

Dear Readers,

We are pleased to share with you an edition comprising of research papers covering the development of constitutive models for various construction materials and the characterization of fresh concrete properties. This edition has been guest-edited by Prof. Oinam Romanbabu Meetei.

Prof. Oinam Romanbabu Meetei is an Assistant Professor at the Civil and Environmental Engineering Department, Indian Institute of Technology (IIT) Tirupati. He is an active researcher in the area of seismic rehabilitation and retrofitting. Prof. Oinam has significant contribution in developing the resilient civil infrastructure of this Nation. As part of his research, he developed low-cost, high efficient Energy Dissipation Devices applicable to both concrete and steel structures. He is well-known in both academia and industry.

We hope you enjoy reading these papers, and we look forward to your valuable feedback on this edition.

Production Editor
Indian Concrete Journal



Dear Readers,

This edition covers sustainable construction techniques, shear design issues, and challenges of the fresh concrete test! Here is what the chosen six papers have to say.

Glass fiber reinforced gypsum (GFRG) is prepared from industrial and agricultural wastes adding glass fibers. Therefore, it's considered a sustainable construction material in the present construction era. Usually, it is used in fast-track mass construction due to its rapid construction property. While designing the GFRG structure, its typical behavior under lateral load needs to be understood. In this regard, the authors did an extensive study to develop a simplified analytical model to estimate lateral load-displacement behavior of GFRG walls with reinforced concrete (RC) infill.

The member aspect ratio greatly influences shear failure in the reinforced concrete structure. The member that has an aspect ratio less than 2.0 has the typical nature of shear failure. Most of the design code uses the empirical equation to predict the shear strength, ignoring the failure mode. Considering these limitations, the authors developed the strut-and-tie model for designing complex structures, which seems to be more appropriate for the design of beams with an aspect ratio less than 2.0.

Limestone calcined clay cement (LC³) is one of the sustainable cementitious materials with a promising future. The authors investigated to assess the fresh state properties of LC³

concrete and compared it with fly ash-based concretes of similar strength ranges (30 to 50 MPa). Fresh concrete properties such as density, slump, slump retention, rheology, and setting time are evaluated. The claims that the rheology of LC³ based concrete have comparable rheological values for specified applications.

In the following article, slag and fly ash have been used as partial replacement of cement in the mix to investigate the effect of different supplementary cementitious materials (SCMs) on shrinkage and creep. The authors have carried out various mixed designs varying the water-cement ratio in the range of 0.50 to 0.65. Based on the experimental results, the authors claim that the addition of fly ash and slag does not significantly influence the drying shrinkage strain evolution compared to conventional concrete. This experimental study data has been used in the subsequent article to calibrate the model parameters of the RILEM B4 and B4s shrinkage models by conducting the regression analysis. The proposed model seems to yield an improved prediction compared to the dataset collected.

In the last article, the author extensively studied the rheology of high-performance concrete (HPC) and highlighted the limitation of single-point and two-point workability tests. Also, expressed challenges to measuring the rheological parameters of normal concrete and high-performance concrete as the ingredients of concrete have a large range of particle sizes, contain different kinds of mineral and chemical admixtures and fibers. Author claims that torque, rotation speed of bob, yield stress, and plastic viscosity have played a crucial role in defining the rheology parameter of HPC.

Hope this edition gives wide range of information on design issues, sustainable materials, and construction practices.

Best regards,

Oinam Romanbabu Meetei