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Editorial

1 **José A. F. O. Correia** PhD, MSc, CEng
Assistant Researcher, Department of Civil Engineering, Faculty of Engineering, University of Porto, Porto, Portugal

2 **Abílio M. P. De Jesus** PhD, MSc, MEng
Assistant Professor, Department of Mechanical Engineering, Faculty of Engineering, University of Porto, Porto, Portugal

3 **Rui A. B. Calçada** PhD, MSc, CEng
Full Professor, Department of Civil Engineering, Faculty of Engineering, University of Porto, Porto, Portugal



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 the Institution of Civil Engineers' *Forensic Engineering* journal reflects on the following topics: engineering legacy in railway tunnelling operations; critical assessment of evidence related to a stadium disaster; participatory approach by survivors in a post-tsunami reconstruction process; and also repair, rehabilitation and retrofitting of concrete structures.

The first full-length paper (Edmondson *et al*., 2018) presents the key lessons from the Victorian engineering legacy mainly in railway tunnelling operations. Their legacy can be easily seen in the railway networks of Great Britain, which show the challenges to civil engineering of the time. These developments resulted in the emergence of so-called 'celebrity' engineers who experimented and developed techniques and site-based practices, and moved to the management and leadership of construction works. The legacy left by engineers and builders remains to this day. In this sense, the paper intends to acknowledge the spectacular feats of engineering that society inherited from them but also reveals how their legacy has contributed to the ways in which tunnelling operations are mobilised today. The authors argue that such contributions should be recognised and consciously rebalanced if the next steps are to be taken to improve tunnelling operations within the profession of civil engineering today.

The second full paper (Dickie, 2018) reports a critical assessment of evidence related to the 1989 Hillsborough Stadium disaster, which unfolded on the Leppings Lane terrace of Sheffield Wednesday Football Club's ground in Sheffield, UK, on 15 April 1989 and resulted in 96 fatalities. In this research, the matters discussed are concerned with fundamental technical principles that provide for spectator safety on terraces. In this way, the author has examined the significance as to the lack of compliance with the applicable guidance and concluded that the terrace barrier testing undertaken prior to the disaster was inadequate.

The paper by Meigh *et al*. (2018) is about survivor participation in the Aceh and Nias post-tsunami reconstruction: involving them in the planning process, training them in construction techniques and, through contracts managed by water user associations, supporting them to rebuild their secondary and tertiary systems. The earthquake of 26 December 2014 off the west coast of Sumatra, Indonesia, resulted in some 300 000 fatalities. A design team was engaged by the Asian Development Bank (ADB) to assist the Indonesian government's Bureau of Rehabilitation and Reconstruction (BRR) to re-establish the irrigation infrastructure and its management. With external assistance, the design engineers followed the BRR policy of 'building back better' by incorporating earthquake-resistant design in the higher-risk areas. This research work presents the participatory approach taken to restore some 93 irrigation systems over some 60 000 ha.

Finally, the last full-length paper, by Bhattacharjee (2018), addresses the deterioration of concrete structures using case studies in India. The deterioration of reinforced concrete structures is recognised as a major problem worldwide. Repair, rehabilitation and retrofitting can be carried out using various types of admixtures and modern repair materials. This research discusses the present state of concrete structures and the major areas where improvement is needed during the service life stage for sustainable development. Additionally, the method for repair, rehabilitation and retrofitting is also discussed. The author details in this paper several case studies based on his field experience of direct involvement in the planning and execution of repair and rehabilitation jobs. All works were successfully completed by using the latest repair materials and techniques.

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