

Enhancing High Temperature Stability of Asphalt to Eliminate Corrugation

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Asphalt is widely used as the road pavement material. Warmer conditions in tropical countries like Sri Lanka, leads to corrugation of asphalt pavements. The main objective of this research is to enhance the thermal stability of hot mix asphalt to eliminate corrugation.

Carbon black (N330) was chosen as the modifier to improve the stability of asphalt at elevated temperature.. Carbon black increases the softening point of the asphalt binder (bitumen) when it mixes with it. Variation of carbon black amount significantly affects the properties of the binder such as consistency, flow behaviors, ductility etc. It was found that carbon black has a better bonding than fine aggregates with asphalts mix. The high temperature (above 65°C) stiffening effect of the asphalt is highly filler dependent. The result shows that, when carbon black is added as the filler (3.8%), stability of the asphalt is increased, and it remains above the required specification limit of road pavement at 70°C temperature.

Key words: Asphalt, Pavements, Corrugation, Carbon black, Filler, Bitumen, Stiffening