Editorial

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Structures and buildings are subjected to a variety of actions (loads) during their lifespan. Engineers must therefore understand structural response to different loading conditions if they are to safely and appositely design and build sustainable and resilient structures. To this end, the February 2020 issue of *Structures and Buildings* presents one briefing article and five papers that report on structural response, both at the component level and the building level, to dynamic, seismic, fatigue or wind loads.

The briefing article by Kaewunruen and Kimani (2020) presents a numerical study on the dynamic behaviour of a steel-concrete composite railway track slab. This form of construction offers a lighter and more feasible alternative to solid concrete slabs. However, modal cross-over can detrimentally affect performance, both at the service and the ultimate states. Designers should take this into account when considering composite track slabs.

Using hybrid testing, the paper by McCrum *et al.*, (2020) investigates the seismic performance of cold-formed steel (CFS) moment-resisting frames. The reported failure mode is local buckling of the column section at the column-to-haunch connection, resulting in a weak column-strong beam structure. This is an undesired failure mode because columns might not be able to resist gravity loads after a seismic event. The reported failure mode must therefore be prevented in such a way that CFS moment-resisting frames comply with the strong column-weak beam design philosophy.

The second paper, by Kazem *et al.*, (2020), examines rehabilitation of steel buildings with a special seismically deficient connection (Khorjinee). Four bracing configurations were used to enhance the lateral resistance of the steel buildings. The results provide valuable insight into the seismic performance of the rehabilitated steel structures. They also enable designers to make an informed decision about the selection of the best seismic strengthening technique for the tested steel buildings.

In the third paper, Keikha and Mofid (2020) develop and utilise a three-dimensional finite element (FE) model to evaluate the seismic response of a beam-to-beam splice connection. The FE

results suggest that the response of the connection to reversed cyclic loads is influenced by end-plate thickness, bolt grade and bolt diameter. The FE model was used to carry out parametric studies, the results of which fed into the development of a simplified bilinear hysteretic moment–rotation model.

The next paper, by Zeng *et al.*, (2020), reports on a half-scale orthotropic steel deck subjected to fatigue loading. The experimental results show that, up to 2 million cycles, the fatigue performance of the steel deck was compliant with the design requirements. Upon further loading to 2.8 million cycles, cracks started to accumulate resulting in structural damage. The paper concludes that, with good welding and standard maintenance, the orthotropic steel deck can perform adequately during its design life.

The last paper, by Chen *et al.*, (2020), examines the effect of location on the in-service wind load of a tower crane. Computational fluid dynamics (CFD) was used to predict the mean force and moment coefficients of an in-service tower crane at five locations. CFD results suggest that along-wind, across-wind and torsion moment loads on the tower crane were more influenced by transverse than by longitudinal distance. The paper concludes that tower cranes should be erected as close as possible to the central axis of the building for convenient operation.

I trust that you will find the high quality papers published in this issue both interesting and enlightening. As always, comments and discussions from the readers of *Structures and Buildings* are encouraged.

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