



What is Pile Foundation?



- *Pile foundation is a special kind of deep foundation, where the depth of the foundation is much greater than the width of the foundation.*
- Today, pile foundation is much more common than any other type of deep foundation.



What is Pile Foundation?



➤ It is used;

1. where the soil is

compressible,

2.2. where the soil is **water**

logged and

3. when stratum of required bearing capacity is at greater depth.

The major uses of piles:

❖ **To carry vertical compression loads,**

❖ **To resist uplift loads**



Classification of Piles:

- **Based on the function;**
- **Based on the material & composition**
- **Based on the method of installation**



➤ **Based on the function;**

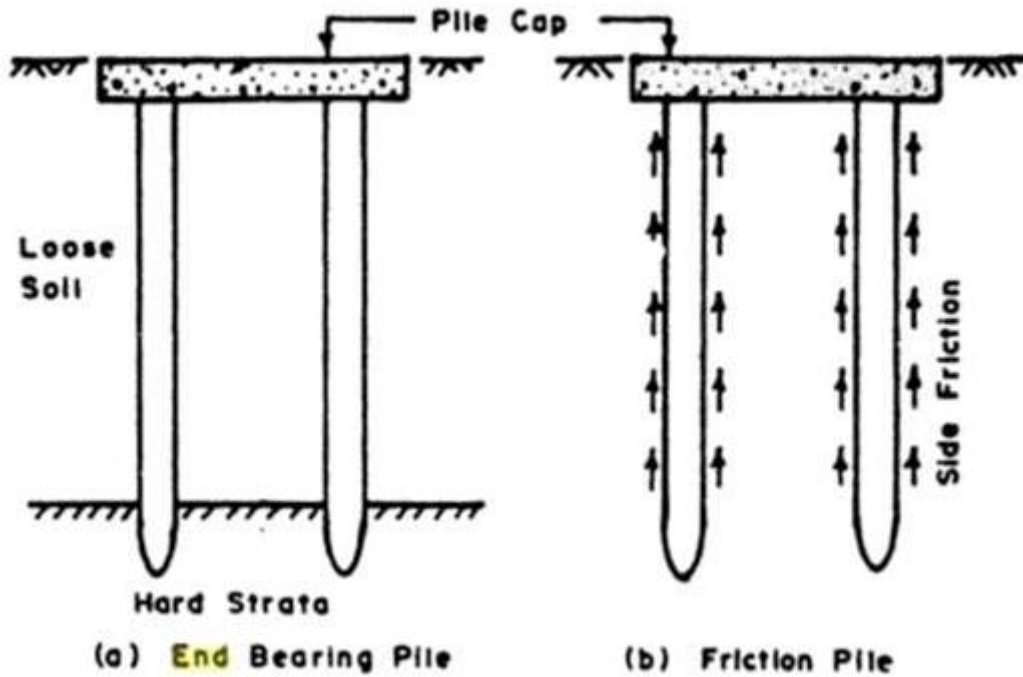
1. End bearing Pile
2. Friction Pile
3. Compaction Pile
4. Tension Pile or Uplift Pile
5. Anchor Pile
6. Fender Pile and Dolphins
7. Batter Pile
8. Sheet Pile

➤ **Based on the material & composition;**

1. Concrete Pile
2. Timber Pile
3. Steel Pile
4. Composite Pile: Concrete & Timber, Concrete & Steel

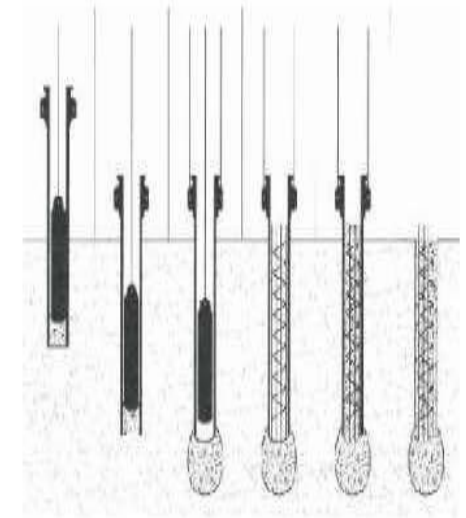
➤ **Based on the method of installation;**

1. Driven Pile
2. Cast-in-situ Pile
3. Driven and cast-in-situ Pile



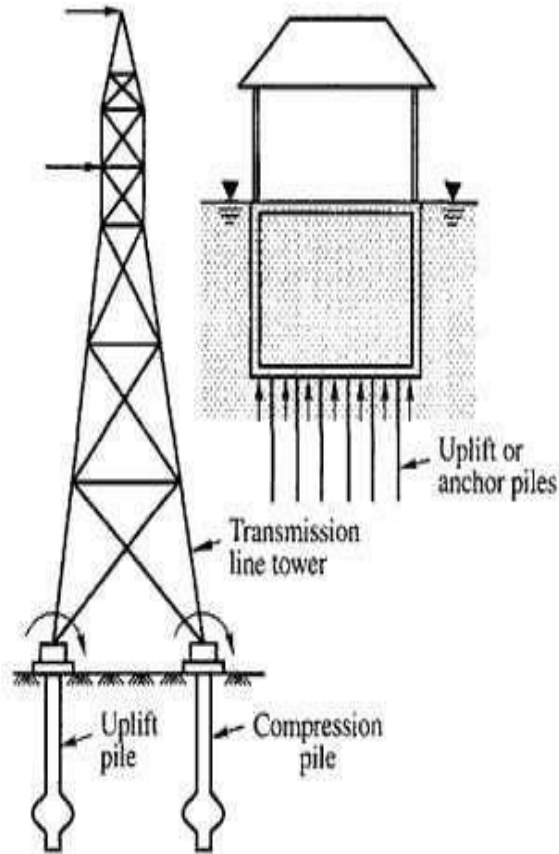
Compaction piles:

- When piles are driven in granular soil with the aim of increasing the bearing capacity of the soil, the piles are termed as compaction piles.

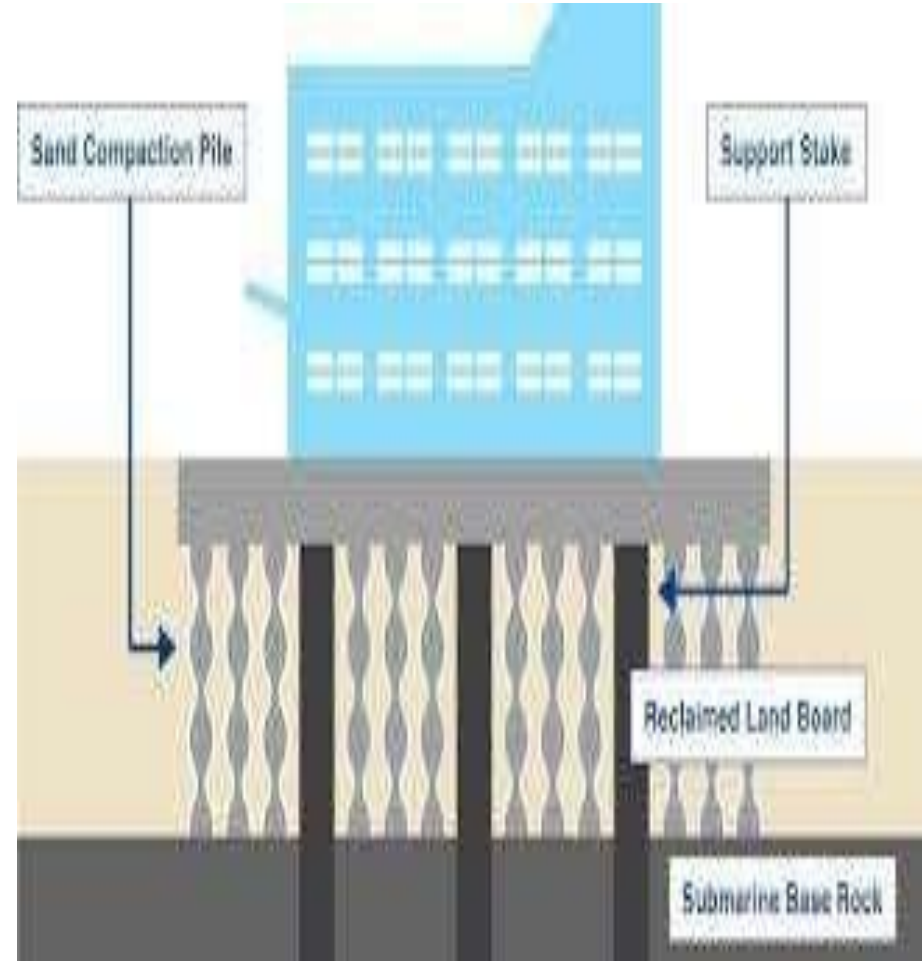




A multi-storied building on piles



Piles used to resist uplift loads





Pile Driving

- Piles are commonly driven **by means of a hammer supported by a crane** or a special device known as a **Pile Driver**.
- Hammers adopted for driving the pile are of the following types:
 1. Drop hammer
 2. Single acting hammer
 3. Double acting hammer
 4. Diesel hammer
 5. Vibratory hammer.



Load carrying capacity of Pile:



- ❖ What is ultimate load bearing capacity?
- ❖ What is allowable load and how is it determined?
- ✓ *Ultimate load bearing capacity of a pile is defined as the maximum load which can be carried by a pile and at which the pile continues to sink without further increase of the load.*
- ✓ *The allowable load is the safe load which the pile can carry safely, which can be determined from ultimate load bearing capacity dividing by suitable F.O.S.*



Selection of Pile



□ Factors governing the selection of piles

They are:

- ✓ Length of the pile in relation to the load and type of soil,
- ✓ Characters of structure,
- ✓ Availability of the materials,
- ✓ Types of loading,
- ✓ Factors causing deterioration,
- ✓ Ease of maintenance,
- ✓ Estimated cost of types of piles, taking into account the initial cost, life expectancy and cost of maintenance and,
- ✓ Availability of funds.