# **COST Action C26**

# **Urban Habitat Constructions under Catastrophic Events**

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Thermo-mechanical analysis of composite slabs under fire conditions D. Pantousa & E. Mistakidis

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The objective of this paper is to study the behavior of composite slabs with corrugated steel sheeting in elevated temperatures.

sophisticated sequel threethe In Two structural systems are considered: a In this case study the composite slabs are dimensional models of the slabs are simply supported composite slab and a exposed to the standard ISO 834 fire developed and they are submitted to continuous composite slab that consists of curve for 180 minutes. The numerically coupled-thermo mechanical analysis, two equal spans. Both of them are obtained results are, compared with those which takes into account the various designed according to the respective expected by the procedures of Eurocode nonlinearities that are present in the Eurocodes for strength and fire resistance. physical model behavior







#### **Description of the problem**

## Simplification of the model







Progressive collapse of the continuous slab in elevated temperatures (moments given in kNm/m).

The nodes of the shell elements are connected to the corresponding nodes of the 3D-solid elements of concrete

### **Results of the thermo-mechanical analysis**





4-node shell element

The results of the numerical analysis indicate that ✓ The simply supported slab fails at the 70<sup>nd</sup> minute ✓ The continuous slab fails at the 154<sup>nd</sup> minute





