Cite this article

Correia JAFO, Montenegro P and Zhu SP (2019)
Editorial on reliability and safety of structures and infrastructures.
Proceedings of the Institution of Civil Engineers – Forensic Engineering **172**(4): 123–124,
<https://doi.org/10.1680/jfoen.2019.172.4.123>

Editorial

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Editorial on reliability and safety of structures and infrastructures

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Forensic Engineering covers the investigation of constructed facilities and systems that fail to perform, function or operate as intended, resulting in environmental, property, personal or economic damage. Research and practice papers are sought on traditional or modern forensic engineering topics and also covering aspects related to structural pathology, new understanding of the application of engineering principles as a result of unexpected unsatisfactory performance, innovative techniques or equipment used in forensic engineering investigations, and the contribution of forensic engineering and investigation techniques to the role of the expert witness.

This issue of ICE's *Forensic Engineering* journal reflects on the following topics: numerical modelling, risk & probability analysis, stress analysis, structural collapse, reinforced concrete viaduct, foundation failure, steel reinforcement, composite rebars, fibre-reinforced concrete and bending test.

The first paper (Li *et al.*, 2019) presents a novel time-variant reliability analysis method with aims to reduce uncertainty due to working load and improve the reliability of connecting bolts for motor hangers in electric-multiple-unit trains. This developed analysis method is based on a time-variant stress–strength interference model and solved by the most-probable-point method. The results of the developed method showed that reliability was lower than that of the traditional methods. It was concluded that the uncertainty of working load has a great impact on reliability.

In the second paper, Reis *et al.* (2019) have made an accident scenario modelling with hazardous materials in transportation infrastructures in the Mortágua Municipality (Central Region of Portugal). The authors analysed the infrastructures that support the transport of dangerous substances, the types of dangerous substances that circulate, and transportation frequency. According

to this study, the authors concluded that if an accident occurs in the presented municipality, the socio-economic losses will be very high.

In the third paper, Pereira *et al.* (2019) describe the project analysis as well as the reasons that led to the collapse of the urban viaduct Olímpio Mourão Filho in Belo Horizonte, Brazil, partly collapsed while under construction in July 2014. In this study, the authors concluded that the failure occurred abruptly and was caused by insufficient longitudinal reinforcement of the pile cap block. Therefore, it is suggested that project verification performed by external companies be a mandatory practice in order to guarantee project quality, preventing human and economic losses.

The paper by Stroński *et al.* (2019) presents a comparative study on strength tests of reinforced concrete beams with glass-fiber-polymer and conventional steel solutions. These tests were used to evaluate the suitability of these reinforcement materials for practical applications. The conventional steel solution showed better performance, however, composite rebars solution seems to be an alternative for aggressive environment applications.

In the last paper of this issue, Sire and Ragueneau (2019) present an overview of the evolution of the fatigue design rules for metallic railway bridges used in France, where aspects related to the monotonic properties of materials, cyclical loading, calculation methods, historical stress calculations, are addressed.

Acknowledgements

This work was supported by: Base Funding - UIDB/04708/2020 and Programmatic Funding - UIDP/04708/2020 of the CONSTRUCT - Instituto de I&D em Estruturas e Construções - funded by national funds through the FCT/MCTES (PIDDAC).

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