ROLLER COMPACTED NO-FINES CONCRETE CONTAINING FLY ASH FOR ROAD BASE COURSE

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ABSTRACT

For a long time, the presence of water under hard surface pavements has been identified as a major cause of pavement distress. Water can enter pavement through its top, bottom, and sides. Extended exposure to water can lead to premature oxidation, pumping, D-cracking, faulting, frost action, shrinkage, cracking, and potholes (1). Of these, pumping is known to be a major mechanism of pavement distress. The infiltrated water is trapped in the pavement structure due to slow draining capabilities of the dense-graded base of pavements and the impermeability of surrounding sails. When high pressure is applied to these pavements from heavy traffic loads, pumping occurs in the presence of water. This causes erosion of the base as fines along with water are pumped out. Consequently, a loss in pavement support occurs, leading to early failure of pavement. In order to avoid this, an open-graded permeable base is used to allow rapid drainage of the water (1-15). A permeable base pavement system consists of three elements: permeable base, separator layer, and edge drainage system. Adequate design of these components is essential to obtaining the desired performance. This investigation was undertaken to present the state-of-the-art information on permeable base pavements, and to demonstrate the application of fly ash in manufacture of permeable base concrete pavements. A demonstration project was designed to use an off spec ASTM C 618 Class F fly ash in the base course and an ASTM C 618 Class C fly ash in the concrete pavement of a loop road that was reconstructed at the Port Washington Power Plant of Wisconsin Electric Power Company, Port Washington, WI.