

## **The Study of Laterally Loaded Piles in Different Layers Using Finite Element Method**

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### **ABSTRACT**

Pile foundations are used for the transfer of loads from superstructures to the earth or ground. They can be used individually for supporting loads or can be grouped together. It has been found to give a reasonable prediction for a single pile subjected to dynamic lateral loading. Dynamic and static responses of a pile subjected to external excitation are complex phenomena resulting from the interactions between the pile and the surrounding soil. This study investigates the bulging and load-settlement behavior of single floating layered piles and soft clay piles embedded in semi infinite clay layers considering the linear elastic-perfectly plastic response for both sand piles and soft clay deposits. Studying the bulging behavior of layered soil piles aims at understanding the effect of various properties of various materials and soft clay on the bulging depth, maximum bulging, and the corresponding depth. Nonlinear analysis is utilized in this study. To predict the lateral deflection of individual piles with different slenderness ratios (L/D) under static and dynamic loading. The lateral and static loading is necessary in pile design, whereas the dynamic loading is the major challenge. The main objective of this study is to assess the lateral deformation of pile in sand, fine clay, and silt clay with elastic and elastoplastic behavior, under lateral static and dynamic loading.

**Keywords:** *Finite Element Method, Lateral deflection, soft clay, layered soil*