

**Unit: -1**

**Drawing of Building Elements-** Drawing of various elements of buildings like various types of footing, open foundation, raft, grillage, pile and well foundation, Drawing of frames of doors, window, various types of door, window and ventilator, lintels and arches, stairs and staircase, trusses, flooring, roofs etc.

**Drawing of Building Elements**

**Foundation:** - The lowest load-bearing part of a building, typically below ground level is known as foundation.

**TYPES OF FOUNDATIONS**

**1. Shallow Foundation**

- a. Isolated spread footings
- b. Wall footings
- c. Combined footings
- d. Cantilever or strap footings
- e. Raft or Mat Raft or Mat

**2. Deep Foundation**

- a. Pile Foundation
- b. Well Foundation

**1. Shallow Foundation:** - are usually located no more than 6 ft below the lowest finished floor. A shallow foundation system generally used when (1) the soil close the ground surface has sufficient bearing capacity, and (2) underlying weaker strata do not result in undue settlement. The shallow foundations are commonly used most economical foundation systems.

**a. Isolated spread footings:** - under individual columns. These can be square, rectangular, or circular, trapezoidal.

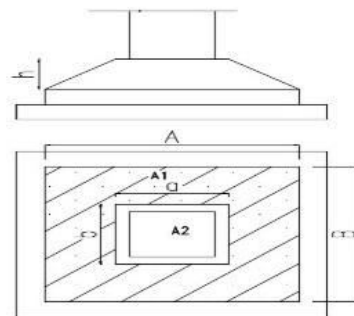


Figure 1: - Isolated spread footings

**b. Wall footings:** - Wall footing is a continuous slab strip along the length of wall.

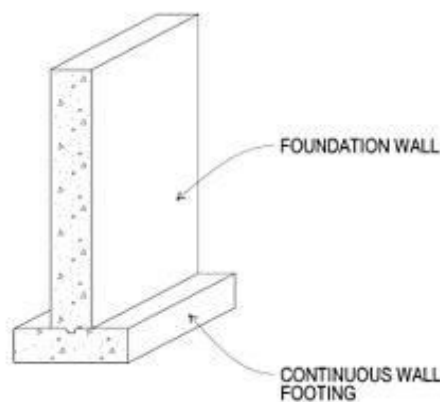


Figure 2: - Wall footings

- c. **Combined footings:** - Combined footings support two or more columns. These can be rectangular or trapezoidal plan.

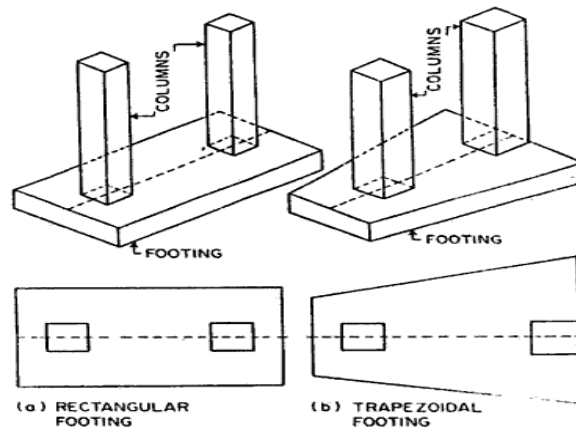


Figure 3: - Combined footings

- d. **Cantilever or strap footings:** - These are similar to combined footings, except that the footings under columns are built independently, and are joined by strap beam.

Figure 4: - Cantilever or strap footings

- e. **Raft or Mat Raft or Mat:** -This is a large continuous footing supporting all the columns of the structure. This is used when soil conditions are poor but piles are not used.

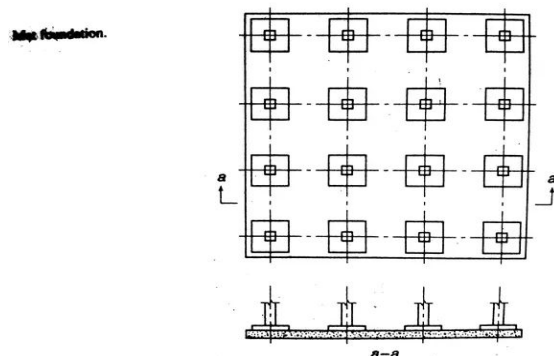
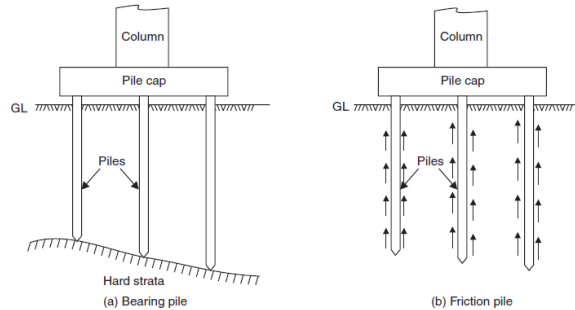
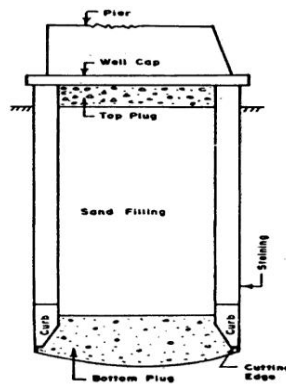


Figure 5: - Raft or Mat Raft or Mat

2. **Deep Foundation:** - The shallow foundations may not be economical or even possible when the soil bearing capacity near the surface is too low. In those cases deep foundations are used to transfer loads to a stronger layer, which may be located at a significant depth below the ground surface. The load is transferred through skin friction and end bearing.
- a. **Pile Foundation:** - A **pile** is a vertical structural element of a deep **foundation**, driven or drilled deep into the ground at the building site.



- b. **Well Foundation:** - Well foundation is a type of deep foundation which is generally provided below the water level for bridges. Cession or well have been in use for foundations of bridges and other structures since Roman and Mughal periods.



### Open Foundation

As the name suggests, open foundations refer to those foundations constructed by carrying out excavations up to founding level in the open conditions. When suitable founding strata are rock exposed in bed or hard strata are available at shallow depths, the excavations may be done entirely in the dry condition especially if the work is done in dry season in seasonal flowing streams. In most other cases, some part of excavation will need to be carried out in wet conditions, i.e. below the surface water or the subsoil water level.

### Grillage Foundation – Steel & Timber Grillage

**Grillage foundation** is used when heavy structural loads from columns, piers or stanchions are required to be transferred to a soil of low bearing capacity. **Grillage foundation** is often found to be lighter and more economical. This avoids deep excavation and provides necessary area at the base to reduce the intensity of pressure within safe bearing capacity of soil. Depending upon the material used in construction of **grillage foundation** can be broadly divided in the following two categories.

- (a) Steel grillage foundation
- (b) Timber grillage foundation

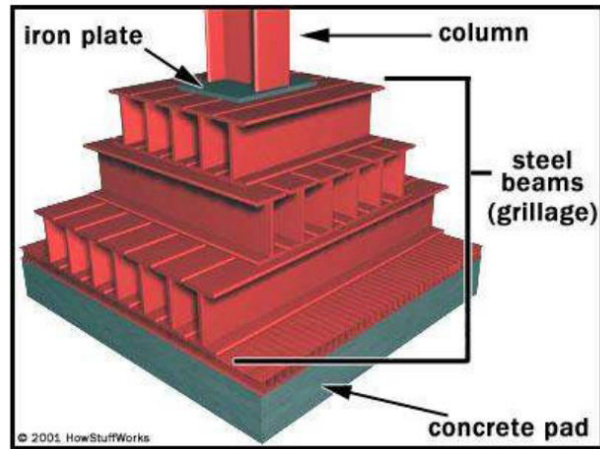


Figure 8: - Grillage foundation

### **Doors and windows**

A door provides a connecting link between rooms, allowing easy free movement in the building. Window are opening provided in walls. Doors and windows provide lighting and ventilation. They provide resistance to weather, sound and heat. They provide security and privacy

#### **Sizes of Doors**

- **For Residential Area**
- **Internal doors 0.9 x 2.0 m**
- **External doors 1.2 x 2 m**
- **Door for bath and w.c. 0.75 x 2.0 m**
- **Industrial Buildings**
- **Width 1.5, 2.0, 2.5 m**
- **Depth or height 2.0 m, 2.5 m**

#### **Drawing of frames of doors, window**

#### **Types of Doors**

- Battened and ledge door
- Battened and braced door
- Battened and framed door
- Battened, ledge, and framed door
- Framed and paneled door
- Glazed door

- Flush door
- Louvered door
- Wire gauged door
- Revolving door
- Sliding door
- Swing door
- Collapsible steel door
- Rolling shutter door
- Mild steel sheet door
- Hollow metal door
- PVC door

(a) **Battened and ledge door:-**Battened and ledged doors are the simplest form of doors and are in use since ages. Such doors consist of vertical wooden battens of the height of the door with about 35 mm thicknesses which are usually tongue and groove jointed. Usually three ledges (horizontal members) are provided, one each at the top and bottom and one in the middle.

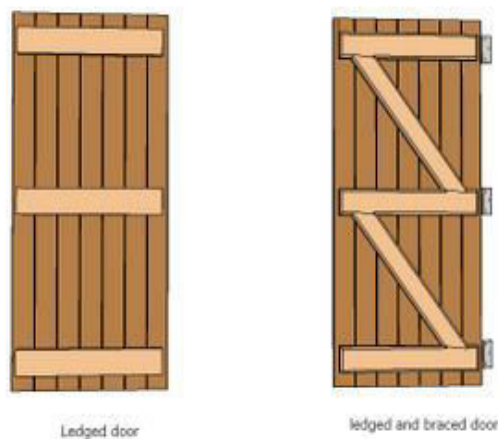


Figure-9: Battened and ledge door

**(b) Battened, ledged and braced doors:**

To make more rigid, braces are provided diagonally in addition to battens and ledges as shown in figure up. Braces are having 100-150mm width and 25-30mm thickness preferable. Braces should place upwards from handing side, then they acts as struts and take compression. These types of doors can be used for wider openings.

**(c) Battened, ledged and framed doors:**

For the simple battened and ledged door, frame work is provided in the form of two verticals, known as stiles. Stiles are generally 100mm wide and as far as thickness is concerned, the thickness of stile should be equal to the combined thickness of ledge and batten Preferably 40 mm.

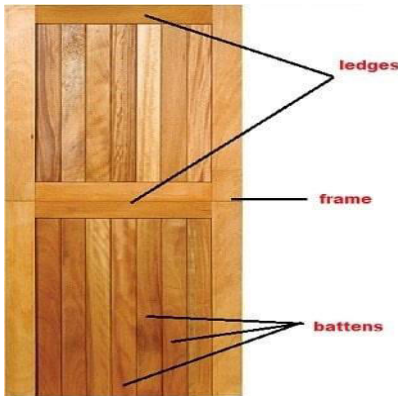


Figure-10: Batted, ledged and framed doors

**(d) Framed and paneled door:** - These are very strong and will give good appearance when compared to batted doors. These are the widely used doors in almost all types of buildings. Stiles, vertical members and rails, horizontal members are grooved along the inner edges of frame to receive the panels. The panels are made up of timber or plywood or A.C sheets or glass.

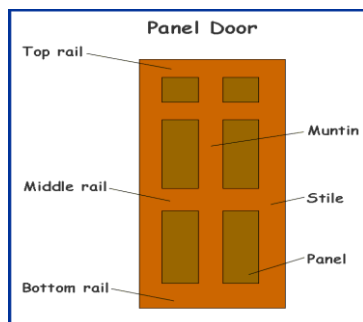


Figure-11: - Framed and paneled door

**(e) Glazed doors:**

Glazed doors are generally provided in interior wall openings or in hospitals, college etc. The interior of room is visible through glazed doors and light also passes through glazed portion of the door. These may be fully glazed or partly glazed and partly paneled. Glass panels are provided for glazed doors.



Figure-12:- Glazed doors

**Sizes of Windows:** 0.6, 0.75, 0.9, 1.0, 1.2, 1.5, 1.8m

• **Depth:** 0.6 0.75, 0.9, 1.0, 1.2, 1.5, 1.8 m

- **Size of Ventilator:** Width= 0.3, 0.45, 0.6, 0.75, 0.9 m

### **Types of Windows**

- Fixed
- Pivoted
- Double hung
- Sliding
- Casement
- Sash
- Louvered
- Metal
- Bay
- Corner window
- Dormer window
- Gable window
- Lantern
- Skylight

### **Ventilation**

Ventilation moves outdoor air into a building or a room, and distributes the air within the building or room. The general purpose of ventilation in buildings is to provide healthy air for breathing by both diluting the pollutants originating in the building and removing the pollutants from it

Building ventilation has three basic elements:

- ventilation rate — the amount of outdoor air that is provided into the space, and the quality of the outdoor air
- airflow direction — the overall airflow direction in a building, which should be from clean zones to dirty zones; and
- air distribution or airflow pattern — the external air should be delivered to each part of the space in an efficient manner and the airborne pollutants generated in each part of the space should also be removed in an efficient manner.

There are three methods that may be used to ventilate a building: natural, mechanical and hybrid ventilation.

## **Types of ventilation**

Natural ventilation

Mechanical ventilation

Hybrid or mixed-mode ventilation

### **1. Natural ventilation**

Natural forces (e.g. winds and thermal buoyancy force due to indoor and outdoor air density differences) drive outdoor air through purpose-built, building envelope openings. Purpose-built openings include windows, doors, solar chimneys, wind towers and trickle ventilators. This natural ventilation of buildings depends on climate, building design and human behavior.

### **2. Mechanical ventilation**

Mechanical fans drive mechanical ventilation. Fans can either be installed directly in windows or walls, or installed in air ducts for supplying air into, or exhausting air from, a room.

The type of mechanical ventilation used depends on climate. For example, in warm and humid climates, infiltration may need to be minimized or prevented to reduce interstitial condensation (which occurs when warm, moist air from inside a building penetrates a wall, roof or floor and meets a cold surface). In these cases, a positive pressure mechanical ventilation system is often used. Conversely, in cold climates, exfiltration needs to be prevented to reduce interstitial condensation, and negative pressure ventilation is used. For a room with locally generated pollutants, such as a bathroom, toilet or kitchen, the negative pressure system is often used.

### **3. Hybrid or mixed-mode ventilation**

Hybrid (mixed-mode) ventilation relies on natural driving forces to provide the desired (design) flow rate. It uses mechanical ventilation when the natural ventilation flow rate is too low.

## **Lintel**

A lintel is a horizontal member which is placed across the openings like doors, windows etc. in buildings. Lintels take the load from the structure above it and provide support. A lintel is also a type of beam, the width of which is equal to the width of the wall, and the ends of which are built into the wall. These are very easy to construct as compared to arches.

## **Arches**

An arch is a curved structure that spans an elevated space and may or may not support the weight above it.

### **Types of Arches**

Arches are classified based on:

1. Shape
2. Number of Centres
3. Workmanship
4. Materials of construction

### **Types of Arches based on shape:**

Based on the shape of construction, arches are classified into 10 types and they are discussed below.

#### **Flat Arch**

- For flat arch, the intrados is apparently flat and it acts as a base of an equilateral triangle which was formed by the horizontal angle of  $60^\circ$  by skewbacks.
- Even though the intrados is flat but it is given that a slight rise of camber of about 10 to 15 mm per meter width of opening is allowed for small settlements.



- Extrados is also horizontal and flat. These flat arches are generally used for light loads, and for spans up to 1.5m.

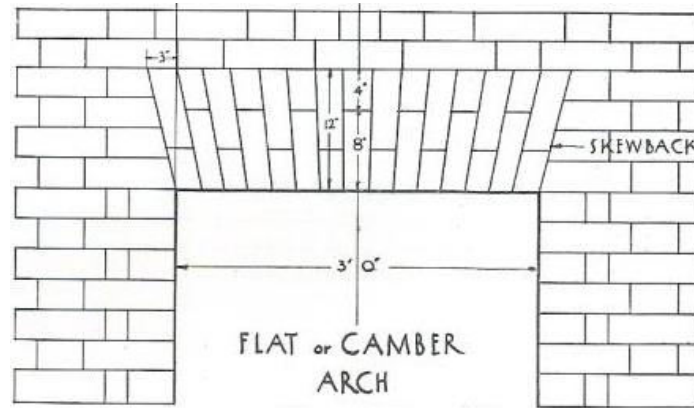


Figure 13: - Flat Arch

### Segmental Arch

- This is the basic type of arch used for buildings in which Centre of arch lies below the springing line.
- In segmental arch, the thrust Transferred in inclined direction to the abutment.

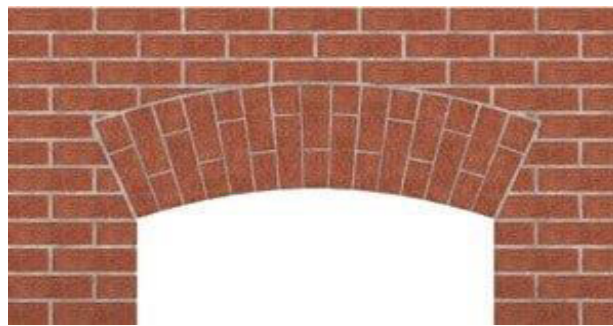


Figure-14:- Segmental Arch

### Semi-Circular Arch

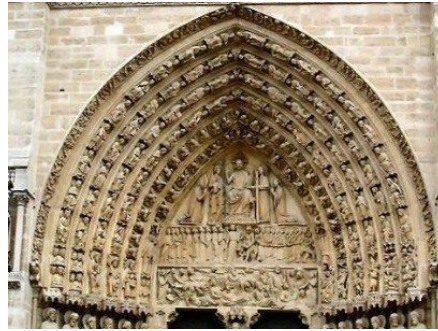
The shape of arch curve looks like semi-circle and the thrust transferred to the abutments is perfectly vertical direction since skewback is horizontal. In this type of arch, the Centre lies exactly on the springing line.



Figure-15:- Semi-Circular Arch

### **Pointed Arch**

The other name of pointed arch is Gothic arch. In this type of arch two arcs of circles are met at the apex hence triangle is formed. This may be either isosceles or equilateral.



**Figure-16:- Pointed Arch**

### **Semi-Elliptical Arch**

This is a type of arch of semi-ellipse shape and having three or five Centers.



**Figure-17:- Semi-Elliptical Arch**

### **Types of Arches based on number of Centers**

Based on number of centers the arches are classified as:

#### **One-centered Arches**

Segmental, semi-circular, flat, horse-shoe arches and stilted arches are one centered arches. In some cases, perfectly circular arch is provided for circular windows which is called as bull's eye arch is also come under these category.

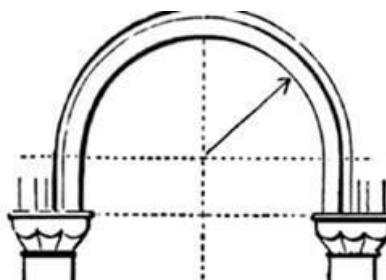


Figure-18:- One-centered Arches

### **Two Centered Arches**

Pointed or gothic or lancet arches are generally come under this type.

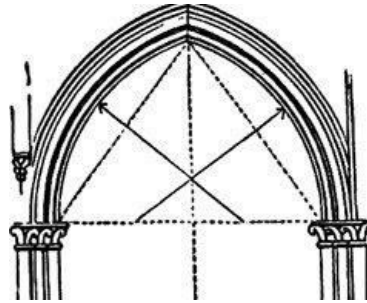


Figure-19:- Two Centered Arches

### **Three Centered Arches**

Semi elliptical and Florentine arches are generally having three number of centers

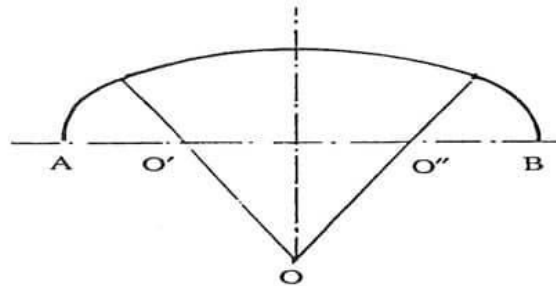


Figure-20:- Three Centered Arches

### **Four Centered Arches**

Venetian arch is a typical example for four-centered arch. Tudor arch is also having four centers.

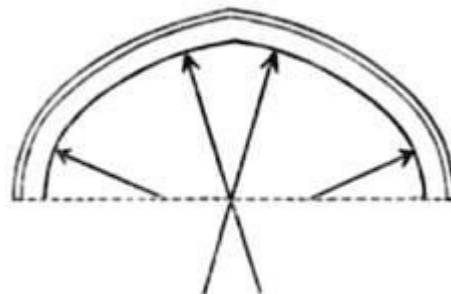


Figure-21:- Four Centered Arches

### **Types of Arches based on Workmanship and Construction Materials**

Based on material used for construction and workmanship, arches may be classified as:

#### **1. Stone Arches**

Based on workmanship, these are sub divided into two types. They are,

##### **Rubble arches**

Rubble arches are very weak and used only for inferior work. These are used up to spans of 1m. These are made of rubble stones which are hammer dressed, roughly to shape and size and fixed in cement mortar. Sometimes these are also used as relieving arches up to a depth of 37.5cm, but these are constructed in one ring. If the depth is more, we can go for two rings in alternate course of headers and stretchers.



Figure-22:- Rubble arches

##### **Ashlar Arches**

In this type, the stones are cut to proper shape of various (a wedge-shaped or tapered stone used to construct an arch) and fully dressed, joined with cement mortar. Ashlar stones are also used to make flat arches.



Figure-23:- Ashlar Arches



## **2. Brick Arches**

Brick arches are also subdivided into:

### **Rough brick arches**

These are constructed with ordinary bricks without cutting to the shape voussoirs. The arch curve is provided by forming wedge shaped joints with greater thickness at extrados and smaller thickness at intrados. So, it looks unattractive. That's why it is not recommended for exposed brick works.



Figure-24:- Rough brick arches

### **Axed brick arches**

The bricks are cut into wedge shape with the help of brick axe. So, these are roughly dressed in shape and size. Hence, Arch formed by these axed bricks is not very pleasant.



Figure-25:- Axed brick arches

**Gauged brick arches**

In this type arch, bricks are cut to exact shape and size of required voussoir with the help of wire saw. The bricks are finely dressed and these bricks are joined by lime putty. But, for gauged brick arches only soft bricks are used.



Figure-26:- Gauged brick arches

**Purpose made brick arches**

The bricks are manufactured, matching with the exact shape and size of voussoirs, to get a very fine workmanship.



Figure-27:- brick arches

### **3. Concrete Arches**

Concrete arches are of two types:

#### **Precast concrete block arches**

In Precast concrete block arches the blocks are cast in molds to the exact shape and size of voussoirs. For key stone and skewbacks special molds are prepared. These will give good appearance because of exact shape and size. Cement concrete of 1:2:4 is used.



Figure-28:- concrete block arches

#### **Monolithic concrete block arches**

Monolithic concrete block arches are suitable for larger span. These are constructed from cast-in-situ concrete. These may be either plain or reinforced, depending upon the span and magnitude of loading. Form work is used for casting the arch. The curing is done for 2 to 4 weeks.



Figure-29:- Monolithic concrete block arches



## **Steps and Stairs**

Steps and stairs are meant to provide access between different levels. Stairs should be properly located to provide easy access and fast services to the building.

- In one flight maximum 8 steps should be provided for more than 8 steps it is recommended to provide them with landing.
- Generally for residential building width of stair is 1.0 m and 1.2 m
- No of risers = Total height of floor / Height of riser
- No of tread = Number of riser - 1

### **Types of stairs and staircase – Classification of stairs:**

Stairs can be broadly classified into three types:

1. Straight stairs
2. Turning stairs
3. Continuous stairs

#### **1. Straight stairs:**

Generally for small houses, available width is very retractable. So, this type of straight stairs are used in such conditions which runs straight between two floors. This stair may consists of either one single flight or more than one flight with a landing.

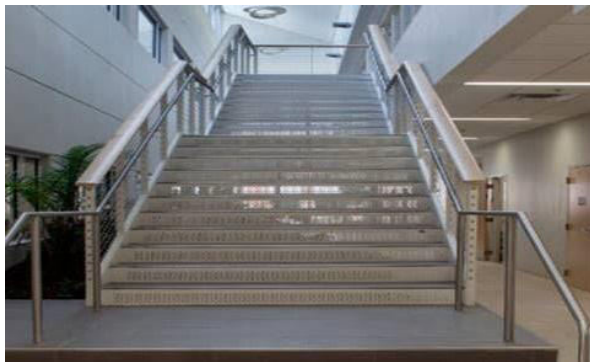


Figure-30:- Straight stairs

#### **2. Turning stairs:**

Turning stairs are sub classified as:

- a) Quarter turn stairs
- b) Half turn stairs (dog legged stairs)
- c) Three – quarter turn stairs
- d) Bifurcated stairs

##### **a) Quarter turn stairs:**

A quarter turn stair is the one which changes its direction either to the right or to the left but where the turn being affected either by introducing a quarter space landing or by providing winders. In these type of stairs the flight of stair turns 90 degrees at landing as it rises to connect two different levels. So it is also called as L-stair. Again these quarter turn stairs are two types.

##### **i. Newel quarter turn stairs:**

These type of stairs have clearly visible newel posts at the beginning of flight as well as at the end. At the quarter turn, there may either be quarter space landing or there may be winders.



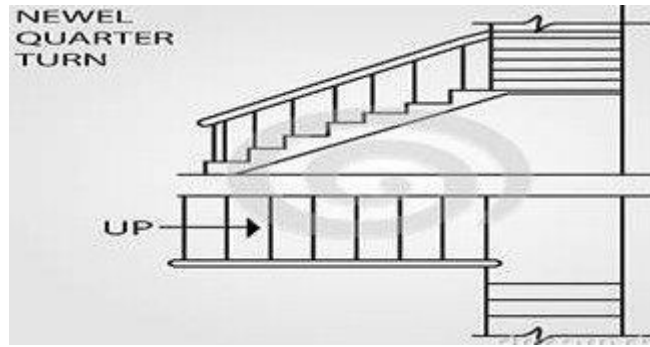


Figure-31:- Newel quarter turn stairs

## ii. Geometrical quarter turn stairs:

In geometrical stairs, the stringer as well as the hand rail is continuous without any newel post at the landing area.

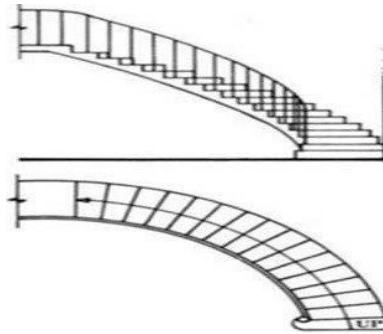


Figure-32:- Geometrical quarter turn stairs

## b) Half turn stairs:

In case of half turn stairs its direction reversed, or changed for  $180^\circ$ . Such stairs are quite common. Again these are three types.

### i. Dog-legged stairs

Because of its appearance in sectional elevation this name is given. It comes under the category of newel stairs in which newel posts are provided at the beginning and end of each flight.

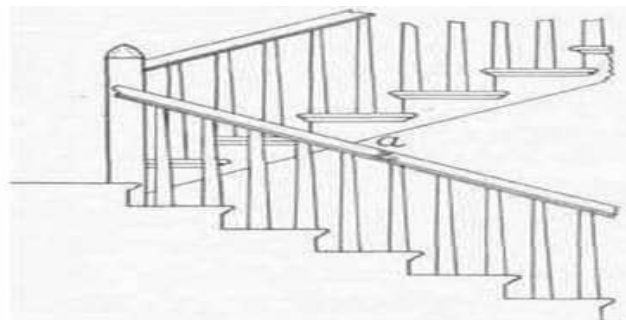


Figure-33:- Dog-legged stairs

## **ii. Open newel half turn stair**

In this type of open newel half turn stairs, stair has a space or well between the outer strings. This is the only aspect in which it differs from the doglegged stair.



Figure-34:- Open newel half turn stair

## **iii. Geometrical half turn stairs**

In case of geometrical half turn stairs the stringers and the hand rails are continuous, without any intervening newel post. These stairs may contain either with half space landing or without landing.

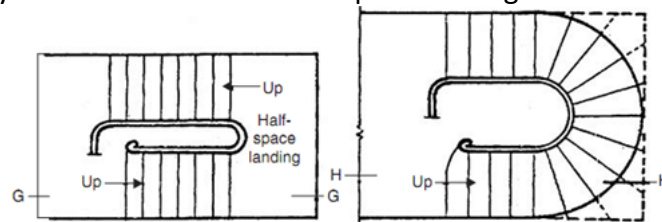


Figure-35:- Geometrical half turn stairs

## **c) Three quarter Turn stairs:**

The direction of stairs changed three times with its upper flight crossing the bottom one in the case of three quarter turn stairs. These stairs may either be newel or open newel type. This type of stairs is generally used when the vertical distance between two floors is more and as well as length of the stair room is limited.

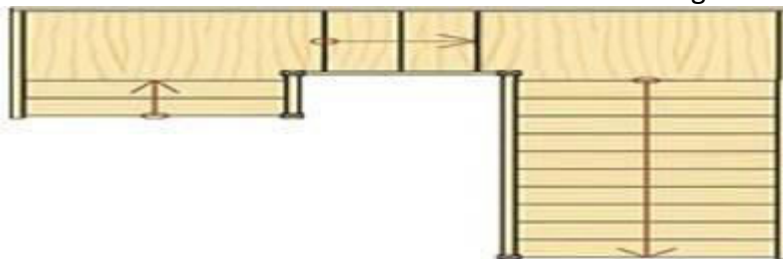


Figure-36:- Three quarter Turn stairs

## **d) Bifurcated stairs:**

Bifurcated stairs are commonly used in public building at their entrance hall. This has a wider flight at the bottom, which bifurcates into two narrower flights, one turning to the left and other to the right, at landing. It may be either of newel type with a newel post or of geometrical type with continuous stringer and hand rails.



Figure-37:- Bifurcated stairs

### **3. Continuous stairs:**

This type of stairs neither have any landing nor any intermediate newel post. They are geometric in shape. These are may be of following types.

- Circular stairs
- Spiral stairs
- Helical stairs

Circular stairs or spiral stairs are usually made either of R.C.C or metal, and is placed at a location where there are space limitations. Sometimes these are also used as emergency stairs, and are provided at the back side of a building. These are not comfortable because of all the steps are winders and provides discomfort. A helical stair looks very fine but its structural design and construction is very complicated. It is made of R.C.C in which a large portion of steel is required to resist bending, shear and torsion.



Figure-38:- Continuous stairs

### **Trusses**

In engineering, a **truss** is a structure that "consists of two-force members only, where the members are organized so that the assemblage as a whole behaves as a single object".<sup>[1]</sup> A "two-force member" is a structural component where force is applied to only two points. Although this rigorous definition allows the members to have any shape connected in any stable configuration, trusses typically comprise five or more triangular units constructed with straight members whose ends are connected at joints referred to as nodes.

### **Flooring**

**Flooring** is the general term for a permanent covering of a floor, or for the work of installing such a floor covering. **Floor covering** is a term to generically describe any finish material applied over a floor structure to provide a walking surface. Both terms are used interchangeably but floor covering refers more to loose-laid materials.

### **MUD FLOORING**

Mud has been the easiest form of material available for building construction. It has been adopted for various elements in the house in different forms. Floorings in mud have mostly been adopted in village housing as besides being economical, mud is readily available and the flooring is easy to construct and maintain.



Figure-39:- MUD FLOORING

### **BRICK FLOORING**

Bricks have been the mainstay of building construction in India since time of Mohenjo-Daro and Harappa. It has been successfully used for foundations, walls, roof, floors etc. Brick flooring is advantageous in areas where bricks are available locally. Such floorings are easy to construct with the help of local mason and are also economical.



Figure-40:- BRICK FLOORING



### **STONE FLOORING**

Stone are available in plenty across the entire stretch of the country. Many of these are suitable for providing floors in residential construction. Stones suited for the purpose should be strong and able to resist abrasion and impact besides giving a pleasing appearance. Some of the stones which is used for floor construction are given below.

- Kota stone
- Granite
- Sand stone



Figure-41:- STONE FLOORING

### **CEMENT CONCRETE FLOORING**

Cement concrete flooring is one of the most common types of flooring provided in houses. This type of flooring is quite durable, easy to construct and maintain besides being economical as compared to tile, marble and other such type of floorings.



Figure-42:- CEMENT CONCRETE FLOORING

### **TERRAZZO FLOORING OR MOSAIC FLOORING**

Terrazzo flooring is yet another type of flooring that has been commonly used in India. As this type of flooring gives a pleasing look, it has been extensively provided in living rooms, bed rooms etc.



**Figure-43:- TERRAZZO FLOORING OR MOSAIC FLOORING**

### **MARBLE FLOORING**

Marble flooring has traditionally been provided in religious places, palaces, havelis etc, as it enhances the look of the structure. Lately such flooring has been used extensively in residential buildings also. Marble floorings are costly and can be used preferable for living rooms and bed rooms.



**Figure-45:- MARBLE FLOORING**

### **TILE FLOORING**

Flooring tiles in India have over the years gained popularity over the cement and concrete flooring. Tiles are available in different patterns, designs and utility options. Usually they are costlier than the cement concrete flooring and its cost depends upon the type of tile being used. Various types of flooring tiles are as follows.

- Chequered tile
- Glazed tile
- Vitrified tile
- PVC tiles



**Figure-46:- TILE FLOORING**

### **WOODEN FLOORING**

Wooden flooring is most commonly used in hilly regions of the country where the temperature are quite low. At present they are also being provided in floors of high end housing to give a good appearance.



Figure-47:- WOODEN FLOORING

### **BAMBOO FLOORING**

Bamboo flooring is very commonly used in areas where bamboo is available locally. However such floorings have recently become quite popular due to its aesthetics, being uniquely attractive, strong and resilient, dimensionally stable, moisture and stain resistant and being environmentally friendly. It is also said to have better properties than hard wood.



Figure-48:- BAMBOO FLOORING

### **LINOLEUM FLOORING**

Linoleum flooring is usually provided on a floor base which is already smooth and plain. It is suitable for interior locations in a building. Linoleum is a combustible material and should not be used in areas prone to fire etc. It should also not be used in areas which are likely to become damp over a period of time.



Figure-49:- LINOLEUM FLOORING

## **Roof**

A roof is part of a building envelope. It is the covering on the uppermost part of a building or shelter which provides protection from animals and weather, notably rain or snow, but also heat, wind and sunlight. The word also denotes the framing or structure which supports that covering.

### **Types of roof**

#### **Gable Roof:**

Gable roof designs are one of the more simple styles when it comes to roofs. The gable roof style looks like an inverted/upside down V. Gable roofs are not ideal for areas with high wind because they easily can catch the wind much like a sail would.

#### **Flat Roof:**

Flat roofs are common especially with commercial buildings. Flat roofs are definitely the simplest roof to build because they have little to no pitch. The most common types of roofing systems used with flat roofs are rubber roofing systems.

#### **Hip Roof:**

Hip roofs are a common residential style roof. This type of roof is more difficult to construct when compared to flat roofs and gable roofs because they have a more complicated truss and rafter structure. A hip roof style roof has four sloping sides with zero vertical roof lines/walls. Hip roofs can be both square and rectangular.

#### **Gambrel Roof:**

The best way to describe a gambrel roof is by saying barn roof. The gambrel style roof is most commonly used on barns. However, it is also used in residential construction. This type of roof has the benefit of providing a good amount of space in the attic. In fact, it provides so much extra space that it is often turned into bedrooms or other living areas.

#### **Dutch Hip Roof:**

The Dutch hip roof is basically a hip roof with a small gable at either end. The gables can be used as ventilation.

#### **Shed Roof:**

A shed roof is basically a flat roof but has more pitch. It is frequently used for additions on homes or other roof styles.

#### **Mansard Roof:**

The mansard roof is a French design and is more difficult to construct than the hip or gable roof.

#### **Butterfly Roof:**

The butterfly roof is not a roof style that is widely used. The style provides plenty of light and ventilation but is not the effective when it comes to water drainage.

#### **Winged Gable Roof:**

The winged gable roof varies slightly from the tradition gable roof. It varies by extended outwards from the peak of the roof.

#### **A-Frame Roof:**























This type of roof is very popular for churches, cottages, homes, and other structures. The roof acts as both the roof and the walls for a structure.


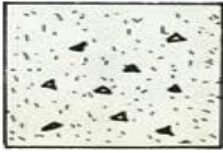

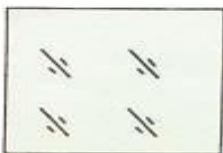

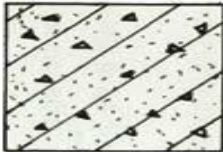



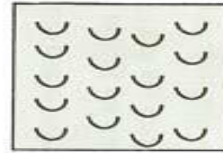



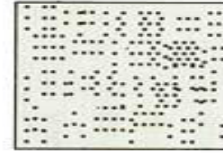
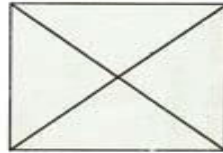

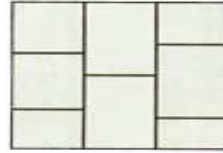


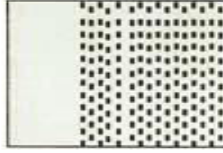
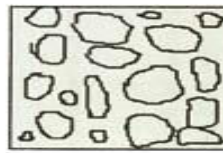


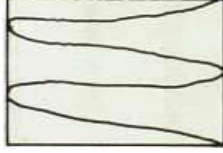
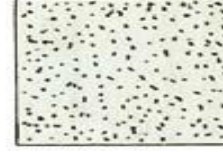
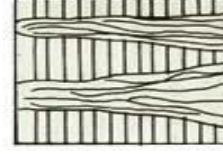


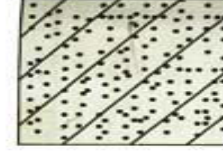



#### **Folded Plate Roof:**








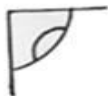

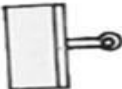

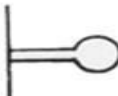



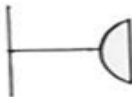
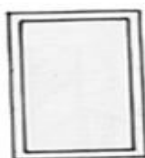


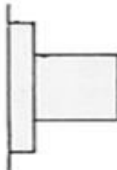
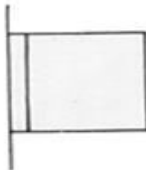


The folded plate roof has limited use in single family homes. It looks like a series of small gable roofs placed side by side of each other.



Drawing of building element

SYMBOLS FOR ELECTRICAL INSTALLATIONS					
					
LIGHT BRACKET	SOCKET - OUTLET 2 PIN 5 AMP			EXHAUST FAN	
				COOKER CONTROL UNIT	
BATTEN LAMP HOLDER	SOCKET - OUTLET 3 PIN 5 AMP				
				EARTH POINT	
FLUORESCENT LIGHT (SINGLE) (TUBE LIGHT)	BELL PUSH				
				REFRIGERATOR	
FLUORESCENT LIGHT (DOUBLE) (TWO TUBE LIGHTS)	BELL				
				PUMP	
MAIN POWER SWITCH	CEILING FAN				
					
CHOKE					
					
ONE WAY SWITCH					
				AUTOMATIC WASHING MACHINE	
TWO-WAY SWITCH					

	BRICK		CONCRETE		CLAY TILE UNGLAZED		GLASS
	BRICK EXISTING		CONCRETE EXISTING		CERAMIC TILES		SHEET METAL
	STONE		CINDERS		PLY WOOD		STEEL AND CAST IRON
	STONE EXISTING		SAND		ROUGH WOOD		ALUMINIUM
	ASHLAR		GROUND LEVEL		WOOD ACROSS		WATER, OIL, PETROL
	RUBBLE STONE		EARTH		WOOD GRAINS ACROSS		FIBRE BOARD AND INSULATING BOARD
	PLASTER		ROCK		WOOD ALONG		STRUCTURAL SECTIONS
	PLASTER EXISTING		CLAY TILE GLAZED		GRAINS		STEEL

							
TOWEL RAIL	STOP VALVE OR SLUICE VALVE	WASH BASIN	LADIES URINAL	COOKING PLAT FORM	CUP BOARD (C.B)	ALMAIRAH	
							
URINAL CORNER HUNG	INDIAN TYPE W. C.	EUROPEAN WATER CLOSET	WATER CLOSET WITH FLUSHING SYSTEM	WATER CLOSET WITH OUT FLUSHING SYSTEM	BATH TUB	PLAIN KITCHEN SINK	KICHEN SINK WITH SINGLE DRAIN BOARD
							
SHOWER HEAD	PEDESTAL LAVATORY BASIN	WALL LAVATORY BASIN	CORNER LAVATORY BASIN	W.C. LOW DOWN	W. C.	URINAL WALL HUNG	URINAL STALL