Editorial

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Welcome to what is not only the first 2021 issue, but also the first online-only issue of the *Structures and Buildings* journal. To start us off, Ms Selina Rai, a structural engineer at Arup, describes the project which won her the ICE *International Emerging Engineers Award* for 2020. The *Commentary* (Rai 2021), which whets the appetite for scientific insight into the effects of staggered openings on the seismic performance of reinforced concrete shear walls, makes for a fascinating read.

This is followed by five full-length technical papers covering a spectrum of topics. The first paper (Javid and Mofid, 2021) presents a study on the load capacities of circular-in-plan concrete funicular shells. After highlighting the key feature of funicular shells, namely that their forms have been optimized to ensure development of only compressive stresses under self-weight, the authors report on experimentally verified nonlinear finite element analysis to predict ultimate loads for specified examples. It is observed that ultimate central concentrated loads are enhanced more by increased shell thickness than by reduced base radius, while ultimate uniformly distributed loads increase linearly with shell thickness and nonlinearly with reduced base radius.

The next paper (Elchalakani *et al.*, 2021) reports on another experimental-numerical examination, focused on glass fibre reinforced polymer (GFRP)-reinforced geopolymer concrete (GPC) members under various axial – flexural load combinations. GFRP-reinforced GPC is an environmentally friendly and durable alternative to steel-reinforced normal concrete for use in, for example, highly corrosive coastal zones. The experimentally observed failure modes ranged from GFRP bar buckling triggered by loss of restraint due to opening up of lapped GFRP stirrups, to fracture of closed GFRP stirrups and also to debonding slip failure in specimens subjected to significant flexure. The numerical analyses show that good predictions of actual nonlinear behavior are obtained by suitable adaptation of existing models for confinement and damage in normal concrete.

The remaining three papers look at evaluation of seismic performance in different contexts. One paper (Halabian and Teymmorian 2021) presents a simplified method for analysing the severe ground bi-directional excitation response of structures with translational – torsional coupling and with significant deformation of the underlying soil. The innovative simplification is based on uncoupled modal response history analysis, which is shown to be highly efficient

when compared with rigorous exact analysis. This is followed by a paper (Cheng *et al.* 2021) which describes shaking table tests to observe the response of liquid-storage concrete tanks to far-field, long-period earthquakes. Rubber isolation and sliding isolation based on a spring-limiting device are found to increase sloshing height, while sliding isolation based on a steel-bar device strongly decreases sloshing height. Then, the closing paper (Lian *et al.* 2021) addresses cyclic testing of large-scale eccentrically braced frame units up to failure. The tests and associated FE analyses show that the frames exhibit good hysteretic behaviour, the nature and extent of which are influenced by the length of the vertical shear link used to connect the top beam to the lower diagonal members.

In closing, let us quickly revisit the concept of the online-only journal. This opens up new and exciting opportunities, for example use of relevant and carefully designed drone or other video footage as attachments to or embedded within papers. Please do contact us with suggestions along these lines if you feel this will enrich the engagement of our readership with your papers. We wish you a safe, productive time over the coming months.

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