Editorial

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In this edition of the journal, four papers are presented. The papers each address specific areas of bridge loading, response and behaviour; to those already familiar with the topics, the papers may cause the practitioner to pause, re-examine and inwardly test previously firmly held understandings. To those encountering some of the topics in their current work for the first time, the papers provide brightly lit signposts for the task to come. For others, the papers provide very interesting examples of the science, indeed the art, of bridge engineering.

In their paper ‘Administration of abnormal vehicles in Ireland’, Corbally *et al.* (2017) review the international practice for the administration of abnormal vehicles, citing practice in the USA, the UK, the Netherlands and the Scandinavian countries, their aim being to develop a software-based procedure to enable rapid load-routing decisions for abnormal vehicle movement requests. A software tool is described based on abnormal vehicles tested against a database of representative influence lines for bridges on the Irish Major Inter-Urban network.

Many engineers will recognise from their own experience of inspecting and assessing masonry arch viaducts, spandrel cracking and displacements, the causes of which are not certain or intuitive and for which arch analysis software provides little, if any, insight. Long and extensive observations have led Harvey and Harvey (2017) to propose a new model for the understanding of ‘load following stiffness’ in arch viaducts and particularly draw attention to rotations of the comparatively stiff ‘pier top blocks’ in relation to pier flexure and slenderness. They posit that rotation of this block is responsible for excessive stresses and cracking in the spandrel. The case made is compelling and the paper invites those grappling with the management of these defects in their bridge stock to perhaps examine and reflect on the efficacy of their intended bridge interventions. The authors recommend further developmental work to fully validate this emerging behavioural model for arch viaducts. In the meantime, they propose that

strengthening works on these structures should be made reversible.

In very many instances, reinforced-concrete bridge piers exist in a salt laden corrosive environment, whether this be a marine location or simply the consequence of salt road de-icing. Worldwide, the consequent corrosion of the reinforcement and self-aggravating fragmentation of the cover concrete is a common and significant maintenance problem. However, when that degraded structural section is additionally tested by seismic actions, what effect does that cyclic loading have on the already degraded structural capacity? This is the question addressed by Fang *et al.* (2017) in their paper ‘Performance of corroded bridge piers under cyclic loading’. A detailed experimental programme is described using eight pier specimens subjected to accelerated corrosion and a diet of repeated axial loading and low cyclic reversed loading. Follow-up experimental analysis and finite-element numerical analysis led to a number of conclusions that will be of interest to those designing seismically resistant bridge elements.

Finally, Abbas *et al.* (2017) provide an in-depth review of methods for flutter stability analysis of long-span bridges. The reader will be familiar with the more well-known bridge failures of the past; those of the commonly remembered Tay Bridge disaster of 1879 or original Tacoma Narrows Bridge in 1940, where wind action was a major factor in their demise. The paper provides a refresher on the subject of aeroelastic instability before setting out a reference work on the topic. The paper is an invaluable source for practitioners in the field and provides extensive references. My own particular interest is drawn to current developments in the field of computational fluid dynamics (CFD) and its utility alongside sectional and full-scale wind tunnel modelling. As the authors point out, CFD in its current stage of development is a useful technique for preliminary design before wind tunnel tests on the final design; computational advances, as in all engineering disciplines may well see this relationship change, as in fact the

September 2017 themed issue on information technology in bridge engineering and construction amply illustrates.

The papers presented in this issue are both highly informative and thought provoking. I hope that the readership agrees. We would encourage readers to submit discussion pieces on these papers through the regular channel. We would thank the authors for these papers and encourage all readers of the proceedings to consider submitting an article to the journal.

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