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PERFORMANCE EVALUATION OF NATURAL RUBBER MODIFIED BITUMINOUS MIXES

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ABSTRACT

Natural Rubber Modified Bitumen (NRMB) is one of the most commonly used modified bitumen in Kerala, which is produced by adding latex or rubber powder to the ordinary bitumen at specific conditions. The early development of distress in the pavements with the conventional mixes revealed the need of design specifications based on performance tests. The performance tests are those tests which simulate the field conditions and measure the response of the bituminous mix in terms of stress, strain and deflection. The present study evaluates the Natural Rubber Modified Bituminous mix properties by conducting different performance tests. Study includes the different tests on aggregates, bitumen and NRMB mix. Different performance tests conducted on NRMB mix are Marshall Test, Indirect Tensile test, Moisture Susceptibility, Repeated Load Test. All the tests were carried out for the aggregate gradation of Bituminous Concrete Grade II. The specimens were made for the lower limit, middle limit and upper limit of the gradation, in order to study the effect of gradation of the aggregates in the properties of bituminous mix. In all the performance tests the specimens prepared for the middle limit of the aggregate gradation showed better results than that of the others. The NRMB mix is showing excellent rut resistance. From the Repeated Load Test it is clear that the fatigue life increases with the increase in resilient modulus and decreases with the increase in the % air void and initial strain. The overall performance of NRMB mix is better compared with that of the ordinary bituminous mix.

KEYWORDS: Natural Rubber Modified Bitumen, Marshall Stability Test, Indirect Tensile Test, Moisture Susceptibility, Fatigue Life