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Title :

**Effects of coated aggregate properties using treated crumb rubber and plastic on the mechanical performance of asphalt mixtures**

**Maximum Duration : 24 month**

Start Date :

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## **EXECUTIVE SUMMARY**

The rapid growth in traffic demands in developing countries, like Malaysia, is often attributed to premature pavement failure due to permanent deformations caused by heavy traffic loads repeatedly and continuously, leading to unnecessary maintenance. Consequently, road agencies and researchers have redesigned and reconstructed conventional pavement to perform better and last longer, including the use of crumb rubber and plastic additives. However, the addition of crumb rubber and plastic as additives into the mixture pavement utilizing the dry process created a major issue in terms of workability and led to inconsistent performance and moisture damage. Hence, the development of treated crumb rubber and plastic had been introduced. Both additives were treated using a physical treatment that upgraded the surface of additives with more porous and higher void compared to untreated additives. This upgraded surface increased the reaction area between aggregates and binders, thus making a dry mixing process more convenient. Although treated crumb rubber and plastic improved mixture performance compared to untreated crumb rubber and plastic mixtures, the mixtures are still prone to moisture damage and fatigue cracking, respectively. The parameters that influence mixture performance are also questionable, either the physical properties of treated additives coating aggregate surfaces or the reaction between additives and binder during the mixing process. Additionally, aggregate properties also a major role in contributing to the mixture strength. Therefore, this research is significant to evaluate the effects of aggregate properties coating with different percentages of treated crumb rubber and plastic on the mechanical performance of the mixtures. The coated aggregate properties using the combination of treated crumb rubber and plastic also will be carried out, with the expectation that the combination of these two different types of polymer will increase the aggregate properties and overcome the issues of moisture damage and fatigue cracking in mixtures.