Dear Readers,

We are pleased to share with you this edition that covers topics related to sustainability assessment of cement and concrete systems, advancement in concrete technology for a cleaner environment and new design methodology of self-compacting concrete (SCC).

Esayas Ftwi, Ph.D. is an Associate Professor of Civil and Environmental Engineering at Addis Ababa University. He received his M.Sc. and Ph.D. degree at the University of Tokyo, Japan. Currently he is a Visiting Professor at the Civil and Environmental Engineering Department of the University of Michigan. His research interest generally relate to the performance assessment of reinforced concrete (RC) structures subjected to combined mechanical, environmental, and material deterioration actions. He has rich experience covering research, teaching, academic administration, and industry experiences. He has published several papers and some of his works were selected as outstanding by the Advanced Concrete Journal of Japan Concrete Institute. He is a member of the Board of Directors of International Association for Structural Control and Monitoring (IASCM), Editorial board member of ICJ, and other several institutions in Ethiopia.

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

Production Editor
Indian Concrete Journal

Dear Readers,

The Indian Concrete Journal (ICJ) in its current edition is pleased to share innovative contributions related to development of a versatile framework for sustainability assessment of cement and concrete, performance assessment method for evaluating corrosion inhibiting admixtures in reinforced concrete, options for creating a cleaner environment through nanotechnology based self-cleaning concrete and robust design methodology of self-compacting concrete (SCC) for large-scale application in practice.

The first article proposed a framework to conduct the life cycle assessment (LCA) of cement and concrete systems for cases where data is not readily available. The precaution needed when using the existing life cycle inventory (LCI) databases for LCA, curated on the basis of developed countries, for cases of developing countries is emphasized. Further, the importance of having a country-specific database and appropriate methodology for calculating cement and concrete production impacts is highlighted. A framework which enables to calculate the impacts of all concrete systems, and to conduct comparison of the impacts due to alternatives with a potential implementation for impact mitigation measures is developed.

Existing methods for performance assessment of corrosion inhibiting admixture-based reinforced concrete are done through accelerated tests, which may not directly represent the reality at normal conditions, and even take long duration for testing. To tackle this, the second article evaluated the performance of corrosion inhibiting admixture-based concrete through resistivity, rapid chloride permeability and petrographical analysis. The finding demonstrated electrical resistivity as a suitable and effective performance assessment method for fresh hardened concrete mixed with calcium nitrite-based inhibitor at normal exposure conditions while rapid chloride permeability test (RCPT) is not. The experimental investigation demonstrated the use of calcium nitrite-based corrosion inhibiting admixture provides significant improvement in the corrosion resistance of reinforcement in the concrete. Further, the study revealed corrosion inhibiting admixture promotes strong aggregate-concrete bonding, reduces shrinkage crack, and minimizes air voids.

The third article reviews the research published on self-cleaning concretes and presents its role in reducing environmental pollution. It offers an overview of the photocatalyst self-cleaning process. Various photocatalytic materials with varying degradation capacities have been examined and the finding indicated that $Bi_2O_2CO_3$ photocatalyst gives better result in self-cleaning than the commonly used TiO_2 and ZnO. The challenges and benefits of self-cleaning application in practice are reviewed. Further research on field level application and the need for identifying photocatalytic with higher self-cleaning effectiveness is emphasized.

The limited robustness, or susceptibility to deviate from expected performance is a major deterrent to the use of SCC in a large-scale application in practice. The fourth article proposed a methodology for SCC mix design and subsequent assessment of the robustness of SCC mixes. The mix design strategy involved separate optimization of paste and aggregate phases. The robustness evaluation regarding effectiveness of the mix design highlighted that the mixes developed are tolerant to an increase in water content up to 5 %. The experimental investigation using the new design methodology demonstrated that mixes with higher water to powder ratio exhibit better robustness with both increase or decrease in water content, with respect to the base mix.

We would like to extend our sincere appreciation to authors for choosing to publish their important outcomes of research in the ICJ and reviewers for their constructive comments and timely review reports. Thanks to the coordinated efforts of all stakeholders, we are delighted to issue this edition of the ICJ with firm belief 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.

Thank you,
Esayas Gebre-Youhannes