Dear Readers,

The Indian Concrete Journal (ICJ) is pleased to release its current edition to the audience. Constant growth of humanity and expansion of built infrastructure results in increasing demand on structures globally that should meet the modern civilization requirements - the need for advanced construction materials with improved characteristics is rising rapidly nowadays. Moreover, prediction of failure patterns of structural members with various materials is quite important for practical and safe utilization. In this quest, the current issue of the ICJ, five papers are being published reporting assessment of structural behavior with manufactured materials. Considering concrete as the most versatile manmade material used in structural applications, these papers deal with novel developments in concrete industry, towards improved behavior of structures in real-life.

For reasonable utilization of natural resources in materials, the first article has investigated on the possible use of presoaked recycled fine aggregate in production of concrete, in an attempt to save the natural resources by introducing alternative means to the use of river sand. With the intent to remove the barrier of using the recycled fine aggregate due to its high-water absorption, the article has demonstrated extensive experimental work and observed notable improvement in the mechanical and durability properties of the concrete when recycled fine aggregate was soaked in water prior to use. This effective approach is therefore recommended for wider applications of recycled aggregate in the manufacture of concrete with added environmental benefits, that helps in reducing the consumption of natural aggregate resources and disposal problems of construction and demolition wastes to a certain extent. As the high-performance concrete is becoming imperative nowadays to meet special performance and uniformity requirements that cannot always be obtained by using conventional ingredient, the second article has elaborated a study on the properties of the high-performance concrete. Optimization of the cement matrix phase in terms of fluidity is a crucial step in the development of high-performance concrete; therefore, this article has elaborated a simple, effective, and reliable methodology to assess the flow behavior of the paste.

The results of the article, in principle enable assessment of the cement-superplasticizer compatibility, that is essential for the manufacture of high-performance concrete. Then, in response to the further demand on the ultra-high-performance concrete, the third article has introduced the reactive powder concrete (RPC) having dense and uniform microstructure and mechanical properties. This study has demonstrated enhanced compressive and flexural strengths as well as higher toughness of concrete with adding fibers to the RPC mix, and proposed analytical expressions for evaluating the flexural strength of the non-fibrous and fiber-reactive powder concrete. The fourth article has undertaken a reliability study to predict the probability of failure of columns using Monte Carlo Simulation technique. The reliability analysis, presented here can be used as an effective tool to predict the safety level of structural members prior to their construction, hence amounts to code assessment for safety, which does help in the code calibration towards reliability-based design. The fifth article has investigated on the effect of soil-structure interaction (SSI) on the design of buildings. The buildings designed as per Indian standard (IS) code were always observed overdesigned as compared to those designed with considering the flexibility of the soil. The safety of these overdesigned buildings against flexible base buildings has been checked using linear dynamic and pushover analyses. This article has recommended considering the SSI during design of buildings, reason being more economical. As the high-rise buildings designed on soft soil are observed sensitive to dynamic loading, it has been recommended that such construction of high-rise buildings on soft soils should be made with more technical and professional assistance.

Thus, we hope you enjoy reading this edition of the ICJ dealing with innovative technologies that could benefit the concrete industry as well as structural sustainability and safety. The topics covered in this edition are quite important and useful for structural engineers towards further advancement in the construction industry. Thank you.

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