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Development of Application Software for Lateral and Vertical Load Carrying Capacity of Piles

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Abstract

Pile foundation is one of the preferred deep foundation for construction of structures either in coastal region or seismically active regions. In the present study, an attempt has been made to develop an application software for determining the lateral and vertical load carrying capacity of pile as per the provisions of IS 2911. This software is developed using Python Programming language and would be helpful for the preliminary design of pile foundation. Libraries such as NumPy, Matplotlib, Pandas, xlwt, etc. were used for backend work, whereas Tkinter and Treeview libraries were used for front end i.e. Graphical User Interface (GUI) work. This software provides you with a comparative study of how the load carrying capacity of pile changes with respect to change in soil profile (density, water table depth) and pile design (length and diameter) in tabular form. This tabular data can be directly exported to MS-Excel for further desired calculation. With the ongoing development enhancement and modification in the software, deflection of pile, slope, bending moment and soil reaction in graphical form with respect to length of pile can be viewed. This is a first step to make designing of pile foundation an easy task, less time consuming and also to make pile foundation more cost efficient. This software can also be used by teachers, professors, engineering professionals for a quick review, check and for optimal designing of pile foundation. This would be made available in public domain for updating and improvement to the source code.

Keywords: Pile foundation, IS 2911, Python