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Testing of Physical-Mechanical Properties of Blue Limestone Used in Pavements in Trinidad and Tobago: A Preliminary Study

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Abstract: *Aggregates used in pavement construction need greater strength to withstand the load of crushing, degradation and disintegration. It is of high importance to analyse the toughness and abrasion resistance of the aggregate prior to its usage. In Trinidad and Tobago, blue limestone is mainly used as source for these aggregates. This blue limestone has two varieties, namely layered limestone and massive limestone. The layered variety contains soft mica rich layers, which are sandwiched between hard calcite rich layers. Micro-structure (fabric) and other geological features play important role in defining the resistance and abrasion resistance of these aggregates. In present study, it was found that aggregate crushing and aggregate impact values were nearly two times lower in the massive limestone than the layered limestone. Whereas, the loads required for the 10% fines were more than two times lower in the layered limestone than the massive quality. However, it was found that the specific gravity values were different in layered and massive limestones (2.3 and 2.5 respectively). Moreover, these measured mechanical properties were combined into a single characteristic, Toughness Index (TI), as performance indicator of overall quality of aggregates. The TI values also suggested that the layered limestones were weaker than the massive limestone. The layered limestones did not satisfy the needs to be aggregates of international quality for pavement construction. However, the massive limestones were found suitable for this purpose.*

Keywords: *Aggregates, pavement construction, mechanical properties, toughness index*