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Effect of Slope Height and Horizontal Forces on the Bearing Capacity of Strip Footings near Slopes in Cohesionless Soil

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Abstract : The problem of determining the bearing capacity of a strip foundation located near a slope of infinite height has been dealt with by several authors. Very often in practical problems the slope is of limited height, and furthermore the resulting load may be inclined at an angle to the horizontal, and in such cases the bearing capacity of the footing cannot be found using the existing methods. The present work comprises finite element based upper- and lower-bound calculations, using the geotechnical software OptumG2 to investigate the effect of the slope height and horizontal forces on the total bearing capacity, both without and with using superposition as presupposed in the traditional bearing capacity equation. The results for friction angles 30, 35 and 40 degrees, slope inclinations 1:2, 1:3 and 1:4, for selfweight and surcharge are given as charts showing the slope inclination factors suitable for design.

Keywords : footings, bearing capacity, slopes, cohesionnless soil
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