Comparative seismic performance of a moment frame equipped with Lateral Impact Resilient Double Concave Frictional devices

EDITORIAL

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Bridge engineering research and practice continuously pursue better understanding of engineering phenomena and delivery of innovative applications, pushing the boundaries of structural engineering. Among the topics that are included in bridge engineering activities, and that also characterise the topics covered by this Journal, there are several aspects related to innovation and research in the field. These can be interpreted both through theoretical research approaches and through the practical exemplification of innovative and challenging applications. This edition of *Bridge Engineering* actually reflects this dichotomy, and in fact the reader finds a first group of papers characterised by a greater abstractionism.

The first paper is an experimental endeavour backed by a 5-year experimental programme and validates experimentally numerical models used for estimating long-term deflections of reinforced concrete cantilevers. This laboratory study with significant practical applicability, also assesses the influence of heterogeneity on the long-term deflections of reinforced concrete components and aims at alleviating these deflections by making use of compression reinforcement and low-shrinkage concrete (ID38 – Sousa et al. 2020). The second paper studies specific models for the preliminary evaluation of the effect of cables in the stiffness of bridges supported by cables (ID28 – Tan et al. 2020). Equations are developed for preliminary estimates of longitudinal displacement in suspension bridges and the cable-spring effect and its longitudinal restraint stiffness on towers is quantified. Research papers in this edition also include a novel approach to improving the estimation of the local scour depth at bridge piers due to accumulated debris (ID45 – Ebrahimi et al. 2020). The method computes a debris factor based on the dimensions the debris blockage. The method takes one step ahead by applying the methodto a full-scale bridge in the UK that is suspected to have failed as a result of debris-induced scour.

On the more practical side of this edition there are contributions describing the most recent applications in the field of bridge engineering, which can represent examples in the field and challenges from which the reader can draw points of interest for new and future applicative developments. This peculiar aspect essentially characterises this journal and may probably be of special interest to professional engineers, which in their activities they have to cope with the implementation of creative and sometimes revolutionary solutions. Some examples are also given in this edition of the Journal, in particular the launch philosophy of the west flyover at Stockley airport junction (ID15 – Beavor et al. 2020), which includes the longest single-span constructed on the Great Western railway since Brunel's Saltash Bridge in 1859. Between these two opposite but connected poles, in bridge engineering, intermediate studies can be found. For example, the preliminary study of special design works, such as the integral bridge concept herein presented for the third runway at Heathrow airport (ID44 – Sandberg et al. 2020), shown in Figure 1 below. At over 140 m in the total length, the adoption of an integral bridge of this length is in excess of most integral bridges in the UK. This paper presents a comprehensive SSI study to understand the behaviour of this long integral bridge during thermal deck movements.

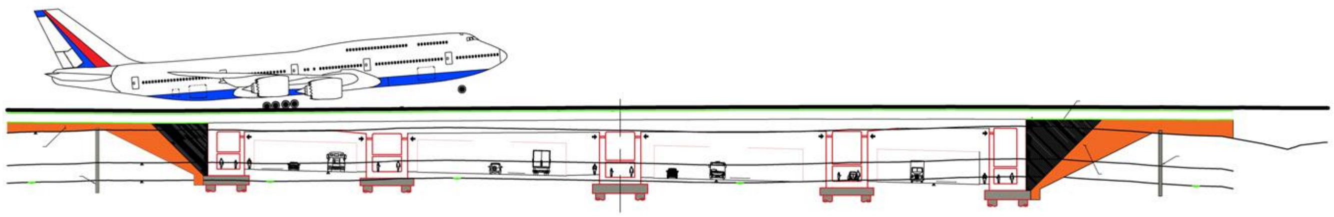

Figure 1: Typical transverse cross-section through the tunnel

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