

## Documents

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**Effect of Bottom Ash on Rheological and Physico-Mechanical Properties of High Early Strength Self-Compacting Brick (HES-SCB)**

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**Abstract**

This study delves into the environmentally responsible application of bottom ash (BA), a prevalent waste product from coal combustion in power plants, which constitutes 15% – 25% of total coal ash in Malaysia. The improper disposal of BA is a significant environmental hazard, with the potential to contaminate groundwater and soil, thereby affecting biodiversity and land usability. This study focuses on the novel application of BA in high early strength-self compacting brick (HES-SCB), known for its rapid strength development and satisfactory flow properties, eliminating the requirement for mechanical vibration during placement. The research meticulously evaluates the substitution of BA for sand in HES-SCB, with a special focus on its influence on the fresh and physico-mechanical characteristics of the bricks. Among various mixes, the 20% BA replacement level emerged as the most significant, demonstrating a superior balance of rheological and physico-mechanical properties, thereby underscoring BA's viability as a sustainable fine aggregate substitute in HES-SCB production. This mix is designated as HES-SCB due to its distinct properties: achieving high early strength essential for rapid construction processes and exhibiting self-compacting qualities that ensure ease of use and uniformity in application. © Nazirah Mohd Apandi et al, 2025

**Author Keywords**

Bottom ash; High early strength; Physico-mechanical properties; Self-compacting brick; Sustainable construction

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