SNS COLLEGE OF TECHNOLOGY

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COIMBATORE

DEPARTMENT OF CIVIL ENGINEERING

23GET102 – BASIC CIVIL AND MECHANICAL ENGINEERING

I YEAR / I SEMESTER

Unit 2 : BUILDING COMPONENTS

Topic : SUB STRUCTURE-TYPES OF FOUNDATION

Sub structure-Foundation

A foundation is the lowest part of any structure. It is the part of a building or home that binds the structure to the soil underneath by safely transferring the load of the structure to the soil.

While choosing the right foundation is a highly technical decision that is to be made by your architect, engineer & building professionals, it is always helpful to understand the process it takes to build your dream home.

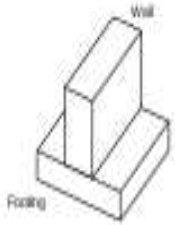
TYPES OF FOUNDATON

Shallow Foundation

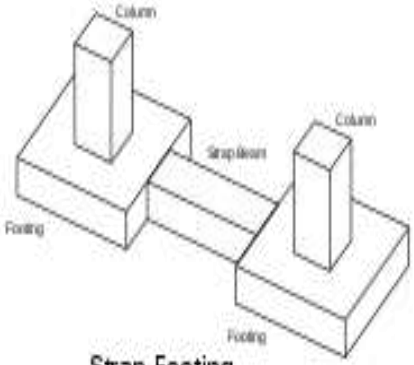
- Isolated footing
- Combined footing
- Strap footing
- Mat foundation

Deep Foundation

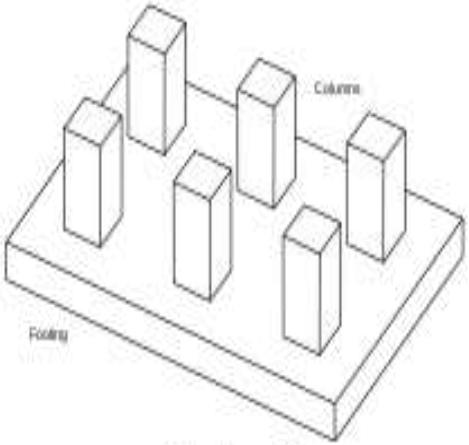
- Basements
- Buoyancy rafts (hollow box foundations)
- Caissons
- Cylinders
- Shaft foundations
- Pile foundations



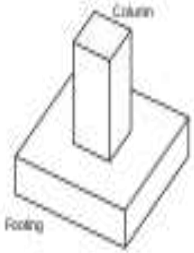
Wall Footing



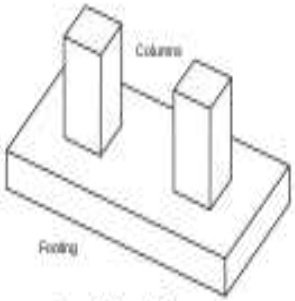
Strap Footing



Mat Foundation



Isolated Footing



Combined Footing

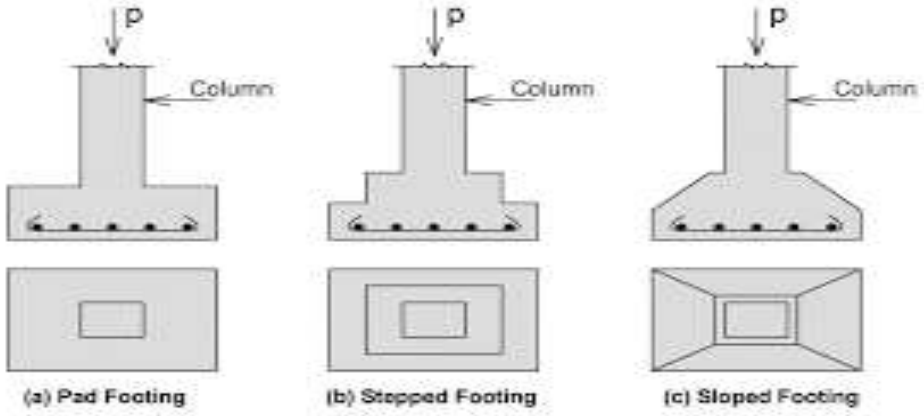
SHALLOW FOUNDATION

A shallow foundation can be constructed in as little as a one-foot depth, whereas a deep foundations is formed at a depth of 10-300 feet.

As such, a shallow foundation is used for projects that are small or lighter-weight buildings, and deep foundations for larger or hillside developments, or those on poor soil.

ISOLATED FOOTING

Also called single-column footing, it is a square, rectangular, or circular slab that supports the structural members individually. Generally, each of its columns gets its footing to transmit and distribute the load of the structure towards the soil underneath. Sometimes, an isolated footing can be sloped or stepped at the base to spread greater loads. This type of footing is used when the structural load is relatively low, columns are widely spaced, and the soil's bearing capacity is adequate at a shallow depth.



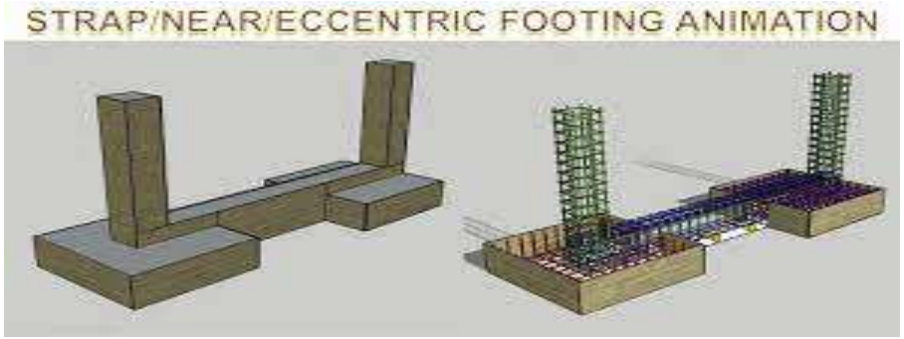
COMBINED FOOTING

When more than one column shares the same footing, these are called combined footing. Utilized when the spacing of the columns is too restricted, that if isolated footing were used, they would overlap one another. Also, when property lines make isolated footings eccentrically loaded, combined footings are preferred.

When the load among the columns is equal, the combined footing may be rectangular. Conversely, when the load among the columns is unequal, the combined footing should be trapezoidal.

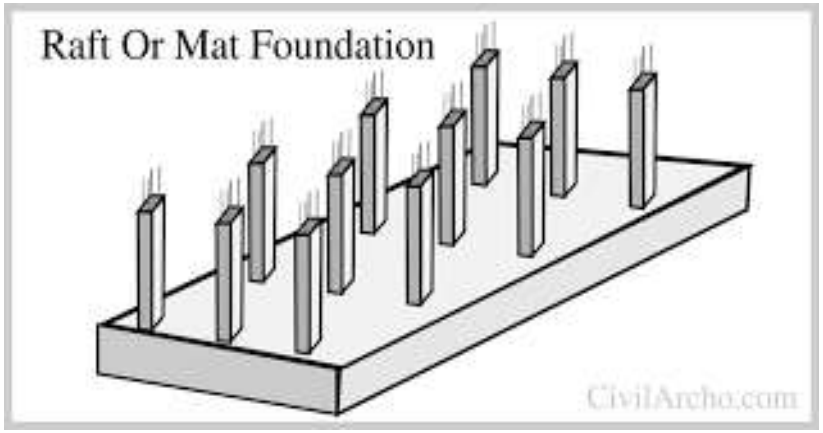
STRAP FOOTING

A *strap footing* is when individual columns are connected to one another with the use of a strap beam. The general purpose of a strap footing is alike to those of a combined footing, where the spacing is possibly limited and/or the columns are adjacent to the property lines.



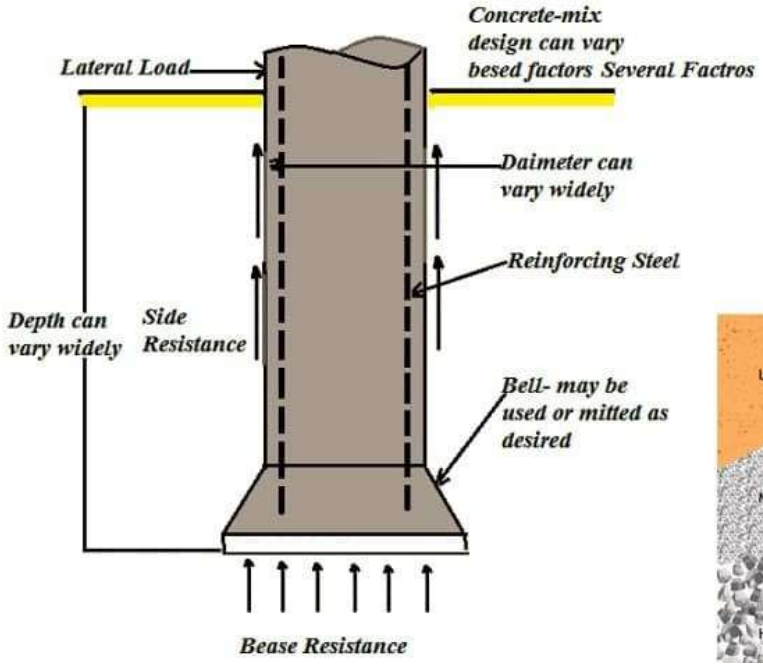
MAT FOUNDATION

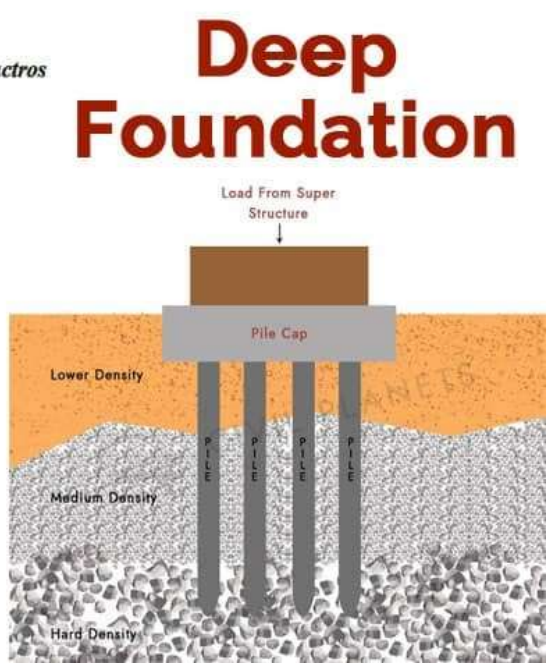
Also called raft foundation, it is a single continuous slab that covers the entirety of the base of a building. Mat foundations support all the loads of the structure and transmit them to the ground evenly. Soil conditions may prevent other footings from being used. Since this type of foundation distributes the load coming from the building uniformly over a considerably large area, it is favored when individual footings are unfeasible due to the low bearing capacity of the soil.



DEEP FOUNDATION

A deep foundation is a type of foundation that transfers building loads to the earth farther down from the surface than a shallow foundation does to a subsurface layer or a range of depths.



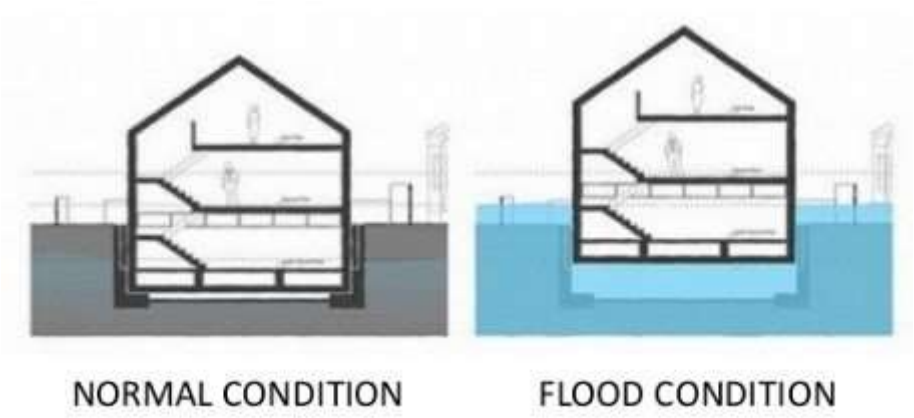


BASEMENTS

The basement foundation is an additional floor partially or completely below ground and built with poured concrete walls. It's the deepest of the common foundation types and matches most or all of the floor space of the level above

BUOYANCY RAFTS

Buoyancy rafts or hollow box foundations also known as the floating foundations is a type of deep foundation is used in building construction on soft and weak soils.

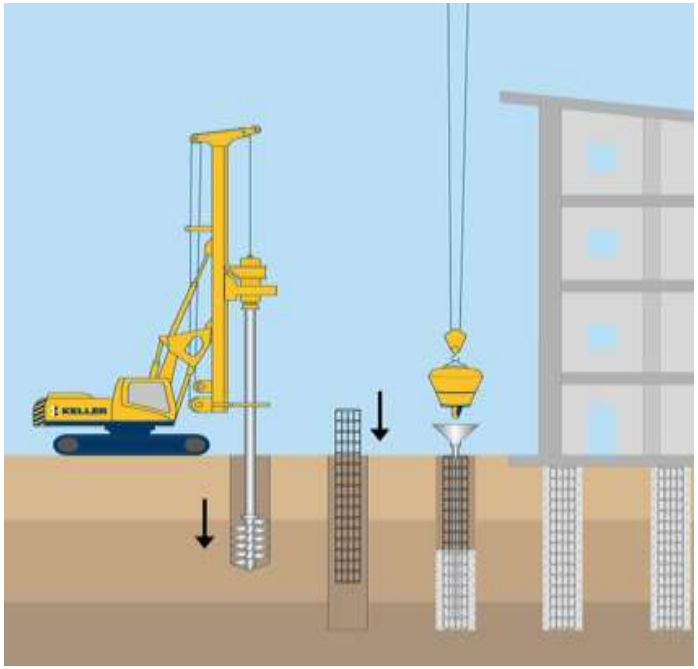


CAISSON FOUNDATIONS

Caisson foundations, also known as pier foundations, are prefabricated hollow substructures designed to be constructed on or near the surface of the ground, sunk to the desired depth and then filled with concrete, thus ultimately becoming an integral part of the permanent structure.

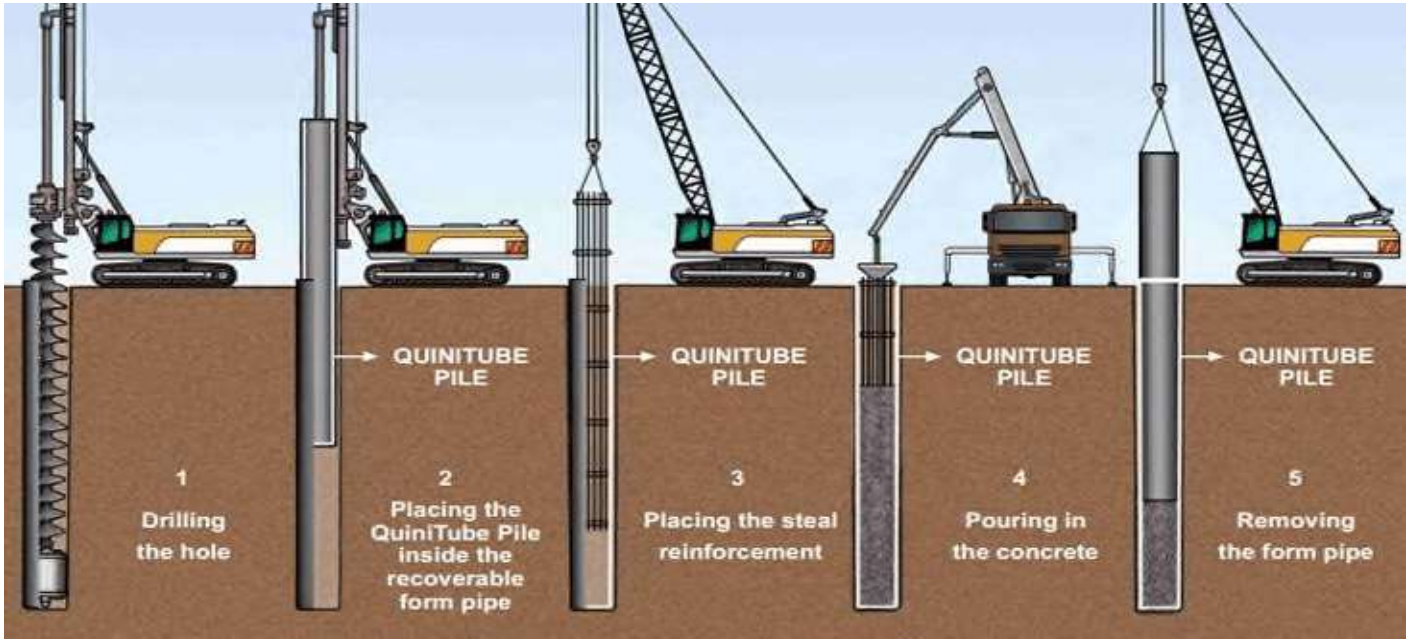
SHAFT FOUNDATIONS

Drilled shaft foundations are broadly described as cast-in-place deep foundation elements constructed in a drilled hole that is stabilized to allow controlled placement of reinforcing and concrete.



PILE FOUNDATIONS

A pile foundation is defined as a series of columns constructed or inserted into the ground to transmit loads to a lower level of subsoil. A pile is a long cylinder made up of a strong material, such as concrete. Piles are pushed into the ground to act as a steady support for structures built on top of them.



Thank You!!