



॥ अंतरी पेटवू ज्ञानज्योत ॥

Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon



Avishkar

Create

Sustain

Prosper

आविष्कारातून शाश्वत विकासाकडे...

Plastic composite mixture

A versatile, economical and environmentally benign alternative for construction of Road



Content:-

- **Introduction**
- **plastic road**
- **Process involved in Plastic road construction**
- **Traditional roads V/s Plastic composite roads**
- **Objective of plastic road**
- **Conclusion**

Introduction:-

Our nation facing problems such as-



Increasing population



Poor roads condition



Plastic waste



How to resolve the problems?????

An Innovative solution for plastic waste and poor road condition problems are.....



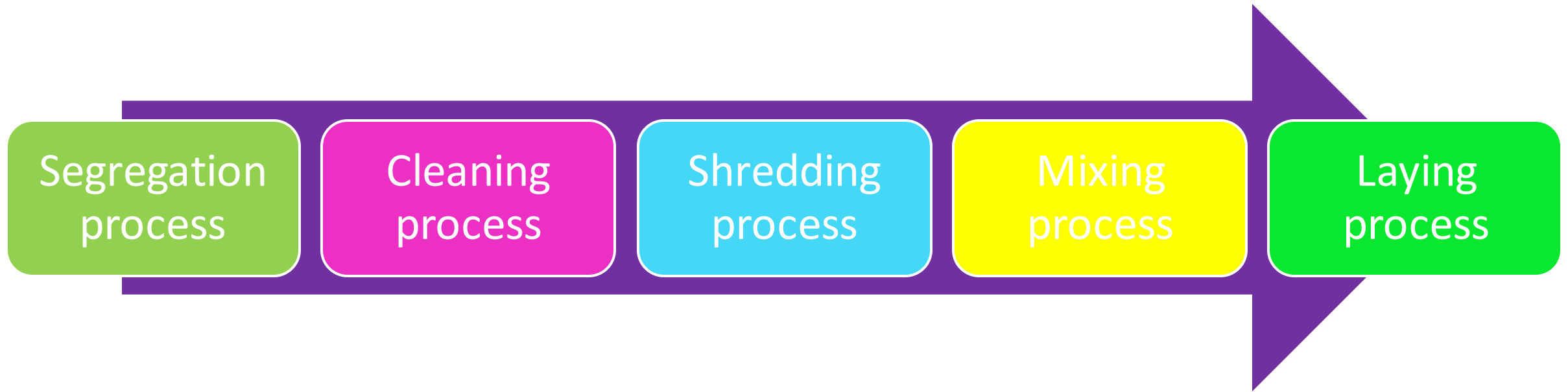
Plastic composite roads

What is plastic Roads?

- **The road made entirely of plastic or of composites of plastic with other materials.**
- **The plastic composite roads are superior to regular asphalt concrete roads; they show better wear resistance.**
- **The implementation of plastics in roads also opens a new option for recycling post-consumer plastics.**
- **The plastic waste items that can be used for road construction are various items like plastic carry bags, plastic cups, plastic packaging wrappers of chocolates –biscuits.**
- **The plastic roads made are of 2 kinds**
 - 1. Bitumen mixture**
 - 2. Asphalt mixture**

Plastic road construction process:-

- The waste plastic is collected first from the households and dumped into the landfill area.
- The process of construction of plastic roads is done by the following processes.



Process involved in Plastic Road Construction

1. Segregation process

The collected waste is separated into two ways

1. Biodegradable
2. Non – biodegradable (Plastic- Raw material for road construction)
3. The maximum thickness of 60 microns.



2. Cleaning process

1. The separated non biodegradable Plastic-waste is cleaned and then dried .



3. Shredding process

- The plastic waste will be shredded or cut into small piece using shredding machine.
- The different types of plastic waste are mixed together of about 2.36mm to 4.75mm



4. Mixing process

- The plastic materials and bitumen are heated at a temp 160 °c for acquiring good binding & to prevent weak bonding then it is transferred into the mixing chamber.
- The shredded plastic is uniformly coated over the aggregate mix in the mixing chamber.



5.Laying process-

- For laying the bitumen mixed plastic aggregate rollers are used.
- The mixture is laid as one would with regular asphalt concrete.



Traditional roads V/s Plastic composite roads -

Traditional Road



Plastic Composite Roads



Objectives-

- ✓ To efficiently utilize the waste plastic in constructive way so that it can be beneficial to society.
- ✓ To coat the aggregates with low density waste plastic materials and use in non load hearing asphalt pavement roads.
- ✓ Utilize waste plastic as powerful binding material
- ✓ To check the properties of bitumen specimen
- ✓ To Compare the properties of bitumen mix. Specimen with pure bitumen specimen

ADVANTAGES OF PLASTIC ROAD

- Use higher percentage of plastic waste.
- Reduce the need of bitumen by around 10%.
- Increase the strength and performance of the road.
- Reduce the cost to around Rs. 5000/Km. of single lane road.
- Generate jobs for rag pickers.
- Develop a technology, which is eco-friendly.
- Improvement in fatigue life of roads.
- Better resistance towards rain water and cold weather Better resistance towards rain water and cold

Conclusion:-

- Plastic Coating on aggregates is useful for better performance of road
- This helps so have a better binding of bitumen with plastic wasted coated aggregate.
- The polymer coating also reduce the Voids.
- This prevents the moisture absorption and oxidation of bitumen by entrapped air.
- This has resulted in reducing rutting, raveling and there is no pathole formation.
- The roads can show better durability.
- With decomposition of waste plastic the construction of durable and high quality plastic composite roads could be construct which built our nation as Corruption free India.



Thank you

