Structures and Buildings
Volume 169 Issue SB5
Editorial
Chan

ice | proceedings

Proceedings of the Institution of Civil Engineers
Structures and Buildings 169 May 2016 Issue SB5
Page 313 http://dx.doi.org/10.1680/jstbu.2016.169.5.313

ice Institution of Civil Engineers
publishing

Editorial

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This issue of *Structures and* Buildings covers fundamental issues on the material properties of concrete with the use of recycled aggregates, as well as the improved strength on cement mortar with the use of carbon nanotubes and nanoclays through a neural network approach. Fuzzy logic has also been discussed to assess the current design methodology on shear strength for a reinforced-concrete beam. This issue is concluded by the experimental investigation on an existing long-span timber truss. Below are the highlights from each contribution.

Lye and his co-authors presented an extensive literature review on elastic modulus of concrete made with recycled aggregates (RAs) (Lye *et al*., 2016). More than 280 publications in English from the last four decades were assessed and yielded more than 14 000 data matrix. They have comprehensively analysed the published data and correlated the modulus of elasticity with the mean cube strength of RA concrete with different RA contents. Finally, authors proposed methods to enhance the modulus of elasticity of coarse recycled concrete aggregate concrete to improve their potential in construction application.

Bani-Hani and his colleagues exercised the neural network approach to optimise the strength of mortar with carbon nanotubes (CNTs) and nanoclays (Bani-Hani *et al*., 2016). The trained, validated and tested genetic algorithm derived an optimised combination of CNTs in cement mortars that has achieved a marked increase in compressive strength of 21% and flexural strength of 54%. The optimised composition of nanoclays in cement mortars even stretched the boundary to a significant increase of 64%, 199% and 133% in compressive, tensile and flexural strengths, respectively. Results have once again demonstrated the key features of nanoscience in building construction.

Choi *et al*. (2016) adopted the adaptive neuro-fuzzy inference system to develop an improved analytical model to predict the shear strength of simply supported slender and deep reinforced-concrete beams with and without shear reinforcement. Authors have used 614 existing experimental data to train the fuzzy model and 400 existing experimental data to test the model. The proposed model yields better shear strength prediction than those predictions from the current design codes in ACI 318-11 and EC2.

Branco *et al*. (2016) shared their technical achievement in testing an existing long-span timber truss that was part of an existing roof structure. They aimed to improve the understanding on how those types of traditional structures can be restored efficiently. Through their carefully conducted experimental tests, they have showed the importance in assessing the damage of the joints and, in particular, the correlation with the validated numerical models, which can be further expanded for parametric analysis.

We sincerely wish you all enjoy the coverage in this issue and share our views to advance our knowledge in structures and buildings research. We look forward to receiving your contributions.

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