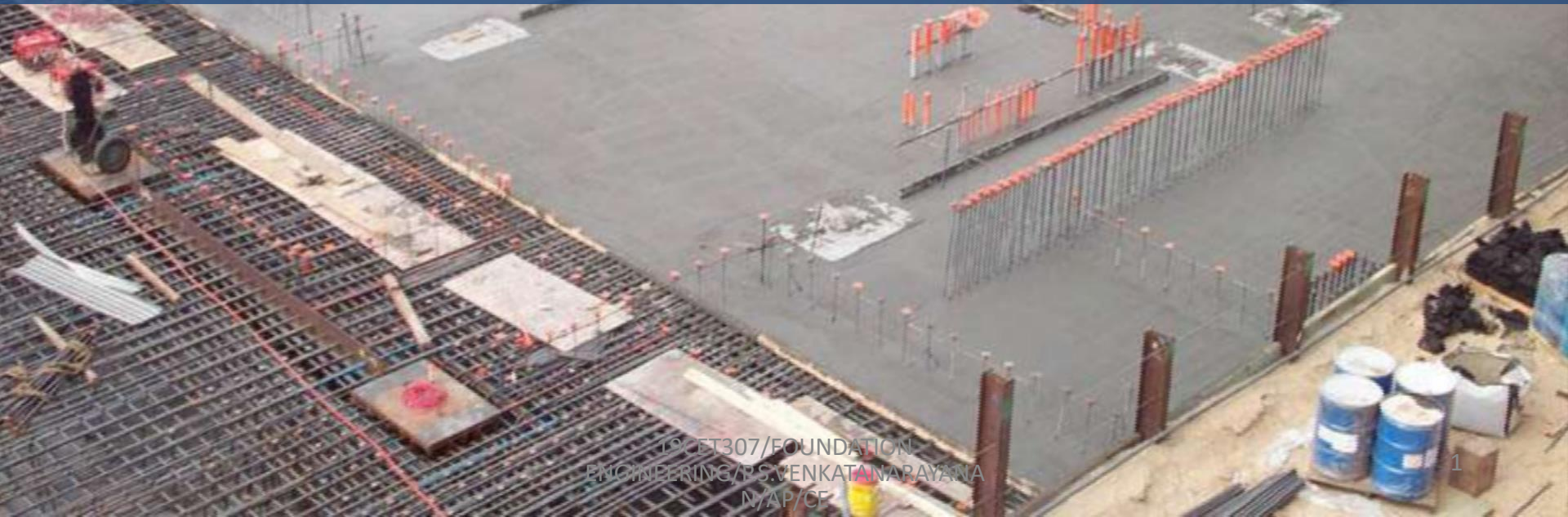




# MAT FOUNDATION





# WHAT IS A MAT FOUNDATION?

**A mat foundation is a thick reinforced concrete slab supporting arrangements of columns or walls in a row or rows and transmitting the loads to the soil. It is used to support storage tanks, industrial equipment, silos, chimneys and various tower structures.**



# WHY IS IT USED?



- The spread footings cover over 50% of the foundation area because of large column loads.

**The soil is soft with a low bearing capacity.**

- When the expenses of deep foundation is higher than raft foundation.

**Walls of the structure are so close that individual footings would overlap.**



# TYPES OF MAT FOUNDATION



Flat plate mat

Plate thickened  
under columns

3

Two-way beam  
and slab

4

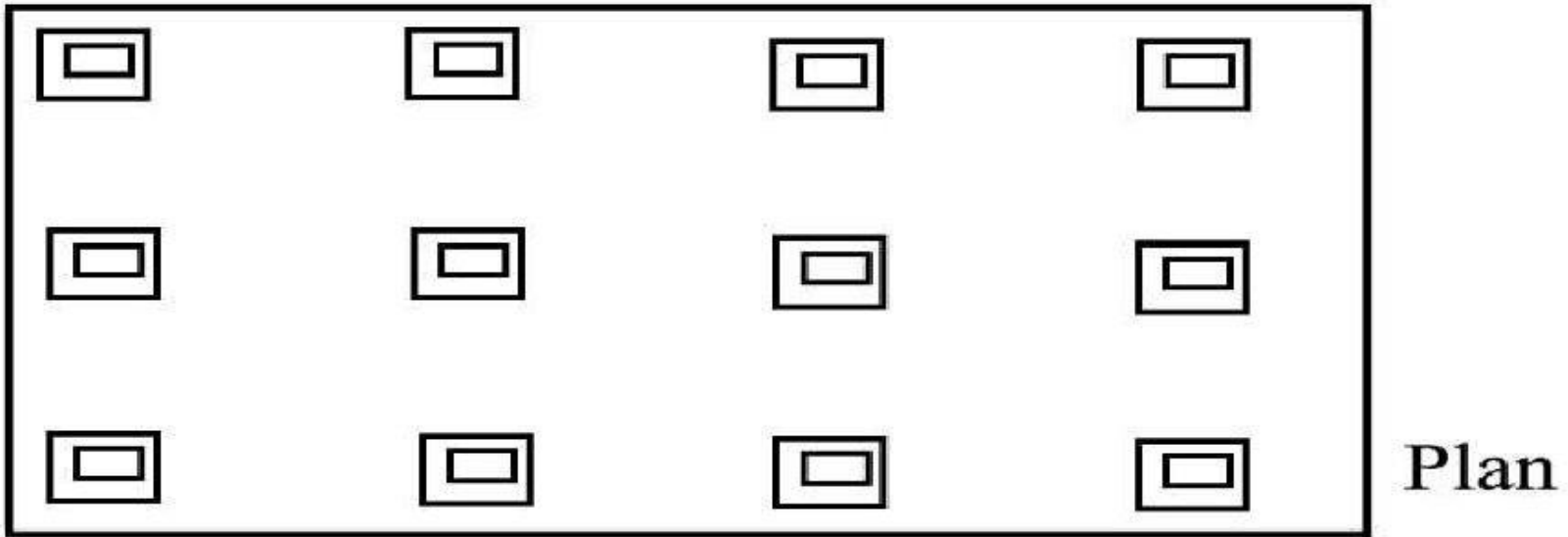
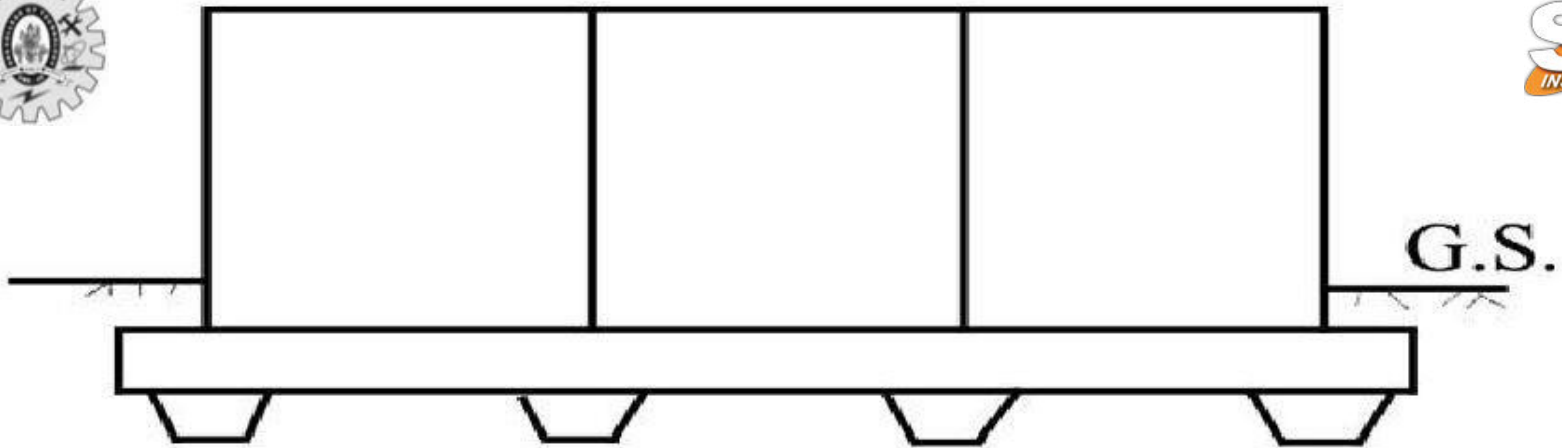
Plate with  
pedestal

5

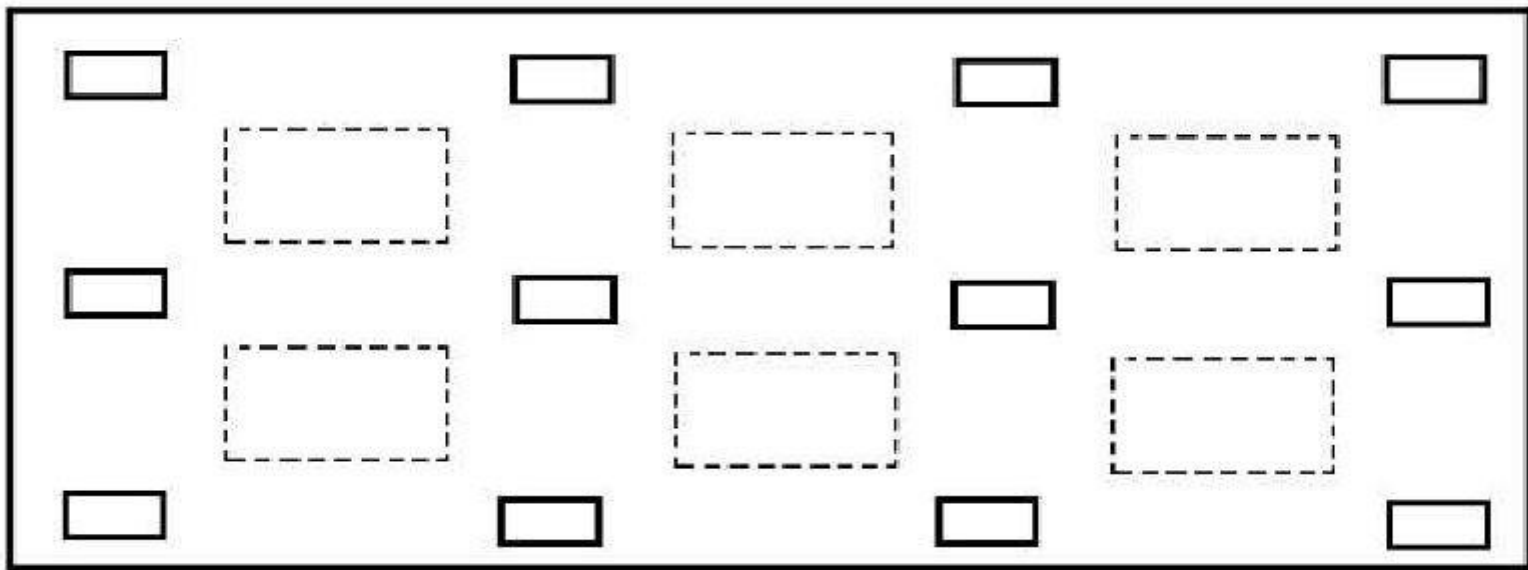
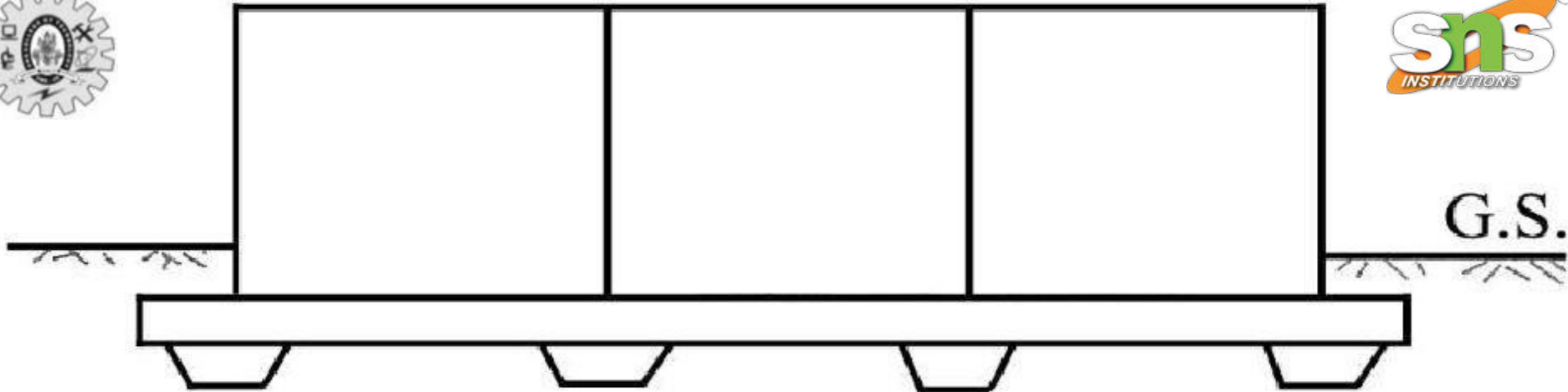
Rigid frame mat

6

Piled raft



**Fig2.Flat Plate Thickened Under Column**



**Plan**

**Fig 3 Two Way Beam and Slab Mat**



# SOIL TEST

1 Bearing capacity of soil

2 Classification of soil

3 Moisture content

4 Ground water level

5 Appropriation and depth of mat







# Shore Pile Construction

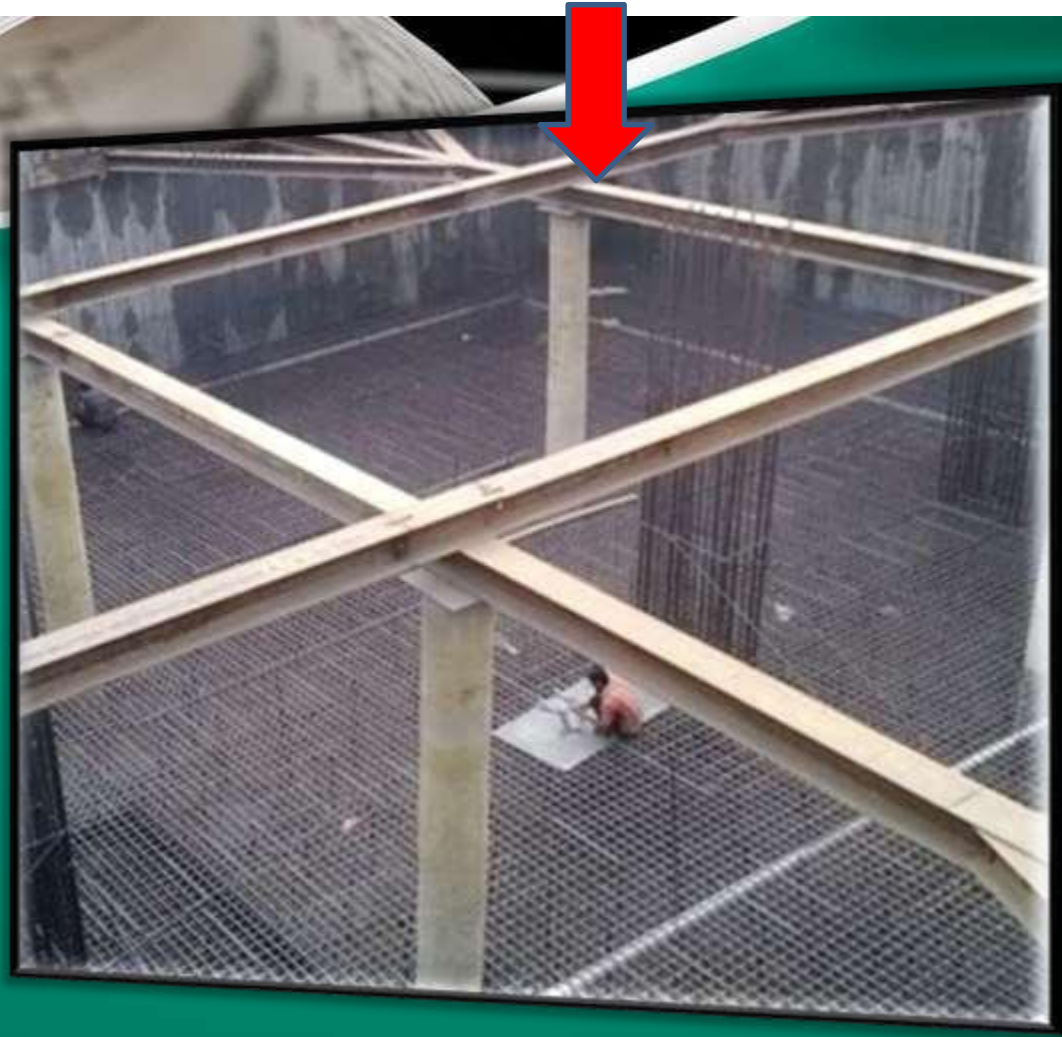
Shore piles support the surrounding loads and prevent the surrounding soil from breaking in at the time of construction.





# TIE BEAM

- A horizontal timber connecting two structural members to keep them from spreading apart, as a *beam* connecting the feet of two principal rafters in a roof truss.
- It is constructed mainly to join the piles of border line





# BRACING

➤ A horizontal support for the boundary shores during excavation and foundation.

It is attached to studs to provide lateral support to wall framing.

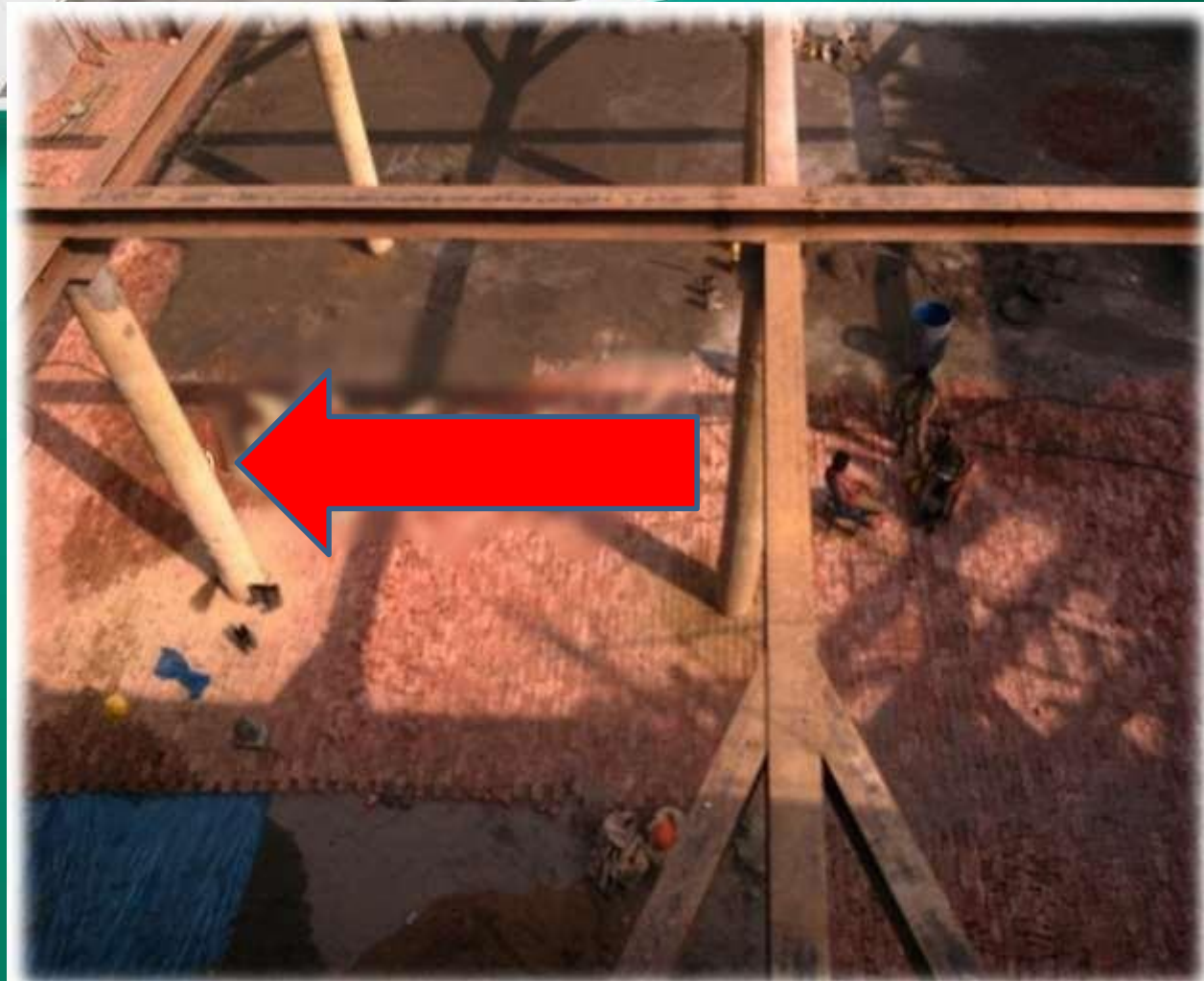
Metal straps, timber or sheet *bracing* can be used for *bracing*





# KING POST

*A king post* is a central vertical *post* used in architectural or bridge designs, working in tension to support a beam below from a truss apex above





# EXCAVATION

**Partial & Full  
Excavation is required  
before the Bracing,  
Strutting, BFS &  
Placement of  
Reinforcement etc...**





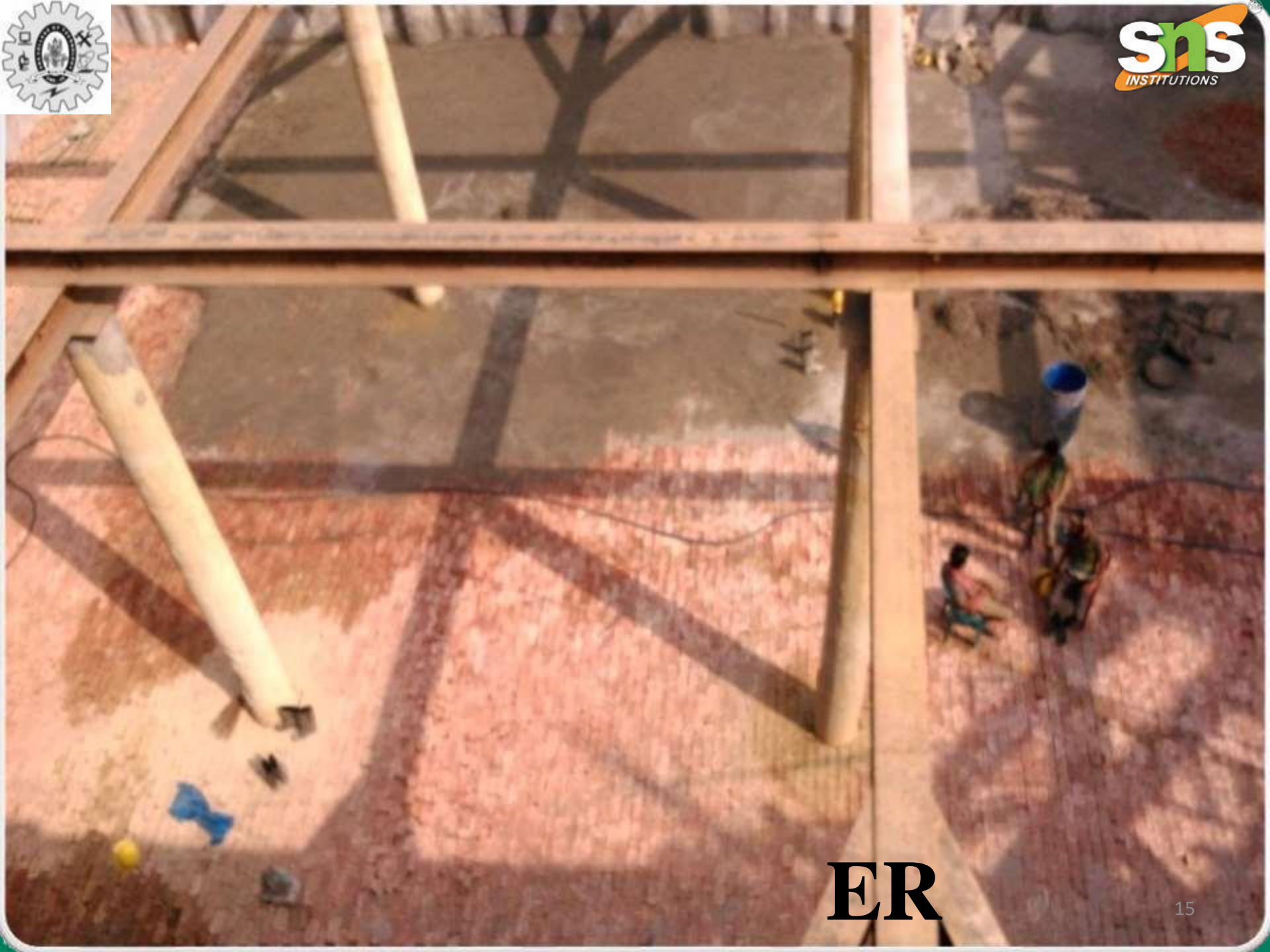
# LEVELING



**Manual Levelling**



**Machine Leveling**



**ER**



CC layer



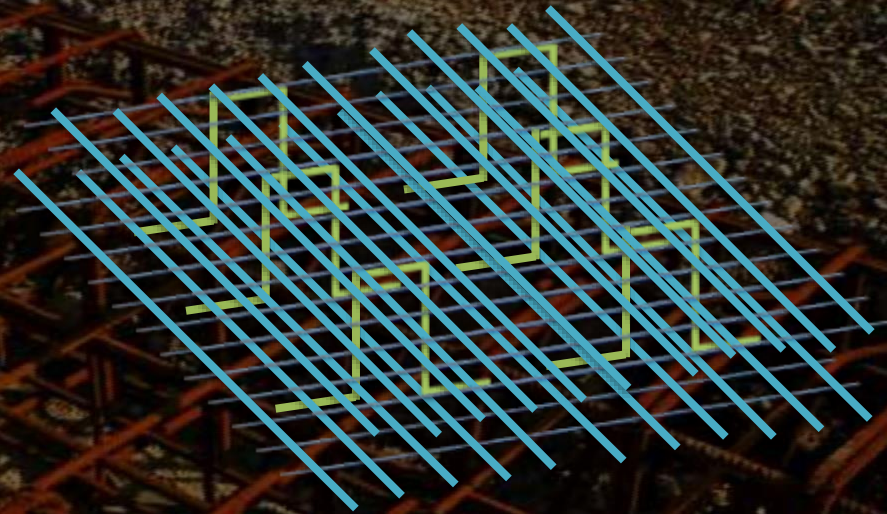


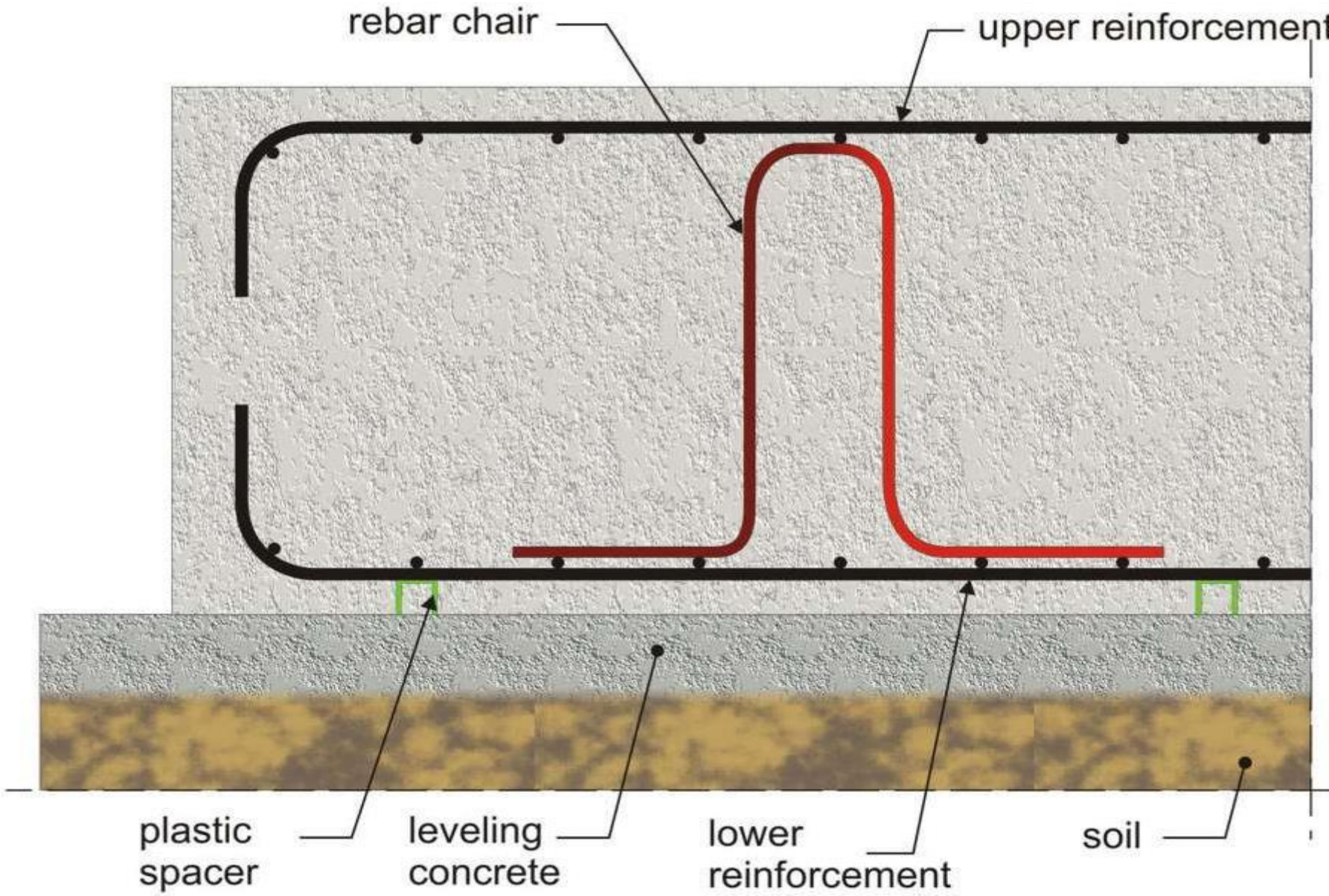




# PLACING OF REINFORCEMENT

- A batch of horizontal reinforcement placing;
- Another batch of reinforcement placement to complete the bottom mesh;
- Column rod placement;
- Vertical rod (chair) placement over bottom mesh to hold the upper mesh;
- Upper mesh placement.















# Column positioning







# FORMWORK

- **Formwork is a mold or open box, like container into which fresh concrete is poured and compacted.**
- **When the concrete is set, the formwork is removed and a solid mass is produced in the shape of the inner face of the formwork.**
- **The top of the formwork is normally left open.**
- **False work is the necessary support system that holds the formwork in the correct position.**





# Types of formwork

- Timber formwork
- Plastic formwork
- Steel formwork



# TIMBER FORMWORK

The formwork is built on site out of timber and plywood or moisture-resistant particleboard. It is easy to produce but time-consuming for larger structures. It is still used extensively where the labour costs are lower than the costs for procuring reusable formwork.





# STEEL FORMWORK

- This consist of panels fabricated out of thin steel plates stiffened along the edges by small steel angles.
- The panels can be fabricated in large number in any desired modular shape or size.
- Steel forms are largely used in large projects or in situation where large number reuses of the shuttering is possible.





# PLASTIC FORMWORK

- They have impervious surfaces that usually create a smooth finish to the concrete.
- Plastic formwork could be reinforced or unreinforced.
- Plastic is reinforced by glass fibers.
- Plastic formwork is lighter but less durable than metal formwork.





# CLEAR COVER

**Clear cover is the least distance between the surface of embedded reinforcement and the outer surface of the concrete.**





# CASTING

- 1. Start from one end**
- 2. Layer basis casting**
- 3. Side basis casting**









# COMPACTION





# LEVELING



**After casting the whole Mat area leveling is essential to be ensured that the thickness of the mat slab is same all over the area.**



# ADVANTAGE OF MAT FOUNDATION

- 1. Raft foundation is economic due to combination of foundation & floor slab**
- 2. Requires little excavation**
- 3. can cope with mixed & poor ground condition**
- 4. it reduces different settlement .**



## DISADVANTAGE OF MAT FOUNDATION

- 1. It requires specific treatment for point loads.**
- 2. Edge erosion occurs if not treated properly**