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STUDIES ON TENSILE AND FATIGUE CHARACTERISTICS OF PLASTIC MODIFIED BITUMINOUS CONCRETE MIXES

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ABSTRACT

Due to increase in traffic loads it has become necessary to enhance the properties of bituminous mixes to improve the performance of the pavements. Plastics obtained from waste is one such additive that can be used as modifier in the bituminous mix. Due to the availability of vast quantity of waste plastic, a study was undertaken to investigate the feasibility of using it in bituminous road construction. Plastic was mixed with bitumen and aggregates at higher temperature and Marshall test specimens were prepared and tested.

The Marshall specimens were tested and the indirect tensile strength of the modified bituminous mix was determined before and after soaking the specimens in water as per ASTM D 1559 – 65 and ASTM D 4123 – 82. The test results show that the plastic additive significantly increases the indirect tensile strength of the bituminous concrete mixes. From the test results it was observed that modification of bitumen with plastics significantly increase the indirect tensile strength of the bituminous mixture and can be advantageously used as a surfacing course in high volume roads, which are subjected to high stresses due to heavily loaded trucks. Also test results indicated that the fatigue life of plastic modified bituminous concrete is significantly higher than that of plain bituminous concrete.

KEYWORDS: Marshall stability, Optimum Bitumen Content (OBC), Optimum Modifier Content (OMC), Indirect Tensile Strength, Fatigue Life, Bituminous Concrete (BC), Plastic Modified Bituminous Concrete (PMBC).