

INFLUENCE OF CRUSHED AND NATURAL AGGREGATE PROPERTIES ON TENSILE STRENGTH OF HMA MIXTURES

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ABSTRACT

Mineral aggregate constitutes approximately 95 % of hot-mix asphalt (HMA) by weight. The mineral aggregate is made predominantly of coarse aggregate. Characteristics of the coarse aggregate such as particle size, shape and texture influence the performance and serviceability of hot-mix asphalt pavement. Flat and elongated particles tend to break during mixing, compaction and under traffic. Therefore, aggregate properties are considered to be very important factors that should be included in the mix design of asphalt pavement to avoid premature pavement failure. The objectives of this research is to: (1) evaluate the influence of coarse aggregate properties selected from different sources in Egypt on the tensile strength of HMA mixes, and (2) evaluate the effect of natural aggregate on HMA properties. To achieve these goals three sources of aggregate were selected from different locations in Egypt to encompass as wide range as possible. The aggregate characteristics included in this study are percentages of flat and elongated particles, percentages of fractured faces and particle index. The strength of mixes was evaluated using the indirect tensile, stability and flow tests. The analysis of the results indicated that the properties of aggregate significantly affect the indirect tensile strength and stiffness of mixtures.