Cite this article
Fu F (2022)
Editorial.
Proceedings of the Institution of Civil Engineers – Structures and Buildings **175(6)**: 435–436,
https://doi.org/10.1680/jstbu.2022.175.6.435

Editorial

Structures and Buildings

ICE Publishing

Editorial

Dr Feng Fu PhD, MBA, MSc,CEng, FIStructE, FICE, FASCE, FHEA
Senior Lecturer, School of Mathematics, Computer Science and
Engineering, City, University of London

This issue of *Structures and Buildings* contains five papers, covering a broad range of civil engineering problems. They are: durability problems of epoxy-coated reinforcing bars reinforced concrete beam, deformation limits for segmental tunnels, stone beams strengthening technology, bond check using ground penetrating radar and vibration assessment technology for footbridges. These technologies are presented through the research outcomes of both experimental and numerical studies.

In the first paper, Wang *et al*., (2022) made a series of experimental tests on reinforced concrete specimens with normal uncoated and epoxy-coated reinforcing bars. The evaluation of the epoxy coating thickness showed that some mechanical properties of bars with a thinner coating were better than those of their uncoated counterparts, while an increase in coating thickness decreased the bond strength. Static and fatigue test showed that higher fatigue loads and longer fatigue loading cycles decreased the corrosion resistance of the bars and increased the chloride penetration. The ultimate loads of the specimens were reduced, and comparatively lower values were obtained for beams with bars with thicker coatings.

In the second paper, Carpio *et al*., (2022) present evaluation for traditional deformation limits of segmental reinforced concrete tunnels built in soft soil. Parametric analyses were performed using finite-element models. The serviceability deformation was defined to prevent typical problems that could jeopardize the serviceability states of segmental linings. These serviceability deformations were then compared with traditional deformation limits. The results showed that the serviceability deformation depends on the slenderness ratio and the soil-pressure distribution. They concluded that empirical recommendations are only suitable for certain slenderness ratios and soil-pressure distributions.

In the third paper, Ye *et al*., (2022) developed a strengthening technique using prefabricated stone plates reinforced with carbon-fibre-reinforced-polymer bars. The effectiveness of the technique was evaluated through tests. The test results showed that the prefabricated plates shifted the failure mode of the stone beams from brittle fracture to more ductile behaviour manner accompanied by multiple flexural cracks. A significant increase in load-carrying and deformation capacities was observed, and the flexural strength tended to increase with an increase in the polymer reinforcement ratio. Good bond between the prefabricated plates and the stone beams and effective composite action are observed.

In the fourth paper, Riad *et al*., (20221) performed a ground penetrating radar scanning approach to examine the bond quality in small-scale concrete beams with flexurally applied CFRP laminates. A three-point bending test and numerical modelling were used to develop simple quantitative relationships between the scanning results and the parametric combinations. This non-destructive evaluation techniques are convenient and provide valuable information for the prediction of the interfacial bond quality and the actual capacity contribution of the CFRP laminate.

In the fifth paper, Rezende *et al*., (2022) made the vibration performance assessment of a long-span steel footbridge. They made free- and induced-vibration tests on a long-span inverted-queen-post-truss steel footbridge. The pedestrian walking is simulated using a simplified footbridge model undergoing a typical dynamic load from a Fourier series, as well as with a biodynamical formulation that considers human–structure interactions. It is found that, the equivalent beam model developed in this paper provides a practical means of investigating corrective intervention strategies for the problem of excessive footbridge vibration using tuned mass dampers and allows the in-service footbridge performance to be assessed based on current standards and design guidelines.

REFERENCES

Carpio F, Peña F and Galván A (2022) Evaluation of traditional deformation limits for segmental tunnels in soft soils. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **175(6)**: 453–467, https://doi.org/10.1680/jstbu.19.00163.

Rezende FA, Varela WD, Carvalho EML and Pereira AMB (2022) Vibration performance assessment of a long-span steel footbridge. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **175(6)**: 500–512, https://doi.org/10.1680/jstbu.19.00184.

Riad M, Yazdani N, Almomani Y and Gonzalez E (2022) Fibre-reinforced polymer laminate–concrete bond check with ground penetrating radar. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **175(6)**: 486–499, https://doi.org/10.1680/jstbu.19.00166.

Wang XH and Zheng L (2022) Durability and ultimate performance of concrete beams with epoxy-coated reinforcing bars. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **175(6)**: 437–452, https://doi.org/10.1680/jstbu.19.00156.

Ye Y, Miao W and Guo ZX (2022) Strengthening stone beams with prefabricated polymer-reinforced stone plates. *Proceedings of the Institution of Civil Engineers – Structures and Buildings* **175(6)**: 468–485, https://doi.org/10.1680/jstbu.19.00165.