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A Review Paper on Usability of Plastic Waste in Bituminous Pavement

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Abstract: ***This review paper delves into the worldwide plastic production is increasing speedily with rise in population and eversion in life style. Disposal of plastic waste is serious problem globally due to their non-biodegradability property. Then it is better to recycle than disposal. One of the trending topic is in recycle of plastic waste use in roads construction. This type of recycling can help in protect the environment from the greenhouse gases that are exposed to atmosphere while disposal. The plastic waste in form of bottles, cups, caps, polythene bags etc are made in form of powder or blended with crusher and coated over the aggregate and bitumen mixture by heating process for roads construction. This polymer coated aggregate and bitumen mixture shows higher strength, better binding property, more stability, and increase in wear resistance, better durability and tear of flexible pavement. This makes the recycle of plastic waste in an efficiency manner.***

Keywords: Plastic Waste, Aggregate, Betumen Mexture, Flexible Road Construction, Ecofriendly, Pavement, Material, Waste Disposal, Recycling.

I. INTRODUCTION

Today everywhere around us the globally from agriculture to electrical, packing, automobile, building construction, communication sector are widely use of plastic. The use of plastic was started after the industrial revolution and its huge scale manufacturing seemed to be cheaper. Plastic is a generally non-biodegradable and In many research found that plastic takes around 4500 years to decomposition reaction. In Several studies proved that the disposal of wasted plastic causes many health problems and also make less the fertility of soil. The plastic manufacturing over the world has crossed 400million tons and the recycling of plastic waste is only 10-15 percent. Various experiments and research are being conducted in order to improve the properties of bituminous pavement. The newly advancement in that case study is use of waste plastic in bituminous road construction. The usability of waste plastic in road construction is gaining importance now a days due to pavements performance and toughness, life span and low-cost construction.

A. Objective

The primary objective of plastic roads is to reduce plastic waste, bags, bottles, etc. Not all plastic waste is recycled, as even the recyclable waste is just too much to reuse 100%. In Road Constructions Plastic bitumen composite roads have better wear resistance than standard asphalt concrete roads. They do not absorb water, have better flexibility which results in less rutting and less need for repair. Road surfaces remain smooth, are lower maintenance, and absorb sound better.

II. LITERATURE REVIEW

1) Dr. R. Vasudevan (2007) hasResaerh paper concludes that polymer bitumen blend is a better binding property as compared to plain bitumen. Blend increases the sifting point of bitumen and decreases the penetration value. When it is used in road construction it increases the higher temperature of the road .the coating of plastic decreases the property of porosity, absorption of moisture and improve soundness. Use of waste plastic in road help in any ways like diposal of waste , better road and presentation of pollution and so on.
2) Anzar Hamid Mir (2015) “Plastic waste in pavement construction He introduce that viscos elastic nature of binder have complex modulus phases of angles of binders , need to be measured at different temperature, loading rates which are resembling to weather and climatic condition

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3) Amit P. Gowanda (2013) "Economics And Viability Of Plastic Road" evaluated flexural fatigue life of asphalt concrete modified by 3% crumb rubber as part of aggregated and reported that fatigue life and creep properties of the polymer modified mixes increased significantly as compared to unmodified asphalt mixes .

4) Verma S.S (2008) studied that plastic will increase the melting point of bitumen. This technology not only strengthens the road but also increase the life of the road.

5) Dr S. Vasudevan and S. Rajasekaran (2006) Examines the polymer bitumen is blend is better binder as compared to plain bitumen. Blend has increased the softing point of bitumen but decreased the penetration value with a suitable ductility.

6) Vatsal Patel et al (2014) "Utilization of plastic waste in road" described that the effect of wax in bitumen can be reduced by adding EVA (Ethyl Vinyl Acetate), aromatic resin and SBS in the waxy bitumen. The addition of 4% EVA or 6% SBS or 8% resin in waxy bitumen effectively reduces the Susceptibility to high temperatures, bleeding at high temperature and brittleness at a low temperature of the mixes.

7) Kurmadasu Chandramouli et al (2016) "Plastic waste: its use in the construction of roads " reported that asphalt concrete using polyethylene modified binders were more resistant to permanent deformation at elevated temperature and found improvement in stripping characteristics of the crumb rubber modified mix as compared to unmodified asphalt mix.

III. CONCLUSION

Plastic will increase the melting point of the bitumen. Plastic waste in bituminous road construction is a new technology which not only strengths the road but also increases the durability of roads. Plastic has property of absorbing sound, which also help in reducing the sound pollution of heavy traffic.

In future will have strong, durable and eco-friendly roads which will relieve the earth from all type of plastic waste.

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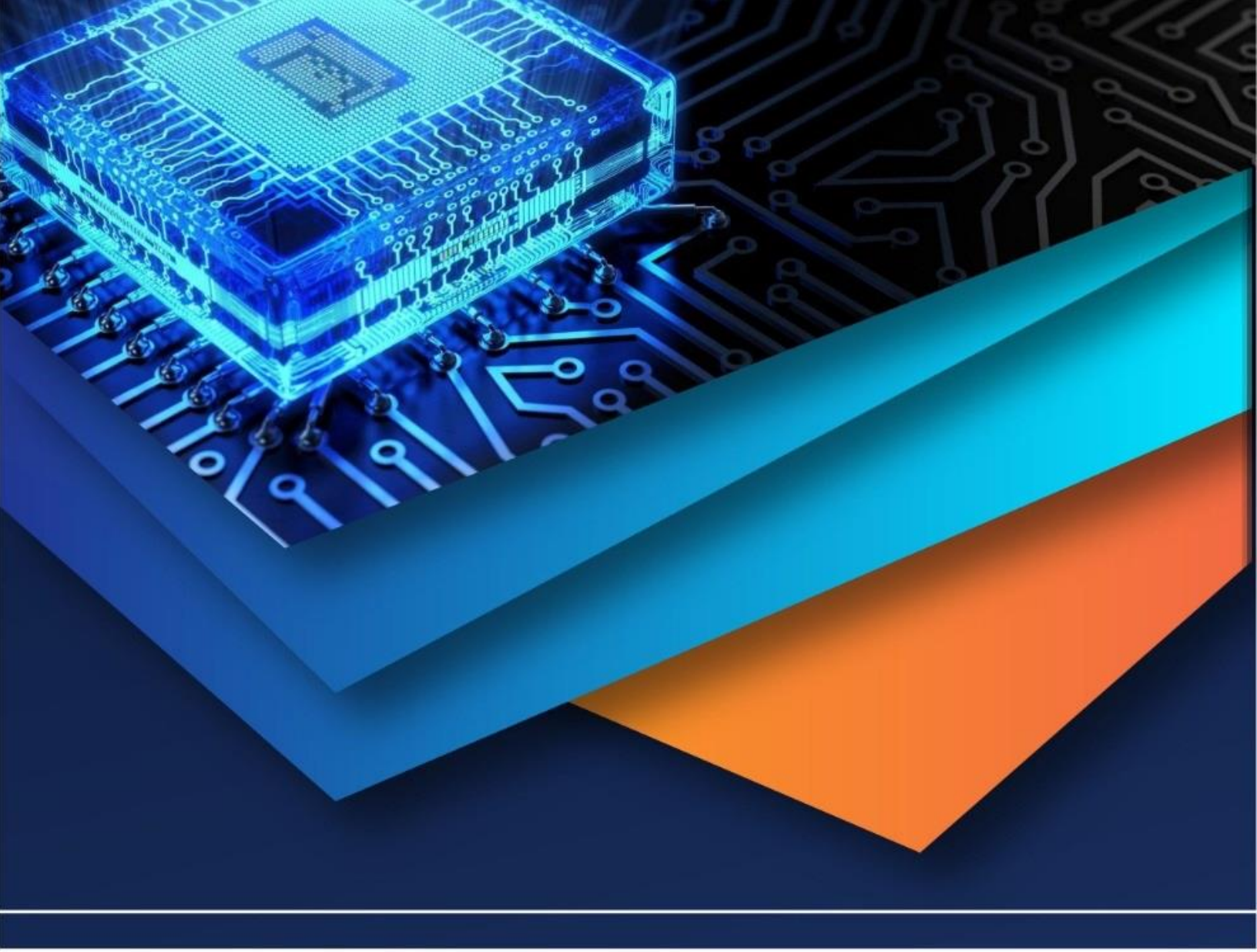
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