Editorial

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The January 2020 issue of *Structures and Buildings* presents five research papers on concrete, both at the material level and the structural component level, including combinations with structural steel. The authors span a spectrum of countries including Bangladesh, Egypt, Iran, Korea, China, the UK and the USA. The papers represent fruitful collaborations between PhD candidates, Post-Doctoral researchers, Post-Master researchers, academic supervisors and in one case an army engineer.

The opening paper (Pachideh *et al.*, 2020) focuses on the material behaviour of concrete incorporating recycled springs. An experimental investigation is reported into the compressive and tensile strengths of such concrete at temperatures up to 900°C, representing post-fire conditions. Across the temperature spectrum, the springs-enhanced concrete was observed to outperform steel and polypropylene fibre reinforced concrete by a factor up to 3 in compression, but the tensile strengths were similar for the two types of concrete. The optimum concrete mix was found to be defined by a 0.2% volume fraction of springs. This study is a step in the right direction, given current emphases on the circular economy and on fire performance of structures.

The second paper, by Kang *et al.*, (2020), continues the theme of tests to determine the fire performance of concrete, but this time in the context of non-welded steel tube columns encasing conventional concrete. Mechanical strip connectors were used to enhance interaction between the tubes and their encased concretes. These weldless composite columns were observed to avoid the local compression buckling exhibited by their welded counterparts, in the process carrying 15% more compressive axial load. During these experimental campaigns, the column specimens were taken up to temperatures exceeding 1000°C.

Loading tests to failure of concrete core columns continue in the third paper (Mahmud and Ahmed, 2020), only this time with a concrete (rather than steel) jacket as a retrofitting measure and in the absence of fire, but with the influence of the composite action between the jacket and the core concrete

remaining a key focus. The tests on third scale specimens revealed that whether the interface was untreated, bonded, roughened, etc, failure occurred at the interface rather than within the core. Consequently, bonding reduction coefficients have been proposed which are functions of the interfaces. It was also found that analytically based interaction diagrams show good agreement with the test results, while finite element analysis (FEA) tended to overestimate jacketed column capacity.

In the fourth paper, by Abu-Sena *et al.*, (2020), parametric studies by FEA are used to establish the structural effectiveness of post-tensioning as a retrofitting method for existing steel-concrete composite bridges. Some interesting trends emerge from the results, including the observation that straight and draped post-tensioned tendons are better suited to distributed and point loads respectively, while the tension flange area relative to the compression flange area has the dominant influence on the ultimate capacity of the post-tensioned composite structures. Experimental verification was used early on to establish confidence in the FEA.

In closing this issue of the *Structures and Buildings* journal, Palikhe *et al.*, (2020) investigate the safety of a process which can be of tremendous value to accelerate work on construction sites, namely tilt-up erection of a 3-storey high Smart column comprising three precast column segments connected via steel joints. By strain gauging the reinforcing bars on a full-scale Smart column specimen which was subsequently lifted from the horizontal orientation on the ground into the upright position via five different tilt-up schemes, the researchers show that the peak strains induced, especially in the critical joint zones, were well within the yield values and indicated that very limited flexure occurred in those zones.

These papers exemplify the mission of the *Structures and Buildings* journal to disseminate work of the highest scientific quality for the benefit of both researchers and practitioners worldwide. Over the last twelve months submissions to the journal have increased (for which we are very grateful to the authors), resulting in more review activity with an unwavering

focus on quality and novelty (for which we are indebted to the reviewers). Over the same period some of our trusted editorial panel members, who collectively ensure that quality is maintained, have stepped down, while new members from both academia and industry across the globe have joined us. Consequently the panel now has representation from fourteen countries, which makes for fertile ground to weave together ideas that guarantee the journal's content continues to reflect important emerging topics within the discipline without abandoning the journal's core themes.

We hope that the professional activities of you our readers continue to prosper over the coming months and that you continue to find our papers stimulating, informative and scientifically advancing. Please keep a look out for possible themed issues in *Structures and Buildings* on topics ranging from timber structures research to response of structures under extreme loads. We anticipate continued engagement with you all.

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