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VARIATION IN BEARING CAPACITY OF FOOTING ON SLOPPING ANISOTROPIC ROCK MASS

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ABSTRACT

The rock mass bearing capacity and its deformational behavior is governed by the interaction of intact blocks with the discontinuities in rock mass. Under very low confining pressure or unconfined stress condition, they dictate a major influence on strength and deformational behavior of the jointed rock mass. In this study, strength and deformational behavior of slopping anisotropic rock mass have been assessed experimentally as well as analytically. The jointed rock mass assembled using sand stone element of 25 mm × 25 mm × 75 mm along different joint angles of 15˚, 30˚, 45˚, 60˚, 75˚ and 90˚ and slope angles of 30˚, 45˚, 60˚, 75˚, and 90˚ with the horizontal in plane strain condition and 15 cm × 15 cm footing placed exactly at the edge of the slope as well as at 15 cm from edge. Joint angle, distance of footing from edge and modes of failure are important parameters, which govern the load intensity at slope apart from rock mass properties. Load carrying capacity of rock mass can be assessed analytically, if the mode of failure can be predicted. Unconfined rock mass with continuous joint parallel to side slope predicts buckling failure which is also observed experimentally. Experimental data has been analyzed by Euler's buckling theory as suggested by Cavers (1981).

KEYWORDS: Bearing Capacity, Slopping Anisotropic Rock Mass, Plain Strain, Edge Distance, Failure Modes, Rock Mass Buckling