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Group No: **6**

Guided By

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Project Title

USE OF MINERAL ADMIXTURE IN CONCRETE

Abstract:

These materials are majority byproducts from other processes. The main benefits of SCMs are their ability to replace certain amount of cement and still able to display cementitious property, thus reducing the cost of using Portland cement. The fast growth in industrialization has resulted in tons and tons of byproduct or waste materials, which can be used as SCMs such as fly ash, silica fume, ground granulated blast furnace slag, steel slag etc. The use of these byproducts not only helps to utilize these waste materials but also enhances the properties of concrete in fresh and hydrated states. Slag cement and fly ash are the two most common SCMs used in concrete. Most concrete produced today includes one or both of these materials. For this reason their properties are frequently compared to each other by mix designers seeking to optimize concrete mixtures. Research indicates that deficiency associated with the use of Fly ash cement is its low strength specially in early age. Similarly research papers show that slag cement gain strength at early stage but rate of gain of strength is low leading to comparatively less ultimate strength. Research studies indicate that inclusion of Silica Fume in binder mix positively improves the strength of the matrix and its chemical resistance but can create increase in water demand, placing difficulties, plastic shrinkage etc. However, all these materials have certain shortfalls but a proper combination of them can compensate each other's drawbacks which may result in a good matrix product with enhance overall quality. In the present work a series tests were carried out to make comparative studies of various properties of concrete prepared by using Fly ash and silica fume. Experimental investigation has been carried out to study the effect of the fly ash, slag and silica fume on the properties of both fresh and hardened concrete. Cement has been replaced by mass with 15, 20 and 30 per cent fly ash content. Three percentages of silica fume (0, 5 and 9 per cent) have been used in the investigation. Tests have been performed for Compressive Strength indicated that compressive strength increased with mineral admixture incorporation. Optimum replacement percentage is not a constant one but depends on the w/cm ratio of the mix.

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