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Mechanical Properties of Unbound Perlis Limestone and Granite Aggregate Mixture for Road Application

Abstract

The most important component of road construction is aggregate. As 70-80 percent of aggregates are used in road construction, the majority of aggregates used in Malaysia's road construction are granite aggregates. Due to the lack of substitutes for aggregates and the rise in demand, this may hinder the development of the road construction process. This research seeks to identify high-quality alternatives to granite aggregate that can be utilised to their full potential. Since there is no granite in Perlis, Malaysia, the mechanical properties of the Perlis limestone aggregates were evaluated to ensure that they can be used alone or in combination with granite aggregates in road construction. The AIV, ACV, and LAA tests were conducted on both individual samples of Perlis limestone and granite aggregate, as well as combinations containing various percentages of each. In all tested parameters, the results indicated that Perlis limestone aggregates were superior to granite aggregates. In addition, when Perlis limestone and granite were combined in an unbound state with the presence of limestone, the strength and resistance to abrasion and impact increased linearly. It is believed that incorporating Perlis limestone into unbound layers of road construction, such as roadbase and subbase, will enhance their performance.