

Steel Aggregate Swelling Potential In Layers Of Road Pavements

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Abstract

Steel slag, one of the by-products from the production of steel, is crushed, sized properly, and treated in relation to its volume swelling potential to be used as a highly resistant aggregate called steel aggregate or steel gravel. This study analyzes the swelling mechanisms of steel aggregate. By laboratory testing, the volumetric swelling potential in samples of steel aggregate and samples of lateritic soil and steel aggregate mixtures was determined in two different proportions: 90% soil +10% steel aggregate (M9010); and 80% soil +20% steel aggregate, by weight (M8020). This analysis is part of a project that assesses the feasibility of the utilization of this coproduct in the construction industry in Brazil. Average swelling values of 0.92, 0.73, and 0.61% were obtained from the steel aggregate samples and from the M9010 and M8020 mixture samples, respectively. According to Brazilian and Japanese standard volumetric swelling limits, all tested materials are suitable for the use of paving as an alternative to the use of natural aggregates.

Keywords

Aggregates; Construction Industry; Mixtures; Pavements; Slags; Soil Testing; Soils; Swelling.