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**Effect of Explosive Load on the Depth Required
for Geotechnical Identification**

The depths required for drilling in different types of soil vary according to the type of load applied. The possibility of dynamic loading from a blast during a military or terrorist attack or by exploding gas pipelines, along with other types of loading, is essential for the construction of safe structures. It is necessary to consider dynamic loading from a possible explosion when determining the depth of the boreholes. The present study numerically modeled sandy and clay soils under dry and saturated conditions that experience 50 to 300 kg of TNT explosive loading on the surface and at a depth of four meters from the soil surface. For this purpose, Abacus software, Eulerian-Lagrangian coupling, and three-dimensional nonlinear dynamic analysis using the finite element method have been used. Case studies were examined by initially determining the net vertical stress created in the soil under the blast load then, after obtaining the range of impact of the blast for each case, the percentage of increase in the borehole depth was calculated by considering the effect of the blast load. The values calculated for sandy soil was 5% to 92.5%, for clay soil was 7.5% to 185%, for saturated sandy soil was 2.5% to 179% and for saturated clay soil was 4.5% to 113%.

Keywords: Blast, Vertical stress, Borehole depth, Coupled eulerian-lagrangian approach

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