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## Editorial

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# Editorial

**Sivakumar Kandasami** BE, ME, PhD, FICT, FIE, MACI, MASTM  
Deputy General Manager, Buildings & Factories IC, L&T Construction,  
Chennai, India



It is a pleasure to write the Editorial for the December 2019 issue of *Construction Materials*, which seeks to publish original research and practice papers of the highest quality on procurement, specification, application, development, performance and evaluation of materials used in construction and civil engineering. In this context, especially for readers based outside India, the Statue of Unity (Figure 1) – the tallest statue in the world at 182 m, built by the construction giant Larsen & Toubro – is a combination of concrete core walls, structural steelwork and custom-cast bronze panels that beautifully clad the main concrete core walls (Kandasami *et al.*, 2019). Such a perfect blend of different construction materials is expected to help the structure outlast an intended service life of 100 years. The December 2019 issue is non-themed, consisting of four papers – two from the UK and two from across the Atlantic – all dealing with the interesting complexities that each material brings with it to its ecosystem.

The opening paper by Anderson *et al.* (2019) deals with full-depth reclamation of asphalt pavement on US Highway 49 and critically evaluates the gradation variability of particles finer than 75  $\mu\text{m}$ . Cement-stabilised layers generally have the advantage of limited deflection and improved load stability, but there is also potential for transverse cracking accompanied by durability problems. In this context, huge variability in the fines content raised concerns on durability and this motivated the authors to undertake a laboratory study for investigating gradation effects on parameters such as strength gain with time, wheel tracking and unconfined compressive strength in various curing conditions. By intelligent design of this extensive study, the authors made sure that the observations were not limited to this particular project, but also serve as useful reference for similar projects elsewhere. The excellent literature review touches upon the current state of practice, durability investigations and gradation effects on strength; quite incisive in capturing the details vividly and also introduces a %Diff parameter to bring data from three papers by different authors

to a common base for comprehensive analysis, which is indeed a laudable effort. The sections on experimental programme and results carry the hallmark of an excellent paper and effortlessly guide the reader on the finer details. The paper concludes that among many other factors, gradation variability is just a one small contributor to the field variability of unconfined compressive strength.

With India being home to 45% of the world's bamboo forests, it is no wonder bamboo finds use in a variety of applications such as scaffolding, reinforcement, walling, roofing, doors and windows, and many more. The next paper by Archila *et al.* (2019) explores the potential of *Guadua* bamboo species for use in mainstream applications, with an intent to move it further up the value chain from its current status as a predominantly local construction material in parts of Latin America. *Guadua* bamboo's high biomass production, renewability, low cost, moderate ductility and high strength-to-weight ratio makes it quite attractive for use in seismically active parts of Latin America. However, transforming bamboo into an engineered product involves energy-intensive processes that also generate considerable waste. A manufacturing process previously designed to produce flat bamboo strips of specific thickness was used to produce cross-laminated panels in two variants (i.e. three and five layers) with inherently enhanced physical and mechanical properties. Axial compression was applied to the panels along and across their main direction and the consequent deformation was recorded by transducers in contact and also by non-contact digital image correlation method (i.e. virtual strain gauge). While applying compression, the panels were loaded with and without buckling restraints. However, with buckling restraints, it was not possible to capture the full-field images using digital image correlation, which was not a problem with the transducers. For both the digital image correlation and transducer methods of measuring deformation, the authors have given complete details of the experimental arrangement – useful for lay readers and researchers alike. Digital image correlation has

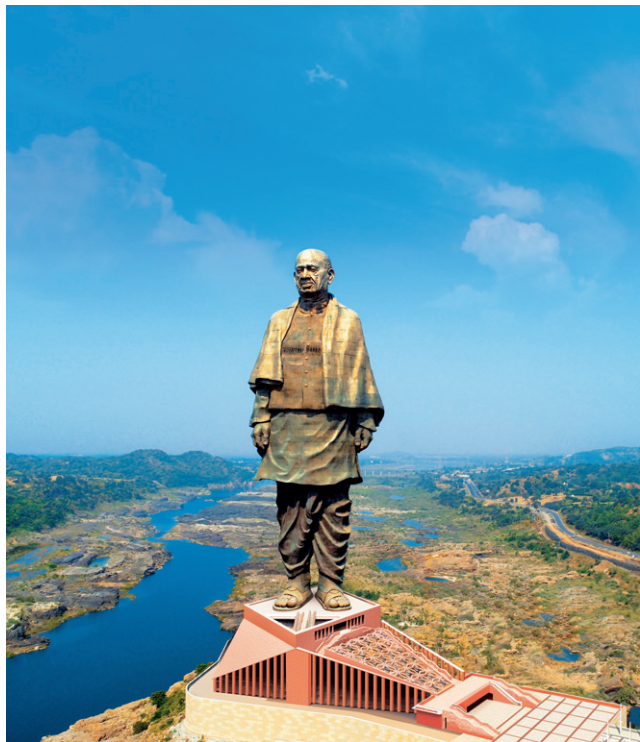


Figure 1. The Statue of Unity (Gujarat, India)

detected even minor manufacturing defects but there is wide scatter of the measured strain values relative to transducers that record deformation only over a localised area. There is great scope for non-contact measurement in varied applications, such as falsework behaviour during concreting, and the scatter in test results could be minimised with further refinements.

In the overcrowded marketplace for fibres, basalt is finding favour among researchers as an alternative to metal fibres and numerous studies are in progress to improve the engineering, mechanical and durability properties of concrete. The paper by Ralegaonkar *et al.* (2019) reports on experiments with short and long chopped basalt fibres in cement mortars. Including long basalt fibres at 0.5% by weight of the dry mortar mix was found to be the optimum for enhancing both the engineering and durability properties. However, the choices made by the construction industry is often dictated by cost economics rather than by low embodied energy qualifications and the viability of basalt fibre as a preferred product over steel will be known in the coming years. Nevertheless, it is a good study on efficacy of basalt fibre in mortars.

Long-term safe storage of dry mortar without sacrificing its characteristics is always a challenge and commercial equipment is available to batch and blend the ingredients in the desired proportions. This is always backed by laboratory investigations on the proportioning of mortars with ingredients having dissimilar properties and variable moisture content. The paper by Starinieri *et al.* (2019) details a brave attempt to partly replace sand with crushed mixed glass cullet and calcium carbonate as supplementary aggregates in dried lime mortars. The supplementary aggregates kept in the storage regime were fortunately not detrimental to the mortar strength and, in fact, with calcium carbonate an increase in early age strength is encouraging. The section on the way forward for practical mortars should be a useful read for guidance as well.

The journal is as relevant as ever and is at the forefront of dissemination of cutting-edge knowledge and is committed to publishing excellent articles. If you would like to join the *Construction Materials* Editorial Panel, please get in touch with the Journal Editor, Rebecca Rivers ([rebecca.rivers@icepublishing.com](mailto:rebecca.rivers@icepublishing.com)). We would love to welcome you to our community.

On behalf of my eminent colleagues in the Editorial Panel, I wish you Merry Christmas and a Happy New Year.

#### REFERENCES

- Anderson BK, Cox BC and Howard IL (2019) Gradation variability assessment of thick-layer cement-stabilised full-depth reclamation. *Proceedings of the Institution of Civil Engineers – Construction Materials* **172**(6): 271–283, <https://doi.org/10.1680/jcoma.16.00070>.
- Archila HF, Rhead A, Ansell MP, Walker P and Lizarazo-Marriaga J (2019) Elastic response of cross-laminated engineered bamboo panels subjected to in-plane loading. *Proceedings of the Institution of Civil Engineers – Construction Materials* **172**(6): 284–295, <https://doi.org/10.1680/jcoma.16.00080>.
- Kandasami S, Kannan LS and Umamaheshwaran V (2019) Designing durable concrete for constructability of the world's tallest statue. In *EuroCoalAsh 2019 Conference Proceedings, Dundee, UK* (McCarthy MJ, Newlands MD, Jones MR *et al.* (eds)). University of Dundee, Dundee, UK, pp. 239–251.
- Ralegaonkar RV, Aswath PB and Abolmaali A (2019) Design investigations of basalt-fibre-reinforced mortar. *Proceedings of the Institution of Civil Engineers – Construction Materials* **172**(6): 296–304, <https://doi.org/10.1680/jcoma.17.00018>.
- Starinieri V, Illingworth JM and Hughes DC (2019) Use of supplementary aggregates in mortars produced using a novel lime-drying technique. *Proceedings of the Institution of Civil Engineers – Construction Materials* **172**(6): 305–313, <https://doi.org/10.1680/jcoma.17.00008>.