

USE OF UNDERUTILIZED COAL COMBUSTION PRODUCTS IN PERMEABLE ROADWAY BASE CONSTRUCTION

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ABSTRACT

This paper presents the results of an investigation carried out to develop permeable base course concrete using under-utilized coal combustion products (CCPs) for pavements. Three sources of under-utilized CCPs were selected for this investigation. These included two sources of high-carbon/sulfate-bearing CCPs, which did not meet ASTM C 618 requirements for coal fly ash for use as a mineral admixture in concrete, and one source of variable-carbon fly ash.

These three sources of under-utilized CCPs were used for no-fines/low-fines concrete as a permeable base course concrete. Two types of concrete mixtures were developed using each of these three CCPs for a base course for a parking area. In these mixtures, the amount of fines was varied for the permeable concrete, another with open-graded and one with an intermediate-graded concrete structure. Tests were performed for fresh concrete properties as well as for compressive strength, splitting tensile strength, and flexural strength. The performance of the permeable concrete mixtures containing under-utilized CCPs was also compared with a reference mixture without any ash.

Test results indicate that variable quality under-utilized CCPs can be effectively used as a permeable base course material for roadways, highways, and airfield pavements. A parking lot pavement with an experimental permeable concrete base course was also constructed.