Cite this article
Saghafi B (2022)
Editorial.
Proceedings of the Institution of Civil Engineers – Construction Materials **175(6)**: 243–244,
https://doi.org/10.1680/jcoma.2022.175.6.243

Construction Materials

ice Publishing

Editorial

Behrooz Saghafi BSc, MSc, PhD, FCIHT, MIAT
Technical Manager, Pavement Testing Service, Preston, UK

Construction materials are the unit blocks of civil engineering. Our built environment, such as structures, dams, roads, railways, airports, maritime facilities, and water and wastewater infrastructures, to name a few, relies on construction materials' strength, durability and performance. While strength, cost and durability dominated the ground for choosing building materials for a long time, they have to share the ground with other factors, such as sustainability, accessibility and environment-friendliness, in the modern era of civil engineering. Innovative construction materials must tick more boxes from the list before they become widely utilised. Policies are pushing the boundaries to encourage the use of more durable, economical, eco-friendly, energy-efficient and possibly locally available building materials.

While recycling and the use of by-products were the leading headlines, the introduction of novel additives and synthetic and smart materials boosted the pace of innovation. The return of some forgotten historic construction materials combined with new methods of doing things, such as three-dimensional (3D) printing, has been very attractive. The way we test and examine material suitability has not sat back, and the development of novel testing machines and regimes has been encouraging.

It is my utmost pleasure to introduce four new papers specifically addressing the above in this issue of *Construction Materials*. The journal is constantly committed to publishing high-quality, novel papers. I would like to invite the researchers and professionals in the field of construction materials to consider this journal as a medium to introduce the most innovative of their findings. *Construction Materials* publishes its most recent articles Ahead of Print on its Virtual Library homepage: https://www.icevirtuallibrary.com/toc/jcoma/0/0.

Testing construction materials costs money. Expensive tests are the main cause of poverty in accessibility of sufficient data to understand the materials more thoroughly. Abhilash *et al.* (2022) have developed a wedge tool technique to facilitate testing the interface properties of rammed earth. The abundance of data will lead to further understanding of the properties of rammed earth and other types of soil structures, paving the way to peruse the hidden advantages of such a natural resource. A simple yet clever innovation gifted a new dimension to the well-known axial compressive strength test machine to be utilised for indirect measuring of the shear parameters. The method has the potential to be used for testing the shear strength of other building materials.

The advantages of using nanoparticle additives in the construction sector are changing our expectations. Even small quantities of nanoparticle additives have the power to modify traditional construction materials to demonstrate extraordinary physical and chemical properties. Asphalt mixtures are the most commonly used material to pave roads and airports, and the linear viscoelastic behaviour of bitumen, the binder phase of asphalt mixtures, influences their performance. Gholampour *et al.* (2022) have evaluated the effectiveness of three types of nanoparticle additives in modifying the linear viscoelastic behaviour of ordinary bitumen. While the paper studies the changes in the physical properties of the binder using traditional tests and techniques, the rheological properties of the binders are also modelled. The study methodology has the potential to work as a role model in assessing the effectiveness of other additives on the performance of bituminous mixtures.

Transportation costs, carbon dioxide footprint (hereafter 'carbon footprint') considerations and socioeconomic aspects encourage the use of locally available construction materials. However, local materials could sometimes fall off the minimum/maximum ranges and would require modification before use. Stabilisation usually comes in handy in such situations, although it poses its own challenges. Khadra *et al.* (2022) report that tuff is locally abundant in Algeria, but new technologies are needed to facilitate the replacement of quality clay with tuff in the production of bricks. They used cement, lime, alfa fibres and human hair to improve the mechanical properties and durability of compressed tuff blocks. Although lime and alfa fibres added some value to the stabilisation, cement reportedly worked better. However, the huge carbon footprint of cement suggests working on a replacement. Perhaps, the authors should read the next paper in this issue for an idea.

Saranya *et al.* (2022) have studied the role of dolomite in improving the physical properties of a slag-based geopolymer mortar by chemically modifying the microstructure of the mixture in an alkali environment. They have considered

various proportions of ground granulated blast-furnace slag (GGBS) and dolomite – both are by-products – as well as different curing regimes and alkali concentrations. Mechanical properties and durability of the samples and the development of crystals and ettringite seem promising. However, the images of scan microscopy open a window to mesmerising views of another world. The paper reports a truly thorough study. The idea of adding dolomite proves to be successful and understanding the properties of GGBS–dolomite geopolymer mortar facilitates its application as a construction material.

REFERENCES

Abhilash HN, Morel JC, Champiré F and Fabbri A (2022) A novel experimental study to investigate the interface properties of rammed earth. *Proceedings of the Institution of Civil Engineers – Construction Materials* **175(6)**: 245–253, https://doi.org/10.1680/jcoma.18.00095.

Gholampour M, Nazari H, Naderi K and Nejad FM (2022) Complex reinforcement potential of inorganic nanoparticles in bitumen. *Proceedings of the Institution of Civil Engineers – Construction Materials* **175(6)**: 254–261, https://doi.org/10.1680/jcoma.19.00010.

Khadra B, Idriss G and Kamel GM (2022) Effect of stabiliser type on the physical and mechanical properties of tuff material. *Proceedings of the Institution of Civil Engineers – Construction Materials* **175(6)**: 262–276, https://doi.org/10.1680/jcoma.18.00091.

Saranya P, Nagarajan P and Shashikala AP (2022) Engineering and durability properties of slag–dolomite geopolymer mortars. *Proceedings of the Institution of Civil Engineers – Construction Materials* **175(6)**: 277–288, https://doi.org/10.1680/jcoma.18.00096.