

# 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.

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## New issue available

The latest issue of *Structures* (Volume 20, August 2019) is now available at [www.sciencedirect.com/journal/structures/vol/20](http://www.sciencedirect.com/journal/structures/vol/20). Editor-in-Chief, Leroy Gardner, has selected an article on composite structures for demountable construction as his 'Featured Article' from the issue. This will be available free of charge for six months.

## Most popular articles

The most popular articles in *Structures* in the past 90 days are:

- **Monotonic and cyclic performance of threaded reinforcement splices**  
D.V. Bompá and A.Y. Elghazouli
- **Design of Truss Structures Through Reuse**  
Jan Brütting, Joseph Desruelle, Gennaro Senatore and Corentin Fivet
- **Slender Roof Structures – Failure Reviews and a Qualitative Survey of Experienced Structural Engineers**  
Anders Klasson, Ivar Björnsson, Roberto Crocetti and Eva Frühwald Hansson
- **Novel Digitally-manufactured Wooden Beams for Vibration Reduction**  
C. Málaga-Chuquitaype and J. Ilkanaev
- **Steel concrete composite systems for modular construction of high-rise buildings**  
J.Y.R. Liew, Y.S. Chua and Z. Dai
- **Rwanda Cricket Stadium: Seismically stabilised tile vaults**  
Michael Ramage, Timothy J. Hall, Ana Gatóo and M. Wesam Al Asali
- **Flexural performance of reinforced concrete beams strengthened with fibre reinforced geopolymer concrete under accelerated corrosion**  
Mohammed Haloob Al-Majidi, Andreas P. Lampropoulos, Andrew B. Cundy, Ourania T. Tsioulou and Salam Alrekabi
- **Axial Rotation and Lateral Torsional Buckling of Extruded Aluminium Mullions in Curtain Wall Facades**  
Adam D. Lee, Jed A. Alimanza, Paul Shepherd and Mark C. Evernden

## Editor-in-Chief's Featured Article

### Optimum use of composite structures for demountable construction

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#### Abstract

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.

The full paper is available at <https://doi.org/10.1016/j.istruc.2019.03.005>.

