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## **Design of Asphalt Mixtures Containing RAP by Balanced Mix Design (BMD) Method**

*The mix design of asphalt mixtures is one of the most important factors that affect their performance. Given the importance of the performance assessment of asphalt mixtures and volumetric parameters, a new method called balanced mix design (BMD) had been created. This method considers volumetric parameters as the initial criterion. The ultimate criterion to determine an appropriate range for the optimum bitumen percentage is the proper rutting and cracking performance of the asphalt mixture. In this study, five different asphalt mixture designs were first investigated using the Superpave method, using low (25%) and high (50%) percentages of RAPs and vegetable oil as a recycling agent. Then the mixtures were designed using the BMD method considering three different bitumen contents for each mixture. The Hamburg Wheel Tracking and I-FIT tests were performed to assess the rutting and cracking resistance, respectively. The results of this study show that the optimum binder content (OBC) obtained by BMD method is different from the Superpave method. The highest discrepancies are observed when 25% and 50% of the RAP materials are used without rejuvenator. In these mixtures, the results show that the OBC obtained by the BMD method compared to the Superpave method for mixtures containing 25 and 50% RAP without rejuvenator increased by 9.56 and 22.18%, respectively. In terms of performance, the percentage of OBC by the Superpave method is not suitable for mixtures containing RAP and rejuvenator.*

**Keywords:** Balanced mix design (BMD), Reclaimed asphalt pavements (RAPs), Rejuvenator, Superpave, Hamburg Wheel Tracking test, Cracking.

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