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Structures and Buildings

Editorial

Luís Costa Neves
University of Coimbra, Coimbra, Portugal (luis@struplano.pt)

I am pleased to present the editorial for the September 2025 issue of *Structures and Buildings*. This journal is one of the longest-standing publications in the field of structural engineering, with a rich history of supporting the advancement of civil engineering practice. It remains one of the few journals globally to publish both theoretical and practical papers on structural engineering topics.

This edition covers a diverse range of subjects, materials and structural types through six insightful papers. With contributions from researchers across the world, the journal underscores its international reach, with authors hailing from the UK, China, UAE, Iran and Australia. The topics explored include the behaviour of composite steel and self-compacting concrete tubes, a review on the properties of fibre-reinforced concrete, an insight into the behaviour of reinforced soil–cement beams, a study on alkali-activated mortar, a research study on the morphology and behaviour of a cable monolayer net with large openings, and finally the application of information technologies to the construction industry based on digital twins.

The first paper in this issue, from the University of Wollongong, Australia, is authored by Muhammad Naveed and colleagues (Naveed *et al*., 2025), and addresses the axial compression behaviour of small square steel tubes filled with self-compacting concrete. The main topics of the research were the influence of the column slenderness and of the infill on the column's compressive strength and on the failure mode; the research methodology was experimental, with a total of 18 laboratory tests.

The second paper is a review paper tackling the properties, applications and advances of functional fibre-reinforced concrete. It is authored by Zheng-Yi Lv and colleagues (Lv *et al*., 2025), from the College of Civil and Transportation Engineering, Shenzhen University, China. This paper begins by examining fibre surface treatment techniques and their influence on the interfacial behaviour between untreated and modified fibres and the cement matrix, as well as the resulting changes in the mechanical performance of fibre-reinforced concrete. It then discusses strategies for enhancing chloride ion binding within concrete. The review concludes by synthesising current research outcomes, emphasising the potential of functional fibres to improve the chloride-binding capacity of this material. Overall, this work provides new insights into the contribution of functional fibres to concrete durability and offers a fresh perspective on their practical application in the construction industry.

This paper is followed by a study presented by Hamed Bayesteh and colleagues (Bayesteh *et al*., 2025), from the Department of Civil Engineering, University of Qom, Iran, and addresses a full-scale experimental analysis of the flexural behaviour of reinforced soil–cement beams, which are widely employed as retaining structures for deep excavations in coastal regions. The considerable bending moments arising from soil pressure are frequently resisted by adding reinforcement to enhance flexural performance, a process that still needs to be further investigated. Furthermore, a design framework for reinforced 'soilcrete' elements needs to be established. The paper reports the results of eight full-scale tests on reinforced soilcrete beams, focusing mainly on their flexural response, including crack propagation mechanism, cracking moments and ultimate moments. These results suggest that conventional reinforced concrete design formulas can be applied to the flexural design of reinforced soilcrete elements.

The fourth paper selected for this issue presents research on morphology and mechanics of spoke monolayer cable net with large oval opening and is authored by Zenghui Di and Bin Luo (Di and Luo, 2025) from the School of Civil Engineering, South-east University in Nanjing, China. A morphological integration method combining nodal equilibrium iteration and total strain theory is proposed for spoke-type single-layer cable nets. Parametric models of elliptical nets were analysed under varying radial cable numbers, layout strategies, surface height differences and aspect ratios. Results show that structural morphology and force distribution can be simultaneously determined, with radial cable count, cable orientation, outer ring height and aspect ratio critically affecting stiffness, force balance and deformation. These findings provide practical guidance for the optimised design of spoke-type cable net structures.

The fifth paper bears the title 'Optimising sustainable alkali-activated mortar: experimental work and machine learning

predictions'. It is authored by Mohamed Rabie and colleagues (Rabie *et al*., 2025), in joint research from the School of Computing and Engineering, University of West London, UK and the Department of Civil and Environmental Engineering, College of Engineering, Qatar University, in Doha. This study combines experimental evaluation and machine learning to predict the mechanical properties of ambient-cured alkali-activated mortar. Using a dataset of 635 compressive and 94 flexural strength measurements, six machine learning algorithms were tested, highlighting the critical role of ground granulated blast-furnace slag content in optimising strength and sustainability.

This issue closes with a contribution authored by Yafeng Wen (Wen, 2025) from the School of Intelligent Construction, Fuzhou University of International Studies and Trade, China. It presents research on the intelligent construction of a prefabricated building based on digital twin. As advances in artificial intelligence (AI) and information technology are driving the rise of intelligent construction, with prefabricated buildings playing a central role, this study explores the integration of digital twin technology to connect digital and physical domains, enabling real-time decision making, enhanced collaboration and predictive analytics. A structured digital twin framework is proposed, and applications in hoisting management, safety and performance monitoring are examined. The findings provide strategic insights for advancing Construction 4.0 and establishing a theoretical foundation for intelligent prefabricated building systems.

I hope you find these papers both insightful and thought-provoking. As always, we encourage feedback and discussion from our readers, and we look forward to your continued engagement with the journal.

REFERENCES

Bayesteh H, Khorshidvand S and Sharifi M (2025) Full-scale experimental analysis of the flexural behavior of reinforced soil–cement beams. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **178(9)**: 798–810, 10.1680/jstbu.24.00107.

Di Z and Luo B (2025) Research on morphology and mechanics of spoke monolayer cable net with large oval opening. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **178(9)**: 811–827, 10.1680/jstbu.25.00094.

Lv ZY, Pei C and Zhu JH (2025) Review on functional fibre-reinforced concrete: properties, applications and advances. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **178(9)**: 759–797, 10.1680/jstbu.25.00025.

Naveed M, Sheikh MN and Hadi MNS (2025) Axial compression behaviour of small square tubes filled with self-compacting concrete: effect of *L*/*B* ratio. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **178(9)**: 745–758, 10.1680/jstbu.25.00074.

Rabie M, Ibrahim M, Ebead U and Shaaban IG (2025) Optimising sustainable alkali-activated mortar: experimental work and machine learning predictions. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **178(9)**: 828–850, 10.1680/jstbu.25.00036.

Wen Y (2025) Research on the intelligent construction of prefabricated building based on digital twin. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **178(9)**: 851–863, 10.1680/jstbu.25.00086.