**USE OF WASTE PLASTIC AND WASTE COOKING OIL FOR THE MODIFICATION OF THE PROPERTIES OF BITUMEN**

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**Abstract**

The expansion in total population has prompted a critical increment in the interest of transportation. Since the thruway gives availability to almost wherever everywhere throughout the world. They are as yet considered as the most ordinarily utilized transportation frameworks on the planet for both traveler and cargo transportation. Nonetheless, the expanding interest for transportation additionally prompts the exorbitant development of parkways, further builds the interest of crude materials utilized for asphalt development. There can be the deficiency of the crude materials utilized for these developments.

1. Introduction

Asphalt is a development material utilized as binder in the flexible asphalt pavement. It is a long chain of hydrocarbon obtained from petroleum products. Hot mix bitumen, warm mix bitumen and cold mix bitumen are the three categories of bitumen, where hot, warm and cold denotes the mixing and laying temperature of bitumen on the topmost layer of flexible pavement. Hot bituminous mix has temperature greater than 300\(^\circ\) F and warm mix bituminous mix has temperature of 200-250\(^\circ\) F [2]. Therefore, warm bituminous mix requires less heat and have less emissions also. The advantage of cold mix bitumen is that it can be applied in rural roads. With increment in the asphalt development, the pace of utilization of bitumen is high when contrasted with its extraction rate. This prompts the shortage of the bitumen. As bitumen is expensive material utilized in adaptable asphalt. Consequently, we need to search for options of the bitumen that have comparative or significantly more improved properties than the bitumen. This should be possible by either supplanting some level of bitumen by utilizing a few materials like, morsel elastic, squander cooking oil, plastics (LDPE, HDPE, PVC, EVA and so forth.) and other various polymers that have versatile properties and different properties taking after with the properties of bitumen. This aides in diminishing the utilization of bitumen and furthermore accomplishing the ideal and much increasingly improved properties in less amount of bitumen.

2. Methodology

The main aim of this examination is based on the utilization of Waste Cooking Oil and Waste Plastic in a bitumen mix. For this, I have to collect the waste plastic of low density or low density polyethylene as well as the Waste Cooking Oil along with the bitumen. I am using VG 30 grade of bitumen for this examination. Various tests like ductility, penetration, flash and fire point, softening point etc. are to be performed on the pure bitumen and then the test is repeated on the modified samples of bitumen at different percentages of plastic waste and waste cooking oil. It is necessary to determine the optimum percentage use of these waste products in the bitumen with same or improved properties than bitumen.. The cost analysis of the final percentages of these waste has to be evaluated to check the economic feasibility of the study.
3. Results

- Feasibility of the elimination of bitumen from the hot mix by replacing it with crumb rubber and waste plastic.
- Performance of the flexible pavement by using this replacement and its comparison with the conventional flexible pavements.
- Decrease in the pollution due to these waste products and may found the alternative for bitumen in future generation.

4. Conclusion

They are as yet considered as the most ordinarily utilized transportation frameworks on the planet for both traveler and cargo transportation. Nonetheless, the expanding interest for transportation additionally prompts the exorbitant development of parkways, further builds the interest of crude materials utilized for asphalt development. There can be the deficiency of the crude materials utilized for these developments. This should be possible by either supplanting some level of bitumen by utilizing a few materials like, morsel elastic, squander cooking oil, plastics (LDPE, HDPE, PVC, EVA and so forth.) and other various polymers that have versatile properties and different properties taking after with the properties of bitumen.

References


