

Resilient modulus of stabilized subgrade for flexible pavement design

ABSTRACT

This paper reports the resilient modulus of stabilized subgrade soil for flexible pavement design using chemical stabilizer; Sodium Silicate (SiO_2). SiO_2 is a water based soil stabilizer which is currently being patented on application by Probase Manufacturing Sdn.Bhd. in stabilizing subgrade soil for low volume road construction. The resilient modulus of the stabilized subgrade soil; with particular variations values of additive content, dry density, moisture content and curing time were investigated. Repeated Triaxial load test was conducted on the stabilized subgrade soil, and the specimens were prepared with 100%, 95% and 90% of dry density, at optimum moisture content (W_{Opt}), 3% dry of optimum ($\text{W}_{\text{Opt}-3}$) and 3% wet of optimum ($\text{W}_{\text{Opt}+3}$), and the amount of stabilizer used were 4%, 8% and 12% from dry density of the soil. It had been found that the density affects the resilient modulus of fine grained soil materials; however the magnitude of this effect is smaller compared to the effect of water (moisture). The addition of liquid SiO_2 stabilizer improves the stiffness (resilient modulus) of the soil and consequently, the optimum concentration of the stabilizer is found to be 4% at 95% density with $\text{W}_{\text{Opt}-3}$ for subgrade soil stabilization from KENLAYER program. The analysis was supported by Asphalt Institute (AI) Models which was used to predict the number of load cycle that lead to failure.

Keyword: Asphalt Institute (AI) Models; Chemicals tabilization; KENLAYER; Resilient modulus subgrade