

Recycled Asphalt Pavement with Warm Mix Additive for Sustainable Road Construction

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Abstract : The recent hike in raw materials costs and the quest for preservation of the environment has prompted asphalt industries to adopt greener road construction technology. This paper presents a study on such technology by means of asphalt recycling and use of warm mix asphalt (WMA) additive. It evaluates the effects of a WMA named RH-WMA on binder rheological properties and asphalt mixture performance. The recycled asphalt, obtained from local roads, was processed, fractionated, and incorporated with virgin aggregate and binder. For binder testing, the recycled asphalt was extracted and blended with virgin binder. The binder and mixtures specimen containing 30 % and 50 % recycled asphalt contents were mixed with 3 % RH-WMA. The rheological properties of the binder were evaluated based on fundamental, viscosity, and frequency sweep tests. Indirect tensile strength and resilient modulus tests were carried out to assess the mixture's performances. The rheological properties and strength performance results showed that the addition of RH-WMA slightly reduced the binder and mixtures stiffness. The percentage of recycled asphalt increased the stiffness of binder and mixture, and thus improves the resistance to rutting. Therefore, the integration of recycled asphalt and RH-WMA can be an alternative material for road sustainable construction for countries in the tropics.

Keywords : recycled asphalt, warm mix additive, rheological, mixture performance

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