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Editorial

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Dear Readers,

Growth in the durable concrete infrastructure has been aided by studies at different levels and scales, beginning from its constituent materials to structural systems. Newer constituents in concrete are making it more sustainable and help increasing longevity of structures made from such materials under the action of various loads, while duly enhancing safety and reliability, i.e., reducing risks of failure. In this edition of Structures and Buildings five articles have dealt with fibre-reinforced concrete, load performance of concrete members and joints, damage assessment under normal and corrosive environment in various applications ranging from pavements, underground infrastructure to framed buildings.

How different particle gradations affect the hydraulic properties and mechanical strength of pervious concrete mixed with polypropylene and glass fibres was studied by Sathe and Gholap (2025). Expectedly, the addition of fibres helped in enhancing split tensile and flexural strengths of concrete. Here, the application of pervious concrete has been shown in pavements, nonetheless for reinforced concrete (RC) members the addition of fibres has been reported to improve flexural toughness through tests conducted on round panels by Jalasutram *et al*. (2017). It would be further interesting to see reduction in the requirement of shear reinforcement by addition of discrete fibres dispersed in concrete. Through series of tests, Abdelsalam *et al*. (2025), investigated punching shear resistance of RC flat slabs under varying bidirectional flexural reinforcement. Different international codes and standards are yet to converge on the specifications on punching shear resistance in RC slabs. Congestion in the reinforcement at the punching shear critical locations may be avoided by addition of various types and dosage of fibres, which offers scope for future studies.

In prefabricated subway construction technology, steel-concrete composite joint is formed by placing two C-shaped and one H-shaped steel connectors on both sides, termed as CHC joint. Thereby, the two concrete prefabricated components are interlocked securely, offering effective shear resistance apart from axial force under applied bending moment. However, the mechanism of force transfer across such CHC joint and theoretical modelling thereof is yet to be fully realised. Nong *et al*. (2025) developed a theoretical model to estimate the bending stiffness of CHC joints by investigating the bending moment-rotation relationship by conducting joint bending performance tests. However, the theoretical model proposed by the authors presently relies on linear behaviour modelled through compressive, tensile, and shearing springs in a unit. To overcome the limitation of the linearity, it is possible in future studies to consider nonlinear force-deformation relations for these springs in the three modes when the CHC joint is damaged extensively.

Damage assessment in RC structures is crucial especially after they are exposed to extreme events. Boroujeni *et al*. (2025) have evaluated wavelet-based damage-sensitive features for RC moment-resisting frames based on absolute acceleration. They were able to effectively detect the damage pattern and damaged floor from the proposed approach. On the other hand, Khorami *et al*. (2025) studied the behaviour of RC beams under cyclic loading upon damage induced due to corrosion. Detection and quantification of damage caused due to various factors in RC structures is essential in structural health monitoring. Under dynamic loading conditions variations in acceleration response are caused due to changes in stiffness, which in turn is affected by deterioration of the structural components. Advanced computational techniques such as proposed by Boroujeni *et al*. (2025) are required to be extended further for their extensive application under different service-life ageing and loading conditions that RC structures are exposed to. For example, service-life damage assessment of RC structures in corrosion environment and under dynamic loads was carried out by Bhaskar *et al*. (2022). Such contributions shall adequately help developing safe and durable concrete infrastructure with advanced sustainable materials in construction.

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