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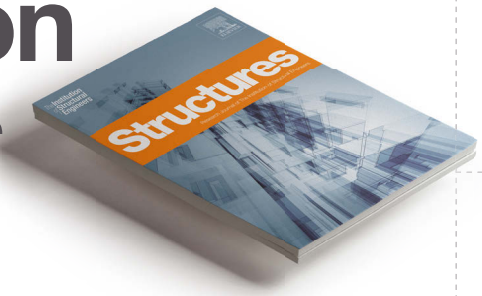

Editor's Featured Articles

Have you read the Editor's Featured Articles in *Structures*? From each issue of the journal, the Editor-in-Chief (or Guest Editor) selects an outstanding paper which is made available free of charge for six months to promote the high-quality research published in *Structures*. Here, we highlight the three latest Featured Articles.

Volume 20 (August 2019)

Optimum use of composite structures for demountable construction

Ana M. Girão, Mark Lawson and Eleftherios S. Aggelopoulos

This paper explores the concept of the optimum span to depth ratio of reusable composite beams with demountable bolted shear connectors so that the beams may be designed most efficiently in terms of their weight and the shear connector distribution along the span. Three patterns of shear connectors were evaluated by a simple pseudo-plastic model and calibrated by finite element modules in terms of their effect on the overall composite beam stiffness in the range of 9 to 15m span. The optimum span to depth ratio of symmetrical and asymmetrical beams was determined and compared to equivalent beams with welded shear connectors. It was found that the optimum span to depth ratio of uniformly loaded unpropped composite beams with demountable bolted shear connectors may be taken as 22 which allows for a utilisation factor of 0.7 at the ultimate limit state to ensure that plasticity does not occur in the first use cycle. It was found that the effect of asymmetry on the optimum span to depth ratio is small. For propped beams with demountable shear connectors, the optimum span to depth ratio may be increased to 24.

→| Read the full paper at **https://doi.org/10.1016/j.istruc.2019.03.005**.

Volume 19 (June 2019)

Least Cost Design of Curved Cable-Stayed Footbridges with Control Devices

Fernando Ferreira and Luís Simões

Cable stayed footbridges have appealing aesthetics but they are flexible and slender and these properties result in vibrational prone structures. Its design is governed by dynamic comfort requirements in particular the horizontal and vertical accelerations and the synchronous lateral instability (also known as 'lock-in'). This paper concerns the optimum design of curved cable stayed footbridges with control devices using a three dimensional model. The structure is designed to guarantee the standard static (live loads, wind, temperature and self-weight) and dynamic (pedestrian induced vibration) requirements. An optimization algorithm is employed to find the least cost design for varying bridge lengths. The goals include finding the bridge geometry (tower shape, number of cables and their location), cross section sizes, control devices properties and cable prestressing. Different bridge lengths lead to different minimum costs, design variables, stress distribution and dynamic response and these solutions are compared. The influence of the tower shape and control device properties on the optimum design is included.

→| Read the full paper at **https://doi.org/10.1016/j.istruc.2018.12.004.**

Volume 18 (April 2019)

Rwanda Cricket Stadium: Seismically stabilised tile vaults

Michael Ramage, Timothy J. Hall, Ana Gatóo and M. Wesam Al Asali

The Rwanda Cricket Stadium, completed in 2017, uses compressed soil-cement tiles, thin-tile vaulting, and geogrid reinforcement for seismic stabilisation in Kigali's moderate risk earthquake zone. The vaults follow the natural resolution of forces toward the ground, closely mimicking the parabolic geometry of a bouncing ball and evoking the cherished hilly topography of Rwanda. The masonry vaults in compression allow the use of geogrid embedded within the mortar layers, adding global ductile behaviour to the thin shell composite of low strength tiles. Structural analysis is based on thrust lines, with additional envelope for the thrust lines to leave the profile of the masonry computed from the tensile capacity added by the geogrid. Construction follows traditional thin-tile techniques adapted for new environments and uses compressed earth tiles as pioneered at the Mapungubwe Interpretive Centre in South Africa. Here, the two approaches are combined in a permanent structure, with the largest vault spanning 16m with a rise of 8m. The Rwanda Cricket Stadium is a fusion of advanced structural analysis and architectural design with labour intensive, locally-sourced material production offering a much-needed solution to building sustainably in the developing world. Employing air-dried, hand-pressed soil tiles, produced using local labour, this method of construction has proved to be innovative, cost effective and beautiful.

→| Read the full paper at **https://doi.org/10.1016/j.istruc.2019.02.004.**