

USE OF GLASS FIBERS IN STONE MASTIC ASPHALT FOR THIN ASPHALT SURFACING

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July 2020

DECLARATION

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Abstract

Sri Lankan road construction sector is dealing with ever depleting construction material problems, especially finding good quality aggregate has become more difficult for projects over the past few years. The accelerated development demands a lot of natural resources and the extraction of resources like aggregate on a mass scale pose a significant threat to the environment. Using the available resources sparingly and optimally is the way forward to brace the scarcity of construction material we are about to face.

There are many projects in progress to upgrade low volume roads. But the designs are done using a 50mm asphalt wearing course, which is a very conservative approach given the traffic movements of the roads are very much limited. For the traffic levels in such roads, by using a thin asphalt layer which is between 25mm-35mm the same function could be achieved while cutting down construction costs for the pavement significantly. The aim is to adopt a mix that can be laid in thin layers, which performs well in Sri Lankan conditions.

Therefore a Stone Mastic Asphalt(SMA) mix design was adopted, and using 60-70 bitumen and added glass fiber laboratory trials were carried out to find the optimum bitumen contents, optimum fiber contents and fiber lengths . Glass fiber was selected as the fiber due to good bitumen coating ability and availability locally. Then indirect tensile strength test was carried out for Marshalls casted in order to observe the structural properties behavior when fibers are incorporated

By analyzing the results, it is concluded that a successful mix which complies with the standard can be achieved with a mix with 6.5% bitumen to weight and by adding 1.6% to 2% of glass fiber to the mix.

Keywords: Thin Asphalt Pavements, Low Volume

Acknowledgment

I would like to express my sincere gratitude to my supervisor Prof. W.K. Mampearachchi for the guidance provided throughout this research. The Road Development Authority, Director Research and Development Dr Mrs. H.L.D.M.A Judith and staff should be mentioned for the support given in conducting laboratory testing

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List of Abbreviations

Abbreviations

AC
ESA
SMA
VA
VMA

Description

Asphalt Concrete
Estimated Number of Standard Axels
Stone Mastic Asphalt
Air Void
Voids in Mineral Aggregate