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Editorial

Judith Sykes MPhil, Meng, CEng, MICE, MCIWEM
Director, Useful Simple Projects, London, UK

Welcome to the August issue of *Engineering Sustainability* and my first as newly appointed Chair of the Editorial Panel. I would like to thank former chair Chris Whitehead for all the hard work he has put into raising the profile and quality of the journal in the last two years.

Taking on this role is challenging because sustainability touches every aspect of civil engineering at a variety of different scales. From strategic decisions about what and where to build, through detailed assessments of material choice, to how the project is delivered, sustainability is by definition multidisciplinary. Not surprisingly therefore, the scope of what we cover in this journal is very broad. Themed issues have been successful at focussing on particular issues and are an approach I would like to continue to actively promote. The panel would be very interested in hearing from the readership on particular topics that would support practitioners and academics in their work.

This issue of the journal contains four excellent papers which will make for a good holiday. Two of the papers touch on the challenge of modelling the environmental performance of buildings and, in particular, predicting thermal comfort.

The first (Baborska-Narozny *et al*., 2016) is a comprehensive study of thermal comfort of two residential buildings in Leeds, UK. The study correlates measured data over the course of a year with surveys of building users to provide rich insight into understanding the different factors that affect individual experience of thermal comfort. The paper quantifies what was suspected to be true; that residential modelling tools underestimate overheating of apartments on higher floors in summer and the energy required to heat homes on ground floors in winter. The paper also highlights the variability of user expectations of thermal comfort depending on factors such as where individuals have lived previously (the 'prebound' effect), their attitude to money saving and environmental awareness. As such, the authors conclude that designers need to create homes that have a high degree of flexibility to enable residents to adapt environments to suit their needs. They also recommend that SAP (Systems, Applications and Products) modelling tools are adjusted to take account of the thermal stratification that occurs in buildings. This paper is a must read and rich source of data for anyone involved in designing residential developments.

We then travel to the much hotter climate of India to investigate how temperatures can be reduced through different material choices (Dakwale and Ralegaonkar, 2016). Deploying materials with higher reflectivity and lower thermal conductivity demonstrated that indoor temperatures can be reduced to provide some relief from the crippling summer heat. At the same time, the materials used in the fabric of the building to reduce indoor temperature can be manufactured locally from recycled materials, thereby also reducing embodied energy and cost of construction.

In the third paper, our focus moves to reducing embodied carbon of building structures. In a study of over 200 buildings, De Wolf *et al*. (2016) have carried out a detailed analysis to give architects and engineers a feel for embodied impact of different building types and different structural systems. The aim of the paper is not to promote any one system, but to raise awareness of the need for consistency in the approach to building life-cycle assessment and increase embodied carbon literacy amongst architects and engineers. Importantly, the analyses show the high degree of variability in embodied carbon assessments, indicating the difficulty in assessing something that cannot be directly measured. No particular material choice or system comes out 'best', which, coupled with range of embodied impact of different systems, highlights the opportunity for designers to focus on material efficiency. Interestingly, the authors show that embodied impacts of buildings do not correlate at all with Leadership in Energy and Environmental Design standards. This serves to demonstrate the lack of emphasis placed on embodied impacts by accreditation standards.

The final paper (Chan and Wolsey, 2016) describes a brilliant example of the circular economy in practice. When Yorkshire Water decided to restore its sludge landfill operations and construct a new facility at one of its largest sewage treatment works – Blackburn Meadows – the team took a novel approach to sourcing the gravels and topsoil required for the project. The gravels were recycled from old filter beds, saving some 6000 m^3 of virgin material. However, it is the reuse of sludge through a process of phyto-conditioning that is the really smart move, saving some 18 000 m^3 in virgin topsoil with an associated 97% saving in embodied emissions.

Ultimately, sustainable development is about good design practice that responds to specific contextual challenges to deliver projects that enhance the environment and bring social benefits. This is easy to say, but is far more difficult in practice. In part, this is due to the trade-offs that have to be made, but also due the lack of or changing evidence base required to make informed decisions, hence the importance of the contribution of this journal and the need to engage with our readership to ensure its relevance. So please do get in touch with areas you would like to see covered in the journal. Also a reminder that journal papers are available 'Ahead of Print' on our Virtual Library homepage to gain quicker access to fresh content.

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