

Life Cycle Analysis of Using Brick Waste in Road Technology

Authors : Mezhoud Samy, Toumi Youcef, Boukendekdji Otmane

Abstract : Nowadays, industrial by-products and waste are increasing along with public needs increase. The engineering sector has turned to sustainable development by emphasizing the aspects of environmental and life cycle assessment as an important objective. Among this waste, the remains of the red bricks (DBR) may be an alternative worth checking out, given their availability and abundance at the construction sites. In this context, this work aims to valorize DBR in the concrete road (BR). The incorporation of DBR is carried out by the substitution of the granular fractions of mixtures from noble quarry materials. The experimental plan aims to determine the physico-mechanical performance and environmental performance of manufactured BRs from DBR with a cement content (6.5%) and compared with a control BR without DBR. The studied characteristics are proctor, resistance to compression, resistance to flexural tensile at 7 and 28 days, modulus of elasticity, and total shrinkage. The results of this experimental study showed that the characteristics of recycled aggregates (DBR) are lower than those of natural aggregates but remain acceptable with respect to regulations. Results demonstrate the mechanical performance of BR made from less DBR than the control BR without DBR but remains appreciable and encourage their jobs in the road sector. Recycled aggregates can constitute an interesting economic and ecological alternative but require elementary precautions before any use.

Keywords : life cycle assessment, brick waste, road concrete, performance

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