

PROJECT REFERENCE NUMBER: **46S_BE_4491**

TITLE OF PROJECT: **REPAIR OF POYHOLES USING ECOFRIENDLY MATERIALS USING COLD MIX ASPHALT TECHNOLOGY.**

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ABSTRACT

In a developing country like India we can observe cold mix technology is lagging behind in both research and application fields. It is our primary motivation underlying selection of cold mix technology as the present research area. Though, it has economical and environmental advantages over the hot mixes, up to now there is no universally adopted cold mix design method. Due to this, deformity is observed in the cold mix design procedures followed by different organization/researchers/agencies. So it is difficult to form reliable correlation and to have a comparative study between experimental results reported by them. So the objective of this project work is aimed to select important mix parameters and determine their effect on cold mix asphalt and also to use different green materials in the mixture. This project is based on the reduction of many CO₂ emissions by explaining the need for sustainable technological innovation as a need for road construction.

INTRODUCTION

Due to vast fuel consumption because of hot mix technology in road construction, there is increase in environmental pollution. This causes the various harmful effects on the environment as well as on human health and also poses a loss to the country's economy. So, measures should be taken for improving this situation. Therefore, this project mainly focuses on the improvements which can be made to tackle this situation by adopting the cold mix technology instead of hot mix technology in road construction. Properties of cold mixes are varied by many parameters like; aggregate source, curing condition and time period of curing, etc. Hence there is no universally accepted mix design method for cold mixes. But Marshall Method is popularly used to design Method emulsified mixes. Marshall Method for emulsified asphalt aggregate

design is based on the research conducted at the University of Illinois. This method is applicable to base course for low Traffic volume road. Cold mix is used in surface Courses also for low to medium traffic volume road. The modification of the cold mix asphalt was done by partially replacing the granite waste and flyash as a filler material by 8, 10 , 12 , 14 and 16% by weight of total aggregates. Replacement of Granite Waste filler with fly ash filler resulted in increment in marshall stability values of mix. Cold mix asphalt samples containing 8 % and above flyash were found to have marshall stability values above 9 kN. The improvement in marshall stability value may be due to the stiffening of mix occurred by the hydration of flyash in the presence of encapsulated water, which is considered as a secondary bond in the mix.

Keywords : Marshall stability , cold mix technology.

OBJECTIVES

- Identification of issues concerned with the potholes.
- Design of Cold mix Asphalt using Coarse aggregate , Granite Waste , Cut back binder, Flyash , Emulsified Bitumen.
- To assess the physical properties of aggregates,mc-800,cutback bitumen , cold mix asphalt and by varying the percentage of filler materials by 8,10,12,14,16 %.
- To use cold mix asphalt technology as a Sustainable cost-effective material and better alternative & also to improve the standard of the transportation.

METHODOLOGY

Literature review suggests that there is vast use of Hot Mix Technology in road construction and repair in India. Hot mix Technology though gives good results and ease in work completion with all the temperature constraints, its production gives more CO2 emission and requires lot energy in the Production. Hence Hot Mix Technology though gives good marshall stability and durability it's not Sustainable. Hence this Project aims to update cold mix asphalt technology with the addition of green materials as the substitute for regular fillers used like Granite waste, fly ash etc.

Step 1. Material selection and Test on Materials used.

Step 2. Mix Proportion and Design of Cold Mix Asphalt.

Step 3. Determination of Optimum Bitumen Content.

Step 4. Marshall Stability Test .

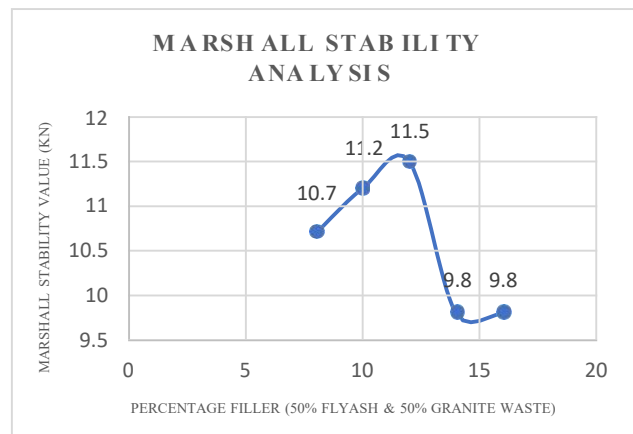
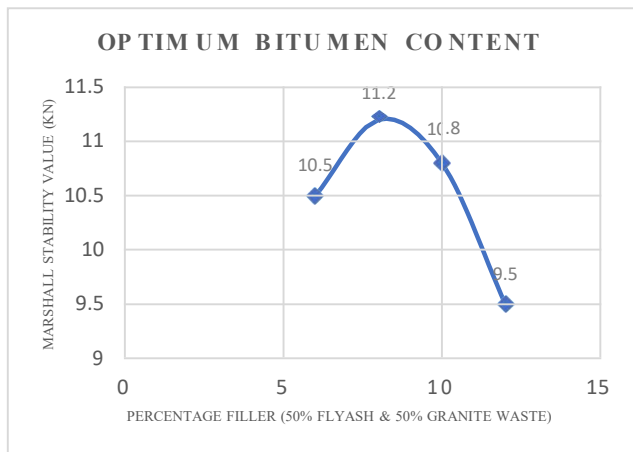
Step 5. Analysis of Test Results and Discussion



RESULTS

- From the test results we obtained
- Optimum Bitumen Content observed From Test Result is 8%.
- At 12% of Flyash and Granite Waste Maximum Marshall Stability Value Can be Observed.

The minimum Marshall Stability value of 9 kN recommended by MORTH.



CONCLUSION

- Cold mix asphalt technology is a Sustainable cost effective material and better alternative & also to improve the standard of the transportation.
- Cold mix asphalt is environmentally friendly and conserves energy. Cold mix pavement can provide energy savings of over 50% compared with hot mix.
- Repair of potholes using cold mix method proves to be cost effective, economical method in a right situation.
- Utilizing waste materials reduces energy consumption, protects non-renewable natural resources, and reduces the quantity of material that causes environmental pollution.
- The increasing incorporation of flyash in CMA decreases the optimum residual bitumen content.
- The marshal stability, marshal quotient, and retained stability increased on increasing content in CBEM, and the maximum value of these parameters was obtained on 12% flyash content.