

BEHAVIOR OF IMPREGNATED PAVING GEOTEXTILES: STUDY OF OPTIMUM TACK COAT RATE

N. S. Correia, S.M.ASCE¹; Jorge G. Zornberg, M.ASCE² ; and B. S. Bueno³

Abstract: Paving geotextiles are becoming increasingly used in highway construction overlays in order to recover cracked asphalt pavements. In antireflective cracking systems, the geosynthetic should have the ability to absorb and retain the asphalt tack coat to effectively bond the system to the existing pavement and overlay. However, the type and rate of tack coat impregnation can significantly influence the reinforcement mechanism, potentially leading to early overlay failure. Stiffness has been identified as the governing property to quantify the potential contribution of the interlayer to the asphalt overlay strength. In addition, the overall behavior of reinforced asphalt pavements may also be incorporated with an increased tensile strength of the geosynthetic. With the purpose of quantifying the often significant changes in the mechanical behavior of paving geosynthetics that occur after bitumen impregnation, a series of tensile strength tests were conducted in this study using nonwoven geotextiles with different rates of asphalt emulsion. Evaluation of the geosynthetics changes in tensile strength and tensile stiffness with increasing tack coat rates provides insight on the identification of an optimum bitumen dosage for these materials. A tack coat rate equal to the asphalt retention capacity was specifically evaluated in this study and was generally found to be the optimum rate that leads to the highest tensile strength and stiffness of impregnated of geotextiles.

Full reference:

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