Compliance criteria for quality concrete

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Abstract:

With the advancement in cement technology, it is now possible to produce concrete of high strength with increased water/cement ratio. While this may satisfy the strength requirement, it is possible that the durability of such concrete is despaired. Though international organizations specify minimum cementititous materials content and maximum water/cementititous materials ratio, the quality assessment parameter is still the compressive strength. There is, however, a need to switch to permeability or chloride diffusion indices to ascertain the quality concrete. At the same time, compliance criteria for the present-day concrete need to be developed. In the reported study, an extensive experimental work was carried out to assess the compressive strength development, depth of water penetration and chloride permeability of plain, silica fume and fly ash cement concretes prepared with varying mixture proportions. The experimental data were utilized to develop statistical relationship between the mixture design parameters and the strength and durability indices. These data were also utilized to develop quality compliance criteria for concrete prepared with the crushed limestone aggregates.