15

WOODEN AND FABRICATION WORK

15.1 INTRODUCTION

In the construction work of building, after making the structure work, doors/windows are used for controlling air, light and security and to make it ready for living. Doors/windows are made of wood, iron, plastic or glass according to the need and the design.

15.2 OBJECTIVES

After going through this lesson you will be able to:

- describe the process of fitting shutters for convenient use of door/windows in building;
- familiarize yourself with different types of shutters;
- explain the process of making joints in the shutters;
- explain the importance of other security measures for doors/windows in the building; and
- familiarize yourself with joining the shutter of doors/windows with the building structure (walls and columns).

15.3 TYPES OF SHUTTER, FOR DOORS/WINDOWS

Generally the shutters are made of wood but due to the cost, choice etc, these are also made of iron, plastic and glass. Generally, woods used for shuttering work, are Teak, Deodar or Sal. In other ordinary buildings, wood from mango and neem etc. are used.

Shutters can have following differences:

1. Materials of frame for fixing them in the walls/structure
2. Fixing arrangement.

Among wooden shutters, Battoned/Braced and Battoned, Panelled, glazed, Panelled-cum-glazed, and flush doors are of the main types. Louvered shutters are also used at some places. Now a days, Battoned/Braced and battoned doors are rarely used except in cheap/temporary houses.

The wooden frames are used for wooden doors. Initially they were having four legs, but generally, they are having three legs. Stone frames are used in those places where natural stone is available in plenty. Now a days frames are made of iron sheets or fabricated from angle iron and concrete are also used. Generally doors are fixed in walls/structures through iron hinges.

The wood used for wooden frames or doors must have some special characteristics.

1. The wood should be saved in the direction of its fibres.
2. There should not be any lose knot.
3. The wood from the middle of the trunk of the tree should only be used.
4. It is sawed according to the requirement, and then kept for 15 to 20 days in stalk, so that it can be seasoned naturally, i.e. the moisture which lies inside the wood is dried completely

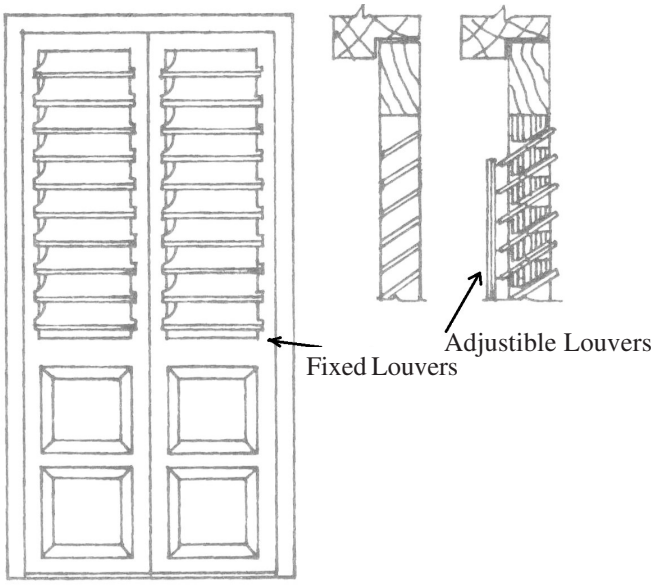


Fig. 15.1: Louvered shutters

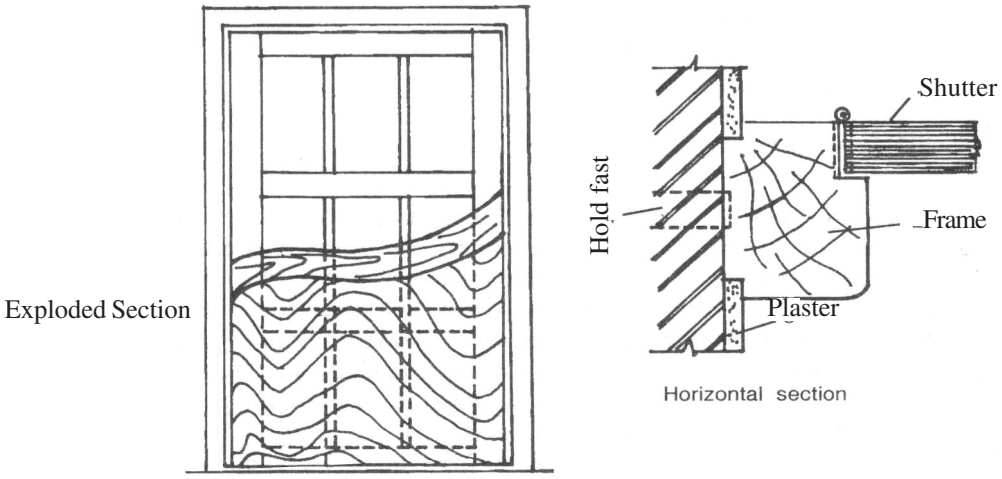


Fig. 15.2: Flush doors

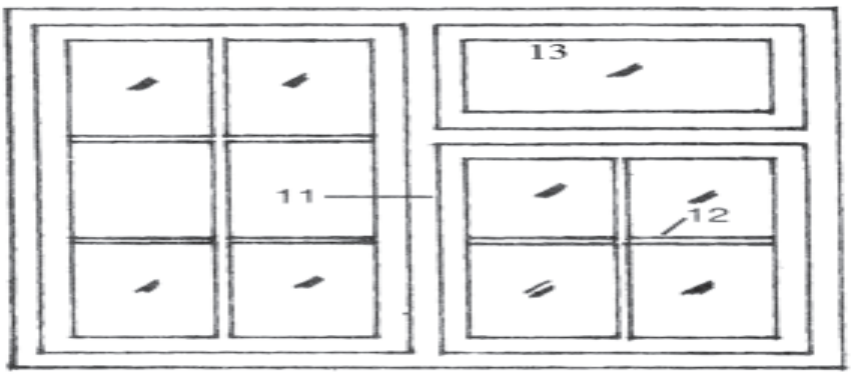


Fig 15.3: Hinged window

1. Hinge 2. Hold fast 3. Bamboo nails or Gujje of frame 4. Patama 5. Frame 6. Style 7. Top rail 8. Lock rail 9. Bottom rail 10. Glass 11. Frame for small window 12. Beading for holding the glass 13. glass.

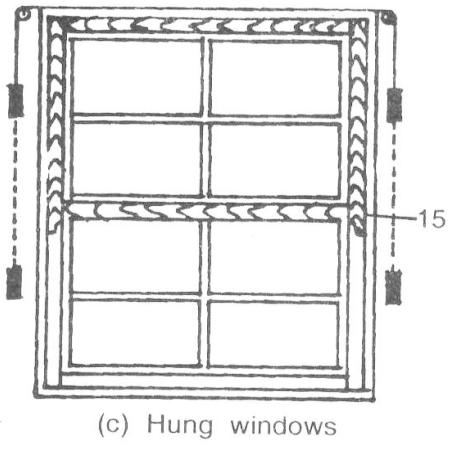


Fig 15.4: Window shutter for the up-down sliding window

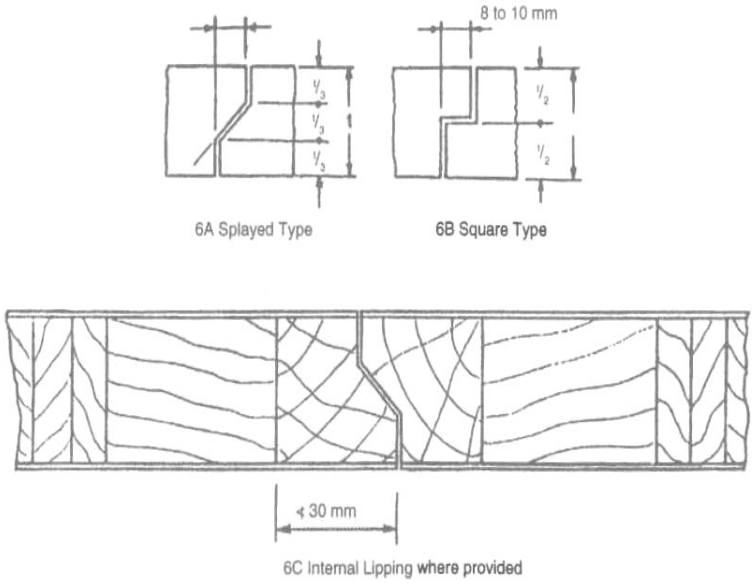


Fig. 15.5: Shape of windows for Inclined roofs

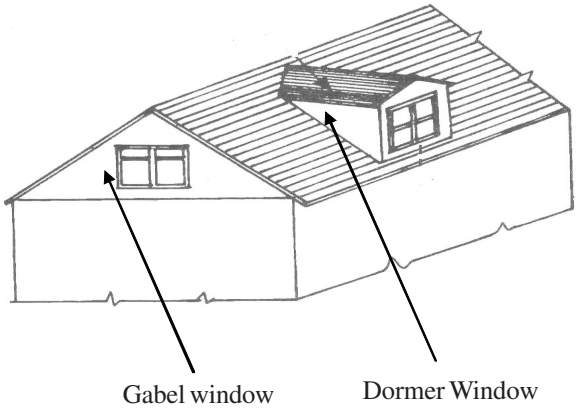
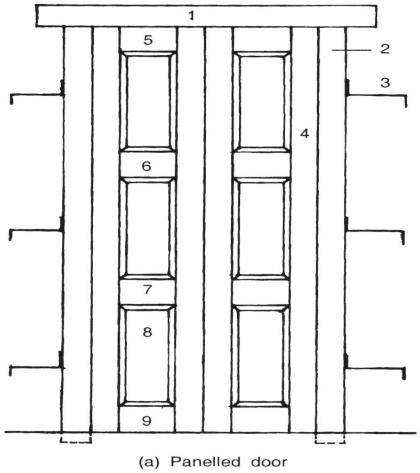


Fig. 15.6: Windows of sliding roofs



1. Top rail
2. Stile
3. Steel Joists

Fig. 15.7: Panelled doors

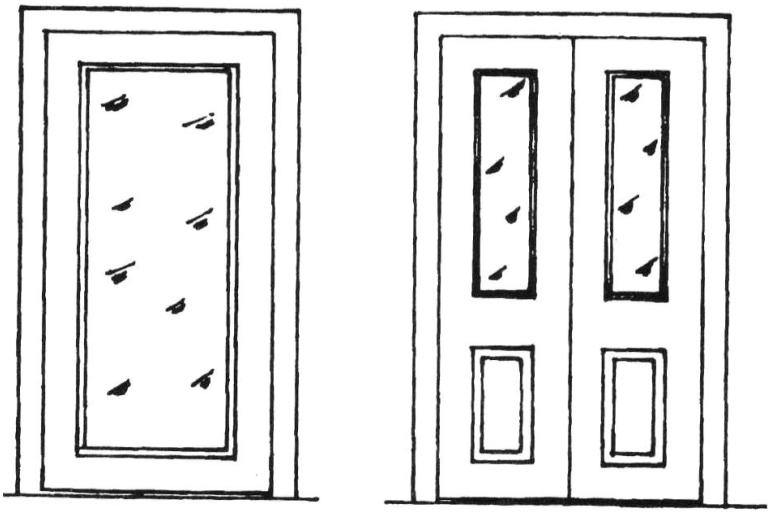


Fig. 15.8: Complete glass window

Process of making joint in the frame: While joining the frame, mortis and tennon joint are used and bamboo nails are used for joining. Before doing this, favicol is used on the mortis and Tennon joint so that is does not get loose.

Joints should be straight and flat. The other part is joined with the first part in such a way that one part gets flushed with the other part of completely if required chieselling can be done. This joint is called Mortis and Tennon joint. Before joining, favicol is applied into it and after that bamboo nails which are also called Gujja are used for joining it. Some more joints are shown in the figures given below.

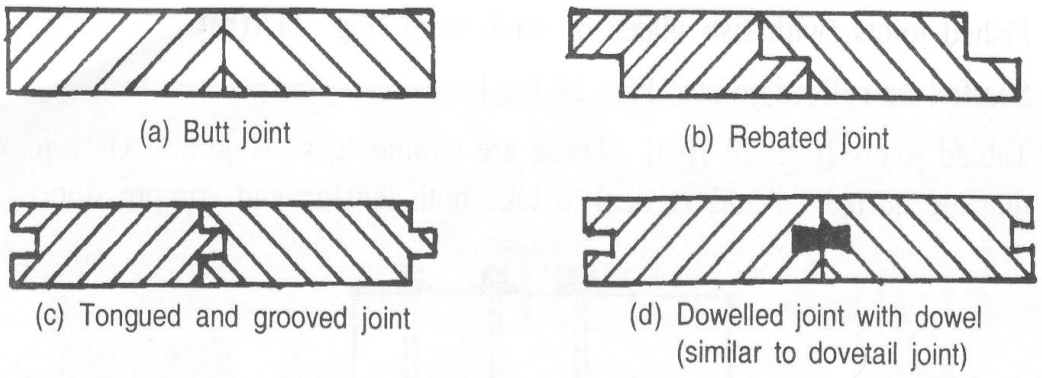


Fig 15.9: Joints in the wood.

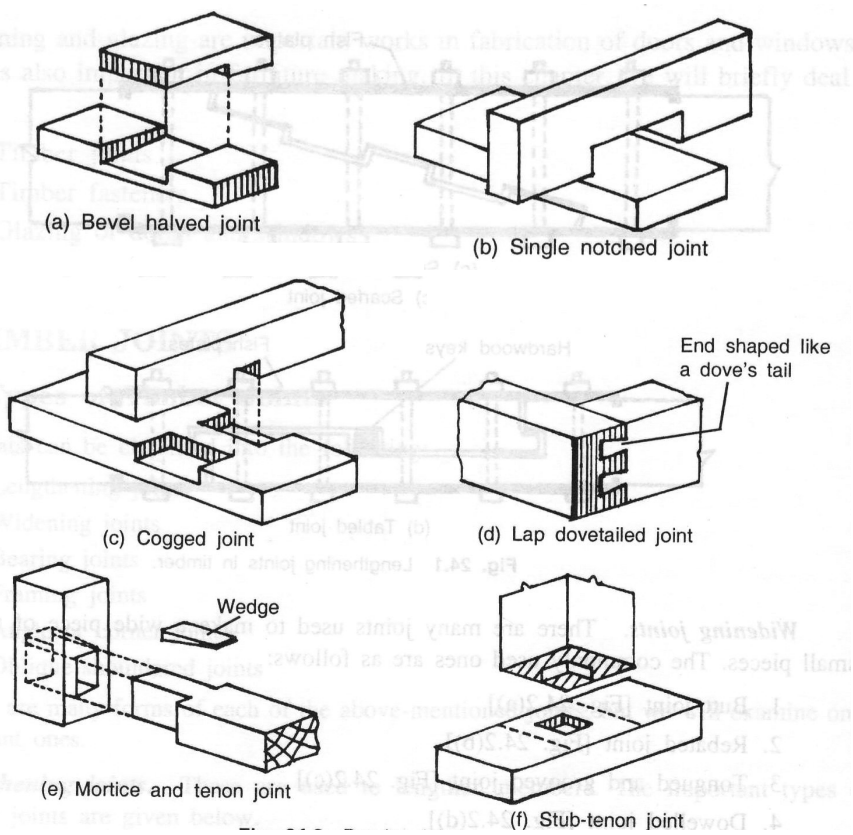


Fig. 15.10: Joints used in the wooden works.

Process of protection from termite: Various types of chemicals are used to protect the wood from termite and wood boarers (an insect)

Fittings of doors and windows: These fittings are made of aluminium, iron or brass as shown in the map. All types of fittings, hinges, locks, stoppers, drawers, etc should be approved by Indian standards Institute, otherwise they must be of that particular company whose name is mentioned on the drawing.

Rules for fittings:

1. The door which is fitted in the courtyard, corridor or lobby, is called outside door.
2. Four hinges are required wherever the height of door is more than 2.15 metre. Three hinges are used if the height is less than this.
3. One extra hinge is used where the width of one panel of the door is more than 80 cm.

4. If the height of the window is more than 1.20 metre, than one extra which means 3 hinge need to be fitted.
5. Places where wooden cleats are fitted in order to give support to the panels of the doors, then these should be fitted with 50 mm hinges.

Glazing (Glass) work: The width of glass in the doors, windows and ventilators depends upon their span (width)

For example:

1. If the size of glass is upto 900 square cm, then the thickness of the glass should be 2 mm.
2. From 900 to 3700 square cm, the width of glass will be 2.5 mm.
3. From 3700 to 5500 square cm, the width of glass will be 3 mm.
4. From 5500 to 8400 square cm, the width of glass will be 4 mm.
5. If the size is more then 8400 square cm, then the glass whose thickness is 6 mm will be used.

Glass is prepared by reducing the size by 1.5 mm from the actual size so that it does not get broken while fitting. Later on it is tightened by fixing the glass putti. In those places where **frasted** glass is to be fitted, **frasted** surface is kept inside.

Flush door shutters (panels)

These are of three types:- 1. Solid core 2. Hollow core 3. Particle board

Solid core

Good quality strips in which there is no gap are fitted inside solid core. These are prepared with the help of big machines. These are complete solids. These can be used just like the wooden battens.

Hollow core:

Hollow core is prepared by making a wooden frame having the four sides and by fitting a ply from the top of it, where the lock is to be put. A wide strip is fitted in the middle at that place.

Normally solid core panels should be used which are approved by any good government organization such as ISI etc.

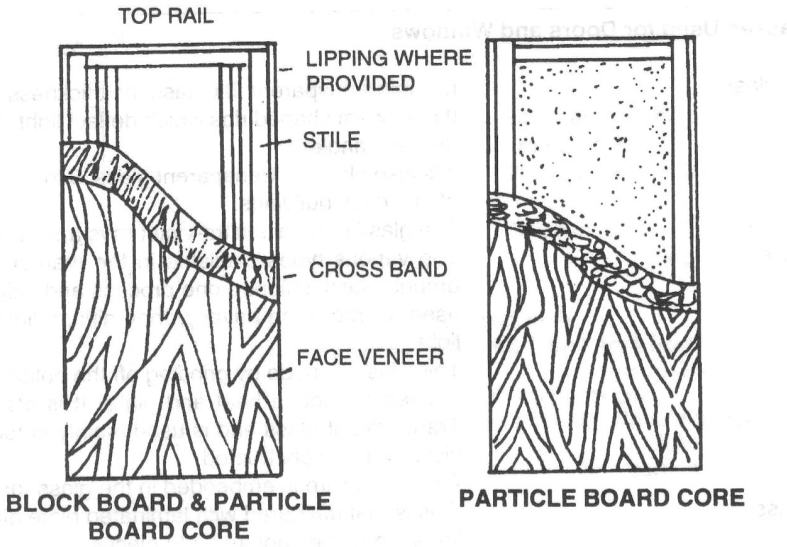


Fig. 15.11: Particle Board

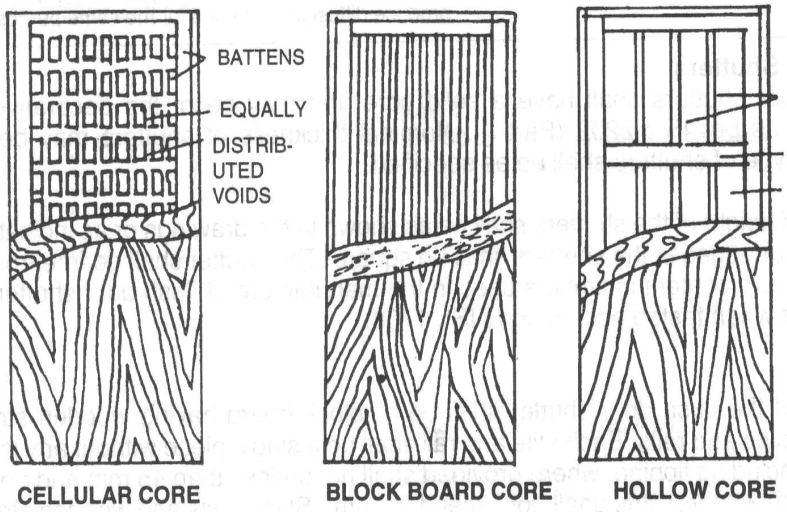


Fig 15.12: Various types of core

15.4 STEEL WORK OR IRON WORK

In building construction work, besides the iron rods, iron is used at various places in various other forms also.

In very normal works frames, grills and windows frames are made of angle iron. Doors are also made by making a frame out of this and then welding a steel

sheet on the top of it. Similarly steel girders, channel T etc. are used where ever they are required. Remember that after finishing all iron jobs and fitting them, they should be primered so that they should not get rusted because as the termite eats up wood, rust eats up iron.

15.5 USES OF GLASS

Glasses are fitted in the windows and ventilators made of steel, which is called glazing. Normally 3 mm thick glass is used for small squares and 5 mm thick glass is used for big squares.

Putti: Putti is used in order to keep the glass safe in the place where it has been fitted. Putti is made by mixing one part of Safeda with 3 part of powdered chalk. Then it is mixed with hot linseed oil and made into a flour like dough and if this putti is to be used on the iron frame, then 5.6 litre varnish is mixed with 100 kg of putti.

15.6 ROLLING SHUTTERS

Rolling shutters are normally made from wide strips whose thickness is 1.25 mm. These can be closed by dragging with hands in an open area upto 11.20 square metre, and can be again taken back to the top. But if the area of doors is more than 11.20 square metre, then they can be opened and closed with a light small machine.

Fig. 15.13: Rolling shutters

Similarly fitting hinges in iron frames, fitting net in the windows, iron girders, fitting channels, making main gate, making railings for stairs and balcony and fitting grills on other places, all these work come under steel work, which are used as per the measurements shown on the maps.

15.7 WELDING WORK

Normally two types of welding are used, such as electric welding and gas welding. Gas welding used for joining brass or thin sheets. Electric arc welding is used for heavy works.

It should be remembered in both types of welding works that the joint should become so hot that it is about to melt. If the rod is melted and the Tanka is done then there is a possibility of breaking down.

15.8 WHAT HAVE YOU LEARNT

- How the shutters are fitted in doors/windows?
- Which material is used for making shutters?
- How the shutters are joined in the walls or structure?
- How joints are made in the wooden panels?
- What are the things to be remembered in iron welding?
- What is the process of fitting glass in wooden panels?

15.9 TERMINAL QUESTIONS

1. How many types of shutters are used in doors/windows?
2. What is the process of fitting frame in the walls or columns of doors/ windows?
3. What fittings are generally used for doors/windows?
4. What type of wood should be used in doors/windows?
5. Many types of joints are used in the wooden panels. Write the names of any three types of joints and show them by drawing picture.