iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** XI **Month of publication:** November 2023

DOI: https://doi.org/10.22214/ijraset.2023.56440

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue XI Nov 2023- Available at www.ijraset.com

Usability of Plastic Waste in Bituminous Pavement

Prof. A. B. Moghe[1] Kartik W. Zite[2], Prathamesh N. Sarode[3], Dnyaneshwar U. Jadhav[4], Mayur P. Thakre[5]
[1]*Assistant Professor,* [2, 3, 4, 5]*Students, Department of Civil Engineering, Jagadambha College of Engineering & Technology, Yavatmal, India*

Abstract: ***The waste materials are utilized as replacement of the non-renewable products that need mining as well as processing has become very common. Code with the release of IRC: SP: 98: 2013 Indian Road Congress (IRC) the formation of roads all over the country has been cleared by using plastic waste .Probable in application of plastic waste in flexible road construction are studied and various negative and positive aspects of road construction are focus in plastic waste using this paper. Various reviewed studies relating plastic road technology reveal growing in resistance to deformation, grow up toughness, durability, improved fatigue life, stability, strength, waterinduced damages and saving of bitumen and gainful plastic waste utilized .***
Keywords: Plastic Waste, Aggregate, Betumen Mexture, Flexible Road Construction, Ecofriendly, Pavement, Material, Waste Disposal, Recycling.

I. INTRODUCTION

Plastic material in our daily life is an integral part and that millions tons amount of plastic waste is generated annually today. The collection of plastic waste and transportation and safe disposal have serious environmental implications. Hence plastic waste utilization in pavement construction is one of the possible solution to overcome from the plastic waste problems. The Plastic Man of India Prof. R. Vasudevan, Department of Chemistry, Thiagarajar College of Engineering, Madurai has introduced a revolutionary solution for plastic waste problems. In the year 2002 Prof. R. Vasudevan has comstructed a plastic tar road inside their institute, that has intact till date. From this, the technology has been going places. The Indian Road Congress and Central Pollution Control Board are also using this same technique.

A. Objective

1) To carry out the soil test.
2) To design the flexible pavement.
3) To design the asphalt pavement with aggregate- plastic- bitumen mix.
4) To coat the aggregate with plastic and incorporate titanium di-oxide.
5) To test the bitumen and the modified bitumen.

B. Scope

1) To eradicate potholes.
2) To minimize the global warming , greenhouse gases and pollution.
3) The lifespan of the roads can be increased.
4) Eco-friendly in nature.

II. LITERATURE REVIEW

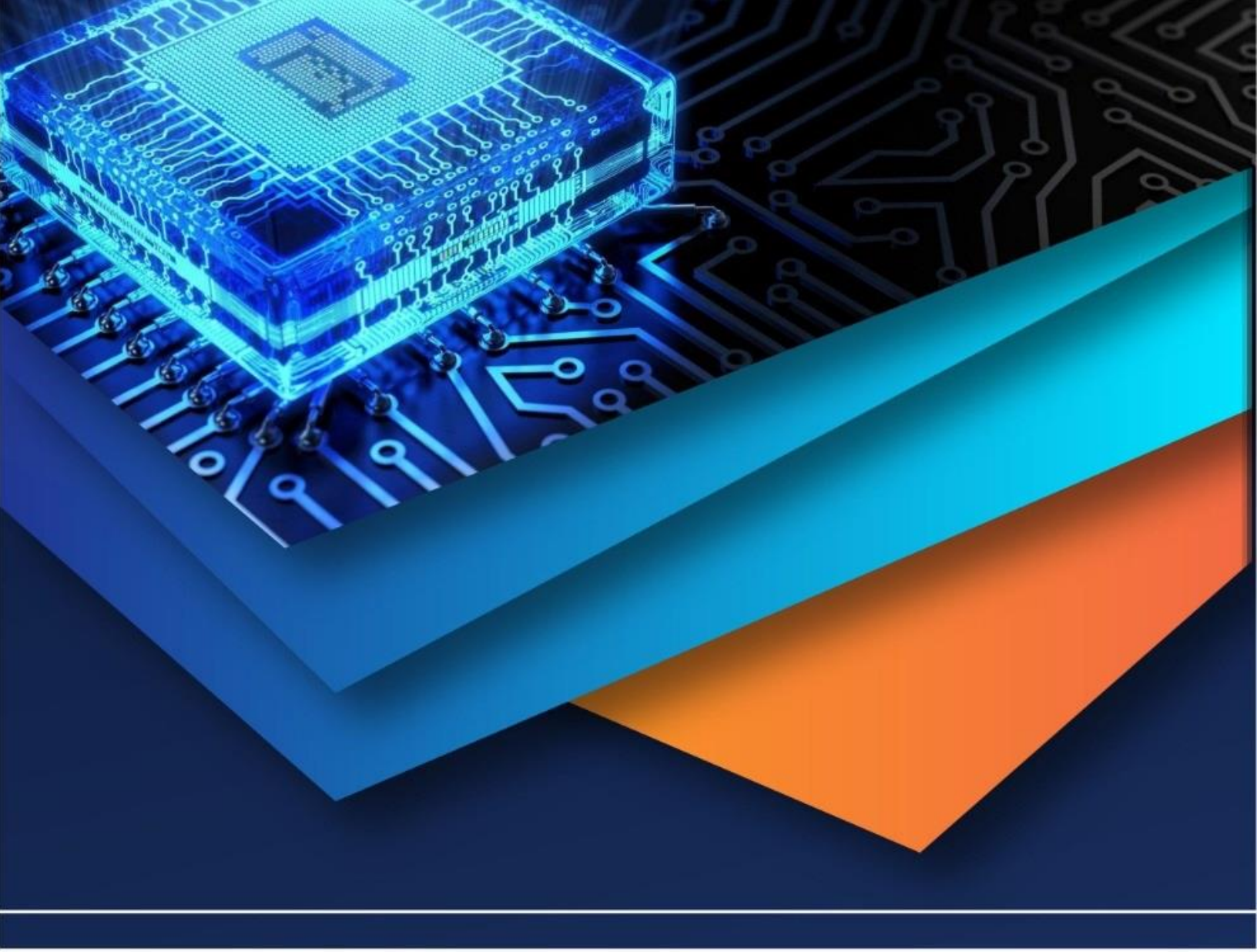
Plastic roads are roads made either entirely of plastic or of composites of plastic with other materials [8]. PET bottles, disposable cups and carry-bags of plastic collected from various garbage dumps are main ingredients of the plastic road construction material. The plastic waste forms an oily coating over the surface of the aggregates after getting melt due to its mixing at high temperature with bitumen and the resulting mixture is laid on the surface in the same way as a normal tar road is laid.

III. CONCLUSION

1) There is marginal growth in the cost because of the mixing requirements for shredded plastic waste and the bitumen but this get overcome by large amount of the overall mix volume resulting in a smaller amout bitumen requirement.
2) Many problems at a global level can be solved by utilizing non-biodegradable waste material as plastic in flexible pavement construction.
3) There is whole growth in road life by opting these technologies in the pavement construction.
4) Properties of bitumen get enhanced with the mixing of plastic waste. The resulting mix shows better result when compared to standard results.
5) Because of the plastic polymer, rain water will not seep through in a voids. Hence there is minimum maintenance requirements.
6) Binding property also get upgrade by making use of these technology.
7) There is batch in the resistance to stripping for plastic waste coated with aggregates followed by bitumen.

REFERENCES

[1] Vasudevan , R, Saravanavel, S, Rajsekaran , S, and Thirunakarasu, D (2006) “Utilization of Waste Plastics in Construction of Flexible Pavements”, Indian Highways, Vol. 34 No.7 IRC, pp 5-20.
[2] Sridhar, R Bose , S Kumar, G and Sharma G, (2004) “Performance Characteristics of Bituminous Mixes Modified by Waste Plastic Bags” Highway Research Bulletin , No 71, IRC pp 1-10.a
[3] IRC:48-1972, “Tentative Specifications for Bituminous Surface Dressing Using Pre-Coated Aggregate”, Indian Roads Congress.
[4] Utilization of Waste plastic Bags in Bituminous Mixes (November 2002), CRRI Report submitted to M/s KK Plastic Waste Management Ltd. (Bangalore).
[5] S.Rajasekaran1*, Dr. R. Vasudevan2, Dr. Samuvel Paulraj3, Reuse of Waste Plastics Coated Aggregates-Bitumen Mix Composite For Road Application – Green Method, American Journal of Engineering Research (AJER) e-ISSN : 2320-0847 p-ISSN : 2320-0936 Volume-02, Issue-11, pp-01-13.
[6] Brajesh Mishra*, M.K. Gupta**, A Study on Use of Plastic Coated Aggregates in Bituminous Concrete Mixes of Flexible Pavement, Int. Journal of Engineering Research and Application ISSN: 2248-9622, Vol. 7, Issue 10, (Part -7) October 2017, pp.26-33.
[7] Flynn F. (1993) “Recycled Plastic finds home in Asphalt Binder” Journal Roads and Bridges.
[8] "EnviroNews Archives - Plastics Recycling and The Need For Bio- Polymers", Vol. 9 No. 4 - October 2003
[9] National Rural Roads Development Agency Ministry of Rural Development, GoI., Guidelines for the use of Plastic Waste in Rural Roads Construction.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY