Filler effect and pozzolanic reaction of ground palm oil fuel ash

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Abstract: This research examines the compressive strength of mortar and how the filler effect and pozzolanic reaction of ground palm oil fuel ash (POFA) contribute to this strength. POFA and river sand were ground to three different particle sizes and used to replace Type I Portland cement at 10-40% by weight of binder to cast the mortar. The compressive strengths of ground POFA and ground river sand mortars were determined at various ages between 7 and 90 days. The results showed that the compressive strength of mortar due to the filler effect of ground river sand was nearly constant during the 7-90 day period for a specified replacement rate of cement. However, the compressive strength of mortar due to the filler effect tended to increase slightly with increased cement replacement. The pozzolanic reaction of ground POFA increased with increasing particle fineness of ground POFA, replacement rate of cement, and age of the mortar. The compressive strength contribution from the pozzolanic reaction of ground POFA was much more pronounced than the contribution from the filler effect when the smallest sizes of both materials were considered.

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