

Influence of ground granulated blast furnace slag (GGBFS) cement in concrete pavement mix designs

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ABSTRACT

Roads and Maritime Services (RMS) pavement specifications require the use of Grade 1 fly ash for Specifications R82 – Lean-mix Concrete Subbase, and R83 - Concrete Pavement Base.

This investigation revisits the prior work done in this area by Whitaker (2014) and further assesses the replacement of fly ash in these applications with ground granulated blast furnace slag (GGBFS).

In recent times fly ash supply has been more volatile, and RMS QA Specification 3211 - Cements, Binders and Fillers allows for varying quantities of slag cement as a direct replacement.

Based on laboratory trials, including assessing the concrete properties for plastic cracking potential using ASTM C1579-13, Standard Test Method for Evaluating Plastic Shrinkage Cracking of Restrained Fiber Reinforced Concrete (Using a Steel Form Insert), this paper assesses the two mixes with alternative supplementary cementitious materials and presents findings of plastic and hardened properties.

The differences in the two Specifications R82 and R83, and application of the two supplementary cementitious materials, including QA Specification 3211, are addressed and comparisons to the actual laboratory mix designs as trialled are investigated.