

Editorial

Venkatesh Kodur

SAFE-D Center, University Distinguished Professor and Director,
Department of Civil and Environmental Engineering,
Michigan State University, East Lansing, MI, USA (kodur@egr.msu.edu)

It is with great pleasure that I present the editorial for this issue of *Structures and Buildings*. This issue features six high-quality research articles that address some of the current challenges in structural resilience and durability, bridge construction and sustainable material science. The papers encompass a diverse range of themes, including the seismic performance of irregular structures, stability in bridge rotation construction, non-destructive assessment of corrosion, and innovations in sustainable concrete and multifunctional coatings. Together, these contributions highlight the global effort to enhance the safety, sustainability and longevity of civil infrastructure.

The first paper, by Kaloni *et al.* (2026), investigates the seismic performance of buildings with coupled plan and elevation irregularities situated on hill slopes in the Indian state of Uttarakhand. Through extensive field surveys of over 1500 structures and non-linear time history analyses, the authors demonstrate that buildings with combined irregularities experience significantly amplified seismic demands compared to regular models. A key finding of this study is that a 135° seismic incidence angle is often the most critical for these structures, and the authors provide vital recommendations for enhancing code-based design practices for hillside construction.

In the second paper, Yang *et al.* (2026) explore the influence of rotational speed on the stability of cable-stayed bridge swivel construction. Using a model bridge experiment and finite-element analysis based on a major project in Asia, the researchers found that higher rotational speeds lead to stronger dynamic responses, specifically increasing the fluctuation range of vertical displacement and stress in the main beam. The study concludes that controlling the rotational speed within a specific range is essential for ensuring structural stability and construction safety.

The third paper, by Musa and Ahmed (2026), addresses the deterioration of reinforced concrete due to corrosion by proposing a simple regression-based model for estimating residual reinforcement. By utilising easily measurable parameters such as surface crack width and cover-to-diameter ratios, the model achieves good predictive accuracy for estimating the penetration depth and remaining steel area. This practical tool allows structural engineers to obtain upper-bound estimates of residual load-carrying capacity during preliminary assessments without the need for destructive testing.

The fourth paper, by Kichouhi *et al.* (2026), contributes to the field of sustainable building materials by examining concrete incorporating date pits (DPs) as an ecological solution for reducing energy consumption. The experimental results show that increasing DP content significantly decreases thermal conductivity, although this enhancement in insulation is accompanied by a reduction in compressive strength. The study highlights the feasibility of using locally sourced DP waste in Morocco for non-structural insulating components, such as blocks and panels.

The fifth paper, by Elsayw and Elhenawy (2026), provides a comprehensive review of multifunctional smart coatings designed to respond to environmental stimuli like temperature, pH and mechanical stress. The authors classify these advanced materials into self-healing, anti-microbial and self-cleaning systems, discussing underlying mechanisms such as microencapsulation and dynamic covalent bonding. This review bridges the gap between laboratory innovation and industrial application, identifying current challenges in scalability and durability for the next generation of intelligent surfaces.

In the final paper, Sun *et al.* (2026) investigate the durability of fly ash concrete subjected to magnesium sulfate attack and sustained static loading. Through multi-scale microstructural characterisation and Weibull distribution-based life prediction, the study identifies 30% fly ash content as the optimal dosage for retarding ion penetration and maintaining structural stability. The researchers also quantify how sustained loading accelerates chemical degradation by up to 1.7 times compared to pure sulfate exposure, emphasising the importance of considering coupled environmental–mechanical effects in durability design.

These papers represent valuable contributions from researchers in India, China, Saudi Arabia, the UK, Morocco and Egypt, reflecting the collaborative nature and global scope of contemporary civil engineering research. I thank the authors for their significant efforts and the reviewers for their thoughtful assessments. I also extend my gratitude to the Editor-in-Chief, the editorial board and the production team for their continued dedication and support in bringing this issue to publication.

I hope that the articles in this issue inspire readers to explore new ideas and advance the field of structural engineering in ways that are both technically robust and environmentally responsible. I

strongly encourage feedback and discussion from the readership to continue shaping the future of our built environment.

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