Editorial

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This issue of the *Structures and Buildings* journal is gifted with a Commentary, five articles on diverse topics and two book reviews. The Commentary, by Ghaffar and Mullet (2018), provides a joint academic and practitioner perspective on the transformation that the construction industry is set to experience with 3D printing (or additive manufacturing). They emphasise the reliance of this technology on successful interplay between materials, printing technology, scale and shape. The readership are welcome to contribute papers to the special issue, targeted for release in 2019, on the theme *Technological Advances in Structural Design* as described at the end of the Commentary.

The first two research articles focus on experimental studies of connections. Lee *et al.* (2018) report on the shear friction behaviour of seismic-resistant connections between in situ RC slabs and prefabricated steel-concrete composite walls in a nuclear power plant. The test results for these connections, comprising different combinations of steel shear plates and slab-to-wall steel reinforcing bars, are assessed against the Korean electrical power industry code. Nonlinear FE modelling is shown to give good predictions of the measured behaviour. The second study of connections is presented by Lu and An (2018) in the context of prestressed concrete composite box girders with corrugated steel webs. Their test data show that shear connectors comprising horizontal steel rods running transversely through holes in vertical steel plates outperform stud connectors on improving the bearing capacity, flexural capacity and crack resistance of the box girders but underperformed the studs on the efficiency of prestressing.

With a shift in emphasis now to prediction, Mendoza-Puchades *et al.* (2018) present a state-of-the-art review of analysis and numerical modelling methods for masonry structures under blast and seismic loads. They conclude that design and construction-induced variabilities in these structures merit the use of a probabilistic/uncertainty approach in prediction. The next paper is a move towards computationally efficient prediction of seismic design demands due to higher modes in high-rise buildings. Ahmed and Mahmood (2018) demonstrate that, for 20- to 40-storey RC buildings, elastic displacement

multi-modal push-over analysis (EDMMPA) produces satisfactory estimates of stress resultant and deformation demands when compared with nonlinear analysis. They conclude that EDMMPA is useful for preliminary design of high-rise RC core wall buildings.

In the final paper, Yang *et al.* (2018) describe an interesting practical application of low-carbon concrete. They reveal that assiduous attention to raw materials, admixtures, mix proportions and the construction team led to successful management of costs and quality on China's first structural application of cast in situ alkali-activated slag concrete. Even at temperatures below 5°C, a standard casting process was used over three stories of a much higher, multi-storey building.

Of the two book reviews, the first by Millais (2018) is a rousing evaluation of the volume entitled *Tension Structures: Form and Behaviour*, authored by Lewis, a recognised authority on the subject. Millais himself, an author of highly educational volumes, concludes that this book is a must have for engineers engaged with the special class of structures for which shape change under load is the defining feature. Finally, in closing the learned society function of this issue of *Structures and Buildings*, Thurlow (2018) expounds on Estrada's and Lee's *Introduction to Earthquake Engineering*, targeted mainly at undergraduate and graduate students, though also of use to practitioners. Thurlow highlights the frequent use of examples backed up by Matlab computational routines and commends the wider technical competence (including discussion of code provisions) captured within the book. His thoughts on this publication are encapsulated in the expressions a 'handy aide-memoire' and 'simply invaluable'.

REFERENCES

- Ahmed M and Mahmood T (2018) Elastic-displacement-based multi-modal pushover analysis in high-rise core wall buildings. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* 171(10): 778–799, <https://doi.org/10.1680/jstbu.17.00014>.
Ghaffar S and Mullet P (2018) Commentary: 3D Printing set to transform the construction industry. *Proceedings of the Institution*

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- of Civil Engineers – Structures and Buildings* **171(10)**: 737–738, <https://doi.org/10.1680/jstbu.18.00136>.
- Lee KJ, Hwang KM, Hahm KW and Yi ST (2018) Shear strength of joints between reinforced concrete slabs and steel-plate concrete walls. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **171(10)**: 739–754, <https://doi.org/10.1680/jstbu.16.00138>.
- Lu Y and An G (2018) Impact of shear connectors on the behaviours of box-girders with corrugated webs. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **171(10)**: 755–767, <https://doi.org/10.1680/jstbu.16.00152>.
- Mendoza-Puchades M, Green PL and Judge R (2018) Variability in masonry behaviour and modelling under blast and seismic actions. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **171(10)**: 768–777, <https://doi.org/10.1680/jstbu.17.00088>.
- Millais M (2018) Review of Tension Structures : Form and Behaviour, by Wanda Lewis. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **171(10)**: 810, <https://doi.org/10.1680/jstbu.18.00143>.
- Thurlow P (2018) Review of Introduction to Earthquake Engineering, by Hector Estrada and Luke S Lee. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **171(10)**: 811, <https://doi.org/10.1680/jstbu.17.00144>.
- Yang K, Yang C, Zhang J et al. (2018) First structural use of site-cast, alkali-activated slag concrete in China. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **171(10)**: 800–809, <https://doi.org/10.1680/jstbu.16.00193>.