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(57) Abstract :
Reactive powder achieves compressive strengths much higher than conventional concrete, often exceeding 200 MPa. Since no proper mix design codal procedure is available for reactive powder concrete. Construction practices are made by trail and error methodology keeping local materials conditions in mind. Silica fume is used as one of the constituents in the reactive powder concrete which reacts with cement forms additional calcium silica hydrates gels and provide dense microstructure and enhanced properties to the reactive powder concrete. But since the manufacturing of silica fume is a tedious process and uneconomical it is necessary to bring a low cost and easily produced materials. The ultra fine slag is found to be such material which also found to be a pozzolanic materials which although does not find to be finer as silica fume but still found to be advantageous as silica fume. Incorporating Ultra fine slag in concrete offers significant environmental benefits by reducing carbon emissions, conserving energy and resources, promoting waste utilization, and enhancing the durability and longevity of concrete structures. These advantages contribute to more sustainable construction practices and support the transition towards a greener and more resilient built environment. Concrete mixes containing ultra fine slag exhibit improved durability and resistance to environmental degradation compared to conventional concrete. Ultra fine slag contributes to denser and more impermeable concrete microstructures, resulting in enhanced resistance to chloride ingress, sulfate attack, alkali-silica reaction (ASR), and other forms of deterioration. This leads to longer service life and reduced maintenance requirements for concrete structures, ultimately lowering their environmental footprint over time. To produce ultrafine slag, the GGBFS undergoes additional grinding and processing to reduce the particle size to a finer scale. After grinding, the ultrafine slag particles are subjected to particle size classification to remove oversized particles and achieve the desired fineness. This may involve screening or air classification techniques to separate particles based on size and ensure uniformity in the final product.

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