

Kompunt Jindawat 2011: The Influence of Soft Foundation on Pavement Layer.

Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Mr. Barames Vardhanabhuti, Ph.D. 286 pages.

One of problems for pavement construction on soft ground is cracks, rutting and undulation of pavement surface. The important factors leading to the damages are thickness of pavement layer and low elastic modulus of soft ground foundation comparing to that of pavement materials. As the wheel load is applied on the pavement surface, the soft ground underneath could flow out laterally, induced flexural stress, and consequently, the confining pressure in the pavement layer was changed.

This mechanism could be illustrated by the finite element analysis result of a continuous two-elastic layer model and assuming the material behavior as elastic-perfectly plastic. In this study, the important variable parameters are (1) the elastic modulus of pavement (E_1) and soft ground foundation (E_2), (2) the thickness of pavement layer, and (3) the width of wheel load.

The analytical results show that, for a very thick soft ground layer and low pavement thickness, the mode of pavement failure is similar to punching shear failure (Mode A). When the proportion of E_1/E_2 is increased to a value higher than 20 to 100 times, the failure mode change from punching shear failure to general shear failure (Mode B). The width of wheel load was no significant effect to the mode of failure mechanism.

Student's signature

Thesis Advisor's signature