

The Usage of Treated Plastic as Additive to Improve the Asphalt Mixture's Performance by Using Dry Mix Method

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ABSTRACT

Nowadays, road damage issue become the norm due to increment of traffic load and traffic volume. It shortens the service life of asphalt mixtures and increase the cost of maintenance. One way to reduce the issue is by using polymer additive in asphalt mixture. Treated Plastic is one type of polymer additive made of plastic bag (Polyethylene). The main purpose of this research is to determine the improvement of asphalt mixture's performance incorporating Treated Plastic (TP) as additive in terms of stability, stiffness, fatigue cracking, stripping and rutting. The mechanical properties of asphalt mixes that include various percentages of TP (0%, 0.25%, 0.5%, 0.75%, 1%, 2% and 3%) were calculated and assessed with laboratory tests. 0.75% by weight of total mix of TP was found to be the optimum amount. The outcomes were analyzed by Marshall Stability and Flow, Resilient Modulus, Tensile Strength Ratio and Hamburg Wheel Tracker test. As the results shown, the addition of TP gave significant improvement to the stability and stiffness of asphalt mixture. 0.75% of TP was selected as the optimum percent content with percent improvement about 100, 73 and 25% for fatigue cracking, rutting and stripping resistance respectively. Hence, 0.75% of TP improved the resistance of rutting and stripping but susceptible to fatigue cracking.

KEYWORDS: Treated Plastic, Hot Mix Asphalt, Rutting, Stripping, Cracking, Dry Mix Method.

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