TOPIC: DOORS AND WINDOWS

DOORS

DEFINITION: A Door is defined as a movable barrier, secured in an opening, known as a door way, through a building wall or partition, for the purpose of providing an access to the inside of a building or rooms of a building. A door is held in position by a door frame, the members of which are located at sides and top of the opening or door way. Sill may or may not be provided at the bottom of door way.

LOCATION OF DOORS

The following guidelines should be kept in view while deciding the location of doors in a building:

1. From consideration of adequate air circulation within the room, the doors should be provided in opposite walls facing each other.
2. From consideration of space utilisation and privacy, doors should as far as possible near the corner of a room (20 cm away).
3. The location of the door should meet the functional requirements of the room.
4. The number of doors in room should be kept minimum to achieve optimum utilisation of space. Large number of doors besides causing obstruction, consume more area in circulation.

SIZE OF DOORS:

Commonly adopted size of doors for different types of buildings are given below:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Type of building</th>
<th>Size of door in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Doors of Residential buildings</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) external door</td>
<td>1000 x 2000</td>
</tr>
<tr>
<td></td>
<td>(b) internal door</td>
<td>900 x 2000</td>
</tr>
<tr>
<td></td>
<td>(c) Door for bath or w.c.</td>
<td>800 x 2000</td>
</tr>
<tr>
<td>2.</td>
<td>Doors of public buildings like school, Hospital, Library etc.</td>
<td>1200 x 2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1200 x 2100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1200 x 2250</td>
</tr>
<tr>
<td>3.</td>
<td>Doors of garage for cars</td>
<td>2250 x 2250</td>
</tr>
</tbody>
</table>
TYPES OF DOORS

Depending upon the type of material used, arrangement of different components, method of construction and nature of working operation, doors can be broadly classified into different types as under:

1. Battened and ledged doors. 2. Battened ledged and braced doors.
3. Battened ledged, braced and framed doors. 4. Framed and panelled doors
5. Glazed or sash doors. 6. Flush doors.
15. Fire check door.

DESCRIPTION OF DOORS WITH NEAT SKETCHES

1. Battened and ledged doors: This is the simplest form of door commonly used for narrow openings. The door consists of a series of vertical battens or boards usually tongued and grooved and fixed together with horizontal battens known as ledges. These are fixed at bottom, top and middle of shutter. The middle ledge is also known as lock ledge. The battens are 75 to 100 mm wide and 20 mm thick. The thickness of ledges vary from 20 mm to 30 mm. The top ledge is 110 mm wide while the middle and bottom ledges are each 175 to 200 mm wide. The door is hung on the frame by iron hinges fixed on the ledges.

This type door, is recommended for W.C’s, bathrooms etc. in buildings where economy rather than the appearance is main consideration. See Fig. 17.5
2. **Battened ledged and braced doors:** This is an improved form of battened and ledged door. In this type of door two additional members are provided in the form of inclined braces between the ledges as shown in (Fig. 17.7). The braces are normally housed and not tongued into the ledges. The braces incline down towards the side on which the door is hung. In this position they act as struts and provide to increase rigidity and strength to the door.

The sizes different components of the door are as:

(i) Battens: 100 to 175 mm wide and 20mm thick.
(ii) Ledges: 175 to 225 mm wide and 25 to 30 mm thick.
(iii) Braces: 125 to 175 mm wide and 25 to 30 mm thick.

This type door can be used for wider opening in situation where appearance is not so important as economy.

3. **Battened ledged, braced and framed doors:** This type of door is considered to the superior in strength, durability and appearance to other two type of doors mentioned above. The frame work of this type of door consists of two vertical members called stiles, three horizontal members known as ledges or rails, vertical battens and two inclined braces. The rails positioned near the top, middle and the bottom of the shutter are morticed and tenoned into the stiles. The battens are generally tongued and grooved and V-joined. At their upper end, the battens are let into the top rail while at mid height lower end, they go right over the middle and bottom rails. The side battens are tongued into the stiles. The braces are normally housed into the rails at about 4 cm from the stiles. For jointing, the thickness of the stiles and top rail is kept same and is equal to the combined thickness of braces and battens.

This type of door is considered suitable for external use as well as in situations where the door is likely to be subjected to rough handing. See Fig. 17.8
4. **Framed and panelled doors:** This type of door is commonly provided in all types of buildings. This door consists of timber frame work of stiles and rails which are grooved on the inside to receive one or more panels. Framed and panelled doors are made in several designs to suit functional as well as architectural requirements. The door may be single, double, three, four or six panelled and so on. The panels can be of timber, plywood, block board or hard board. Timber panels are fixed within grooves in the frame. However, additional timber beading is also provided either on one or both sides to improve the elevation of the door. Commonly adopted designs of framed and panelled doors are shown in Fig. 17.10 and Fig. 17.11. A review of the important construction details as:

(i) The stiles are continuous from bottom to top.
(ii) Different rails, i.e, top rail, bottom rail, lock rail frieze rail are jointed to the stiles.
(iii) Mullions or muntins, if any, are jointed to the rails.
(iv) Bottom and lock rails are of bigger size than the top and friez rails.
(v) The lock rail is so placed that its centre line is at height of 800 mm from the bottom of the shutter.
(vi) The stiles and the rails are mortised and tenoned.
(vii) The minimum width and thickness of timber panel should not be less than 150 mm x 15 mm. The maximum area of a panel in timber should not be more than 0.5 m$^2$.
(viii) The thickness of plywood should not be less than 10 mm.
(ix) The width of stiles is normally 10 cm. the bottom and lock rail are 15 cm wide each. The thickness of shutter can vary from 30 mm to 50 mm depending upon size of door, thickness of panels, the situation of door and type of usage.