USE OF WASTE MATERIALS IN FLEXIBLE PAVEMENT

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Abstract- Waste materials not only strengthen the road but also increase the road life, and help to improve environment and create a source of income. 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. Use of plastic waste (LDPE) and Crumb Rubber i.e. the rubber obtained from the waste tyres of vehicles, in the construction of flexible pavement is gaining importance. The modifier raw-material has been sourced from disposed waste plastic and crumb rubber. This not only allows us to collect modifier raw material at low cost, but also provides a solution towards ecological menace posed by increased use of plastics (non-biodegradable). Waste materials cause degradation of environment & are harmful to human health. Waste materials enhance various properties of pavements like durability, resistance to rutting, penetration resistance etc. Waste plastic, CRMB, steel slag are waste materials that are highly used in the construction of flexible pavements. A tire that can no longer serve its original intended purpose is termed as a waste tyre. A waste tire typically consists of rubber compound (70%), steel (16.5%), and nylon or fibre (5.5%). The use of commercial polymers, such as styrene butadiene styrene (SBS) and Styrene-Butadiene Rubber (SBR) in road and pavement construction will increase the construction cost as they are highly expensive materials. However, with the use of alternative materials, such as CRMB, will definitely be environmentally beneficial, and not only can improve the bitumen binder properties and durability, but it also has a potential to be cost effective. Indian consumption of plastics is 15 million tonnes (2015) and is set to be the third largest consumer of plastics in the world. Plastic wastes consisting of carry bags, cups and thermocoles that can be used as a coating over an aggregate which can be used for road construction. The strength is increased by 100% without any pothole formation. Waste materials not only strengthen the road but also increase the road life, help to improve environment and also create source of income. The strength of Semi Dense Bituminous Concrete (SDBC) has increased by about 25% by CRMB according to 2012 International Conference on Future Environment and Energy IPCBEE vol.28 (2012). Waste plastic helps in better binding of bitumen with plastic wasted coated aggregate. The polymer coating also reduces the voids, results in reducing rutting, ravelling and there is no pothole formation.