



Study the Using of Reed Mats in Asphalt Pavement Layers

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Abstract

During the service life, the asphalt pavement layers subjected to various detrimental types of distresses such as permanent deformation, fatigue, stripping and shoving which lead to the complete failure of the pavement. In Iraq roads the permanent deformation (rutting) is the importance distresses which cause impact on the highway performance and reducing the service life of the pavement. The research aims to utilize locally available materials and environment friendly as reinforcement layer. The program of this research include preparing asphalt mixes represent surface layer by using locally available materials and using the reinforcement layer which made of reed. The permanent deformation test has been done with three temperatures (40°C, 50°C and 60°C) and four locations of the reed mats. The test results of the wheel- Track for the rutting measurement showed that the rut depth decrease in reinforcement layers as compared with unreinforcement layers for all temperature testing. The reed netting embedded bottom and middle of wearing layer has the best amount of improvement (75%, 84% and 85%).

Keywords: Asphalt Pavement; Distresses; Permanent Deformation; Reed; Wheel-Track; Improvement.

1. Introduction

The asphaltic paving mixture during the service life it is normally subjected to various detrimental types of distresses. These distresses are caused by weather, load, construction practices and deceleration of vehicle at checkpoints, and deficient materials. Some of these serious failure includes permanent deformation or rutting, fatigue, stripping and shoving which lead to the complete failure of the pavement. Such types of failures reduce the performance of asphalt pavements, which does not cause bad ride quality to motorists, but also are caused the higher cost at life cycle, some of the mentioned distresses are related to the asphalt cement binder and it can be controlled significantly by modifying the material with chemical additives [1]. Pavement reinforcement recently became an important part of designing and rehabilitating pavement systems which improve pavement performance, increase the service life, and reduce its current premature failures [2]. Base or subbase reinforcement is defined in flexible pavements to support vehicular traffic over the pavement structure, improve the service life and obtain equivalent performance with a reduced structural section [3]. Signs of distresses in the roads due to high traffic loads and the harsh environment. The environmental variations, especially between day and night as well as between summer and winter, are greatly affected the durability of asphaltic pavement. During summer the high pavement temperature that reduces the stiffness of paving mixture that results in pavement deformation[4]. In Iraq, for a little recent year after construction the pavements, permanent deformation distress was appeared at several locations in the highways, because of the increasing of traffic loading, the hot claimant condition during summer days, and poor quality control as shown in Figure 1 [5].

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