Review of Grading Systems for Asphalt Binders in Hot Mix Asphalt Pavements

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Asphalt binders are typically categorized by one or more grading systems according to the physical characteristics. Traditional grading systems such as penetration and viscosity grading system and the new method, Superpave grading system are available currently.

While some developed countries are using the latest Superpave grading system, most of the other countries are still rely on the empirical Penetration grading system. Sri Lanka also has not moved even to the Viscosity grading system. Some developed countries such as USA, UK are conducting many researches under those areas. India has developed their own grading system to comply with their climatic conditions as well as its location. A study relevant to the Sri Lankan conditions based on pavement performances, currently using grading system and binder grades, the suitable binder grades will be carried out herein.

A road investigation on pavement distresses is carried out to evaluate the pavement performances with the change of climate and the binder grade used. Current practice in the industry when dealing with asphalt binder including the property variations, temperature susceptibility, testing methods, etc is evaluated with the test reports collected from the industry and a survey conducted. The suitable binder grades for different areas of the country are identified then, according to the climatic conditions especially the Superpave prediction algorithms, used to convert the air temperatures into pavement temperatures are verified to Sri Lankan climatic conditions.

The research identified that binder grade using for the construction make a significant effect on pavement distresses. Even though the literature, reviews that the Superpave grading system is most suitable, Sri Lanka has many restrictions to move even to the Viscosity grading system. The research clearly shows that industry do not maintain even the current using Penetration Grading system. From the analysis of binder grades for different areas, the requirement of different binder grades for different zones are identified. Moving to a better binder grading system while maintaining its standards and changing the binger grade with the climatic conditions as identified is recommended here in.

Key words: Asphalt Binder, Grading, Pavement Temperature, Performances, Penetration, Viscosity, Superpave