I am pleased to welcome readers to this issue of Construction Materials. Since I have served as a member of the Editorial Board for the journal, a key aim has always been to publish research that encompasses the broad range of materials used in building and civil engineering projects. The briefing article and three papers presented herein indeed cover various construction materials and present research of high quality, and reflect the current concerns of the industry.

Sustainability has dominated construction materials research over the last decade, and is likely to do so for some considerable time in the future. While there is some way to go, sustainability has become an integral part of construction practice and material research.

In particular, papers in Construction Materials have highlighted the need to deliver low-carbon solutions in order to limit the effect of the built environment on climate change. The first paper, involving the use of glycerol and cooking oil in masonry unit production (Vu et al., 2017) covers this goal. The binder used is the blend of clean cooking oil and pure glycerol incorporated with secondary aggregates, including incinerator bottom ash and pulverised fuel ash. The masonry units using a blend of glycerol and cooking oil could be produced with a level of performance that is at least comparable with those of current traditional UK masonry units. The product appeared to have a fairly high compressive strength (more than 30 MPa) and even the saturated compressive strength was 8.1 MPa, which was higher than that of normal concrete blocks. It is recommended that, even exposed to saturated conditions, the strength of these units is still favourable. However, leaching of glycerol may be an issue and needs further investigation. In terms of sustainability, the products developed in this study are promising; they will allow the utilisation of a large amount of waste materials such as incinerator bottom ash, pulverised fuel ash, waste glycerol and waste cooking oil. Furthermore, the recommended curing temperature was only 160°C (much lower than traditional clay bricks), which helps to reduce the energy required for manufacturing.

The second paper by Tingley et al. (2017) considers phenolic foam insulation of external walls and investigates the environmental impacts of this foam insulation across a range of impact categories, with detailed examination focusing on the cradle-to-gate manufacturing stage. By showing the processes and calculation procedures in combination with assumptions made, the information reported is sufficiently transparent to enable others to utilise it in further building life-cycle assessments studies, filling the gap in current environmental impact information. The impacts have been estimated and shown for 1 kg of phenolic foam so that the information can be utilised in specific case studies to explore impacts and payback times. Overall, phenolic foam insulation should have a net positive effect across its life cycle, owing to its use in improving the thermal efficiency of buildings.

Optimising construction with self-compacting concrete (SCC) is considered by Rich et al. (2017). Most existing SCC research focuses primarily on understanding and optimising physical and structural properties, with little examination of its effect on commercial out-turn measures such as the construction cost (including materials, labour and plant). The paper reports on research into SCC and conventional concreting methods in 14 UK single-family home projects. Work measurement and cost modelling through scenario analysis captured data on material costs, placement rates, workers’ activities and plant/truck movements, to identify any significant time and cost differences between SCC and conventional concrete. It has been possible to establish the maximum permissible premium (Pmax) per unit volume (m³) that can be applied to SCC by the supplier, such that the contractor can achieve parity between the as-built costs for both conventional and SCC methods (and therefore be at no overall disadvantage from using SCC). Using data from 14 residential concrete slabs, the
authors conclude that SCC presents significant time savings and, even if these may not always result in actual cost savings, then SCC can be priced to closely match conventional concrete project costs overall. The relationship between costs for SCC and conventional concrete for slabs has been clarified and a new mechanism for understanding profitability and viability of SCC (Pmax) has been presented.

Appearing before these reviews in this issue is the Briefing by Coste et al. (2017), which presents the non-CEM I cements for their use as inhibitors of alkali–silica reaction (ASR) in concrete. In the Briefing, a methodology for the determination of a compositional parameter, such as the maximum allowable total alkali content (Matac) of cement is proposed in order to identify the non-CEM I cements as ASR inhibitors between low- and high-alkali cements, in analogy with CEM I. The values of Matac for different types of Italian non-CEM I cements is calculated using the authors’ previously published experimental results, which are discussed in the Briefing. The use of this parameter may overcome the problem related to the determination of the undefined available alkali content by non-CEM I cements.

Finally, I would draw the attention of our readers to the fact that the journal publishes its most recent articles Ahead of Print on its Virtual Library homepage. This allows the community quicker access to fresh content.

REFERENCES