

Strength Performance Results of “Eco-Pad”

A High Recycled Content In-Situ Mixed Concrete Pavement

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ABSTRACT

This paper presents research performed to identify mixture proportions and to develop an in-situ mixed concrete for a 3.5 acre outdoor storage area pavement. The 20 cm (8 in.) thick storage pavement is being used for bottom ash and synthetic gypsum produced at We Energies’ Pleasant Prairie Power Plant, which is located in Kenosha County, Wisconsin. The unreinforced roller compacted concrete consists of recycled concrete coarse aggregate, bottom ash fine aggregate, class C fly ash and either Portland cement or slag cement, respectively.

Based on the laboratory and field test results, when the selected materials are properly mixed, moisture conditioned and compacted, a compressive strength of 21 MPa (3,000 psi) is attainable at the one year age with the 50% Class C fly ash: 50% Portland cement blended binder. When ground granulated blast furnace slag is substituted for the Portland cement, a compressive strength of 10 MPa to 14 MPa (1500 to 2000 psi) in one year is attainable.

Owners are demanding “green” materials and construction alternatives to meet sustainability requirements by meeting the human infrastructure needs of today while preserving natural materials for future generations. The “eco-pad” will be monitored for performance to determine if it is a long term solution for large storage areas such as manufacturing and commercial warehousing storage yards, terminals, dockyards, and other large pavements that do not require a hard troweled finish.

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