Building Material Building Construction :- 1

Bricks :-

Manufacturing of bricks :-

1. Site Selection
2. Collection of soil
3. Preparation of clay
4. Moulding → Hand moulding → Ground moulding, Table moulding; → Machine moulding
5. Drying → Sun drying, Air drying } 5 to 12 days
6. Burning → Over burning, → under burning

Qualities of Good Bricks :-

1. Bricks should have perfect edges, well-burnt in kilns, copper coloured, free from cracks with proper rectangular shape and of standard size (19x9x9 cm)
2. Bricks should give a clear ringing sound when struck with each other.
3. Bricks must be homogeneous and free from voids.
4. The % absorption of water by weight should not be greater than 20% for first-class bricks and 22% for second-class bricks when soaked in cold water for 24 hrs.
5. Bricks should be sufficiently hard, i.e, no nail impression must be present when scratched. The average weight of bricks should be 3-3.5 Kg.
6. Bricks should not break when dropped from a height of 1m.
7. Bricks should have low thermal conductivity and should be soundproof.
8. Bricks should not show deposits of salts when immersed in water and dried.

9. The minimum crushing strength of bricks must be 3.5 N/mm².

10. Bricks should be preferably table mould.

11. Bricks shall not absorb over 20% of water of the dry wt. when maintained under water for 24 hrs.

Crushing strength varying from 3 N/mm² to 15 N/mm² for hand made brick.

4.5 to 50 N/mm² for heavy duty (Machine pressed)

Common	3.50 N/mm²
Second class	7 N/mm²
First class	10.50 N/mm²
Class AA bricks	14 N/mm²

Classification of Bricks :-

1. First class bricks – Table moulded & of standard shape. These comply with all good qualities of bricks and are used for superior and permanent works.

2. Second-class bricks – ground or surface moulding and burnt in kilns. The surfaces of such bricks are rough and are slightly irregular in shape. Such bricks are used with a coat of plaster.

3. Third-class bricks :– Ground moulded and are burnt in clamps. These bricks are not hard but rough with irregular and distorted edges. These give a dull sound when struck with each other. They are used for unimportant and temporary structures and at places where there is less rainfall

4. Overburnt bricks :– with irregular shape and dark colour are classified as the fourth class bricks. These are used as aggregates for concrete in foundations, floors, roads.

Uses of bricks :-

1. Bricks are mainly used for the construction of walls.
2. Bricks when moulded in the shape of a gutter can be used as drains.
3. Bricks with cavities known as hollow bricks can be used for insulation purposes and because of their light wt. they are more useful in speedy constructions.
4. Paving bricks prepared from clay containing higher % of iron can be used for pavements, since they resist abrasion in a better way.
5. Bricks with holes are used in multi-storied framed structures
6. Fire bricks made of fire clay can be used as a refractory material.
7. Sand-lime bricksss are used for ornamental work.
8. Bricks are used in the constructuction of compound walls, columns etc. Broken pieces of bricks are used as agg. in concrete.
9. Bricks of superior quality can be used in the facing of a wall.
10. Bricks are used in the construction of chimneys and other special works.

Constituents of a Brick :-

1. Alumina · A good brick should have 20-30% of alumina. This imparts plasticity to the earth.
2. Silica A good brick earth should contain about 50-60% of silica. The present of silica prevents cracking, shrinking and warping of raw bricks. It imparts uniform shape to bricks.
3. Lime Up to 5% of lime is desirable in good brick earth. Prevents shrinkage in raw bricks.

4. Oxide of Iron This gives the red colour to bricks. A small quantity of Iron oxide up to 5 or 6% is desirable.

5. Magnesia This imparts yellow tints and it reduces shrinkage.

Advantages of using Bricks :-

(a) Bricks are cheaper and easy to handle
(b) They are of std. size and hence easy to have proper bonding.
(c) Consumes less mortar when compared to stone masonry.
(d) Labour required for a brick masonry is less.
(e) Brick walls can be raised to a larger height, when compared to stone masonry.
(f) Because of regular size the surface of wall be plane & given a neat appearance.
(g) It consumes less mortar for plastering.
(h) Easy to drill holes for fixing service connection line.
(i) Low thermal conductivity and high sound insulation properties.
(j) They possess very high resistance to fire.
(K) They are non-combustible and non-inflammable.

Disadvantages of using bricks :-

Test on Bricks :-

Field Tests :-

1. The bricks should be truly rectangular in shape with sharp edges and plane faces and of the same size.
2. They should be hard and well burnt and should give a metallic ringing sound when struck with a steel rod.
3. They should be of uniform red colour and of fine texture.
4. When the bricks are dropped on the ground from one metre ht., they should not crack or break.
5. They should be free from cracks, fissures, pebbles or nodules of free lime.

Lab Tests :-

1. Test for water absorptions
2. Test for efflorescence (For the presence of salt)
3. Test for compressive strength

STONES :-

Building stones are obtained from rocks.

Rocks mainly classified as

1. Igneous rocks :- It formed by the cooling of the molten material from beneath the earth's surface. These stones are harder. Granite is example.
2. Sedimentary rocks :- It formed by the deposition of weathering products on existing rocks. Deposits are in layers and when load is applied along the layers these rocks easily split.