

Evaluation of Feasibility of Polymer Modified Asphalt Binders for Sri Lankan Conditions

H.S.Sitinamaluwa¹ and W.K.Mampearachchi²

Polymer modification of asphalt binders has increasingly become the norm in designing optimally performing pavements. Pavements with polymer modification exhibits greater resistance to permanent deformation and thermal cracking, and decreased fatigue damage and temperature susceptibility. Polymer Modified binders (PMB) are effectively used in many countries, such as USA, Europe, Australia and India over last three decades to construct pavements with the superior performance and Extended service life.

In Sri Lanka 80/100 and 60/70 penetration grade bitumen has been used and it is observed that both binders cannot perform satisfactorily due to their temperature susceptibility. Modification of bitumen decreases the temperature susceptibility and therefore now it's time to Sri Lanka to move forward from conventional binders to modified binders.

Initial step of this research was to study about functionality of polymer modified bitumen and evaluating the need of polymer modified binders for Sri Lanka. After reviewing available data, it was identified that most suitable polymer modifiers for Sri Lanka are SBS, EVA, SBR, PE and Crumb rubber. Modification up to 4% - 8% of polymer is recommended and the modification level can vary with the desired properties of binder. That depends on the factors such as temperature, moisture level and other climatic conditions of the area and also traffic level.

PMB has to be characterized differently from penetration grade bitumen and the improved performance properties are difficult to demonstrate with conventional empirical rheological tests. This research is focused on reviewing the available PMB specifications and finally come up with a set of required properties for modified binders relevant to Sri Lankan roads, required testing methods and handling procedures for PMB. The final outcome of this research would become a good initiating point for local highway engineers to move from conventional binders to modified binders.

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Authors Details;

1. Research Student, Department of Civil Engineering, University of Moratuwa, Katubedda, Sri Lanka. hansiuom@gmail.com, 0112 650 567 (ext. 2023)
2. Senior Lecturer, Department of Civil Engineering, University of Moratuwa, Katubedda, Sri Lanka. wasanthak@civil.mrt.ac.lk, 0112 650 567 (ext. 2024)