

EVALUATION OF TIRE EFFECT ON TOP DOWN CRACK  
IN ASPHALT PAVEMENT IN SRI LANKA

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## Evaluation of tire effect on asphalt pavement in Sri Lanka

### Abstract:

While considering Sri Lankan Road network, several failures can be seen especially cracking in Sri Lankan road network. The main objective of this research is to determine whether effect of tires is a reason for the longitudinal crack in roads in Sri Lanka. Under literature review wheel loads of trucks mainly contribute to fatigue crack and permanent deformation. The tire pavement contact pressure distribution is significantly affected by tire inflation pressure, tire type, tire load and tire tread pattern. Two roads having longitudinal cracks were selected for this case study with varying composition of heavy vehicles. Traffic distribution of the roads was investigated. The survey conducted among tire sellers found that bias tires are widely used in heavy vehicles in Sri Lanka. It was found that in heavy vehicles radial tires are mostly used for the front axle and bias tires are mostly used for the rear axle which distribute significant amount of load to road surface. The core samples extracted from crack locations on the pavement exhibited that cracks originated from the top surface of the pavement (top down cracking) and asphalt layer thickness are not uniform throughout the road. The result of extraction test done for the core samples show that some samples are not in standard mixtures. From the literature review it found that Climatic conditions, traffic, ageing, structure and construction quality are the main causes pointed out for the initiation and propagation of top down cracking. And also usage of radial truck tires can be affect to top down cracking. Due to less usage of radial truck tires in Sri Lanka it might not be a main reason for such failure. Sri Lanka is a developing country having poor construction qualities. It seems that poor construction quality might be a significant reason for such failures in selected road section in Sri Lanka.

Key words: Top-down cracking, radial tires, bias tires



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## DEDICATION

To All Who guide me to the Success.



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## LIST OF ABBREVIATIONS

Abbreviation	Description
TDC	Top Down Crack
AC	Asphalt Concrete
HMA	Hot Mix Asphalt
RDA	Road Development Authority



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