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# EVALUATE THE PROPERTIES OF STONE MATRIX PREPARED USING SLAG

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**ABSTRACT**
Since development of a area largely depends upon the road connectivity of that area as well as the development done by using local available resource is essential for countries like India, such a thing is Bamboo fiber which is available in abundant in our North Easter region. India is developing it as industrial hub for which road connectivity is of prior importance. Looking up for a solution and cost-effective project, an attempt has been made in this project to utilize bamboo fiber as stabilizer in the SMA mix prepared for the pavement design of a road.

**Keywords**
SMA, iron slag, road construction, Bamboo fiber.

## I. INTRODUCTION

Stone Matrix Asphalt is being used over the world as bituminous course due to its highly rut resistant properties as well as for both binder course and wearing course over the expressways in the developed country. The major difference which can be observed in the mix is of its structural skeleton as its recycled asphalt. Being the recycled asphalt, major ingredient is coarse aggregates varying up to 70 – 80 percent in the mix. As it help in developing better interlocking in the coarse aggregates and provide better contact between the stone which will definitely help in load carrying mechanism in SMA and will result in providing durability whereas conventional mix have lower content of course aggregate up to 40-60% and lack in the stone to stone contact due to the larger gravel floats in the matrix which is composed conventionally including filler particle and asphalt as well as bitumen. Such prepared mix whose stability mainly depends upon the cohesion as well as internal friction of the mix which provide support to the coarse aggregates.

## II. MATERIAL AND METHODS

Stone Matrix asphalt (SMA) is the matrix prepared using gap graded aggregate whose result varies depending upon the method adopted, procedure used, apparatus available and material in the nearby area used in preparation of the mix and the result obtained depends upon a particular area and vary along the area to area. For this topic, the procedure to prepare mix using above mentioned item is done according to the nearby area. In this main ingredient coarse aggregate of two types are taken i.e. stone aggregate (gap graded) as well as Slag aggregate. Bitumen as the binder of grade 60-70 is used due to its properties are suited to Indian weather along with Bamboo fibre as stabilizer to check the variation in the mix.

## III. RESULT AND DISCUSSION

The mechanical properties of the mix obtained after preparing Control mix and then replacing the bitumen mix by 4, 5, 5.5, 6, 7 % with slag along with bamboo fibre as stabilizer. The average result of the average sample are shown below :

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***Table 1: Test Result Values of bitumen mix***

| Sample No. average | Bitumen content | Average Stability (Kn) | | |
|---|---|---|---|---|
| | | Control mix | Mix with Slag | Mix with slag and bamboo |
| B | 4% | 7.06 | 6 | 5.96 |
| B | 5% | 9.21 | 8.31 | 8.31 |
| B | 5.5% | 8.58 | 7.88 | 8.42 |
| B | 6% | 8.62 | 6.946 | 7.88 |
| B | 7% | 6.34 | 6.77 | 6.94 |

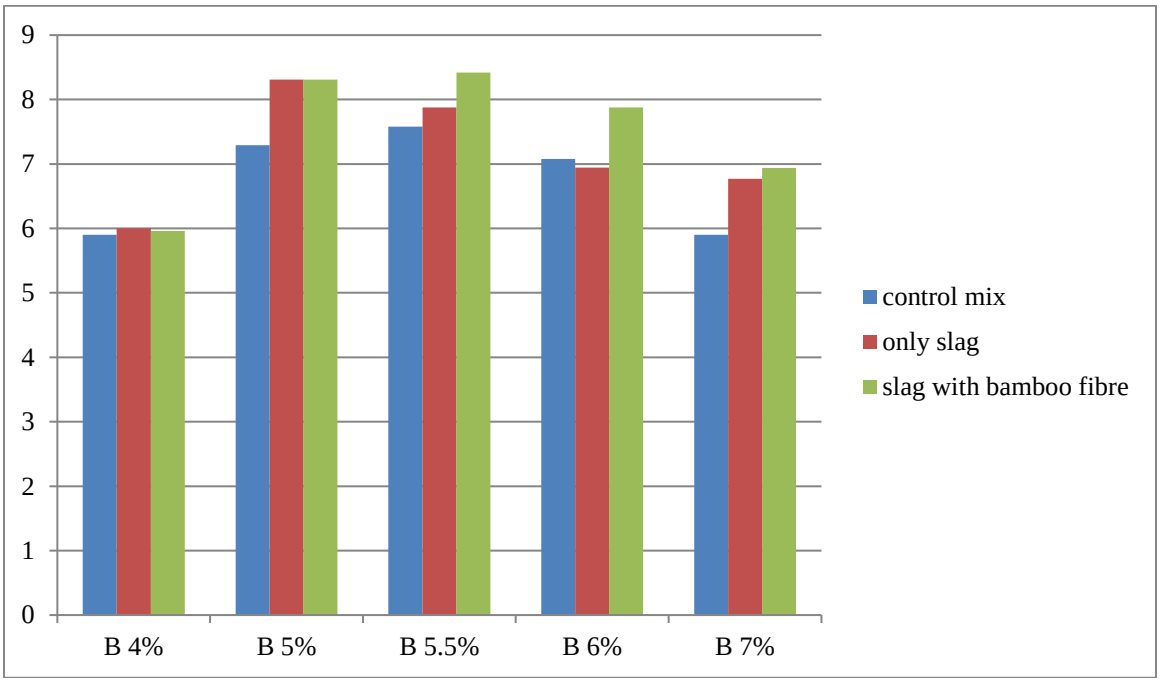


***Figure 1 Average value of different ingredient***

The above figure shows about the comparative study done after preparing control mix in lab replacing coarse aggregate with iron slag obtained from steel industry along with bamboo fibre as stabilizer.

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## IV. CONCLUSION

The SMA mix using Bamboo fibre has given quite expected results, which can be applied in the practical field.
SMA mixes obtained with no stabilizers have given result of inferior than the result obtained by preparing mixes by adding similar ingredients as above with the best suited stabilizers. Slag as Coarse Aggregate using Bamboo Fibre has the best stability followed by Stone aggregate with Bamboo Fibre. So the use of Bamboo Fibre as stabilizer will be highly beneficial in consideration of stability and Flow Value.

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