

Investigating the Properties of Nylon Fiber Reinforced Asphalt Concrete

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Abstract : The performance of asphalt pavements is highly dependent on the mechanical properties of asphaltic layers. Improving the mechanical properties of asphaltic mixtures by fiber reinforcement is a common method. Randomly distribution of fibers in the bituminous mixtures and placing between the particles develop reinforcing property in all directions in the mixture and improve their engineering properties. In this research, the effects of the nylon fiber length and content on some engineering properties of a typical binder course asphalt concrete have been investigated. The fibers at different contents of 0.3, 0.4 and 0.5% (by the weight of total mixture), each at three different lengths of 10, 25 and 40 mm have been used, and the properties of the mixtures, such as, volumetric properties, Marshall stability, flow, Marshall quotient, indirect tensile strength and moisture damage have been studied. It is found that the highest Marshall quotient is obtained by using 0.4% of 25mm long nylon fibers. The results also show that the indirect tensile strength and tensile strength ratio, which is an indication of moisture damage of asphalt concrete, decreases with increasing the length of fibers and fiber content.

Keywords : asphalt concrete, moisture damage, nylon fiber, tensile strength,

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