PRODUCTION OF WOOD

All materials used in engineering are produced from raw materials. The raw materials are worked upon to make them useful for various purposes. In processing these materials from their raw materials. They go through different stages. Wood suitable for engineering work is called timber. The body of a tree which has not been felled (cut down) is called standing timber, while that of felled trees is called rough timber.

Growth of Timber

A tree grows by obtaining its food in the form of sap from the soil by suction through its roots. The sap contains moisture and minerals such as phosphates and nitrates. The sap is transported through the step to the branches and leaves of the tree. The sap loses moisture through the leaves, absorbs carbon dioxide from the atmosphere by the process of photosynthesis and becomes heavier. The dense sap later descends and gets deposited under the bark in the form of a thin layer called cambium. The cambium hardens with time, and adds a new annual ring to that section of the tree stem. Annual rings show the number of years growth that has occurred in a tree.

Trees grow in two direction, vertical and horizontal. Vertical growth occurs near the tips of the shoot and root of the plant. Vertical growth starts at germination and continues throughout the life of the tree. It is known as primary growth, while horizontal growth is called secondary. Horizontal growth occurs mostly in the cambium. The cambium layer is the thin layer of the young plant. The cambium divides to form two new layers of cells: wood cells on the inside, and bark cells on the outside of the cambium.

Felling of Timber

The act of cutting down a tree is referred to as felling of timber. Timber is usually felled for one form of engineering work or the other, and should considering.

- The age of the tree

- The season of the year
- The method of fellign

Conversion of Timber

Conversion is the process of cutting and sawing timber into commercial sizes. The tree trunk or stem is first cut into transportable sizes called logs. At the saw mill the log is converted (cut) into commercial (marketable sizes such as boards and planks. The popular methods of conversion are plain-sawn and quarter-sawn. Thereafter, the converted timber is then stacked in the timber shed.

Seasoning of Timber

Freshly felled timbers or green timbers has a large amount of moisture in them which makes them heavy. Such wet wood possesses low strength and cannot be used for any engineering work. The process of reducing moisture or drying the water content in timberis called seasoning. Two methods of seasoning timber are natural or air seasoning and artificial seasoning.

Preservation of Wood

Preservation is the proess of applying chemicals on wood to prevent insect and fungi attack. Because of the starch and sugar in wood, insect, fungi, and termite usually attact it. To drive away or kill these organisms in wood, wood preservatives are applied to it. Preservatives help to protect wood against termite, insect and fungi attack. Examples of good wood preservatives are creosote, coal-tar, solignum, chlorinated phenols, and sodium PCP.

Preservation can be applied using any of these methods: charring, tarring, painting, creosoting, fire proofing, vacuum pressure process, etc.

Defects in Timber

Defects are blemishes in timber that reduces the quality and utility value of timber. Defects in timber can be natural or artificial.

Natural defects occur during the growth of the tree. Common natural defects in wood include knots, shakes, upset grain and cross grain.

Artificial defects are defects caused by careless handling and faulty seasoning and preservation of wood. Improper handling especially during stacking can shrink and warp the planks. There are different types of artificial defects namely cup, bow, twist, check, and insect attack.

Veneer and Manufactured Boards

A veneer is a thin sheet or slice of sheet obtained from wood. Verneers are used for manufacturing laminated boards such as plywood, decorating furniture, and making the faces of other types of composite boards. Veneers are made from wood using rotary or peeling, slicing and sawing methods.

Manufactured boards are man-made wood products that vary in size, weight and structure. The advantages of manufactured boards over solid wood include:

i. They can be made in large flat sheets
ii. They do not shrink and warp like solid wood
iii. Some of them can be bent to form curves
iv. They can be worked and cut easily

The disadvantages of manufactured boards include:

i. They are costly
ii. Some of them can buckle if not properly stored
iii. Some of them have rough edges

Some common manufactured boards are: plywood, laminated board, block board, chip or particle board and hard board.