

## Studies on Mechanical properties of Semi Rigid Pavement (CTSEM\_132)

### Abstract

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Pavement distress due to heavy loads will leads to frequent rehabilitation and that will increase the global cost of pavement section. Semi rigid pavement, a composite pavement, is formed by filling into open porous bitumen skeleton with cement mortar. Hence semi rigid pavements are the pavement that will take heavy loads and cost less damage to the pavement. Here gradation adopted for open graded is ASTM D7064, New Jersey and New Zealand. The main objective of the study is to maintain 20 to 30 % voids and cementitious grout consists of Cement, M sand and Super plasticizer (1:1:0.4). After grouting the samples are cured for 1, 7 & 28 days respectively. Mechanical properties were carried such as Compressive strength, indirect tensile strength flexural strength and Fatigue for 1, 7 & 28days respectively. The results confirmed that different aggregate gradations significantly affect the properties of Semi rigid pavement.

*Keywords: Semi rigid pavement, Gradation, Compressive strength, Flexural strength, Indirect tensile strength, Fatigue*

## 1. INTRODUCTION

### 1.1 General

In the developing countries like India day by day traffic goes on increasing and as the traffic increases wheel load stress also increases on the pavement surface. Due to increase in the wheel load stresses the problem of initial distresses occurs on the flexible pavement.

On the other hand concrete roads have high compressive strength, But problem with concrete roads is high susceptible to thermal stresses ad compared to flexible pavement it is less economical in terms of maintenance. Keeping in mind a view to improve the performance of pavement and life span of pavement, Semi flexible pavement has been introduced. The SFP combines the positive qualities (Flexibility and Rigidity) of flexible and rigid pavements.

A typical semi flexible pavement consists of open graded asphalt skeleton (with voids ratio 25 to 30 %) and by filling the voids with cementitious grout. The construction of SFP is done in two stages, A flexible pavement with open graded asphalt skeleton is laid to 50 to 70mm depending upon the design thickness with voids greater than 25% and then fill the voids with cementitious grout. After curing the pavement clearly shows the combined positive attributes of rigid and flexible pavement.

The imperviousness of grouted pavement prevents water seepage and its high strength reduces stress level. Grouted pavements are likely to be used and suitable for heavy loading conditions like airports, loading yards etc. The semi flexible pavement has life span more than that of normal flexible pavement.

### 1.2. Literature review

**Shuguag Hou et.al., (2015)** Grouted macadam composite material has better high temp stability fatigue performance and moisture stability then that of conventional asphalt mix, while it shows an acceptable decrease in crack resistance because of the relative brittleness of hardened cement paste at low temperature.

**BohanYang,(2015)** In this study application of semi rigid pavement have become more