

# Spotlight on Structures

Research Journal of The Institution of Structural Engineers

In this new section of *The Structural Engineer*, 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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*Structures* Volume 3 has recently been published online ([www.sciencedirect.com/science/journal/23520124/3](http://www.sciencedirect.com/science/journal/23520124/3)) and features the following articles:

#### **Semi-active Damping Device Based on Superelastic Shape Memory Alloys**

*Paulo Silva Lobo, João Almeida and Luís Guerreiro*  
<http://dx.doi.org/10.1016/j.istruc.2015.06.006>

#### **Experimental Investigation of Crumb Rubber Concrete Columns under Seismic Loading**

*Osama Youssf, Mohamed A. ElGawady and Julie E. Mills*  
<http://dx.doi.org/10.1016/j.istruc.2015.02.005>

#### **Stress field based truss model for shear-critical prestressed concrete beams**

*K. De Wilder, P. Lava, D. Debruyne, Y. Wang, G. De Roeck and L. Vandewalle*  
<http://dx.doi.org/10.1016/j.istruc.2015.02.006>

#### **Seismic Rehabilitation of RC Columns Under Biaxial Loading: An Experimental Characterization**

*Hugo Rodrigues, António Arêde, André Furtado and Patrício Rocha*  
<http://dx.doi.org/10.1016/j.istruc.2015.03.001>

#### **Rapid visual screening for seismic evaluation of RC hospital buildings**

*Daniele Perrone, Maria Antonietta Aiello, Marisa Pecce and Fernando Rossi*  
<http://dx.doi.org/10.1016/j.istruc.2015.03.002>

#### **Automating measurement process to improve quality management for piping fabrication**

*Mahdi Safa, Arash Shahi, Mohammad Nahangi, Carl Haas and Hamid Noori*  
<http://dx.doi.org/10.1016/j.istruc.2015.03.003>

#### **Effect of span length on progressive collapse behaviour of steel moment resisting frames**

*Farshad Hashemi Rezvani, Amir Mohammad Yousefi and Hamid Reza Ronagh*  
<http://dx.doi.org/10.1016/j.istruc.2015.03.004>

#### **Experimental testing of grouted connections for offshore substructures: A critical review**

*Paul Dallyn, Ashraf El-Hamalawi, Alessandro Palmeri and Robert Knight*  
<http://dx.doi.org/10.1016/j.istruc.2015.03.005>  
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#### **Shear tests of hollow flange channel beams with real support conditions**

*Poologanathan Keerthan, Mahen Mahendran and Anand Narsey*  
<http://dx.doi.org/10.1016/j.istruc.2015.03.006>

#### **Robustness of simple joints in pultruded FRP frames**

*Jawed Qureshi, J. Toby Mottram and Behrouz Zafari*  
<http://dx.doi.org/10.1016/j.istruc.2015.03.007>

#### **Replacement of Deformed Side-Face Steel Reinforcement in Deep Beams With Steel Fibers**

*Robin G. Tuchscherer and Alejandra Quesada*  
<http://dx.doi.org/10.1016/j.istruc.2015.03.008>

#### **Modelling of beam response for progressive collapse analysis**

*P. M. Stylianidis, D. A. Nethercot, B. A. Izzuddin and A. Y. Elghazouli*  
<http://dx.doi.org/10.1016/j.istruc.2015.04.001>

#### **Full-scale experimental study on the influence of damages on the static behavior of the single-layer cable net structure**

*Lu Yang, Gang Shi, Hao Yin, Xiaohao Shi and Zaoyang Guo*  
<http://dx.doi.org/10.1016/j.istruc.2015.04.002>

#### **U-shaped metallic-yielding damper in building structures: Seismic behavior and comparison with a friction damper**

*Saman Bagheri, Majid Barghian, Farhad Saeri and Ali Farzinfar*  
<http://dx.doi.org/10.1016/j.istruc.2015.04.003>

#### **Imperfection sensitivity and geometric effects in stiffened plates susceptible to cellular buckling**

*M. Ahmer Wadee and Maryam Farsi*  
<http://dx.doi.org/10.1016/j.istruc.2015.04.004>

#### **Highlights**

- Analytical model for elastic stiffened plates under axial compression is exploited
- Nonlinear variational approach developed to model local–global mode interaction

- Study suggests care is needed when analysing stiffened plates using imperfections affine to eigenmodes
- Geometric ranges where mode interaction is practically significant are defined

#### In Situ Out-of-Plane Testing of Unreinforced Masonry Cavity Walls in as-Built and Improved Conditions

*Kevin Q. Walsh, Dmytro Y. Dizhur, Jalil Shafaei, Hossein Derakhshan and Jason M. Ingham*

<http://dx.doi.org/10.1016/j.istruc.2015.04.005>

#### Seismic response of nonstructural components supported by a 4-story SMRF: Effect of nonlinear soil–structure interaction

*Prishati Raychowdhury and Samit Ray-Chaudhuri*

<http://dx.doi.org/10.1016/j.istruc.2015.04.006>

#### Performance of concrete-encased CFST box stub columns under axial compression

*Yu-Feng An, Lin-Hai Han and Charles Roeder*

<http://dx.doi.org/10.1016/j.istruc.2015.05.001>

##### Highlights

- A finite element model on concrete-encased CFST box stub columns is developed
- Full-range response of the load versus deformation relations is analyzed
- Simplified model for the ultimate strength of the composite column is suggested

#### Timber gridshells: Numerical simulation, design and construction of a full scale structure

*B. D'Amico, A. Kermani, H. Zhang, A. Pugnale, S. Colabella and S. Pone*

<http://dx.doi.org/10.1016/j.istruc.2015.05.002>

#### Unequally spaced lateral bracings on compression flanges of steel girders

*Hassan Mehri, Roberto Crocetti and Per Johan Gustafsson*

<http://dx.doi.org/10.1016/j.istruc.2015.05.003>

##### Highlights

- A simplified expression for critical moment of laterally braced girders is derived
- Solutions for rotational restraint of unequal spans between bracings are derived
- Applicability of the approach is examined by one comprehensive example
- Approach enables choosing more proper location and stiffness of lateral bracings
- Results verify that the approach can be very useful in pre-design stage

#### Torsional stiffness bounds of helical structures under the influence of kinematic constraints

*Nikolaos Karathanasopoulos*

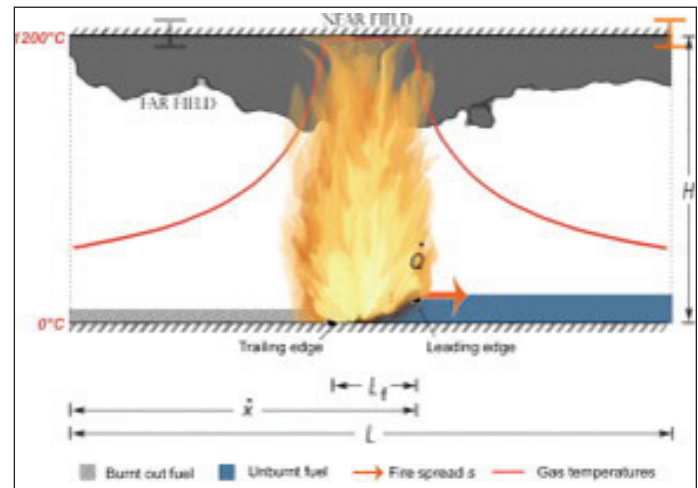
<http://dx.doi.org/10.1016/j.istruc.2015.05.004>

#### Improved Formulation of Travelling Fires and Application to Concrete and Steel Structures

*Egle Rackauskaite, Catherine Hamel, Angus Law and Guillermo Rein*

<http://dx.doi.org/10.1016/j.istruc.2015.06.001>

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#### Experimental response and design of O-connectors for rocking wall systems

*K. M. Twigden and R. S. Henry*

<http://dx.doi.org/10.1016/j.istruc.2015.06.002>

##### Highlights

- A series of nine cyclic tests on O-connector seismic dissipaters were performed
- Two failure mechanisms were identified and the less desirable eliminated with a novel design
- The welding process was found to have a significant effect on O-connector ductility
- Previously observed out-of-plane buckling of the O-connector was mitigated with an improved design
- A bilinear force–displacement approximation was proposed and validated

#### Development of a nonlinear FE modelling approach for FRP-strengthened RC beam-column connections

*H. Baji, A. Eslami and H. R. Ronagh*

<http://dx.doi.org/10.1016/j.istruc.2015.06.003>

#### Seismic Behaviour of Different Bracing Systems in High Rise 2-D Steel Buildings

*Dhanaraj M. Patil and Keshav K. Sangle*

<http://dx.doi.org/10.1016/j.istruc.2015.06.004>

#### Experimental Response of Reinforced Concrete Frames With AAC Masonry Infill Walls to In-plane Cyclic Loading

*S. Schwarz, A. Hanaor and D. Z. Yankelevsky*

<http://dx.doi.org/10.1016/j.istruc.2015.06.005>