

SUITABILITY OF USING AL SLUDGE WASTE TO PRODUCE PAVING BLOCK

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Aluminum sludge is a by-product of water treatment plants that use aluminum salts as a primary coagulant. Researchers examine the influence of dry aluminum sludge as a partial Portland cement type I replacement on the mechanical properties of high-performance concrete (HPC). The alum sludge was introduced at various weight percentages concerning cement and fine aggregate 0%, 3%, 5%, 7%, 10%, and 15%. The results revealed that the compressive strength of the concrete rapidly decreased as the amount of cement replaced with AS increased. Subsequently, Superplasticizers were used for more performance. This content was varied (2%, 3%, 4%, 5%, and 6% by wt% of cement). It was found that the concrete with 5% AS and 2% superplasticizers cement replacement demonstrated improved compressive strength and splitting tensile strength at all ages, compared with the control concrete. Ultimately identified the optimal level required for the paving block to comply with standards and be cost-effective.

Keywords: Alum Sludge, High-performance Concrete, Compressive Strength, Splitting Tensile Strength, Water Absorption, S.P-superplasticizers