

ABRASION RESISTANCE OF CONCRETE AS INFLUENCED BY INCLUSION OF FLY ASH

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ABSTRACT

This research was conducted to evaluate abrasion resistance of high-volume fly ash concrete. A reference plain portland cement concrete was proportioned to obtain 28-day strength of 41 MPa. Concrete mixtures were also proportioned to have two levels of cement replacements (50 and 70%) with an ASTM Class C fly ash. Abrasion tests were carried out using the rotating cutter method as per ASTM C-944. In this work all the concrete specimens made either with or without fly ash passed the abrasion resistance requirements per ASTM C-779, Procedure B.

An accelerated test method was also developed to evaluate abrasion resistance of concrete. This method used the rotary cutter device having dressing wheels equipped with smaller size washers. A measured amount of standard Ottawa sand was added to the surface being abraded at one-minute intervals. The accelerated test results exhibited lower abrasion resistance for high-volume fly ash concrete systems relative to no-fly ash concrete.