

Effect of coal bottom ash as partial sand replacement for lightweight aggregate concrete

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ABSTRACT

Environmental degradation due to disposal of waste namely coal bottom ash waste from thermal power plant, clinker waste of palm oil mill and river sand mining activity for concrete production need to be resolved. Palm oil clinker lightweight concrete with zero granite aggregate that been produced in effort to reduce dependency of natural stone consumption has been further explored its potential in this research. Thus, the present research investigates the compressive strength, water absorption and acid resistance of lightweight aggregate concrete containing coal bottom ash as partial sand replacement. Five types of concrete mixes were produced using 0%, 10%, 20%, 30% and 40% coal bottom ash as fine aggregate replacement. After curing process, specimens were immersed in acid hydrochloric solution before subjected to compressive strength testing. Findings show that all specimen experience strength reduction after exposed to acidic environment. On overall, the use of coal bottom ash influences the durability performance of lightweight aggregate concrete.

KEYWORDS

Acid resistance; Durability; Industrial waste; Partial fine aggregate replacement; Sustainable concrete

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