Dear Readers,

We are pleased to share with you papers covering recent developments on construction materials. This edition is guest edited by Dr Suman Saha. Dr Suman Saha is an Assistant Professor at the Department of Civil Engineering, National Institute of Technology (NIT) Durgapur, West Bengal, India. Prior to join NIT Durgapur, he worked as Assistant Professor in the Department of Civil Engineering at National Institute of Technology (NIT) Calicut, Kerala, India. He received PhD and M. Tech. degrees both from National Institute of Technology (NIT) Karnataka, Surathkal, India and B. E. from Jadavpur University, Kolkata, India. His research interest includes alternative construction materials towards sustainability and advancement in concrete technology.

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

Production Editor

Indian Concrete Journal

Dear Readers,

Greetings from the Indian Concrete Journal.

I am pleased to present the current edition, which offers insights into recent developments in civil engineering, specifically in the field of construction materials. This edition comprises four research articles focused on the advancements in the field of construction materials towards sustainability, which are expected to provide significant insights to the readers.

The first article presented an empirical model to predict flexural tensile strength and splitting tensile strength of light-weight concrete containing sintered fly ash aggregate (LC-SFA). An experimental investigation was carried out to produce light-weight concrete of compressive strength ranging 20-55 MPa. Based on the experimental observations, an empirical model has been developed for predicting flexural tensile strength and splitting tensile strength of LC-SFA and normal-weight concrete (NC). The proposed models reasonably predict flexural tensile strength, split tensile strength, and the relationship between them for LC-SFA and NC.

The second article investigated an experimental investigation on the performances of Portland slag cement paste incorporating graphene oxide (GO). Water absorption, sorptivity, and compressive strength were evaluated. The findings show that GO significantly increases the resistance of PSC-based cement paste to harsh environmental conditions. Specifically, GO-modified pastes exhibit reduced water absorption and sorptivity. The findings suggest that GO can play a crucial role in enhancing the performance of cement-based materials in harsh environments, making it a valuable addition to the construction industry's quest for increased durability and sustainability.

The following study conducted an experimental analysis to explore the compressive strength of specimens cast with M50 grade of concrete after being subjected to elevated temperatures (200, 350, 400, 500, 600, 800°C *etc.*). Considering a dataset from other researchers, a non-linear finite element (FEM) analysis using ANSYS 2022 was also carried out and observations were compared with the experimental data. Compressive strength of cubical specimens is found to decrease significantly above 400 °C and for cylindrical specimens, it decreases with an increase in temperature.

The last article focused on determining the environmental impact of the production of ordinary Portland cement (OPC) using life cycle assessment (LCA). Considering four sub-processes such as the extraction of raw materials, preparation of the recipe, calcination, and cement production, the entire LCA process was carried out using CML-IA baseline method. The study indicates the calcination stage of the cement production process has the most significant impact, accounting for about 90 % effect on climate change, 93 % for acidification and 96 % towards eutrophication.

On behalf of the ICJ, I extend our sincere appreciation to the contributing authors for choosing the ICJ to publish their research works, and thank the reviewers for their constructive comments and detailed review reports submitted 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 will be of meaningful benefit to researchers and practicing engineers involved in the design, construction, and maintenance of concrete materials and structures.

Dr Suman Saha

Guest Editor, ICJ

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