Editorial

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This issue of *Structures and Buildings* presents five papers on different scientific topics, ranging from steel structures to reinforced-concrete structures. They shed light on technical problems usually dealt with in current engineering practice.

The first paper in this issue, authored by Manis and Bloodworth (2017), assesses the safety of UK transmission tower infrastructure under extreme wind loading. They evaluate the storm magnitudes by applying a change factor methodology to present day wind speeds and using the information provided by the 2009 UK climate change projections. Wind loading on the structure and cables is then determined using Eurocode, and the structure is analysed using pseudo-static finite-element analysis. Fortunately, and despite an estimated increase in wind velocities due to climate change, the typical tower analysed in the study continued to perform satisfactorily at all hazard levels.

The second paper by Lawson *et al.* (2017) addresses the problem of steel–concrete composite beams with low shear connection (interaction) between the beam and slab and presented a design formula to calculate the effective stiffness of composite beams taking account of the stiffness of the shear connectors and their longitudinal spacing. With this formula, the significant additional deflections that occur due to slip in the shear connectors can be accurately calculated. To avoid permanent deformations of the composite beam due to the slip at the serviceability limit state, they propose lower bound limits for the degree of shear connection (30–40%).

In the third paper, Johnson *et al.* (2017) address the analysis and design of tunnel linings of steel fibre reinforced concrete (SFRC). They propose a design method based on principles established by Eurocodes EN 1990 and EN 1992-1-1, EN 14651 and the methodology for SFRC characterisation from the 2010 fib Model Code. Verification methods for both the serviceability limit state and ultimate limit state are discussed and tentative methods of analysis are given, some of which need more test-based evidence. The paper also unveils the areas where stronger evidence from tests and site

measurements is needed to enable SFRC tunnel linings to become more economic.

The fourth paper in this issue, authored by Sri Rama Chand *et al.* (2017), presents a study on the behaviour of self-compacting concrete with recycled aggregates. The compressible packing model, which considers important parameters such as wall effect, loosening effect and perturbed volume, is examined. The authors conclude that this method enables the recycled aggregates to achieve dense matrices in self-compacting concretes. They also report that because of polydispersal of the mixes, it is possible to minimise the porosity and thus enhance the concrete performance.

The fifth paper by Ali *et al.* (2017) reports a study on the seismic vulnerability of masonry infilled reinforced-concrete frame structures in developing countries. Typical two-dimensional reinforced-concrete frames with and without infill panels and with infill openings are considered. The infill panels are simulated by means of three-strut models and the compressive strength of a typical Pakistani brick masonry prism is evaluated for modelling the equivalent strut. These authors conclude that (i) the study's masonry infilled structural configurations provide better results than bare frame structures and (ii) openings in masonry panels increase the seismic vulnerability of infilled structures.

In summary, these papers give new insight into several unsolved structural problems and I hope the interested reader finds these papers stimulating and informative. As in the past, comments, suggestions and discussions from readers on the papers in this issue are most welcome through the submission of discussion articles.

REFERENCES

- Ali MU, Khan SA, Anwar MY *et al.* (2017) Seismic performance of deficient masonry infill reinforced-concrete structures. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **170**(2): 143–155, <http://dx.doi.org/10.1680/jstbu.15.00115>.

Johnson RP, Psomas S and Eddie CM (2017) Design of steel fibre reinforced concrete tunnel linings. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **170(2)**: 115–130, <http://dx.doi.org/10.1680/jstbu.14.00113>.

Lawson RM, Lam D, Aggelopoulos ES and Nellinger S (2017) Serviceability performance of steel–concrete composite beams. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **170(2)**: 98–114, <http://dx.doi.org/10.1680/jstbu.16.00048>.

Manis P and Bloodworth AG (2017) Climate change and extreme wind effects on transmission towers. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **170(2)**: 81–97, <http://dx.doi.org/10.1680/jstbu.16.00013>.

Sri Rama Chand M, Radhika KL, Rathish Kumar P and Rakesh S (2017) Mix model for self-compacting concrete with recycled aggregate. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **170(2)**: 131–142, <http://dx.doi.org/10.1680/jstbu.16.00076>.