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Editorial

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This issue of *Proceedings of the Institution of Civil Engineers – Structures and Buildings* provides both a balanced spread of topics ranging from material characterization, analysis, testing and validation to failure probability of structures, and an equally balanced geographical spread. This signifies the whole-hearted and sincere effort of all those associated with the journal in various capacities. Owing to the continuous improvement in computation techniques and measuring devices, various areas of research are frequently being revisited and improved upon, while novel construction techniques are being explored to reduce labour intensity. The issue in hand is a blend of such exploration and invokes a sense of participation and sharing of knowledge with no geographical bounds. ICE Proceedings are a fore runner in this cause and http://www.icevirtuallibrary.com/upload/guidepdf provides a prompt response to your emerging research desires.

Mortarless interlocking block masonry systems provide an efficient way of reducing labour, materials and time. The behaviour of the system is dependent on the mortarless joint and the geometric imperfection of the block bed. In the first paper Alwathaf *et al.* (2015) present the analysis and modelling of interlocking mortarless blocks based on an incremental-iterative finite-element programme code developed in this study to implement the proposed constitutive model. A close simulation and prediction for structural behaviour has shown to be achieved for both stiffened and unstiffened walls subjected to axial and eccentric compressive loading. The authors confidently note that instead of conducting further experimental work, the developed model can be used to obtain the capacity and design relations for interlocking mortarless walls having various slenderness ratios and eccentricities, as well as different reinforced concrete stiffener arrangements in the wall panels.

It is claimed by classicists that the first iron was accidently produced during a forest fire near Troy, and steel was also almost accidently developed during the moulding of iron. Currently not only are almost 200 hundred types of steel available but almost 500 steel shapes are available in a variety of grades. Aside from hot rolling, cold-formed steel sections, which are mostly used in secondary structural elements, are finding applications in primary structures. The second paper by Maduliat *et al.* (2015) investigates the post-yielding behaviour under bending of cold-formed channel section with partially stiffened elements. Apart from simplified methods to determine the member moment capacity due to local buckling and distortional buckling duly validated through experimental results, a simplified equation to estimate the failure curve proposed earlier by the first author has also been made part of this paper for comparison of experimental results. The results of both experimental and numerical methods were compared with Australian standards to prove the effectiveness of the simplified numerical approach.

The landscape of most countries is changing rapidly and urbanisation is on the increase; earthquake-prone countries are becoming more and more conscious of providing lateral resistance in buildings. Efforts in this direction would be further accelerated once global projects, such as Earthquake Model for Middle East (EMME) and Global Earthquake Model (GEM) finalize their findings and place them in public domain. Shear walls are an effective way of providing lateral resistance to lateral loads and precast concrete shear walls are finding application in low-to-medium-rise buildings due to rapid cost-effective construction and durability. In the third paper of this issue, El Semelawy *et al.* (2015) proposed a novel anchor-jointed precast shear wall. The paper presents a part of continuing research on an anchor-jointed precast structural wall system, where the main focus has been on testing and validating the new jointing system experimentally. Four specimens with the new jointing system were loaded laterally using a 250 kN hydraulic actuator mounted against a reaction frame. The behaviour of the tested specimen has been discussed under failure modes, ductility demand and gap/contact behaviour. It has been concluded that an anchor-jointed precast structural wall system provides a feasible alternative to conventional cast-in-place shear walls in low-to-medium seismic regions.

The energy absorption/dissipation capacity of wood is well established and, therefore, its use in buildings in seismic regions is common. Cross-laminated construction as an effective new technology is establishing its place in multi-storey earthquake-resistant buildings due to its lightness and good energy dissipation capacity. The fourth paper of this issue by Pozza and Scotta (2015) describes a new wood-joint numerical model which applies commercial software and estimates a reliable appropriate behaviour factor (q) in multi-storey, cross-laminated timber buildings. The model has been calibrated and validated through the results of cyclic shear wall tests and full-scale shake table tests. This work demonstrates the efficacy of reproducing the seismic response of the entire building using simplified assumptions.

Concrete is now almost a household name. Technological development has led to the creation of a wide range of concrete types, each having very different properties. With concrete being

a cracking material and having certain inherent characteristics to produce cracks, utmost care at each stage of its service life is important. Shrinkage and creep makes concrete one of the most difficult materials, therefore efforts to control the same has always been on the research agenda. Various discrete fibres have been under investigation during the last decade and recently an amorphous metallic fibre has found its place in the related research agenda. In the fifth paper of this issue, Choi *et al.* (2015) undertook a study to investigate the characteristics of drying shrinkage cracking of concrete reinforced with amorphous metallic fibres by performing both free and restrained shrinkage tests. Compressive as well as flexure tests were also made part of the study at different ages of concrete. A prediction model of shrinkage cracking duly verified by comparing with the test results has also been proposed and is shown to be working well.

Reliability analysis of structures has gained great interest in recent years and among various methods, first-order reliability method has been considered as the most accurate computational method. However, both the first- and second-order reliability method have limitations of various degrees. In the sixth and the last paper of this issue, Arab and Ghasemi (2015) – while proposing a fast and robust method for estimating failure probability of structures – have argued that accurate estimates of the failure probability have to rely on simulation methods such as Monte Carlo methods. Although in many situations the time and effort increases computational cost, therefore a fast and robust method has been proposed to reduce the number of Monte Carlo calculations. A numerical example has been chosen to demonstrate the effectiveness of the proposed method. The paper reflects an interest-generating factor for those working in this area.

This brings an end to the present issue. However, before closing, it is my earnest desire that each issue of the journal contains a discussion on the published papers. Discussion always generates new thinking and is very valuable, particularly for younger researchers, as for me I have learned more from discussions then from the original papers. I, therefore, request that we all should find time to write a discussion in our own area of research interest so that the resident knowledge may flow and be transmitted to the future generation of researchers, which indeed is one of the important roles of a research journal.

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