TEACHING LEARNING MATERIAL

GANDHI SCHOOL OF ENGINEERING, BHABANDHA

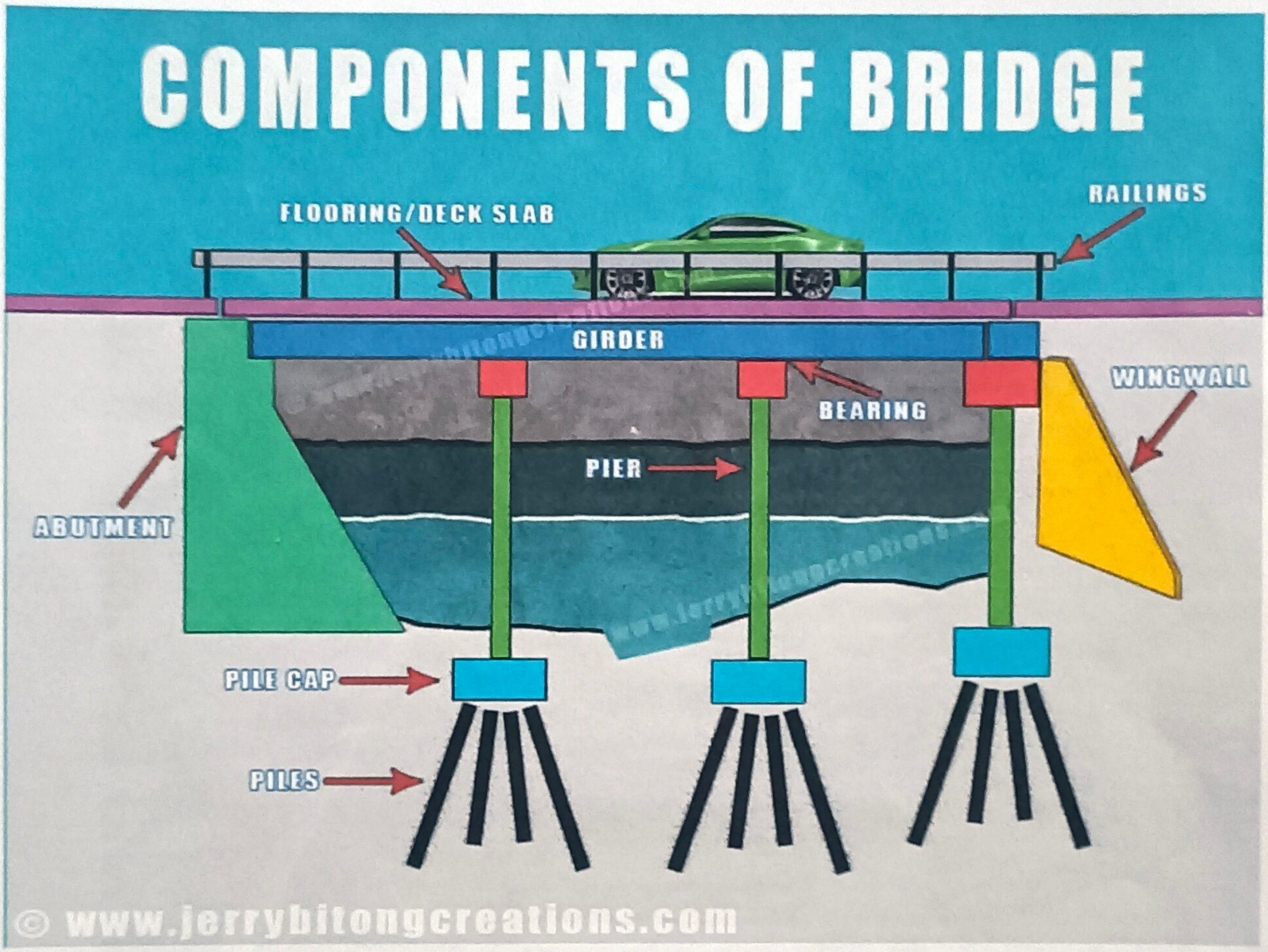
BRANCH- CIVIL ENGINEERING

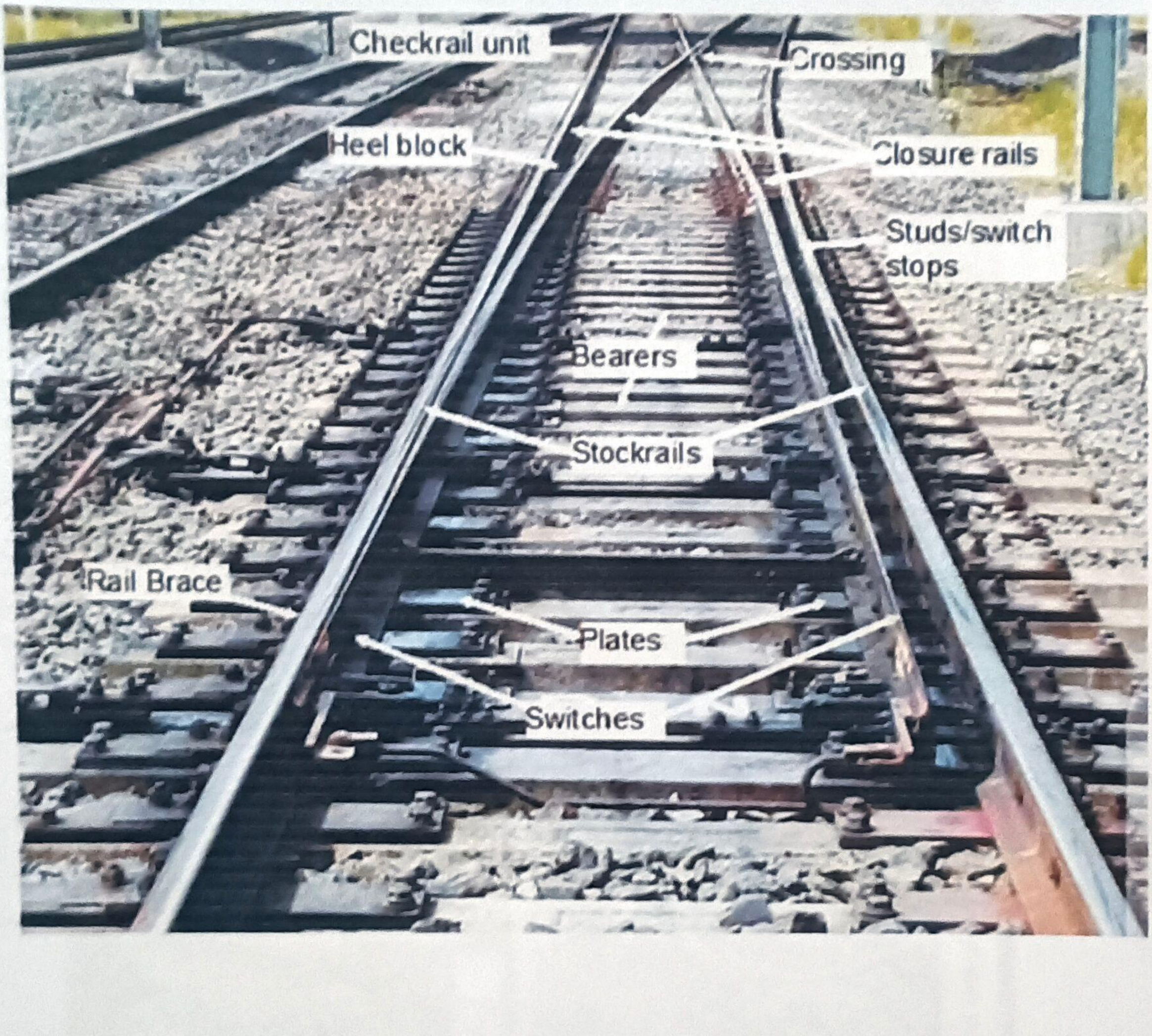
SUBJEECT - RAILWAY & BRIDGE ENGINEERING

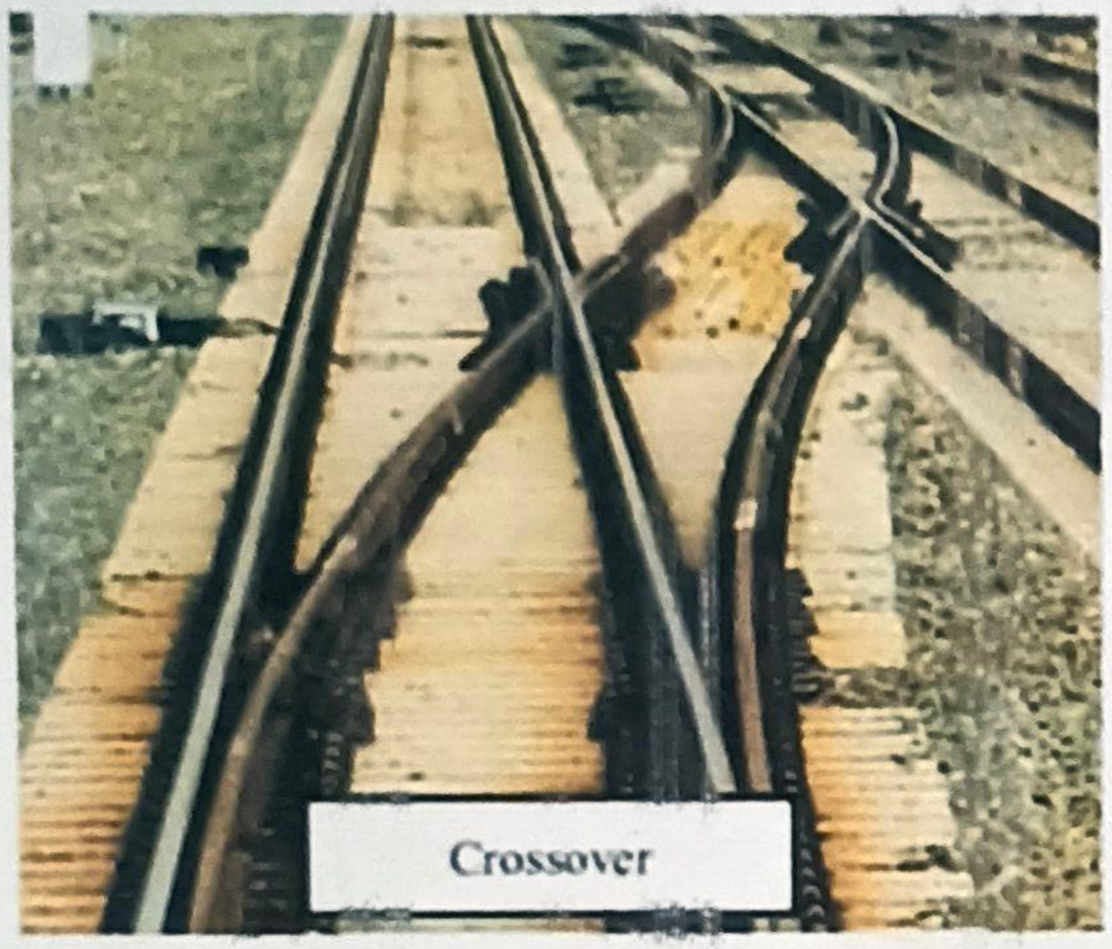
SEMESTER – 5TH

PREPARED BY- Er. SRIDHAR SAHU & Er. ROJALIN MISHRA

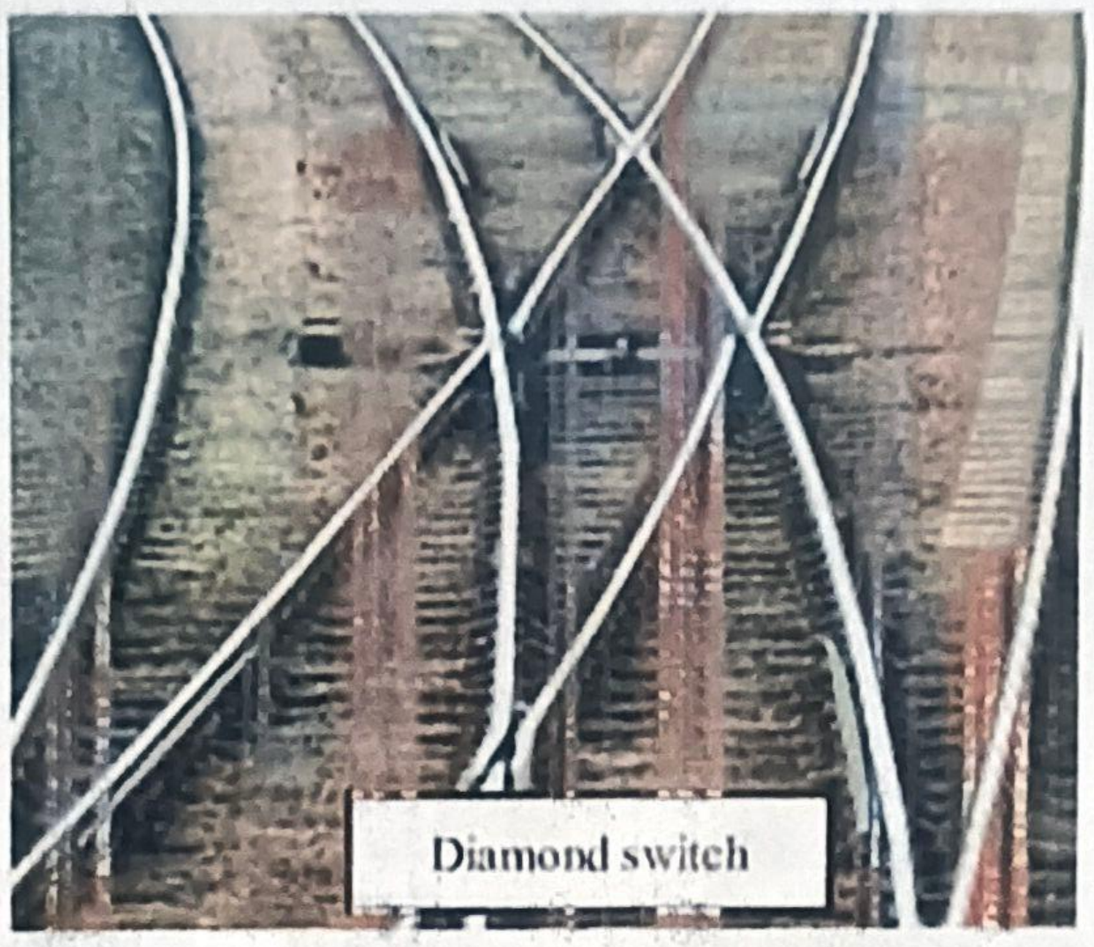
COMPONENTS OF BRIDGE




Checkrail unit
Crossing
Heel block
Closure rails
Studs/switch stops
Bearers
Stockrails
Rail Brace
Plates
Switches

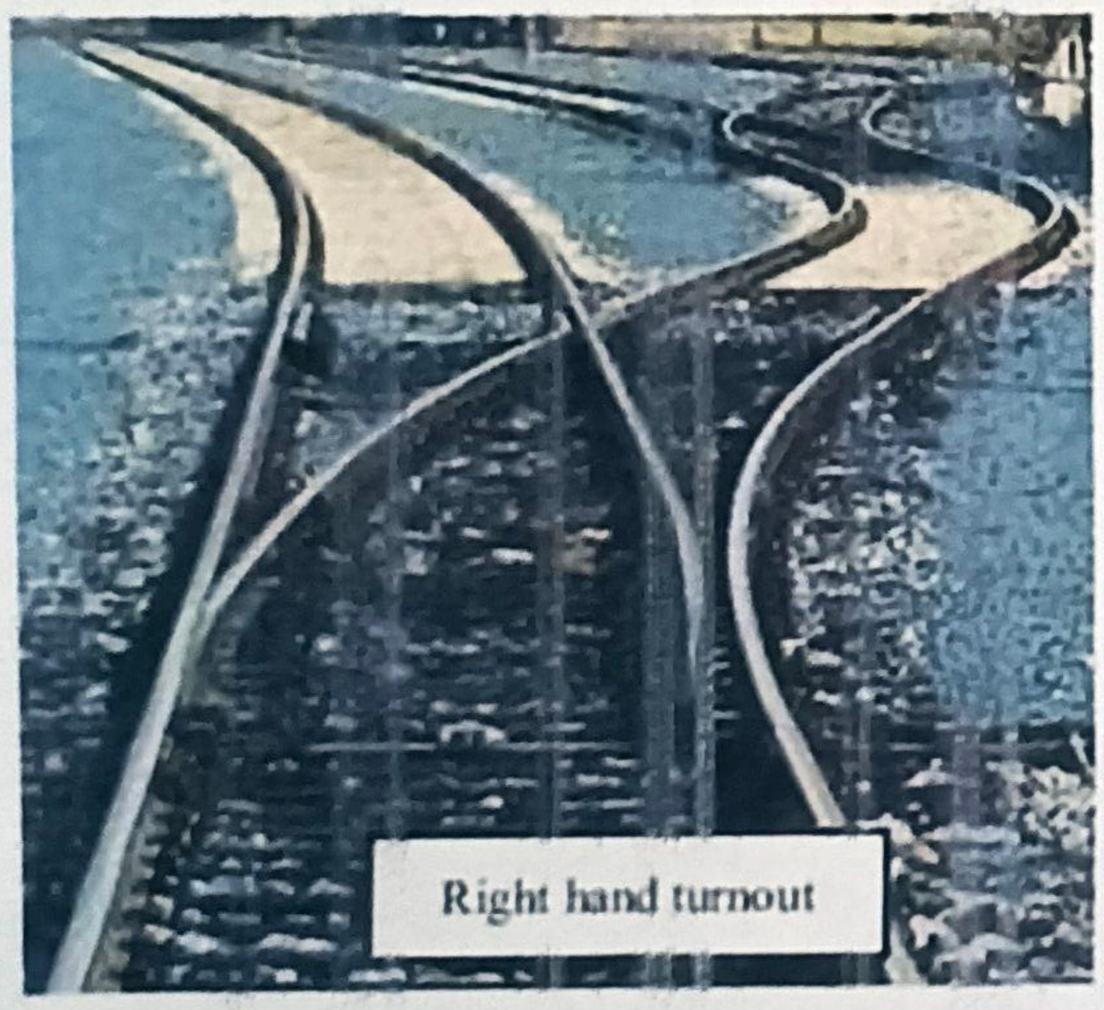


Crossover

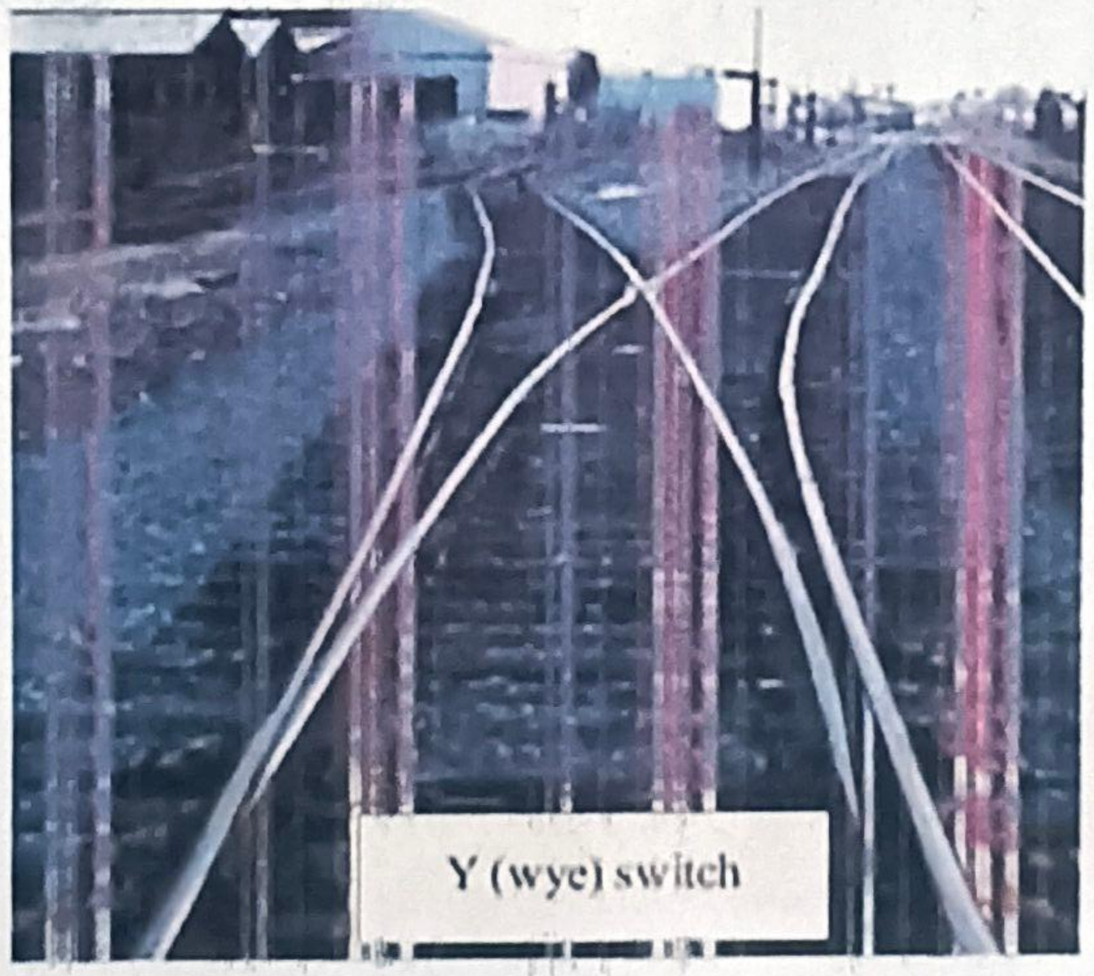


Diamond switch

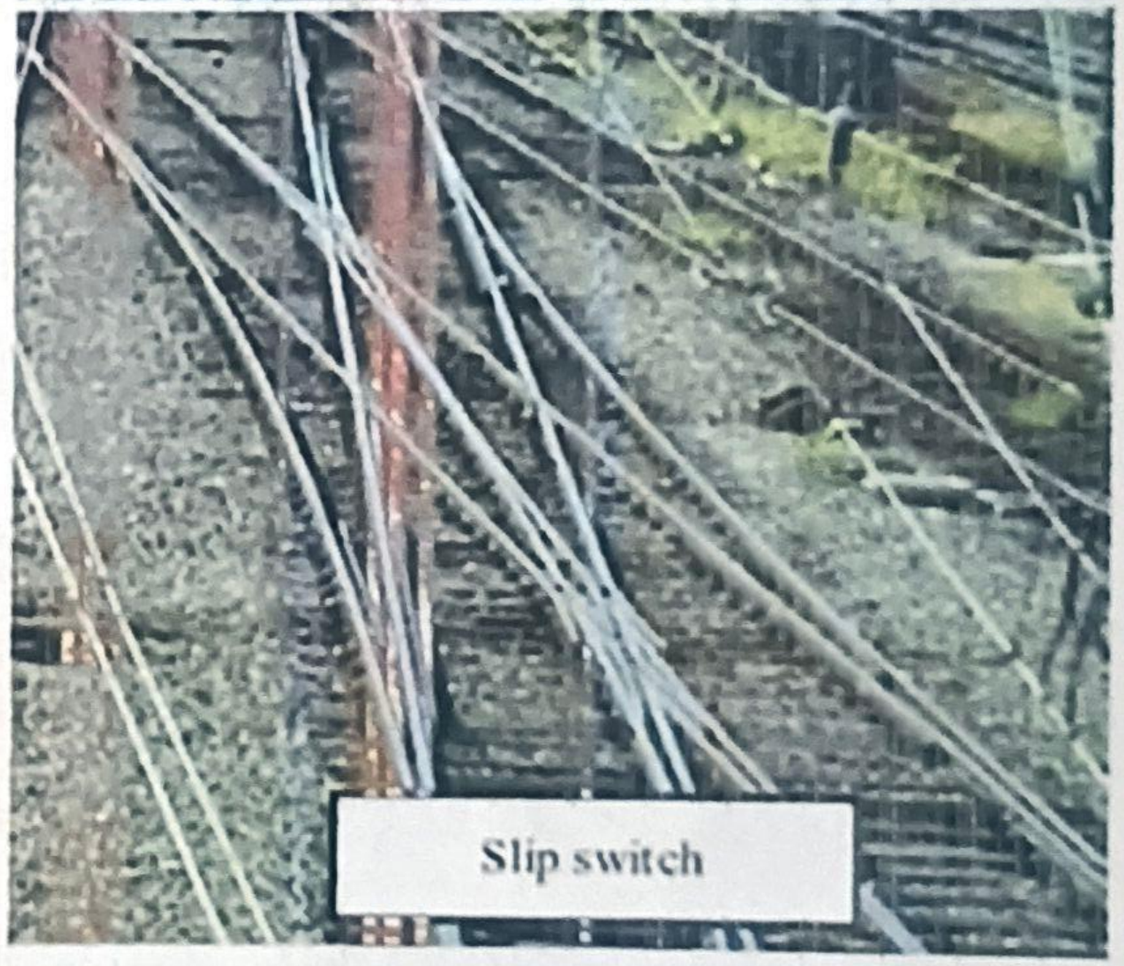
3-way turnout



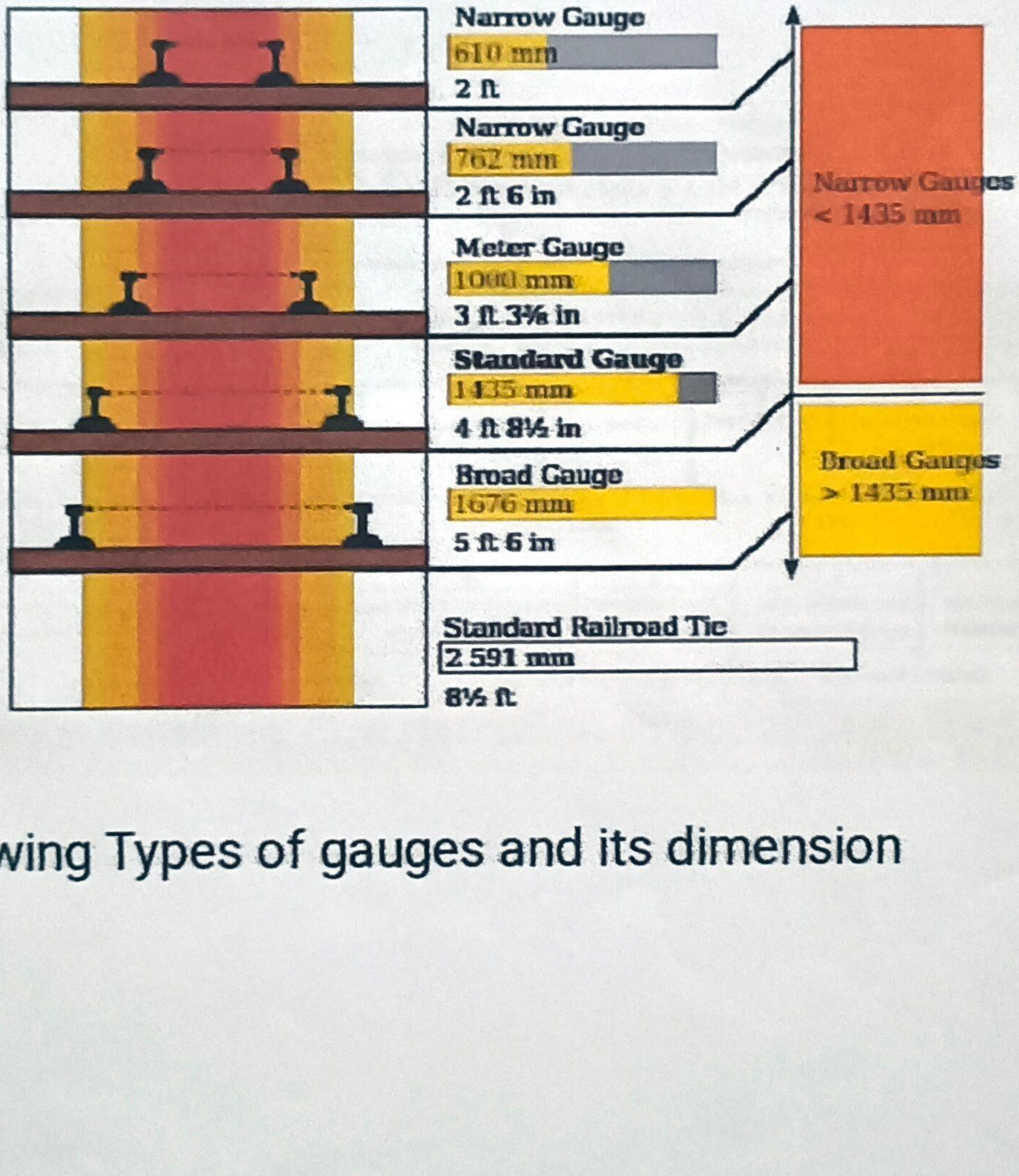
Right hand turnout



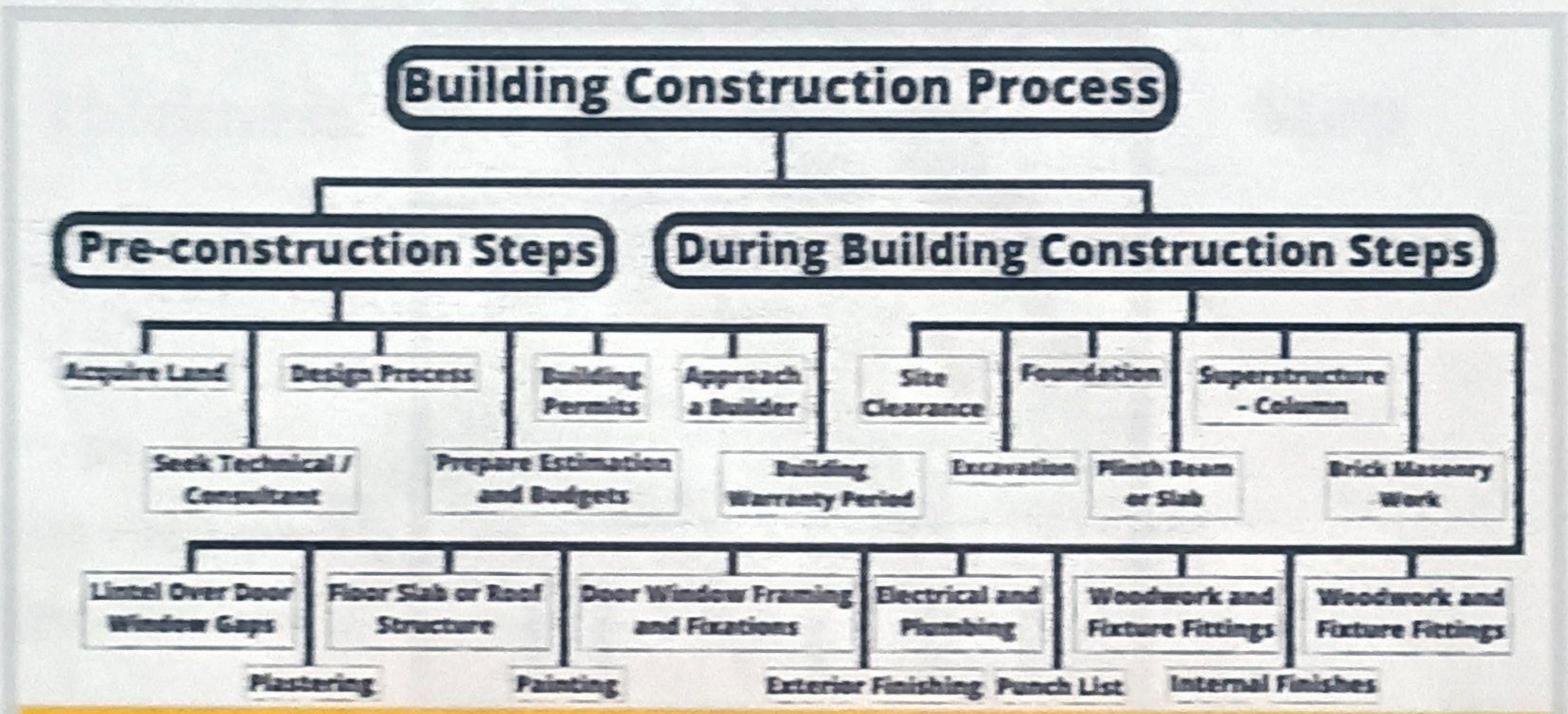
Y (wye) switch



Slip switch



showing Types of gauges and its dimension



How to Building Construction Process Step by Step

Highway OR Road Construction Process

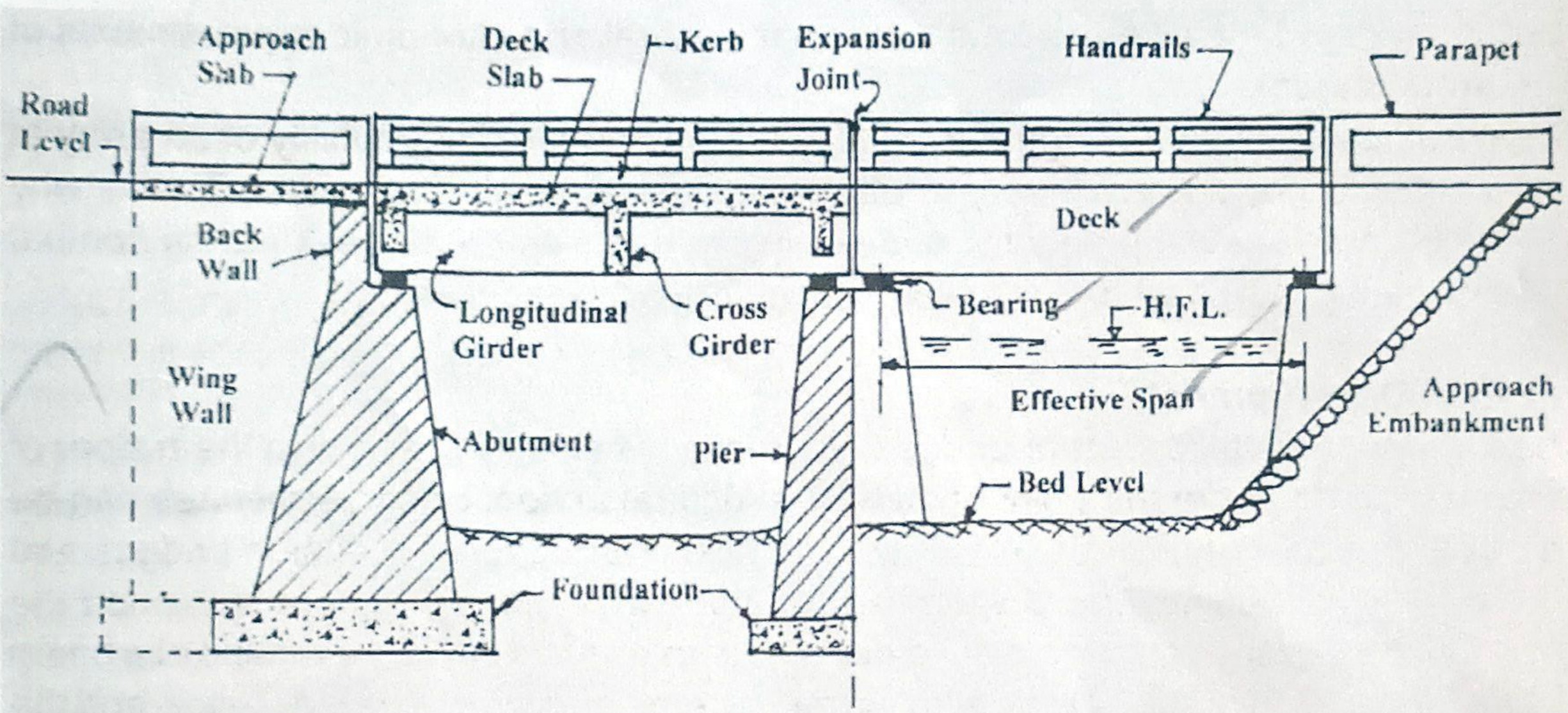
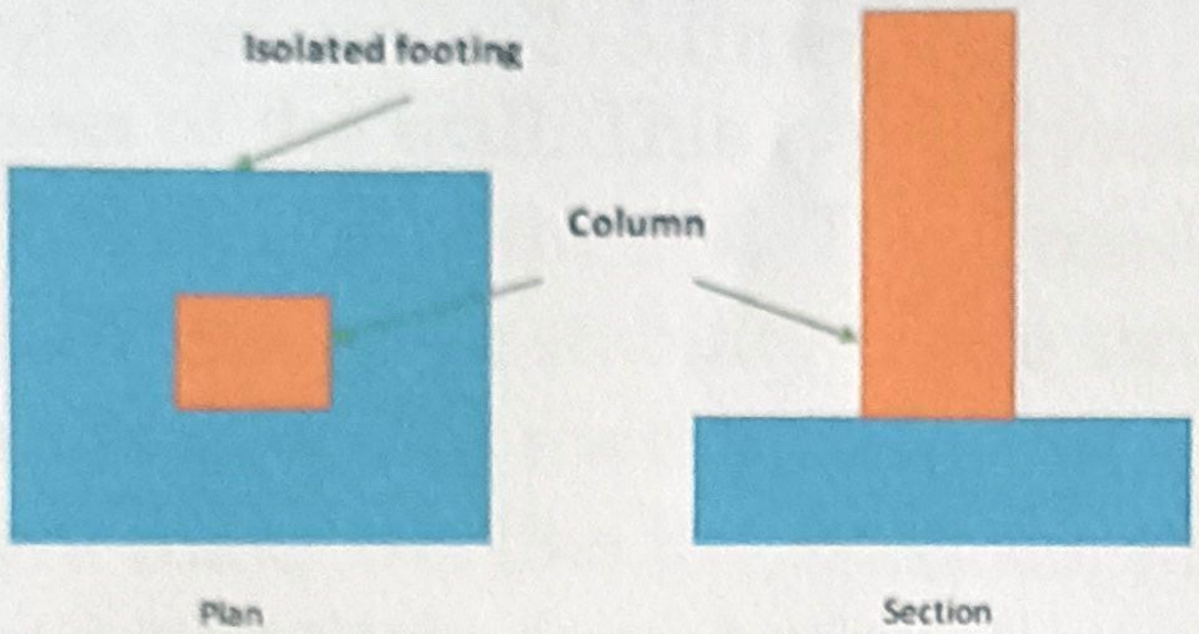
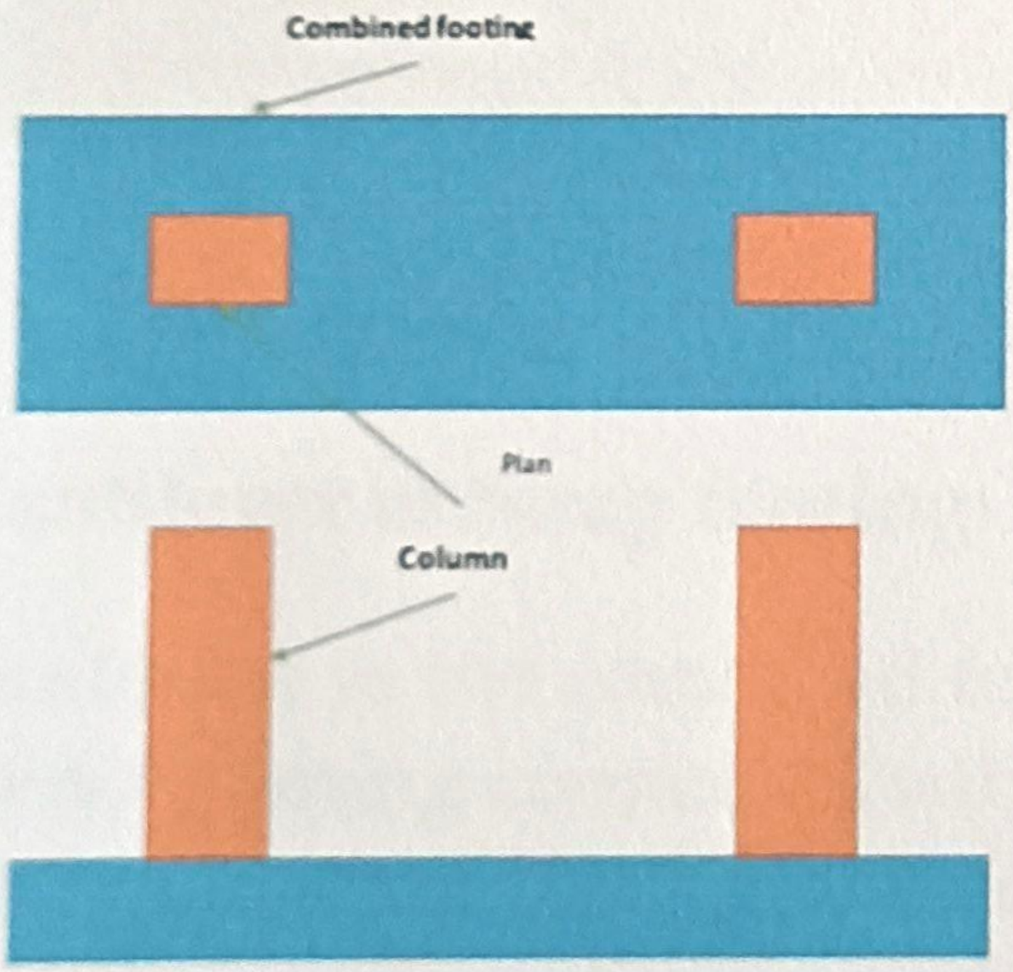


Figure 1.1 Components of a Typical Bridge.



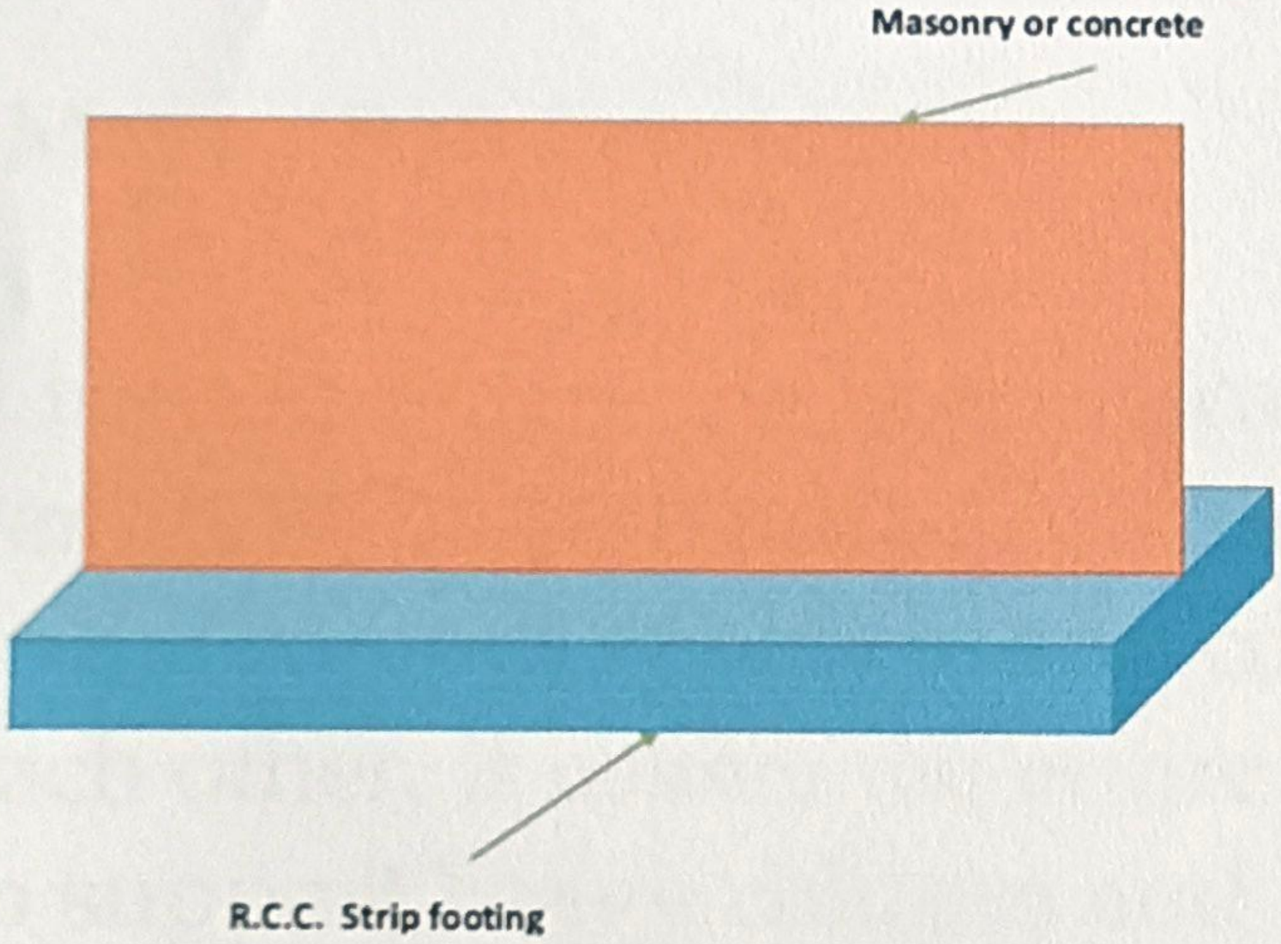
2. Combined footing:

If two to three columns connected collectively with one single footing is called Combined Footing. It provides where the distance between the two columns is small. The shape of combined footing is in a rectangular or trapezoidal. It is the formation of two isolated footings, together.



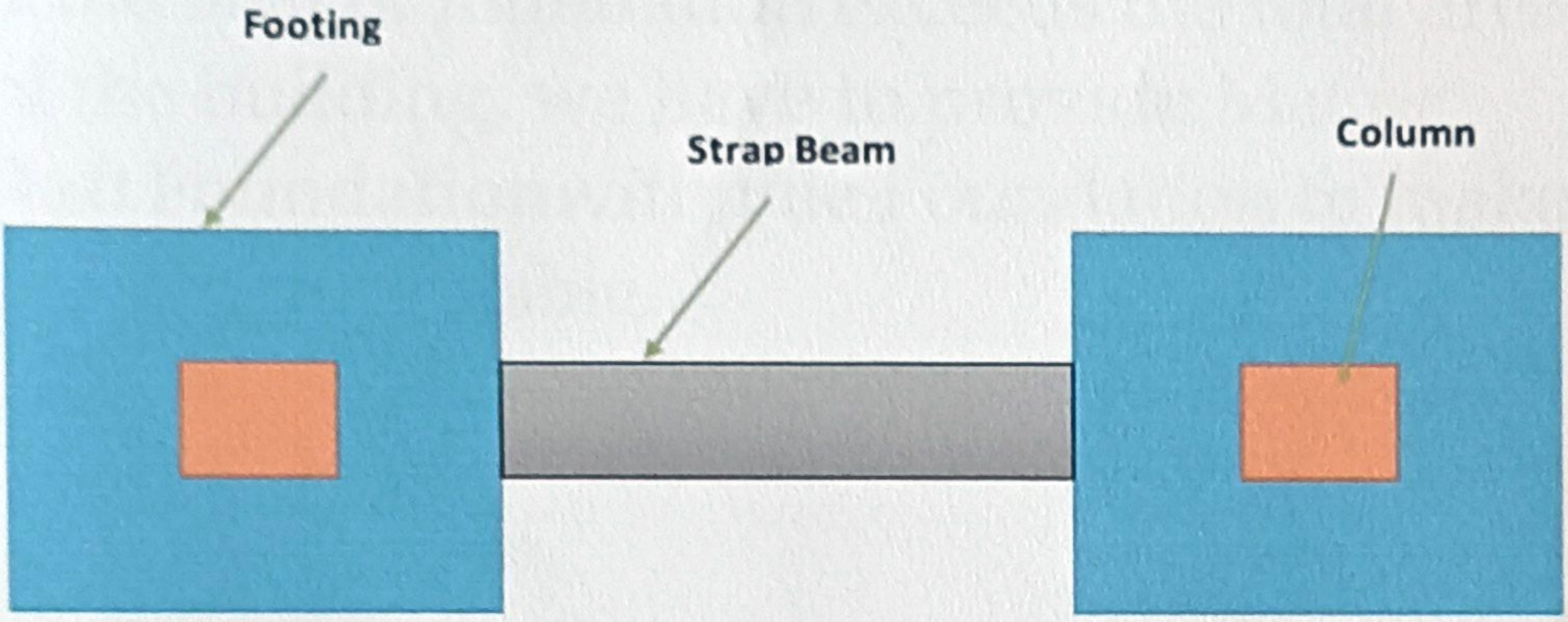
3. Wall footing or Strip footing:

It is generally used as a load-bearing wall. The width of the footing is generally 2 -3 times the thickness of the wall. This type of footing distributed all structure load into the soil. This broader base of the footing area provides more stability to the structure. For the construction of this footing, different materials like Brick, Stone, R.C.C, used. It is also known as the **Strip foundation**. It can also be used for retaining wall foundation.



4. Cantilever or Strap footing:

It is similar to the combined footing. In this footing, the exterior footing connected with strap beam to the interior footing. In strap footing, the edge of the footing should not cross the property line.

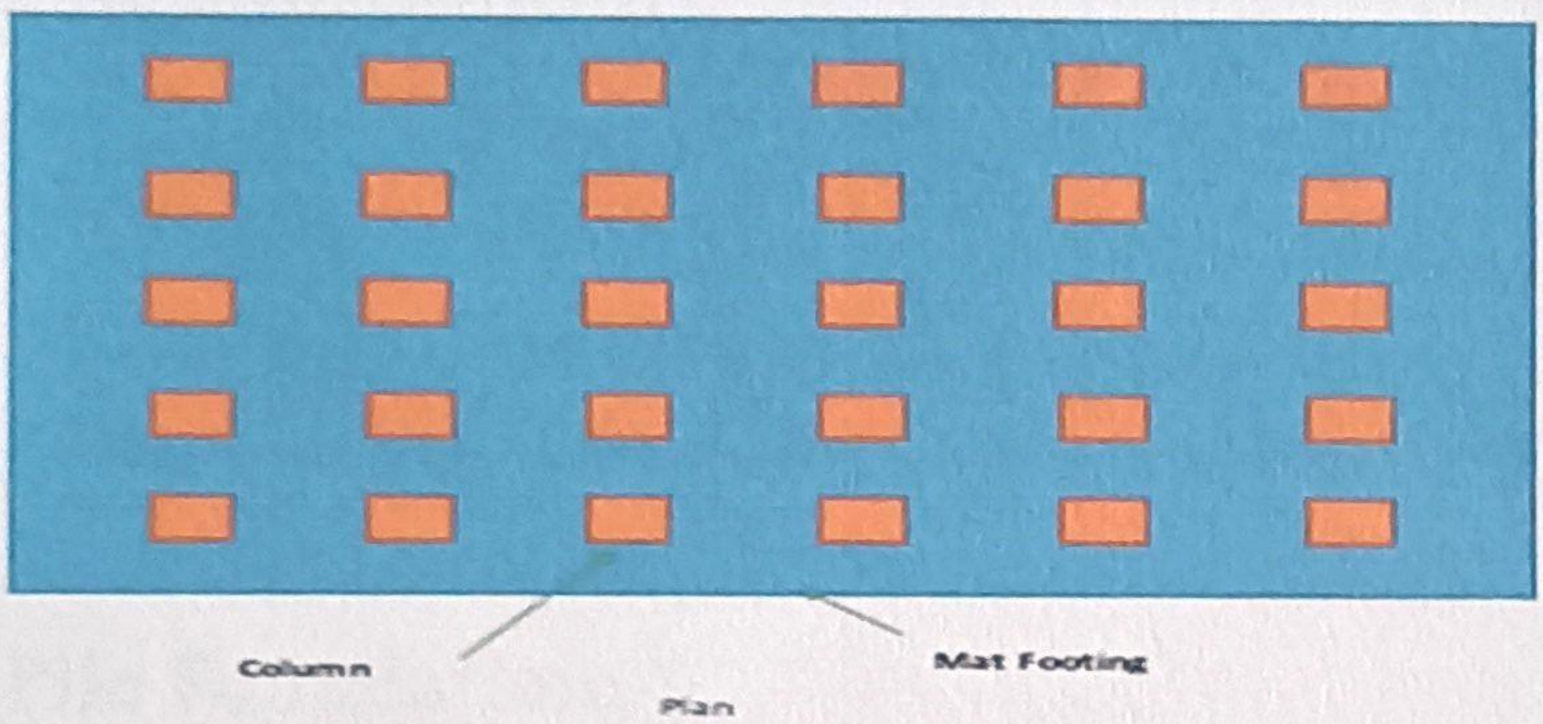


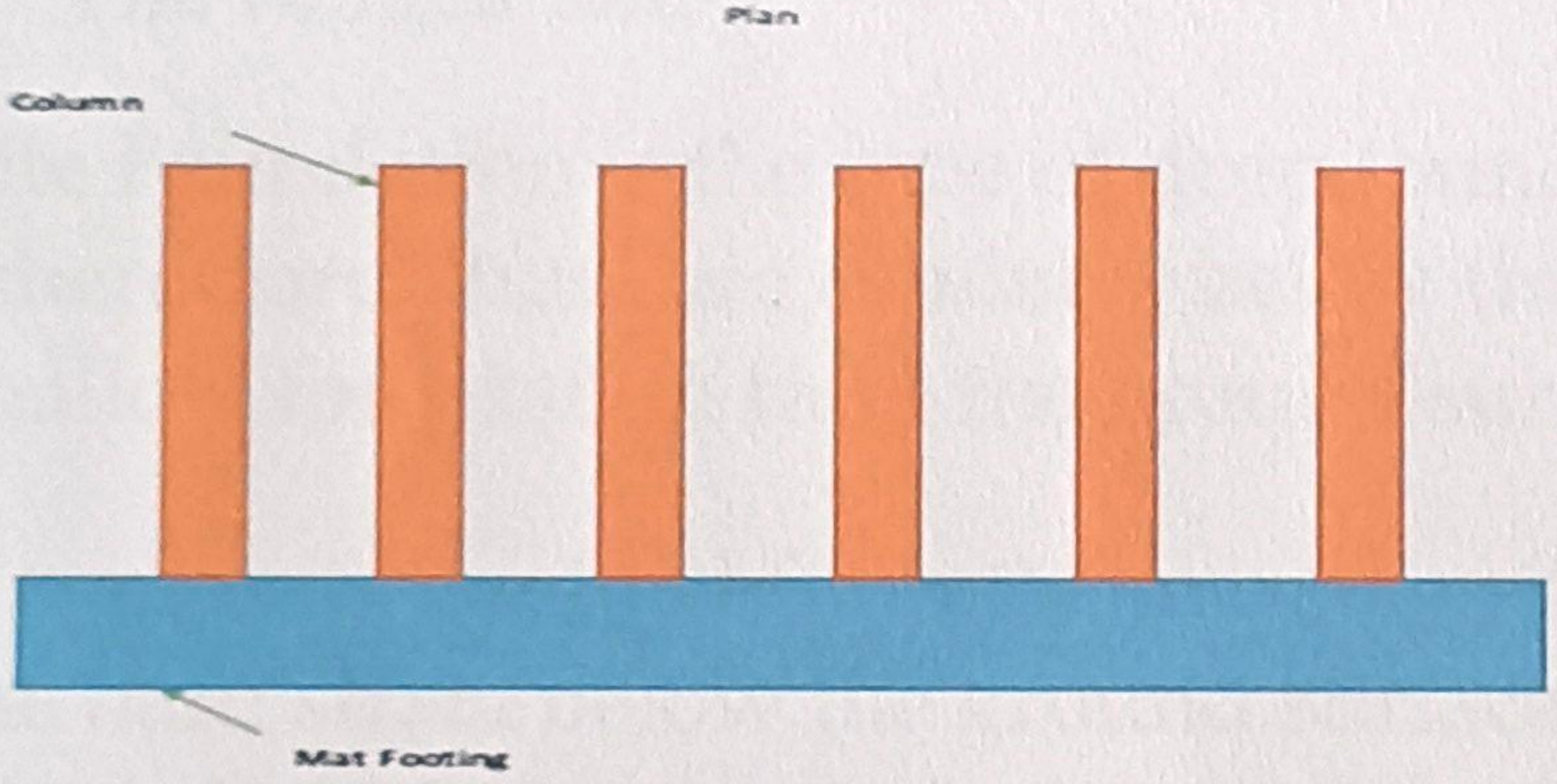
Plan

5. Mat or Raft Foundation:

It is used where the bearing capacity of the soil is very low, base required in structure, vertical load on the column are high, and columns are closed to each other. It covers the entire area of the structure to support heavy column and wall loads.

If the area of foundation exceeds the total area of the building, we have to provide Mat or **Raft Foundation**with Pile Foundation to make the structure stable.





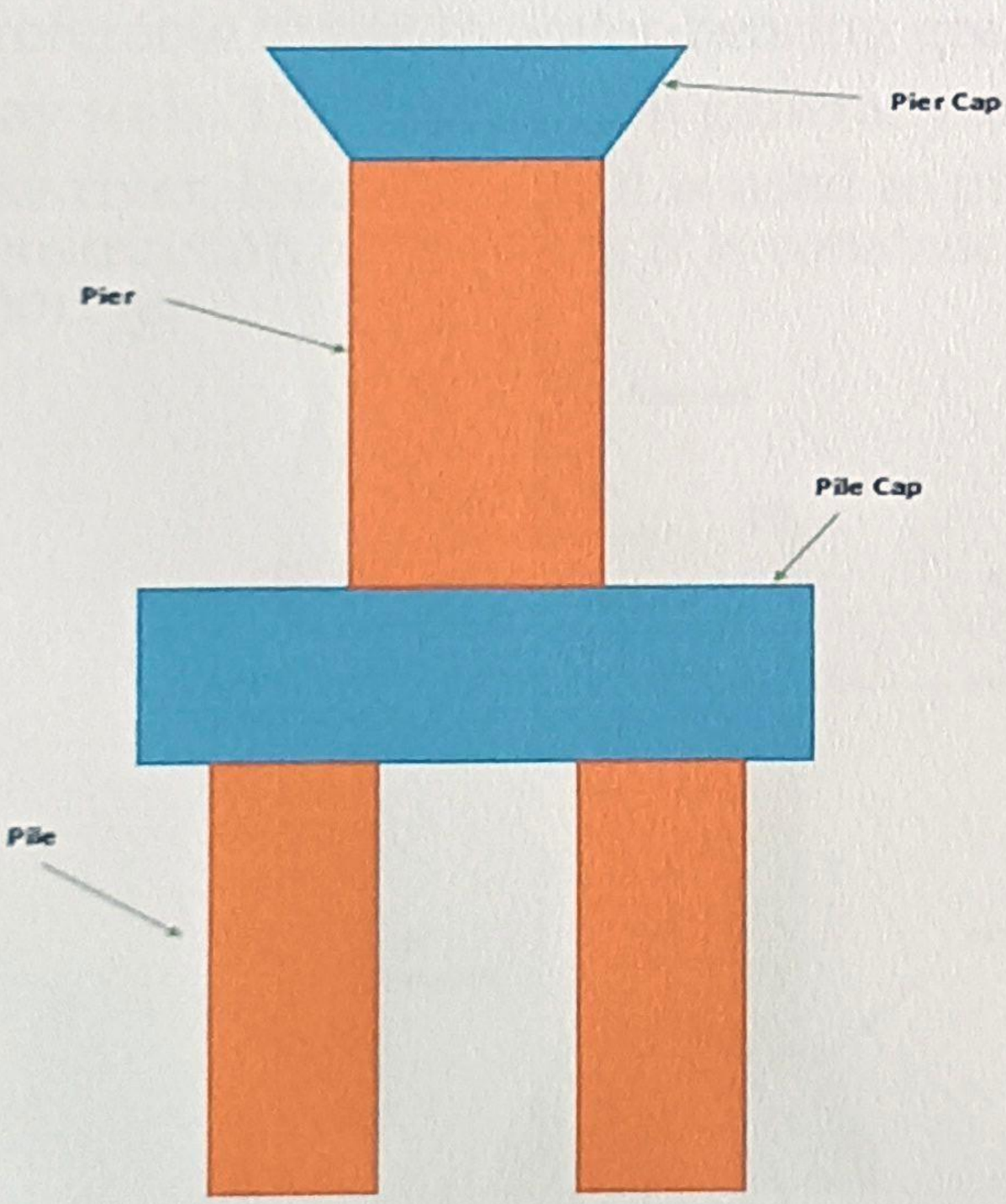
DEEP FOUNDATION:

This foundation is used for where hard strata are not available within the limit of shallow foundation. It helps to prevent the structure from the uplift.

2. Pier Foundation:

Pier foundation generally used to transmit the massive load from the structure to hard strata of the soil. The shape of the pier foundation is cylindrical, and it is supported with the help of piles.

It is used for a heavy multi-storey structure where the load of the structure is hefty, and it is generally used in bridges and fly-overs to resist the heavy traffic loads. It is used to transfer the load from the
end bearing pile to the hard strata of the soil.



14.5. TERMINOLOGY OF BUILDING COMPONENTS

Any building structure essentially comprises of three parts, viz. :

(a) Sub-structure or foundation

(b) Super-structure

(c) Roof

(a) Sub-structure or foundation : It is that part of the building which is below the ground level. It bears the load of the super-structure of the building and transmit to the sub-soil. It consists of concrete, stone and brick footings above the base concrete.

(i) *Base concrete* : It is the first course of the foundation immediately above the levelling course.

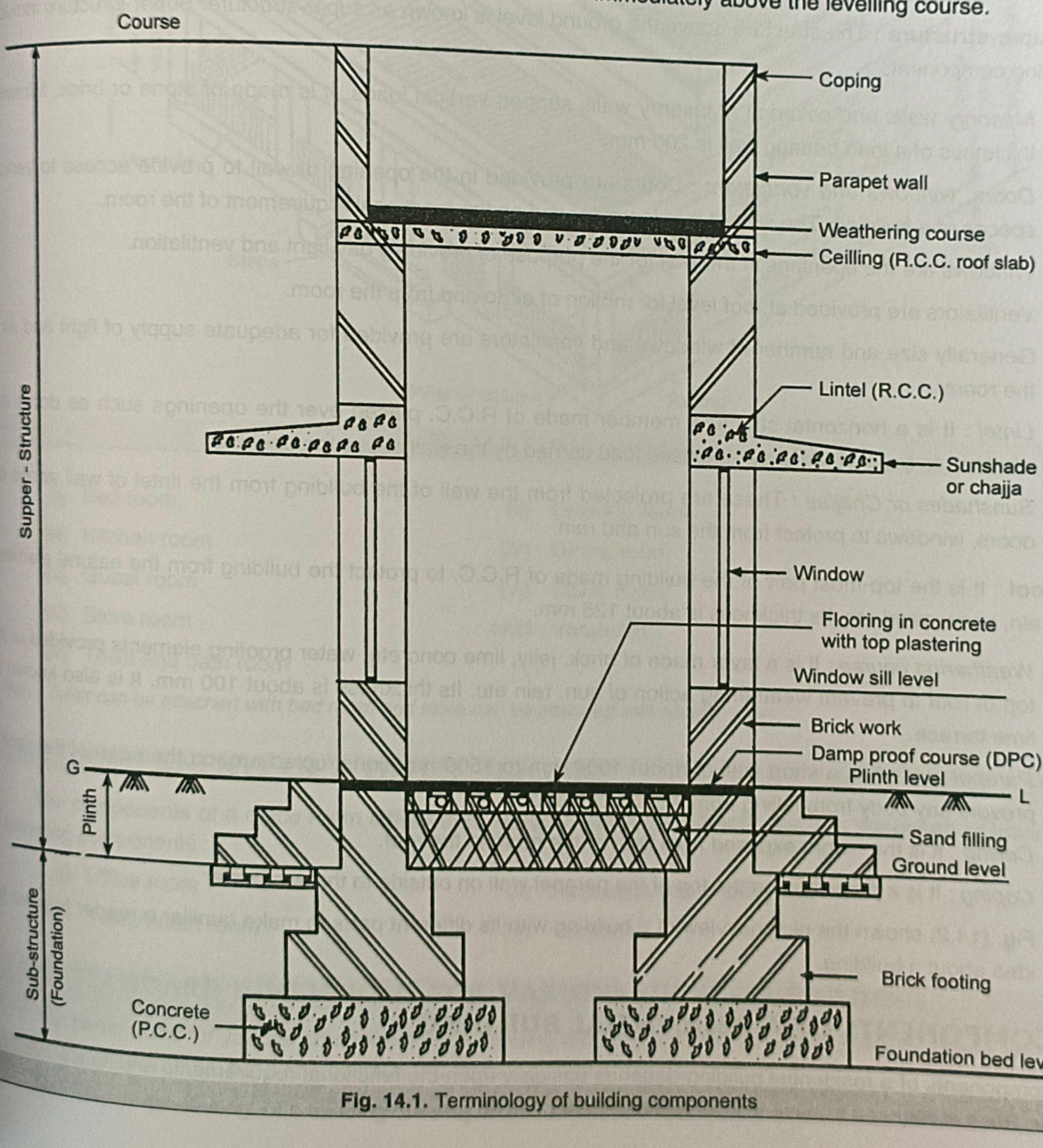


Fig. 14.1. Terminology of building components

(v) Size of door, D = 1200 × 2100

(vi) Windows, W = 1000 × 1200

(vii) Thickness of roof =100

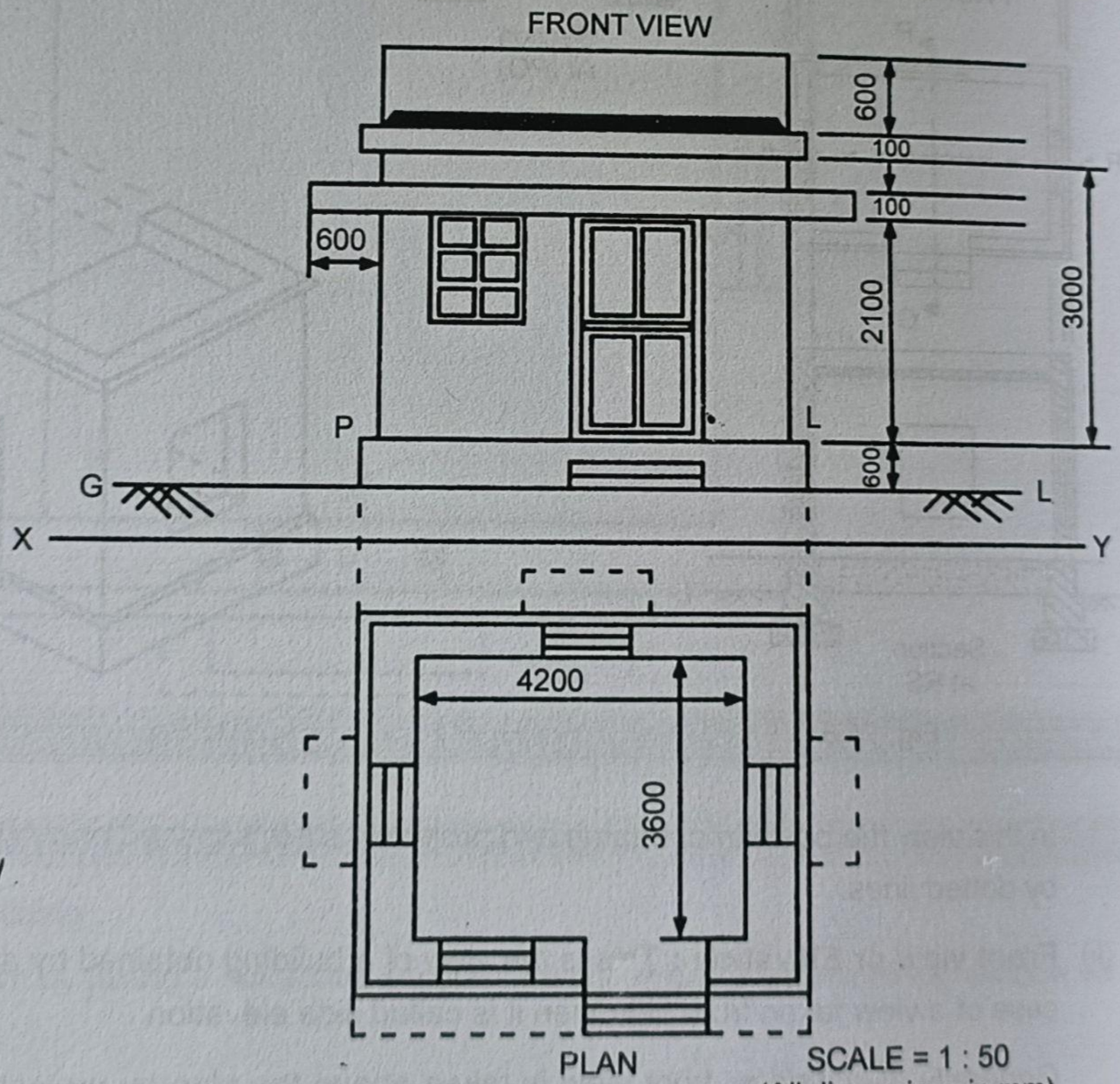
(viii) Ceiling height = 3000

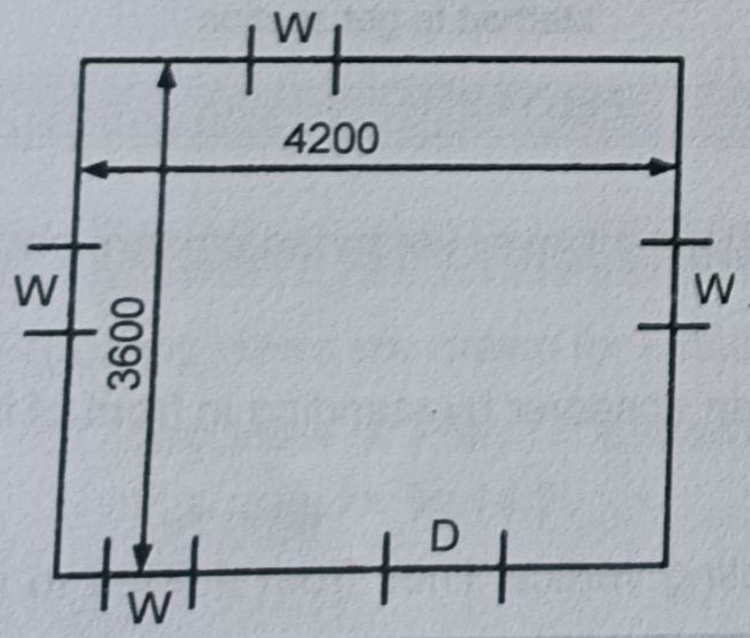
(ix) Steps = 230 × 150

(x) Parapet height = 600

(xi) Scale = 1 : 50, All dimensions in mm.

Assume any other data if necessary.





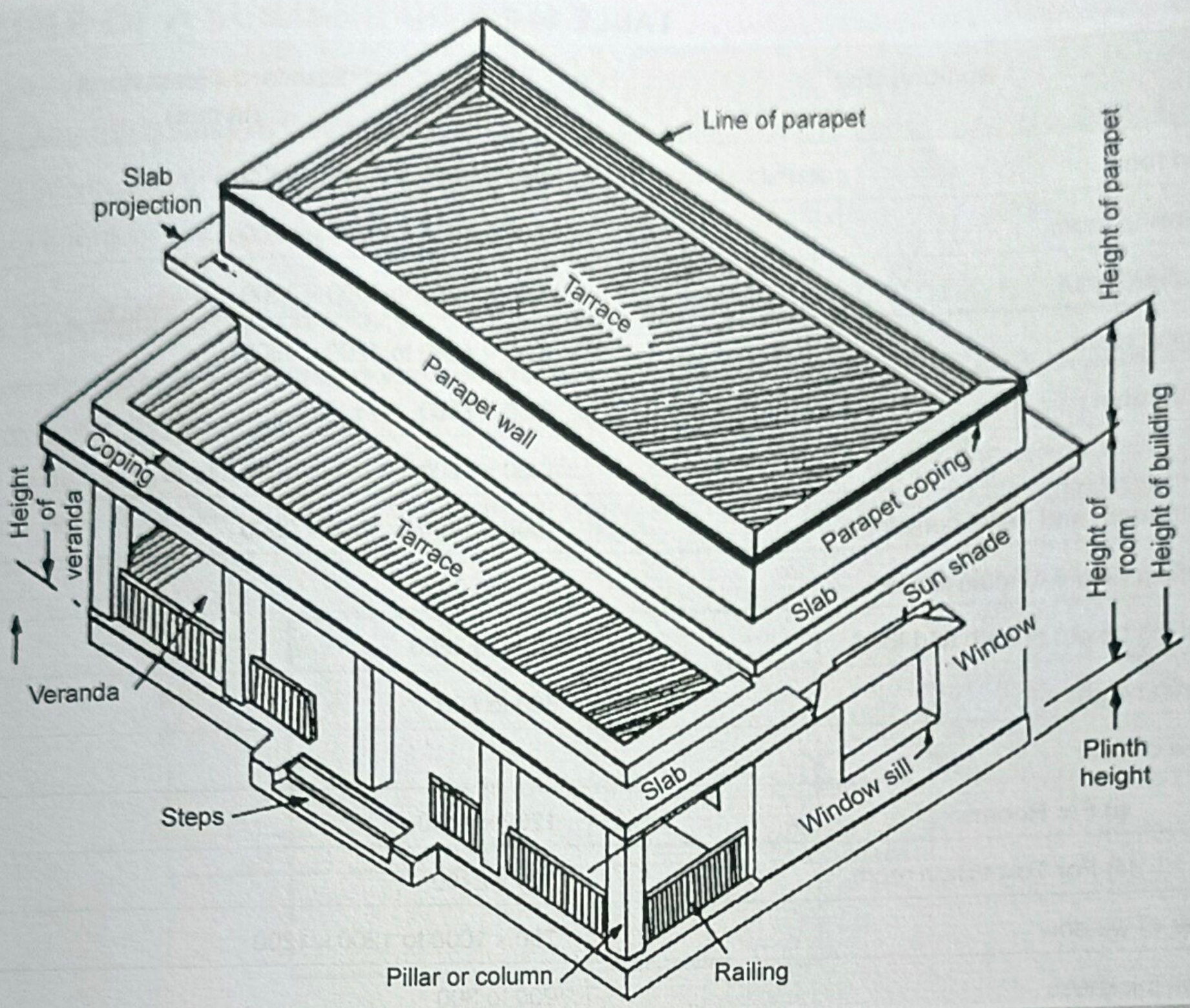


Fig. 14.2. Pictorial of a Building

(i) Bed room
(ii) Drawing room
(iii) Kitchen room
(iv) Dining room
(v) Guest room
(vi) Study room
(vii) Store room
(viii) Verandah
(ix) Toilet and bath room

N.B. : *Toilet can be attached with bed room and store can be attached with kitchen room.*

14.7. COMPONENTS OF A OFFICE BUILDING

The components of a office room differs from its functional requirements. But it is supposed to have at least the following components :

(i) Office room
(ii) Reception with waiting hall
(iii) Toilet/Wash room
(iv) Verandah

14.8. STANDARD DIMENSIONS FOR VARIOUS UNITS OF BUILDING

The dimensions for various components of a building (either residential or official building) differs according to the functional requirements, but it should have the following standard dimension.

Normally dimensioning of a building drawing shall be done in millimeters.


MODEL OF :- BRICK'S