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Summary of abstracts

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Exposed Aggregate Concrete for Highway Pavements-experimental Study on the Durability Performance

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Abstract: Exposed aggregate pavement technology is used for construction of highly trafficked highways and expressways. When properly executed, it is an efficient technique to provide desired friction for skid resistance without compromising the noise limitations and riding comfort. However, the materials selection for concrete and the proper timing of technological operations is critical to achieve the designed performance. An experimental study on mechanical properties and durability of concrete with exposed aggregates was performed. Air-entrained concrete was designed as a top layer of two-lift pavement using two types of cement: Portland cement and slag cement. For concrete mix design the optimal aggregate grain-size distribution was selected. Adequate air-entraining and water-reducing admixtures were applied to achieve the target spacing factor and microvoids content in concrete. Concrete specimens were made in the laboratory in a way that imitated the manufacturing of two-layer concrete slab with exposed aggregate achieved by using the retarder and the curing compound. The compressive strength of concrete, the water absorption rate, and permeability of chloride ions through concrete were determined. The freeze-thaw resistance and surface scaling resistance were also tested and analyzed with respect to air void characteristics and intensity of curing. Observed durability characteristics of concrete was correlated proper curing.

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