

**A Review paper on effect of various additives on performance of
Dense Bituminous Macadam (DBM)***Kaushik Mendapara¹, Ravindra Solanki², Himanshu Gupta³**¹ME.Transportation Engineering, MEFGI,**²Faculty of PG studies, MEFGI,**³Faculty of PG studies, MEFGI*

Abstract-Bituminous for mix can be prepared and used in a pavement section for a bituminous binder course use different types of additives likes as Polymers, Rubber and waste materials like discard rubber fibre (tube Tyres), plastic west and jute fiber. Modifying bituminous mix is expect to gives higher life.

The present study objective are developing bituminous mixes for the Dense Bituminous Macadam (DBM) incorporating the plastic wastes, waste tyre tubes and rice husk ash as partial replace of the different bitumen content. In this study, the Stability and Flow value analysis for the various DBM Grade 1 mixtures with binders and with different percentage replacement of bitumen with plastic wastes, waste tyre tubes and jute fibre are reported.

Keyword – Marshall Stability, flow value, west plastic fibre, jute fibre

I. Introduction

The Indian Highway road are very large area provide surface by bitumen. A bitumen concrete (BC) and dense bituminous macadam (DBM) is mostly using bituminous courses grade. A Mix designs of like a DBM and BC are based on the MORTH. In this mix design method to improve. And the aim to achieve long life of pavements. A flexible pavement bituminous mixes following three main functions: It is Provide structural strength, as well as Facilitate subsurface drainage and Provide surface friction when pavement should be a wet condition.

When increasing of traffic volume and load of vehicles are applying on highways, it becomes increasing very important that the pavements meet the Need of high durability. Providing Good comfort ride to the user of vehicle. Pavement service life increase with the reduce durability mix of maintenance and operation cost. The bituminous mix design main aims is that the determine proportion of bitumen, like a coarse aggregate, fine aggregate, filler to produce a mix which is very economical, durable, strong. The mix design in two major stages of the mixing, i.e. one of the dry mix design and second is wet mix design. Mix design objectives are to provide good workability to permit easy placement sufficient flexibility to avoid premature cracking due to repeated bending by traffic, sufficient air voids in the compacted bitumen to allow for additional compaction by traffic, sufficient strength to resistance deformation under traffic at higher temperature, durable pavement and good flexibility at low temperature to prevent shrinkage cracks.

In India road transport mostly large area about 85% of passenger traffic and the 72% of freight transport.

The drawback of a Marshall test is number of hammer blow to compacted the specimen are fixed. The compaction effort by this method which is 55 to 75 blows is not adequate to examine the field condition.

And increase refusal density of pavement. A compacter can be simulate 90% of field characteristics. The quality of roads the economy of a country but the construction of highways involves large amount of the investment and mainly sixty percent of the highway project cost is associated with the pavement construction. Pavement is a durable surfacing of a road, airstrip, and the primary function are to transmit loads to the sub-base and underlying soil subgrade.

II. Literature review

Amit Gawande et al. (April 2012) have done based on the using of waste plastic in construction of flexible road pavement. Also dense bituminous macadam with reduced plastic low density replacing 30% of 2.35- 5 mm aggregate reduce density to 16%.

Nitinprasad.r et al. (Nov-2013) have done check out binder properties as per IS: 1203-1978 and IS: 1205:-1978 .also determining property of OBC to increase the Marshall stability and flow value.

Aline colares do vale et al (2014) have done work on the

Using Cellulose fibre and coconut fibre to result drain down test value 0.7% coconut fibre. The SMA studied presented value of optimum binder content as per methodology of Marshall Test.

Vikash Sharma et al. (Feb-2006) have been work on the Natural fibre and crumb rubber fibre. A Stabilizing adding such as mineral fibre and polymer fibre is add SMA Mixture. Value bulk density with CRMB 2.331, VMA (18.25%), and VTM (4%).

Darshna b. joshi et al. (oct-2103) have work base on the OBC by Marshall Mix design for Dense bituminous macadam. Adequate mix stability to prevent displacement and distortion when traffic load is applied without bleeding and loss of stability.adequate workability to facility placement of a mix without segregation.

H.M.Rasel et al. (2011) have polymer Uses for modified bitumen at paving purpose copolymer fibre. For determine of OBC by adding bitumen different percentage 4, 4.5, 5, 5.5, 6 % as per weight of aggregate. As recommended Mixing of the PVC modified is up to 10% by weight of bitumen content utilized for construction of road.

S.Fatima et al. (2010) have work based on jute and its composite have been introducing as veryeco-friendly, biodegradable and economical alternative for noiseControlling materials. As , jute showmore significant acoustical attenuation properties like as well asproperties than glass fibre in terms of limiting oxygen index, flame propagation and smoke density.

A.K.Rana. et al. (Oct 2002) have Effect of the different types fiber loading up to a 30, 40 and 50 wt. % on impact value strength, flexural and tensile strength properties have been studied using 4,7,9,11 and 14% of Excellor VA 1803 and 1%compatibiliser.

B.singh et al. (Oct-1999) have function of jute composite level to increased humidity level, also increased weight gain. So he was found to be anegligible as compare to the unexposed sample. A result was that the loss in physico mechanical property
Of jute composite material.

O.S.Obiola et al. (2014) have design of flexible pavement in mixing to bituminous with different fibre as per weight of aggregate. And result was that a natural fibres can replace synthetic fibres in SMA mixtures as there is a good adhesion of the fibre with asphalt.

M. jawaid et al. (2013) have check out the tensile strength. This test carried out by using ASTM D 3039 specifications. In this study result was that the adding of different mineral fibre and jute fibre on mixing of bituminous. So value of VMA is up to 19.20% and VTM 5%

Abdul jabbar et al. (2015) was work based on jute epoxy composite material .the creep starin was found to increase with temperature. The treated composites
Show less creep deformation than untreated one at all temperatures.

R.suthamyog et al. (2014) have work done base on the effect of modified jute fibre on a mechanical property of rubber composite. And result was that the cellulose fibre can be effect use as reinforcing NR material. And that NR/jute treated with DPNR latex can improve the mechanical properties.

Vishnu Prasad et al. (2014) was work based on the analysis of jute fiber and hybrid polymer can replacing many composites considering the cost factor. And improve the value of stability, flow value

B.M Jain et al. (2010) have work carried out the uses of modified bitumen with natural fibre and banana fibre. Result was that increase the Marshall Stability value and flow value.

III. Conclusion

From this literature review study that the performance of Dense bituminous macadam using a different type of fiber likes a natural fibre , jute fibre, west plastic fibre adding in the bituminous as per weight of bitumen. And checkout the property of aggregate and bitumen. When uses of new bituminous with different fibres like a jute fibre, rubber fiber, and west plastic fibres of 5 – 12 % weight of bitumen. So improve the Marshall stability, flow value , OBC , strength.

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