

Qualitative Analysis of Bituminous Mix Modified by Polypropylene and Impact Characteristics on Pavement Wearing Course

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Abstract : This paper contains continuous research which helps to analyze polypropylene modified bituminous mix and its impact characteristics with respect to original bitumen. Three percentages of polypropylene varying from (1-3) % of the weight of bitumen have been used to alter bitumen's performance. The temperature of 170°C has been maintained during the blending of polypropylene with bitumen. It was performed by a wet process as it has certain advantages over the dry process. A rough estimate of 210 rpm rotation speed was set to prepare the blend in a mixer for 30 minutes producing homogeneous mixture. The blended mix shows a change in physical properties in comparison with the original bitumen content. Modification shows that for a 1% increment of polypropylene, softening point increases by 1 degree, penetration values decrease gradually to 55.6, 54, 52.5, ductility values decrease gradually to 87, 76, 63 and specific gravity remains the same. Then Marshall mix design is performed with 60/70 penetration grade bitumen contents varying from (4-6) % with .5% intervals. Marshall stability and flow test results indicate the increase in stability and decrease in flow.

Keywords : bitumen, marshall, polypropylene, temperature

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