

Hi guys this is Structures Explained, and in this video we will be learning about various kinds of footings, used in a building construction.

Foundations are a part of Sub structure which are below ground level and transfer all kinds of loads on the structure, to the ground.

Various factors play a role in selecting the suitable type of Foundation for the structure such as, type of structure, condition of the soil at the location of construction, other surrounding structures, water table below, property limits and many more depending on site conditions.

Once the foundations are laid for a structure, it is very difficult or impossible to repair or inspect it for structural damages.

Hence it is very important to select and design appropriate foundations.

Foundations are broadly divided in two categories.

First is Shallow Foundations and second is Deep Foundations.

Shallow Foundations are nearer to the surface where as Deep foundations as the name suggests, are embedded deeper in earth.

Now let us see various types of shallow foundations.

These types of foundations are used when the soil has sufficient strength within a short depth below the ground level.

First is isolated footings which are provided under each column individually.

They can be just a uniform thickness, reinforced concrete pads and can be square, rectangular or circular in plan as per design and analysis requirements.

They can also be provided below individual shear wall.

Isolated footings can be sloped or in steps, as per design or construction requirements.

Next comes Combined Footings, which accommodate more than one column.

When the spacing of the adjacent columns is so close that separate isolated footings are not possible due to the overlapping areas of the footings or inadequate clear space between the two areas of the footings, combined footings are provided.

Such footings are either rectangular or trapezoidal in plan, with or without a beam joining the two columns.

Next we will look at Strap footings.

When two isolated footings are combined by a beam, with a view to share the loads of both the columns, is known as strap footing.

The connecting beam is designated as a strap beam.

These footings are required if the loads are heavy on columns and the areas of foundation are not overlapping with each other.

Next in shallow footings we have is Eccentric footing, which is a type of isolated footing in which column is at the edge of the footing.

It is constructed when the exterior column is close to the boundary or property line and hence there is no scope to extend footing beyond the column face.

In this case the eccentric footing is connected by a strap beam to the isolated footings.

Next is Strip or wall footings, which are long strips especially for reinforced concrete walls or load bearing masonry walls.

The concrete walls on strip footings can be retaining walls, basement walls or core walls.

Last in shallow foundations we have is Raft or mat foundation.

This type of foundation is provided when the column loads are heavy or the safe bearing capacity of soil is very low.

These are special cases of combined footing where all the columns of the building are having a common foundation.

Rafts can have local thickenings or drops below columns, if the thickness of the raft is insufficient for shear stresses.

This ends our shallow foundations, next we have is Deep Foundations.

These types of foundation are used when there is poor condition of soil near to the surface which means the bearing capacity of soil is very less.

Pile foundations are a type of deep foundations with long vertical load transferring members made of steel or concrete.

Piles are in fact, small diameter columns which are driven or cast into the ground by suitable means.

Precast piles are driven and cast-in-situ are cast.

They are normally provided in a group with a pile cap at the top through which the loads of the superstructure are transferred to the piles.

These piles transfer loads to the hard strata deep below the surface.

This type of pile is called as end bearing pile.

If the hard strata is not available, the piles transfer load via skin friction mechanism in which friction is developed between soil and pile surface.

Raft foundations can be combined with piles, when more number of piles are closely spaced and the whole raft acts as a big pile cap.

That's it for this video guys.

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