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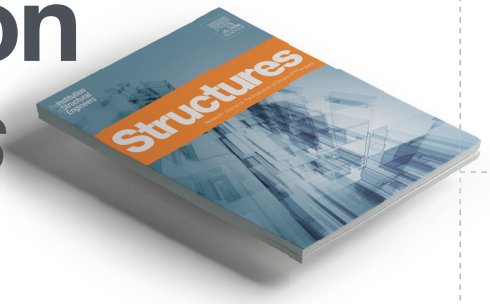
Spotlight on *Structures*



Special issue: Advances in Steel-Concrete Composite Structures

The latest issue of *Structures* is a special issue of selected papers from the 12th International Conference on Advances in Steel-Concrete Composite Structures (ASCCS 2018) held in Valencia, Spain from 27–29 June 2018.

Guest Editors Manuel Romero and Ana Espinós of ICITECH, Universitat Politècnica de València, Spain have selected a paper on fatigue design for steel bridges as their Featured Article. This is will be available free of charge for six months.

Institution members may also find the paper on steel-concrete composite systems for modular construction of high-rise buildings of particular interest. The authors examine the problems typically faced in this type of construction and propose innovative solutions to overcome these – see their 'impact statement' for further details.

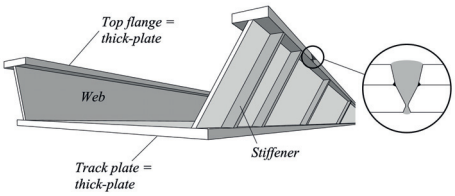
→| Read the full issue at **www.sciencedirect.com/journal/structures/vol/21/suppl/C**

Editors' Featured Article

Fatigue design of selected details in steel bridges

U. Kuhlmann, S. Bove, S. Breunig and K. Drebenstedt

Highway and railway bridges are exposed to cyclic stressing due to traffic loads and, therefore, have to be evaluated concerning fatigue. In most cases the fatigue evaluation is performed according to Eurocode 3 Part 1–9 on nominal stresses. To apply this nominal stress approach a detail catalogue is required classifying all relevant constructional details in terms of fatigue. Unfortunately, the existing detail catalogue of Eurocode 3 Part 1–9 reflects the state of the art of the 1990s and misses constructional details being important for today's bridge design. As an example the derivation of a new detail, the so-called lamellae joint, is presented. Furthermore, for two new types of innovative steel bridges, where Eurocode 3 Part 1–9 does not yet specify rules able to evaluate the characteristics of these bridges, research results are shown. These are the thick-plate trough bridges and truss bridges made of thick-walled circular hollow sections (CHS). The paper starts with an overview on the recent Eurocode developments, addressing more specific the fatigue verification according to EN 1993-1-9 and the statistical analysis of fatigue test data. In the following, information is given on the outcome of some recent research projects striving to extend the application range of Eurocode 3 Part 1–9. The final conclusion, in spite of all differences, shows a common tendency.

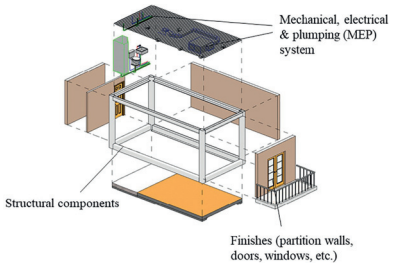


→| Read the full paper at **https://doi.org/10.1016/j.istruc.2019.04.014**

Impact statement

Impact statement on 'Steel concrete composite systems for modular construction of high-rise buildings'

J.Y.R. Liew, Y.S. Chua and Z. Dai



This paper provides an overview for practitioners and researchers of the problems faced in modular construction of multistorey buildings and then proposes innovative solutions to overcome these problems. Despite the potential benefits of implementing modular construction, constraints such as weight and transportation limitations, as well as module connection design, mean there is a need to develop more efficient modular systems, especially for high-rise buildings.

The paper presents a novel lightweight steel-composite modular system that has been developed for long spans of up to 12m to allow for greater architectural flexibility. Lightweight concrete is used in the slab, resulting in a weight reduction of up to 40%. High-strength concrete is infilled into steel tubular columns to enhance the load-carrying capacity and standardise the column sizes and connection details throughout the height of the building. A slim-floor composite system is adopted to increase the headroom by 20 to 30%.

The proposed design can expand the applications of modular construction from residential and commercial buildings to industrial buildings which require larger open spaces and carry heavy imposed loads, ranging from 5 to 20kN/m^2. A fast and easy jointing technique has been developed and its behaviour can be modelled in a global analysis to ensure adequate lateral stability and robustness.

This paper ends with suggestions for future research, providing further insights into ways to enhance the structural efficiency of modular buildings.

→| The full paper is available at **https://doi.org/10.1016/j.istruc.2019.02.010**

Full issue

Topics covered at the ASCCS 2018 conference included beams, slabs, columns, connections, applications, case studies and new materials, earthquake, fatigue and dynamic response, design and standard developments, fire resistance, impact, blast and robustness. The 14 papers published in this issue were selected from 123 presented at the conference.

Authors	Title	Available at
Dennis Lam, Jie Yang and Xianghe Dai	Finite element analysis of concrete filled lean duplex stainless steel columns	https://doi.org/10.1016/j.istruc.2019.01.024
Therese Sheehan, Xianghe Dai, Jie Yang, Kan Zhou and Dennis Lam	Flexural behaviour of composite slim floor beams	https://doi.org/10.1016/j.istruc.2019.06.021
Yadong Jiang, António Silva, Luís Macedo, José Miguel Castro, Ricardo Monteiro and Tak-Ming Chan	Concentrated-plasticity modelling of circular concrete-filled steel tubular members under flexure	https://doi.org/10.1016/j.istruc.2019.01.023
J.Y.R. Liew, Y.S. Chua and Z. Dai	Steel concrete composite systems for modular construction of high-rise buildings	https://doi.org/10.1016/j.istruc.2019.02.010
V. Vigneri, C. Odenbreit and M. Braun	Numerical evaluation of the plastic hinges developed in headed stud shear connectors in composite beams with profiled steel sheeting	https://doi.org/10.1016/j.istruc.2019.03.017
O. Mirza, A. Talos, M. Hennessy and B. Kirkland	Behaviour and design of composite steel and precast concrete transom for railway bridge application	https://doi.org/10.1016/j.istruc.2019.03.006
U. Kuhlmann, S. Bove, S. Breunig and K. Drebenstedt	Fatigue design of selected details in steel bridges	https://doi.org/10.1016/j.istruc.2019.04.014
Jean-François Demonceau and Adrian Ciutina	Characterisation of Beam-to-column Steel-concrete Composite Joints Beyond Current Eurocode Provisions	https://doi.org/10.1016/j.istruc.2019.01.014
T. Bogdan, M. Chrzanowski and C. Odenbreit	Mega columns with several reinforced steel profiles – Experimental and numerical investigations	https://doi.org/10.1016/j.istruc.2019.06.024
A. Kozma, C. Odenbreit, M.V. Braun, M. Veljkovic and M.P. Nijgh	Push-out tests on demountable shear connectors of steel-concrete composite structures	https://doi.org/10.1016/j.istruc.2019.05.011
Qiuni Fu and Kang-Hai Tan	Numerical study on steel-concrete composite floor systems under corner column removal scenario	https://doi.org/10.1016/j.istruc.2019.06.003
C. Ibañez, L. Bisby, D. Rush, M.L. Romero and A. Hospitaler	Post-heating response of concrete-filled steel tubular columns under sustained loads	https://doi.org/10.1016/j.istruc.2019.04.003
C. Odenbreit, M. Chrzanowski, R. Obiala, T. Bogdan and H. Degée	Characterisation of a new flat mechanical shear connection mean for steel-concrete composite columns	https://doi.org/10.1016/j.istruc.2019.03.001
Clemence Lepourry, Piseth Heng, Hugues Somja, Nicolas Boissonnade and Franck Palas	An innovative concrete-steel structural system for long-span structure allowing a fast and simple erection	https://doi.org/10.1016/j.istruc.2019.04.016