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# Case Study on “Use of Plastic Waste & E-Waste in Flexible Pavement”

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**ABSTRACT:** In the Modern era the plastic is the biggest waste which cannot easily recycle. Plastics are rapidly growing segment of the municipal solid waste. Disposal of waste materials including waste plastic bags and E-waste has become a serious problem. And next one is the E-waste (Electronic Waste) which also rapidly grows with the social status of people. Amount of E-waste and plastic bags being accumulated in 21st century has created big challenges for their disposal. In order to overcome this issue; we have to use it in an effective way. Flexible Pavement are perfect materials on the pathways and streets for simple laying and finishing. So to overcome this problem the designing of Plastic waste in the form of Pavement Block, Flexible Pavement on study in this Project. This paper is to give the idea about recycling of E-waste, Commercial use of E-waste in the industry and how to convert them into money. Advantage is that to maintain the Economic and cost of Construction

**KEYWORDS:** Analysis, Contains Replacement, Reuse E-waste, Plastic waste, Flexible Pavement

## I. INTRODUCTION

The introduction should be given in the Paper is about the Analysis and case study on the “Use of Plastic Waste and E-Waste”. The Pavement is those pavement whose deflection under heavy load over it and it gets deflected under load. Such as pavement known as Flexible Pavement. In this paper highlight the importance of e-waste and plastic waste to making Flexible Pavement and other products which can be recycled and Reuse. In this paper presenting an overview on current research on the Use of Plastic Waste and E-Waste”. The simplest way is to replace (Reuse and Recycle to Make Flexible Pavement). We are introducing the use of plastic, Polyethylene terephthalate (PETE), High-density polyethylene (HDPE), Polyvinyl chloride (PVC), Low-density polyethylene (LDPE) and E-Waste (all types). Discussion on process and the content.

## II. LITERATURE REVIEW

### 1) Sir Zoorab and Suparma (2000)

**Research :- Use of Plastic Waste in Construction.**

**Type of Waste :-** Polyethylene, other construction Material.

**Conclusion :-** Use of 20 % plastic Waste which increasing Durability and Fatigue life  
As well as 20 % stability and 30% Indirect tensile Strength.

### 2) Bangalore Method (2000) :-

**Research :- Use Of plastic waste in road**

**Type of Waste :-** Polyethylene, other construction Material.

**Conclusion :-** He Making 25 Km road by Plastic Mix Material. It gives the better strength like tensile, compressing strength.

### 3) Justo *et al* (2002) :- Use Of plastic waste with bitumen in road construction .

**Research :-** Use of 12 % Plastic waste ( Bags) with Bituminous concrete mixture.

**Type of Waste :-** Plastic Bags , other concrete Material

**Conclusion :-** It is observed that the modified mixture is ductility is decrease with increasing plastic waste.

- 4) **Prof. CEG Justo (2002):-** Use Of plastic waste with bitumen in road construction  
**Research :-** Use of Plastic in term of cost reduction and increasing in strength .  
**Type of Waste :-** Plastic Bags , other Plastic Material etc  
**Conclusion :-** Significance about the cost comprise with bitumen .
- 5) **Sir Dr. R. Vasudevan (2006) :-** He has Explain the Property of plastic waste with bitumen  
**Research :-** Effect on bitumen by use of plastic waste  
**Type of Waste :-** Plastic bag ,Etc.  
**Conclusion :-** It increase the durability and strength of Bituminous concrete mixture.
- 6) **Sir DeveshOjha et al (2006) :-** Use Of plastic waste to design of flexible Pavement construction  
**Research :-** Use Of plastic waste to design of flexible Pavement construction ( Tar Road )  
**Type of Waste :-** Plastic Bags ,tar other Plastic Material etc  
**Conclusion :-** Significance about the cost comprise with bitumen and Tar .
- 7) **Sir Mohammad T. Awwad et al (2007):-** Use Of plastic waste to enhancing the plastic waste pavement construction  
**Research :-** Use Of plastic waste to enhancing the plastic in waste pavement construction  
**Type of Waste :-** Plastic Bags ,tar other Plastic Material etc  
**Conclusion :-** Significance is found that increase the stability, reduce the density and slightly increase air voids .
- 8) **Sir SasaneNeha et al(2008):-** Use Of plastic waste to design of flexible Pavement construction  
**Research :-** Use Of plastic waste to design of flexible Pavement construction  
**Type of Waste :-** Plastic Bags , other Plastic Material etc  
**Conclusion :-** Significance about the comprise of simple Pavement construction with to Modified Pavement construction make by waste Plastic .
- 9) **Sir Shankar et al (2009) :-** Use Of plastic waste identify the optimum blinder content .  
**Research :-** Use Of plastic waste identify the optimum blinder content .  
**Type of Waste :-** Plastic Bags , other Plastic Material etc  
**Conclusion :-** Significance about the Marshall mix design and Blenden rubber with bitumen .
- 10) **Sir P.K. Jain et al. (2012) -** Use Of plastic waste identify the Optimum dose of Plastic waste .  
**Research :-** Use Of plastic waste identify the Optimum dose of Plastic waste .  
**Type of Waste :-** Plastic Bags , other Plastic Material etc  
**Conclusion :-** Significance about the Optimum dose of plastic waste 4% by weigth of mix and 8% weigth of bitumen .
- 11) **Sir Ranadive and Tapase (2015) :-** Use of Plastic waste bituminous mix in shredded form.  
**Research :-** Use of Plastic waste bituminous mix in shredded form.  
**Type of Waste :-** Plastic Bags , other Plastic Material etc  
**Conclusion :-** Significance ids the use of plastic waste it reduce 8% cost of construction.
- 12) **Sir KadamDigvijay et al. (2015) :-** Use of E- waste replace with some percentage of aggregate  
**Research :-** Use of E- waste replace with some percentage of aggregate  
**Type of Waste :-** E- waste ,Aggregate other etc  
**Conclusion :-** Significance that 7.5% aggregate is replace by aggregate is reduce the cost of construction .And he conclude the E- waste is sutable for construction.

### III. DISCUSSION

Method and analysis which is performed in our research work is as follows.

The Modern method is use to prepare Flexible Pavement make by Plastic and E-waste such as follows.

The total Method is are adopt in lab. In which Testing of raw material , screening , burning etc.

The Main important this is to select proper material to making flexible and the most tested free form impurity.

1) First the Collection of material (Plastic Waste and E-Waste ) required for experimental work .

2) On Above Performing various test on collected materials such as Plastic E- waste, aggregates etc.

3) This lab test adopted Marshall test preparation.

4) Performing marshal stability and flow value test according to above designed mix on various bitumen mixers

4) Results

5) Conclusion

#### Melting of Plastic Waste

This Process done by burner in absence of air .

**Grading And Crushing of E-waste** Grading and Crushing of E-waste ids done by Modern Crusher..

### IV. CONCLUSION

Disposal of waste materials including waste plastic bags and E-waste has become a serious problem. And next one is the E-waste (Electronic Waste) which also rapidly grows with social status of people. Amount of E-waste and plastic bags being accumulated in 21st century has created big challenges for their disposal. Flexible Pavement is perfect materials on the pathways and streets for simple laying and finishing.

General for E-Waste the waste is use with replace of aggregate and course material. This waste have better compressibility and anti Erosion capability . For that purpose it is use in construction. The use of E- waste

It has two benefit first is to reduce the quantity of E-waste over the earth and To reduce the construction cost also ther fore as is beneficial to reuse.

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