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INFLUENCE OF COMPACTIVE EFFORT ON SULFUR MODIFIED SAND-BITUMINOUS PAVING MIXES

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ABSTRACT

The rapid development of road network and many other infrastructure projects has led to a severe depletion in the reserve of available natural stone resources. While in many places in India, the good quality aggregates, especially coarse aggregates are costly and are in short supply; the sand is cheaply and abundantly available in such places. Keeping the fast depleting aggregate resources in mind, the researches on exploring an alternative material such as sand as a substitute for stone aggregates in bituminous paving mixes are worth taking up, even though few earlier studies show not so promising results in respect of sand-bitumen mix.

This work presents an approach to use sand-bitumen mix by modification with sulfur. This paper specifically addresses the influence of compactive effort on performance characteristics of the sand-sulfur-bitumen (S-S-B) paving mixtures. An S-S-B mix comprising of poorly graded river sand, sulfur and VG 30 bitumen with the proportion of 85:10:5 by weight is selected for this study. The test results show that the Marshall stability increases initially and then decreases with the increasing compaction effort applied in the form of number of compaction blows during Marshall specimen preparation. The air voids of the mix are found to decrease with the compaction level initially and thereafter remain more or less constant. It is concluded that a compaction level of 50 blows on each face of the sample is optimum as the improvement in Marshall characteristics beyond this compaction level is marginal.

Key Words: Sand-sulfur-bitumen mix, Marshall Characteristics, Compaction Level