Dear Readers,

The Indian Concrete Journal (ICJ) is pleased to release its current November 2022 edition to the readership. The increased global warming and climate change have brought attention of researchers toward sustainable construction materials and design. Therefore, replacing the conventional construction materials such as cement with environment-friendly materials and agro- or industrial wastes has become essential. Moreover, the prediction of failure patterns of structural members with various materials is essential for practical and safe utilization. In this quest, the current issue of the ICJ, five articles are being published reporting assessment of the performance of concrete with substituted or added constituents proposed. Additionally, effective structural framing systems are proposed for multi-story buildings. Further, these articles contribute to the construction industry towards improved and sustainable concrete mix and efficient design of high-rise buildings.

For reasonable utilization of the industrial waste materials, in the first article the performance of concrete with alkali-activated industrial wastes has been investigated as alternatives to ordinary Portland cement (OPC) [1]. The alkaline solutions are sodium hydroxide combined with sodium silicate and aggregates, producing geopolymer concrete. The article presents the physical and chemical properties of industrial wastes, i.e., fly ash, bottom ash, high calcium wood ash, treated palm oil fuel ash, ground granulated blast furnace slag, and silica fume. Further, the effects of adding these industrial wastes on the properties of geopolymer concrete (GPC) has been explored. The fly ash has shown an increment in the durability of the GPC. Moreover, the effect of the curing on the compressive strength of the GPC has been presented.

For reasonable utilization of the industrial waste and natural resources in construction materials, in the second article the potential of iron slag and recycled concrete aggregates (RCA) has also been demonstrated to be used as a replacement of natural fine aggregate and natural coarse aggregate, respectively, in concrete through experimental findings [2]. The performance of concrete has been evaluated in terms of compressive strength, tensile strength, chloride penetrability, and surface absorption tests. This replacement of the aggregates has led to better workability and compressive strength if used with optimum content and mix ratio. However, the RCA has resulted in a decrease in tensile strength. Therefore, the encouraging results of both the articles promote readers to replace the conventional constituents of concrete with industrial waste to improve the performance of the concrete and to protect the environment.

With the demand to reduce adverse effects of the conventional construction materials to preserve the environment, the third article has investigated the effect of reducing the cement content of ultra-high-performance concrete by adding metakaolin and limestone with water curing from 90 to 360 days [3]. Various tests have been conducted to evaluate the compressive and flexural strengths, chemically bound water, differential thermal analysis curves, X-ray diffraction patterns, pore structures, and micro-morphology at different periods. The addition of metakaolin has resulted in an increment in the water resistance and stability of the late-age mechanical property and microstructure of concrete. However, limestone has shown no significant effect on the performance of concrete. With improved construction materials, the structural

configuration plays a significant role in determining the complete structural performance.

In the fourth article, the performance of buildings with various configurations of the structural framing systems has been compared, i.e., rigid frame, braced frame, and wall frame structural systems under lateral loads for high-rise buildings [4]. With an increased height of the structure, the influence of the lateral loads and the importance of the lateral structural framing systems increase. Moreover, the effective position and the height of the shear wall has been determined for improved seismic resistance of the structure. The article has potential to help readers in choosing an effective lateral structural framing system and shear wall position based on the height of the building.

In addition to building new and sustainable structures, preserving the existing structure is also crucial. Therefore, retrofitting of existing structures plays an important role in the construction world. To contribute in this direction, in the fifth article multiple ways of strengthening a bulk urea silo has been demonstrated through a case study [5]. Further, analysis and design adequacy checks of the silo have been performed using the relevant Indian standards. The reinforced cement concrete (RCC) jacketing, structural steel sections (I or C shape sections), and carbon fiber-reinforced polymer (CFRP) composite laminated wraps have been proposed as efficient ways of retrofitting for conveyor and hanger structural members.

Thus, we are glad to issue this edition of the ICJ dealing with innovative technologies that could potentially 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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