

A Numerical Study of Seismic Effects on Slope Stability Using Node-Based Smooth Finite Element Method

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Abstract : This contribution considers seismic effects on the stability of slope and footing resting on a slope. The seismic force is simply treated as static inertial force through the values of acceleration factor. All domains are assumed to be plasticity deformations approximated using node-based smoothed finite element method (NS-FEM). The failure mechanism and safety factor were then explored using numerical procedure based on upper bound approach in which optimization problem was formed as second order cone programming (SOCP). The data obtained confirm that upper bound procedure using NS-FEM and SOCP can give stable and rapid convergence results of seismic stability factors.

Keywords : upper bound analysis, safety factor, slope stability, footing resting on slope

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