

8. The Effect of Intermediate Columns with Slider Structure of the Underground Structure

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The authors have simulated the experimental results by the Static FEM nonlinear analysis. In this experiment box culvert models with intermediate columns embedded in the simple shear stack box were broke by static load. Good Agreement was obtained between the test and analytical results. Consequently, Property of Slider and rigid structure was studied by static FEM nonlinear analysis. As a result of analysis, bending moment and shearing force of intermediate columns decrease in the slider structure. Furthermore, the sectional force at the corner of frame make no difference between two types of structure. This is considered that the horizontal force of intermediate columns is transferred to an increase of the subgrade reaction. It is concluded that seismic design applied to slider structure of intermediate columns can decrease section dimensions and reinforcement ratio and can rationalize seismic design of underground structure.

Key words : underground structure, soil-structure-interaction, earthquake response, non-linear analysis, open-cut tunnel