

DEVELOPMENT OF HIGH-STRENGTH SELF-CONSOLIDATING CONCRETE

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ABSTRACT

This paper presents important information regarding development, properties, and advantages and disadvantages of using self-consolidating concrete in the construction industry. It also presents some results of a study recently completed for the manufacturing of economical high-strength self-consolidating concrete containing high-volumes of fly ash. In this study, portland cement was replaced by Class C fly ash in the range of 40 to 60% by the weight of cement. The results of fresh and hardened properties of concrete show that the use of high-volumes of Class C fly ash in self-consolidating concrete drastically reduces the requirements for superplasticizer and viscosity modifier agent compared with the normal dosage for such admixtures in self-consolidating concrete. The results further indicate that economical self-compacting concrete with 28-day strengths up to 10,000 psi can be made using high-volumes of fly ash. Such concretes can be used for a wide range of applications from in-situ to post-tensioned concrete construction.