Dear Readers,

Wishing all our community members a very happy New Year! Hope you all had a great start to 2023. We 'thank you' for your patronage as a revered member of the Indian Concrete Journal (ICJ) family and for journeying together through contemporary advanced technological developments in concrete materials and structures.

In this inaugural edition of the 97th volume of the ICJ, we bring to you five technical papers addressing various topics, such as corrosion issues in post-tensioned concrete bridges, development of sustainable microbial coalesce bio-cement mortar blended with powdered seashells, tree pod based natural plasticizer, concrete block pavement, and recycled aggregate concrete. Improving durability of concrete structures and thereby eventually leading to sustainability is a common narrative observable in these enriching research articles.

To compensate for the limitation of low tensile strength, when steel reinforcement is introduced in concrete, occurrence of corrosion-related issues seriously affects the longevity of the reinforced concrete (RC) and prestressed concrete (PSC) structures. Grouting materials and construction practices followed to provide corrosion protection in post-tensioned concrete bridges has been presented by Manickam and Pillai[1]. The recommendations made through this investigation will be useful in the bridge engineering discipline to effectively ascertain a service life of 100 years, unless the corrosion-prone reinforcements are replaced by some noncorrosive reinforcement alternatives.

Microbial blended cement mortar using seashells has been developed by Adi [2] in pursuit of achieving sustainability in construction materials. Here, the addition of seashell powder and bacteria in mortar leads to reduced usage of ordinary Portland cement (OPC) and natural sand. Eventually, mortars and in future concretes made from the seashells and the microbial blending will need to maintain the required strength and durability properties, while helping reduce ill-effects on the environment. The encouraging results from the present investigation therefore pave the way for further research work.

Physical and chemical behaviors of concrete mix with natural and chemical plasticizers are assessed comparatively by Shenoy and Ravindra [3] while considering potential enhancement in mechanical properties and durability. In this study, few physical and chemical properties such as workability, compressive strength, durability performance of concrete were assessed by carrying out slump cone test, compressive strength test, test for resistance to acid attack, water absorption test, rapid chloride permeability test (RCPT), and water permeability and sorptivity tests. The natural plasticizers prepared from rain tree pod extract have shown to offer an alternative to the chemical plasticizers. The proposed use of the natural plasticizer in concrete is found to be an effective, economical, and environmental-friendly option.

In concrete block pavements, Pani and Panda [4] have presented past experimental and numerical investigations, which show promise in using the predicted values of elastic modulus to design wearing and base courses. In the design of the concrete block pavement, elastic modulus of the composite layer formed by the paving blocks along with the bedding and jointing sand is essentially required, evaluation procedure for which has been elaborated through this investigation.

Tantray [5] presented a study on improving mechanical and durability properties of recycled aggregates by accelerated carbonation and incorporation of colloidal nano-silica. Calcium carbonate formed in recycled aggregate concrete, and colloidal nano-silica filling the pores contribute to the improvements achieved. In order to establish the efficiency of the approach presented, several experiments were performed, such as that on compression, abrasion, RCPT, water absorption, flexural and split tensile strengths, water permeability, which help in assessing efficacy of the method to enhance the performance of concrete. Nonetheless, significant research efforts are required to establish such positive outcomes achieved by accelerated carbonation and incorporation of colloidal nano-silica in recycled aggregate concrete for consistent enhancement in mechanical and durability behavior.

In our future editions of the ICJ this year, we will continue delivering to you the rich knowledge generated in the realm of concrete industry, keeping our readership abreast with the scientific developments and emergence of new construction practices from both advanced materials and structural systems perspectives.

Thank you.

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