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# Spotlight on Structures



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## Read the latest issue

The latest issue of *Structures* (Volume 25, June 2020) is available at [www.sciencedirect.com/journal/structures/vol/25](http://www.sciencedirect.com/journal/structures/vol/25).

As his 'Featured Article' from the issue, Editor-in-Chief, Leroy Gardner, has selected an

article that presents a new design concept for the calculation of the local bending stresses in webs of retrofitted crane runway girders with a new boxed upper flange. The article will be available free of charge for six months.

## Editor-in-Chief's Featured Article

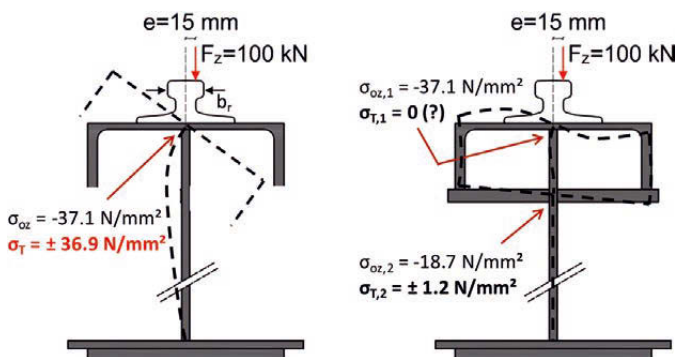
### Local stresses in retrofitted crane runway girders with boxed upper flange due to eccentric wheel loading

Markus Kettler, Franz Kiem and Harald Unterwiesinger  
Institute of Steel Structures,  
Graz University of Technology,  
Austria

The local stresses near the web-flange connection usually represent one of the most decisive criteria for the fatigue design of steel crane runway girders, particularly because every crane wheel induces an individual stress cycle and fatigue failure can potentially occur at any position of the girder's length. This paper presents a crane runway girder made of steel that has been retrofitted in the past to reduce the local bending stresses in the web, because of the installation of a new, heavier crane. This was done by additional longitudinal stiffeners to form a boxed upper flange. The local vertical stresses in the girder's web are investigated numerically and experimentally and the influence of the subsequently

attached reinforcement plates, forming a boxed upper flange, is studied. Traditionally, it is state of the art to neglect any local bending stresses in the web after retrofitting the upper flange area to get a local box section. The results presented in this paper indicate that the additional local bending stresses within the upper flange box section can be significant and should not be neglected for fatigue design. Therefore, a new design concept for the calculation of the local bending stresses in webs of retrofitted crane runway girders with new boxed upper flange is presented.

→ Read the full paper at <https://doi.org/10.1016/j.istruc.2020.03.024>



## The Drawing Board

TheStructuralEngineer

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The Drawing Board is *The Structural Engineer's* quarterly sketching competition, judged by Ron Slade FStructE of WSP.

### Sketches must be:

- hand drawn (no CAD, except for 'guided freehand')
- from a real project or assignment
- at a suitable scale for publication (i.e. not too intricate/detailed).

Please also submit a short description (150 words) to put the sketch into context.

To take part, submit your entries to: [tse@istructe.org](mailto:tse@istructe.org)

Each published entry will receive a free single e-book from the Institution's current list of titles.

Background sketch by Kevin Lyons (Lyons O'Neill)