

## **Establishing stress boundaries for various loading and pavement configuration**

### **ABSTRACT**

This article is aimed to understand the relationship between stress and pavement components and finding the boundaries of the vertical and lateral stress distribution. It is carried out on four-layer pavement structure to understand the load distribution behavior through different type of materials in each layer with different resilience modulus values and different thickness. This analysis supports us to improve the pavement design accuracy and realistic, which will reduce the road maintenance cost and increase the pavement service life. Several simplifying assumptions regarding tire load applied location has been used. Therefore, 25,000 different vertical stress values in form of 125 different set of data (difference loading and pavement configuration) under five different loading conditions were analyzed using the KENPAVE software (using mechanistic empirical design method). Conclusions from the data and plot analysis show that pavement layer load distribution is affected unevenly as the effect of thickness is greater than the impact of the strength of the layer. Moreover, the results showed that there is a theoretical boundary for load distribution in the lateral direction at the bottom of the surface layer between (8 in - 14.5 in), bottom of base layer (10 in - 19.5 in) and bottom of sub-surface layer (12 in - 22 in). The stress distribution might be used as an indicator for engineers to determine the pavement behavior under an applied load.