Engineering Properties of Porous Asphalt Mixture Incorporating Kenaf Fiber

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Abstract. Porous asphalt (PA) is one type of flexible pavement known as pavement that has a permeability capability designed to control rainwater and reduce surface runoff. However, the structure is subject to damage from cracking, grooves, stripping and rapid aging under the effects of repeated vehicle loads on the road, hot weather and heavy rain. The use of kenaf fiber benefits in an effort to increase the strength, lifespan and durability of road pavements because kenaf fiber tends to be used for crack control and strengthens the path by resisting cracking stress. Therefore, the purpose of this study was to evaluate the performance of porous asphalt incorporating kenaf fiber and to determine the optimum fiber content of kenaf fiber modified porous asphalt. The mixtures containing varying percentages of kenaf fiber were evaluated to check which samples provided the best performance. The laboratory test as per requirement was carried out which are LA Abrasion, Resilient Modulus, Marshall Stability and Flow and Dynamic Creep. The results showed that the addition of 0.3% kenaf fiber gave the lowest value of abrasion and kenaf fiber content contributed the highest value of Resilient Modulus. While the kenaf fiber content for Marshall Stability is 0.5% and the Dynamic Creep is 0.4%. Using ranking method, the optimum fiber content can be identified which is 0.3%. The modified PA mixture with kenaf fiber resulted in improved performance of PA as a road surface material. In conclusion, asphalt mixtures containing kenaf fiber improved the stability and strength of the mix.

INTRODUCTION

Porous asphalt (PA) is a highly porous and permeable asphalt surface that serves as a stormwater management system. The mixes include more coarse particles than fine particles. This porous asphalt is different from other asphalt types. Water can enter the soils underneath the pavement by penetrating the pavements from the surface into a recharge bed. Natural fiber has a lot of benefits and a significant advantage over typical addictive materials like as