

Editorial

Luis Costa-Neves BE, MSc, PhD

Assistant Professor, Civil Engineering Department, University of Coimbra, Portugal



I am delighted to present the editorial for the September 2023 edition of *Structures and Buildings*. This comes nearly three years after the implementation of online-only issues for the journal. It is evident that this delivery approach greatly enhances the community's ability to swiftly and conveniently access the latest content from the featured papers. This accessibility is further streamlined by the journal's practice of publishing its most recent articles ahead of print on its Virtual Library homepage.

This issue covers a wide range of topics, materials and structures. They tackle the behaviour of concrete beams under shear, steel building seismic analysis, safety assessment of existing structures and novel combinations of materials and approaches. The five contributions to this issue come from different countries, including contributions from India, Iran, and South Korea, reflecting the global impact of the journal.

The inaugural paper in this edition originates from India, authored by Negi and Jain (2023). It focuses on the evaluation of shear-resisting mechanisms in steel-fibre-reinforced concrete beams. The study investigates the use of fibres as the primary shear reinforcement for beams through an extensive series of full-scale experiments. The behaviour of these test specimens underwent comprehensive analysis, and their performance was compared to available analytical models categorized based on their accuracy. Moreover, this research critically examined existing code guidelines and put forth suggestions for their enhancement. Additionally, it elucidated the intricate behaviour of steel-fibre-reinforced concrete by presenting the individual components that contribute to shear resistance. These components were integrated into a novel analytical model, representing a significant advancement in the design of steel-fibre-reinforced concrete structures.

The second contribution in this issue, authored by Lim *et al.* (2023) from South Korea, also delves into the topic of shear resistance in beams. The study focuses on traditional reinforced concrete beams and employs a numerical approach using the meso-scale finite-element method. In this method, concrete is treated as a composite material consisting of three phases:

aggregates, cement matrix, and interfacial transition zone. The material properties of each phase are incorporated into the numerical analysis. The primary objective of this research is to investigate the influence of shear span-to-depth ratio on the shear strength of reinforced concrete beams. The study's findings are then compared to experimental results obtained from other researchers' work and from model codes.

The third contribution in this issue is a joint research project from Taiwan and India (Joju and Goswami, 2023) and deals with the design of steel structures and their behaviour under cyclic loading resulting from earthquakes. 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 tragical. The proper prediction of the structural response and the safety assessment is of paramount importance. In steel beam-to-column joints, as in most of other structural elements, ductility plays a major role in the capacity of the structure to dissipate energy and to survive a major earthquake. This ductile behaviour in major axis joints may be accomplished by designing the web panel so that its resistance in shear governs the joint design. This research highlights the importance of appropriately estimating both the shear demand and capacity of panel zones in the design of moment resisting frames in steel buildings.

The fourth contribution to this issue comes from Iran, authored by Maddahi *et al.* (2023) and deals again with steel structures and their behaviour under cyclic loading resulting from earthquakes. It focuses on the seismic rehabilitation of a portal frame introducing a steel shear wall as a secondary system added to the existing structure. A numerical approach based on a reliability index is presented where the effect of uncertainties on the seismic performance of the rehabilitated steel moment frame was investigated using reliability methods.

Understanding the behaviour of historical structures can make a significant and valuable contribution to the preservation of world heritage. This encompasses both the conservation and enhancement of existing buildings, as well as the construction

of new structures and buildings using the same materials as those found in historical constructions. This is certainly the case of cob walls, and the closing contribution for this issue, authored by Sangma and Tripura (2023), from India, tackles the behaviour of cob wallettes reinforced with bamboo and shear mesh when subjected to compression and shear. Combinations of material variations, using fibres, cement, bamboo, and steel were tested for different load cases and the interesting conclusions presented show that an impressive resistance increase of more than 100% may be achieved with very slight changes in the traditional material, thus being an opportunity for its use in retrofitting while keeping the existing and traditional constructions.

I extend my best wishes for an enriching reading experience, and I hope you make the most of the excellence and variety offered by these papers. As always, we eagerly welcome and highly value comments and discussions from our readers.

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