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Design and analysis of types of footings

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ABSTRACT

In engineering, a foundation is the element of a structure which connects it to the ground, transferring loads from the structure to the ground. They are generallyconsidered in shallow foundations. Foundation is that part ofstructure which is in direct contact with soil and transmits loadinto it. In other words, a group of footing is known as foundation. They are typically made of concrete with rebar reinforcement that has been poured into an excavated trench. The purpose offootings is to support the foundation and prevent settling. Footings are especially important in areas with troublesome soils. Here, in this report we are going to show a detailed study of isolated footing, which is further differentiated in three parts i.e. Pad footing, Slope footing, Step footing. We are going to study about Pad footing in isolated type of footing.

Keywords: *STAAD Pro, Residential Building, AUTOCAD, Microsoft Excel, with Bearing Capacity Method / Limit State Method*

1. INTRODUCTION

Footing is defined as a structure constructed in brickwork, Masonry or Concrete under the base of a wall or column for the purpose of distribution. Footing are an important part of foundation construction. They are typically made of concrete with rebar reinforcement that has been poured into an excavated trench.

2. OBJECTIVES OF THE PROJECT

Comparison of the manually designed footing and footing designed from design software i.e. STAAD FOUNDATION in terms of time and problems occurred. To design two different types of footing for same load and same soil condition. Cost analysis of the above designed two footings and comparison of the same from economic point of view.

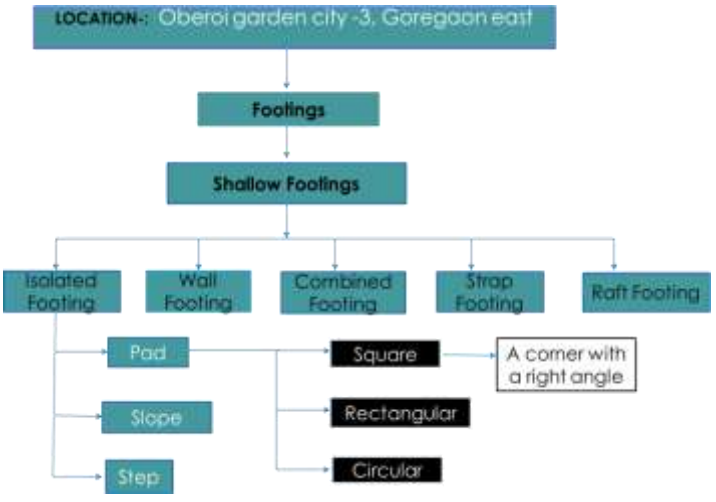
3. METHODOLOGY

They are different types of foundation based on no. of the factor. The isolated footing is one of the most popular and simplest types of foundation used worldwide.

Foundation are very important to the building. Ultimately the entire load of the building is transferred to the ground through the foundation.

Isolated footing are the most commonly used footing for reinforced cement concrete because it is simple and most economical.

An isolated footing is used to support a single column. Isolated footing are independent footings that are provided for each column



4. FUTURE SCOPE

In future, these footing types can applicable for the construction for low-rise structure. With the help of this project we get know detailed information a detailed knowledge of isolated footing in

shallow foundation. By applying different types soil condition in this structure i.e. low-rise structure in pad type of footing weget know whether we can applicable the same condition or we used particular one to two condition if it useful.

5. LITURATURE SURVEY

Arnulfo Luévanos Rojas

The foundation is part of the structure which transmits the loads to the soil. Each building demands the need to solve a problem of foundation. The foundations are classified into superficial and deep, which have important differences: in terms of geometry, the behavior of the soil, its structural functionality and its constructive systems.

Sarafraz Akhter, Rachna M Bajaj, Kapil Soni

The lowest part of a structure which transfers its load to the soil underneath is foundation. It is the component of a structure which associates it to the ground and moves loads from the structure to the ground. These are commonly viewed as either shallow or profound. The strength of a structure for the most part relies upon the performance of foundation. Its plan ought to be done appropriately, thinking about its significance. With the assistance of bearing capacity an ultimate load of soil is recognized.

Bindusara T.S., Keerthi Gowda B.S., Easwara Prasad G.L. and Velmurugan R.

Manual design of isolated RCC footing is a very tedious job. It demands experienced knowledge of reinforced cement concrete behavior under axial load and bending moment. A less experienced (new) engineer feel complex to analyze and design the isolated RCC footing under various types of load. Even though, check for safety against one-way shear, two-way shear, flexure failure, bending stress and development length is another difficult task. To minimize all the above mentioned complexity, soft computing technique like artificial neural network approach is adopted.

Gopal Mishra

Isolated footings are designed to sustain the applied loads, moments and forces and the induced reactions and to ensure that any settlement which may occur is as nearly uniform as possible, and the safe bearing capacity of the soil is not exceeded (see IS 1904). In sloped or stepped footings the effective cross-section in compression is limited by the area above the neutral plane, and the angle of slope or depth and location of steps is providedsuch that the design requirements are satisfied at every section.

Dr. S.S.Pusadkar, K. R.Ninghot

The foundations are designed for transmitting the loads from a structure to soil without causing any shear failure or settlement failure of the foundation. For any project, the choice of a suitable bearing capacity of soil becomes the most important. However, due to scarcity of urban land, it is unavoidable to avoid the existence of nearby structures or footings. These footings when come closer affect the bearing capacity of footing. The interference effect or such footing become more complicated as layered soil exists below footing.

Anurag Kashyap

Foundation design consists of two distinct parts: the ultimate bearing capacity of the soil under the Foundation, and the tolerable settlement that the footing can undergo without affectingthe superstructure. The ultimate bearing capacity aims at determining the load that the soil under the foundation can handle before shear failure; while, the calculation of the settlement caused by the superstructure should not exceed the limits of the allowed deformation for stability, function and aspects of construction. Research on the ultimate bearing capacity problems can be carried out using either analytical solutions or experimental investigations.

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