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The Impact of Steel Connections on the Fire Resistance of Composite Buildings

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Abstract : In the majority of previous research into modelling large scale composite floor subjected to fire, the beam-to-column and beam-to-beam connections were assumed to behave either as pinned or rigid for simplicity, and the vertical shear and axial tension failures of the connection were not taken into account. We have recently developed robust two-noded connection models for modeling endplate and partial endplate steel connections under fire conditions. The main objective of this research is to systematically investigate the impact of the connections of protected beams, on the tensile membrane actions of supported floor slabs in which the failures of the connections, such as, axial tension, vertical shear and bending are accounted for. The models developed have very good numerical stability under a static solver condition, and can be used for large scale modelling of composite buildings in fire.

Keywords : fire, steel structure, component-based model, beam-to-column connections
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