

INNOVATIVE DESIGN STRATEGY INCORPORATING TEMPERATURE EFFECT ON THE PENNSYLVANIAN PAVEMENTS

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ABSTRACT

The objective of this research is to develop an innovative design strategy capable of handling the temperature variations in the asphalt concrete layers. This strategy handles weak soils specific to Pennsylvania using a wide variety of variables consisting of standard deviations, traffic, MR, Delta PSI, surface course, base course, and subbase materials. For all designs, the surface course, and the base course contain minimum thicknesses as a function of traffic. The efficacy of expansive soil-limestone as subbase material was evaluated by designing and estimating flexible pavement thicknesses. The modified strength coefficients were used for designing the pavement sections in Pennsylvania. Based on this paper, it can be concluded that the subbase thickness has (i) a linear relationship with the structural number, and (ii) a nonlinear relationship with the change in serviceability index and the resilient modulus. In this innovative design strategy, the effect of temperature is built into the structural number. This is achieved by appropriately modifying the strength coefficient for the asphalt concrete layer.

KEYWORDS: *Expansive Soil, Innovative Strategy, Pavement Performance, Regression Analysis, Temperature, Effect*

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