

# Spotlight on Structures

Research Journal of The Institution of Structural Engineers

In this section we shine a spotlight on papers recently published in *Structures* – the Research Journal of The Institution of Structural Engineers.

*Structures* is a collaboration between the Institution and Elsevier, publishing internationally-leading research across the full breadth of structural engineering which will benefit from wide readership by academics and practitioners.

Access to *Structures* is free to paying-grade Institution members as one of their membership benefits, with access provided via the 'My account' section of the Institution website. The journal is available online at: [www.structuresjournal.org](http://www.structuresjournal.org)

## Editor-in-Chief's Featured Article

Editor-in-Chief, Professor Leroy Gardner, has selected the following article from Volume 19 (June 2019) as his featured article. Featured articles are made available free of charge for six months following publication of the issue.

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

Fernando Ferreira and Luís Simões, Department of Civil Engineering, University of Coimbra, Portugal

#### Highlights

- The proposed algorithm is efficient in finding an optimum solution for curved cable stayed bridges.
- The variables are the geometry, section sizes, control devices properties and cable prestressing.
- Viscous dampers in the tower-deck connection are used to satisfy dynamic requirements.

- A cost comparison is made between the optimum straight and curved designs.

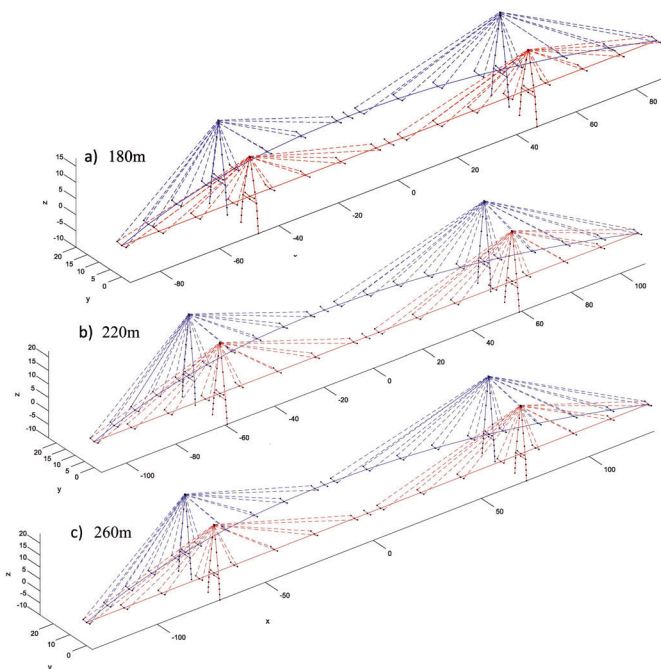
#### Abstract

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.

The full paper is available at <https://doi.org/10.1016/j.istruc.2018.12.004>.



### Structures receives first Impact Factor

We are delighted to announce that *Structures* has been awarded its first Journal Impact Factor – an important measure of quality for academic journals.

With an Impact Factor of 1.646, *Structures* is ranked 68th out of 132 journals in the field of civil engineering, confirming its position as a high-quality journal in the field.

The Impact Factor measures the average number of citations received in a particular year by papers published in the journal during the two preceding years.

The award of an Impact Factor follows the admission of *Structures* to the Science Citation Index Expanded database earlier this year, and is expected to lead to a further increase in both the quantity and quality of submissions to the journal.

**IMPACT FACTOR:**  
1.646

