Editorial

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It is a great pleasure for me to deliver the editorial of *Structures and Buildings* for the December 2021 issue, closing the first year of the online-only issues of the *Structures and Buildings* journal. It is the Editors wish that this delivery method really potentiates the community to get a quicker and easier access to the fresh content of the selected papers, especially in these troubled times.

This issue covers a wide range of topics, materials and structures. They tackle fundamental research on geometrical non-linear analysis, on safety assessment of existing structures, building seismic analysis, experimental investigation of innovative building structural systems and even the development of large-scale test systems for underwater structures. The five contributions to this issue come from different countries, including contributions from China, Iran and Pakistan, reflecting the global impact of the journal.

The first paper in this issue comes from China (Yue *et al.*, 2021) and describes the development and application of a large-scale model test system for underwater shield tunnels. The study has high practical relevance due to the substantial number of underwater tunnels under construction or planned in China and in other parts of the world. The paramount importance of this contribution lies on the fact that the presented experimental model has the capability of multi-directional loading under high water pressure, thus simulating the real conditions during the structure's life span. Furthermore, the model was tested to simulate an actual tunnel (Nanhu Road tunnel, China), and the comparison with actual engineering measurements has highlighted the relevance of the model and potentiate future validations of much easier, faster and cheaper numerical studies.

The second contribution to this issue comes from Iran (Gholhaki *et al.*, 2021) and focuses on the earthquake resistance of building portal frames reinforced with steel-plate shear walls. Its' relevance lies essentially on the fact that the response of structures to extreme events like earthquakes is often unsatisfactory and the consequences may therefore be tragic. The proper prediction of the structural response and the safety

assessment is of paramount importance. In addition, the development of reinforcing techniques is also a key strategy to improve the safety of existing structures. The paper gives a general study of various building types with different structures under seismic loading with interesting comparative conclusions, resulting in recommendations for the improvement of regional seismic codes.

China is the origin of the third contribution to this issue, with an interesting paper that focuses on the load combination values for existing frame structures (Cheng *et al.*, 2021). A deterministic optimisation process was performed based on the design expression of the ULS and probabilistic approaches considering the characteristics of the structural resistance and loads of existing structures. Different prescribed service times for a structural system were considered in the study to assess the safety of existing frame structures, and the results will facilitate the performance evaluation for these scenarios.

The fourth paper, originated in Pakistan (Saleem *et al.*, 2021), presents a constructive system for low-rise small single-family houses with ferrocement wall panels. This method is proposed in the context of the development of fast and low-cost techniques with some concern of sustainability, environmental and energy efficiency issues. Results from full-scale experimental tests are presented in this paper and allowed to demonstrate the potential of the system to serve as an alternative to the traditional brick masonry with considerable advantages from the economical and the structural points of view.

Finally, this issue closes with a paper from Iran (Rezaiee-Pajand *et al.*, 2021) focusing on the development of a new strategy for the geometric non-linear analysis of structures. The proposed analytical method shows higher efficiency, a better performing iterative path and a faster convergence when compared to the traditional non-linear analysis methods. Furthermore, its application to various types of planar and space structures is illustrated to demonstrate its advantages.

I wish you a good reading and that you take full advantage of the quality and diversity of these papers. As usual, comments

and discussions from our readers are most welcome and appreciated.

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