

# ADVANCED BUILDING CONSTRUCTION AND EARTHQUAKE RESISTANT TECHNOLOGY

5<sup>th</sup> Semester

DATE-30/09/2020

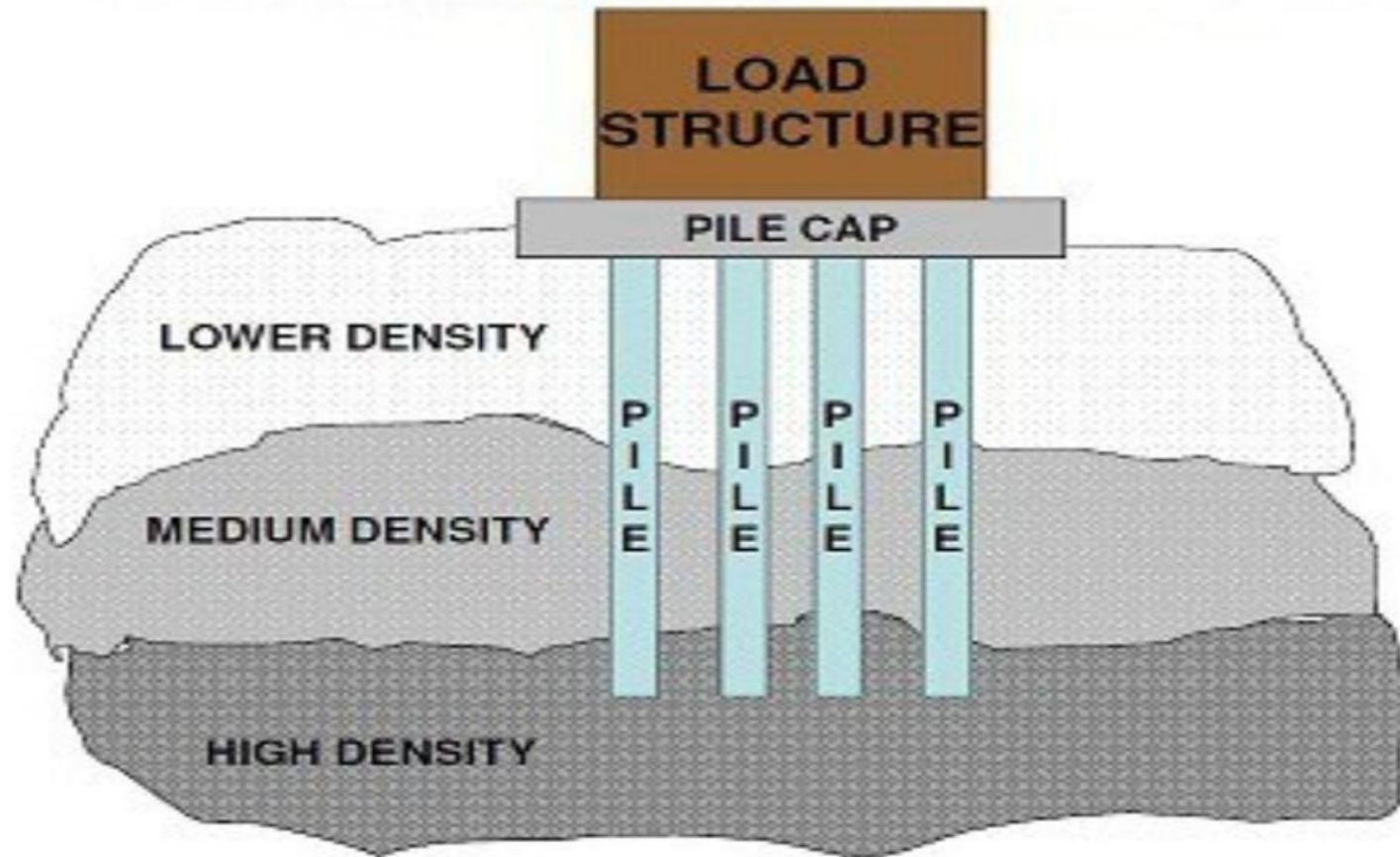
# Chapter-2 Pile Foundation



# What is pile foundation?

- Pile foundations are deep foundations used when the site has a weak shallow bearing strata making it necessary to transfer load to a deeper strata either by friction or end bearing principles.
- Foundations provide support for structures by transferring the load to the rock or layers of soil that have sufficient bearing capacity and suitable settlement characteristics.
- There are a very wide range of foundations types available which are suitable for different applications. Foundations are classified mainly as **Shallow foundations** and **Deep foundations**.

Fig shows coss section of a pile Foundation.



pile foundation

# When to use pile foundation:

1. When the groundwater table is high.
2. Heavy and un-uniform loads from superstructure are imposed.
3. Other types of foundations are costlier or not feasible.
4. When the soil at shallow depth is compressible.
5. When there is the possibility of scouring, due to its location near the river bed or sea shore, etc.

6. When there is a canal or deep drainage systems near the structure.
7. When soil excavation is not possible up to the desired depth due to poor soil condition.
8. When it becomes impossible to keep the foundation trenches dry by pumping or by any other measure due to heavy inflow of seepage.

# Types of pile foundation:

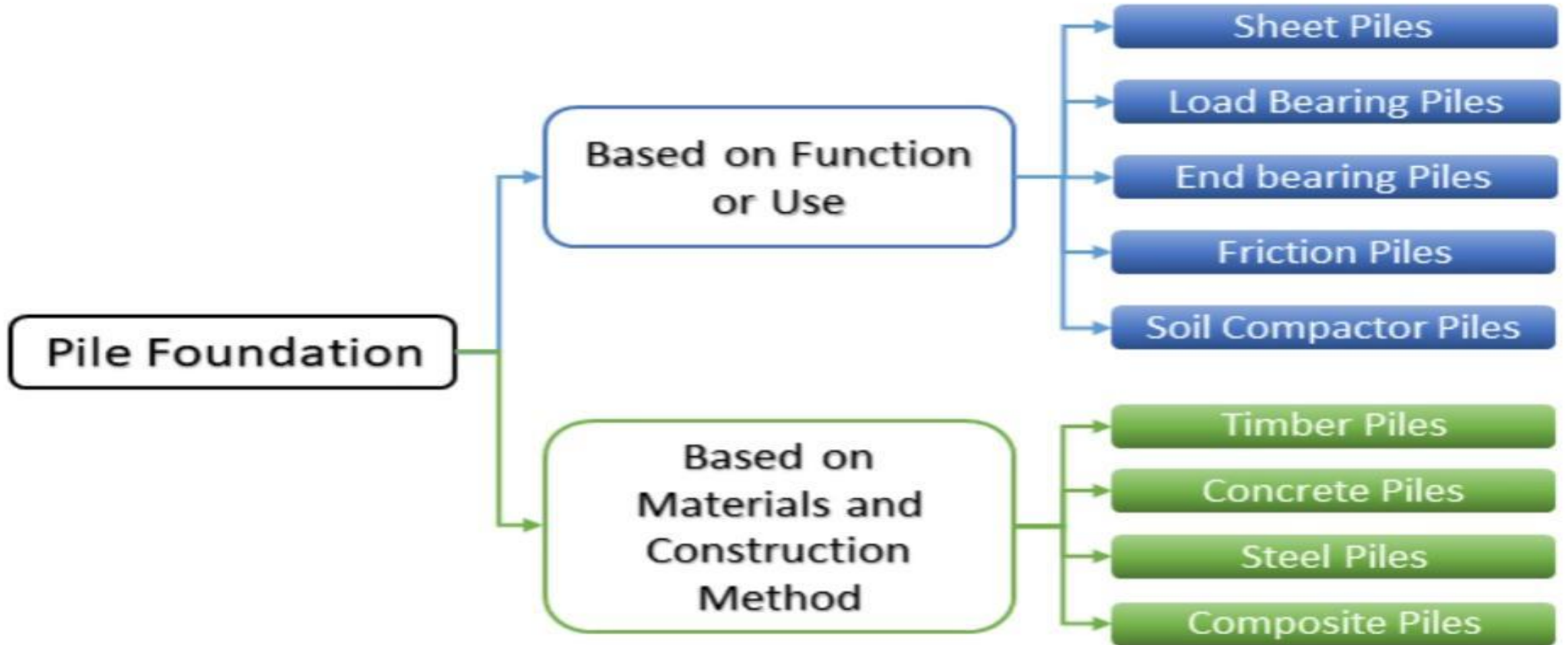
- Pile foundations can be classified based on function, materials and installation process, etc. Followings are the types of pile foundation used in construction:
  - *A. Based on Function or Use*
    - 1. Sheet Piles
    - 2. Load Bearing Piles
    - 3. End bearing Piles
    - 4. Friction Piles
    - 5. Soil Compactor Piles

- B. *Based on Materials and Construction Method:*

- 1. Timber Piles
- 2. Concrete Piles
- 3. Steel Piles
- 4. Composite Piles



The following diagram is representing pile foundation types discussed above.



# Advantages of pile foundation:

- 1. According to the specification we can preorder the pile.
- 2. The pile can be pre-made its length, breath, its size according to site use.
- 3. Precast is the process through which reducing the completion time.
- 4. Can be installed in a very large area.
- 5. Can be installed in very long lengths.
- 6. We can use piles in a place where drilling and holes are not done.
- 7. Work of pile is very neat and clean.

# Disadvantages of pile foundation.

- 1. A pile can be damaged quickly by driving through stones and boulders.
- 2. Piles are can be attacked by marine borers in salt water.
- 3. A pile cannot be above ground level.
- 4. It is very difficult to know the actual required length in advance.
- 5. Vibrations generate when piles are driving which affects the neighboring structures.
- 6. Heavy equipment is required for driving the piles.
- 7. Pile is not containable for lowdrainage.