Dear Readers,

Greetings from the Indian Concrete Journal.

I am pleased to bring out the current edition with insight into the recent developments in civil engineering, specifically construction materials. This edition comprises four research articles focused on the advancement in the field of construction materials towards sustainability, which is expected to provide significant insight to the readers.

The first article demonstrates the synergistic effect of mineral admixtures and styrene acrylic ester-based polymers on the properties of repair composites. Repair composites are developed with Portland pozzolana cement (PPC), river sand, styrene acrylic ester-based polymer (SAR), metakaolin (MK), and silica powder (SP). Incorporating synergy aspects, the findings of the article demonstrate a significant improvement of mechanical and transport properties for MK and SP-based repair composites modified with SAR.

The following article focuses on the possible techniques to be adopted to improve the quality of recycled aggregate for sustainable concrete construction. It demonstrates the different treatment methods, namely mechanical scrubbing, sulphuric acid, hydrochloric acid, cement coating and silica fume coating treatments for improving the quality of recycled aggregate. Article's findings indicate that mechanical scrubbing technique is better for removing old attached mortar from recycled aggregate. Properties of concrete produced with treated recycled aggregate exhibit better performance than controlled concrete mix.

The next article investigates the shear strength and toughness of geopolymer concrete (GPC), an environment-friendly construction material. This article explores the possibility of well graded aggregate, prepared using 45 % river sand and 55 % treated sea sand as fine aggregate to manufacture GPC. This article extends the experimental work to produce ambient temperature cured GPC by adding 4% ordinary Portland Cement (OPC). The results show that fly ash-based GPC with 4 % OPC with ambient curing can produce strength similar to that of fly ash-based GPC with temperature curing. The toughness of GPC with ambient and temperature curing is better than that of cement concrete.

The last article presented a detailed analysis of the robustness of three Boltzmann-profile, $\theta_n(\varphi)$ models considering the moisture distribution profiles taken from literature and gravimetric observations made in the laboratory for the modelling of non-linear hydraulic diffusivity, $D(\theta_n)$ of drying mortar and concrete. The findings of the article indicated that a 2-parameter $\theta_n(\varphi)$ model is better suited for the inverse estimation of $D(\theta_n)$ in compared to a widely used 3-parameter model.

On behalf of ICJ, I would like to extend our sincere appreciation to the contributing authors for choosing ICJ to publish their research works and thanks to the reviewers for their constructive comments and detailed review reports on time. Thanks to the coordinated efforts of all stakeholders, we are delighted to publish this edition of the ICJ with the hope that it would be of meaningful benefit to the researchers and the practicing engineers involved in design, construction, and maintenance of concrete materials and structures.

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REFERENCES

[1] Md Muheeb Ahmed, Mohd Umar, and Haji Sheik Mohammed, M. S. (2024). "investigation on synergistic effect of mineral admixtures and styrene acrylic ester-based polymer on mechanical and transport properties of repair composites", *The Indian Concrete Journal*, Vol. 98, No. 2, pp. 6-16.

[2] Marshall, J. V. R., Ramasamy, V., Kandasamy, S. (2024). "Enhancing the quality of recycled aggregate by surface treatment techniques for sustainable construction", *The Indian Concrete Journal*, Vol. 98, No. 2, pp. 17-35.

[3] Shinde, B. H., and Nawale, B. S. (2023). "Shear strength and toughness of fly ash based geopolymer concrete with ambient curing", *The Indian Concrete Journal*, Vol. 98, No. 2, pp. 36-42.

[4] Kamran, M., Sarkar, K. (2024). "robustness of boltzmann-profile models for the inverse estimation of drying diffusivities of mortar and concrete", T*he Indian Concrete Journal*, Vol. 98, No. 2, pp. 43-60.