Dear Readers,

we are pleased to share with you an edition themed on 'Reinventing Concrete for a Greener Tomorrow, edited by Dr Hindavi Tikate (Gavali) and Dr Nilesh Patil. In this edition, we extend our heartfelt gratitude to all the Indian Concrete Journal (ICJ) Reviewers, Guest Editors, and the Editorial Board for their exemplary pro bono service. Your steadfast support to the ICJ fosters good practices, shares knowledge, and helps the growth of the construction community.

In our effort towards digitalization, we are excited to announce that the ICJ manuscript portal that supports the double blind -peer review process online has been successfully rolled out. This portal is user-friendly, and we encourage you to please use the same for your contributions.

Dr Hindavi Tikate (Gavali) is an Assistant Professor at the National Institute of Construction Management and Research (NICMAR) University, Pune, India. She earned her Doctorate and Master's degrees from Visvesvaraya National Institute of Technology (VNIT), Nagpur, in 2020 and 2016, respectively. She also holds a B.Tech. degree in Civil Engineering (2010-2014) from Walchand College of Engineering, Sangli.

Her research and teaching interests span a wide range of topics, including sustainable construction and Building Information Modeling (BIM). Her expertise includes energy-efficient buildings, affordable mass housing, sustainable construction materials, alkali-activated materials, advanced construction techniques, digital construction management, and information modeling. She has authored or co-authored more than 40 papers published in scholarly journals and presented at peer-reviewed national and international conferences. She holds an Indian patent for bio-based bricks developed with a focus on sustainable construction materials. Her contributions to the field have been recognized with awards, including the prestigious RISE Award-Dublin, sponsored by the Chartered Institute of Building (CIOB), UK, for her research work. She is actively involved in technical forums, serving as a reviewer for several national and international journals and conferences, and as a guest editor for a reputed international journal. Beyond her academic pursuits, Dr Hindavi is a life member of professional organizations such as the India BIM Association and the Confederation of Engineers (India).

Dr Nilesh Agarchand Patil is an engineering professional with an overall experience of 25+ years in academics and research in the field construction technology and management (CTM). Currently, he is Head of Open Enrollment Programs, School of Executive Education and Assistant Professor, School of Construction at NICMAR University Pune. He has obtained his bachelor's degree in civil engineering from North Maharashtra University and master's in construction management from Pune University. He has done his PhD from Indian Institute of Technology (IIT) Guwahati.

His core competencies are in the areas of PPPs in infrastructure development, value engineering, sustainable construction materials, sustainable infrastructure development, construction quality management, project management, concrete technology and lean construction. He has published more than forty research articles in referred journals and conferences held in India and abroad, and he has won the best research paper award for two of them. Over the period of his teaching career, he has learned and taught courses on construction project management, infrastructure planning and software's like MS project, Lean PlanDo, VisiLean, digiQC, SmartPLS, SPSS, NVivo, EndNote and Vensim PLE at graduate and post-graduate level.

He is serving as a reviewer to various reputed international journals and extensively supporting students in the area of sustainable infrastructure development, construction management, project management, construction materials and concrete technology.

Production Editor
Indian Concrete Journal

Dear Readers,

as guest editors of this edition, we are delighted to present a collection of thought-provoking papers focused on sustainable concrete solutions for a greener tomorrow. This issue highlights selected and extended versions of outstanding research papers originally presented at the International Conference in Construction, Real Estate, Infrastructure, and Project Management (ICCRIP 2024) held on August 23-24, 2024, at NICMAR University, Pune, Maharashtra, India. The conference provided a platform for scholars, researchers, and experts from various fields to discuss the latest innovations in construction materials and concrete technology and their potential to drive sustainable development.

The growing demand for sustainable construction practices has led to an increased focus on innovative materials and techniques that enhance both the strength and durability of concrete. This edition features four significant papers exploring the potential of alternative materials and their impact on concrete performance.

From quaternary blended concrete to pervious concrete and geopolymer innovations, these studies highlight the role of supplementary cementitious materials, mineral admixtures, and alternative aggregates in addressing pressing issues like environmental sustainability, material scarcity, and concrete performance enhancement.

Our first paper by Seshadri Sekhar T., P. Srinivasa Rao, and V. Kiran Kumar[1] highlights the sorptivity performance of quaternary blended concrete (QBC), emphasizing its potential to improve durability and strength through the inclusion of supplementary cementitious materials (SCMs) such as fly ash, nano- silica, and metakaolin. These SCMs, by-products of other industries, not only enhance the concrete's microstructure and water resistance but also contribute to sustainability by reducing greenhouse gas emissions and waste disposal issues. The study reveals that QBC outperforms control concrete due to its denser pore structure and refined interfacial transition zone, demonstrating superior resistance to water penetration and harmful liquid ingress.

The second paper, authored by Khandare Manish A. and Agarwal Anil L.,[2] reviews the impact of mineral admixtures and aggregate types on the compressive strength and infiltration properties of pervious concrete. Pervious concrete, characterized by high void content and permeability, aids in groundwater recharge but has limited structural applications due to reduced strength. The study examines the effects of mineral admixtures such as fly ash, metakaolin, rice husk ash, GGBS, and silica fume, highlighting their role in improving compressive strength. Cement replacement with GGBS and silica fume-fiber combinations achieves strength levels up to 42 and 41.2 MPa, respectively. Additionally, the paper explores the role of biopolymers like cellulose, starch, and Gum Arabic in enhancing conventional and hemp concrete properties, observing strength improvements of up to 92 %. The authors propose further research into the effects of biopolymers on pervious concrete's mechanical performance to address existing knowledge gaps.

The paper, authored by U. S. Agrawal[3] and others explores the impact of low-calcium fly ash fineness on the compressive strength of geopolymer concrete. Fly ash from two thermal power plants was ground to finer sizes using a Los Angeles Abrasion Testing Machine for 250 and 500 revolutions. Geopolymer concrete was synthesized using a 14M sodium hydroxide (NaOH) and sodium silicate (Na_2SiO_3) solution in a 1:2.5 ratio as the alkaline activator, combined with aggregates and water. Specimens were heat-cured at 80°C for 24 hours to promote geopolymerization. The study demonstrated that increased fineness of fly ash significantly improved compressive strength, highlighting its importance in enhancing geopolymer concrete's mechanical properties and showcasing its potential for sustainable construction.

This study by Shashank B. S. and Praveen Kumar[4] addresses the critical issue of river sand shortages and the limitations of M-sand in the construction industry. The research evaluates the performance of alternative fine aggregates, such as Pond Ash and Steel Slag, in M25-grade concrete. Steel Slag, characterized by its angular shape and rough texture, demonstrates superior strength properties compared to the smoother Pond Ash. Findings reveal a 60 % increase in compressive strength with 30 % Pond Ash replacement, while a combination of 10 % Pond Ash and 50 % Steel Slag achieves a 49 % strength improvement. Although these alternatives enhance strength, workability is not significantly improved due to fine particles. The study underscores the potential of Steel Slag and Pond Ash as sustainable replacements for river sand and M-sand in concrete production.

In conclusion, the research featured in this issue offers promising insights into the future of sustainable concrete technologies. The use of alternative materials not only improves concrete's mechanical properties but also contributes to reducing environmental impacts, making these solutions crucial for the construction industry's shift toward greener, more efficient practices. As we move forward, continued exploration of these innovative approaches will be essential in tackling the challenges of resource conservation and climate change.

It is a pleasure to present this concise summary of the latest advancements highlighted in the four papers, which explore the innovative use of industrial by-products and alternative materials in concrete for enhancing sustainability, durability, and performance.

Dr Hindavi Tikate (Gavali)
NICMAR University, Pune

Dr Nilesh Patil
NICMAR University, Pune

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