

Effect of replacing natural pozzolans and fly ash on the rate of alkali-silica reactions in Seymareh dam site

by

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ABSTRACT

In recent years, an increasing number of deleterious chemical reactions between some aggregates and the surrounding hydrated cement paste have been observed. Alkali-Silica Reaction (ASR) is a very common and important reaction between reactive forms of silica present within aggregate particles and alkali hydroxides, usually derived from the alkalis present in the cement used.

In this paper, aggregates in Seymareh dam site, located on west of Iran, including both river and rock origin have been studied with respect to alkali-silica reaction potential, using the accelerated test method of ASTM C1260. Investigations show that river aggregates have high alkali-silica reaction potential. In order to decrease the rate of this reaction, effects of combining river with rock aggregate and replacing a part of cement by natural pozzolans and class F fly ash have been studied.

Finally, it was observed that replacing some amount of cement by natural pozzolans and fly ash would highly decrease the rate of alkali-silica reaction, although even a little amount of silica particles can increase the rate of alkali-silica reaction.

Keywords: alkali-silica reaction, fly ash, pozzolan, reactive aggregate

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