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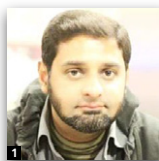
Structures and Buildings

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Editorial

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This issue of *Structures and Buildings* addresses a spectrum of topics from the axial compressive behaviour of special-shaped steel-fibre-reinforced concrete columns, to a model for infilled reinforced concrete frames and semi-rigid beam element modelling for progressive collapse analysis of steel frame structures. The issue also focuses on the residual bond between concrete and reinforcing glass-fibre-reinforced-polymer (GFRP) reinforcing rebars at elevated temperatures as well as economical design of buried concrete pipes subjected to UK standard traffic loading. The presented papers continue the tradition of this journal to provide results useful for the professional development of its readers.

The first paper (Li *et al.* 2019), a collaborative effort between four academics within Wenzhou University in China, presents tests aimed at significantly improving the ductility of cruciform-section reinforced concrete columns, themselves used to enable more efficient use of space in buildings. The results show that use of steel fibres in the concrete mix is far more effective than use of high-performance concrete. Analysis reveals that existing confinement models are of limited value in this context and so new models must be developed targeted at these special-shaped columns.

In the second paper (Dautaj and Kabashi, 2019), an experimentally verified multi-strut based macromodel is formulated for predicting the failure behaviour of infilled RC frames. This model is shown to be superior in performance to the status quo on predicting failure mechanism (including shear failures) and failure load.

The third paper (Zhao *et al.* 2019), again by four academics this time from Liaoning University in China, introduces a novel beam element model to represent the axial and bending stiffness effects of semi-rigid joints in steel frame structures. This element is shown to perform well in both seismic and progressive collapse analyses of steel frame structures. Its use in general finite element (FE) software is recommended as a significant improvement on the traditional assumption of either pinned or rigid joints.

Next, Aslani (2019) considers the effects of fire on concrete reinforced with glass fibre reinforced polymer (GFRP) bars. To that end models are proposed for the fire-induced changes to both the mechanical properties of the GFRP/concrete materials and to the GFRP-concrete shear bond properties. An experimental database is used to verify the modelling. It is concluded that the reliability and simplicity of these models make for a particularly attractive feature of this predictive framework.

The final paper, by Alzabeebee *et al.* (2019), shifts focus from embedded GFRP reinforcement in fire to buried concrete pipes under traffic loading effects. Essentially, the study seeks to highlight the extent of conservatism of the design code bedding factor used to translate laboratory-based assessment of pipe capacity into a field capacity. Using FE models, it is shown that oversimplification of the code approach is responsible for the conservatism, which extends up to a factor of 4.92. It is concluded that the updated approach can lead to both economic and robust design of buried concrete pipes.

We hope that you will find these articles informative and useful to your work and we invite you to contribute to the discussion by sending your comments to the journal. Furthermore, beyond the classical printed and electronic version, *Structures and Buildings* publishes the most recent articles online Ahead of Print on the Virtual Library homepage of the journal: <https://www.icevirtuallibrary.com/toc/jstbu/current>.

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