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 Institution members (excluding Student 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**

Volume 9: Special issue

Readers are reminded that the latest issue of *Structures* is a special issue presenting selected papers from the 11th International Conference on Advances in Steel-Concrete Composite Structures (ASCCS 2015), held in Beijing, China, on 3–5 December 2015.

The Guest Editors for the issue were:

- **Lin-Hai Han,** Department of Civil Engineering, Tsinghua University, China
- **Wei Li,** Department of Civil Engineering, Tsinghua University, China

The issue includes the following papers:

►Behaviour and Design of Connections for Demountable Steel and Composite Structures
►Influence of Ultra-high Strength Concrete on Circular Concrete-filled Dual Steel Columns
►Hot-rolled steel and steel-concrete composite design incorporating strain hardening
►Performance of Partially Encased Composite Beams Under Static and Cyclic Bending
►Structural Behaviour of Beam to Concrete-filled Elliptical Steel Tubular Column Connections
►Experimental study on seismic performance of new RCS connection
►Finite Element Analysis on Mechanical Performance of Middle Long CFST Column with Inner I-Shaped CFRP Profile under Axial Loading
►Effects of Welding on the Tensile Performance of High Strength Steel T-stub Joints
►Structural Behaviour of Stud Shear Connections with Solid and Composite Slabs Under Co-Existing Shear and Tension Forces
►Seismic Behavior of Blind Bolted CFST Frames with Semi-rigid Connections
►A New Codified Design Theory of Second-order Direct Analysis for Steel and Composite Structures – From Research to Practice
►Numerical Modelling of Composite Floor Slabs Subject to Large Deflections
►Progressive Collapse Analysis of Concrete-filled Steel Tubular Column to Steel Beam Connections Using Multi-scale Model
►Shear transferring mechanisms in a composite shallow cellular floor beam with web openings
►Post-fire Behaviour of Innovative Shear Connection for Steel-Concrete Composite Structures
►Axial Compression Behaviour of Long Concrete Filled Double Skinned Steel Tubular Columns
►Seismic Analysis and Performance of High Strength Composite Special Moment Frames (C-SMFs)
►Load-Carrying Capacity of End Cross-Girder with Inspection Holes in Composite Bridge
►An Analytical Design Method for Steel-Concrete Hybrid Walls

Articles in press

The following articles have also recently been made available online:

Prediction of Wear in Grouted Connections for Offshore Wind Turbine Generators
Paul Dallyn[a], Ashraf El-Hamalawi[a], Alessandro Palmeri[a] and Robert Knight[b]
[a] School of Civil and Building Engineering, Loughborough University, UK
[b] Civil Engineering, E.ON Technologies (Ratcliffe) Limited, Nottingham, UK
http://dx.doi.org/10.1016/j.istruc.2017.02.001

Buckling Analysis of Steel Frames Exposed to Natural Fire Scenarios
Thiago Silva[a], Martina Carić[b], Carlos Couto[a], Paulo Vila Real[a], Nuno Lopes[a] and Davor Skejic[b]
[a] RISCO – Civil Engineering Department, University of Aveiro, Campus Universitário de Santiago, Aveiro, Portugal
[b] Faculty of Civil Engineering, University of Zagreb, Zagreb, Croatia
http://dx.doi.org/10.1016/j.istruc.2017.02.003

AND FINALLY...

Answer to March's question

The lateral or sideways thrust from the vault is found from

$$R_h = \frac{wL^2}{8H}$$

$$= 22\text{kPa} \times 6\text{m(bay)} \times 0.2\text{m} \times \frac{12^2/8}{6}$$

$$= \mathbf{79kN}.$$

Buttress weight

$$= 22 \times 2.0\text{m(wide)} \times 10\text{m(high)} \times 2.4\text{m}$$

$$= \mathbf{1056kN}.$$

Thrust location

$$= 79\text{kN(thrust)} \times \frac{10}{1056}$$

$$= \mathbf{0.79m} < 0.80.$$

Therefore, it is within the middle third of the buttress, further alleviated by the spread base.

This may easily be drawn to scale as a vector of forces with resultant.