Building Materials II

Lecture 3

Stacking and Storing of Bricks

There are two major factors while you are storing the bricks, first one is it should be stored near the site of work so that it can be easily loaded and taken to the site of work. The second thing is different types of bricks should be stack separately. The different types in the sense are different material, strength and size and type based on the structure. Why is to be stack in different places is it will be easy for counting purpose and it will be easier for workability.

You might have seen the different type of bricks is stacked perpendicular to each other, why it is done? This ensure there is uniform load distribution among the bricks because the brick is stack in the dry formso there will be less cracking or falling off etc. And another important reason why the bricks to be stacked separately is if the weaker brick is stacked in the lower part and the heavier one at the top the pressure applied by the heavier one on the weaker brick may cause the weaker brick to break and the entire stack may fall and cause huge damage.

While stacking the bricks following guidelines must be followed for easy quality inspection and counting.

- Stack the bricks on dry firm ground.
- Stack should be 50 bricks long and 10 bricks high and not more than 4 bricks in width.
- Clear distance between adjacent stacks should not be less than 0.8m.
- Put bricks of each truck load in one stack.

Test for Bricks

Test for bricks conclude the quality of the brick that is produced. So usually test is done after manufacturing of bricks. Before packaging a particular brick from the batch of burnt bricks are taken and test is done on those bricks to see if they are

in quality standards. If those few bricks pass these test it is assumed that whole batch of bricks are having the same quality.

Varies quality test are done on the brickssuch as absorption test called water test, crushing strength test, hardness test, shape and size test, Color test, Soundness test, structure test and the presence of soluble salts test.

Absorption test:

Absorption test is conducted on brick to find out the amount of moisture content absorbed by brick under extreme conditions. In this test sample dry bricks are taken and weighed. After weighting these bricks are placed in water with full immersing for a period of 24 hours. Then weigh the wet brick and note down its value.

The difference between dry and wet brick weight will give the amount of water absorption. For a good quality brick the amount of water absorption should not exceed 20% of weight of dry brick.

Crushing Strength test:

In this test we check the quality of the brick that how much it has the compressive strength in it. So crushing strength test is otherwise known as compressing test. Crushing strength of bricks is determined by placing brick in compression testing machine.

After placing the brick in compression testing machine apply load on it until brick breaks. Note down the value of failure load and find out the crushing strength value of brick. Minimum crushing strength of brick is 3.05N/mm^2. If it is less than this value then it is not useful for the construction purpose.

Hardness test:

In this test we test the hardness of the brick and a good brick should resist scratch against sharp things. For this test a sharp tool or finger nail is taken and a scratch is made on the top surface of the brick. If the scratch leaves an impression on the

brick then it is not said to be a good brick. If there is no impression of scratch then it is said to be a good quality hard brick.

Shape and Size test:

The shape and size of brick are very important consideration. All bricks used for construction should be of same size. The shape of bricks should be purely rectangular with sharp edges. For a standard brick the size is consists of length x breadth x height as 19cm x 9cm x 9cm.

To perform this test some amount of bricks say 20 bricks is selected randomly from the brick group and stack them along its length, breadth and height and compare. So it all bricks are in similar size then they are qualified for construction work.

Color Test:

A good brick should possess bright and uniform color throughout its body. The color of brick indicates how well it is burnt and how qualitative its components are. For the color test a brick is taken and it is broken into half and the uniformity of color is checked throughout as the outer surface and at the broken surface.

Soundness test:

Soundness test shows the nature of brick against sudden impact. In this test two bricks are chosen randomly and then struck with one another. When there are struck it should produce a ringing sound and the bricks should not break. If the bricks produce this sound then it is fit for construction.

Structure test:

This test is done to know the structure of the brick. To know the structure of the brick pick any one brick randomly from the group and break it. Observe the inner portion of brick clearly. It should be free from lumps and homogeneous.

Efflorescence test (or) Presence of soluble salt test:

A good quality brick should not contain any soluble salts in it. If soluble salts are there then it will cause efflorescence on brick surface. To know the presence of soluble salts in a brick take a brick and place it in a water bath for 24 hours and dry it in shade.

After drying observe the brick surface thoroughly. If there are any white or grey color deposits then it contains soluble salts and not fit for construction.

Classification of Bricks

There are so many different types of bricks with so many varied applications, structures and manufacturing process. In general brick has been classified as two types such as Burnt bricks and Un-burnt bricks. The un-burnt brick doesn't mean it is not burnt but it is sun dried bricks.

The burnt brick is further classified on basis of practice, Usage, Finish, manufacture, Burning and strength. In practice the bricks are classified as 1^{st} class bricks, 2^{nd} class bricks, 3^{rd} class bricks, and 4^{th} class bricks. The 1^{st} class bricks have the best quality and the quality reduces further for 2^{nd}, 3^{rd} and the 4^{th} class bricks have the least quality. The first class bricks have the good quality and they have been used for the engineered purposes and the 3^{rd} class and 4^{th} class bricks are have been used for filling purposes, floor etc.

The next classification is based on usage. The first one is common usage for example the bricks that we are uses for constructing our walls. Then Facing bricks it is specifically used for facing or cladded purposes. They have good weather resistance because they are exposed to the atmosphere. And several types of textures are also available on it. The next one is engineered bricks this bricks are also used for constructing buildings they have a good strength and very durable.

Then coming to finish they are so many finishes are available in the market. Now a day they customize the finishes according to out requirement. Most common finish they use in burnt brick is rustic finish and you have the sand face.

Based on how the bricks are manufactured they are classified as hand-moulded and machine moulded.Hand moulded bricks edges may not be as sharp as the

machine moulded bricks. Machine moulded bricks are wire cut and hallow bricks. Hallow bricks are not be possible by hand moulding. The next classification is burning that is how well the bricks are burnt.

There are three types under burnt bricks. Under burnt bricks are not fully burnt since there are not brighter in color. Well burnt bricks have good and uniform color and over burnt bricks are like darker in color sometimes blackish to bluish. We can use under burnt bricks and over burnt bricks it is not that only well burnt brick alone should be used. We have applications for under burning bricks and the over burnt bricks.

Based on the strength we have class A, class B and there are several classes from 350 to 35. Based on the requirement good strength brick are used where it is required and the low strength bricks are also be used based on the place it required.

Types of Bricks:

There are several types of bricks that are used in the market. The most commonly used bricks in the market are five types. They are

1. Common burnt clay bricks.
2. Sand Lime bricks (Calcium Silicate bricks).
3. Engineering Bricks.
4. Concrete bricks.
5. Fly ash Clay bricks.

To have the better understanding we will separate the types based on the following bases.

1. Material
2. Strength and sizes
3. Structure.

Material:

In material there are several types like common burnt clay bricks, fireclay bricks, Concrete bricks, Sand lime bricks and fly ash bricks.

Strength and Size:

There are varies size and strength of the brick based on the requirement the size and strength of a brick is manufactured.

Structure:

Depending on the structure we have hallow bricks, solid bricks, even in hallow bricks we have varies different types of bricks which have different types of holes.