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BEARING CAPACITY OF FOOTING ON SLOPPING ANISOTROPIC ROCK MASS

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ABSTRACT

Rocks are inherently strong and stable to withstand loads. Rock mass bearing capacity governs by its discontinuities like folds, faults, bedding plane which could be assessed by various theories considering rock mass either isotropic or anisotrpic medium. Despite having strong and stable behavior, a jointed rock mass under unconfined condition has very low bearing capacity, sometimes rock mass collapse under its own weight. In this study, bearing capacity of jointed rock mass has been assessed under unconfined condition. The bearing capacity of footing at the edge of slopping anisotropic rock mass has been obtained experimentally in plane strain condition. 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. All the tests were performed on stable rock mass having continuous joint angle. It is observed that magnitude of load intensity at failure on slope depends upon joint angle with major principal axis, joint frequency, joint strength, unconfined compressive strength and modulus of elasticity of rock mass and mode of failure. Joint angle and modes of failure are important parameters, which govern the load intensity at slope. Load carrying capacity of rock mass can be assessed more rationally if the mode of failure can be predicted. The mode failures as observed are buckling/sliding/rotation/toppling towards unconfined side. Analysis of the experimental data has been attempted based on Caver's (1981) suggestions and Euler's theory. Comparative values of failure loads have been predicted

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