

Dear Readers,

We are pleased to share with you in this edition of the Indian Concrete Journal, papers which range from the domain of experimental research on materials to those of structural and durability design. The edition is guest edited by Dr Kaustav Sarkar.

Born and brought up in Chhattisgarh, Kaustav Sarkar obtained his B.E. (Hons.) in Civil Engineering from Pt. Ravishankar Shukla University, Raipur and M.E. (Hons.) in Structural Engineering from Chhattisgarh Swami Vivekanad Technical University, Bilai. Later, he earned his Doctoral degree from Indian Institute of Technology (IIT) Delhi. His primary research interests pertain to the analyses of moisture transport in porous building materials and of the durability of structural materials in tropical climates. He has made important contributions towards the mapping of exposure severity to facilitate the sustainable design and management of steel and concrete structures in India. Dr Sarkar is also a passionate teacher. He has developed and delivered courses related to materials, design, and computational aspects of structural engineering for under- and post-graduate students. Presently, Dr Sarkar is an Associate Professor in the School of Civil and Environmental Engineering at IIT Mandi. He is also a member of the ICI, IBC, ISTAM, ISCMS and ISTE.

We hope you enjoy reading this edition and look forward to your feedback!

Best Regards,

The Production Editor



Dear Readers,

ICJ is in its 97th year of circulation and continues to be amongst the most popular archives of structural engineering research in India. It gives me great pleasure to present to you its October 2023 issue.

As we know, the need to achieve higher levels of sustainability in concrete construction has remained well-recognized for decades. Since its inception, concrete technology has made significant strides towards this goal through advances in the utilization of valorized wastes; recognition of durability as an explicit design requirement; development of compositions optimized for various applications; development of improved equipment, and lately through the adoption of modern techniques of additive manufacturing. The growing scarcity of natural resources and the indications of a changing climate have, however, made the sustainability requirement in the present times steeper than ever. In India, the principle of Reduce, Reuse and Recycle has been adopted, most notably by the cement industry, but the same remains to be done with the usage of aggregates which constitute the bulk of concrete. Achieving the goal of sustainability also requires the development of rational design aids and guidelines to facilitate the efficient use of a continuously evolving material. The papers in this edition of the ICJ are devoted to these aspects.

The first paper, by Rohit Prajapati and coauthors, presents a comprehensive experimental investigation on the utilization of recycled concrete aggregates obtained from a 20-year old structure. The paper demonstrates that thermo-mechanically

beneficiated recycled concrete aggregates can work as full replacement of pristine aggregates in concrete. The reported results are indicative of the utility of appropriately recycled concrete and that this has immense potential to reduce the carbon footprint of concrete in the times to come.

The second paper, by Nisheeth Agnihotri and Vaishali Sahu, explores the aspect of alkali silica reaction (ASR) based on ASTM's mortar-bar method in systems constituted by ordinary, pozzolana and slag cements mixed with sands obtained from a rock quarry located in the Himalayan region and its replacements with manufactured aggregates obtained by recycling old-concrete and C&D waste. Their results indicate that a fly ash based Portland pozzolana cement mitigates ASR-expansion more efficiently than the Portland slag cement. The finding is of particular importance for projects which involve mass concrete, wherein, durability issues are of greater concern than strength.

In the next paper, Rewa Bocharé and coauthors study the possibility of using non-biodegradable PET as a partial replacement of sand in mortar and concrete. The results of this preliminary investigation reveal that the replacement levels need careful optimization to avoid adverse effects on compressive strength. The study shows that there is a need for further research in this area, so as to make the application amenable for practice.

The last paper of the edition is by Anasuya Mondal and Santanu Bhanja, wherein, P-M interaction curves have been developed for the limit state design of shear walls with high strength concrete (M65 to M90) and HSD bars (Fe 415 to Fe 600). These can serve as useful design aids for practicing engineers.

I believe that the current edition of ICJ will be of interest to researchers and practitioners alike.

Happy reading and best wishes for Dussehra!

Dr Kaustav Sarkar

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