
Use of Waste Plastic Material in Road Construction

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ABSTRACT

In this research we try to deal with two main problems

1. *The management of municipal solid waste and used plastics*
2. *The formation of potholes on roads by the excessive traffic load.*

We examines the effect of blending waste plastic and bitumen. The plastics were shredded and blended with the bitumen with a shear mixer at a temperature range of 140 °C–160 °C. Some tests such as penetration, softening point and viscosity tests are conducted for bitumen. The properties of the blend of waste plastic and bitumen were found to be enhanced and can be used for the road construction.

INTERODUCTION

The bitumen is used as one of the main construction materials in flexible pavements. The used plastic waste and bitumen blend is used in the construction of flexible pavement is used because of the several reasons. That mix show better properties for road construction otherwise that plastic waste considered to be a pollution menace that can be use in this process and that can help solving the problem of pollution.

RAW MATERIAL FOR ROAD CONSTRUCTION

1. AGGREGATE
2. BITUMEN (TAR)
3. PLASTIC (WASTE)

METHODOLOGY

Segregation: The separation of plastic waste collected from various sources.

Cleaning process: Plastic waste is washed, cleaned and dried.

Shredding process: Plastics will be shredded into small pieces

Collection process: The retention of plastic waste on 2.36 mm IS sieve used

TESTING OF MATERIALS

1. The tests to be performed on aggregate:

- a) Aggregate impact value test

- b) Los Angeles abrasion test
- c) Water absorption test
- d) Specific gravity test
- e) Stripping value test

2. The tests to be performed on bitumen:

- a) Penetration value test
- b) Ductility test
- c) Flash & fire point test
- d) Softening point test

BASIC PROCESS

Waste plastic is ground (size 5-10mm) and then 2 to 5% plastic is mixed with the bitumen. Plastic waste and bitumen makes the road retinitis ability during winters results in its long life. The shredded plastic waste acts as a strong binding material that last long. That blend of plastic with bitumen shows the ability to withstand high temperature increases. Another important observation was that the blend of waste plastic and bitumen could withstand adverse water and soaking condition for longer duration.

Advantages

1. The road with increased stability Value.
2. Good resistance towards rainwater.
3. Minimizing the potholes formation.
4. The bonding of the waste plastic and bitumen Increased.
5. Less wear and tear of surface course.
6. Less effect of sunlight.
7. The road strength is increased.
8. The property of load carrying is increased.
9. The maintenance cost of the road is low.
10. The problem of disposal of waste plastic will no longer be a problem.
11. Employment for laborers will be generated.

Disadvantages

1. Toxics present in the plastic waste would harm the soil below.
2. During the road laying process- in the presence of harmful gas can harm the environment.
3. This type of road construction can increase the construction coast (a little).