

UNIT-3

BRICKS:

A **brick** is a type of block used to build walls, pavements and other elements in [masonry](#) construction. Bricks are a regular size rectangular unit. **Bricks are made of clay.** They are usually used for most of the building works.

Types:

1. Burnt Clay Brick
2. Fly Ash Brick
3. Fire Brick
4. Sand Lime Brick
5. Concrete Bricks
6. Engineering Bricks

Burnt Clay Brick: Burnt clay brick is created from clay that is either molded, dry-pressed.

Fly Ash Brick: Fly ash brick, also called fly ash clay brick is created from a mixture of fly ash and clay fired at extremely high temperature.

Fire Brick: it also called [refractory brick](#), is a type of brick that is built from fire clay.

Sand Lime Brick: Sand lime brick, also called calcium silicate bricks or flint lime bricks, is manufactured from a mix made up of sand, lime, and water.

Concrete Bricks: these are created by pouring concrete into a mold to cast and generate a uniformly- sized brick product.

Engineering Bricks: Engineering bricks are specifically made to exhibit both high compressive strength and low porosity.

Test for Bricks:

A brick is generally subjected to the following tests to find for the [construction](#) work,

(1) Absorption

(2) Crushing strength

(3) Hardness

(4) Presence of soluble salts

(5) Shape and size

(6) Soundness

(7) Structure

(1) Absorption:

A brick is taken and it is weighed dry. It is then immersed in water for a period of 16 hours.

(2) Compressive/Crushing strength of Bricks:

The crushing strength of a brick is found out by placing it in a compression testing machine.

(3) Hardness test on bricks:

In this test, a scratch is made on brick surface with the help of a finger nail. If no impression is left on the surface, the brick is sufficiently hard.

(4) Presence of soluble salts:

The soluble salts, if present in cause [efflorescence in brick work](#). For finding out the presence of soluble salts in a brick, it is immersed in water for 24 hours.

(5) Shape and size:

In this test, a brick is closely inspected. It should be of standard size and its shape should be truly rectangular with sharp edges.

(6) Soundness test on brick:

In this test, the two bricks are taken and they are struck with each other. The bricks should not break and a clear ringing sound should be produced.

(7) Structure of a brick:

A brick is broken and its structure is examined. It should be homogeneous, compact and free from any defects such as holes, lumps, etc.

Classification of Timber

Various bases are considered for the classification of timbers. The following are the important basis:

- (i) Mode of growth
- (ii) Modulus of elasticity
- (iii) Durability
- (iv) Grading
- (v) Availability.

(i) Classification Based on Mode of Growth: On the basis of mode of growth trees are classified as (a) Exogeneous and

(b) Endogeneous

(a) Exogeneous Trees: These trees grow outward by adding distinct consecutive ring every year. These rings are known as annual rings.

Seasoning of Timber

The process of drying timber or removing moisture of sap present in a freshly felled timbers under more or less controlled conditions is called as 'Seasoning of Timber'. A well-seasoned piece of wood should have 10% to 12% of moisture equal to atmospheric humidity of a place.

Objectives of Seasoning of Timber :

- The main objective is minimize shrinkage, warping and splitting.
- To increase strength, durability and electrical resisting power.
- And to protect it from the attacks of insects and fungus.

Methods of Seasoning of Timber :

1. Natural Seasoning :

Timber pieces can either be stacked horizontally or vertically and the seasoning is carved out by natural air.

2. Artificial Seasoning :

a. Boiling :

In this method, the Timber is immersed in boiling water or exposed to the action of steam.

b. Chemical seasoning :

An aqueous solution of chemical salts like common salt or urea have low pressure.

c. Electrical seasoning :

The logs of wood are placed in such a way that their two ends touch the electrodes.

d. Kiln Seasoning :

Carried out in an air tight chamber under controlled conditions of circulating air, relative humidity and temperature.

e. Water Seasoning :

The timbers like bamboo are placed in the flowing water. The flow of water takes away the sap wood.

defects in timber:

1. Defects due to Natural Forces
2. Defects due to Attack by Insects
3. Defects due to Fungi
4. Defects due to Defective Seasoning
5. Defects due to Defective Conversion

Defects in Timber due to Natural Forces

Knots: Knots are the most common defects caused due to natural forces. During the growth of a tree, branches close to the ground or lower branches die.

Types of Knots: Knots are of two types.

- i. **Dead knots:**
- ii. **Live knots:**

Defects of Timber due to Attack by Insects

Insects like [beetles](#), [termites](#) or marine boars eat wood, make holes and weaken the strength of the wood.

Classification Of Glass

The glass is a mixture of a number of metallic silicates, one of which is usually that of an alkali metal. It is amorphous, transparent or translucent. For the purpose of classification, the glass may be grouped in to the following three categories.

(1) Soda-lime glass.

(2) Potash-lime glass.

(3) Potash-lead glass.

There are four main types or strengths of glass:

- Annealed Glass.
- Heat Strengthened Glass.
- Laminated Glass.

Steel & its application in construction industry:

1) To Build High Rise Buildings

Structural steel is resistant to external forces such as wind and earthquakes. It is a flexible metal, so in the case of a storm or an earthquake, the steel component in the building will not break but bend.

2) To Build Industrial Sheds

Another benefit of structural steel is that it is cost effective. With the availability of ready-made steel sections, structural frameworks can be erected in no time. Moreover, a lot of work can be pre- done in the industrial site, thereby saving time and money.

3) To Build Residential Buildings

As mentioned above, these buildings have to stand the test of time. They should be able to withstand external forces such as wind, earthquakes, and storms. The plasticity and flexibility of structural steel make it suitable for the construction of residential buildings. A technique called light gauge steel construction is used to build residential buildings.

4) To Build Bridges

Steel has a high strength to weight ratio, which means, steel is a tensile metal. It is durable and can withstand the weight of a fleet of cars and people. These qualities enable engineers, designers, and fabricators to build large, monumental bridges that can stand the test of time.

5) To Build Parking Garages

Structural steel is useful to build parking garages for the same reasons as mentioned above. But another quality that makes it distinctly suitable in construction is that it is lightweight. This makes it easier to construct structures.