All articles in *Structures* are available free of charge to paying-grade members of the Institution as one of their membership benefits. The journal is available online at: www.structuresjournal.org

Spotlight on *Structures*

Read the latest issue

Volume 36 of *Structures* (February 2022) is now available to read at www.sciencedirect.com/journal/structures/vol/36.

Associate Editor, Mario D'Aniello, has selected a paper on tensile membrane action of composite slabs as the 'Featured Article' from this issue. The article will be available free of charge for six months.

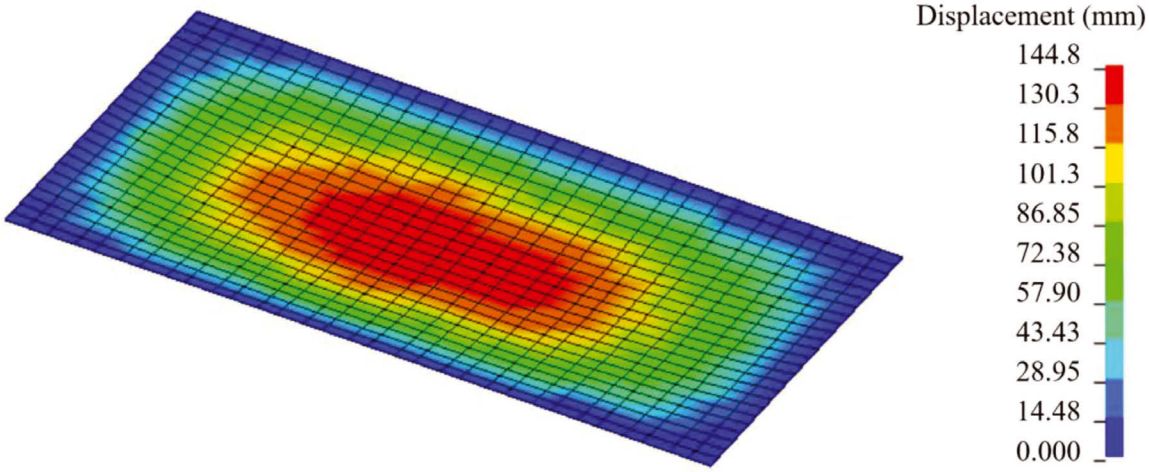
Editor's Featured Article

Improved tensile membrane action model of composite slabs at elevated temperatures

Hong-hui Qi[a,b], Yong Du[a], Jian Jiang[c], Guo-qiang Li[b]
[a] College of Civil Engineering, Nanjing Tech University, China
[b] College of Civil Engineering, Tongji University, Shanghai, China
[c] Jiangsu Key Laboratory of Environmental Impact and Structural Safety in Engineering, China University of Mining and Technology, Xuzhou, China

Previous fire tests have showed that tensile membrane action (TMA) between composite slabs and reinforced concrete slabs is different. An improved TMA model is proposed in this paper to accurately and reasonably determine the fire resistance of composite slabs exposed to ISO834 fire. It is assumed that the fracture of steel reinforcement in the long span is the governing failure mode of composite slabs at elevated temperatures. The slab is divided into four concrete rigid plates and one elliptic reinforcement net at centre considering TMA, and the contribution of rotation of concrete rigid plates on the deflection in short-span is taken into account. Meanwhile, coupling thermo-mechanical finite element analyses are carried out to simulate the TMA response of composite slabs at elevated temperatures. The accuracy of the proposed improved model is validated against experimental and numerical results, with a maximum error within 10%. It is found that the improved model has a better prediction of the mid-span deflection and fire resistance than Li's model and Bailey's model. It is important to consider the stress redistribution of the reinforcement in two directions in determining TMA in composite slabs under fire conditions.

→| Read the full paper at **https://doi.org/10.1016/j.istruc.2021.11.042**



Register for alerts
If you'd like to receive regular updates about new content in *Structures*, register for email alerts at **www.sciencedirect.com/**.