

# Utilisation of Waste Plastic in Bituminous Mixes for Road Construction

Disposal of waste materials including waste plastic bags is a menace and has become a serious problem, specially in urban areas, in terms of its misuse, its dumping in the dustbins, clogging of drains, reduced soil fertility and aesthetic problem etc. Waste plastics are also burnt for apparent disposal, causing environmental pollution.

The laboratory studies conducted by CRRI in utilization of waste plastic bags in bituminous concrete mixes have proved that these enhance the properties of mix in addition to solving disposal problems. The results indicated that there was an improvement in strength properties when compared to a conventional mix. Therefore, the life of pavement surfacing using the waste plastic is expected to increase substantially in comparison to the use of conventional bituminous mix.

There are two different processes, namely dry and wet process, to incorporate waste plastic bags into the bituminous mixes. The performance test proved that

- the fatigue life was doubled and
- increased resistance to rutting and water damages when plastic waste was used.

**Field trials** have been carried out using dry process i.e. by mixing the appropriate quantity of dry shredded plastic bags with hot aggregate prior to production of bituminous mixes at hot mix plant. Wet process i.e blending of

shredded plastic bags & bitumen prior to the production of modified bituminous mixes, is at the commercialization stage. The wet process for modification of bitumen using waste plastic has been patented by CRRRI

Field trials have also been carried out, using Dry process in Delhi under which about 3.5km road stretch has recently been constructed with 40mm bituminous concrete overlay on the above said location. The section will be monitored for another three years for its performance.



Photo1 : View of test section  
waste using waste plastics



Photo 2 : View of road section with  
plastic after one year

For further enquiry, Dr. Sangita, Scientist, Flexible Pavement Division may please be contacted.