

ABRASION RESISTANCE OF HIGH VOLUME FLY ASH CONCRETE SYSTEMS

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ABSTRACT

This report presents the state-of-the-art information on fatigue behavior of plain concrete manufactured with or without fly ash. The report includes the information on the mechanism of fatigue fracture, the factors affecting fatigue behavior, and fatigue models for plain concrete.

A number of studies have shown that concrete fatigue strength is significantly influenced by a large number of variables including stress range, rate of loading, load history, stress reversal, rest period, stress gradient, material properties, etc. The effects of these parameters on fatigue characteristics of concrete are addressed in this report. In general, endurance or fatigue limit of plain concrete was found to vary between 50 and 60% of its static strength. In compressive mode of loading, concrete containing a class C fly ash showed improved fatigue strength over either concrete contained class F fly ash or no fly ash. However, in flexural mode of loading, inclusion of fly ash in concrete exhibited little effect on the endurance limit of plain concrete.