Parametric Study of Mechanically Stabilized Earth Wall

***Abstract*—** Conventional embankment construction needs more right of way space and more backfill material or heavy retaining walls to retain the soil. This may lead to foundation problems in areas of weak soil. Reinforced soil can be used for greater heights, vertical slopes, less and uniform deformations. They are easy to work with, takes less time and are cost effective. This paper attempts to make parametric analysis of geosynthetic reinforced wall known as Mechanically Stabilized Earth (MSE) wall. Numerical simulations are done using a Finite Element Program (PLAXIS 2D). Soil is simulated as Mohr-Coulomb material and geosynthetic reinforcement modeled as elastic material. The foundation soil and reinforced soil having angle of internal friction value of 30° and 32° is used in the analysis. Plate element with axial stiffness value of 42 x 106 kN/m and bending stiffness 78,500 kNm2/m is used in the analysis. Parametric analysis of spacing of geosynthetic reinforcement, geosynthetics stiffness value, aspect ratio (L/H), slope of wall, angle of internal friction and height of wall on factor of safety (FOS) and maximum horizontal displacement are studied. The FOS initially increased marginally with increase in the stiffness value whereas axial stiffness value of 2000 kN/m and 2500 kN/m yielded the same FOS value of 2.091. With the decrease in the slope of wall, the FOS increased from a value of 1.886 with vertical wall face to 2.299 for 75.96° angle slope.

Keywords—MSE wall, Geosynthetics.