

A Review on Use of Waste Rubber Tyres In Flexible Highway Pavements

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Abstract Plastics are user friendly but not eco-friendly as they are non-biodegradable. Generally it is disposed by way of land filling or incineration of materials which are hazardous. The better binding property of plastics in its molten state has helped in finding out a method of safe disposal of waste plastics, by using them in road laying.

Index Terms- non-biodegradable material, road type, tests.

I. INTRODUCTION

Scrap tyres form a major part of the world's solid waste management problem. Each year the UK alone produces around 30 million waste tyres with 1 billion being produced globally. Almost half of them are landfilled or stockpiled with the rest being recycled, exported and disposed of illegally. In Europe, governments are attempting to find alternative uses of scrap tyres as new European Union Landfill Directives have already prohibited the disposal of whole tyres to landfill from 2003 and will prohibit land filling of shredded tyre by 2006 (Hird et al, 2002). If alternatives to landfill disposal are not found, disposal costs will increase and illegal dumping or inadequate storage will continue to worsen. The fire risk associated with illegal dumps has the potential to cause significant environmental harm. In addition, road traffic is predicted to increase by 17% in the UK alone between 2000 and 2010 (DETR 2000) and, consequently, the number of post-consumer tyres arising in UK is likely to increase.

Within the expanding recycling market, only two applications, to date, have shown the potential to use a significant number of scrap tyres, (i) fuel for combustion and (ii) crumb rubber modified (CRM) material for asphalt paving. Although combustion can consume millions of tyres, it is not an ideal environmental solution. The only remaining potential market for using crumb rubber is CRM material for asphalt paving. In the last two decades, utilisation of scrap tyres as a road construction material has

become a popular means to minimise this environmental pressure. Considerable work has been done in various countries in terms of the utilisation of scrap tyres and there is a long list of published literature dealing with different aspects of this challenging material.

II. LITERATURE REVIEW

Bangalore Process (2002), study regarding plastic roads presented. A 25 km plastic road was laid in Bangalore. The plastic road showed superior smoothness, uniformity and less rutting as compared to a plastics-free road laid at the same time, which began developing "crocodile cracks" soon after. The process was also approved in 2003 by the CRRI (Central Road Research Institute Delhi). Road life improves through improved tackiness and viscosity of the bituminous mix, thereby binding the stones more firmly together and improving the water-resistance of the mix to rain etc.

Justo et al (2002), at the Centre for Transportation Engineering of Bangalore University on the possible use of the processed plastic bags as an additive in bituminous concrete mixes. The properties of the modified bitumen were compared with ordinary bitumen. It was observed that the penetration and ductility values of the modified bitumen decreased with the increase in proportion of the plastic additive, up to 12 % by weight. Therefore the life of the pavement surfacing course using the modified bitumen is also expected to increase substantially in comparison to the use of ordinary bitumen.

Patel Chirag B (2013), By using the waste plastic and Crumb Rubber as a modifier the properties of bitumen will be change and this change in physical properties like softening point, penetration value, elastic recovery and Marshall stability was checked by different test. In this study we used modifier in proportion (1%,2%,3% and 4%) by the weight of bitumen.

R.Vasudevan et.al. (2007), Has studied that the crumb rubber modified bitumen and they construct different stretches and perform field study with the help of National Transport Planning and Research Centre, Trivandrum. From this field study they concluded that the entire road having a good skid resistance value and from bump instigator study a good surface evenness.

III. CONCLUSION

- This will provide more stable and durable mix for the flexible pavements. The serviceability and resistance to moisture will also be better when compared to the conventional method of construction. The values of other parameters i.e. Vv, VMA and VFB in both the cases CRMB have found out to be within required specifications. This study not only constructively utilizes the waste plastic and tyres in road construction industry but it has also effectively enhanced the important parameters which will ultimately have better and long living roads.
- The modified asphalt and bitumen gives the better properties for road construction.

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