

ABSTRACT

A major portion of roads in India are mainly granular with thin bituminous surfacing. Only heavy traffic city streets and National Highways have thick bituminous construction. In some places the subgrade soils are stabilised with cement or lime before laying of granular layers.

For the pavement composition mentioned above, clear cut guidelines are not available for assigning elastic modulus to the granular layer for elastic layered analysis using Burmister's approach. Many of the available research findings are conflicting.

The investigation deals with a study of the stress dependant modulus of granular bases in pavements and development of a finite element program for non-linear analysis of multilayer pavements consisting of

- (i). full depth granular pavements,
- (ii) granular base topped with asphalt concrete surfacing,
- (iii) granular layer laid over cement treated subbase and
- (iv) granular base laid over a granular subbase.

K-Theta model of U.C. Berkeley was used for the analysis. A few problems were solved by K-G Model developed at Nottingham University.

From data obtained by Falling Weight Deflectometer and the analysis by the author, limiting value of elastic modulus of the granular layer has been determined.

The effective resilient modulus of granular materials for different combinations of layer thicknesses were obtained for determination of realistic values of stress and displacement for use in design of pavements. Finally a series of curves for determination of the value of effective resilient modulus of waterbound macadam were obtained for analysis of pavements using Personal Computer (P.C) compatible elastic analysis programs.