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Editorial

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Studies investigating the behaviour of structural elements and systems under diverse loading conditions constitute a baseline for code provisions and guidelines, equally diverse in form, for professional practitioners. Concurrently, the performance of structural systems under adverse loadings, progressive deterioration and application of strengthening methodologies has assumed greater attention ensuing continuous and concerted efforts jointly by academia and industry towards the creation of new knowledge. The body of knowledge, that is cultivated by academia and applied by practitioners is largely disseminated through research journals. The *Proceedings of the Institution of Civil Engineers – Structures and Buildings* has been fulfilling this objective remarkably well and the current issue (the content of which can be found at www.icevirtuallibrary.com/content/issue/stbu/166/5) is a convincing testimony of the same.

The first paper of this issue (Nip *et al.*) examines the cyclic performance of hollow steel bracing members and describes the development of detailed finite-element models for hollow sections subjected to cyclic axial loading. The models, in addition to being used to conduct parametric investigation of the influential key parameters, are validated against experimental results on braces formed of hot-rolled carbon steel, cold-formed carbon steel and cold-formed stainless steel. The discrepancies between the findings of the related studies are discussed along with a proposal regarding a relationship that addresses the co-existing influence of global slenderness with local slenderness. The paper, thus, addressed some significant features of the ultimate behaviour of steel braces under cyclic loading.

The assessment and rehabilitation of reinforced concrete (RC) structures is becoming increasingly pervasive for a range of reasons. The most notorious of the deteriorating factors is the corrosion of reinforcement. As conflicting views regarding the mechanism of corrosion still persist, research findings from around the globe, therefore, are viewed with immense interest. The second paper (Xia *et al.*) reports an experimental investigation of the corrosion of varying diameter bars composed of four different grades in two different environments. The mechanical performance characteristics including yield strength, ultimate strength, yield ratio, elongation and modulus of elasticity are examined and a time-dependent assessment method for the mechanical behaviour of corroded reinforcing steel bars in multi-environmental regimes are proposed. The use of a compensation factor, however, has been recommended for different corrosive environments in real structures while implementing the model.

There are myriad reasons driving the constant need to strengthen RC structures that ultimately result in identification of newer techniques. The changes in the code of practice specifically related to flexure necessitate strengthening in shear. The third paper in this issue (Ahmad *et al.*) relates to shear strengthening of RC continuous beams with carbon-fibre-reinforced polymer sheets, cost effectiveness as its major concern owing to its significance to developing countries. An experimental study, with variation in wrapping schemes and anchorage length of the polymer sheets, is accomplished indicating that the area of the polymer sheet can be minimised with marginal compromise on the shear carrying capacity of strengthened concrete beams.

Shear in RC is one area of research that has been very religiously followed in the latter part of the 20th century, and is being pursued with the same enthusiasm currently. Be it the review of the already established behaviour or its fine tuning, the subject fascinates the research fraternity. The fourth paper (Singh and Chintakindi) entails an appraisal of dowel action in RC beams following an experimental investigation. The results of beams tested with varying bar size and amount of tension reinforcement are compared with an analysis using compressive-force path concept. The findings demonstrate that the load-carrying capacities of the beams were insignificantly affected by bar size and that the absence of a kinking mechanism implies that dowel action is unlikely to be a significant mechanism in the shear capacity of longitudinally RC beams.

A lively discussion on the question posed by (Johnson, 2009) regarding Eurocodes by the past president of the Institution of Structural Engineers and a renowned structural engineering consultant, along with the author's reply, aptly brings an end to this issue of *Structures and Buildings*.

REFERENCE

Johnson RP (2009) Eurocodes, 1970–2010: why 40 years? *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **162(6)**: 371–389, http:dx.doi.org/10.1680/stbu.2009.162.6.371.