

Behavior of Masonry Mortars – A Factorial Design Approach

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Abstract:

Even though mortar in masonry constitutes a very small percentage compared to total volume of masonry, plastic and hardened properties affect the behavior of masonry. First, the factors influencing the workability and compressive strength of mortar have been identified. As several factors influencing the workability and strength of mortar are studied simultaneously, in order to identify the significance of each of these parameters and their interaction effects, factorial design of experiments has been made for a range of cement-sand and cement-lime sand mortar mixes for the influence of water content, fineness modulus (FM) of sand, and cement strength on the compressive strength and workability of mortar. Detailed statistical analyses of the test results has been made and separate multiple regression models have been developed for predicting compressive strength of cement-sand and cement-lime-sand mortars. Also a relationship has been established between FM of sand and water/cement ratio which will serve as a ready reckoner in arriving at the approximate water requirement for a given mortar mix, workability of mortar and FM of the available sand.

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