

THERMAL SUSCEPTIBILITY OF SOME HOT MIX ASPHALT WITH LIME AND POLYPHOSPHORIC ACID

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ABSTRACT

Damage to asphalt mixes by environmental condition, construction procedures and traffic loading is a critical problem to be solved. Combination of these factors leads to severe and premature distress occurrence, resulting in potholes in asphalt pavement wearing course. Additives and asphalt modifiers have been used by researchers in the search of mixes with lower thermal susceptibility. Therefore, this study evaluated the effects of the incorporation of hydrated lime at three contents and polyphosphoric acid, also at three contents, on the thermal susceptibility of asphalt mixes. So, the experimental program resulted in 9 experimental conditions with 4 replicates for each condition, or 36 specimens. The resilient modulus test was performed on specimens at three temperatures, 10, 25 e 40 °C. In order to analyze variations on asphalt mixes recuperation, it was evaluated a secondary parameter obtained from resilient modulus related to the type of recuperation of the dense-graded hot mix asphalt mixes under cyclic loads. The resulting values of the resilient modulus showed that the binder modification with polyphosphoric acid increased the mix stiffness and flexibility and it was also noted that the effect of lime addition to the mix has little influence on the mixture stiffness. However, the combination of both modifiers, in certain contents, can be interesting.

KEY WORDS: Thermal susceptibility, HMA mixtures, polyphosphoric acid, lime