

STRENGTH AND DURABILITY OF ROLLER - COMPACTED HVFA CONCRETE PAVEMENTS

By Tarun R. Naik, Yoon-Moon Chun, Rudolph N. Kraus, Shiw S. Singh, Lori-Lynn C.
Pennock, and Bruce W. Ramme.

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ABSTRACT

This investigation was conducted to collect the state-of-the-art information on strength and durability of roller-compacted concrete (RCC) for pavement construction made with and without supplementary cementitious materials, and to describe the construction experience gained in two pavement projects (Project I and Project II) recently completed in Wisconsin. Project I deals with performance of conventional high-volume fly ash (HVFA) concrete pavement having a roller-compacted, no-fines permeable base course containing fly ash obtained from a SO₂ control technology (dry desulphuring process), and Project II deals with RCC pavement (RCCP) containing 30% ASTM Class C fly ash. Past studies have shown that mechanical behavior of RCC pavement is similar to that of conventional paving concrete. However, non air-entrained RCC is susceptible to freezing and thawing (F & T) damage if critically saturated when subjected to freezing actions. Laboratory testing of specimens derived from the pavements showed excellent results for conventional HVFA pavement, and satisfactory performance of the RCCP except F & T resistance. Specimens from the RCCP performed poorly in laboratory freezing and thawing testing according to ASTM C 666, Procedure A. However, they showed adequate performance for up to 210 cycles of F & T when tested in accordance with ASTM C 666, Procedure B.