

Evaluation of Ultrasonic Techniques for the Estimation of Air Voids in Asphalt Concrete

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Abstract : One of the important factors in the design of asphalt concrete mixes is the accurate measurement of air voids and their variable distribution. Both can have significant impact on long and short term fatigue and creep behaviour under traffic. While some simple methods exist for overall evaluation of air voids, measuring air void distribution in asphalt concrete is very complex, involving expensive techniques such as X-ray methodologies. The research reported in the paper investigated the use of non-destructive ultrasonic techniques as an alternative to estimate the amount of air voids and their distribution within asphalt samples. Seventy-four Standard AC-14 asphalt samples made with three types of bitumen; Multigrade, PMB and C320 were analysed using ultrasonic techniques. The results have illustrated that ultrasonic testing has the potential of being a rapid, accurate and cost-effective method of estimating air void distribution in asphalt.

Keywords : asphalt concrete, air voids, ultrasonic, mechanical behaviour

Conference Title : ICTHE 2017 : International Conference on Transportation and Highway Engineering

Conference Location : Melbourne, Australia

Conference Dates : February 02-03, 2017