**NUMERICAL INVESTIGATION IN TO THE BEHAVIOR OF**

**LATERALLY LOADED PILES IN c-φ SOILS**

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***ABSTRACT***

*Analytical methods used to determine the behavior of laterally loaded piles in cohesive and cohesionless soils were proposed by several researchers, but studies of these piles when they are embedded in soils which is neither purely cohesive nor cohesionless is seldom available. And the usual existence of these soils throughout the ground requires to be investigated. This research paper examines the response of a laterally loaded single vertical pile in a c-φ soil. The variation on the ultimate lateral load resistance, the maximum bending moments, deflection and net pressure on the side of the pile of such soils were investigated using FLAC3D. In the course of the modeling, the sensitivity analysis and validation of the model were checked by comparing the outputs of the numerical model with experimental results and available analytical methods proposed for laterally loaded piles in cohesive and cohesionless soils. Moreover a parametric study was performed for various values of the strength parameters. This showed that the magnitude of the mobilized maximum net pressure on the pile’s surface increases with increasing the values of the shear strength parameters and pile length. The increase on the internal friction angle, cohesive strength of the soil and pile length also results a rise in the ultimate lateral load resistance and maximum bending moment of the pile. The rate of increase in the ultimate lateral load resistance and the maximum bending moment when the internal friction angle rises by 10o is 15-30 % and 20-35 %, respectively. And a 25 kN/m2 increase in the undrained shear strength of the soil increases the ultimate lateral load resistance by 30-70 % and the maximum bending moment by 30-65%. For fixed and free head piles, the path followed by the ultimate lateral load resistance and maximum moment when the pile length increases is similar.*

**Keywords**

c-φ soil , Cohesive, cohesionless, FLAC3D, undrained shear strength, maximum bending moment