developed methodology to predict heat transfer across a cable assembly is described and analyzed. The model predictions are compared to experimental data collected from the University of Edinburgh.

“Damage assessment, residual cyclic behaviour and repair of fire-exposed reinforced concrete columns”

Zafiris Triantafyllidis, University of Edinburgh

An experimental study was conducted as part of the ‘Challenging RISK’ research project, focusing on the assessment of damage in fire-exposed reinforced concrete columns and their performance in sequential post-fire seismic events. Full-scale columns were tested in a furnace under two different fire intensities and were subsequently tested under cyclic lateral load to examine their residual behaviour, before and after being repaired with external FRP confinement (wrapping). Preliminary results of this study will be presented and discussed

12.30 – 13.15 Lunch

“Modelling charring of timber across scales”

Franz Richter, HazeLab, Imperial College London

In this talk I will present the development and some capabilities of a high-fidelity model of charring of timber. The role of chemistry will be highlighted together with our work on the microscale to unravel the chemistry of charring.

“Reliability-based methodology for determining the effects of sprinkler and fire brigade intervention on post-flashover fire temperature development”

Iziengbe Inerhunwa, University of Manchester

Sprinklers and fire brigade intervention are two effective active fire protection measures that have profound effects on controlling fire behaviour in the post-flashover. Currently, multiplication factors are used to incorporate their effects on fire temperature development, but there are some limitations. In this presentation, a general methodology is discussed that incorporates more accurately the probabilistic effects of fire brigade intervention and sprinkler activation on temperature-time relationship in post-flashover compartment fires based on comparable levels of probability of structural failure.

15.00(ish) Tea