RAMA UNIVERSITY

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FACULTY OF RNGINEERING AND TECHNOLOGY (DEPARTMENT OF CIVIL ENGINEERING)

CONSTRUCTION TECHNOLOGY

B. Tech (IInd YEAR/ IIIrd SEM)

SATISH KUMAR

M.TECH (NIT, WARANGAL)

ASSISTANT PROFESSOR

(DEPARTMENT OF CIVIL ENGINEERING,

RAMA UNIVERSITY)

- **PILE ACCESSORIES**
- In case of wooden piles, steel piles, pre-cast concrete piles, to protect the top and bottom of the pile while driving in to the ground and to facilitate easy pile driving certain accessories are required as under :

1. PILE CAP

- In case of driven pile, piles are driven in to the ground by applying blows of a heavy hammer on their tops. Thus, to protect the top of pile, pile cap is provided.
- Normally, pile cap is made of steel. The thickness and size of pile cap depends upon the shape and size of the pile driving hammer.
- The pile should penetrate into the cap for at least 10 cm length. In case of group of piles, a common cap of R.C.C. is provided for all the piles.

2. PILE SHOE

- While driving wooden or steel pile by hammer the bottom end of the pile gets damaged causing difficulty in driving.
- Therefore, a pile shoe is fitted at the bottom end of the pile to protect the pile and to facilitate easy pile driving.
- Pile shoe are made of cast iron, steel iron.

ACCESSORIES OF PILES

- Various Types of Pile Shoe :

1. Square Pile Shoe
2. Wedge shape Shoe
3. Round Pile Shoe
4. Steel Trap shoe
5. Socket Type pile shoe
6. Closed end shoe for pipe pile.

- **PILE DRIVING**
- The operation of inserting a pile into the ground is known as pile driving.

- Points to be considered for selection of pile driving method. There are Various Methods of Pile driving :

I. Hammer driving

II. Vibratory pile driver

III. Water jetting and hammering

IV. Partial augering method

HAMMER DRIVING

- Pile frame
- Pile hammer
- Leads
- Winches
- Miscellaneous equipements.

PILE DRIVING

- Vibratory pile driver
- Drop hammer
- Single acting hammer
- Double acting hammer
- Diesel hammer

LOADS ON PILES

- Direct vertical load coming from super structure.
- Impact stresses developed during the process of pile driving
- Stresses developed during handling operation.
- Bending stresses developed due to eccentricity of loads coming on the pile.
- Lateral forces due to wind, waves , currents of water etc.
- Impact forces due to the ice sheets or begs.
- Impact forces due to ships, in case of marine structures.
- Forces due to uplift pressure.
- Earthquake forces etc.

FAILURE OF PILES

Causes of Failure of piles

- Absence of statistical data regarding the nature of soil strata through which the piles are to be driven.
- Actual load coming on the pile being more than the design load.
- Bad workmanship in case of the cast-in-situ cement concrete piles.
- Attack by insets, etc. on wooden piles.
- Breakage due to over driving especially in case of the timber piles.
- Buckling of piles due to removal of side support, inadequate lateral support, etc.
- Lateral forces (wind, waves, currents etc.) not being taken into the design of the pile.
- Improper choice of the type of pile. Improper choice of the method of driving the pile.
- Improper classification of pile.
- Insufficient reinforcement or misplacement of reinforcement in case of the R.C.C. piles.
- Wrongful use of pile formula for determining its load bearing capacity.

THANK YOU