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Significant Stressed Zone of Highway Embankment

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Abstract : The Axle Pressure and the Consolidation Pressure decrease with the height of the highway embankment and the depth of subsoil. This reduction of pressure depends on the height and width of the embankment. The depth is defined as the significantly stressed zone at which the pressure is reduced to 0.2 or 20%. The axle pressure is reduced to 7% for embankment height 1-3m and to 0.7% for embankment height 4-12m at the bottom level of Highway Embankment. This observation implies that, the portion of axle pressure transferred to subsoil underlying the embankment is not significant for ESAL factor 4.8. The 70% consolidation to have occurred after the construction of the surface layer of pavement. Considering this ratio of post construction settlement, 70% consolidation pressure (Δσ70) is used in this analysis. The magnitude of influence depth or Significant Stressed Zone (Ds) had been obtained for the range of crest width (at the top level of the embankment) is kept between 5m and 50m and for the range of embankment height from 1.0m to 12.0m considering 70% of consolidation pressure (Δσ70). Significantly stressed zones (Ds) for 70% embankment pressure are found as 2-6.2He for embankment top width 5-50m.

Keywords : consolidation pressure, consolidation settlement, ESAL, highway embankment, HS 20-44, significant stressed zone, stress distribution
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