Thin Lift Asphalt Concrete Pavements for Low Volume Roads

P.M.A.K Udayakantha[1] and W.K Mampearachchi[2]

Abstract

Sri Lankan road construction sector is dealing with ever depleting construction material problem specially finding good quality aggregate has become more and more difficult for projects over the past few years. The accelerated development demands lot of natural resources and the extraction of resources like aggregate in mass scale also pose a great 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 50mm asphalt wearing course which is a very conservative approach given the traffic movements of the roads are very much low. For the traffic levels in such roads by using a thin asphalt layer which is between 25mm-35mm the same design life could be achieved while cutting down costs significantly. The aim is to adopt a mix which can be laid in thin layers and perform well in Sri Lankan conditions.

To determine the characteristics and performances of thin layers first a suitable 10mm aggregate mix should be selected, for that mixes in section 404 of VicRoads August 2018 were selected and SMA10N mix was selected from the available mixes due to replicatability of the mix using available plant hot bins. Then Marshals were casted using the average line of the aggregate gradation and mixing with 60-70 penetration grade bitumen and tested for their properties. It was evident that though all other properties were satisfied except the VMA values, the specification requires addition of cellulose fibres to the mix but literature and availability prompt the use of glass fibers which exhibits superior properties. Addition of glass fibers 0.1%-0.2% can increase the air voids and VMA values while retaining the other parameters in specification range. The glass fibers can be used to manipulate mix properties in order to get desired properties and a satisfactory mix. The addition of fibers may also increase fatigue life and it should be checked using indirect tensile test.

Keywords: Thin Asphalt, Rural Roads

Author Details

1. MEng Student, Department of Civil Engineering, University of Moratuwa, Sri Lanka. asiraudayakantha@gmail.com

2. Professor, Department of Civil Engineering, University of Moratuwa, Sri Lanka. wasanthak@uom.lk