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Utilization of Waste Plastic in Flexible Pavement

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Abstract: *Plastic waste has become one of the most serious environmental problems due to its non-biodegradable nature and increasing use in daily life. Improper disposal of plastic waste leads to environmental pollution affecting soil, water resources, and ecosystems. This study focuses on the utilization of waste plastic in road construction by modifying bitumen using the wet process.*

In this method, shredded plastic waste is blended with hot bitumen to produce plastic-modified bitumen. Different types of plastic such as LDPE, HDPE, and PP are used along with bitumen of grades VG-30, VG-40, and VG-50. Plastic is added in proportions of 2%, 4%, 5%, 6%, 7%, and 8% by weight of bitumen.

Various laboratory tests such as penetration, softening point, ductility, viscosity, flash point, and fire point are conducted. The results show that penetration and ductility decrease while softening point, viscosity, flash point, and fire point increase with increase in plastic content.

The optimum result is obtained at 6% HDPE with VG-30 bitumen. The study concludes that the use of plastic waste in road construction is an economical, eco-friendly, and sustainable solution.

Keywords: Plastic Waste, Bitumen, LDPE, HDPE, PP, Sustainable Construction

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