عنوان مقاله:

Sustainable roller-compacted concrete pavement; a solution to reduce carbon dioxide footprint

محل انتشار:

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خلاصه مقاله:

Abstract Modern civil engineering projects put more emphasis on sustainable and environmentally friendly construction. Concrete pavements contribute a considerable amount of carbon dioxide (CO2) to the atmosphere due to the use of Portland cement. Among different kinds of concrete pavement, Roller Compacted Concrete Pavement (RCCP) is a durable, economical, and eco-friendly type of concrete pavement. However, mass production of RCCP for infrastructure development may lead to a large amount of CO2 emissions. Therefore, it is very vital to identify a substitution for the cement to make a more cost-effective and environmentally friendly RCCP. In this study, the possibility of using fly ash (FA) and ground granulated blast-furnace slag (GGBFS) as cement replacement in RCCP is investigated. The use of FA and GGBFS in RCCP mixtures reduced the global warming potential (GWP) up to around 40%. Also, the use of FA and GGBFS in RCCP have had a great effect on compressive strength, water absorption anddensity. Therefore, it can be concluded that durable and eco-friendly RCCP with suitable hardened state properties with low CO2 production could be produced by incorporating FA and GGBFS as a cement .replacement by 45% and 30%, respectively

کلمات کلیدی:

Roller Compacted Concrete Pavement, sustainability, Fly ash, ground granulated blast-furnace slag, CO2 emissions