Dear Readers,

We are pleased to bring to you our pentalogy edition on Construction & Demolition (C&D) Waste in Construction. This edition includes research and practice papers providing a comprehensive view of recent developments on this theme across geographies and the possibilities it holds. This edition has been guest edited by Dr Sivakumar Kandasami and Prof. Dr-Ing. Jiabin Li.

Dr Sivakumar Kandasami holds a Ph.D. degree from the University of Dundee, UK and is a Deputy General Manager with the 'Buildings & Factories IC' of *L&T Construction* in Chennai, India. Basically, a civil/structural engineer, he is a specialist in concrete technology and practice having substantial experience in concrete durability design for a variety of infrastructure, including assessment-cum-substantiation of civil nuclear facilities. A strong exponent of concrete technology, he has delivered several invited lectures for academia and examined several graduate theses at the Indian Institute of Technology Madras and Anna University. Dr Kandasami is a Fellow of The Institution of Engineers (India) and The Institute of Concrete Technology (ICT), UK. And, he is a member of the American Concrete Institute (ACI), ASTM International and the Indian Concrete Institute (ICI) with involvement in various technical committees. Further, he represents *L&T Construction* in the General Council of ICI and represents India in the Council of ICT. Dr Kandasami is a recipient of ORS Award (Universities UK) and MCR Award 2012 (The Institution of Civil Engineers [ICE], UK). He has contributed to the Editorial Boards of Journal of Testing and Evaluation (ASTM International, 2009 - present), Construction Materials (ICE, 2018 - present) and Civil Engineering (ICE, 2010 - 2016). Furthermore, he reviews manuscripts for several journals including ACI Materials Journal and ACI Structural Journal. Dr Kandasami is a member of Technical Board of the ICI.

Prof. Dr-Ing. Jiabin Li is a Professor of Civil Engineering with a research focus on circular economy in construction, sustainable materials management - recycling and reuse of construction materials within the context of urban mining and development of alternative construction materials at KU Leuven, Belgium. He received his Masters degree in Structural Engineering in 2004 from Tongji University in Shanghai, China with an award-winning thesis on the fundamental mechanical behavior of concrete with recycled concrete aggregates (RCAs). In 2011, he obtained his Ph.D. degree in Civil Engineering from Leipzig University, Germany. He Joined KU Leuven in October 2016 and has been head of the research group RecyCon – Recycling in Construction since October 2018 and coordinator of Research and Education Civil Engineering on Bruges Campus since October 2020. He is holder of three (solely) industrially sponsored research Chairs at KU Leuven in smart & sustainable infrastructure, construction waste recycling and circular economy, respectively. Prof. Dr-Ing. Li was a recipient of the SEMC 2010 Young Researcher Fellowship Award and a recipient of the Shanghai Science & Technology Prizes in 2007.

Production Editor
Indian Concrete Journal

Dear Colleagues,

Firstly, we would like to greet all readers of the Indian Concrete Journal (ICJ) and we sincerely wish you to stay safe and healthy during the COVID-19 pandemic. We are very pleased to see that the COVID situation has become better and better in many countries and regions across the world. We could surely foresee that the construction industry will reboot again in the post-COVID period, and the signs of a strong recovery can be seen in many countries.

Welcome to the fifth special edition of ICJ on Construction & Demolition (C&D) Waste in Construction, which is composed of invited papers by authors from India, UK, Belgium, Spain, Serbia, and Norway. Such an international spread of contributions shows the constant reinvention happening continually throughout the world to tackle the huge amount of C&D waste from various construction practices and the consequent searching for new possibilities for valorization of C&D waste after being processed.

We sincerely thank all the authors for their kind acceptance of the invitation and hopefully this special edition can promote new research and development as well as practical implementation of building materials and products with recycled C&D waste. We are excited to introduce the contents of this issue which can hopefully drive genuine conversation between stakeholders.

The leading paper by Wharton (2022) discusses the future of recycled aggregates in the UK and EU construction industry. The paper provides a review of the trends and thorough insights into the challenges, end of waste criteria and recent developments in the use of recycled aggregates in the UK and European construction sector. Based on that, it is concluded that the recycling of construction and demolition waste into recycled aggregates will become a strategic and essential priority in the future for achieving sustainability and circular economy in the construction industry. This shows the pathway for rest of the world awaiting transition into a circular economy.

Recycling of end-of-life (EOL) concrete into recycled aggregates provides a sustainable solution that saves land space, reduces the transportation cost, and decreases the consumption of natural resources. The use of recycled concrete aggregates (RCAs) in new concrete has received much interest in the past decades. However, some significant issues on the quality of RCAs and fundamental behavior of concrete with RCAs still exist, limiting its widespread implementation in practice. In the paper of Bhashya and Bharatkumar (2022), an extensive study is provided on the influence of different sources and crushing types on the properties of RCA-containing concrete. RCAs from three different waste concrete sources and two types of crushing techniques were prepared. The coarse fraction of the RCAs was used to completely replace the natural aggregates in a concrete mixture. Results showed that crushing technique has a marginal effect on the properties of RCAs and the concrete. However, no significant variation was observed in the properties of concrete made with recycled aggregate from different sources.

The use of the coarse fraction of RCAs as a substitute of natural coarse aggregates in concrete has been proven to be technically feasible and economically viable. Previous research results have

shown that RCAs can be used in producing normal strength structural concrete (e.g. Xiao et al. 2005; Xiao et al. 2006), high strength high performance concrete, see e.g. Sierens and Li, 2018; Chen et al. (2021); Sierens et al., (2021c), and even ultra-high performance concrete, as reported by Sierens et al. (2021b). However, the application fields for the fine fraction of recycled aggregates have not been adequately explored. Before the fine recycled aggregates (FRAs) are used, their properties need to be well understood. The paper of De Vlieger and Li (2022) presents a comprehensive analysis of the geometrical properties of fine recycled aggregates using digital image processing (DIP) technique. The effect of processing methods, crusher openings and crushing cycles on the geometrical properties of the collected FRAs were investigated. This paper provides important information for better understanding the rheology properties for fresh mixed cement-based materials incorporating FRAs.

High quality recycled concrete aggregates (RCAs) have been found to have great potential for high grade use, such as in precast structural concrete, as demonstrated by Sierens et al. (2021a, 2021c). The paper by Kanagaraj et al. (2022) explores the possibility of using high quality RCAs in Geopolymer Concrete (GPC), which is commonly regarded as a sustainable construction material without cement. Recycling the concrete waste for the development of GPC can satisfy the goals of this sustainable development. In this study, trials were performed to accomplish a perfect blend of the binder, alkali activator, alkaline liquid to binder ratio and aggregates to develop the GPC, and three types of curing methods for the development of the GPC mixes were used. The mechanical properties and microstructure of the GPC developed with Natural Aggregates and RCAs were evaluated. It was observed that temperature influences the development of early strength gain of GPC, irrespective of the used aggregates. In addition, an increase in the alkaline activator ratio decreases the workability while increasing the strength of the GPC mixes.

Deformation control of concrete elements and structures is a very important issue in ensuring a satisfactory service behavior during their life. For structures with recycled aggregates, deflection control becomes an outstanding problem since the use of recycled aggregates reduces the modulus of elasticity while increasing the shrinkage and creep deformation of the material. The paper of Tošić et al. (2022) reports a parametric analysis of deflection control of reinforced concrete one-way members containing RCAs. In their study, the effects of the member boundary condition, ambient condition, reinforcement ratio, and quasi-permanent–to–design load ratios were investigated. It was found that the change in deflections of the investigated element is relative to the content of RCA in the concrete mixtures and span-to-effective depth ratio (L/d). The results are very helpful for understanding the variability of the deflections of concrete members in which RCAs are used.

The last paper by Engelsen et al. (2022) deals with the full-scale demonstration of using recycled aggregates in new concrete in Navi Mumbai. In this paper, a pilot project was completed using fine RCAs for two different concrete qualities with high replacement of natural aggregates. The fine RCA was processed into RCA 0/2 mm by a wet recycling technique. Characterization results showed that the properties of the fine RCA can meet the requirements for natural sand for concrete, as specified in the Indian Standard. The fresh and hardened properties of the concrete with the fine RCA were found to be comparable to that of the reference concrete. This pilot project successfully demonstrated the great opportunities for using fine RCA as replacement of sand in concrete for the Indian construction sector.

Once again, we thank all the contributors and the reviewers for their valuable help in enhancing the quality of the papers.

We would like to recommend all the papers to our readers, and we believe that the content is very useful, not only for further research but also for practice.

Enjoy your reading!

Sivakumar Kandasami
Jiabin Li

Guest Editors for the Special Issue, ICJ

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