

National project on the behavior of structures under fire after earthquake scenarios

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Objective of the research project :

Combined scenario of fire after a seismic event

Damage to structural & non-structural elements

Reduced fire resistance of structure

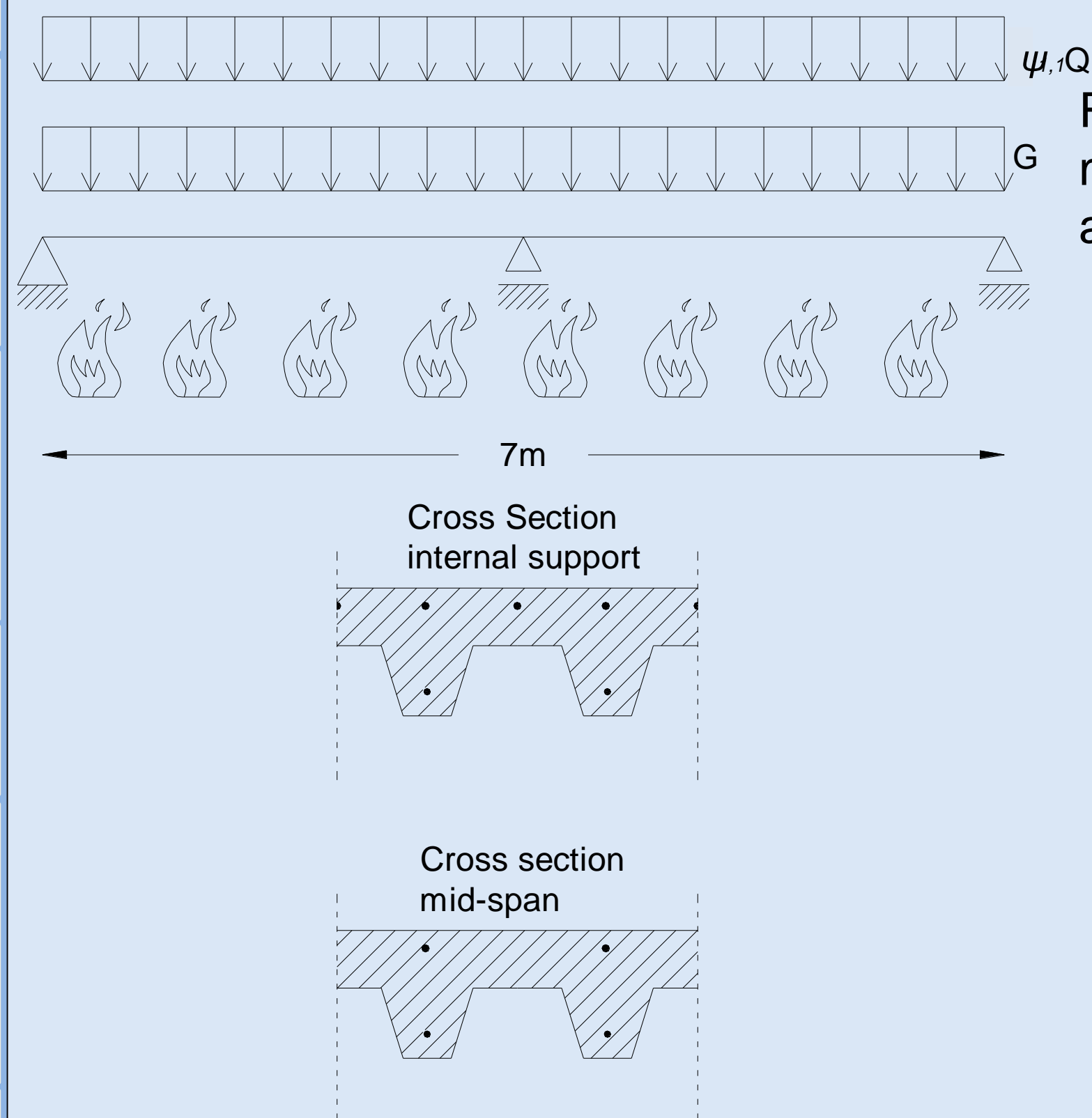
Results: Development of certain design procedures to cover the considered situation

Organization of project

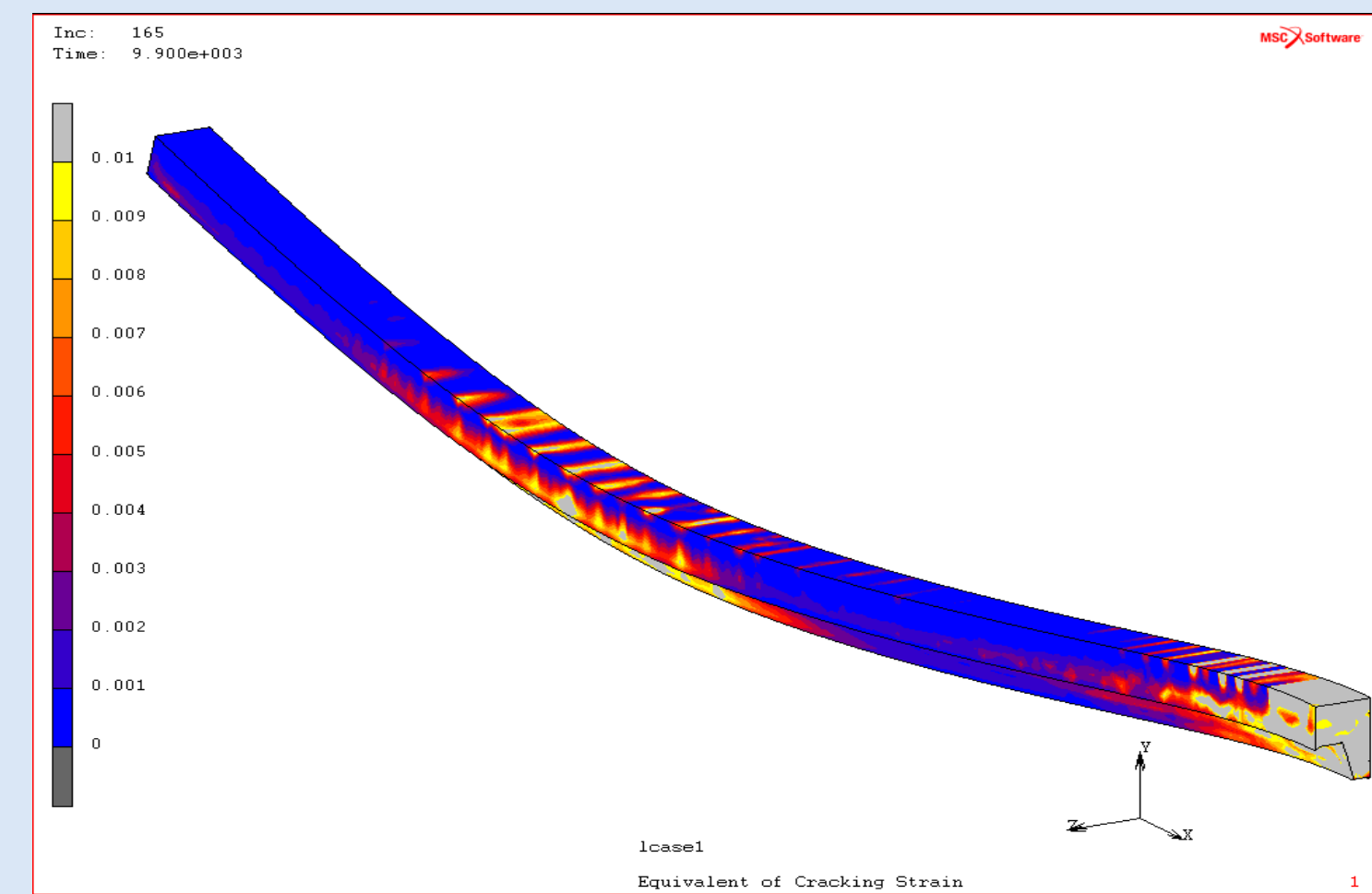
- Definition of performance requirements for combined actions (fire after earthquake)
- Simulation of natural fire under the consideration of damage induced by seismic events (development of various thermal scenarios)
- Experimental study of "damaged" members and structures in elevated temperatures
- Numerical simulation of the performed experiments
- Analysis of model structures, designed according to the current codes, in the fire after earthquake scenarios.
- Simulation of natural fire under the consideration of damage induced by seismic events (development of various thermal scenarios)
- Comparative analysis of fire vulnerability of RC and steel structures pre-damaged by earthquake
- Study of protection measures
- Development of design guides for practical applications

Numerical simulation of the fire behaviour of structural components

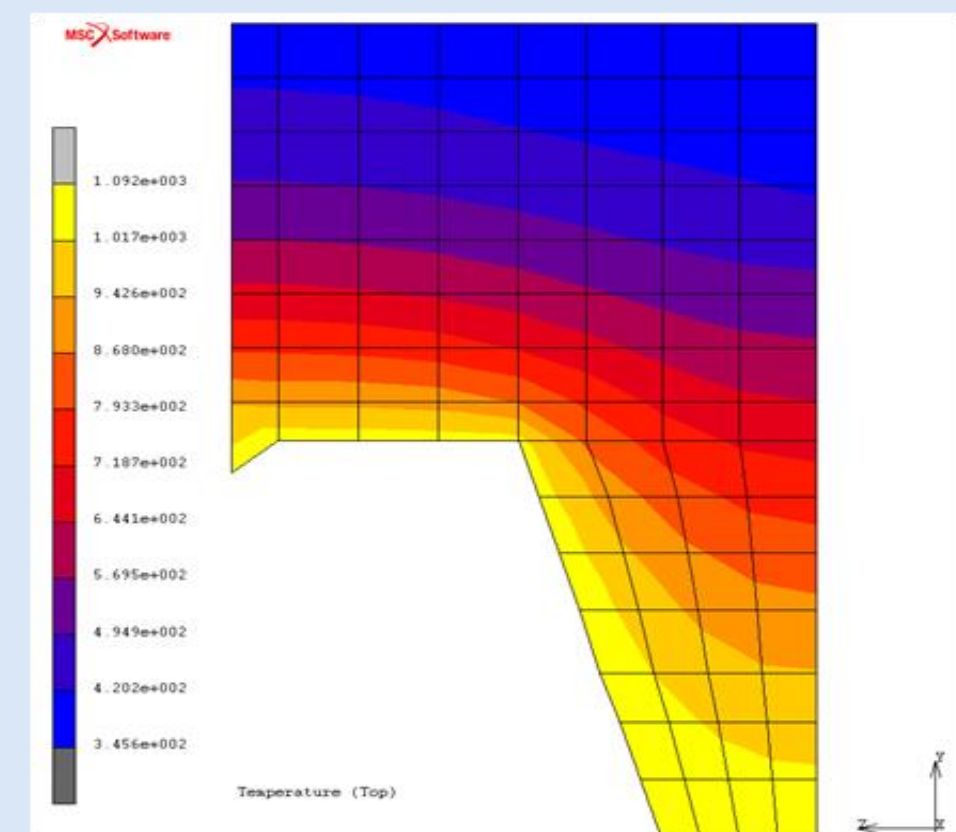
Thermo-mechanical analysis of continuous composite slabs under fire conditions



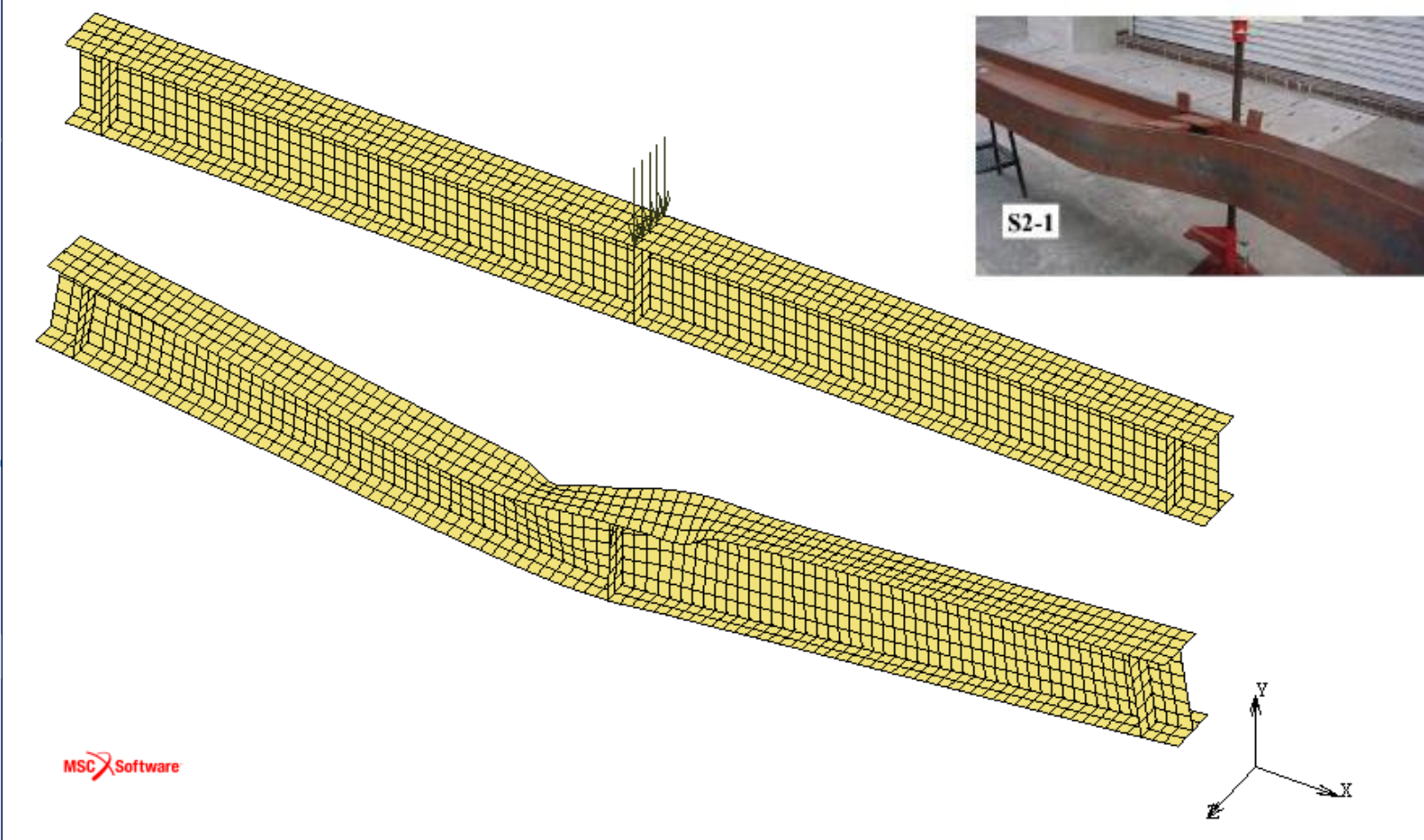
Results of mechanical analysis



Results of heat transfer analysis

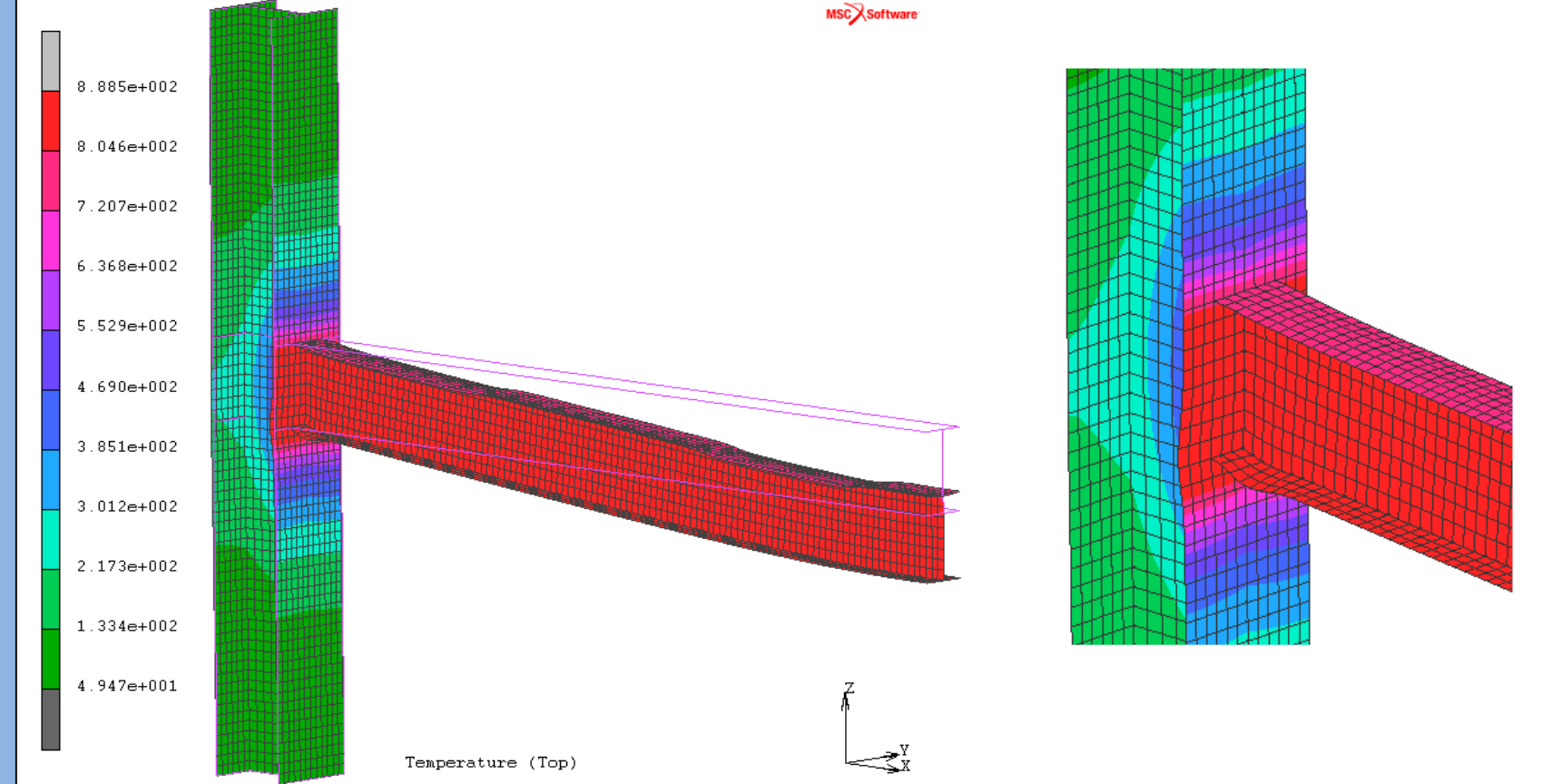


Numerical simulation of steel I-beams at elevated temperatures simulation of tests performed by R. B. Dharma, K.-H. Tan



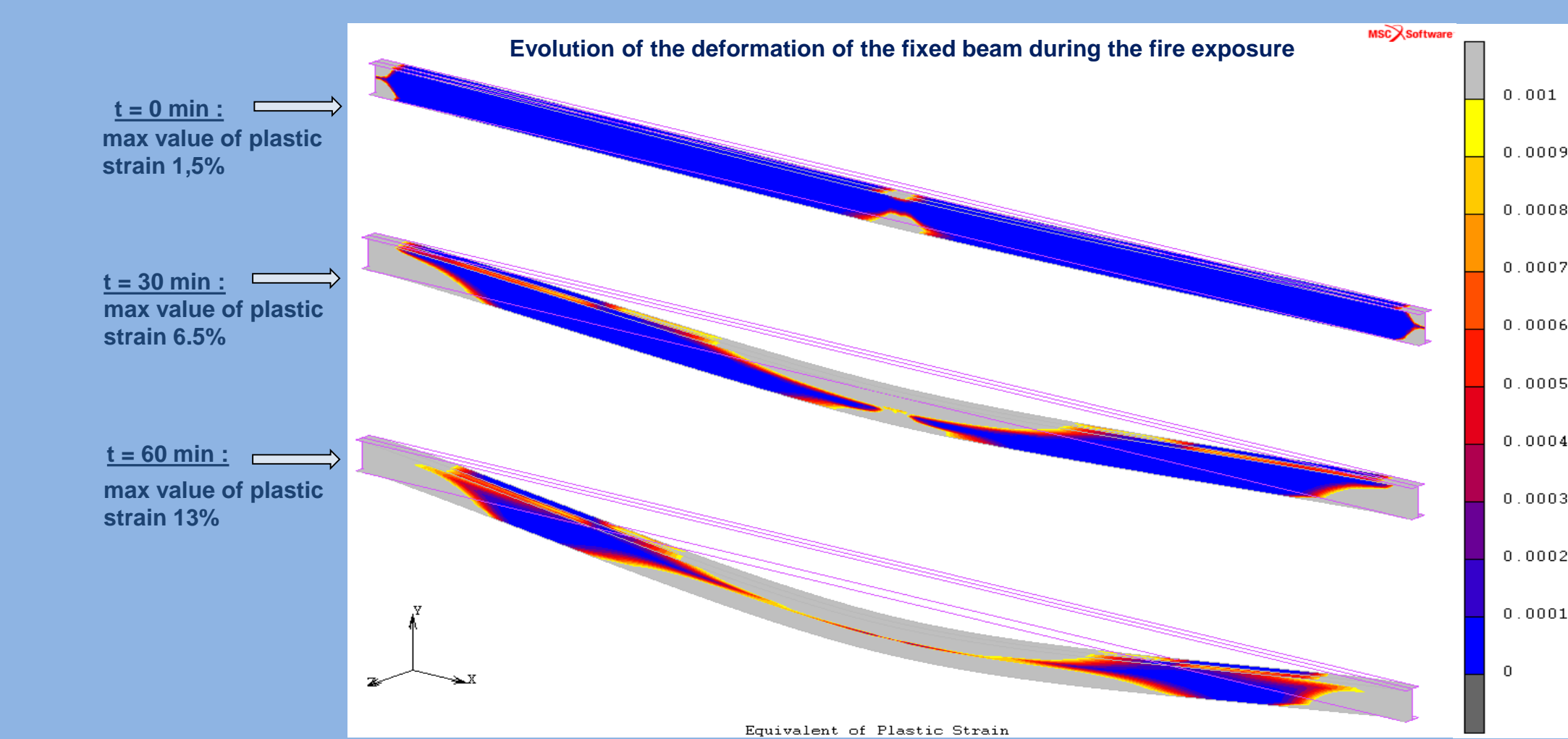
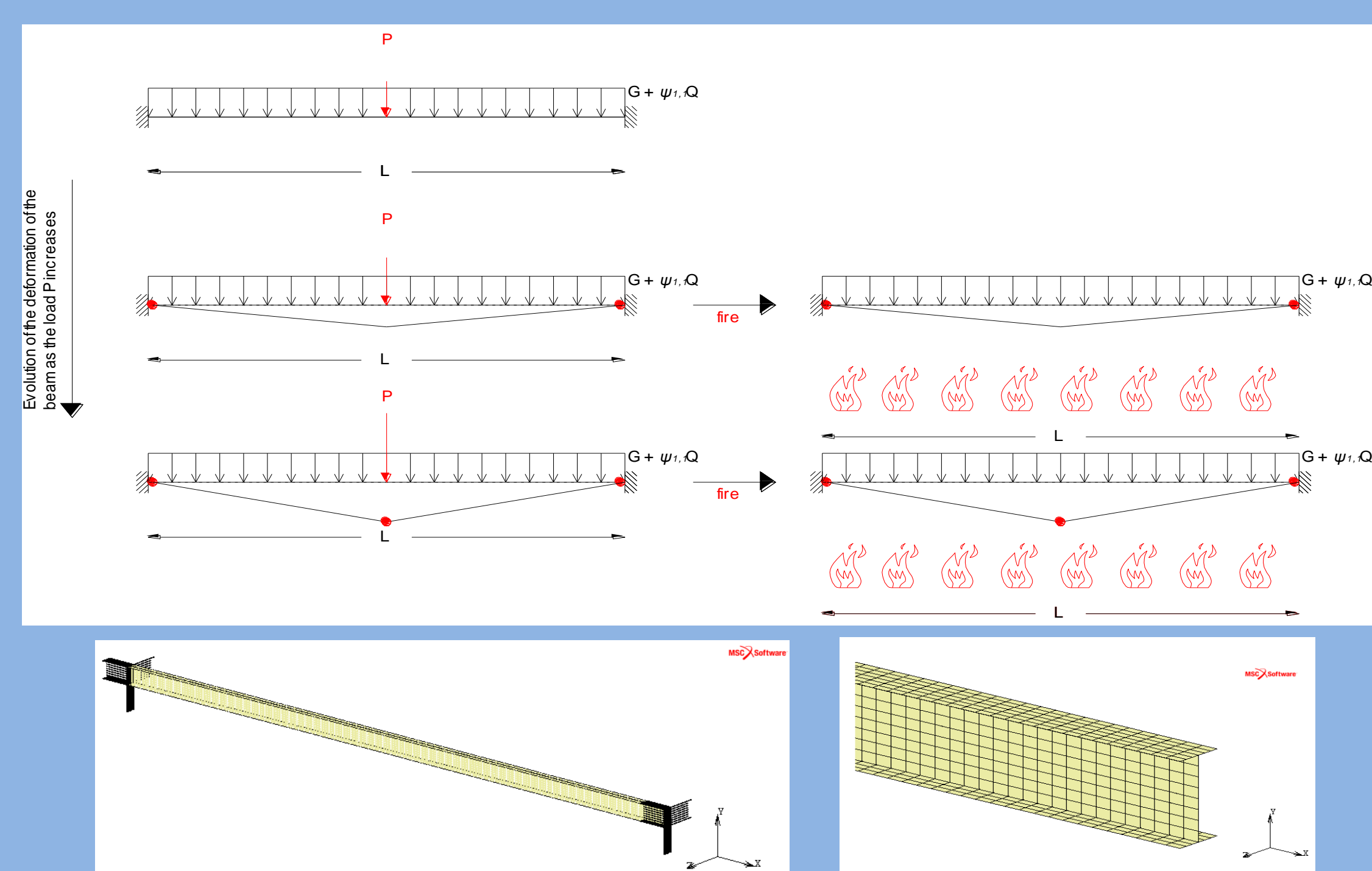
Numerical simulation of a steel sub-frame in fire (simulation of tests performed by A. Santiago, L. S. da Silva, P.Vila Real and M. Veljkovic.

Deformed shape of sub-frame at the end of the analysis

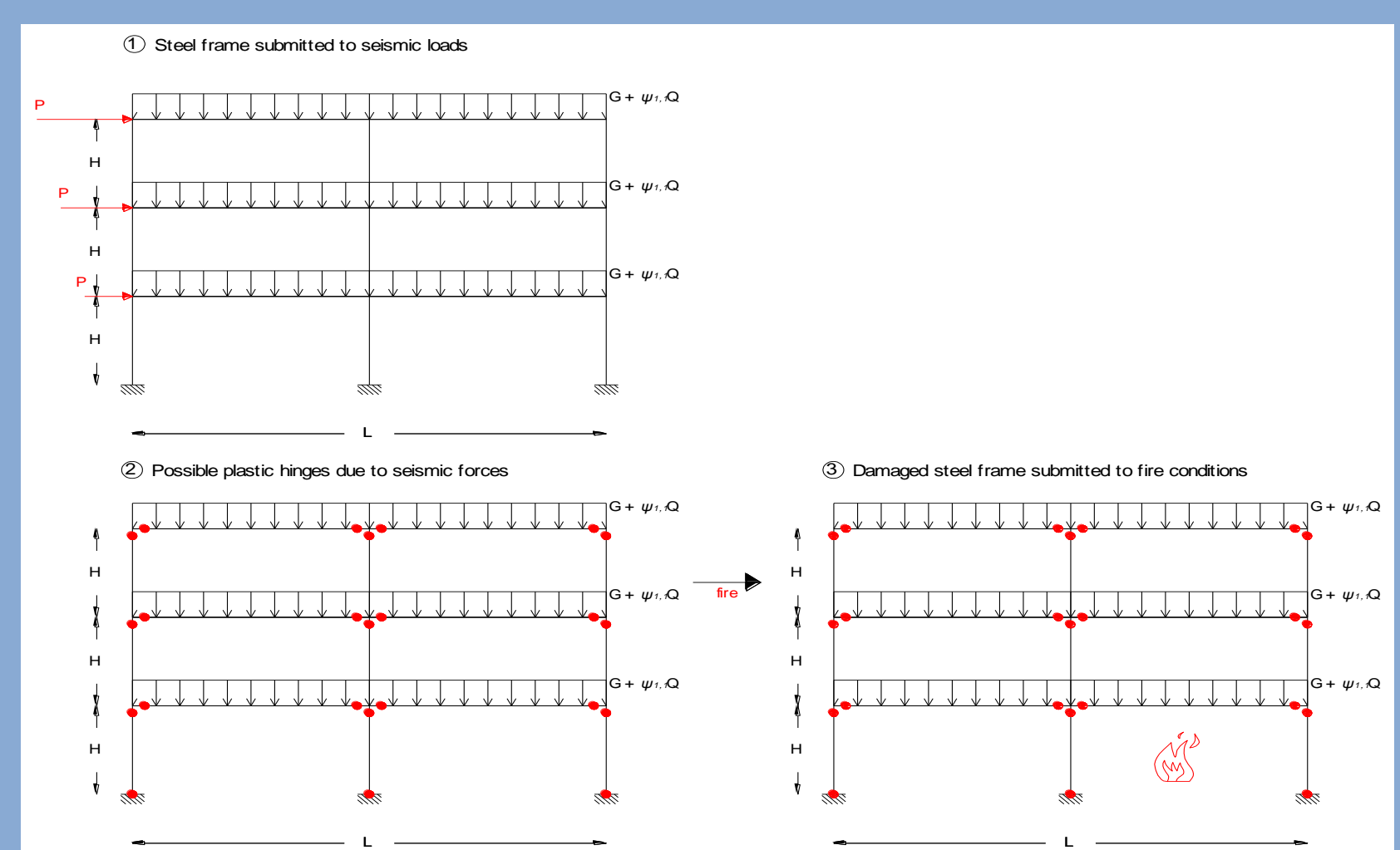


Numerical simulation of the fire behaviour of damaged structural components

Numerical simulation of a damaged steel I-beam submitted to fire



Numerical simulation of an industrial steel building under fire conditions after earthquake events



Parametric study related with the magnitude of plastic strain caused by prior seismic forces

