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Editorial

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The world has been suffering from the pandemic for nearly 2 years. Although vaccination has not removed the shadow of Covid-19 completely, it certainly chipped in by stopping the death rates from skyrocketing when the cases were at record highs. While we were washing our faces to see a better and safer world in early 2022, the rattle of blasts and the hissing of rockets from yet another 'war' disrupted minds and derailed thoughts.

These days, the booms of the wars never remain local. The consequence of the conflict in the east of Europe has caused, and will continue to cause, disruption to the key supply chains, construction materials being one of the major ones. This will shortly be reflected in research as it has already been in the cost of current construction projects. Can we diversify the supply sources? Can we reduce our dependency on certain materials for a while (or perhaps for ever)? How should we mitigate the risk of construction material supply chains in the gloom caused by the recent war?

I wish the politicians valued the constant efforts made by researchers to turn the world into a nicer place to live.

Proceedings of the Institution of Civil Engineers – Construction Materials has gathered four brand new research papers from across the world into its April issue. Two papers, one from India and another from South Africa, address the use of wastes as components of construction materials and advocate sustainability and care to the environment. A paper from Iran studies application of a synthetic material to reinforce soil masses. Last but not least, an Italian work investigates mechanical performance of different prototypes of dome-shaped roof structures built out of bamboo strips.

I encourage readers to contribute to *Construction Materials* by discussing the papers. The discussions are sent to the authors and, if found appropriate by the editorial board, will be published in a subsequent issue.

It has been more than half a century that we have been looking into the potential of different types of wastes to replace virgin materials, not only for their economic benefits, but also the environmental advantages and sustainability of the infrastructures. Pavement embankments have been one of the first potential candidates to incorporate burial of wastes.

Sinha *et al.* (2022) have completed an invaluable 2-year study of utilising jarofix, a waste material generated during the extraction of zinc from its ore, in soil-based embankments. Having monitored the performances in three real-scale embankments and lab-size models (made from soil only, jarofix only and a 1:1 mixture of soil–jarofix), the authors have found that the mechanical properties of the fine-grained jarofix is improved when mixed with soil. Interestingly, performance of the pavement built on top of the embankment was studied by evaluating the pavement surface condition, structural number and functional parameters. The authors have respected the environment by studying leachability of jarofix and soil–jarofix embankments. The construction cost and economic benefits of utilising jarofix have been compared to those of merely using soil for pavement embankments. It appears that the soil–jarofix mixture has proved itself as an alternative candidate to the conventional soil.

The carbon dioxide footprint of cement is not unknown to the construction industry. Researchers endeavour to alleviate the negative impacts of this hefty greenhouse gas emitter by inventing even partial substitutions. More than 12 years ago, I was trying to kill two birds with one stone and develop a cementitious binder from wastes; I am glad to see the legacy is still flourishing. Fadele and Otieno (2022) have accommodated several findings around supplementary cementitious materials (SCMs) made from agricultural wastes under one umbrella in their paper. Comparing with the already commercialised SCMs, the authors have raised the significance of utilising agricultural pozzolans, their challenges, mechanical properties, hydration behaviour and durability. There are still some missing pieces to complete the jigsaw and create a full picture

of the performance of agricultural waste-based SCMs. However, I invite the relevant researchers to read and digest this paper in the early steps of their research projects.

Reinforcing the soils is another interesting topic for those interested in foundations, either for structural or pavement purposes. The next paper, authored by Hojjati and Sarkar (2022), delves into the mechanical properties of reinforcing soil with a synthetic material, polypropylene fibre. A successful stabilisation should improve the soil properties in certain ways. Therefore, in addition to static loading tests, the stabilised material should be tested under cyclic loading, from where some important parameters are achieved for pavement design purposes. Resilient modulus is an active element nowadays in mechanistic pavement design approaches. It is evident from the conclusions that using the polypropylene fibre-reinforced soil is a generally successful approach in improving the soil mechanical properties, particularly under dynamic loading, although the micro-level interaction of soil and the polypropylene fibre is yet to be understood.

Usually known in conjunction with the giant panda, bamboos are interesting to us humans, too. Although bamboo's natural fire resistance, high tensile strength, relatively light weight, sturdiness (good compressive strength) and health and safety aspects are attractive, its availability and low cost turn bamboo into an essential construction material in some poor parts of the planet where a roof to provide shelter from direct sunshine and precipitation is a basic need. Chiacchiera *et al*. (2022) have studied constructional properties of real-scale and computer models of four bamboo roof structures proposed by Yona Friedman. Loading and reading the deflections of the full-scale roof structures to failure showed that use of the finite-element modelling approach to predict the behaviour of bamboo roof structures deserves to be reconsidered. Further development is required to model such roofs accurately analytically.

Finally, I would like to invite everyone to read Dr Robert Hunter's thorough review of *Asphalt Mixture Selection*, an immensely technical book authored by two remarkable British asphalt professionals.

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