Editorial

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It is with great pleasure that I write my first editorial as Chairman of the Editorial Advisory Panel for the *Construction Materials* journal. I am writing it returning from a very interesting day at ICE Headquarters, One Great George Street in London, at the ICE Journals Convention, a gathering of journal staff, fellow editors, and panel members to discuss the future direction for the 32 technical journals currently produced by the Institution. A morning of presentations from external experts in journal publication production and procurement was followed by a series of presentations from ICE staff and ICE journal editors. Open Access to journal content was an important subject of discussion for the day. However, the one constant theme that came through all presentations and discussions was quality; quality of journal content and production standards. In my role as Chairman I will strive to continue to improve the overall quality of this journal. In this I am supported by fellow panel members and journal production staff who share a common goal to publish only the very highest quality papers in *Construction Materials*. While we rely on a network of reviewers and assessors to ensure this quality, most of all we rely on both researchers and industry practitioners submitting the highest quality papers of interest to our wider readership. While we continue to receive a very healthy body of research papers, I am particularly keen to receive more papers from industrial practitioners, where ultimately all innovation in construction materials has to take place if innovation is to have any impact and wider benefit. Since its inception *Construction Materials* has published papers from all relevant material fields and technologies. Moving forward this will remain so although *Construction Materials* is particularly keen to receive high-quality international papers on metals, timbers, glass, ceramics, bricks, terracotta, stone, finishes, plastic, sealants, adhesives, bitumen and fabrics, in addition to high-quality papers on cement and concrete materials. A series of themed issues in forthcoming issues will support this approach.

The six papers presented in this April 2013 issue reflect the over-riding importance that environmental impact and minimising carbon emissions continues to have on materials research and practice. This edition supports the continued importance of concrete technology to international construction with research papers from teams based in India, Saudi Arabia and the UK presented. Reduction in carbon dioxide emissions remains a key challenge for humanity, especially as we continue to rely on fossil fuels as our primary source of

energy. Making better use of local waste stream materials to reduce environmental impact is a key strategy for reducing the environmental impact of construction materials usage throughout the world. However, additives and replacements can often have detrimental effects on material performance, including for example setting times, strength development and durability performance of concrete. It is essential we understand the short-term and long-term effects of these new materials before their widespread adoption by industry. As well as using materials with lower environmental impact we can also make significant improvements to the carbon emissions impact of construction through more efficient design, removing unnecessary redundancy wherever possible. Dissemination of international construction materials research is essential to wider adoption, future innovation and impact. In this April issue of *Construction Materials* the journal continues to fulfil this essential role.

The first paper by Al-Akhras (2013) reports on the durability of concrete containing wheat straw ash pozzolanic additive to alkali-silica reaction (ASR). Plant materials, such as rice husks and bagasse (from sugar cane), are well known sources of silica, that when burnt provide a renewable source of pozzolanic additive for concrete and lime. Although wheat straw ash is perhaps a less well known source of pozzolanic material for concrete, such co-products of the agricultural industry can provide very valuable and sustainable sources of construction materials around the world. This paper builds on previous work by the same author published previously in *Construction Materials* (Al-Akhras *et al.*, 2008). The primary focus of the current work is an experimental study to assess impact of the wheat straw ash on ASR.

In the second paper Al Mutlaq and Page (2013) report on their findings from an experimental study addressing the important detrimental effects on cement hydration retardation and workability as a result of adding electric arc furnace dust to concrete. To counteract this effect Al Mutlaq and Page investigated different cement hydration accelerators to reduce setting times and enable practical construction times. Though addition of calcium nitrite and calcium formate were both found to have beneficial effects on workability and the concrete hardening process, they did not, however, reduce the setting times. An on-going field of work the techniques used and results reported in this paper will provide the basis for

future research to understand retardation and acceleration effects in electric arc furnace dust concretes.

Continuing with the theme of lower environmental impact cements and concretes, Karami *et al.* (2013) report on study of concretes in which all cement was replaced with fly ash, slag and gypsum. The use of fly ash and slag as replacement materials in concrete has been the subject of previous *Construction Materials*, including Chakraverty *et al.* (2007) and Venkatarama Reddy and Chander (2009). However, the aim of the current work was to experimentally develop cement free concrete mixes using combinations of ash, slag and gypsum that will produce satisfactory strength performance. A variety of mixes were considered with strength performance data at 3, 7 and 28 days reported together with data on flow, density and coefficient of permeability performance. The resulting mixes produced are considered by the authors to be suitable for low strength concrete applications.

In the next paper Singh *et al.* (2013) presents a comparison of code-based predictions for shear strength of recycled aggregate concrete beams. Accurate prediction of performance is key to delivering sustainable construction; there is little benefit to seeking benefits from using recycled aggregates if our design models are overly conservative. Existing experimental results are compared with a range of code models, including North American and Euro Code 2.

The use of by-products, including limestone dust and slag, to improve the performance characteristics of unbound sub-base materials has been evaluated in the paper by Saghafi *et al.* (2013). The main driver for this study has been to find valued added uses for limestone dust within sub-base applications. Small quantities of limestone dust slightly increased resilient modulus of the sub-base, but with further addition the sub-base material was no longer considered suitable. However, the use of fly ash with lime produced facilitated increased use of limestone dust in hydraulically weakly bound material.

The final paper of this issue, by Singh and Jangir (2013), presents findings from an experimental study of shear strength in reinforced concrete beams. Results of 25 simply supported beam tests are presented and compared with predicted strengths. In general predicted performance was conservative though beam ductility with small shear spans was improved by continuation of the transverse steel beyond the shear span.

We hope you enjoy the latest edition of *Construction Materials* and welcome your feedback.

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