BUILDING MATERIALS

6SKFN

Unit - 3
Basic Civil Engineering

3.1 STONES

3.2 BRICKS

3.3 SAND

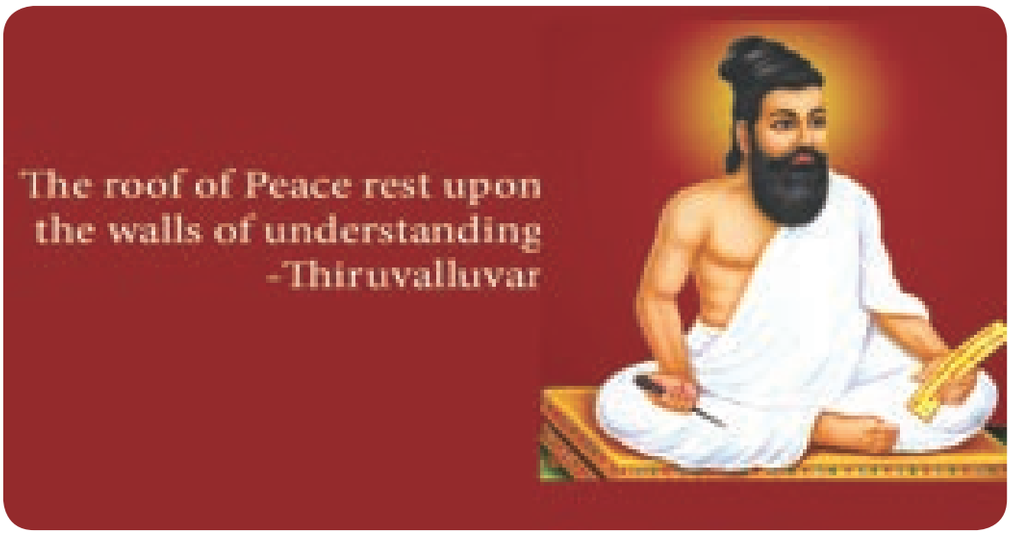


TABLE OF CONTENTS

3.1 STONES

Learning Objectives

At the end of this lesson you shall be able to

- Define stone
- Understand the classification of rocks
- Explain the characteristics of good building stone

3.1.1 Introduction

In many places, stones are more freely available than any building material. They are derived from rocks.

The stones for building are obtained by quarrying rocks. Such stones are very irregular in shape and size. They are therefore dressed for proper bedding, thin joints and speedy construction. When such stones are laid with cement or lime mortar in a systematic manner, they form a structural mass which can resist load without disintegration.

3.1.2 Classification of Rocks

Rocks are classified in three ways. They are,

1. Geological classification
2. Physical classification
3. Chemical classification

3.1.2.1 Geological Classification

According to this classification, rocks are of 3 types. They are:

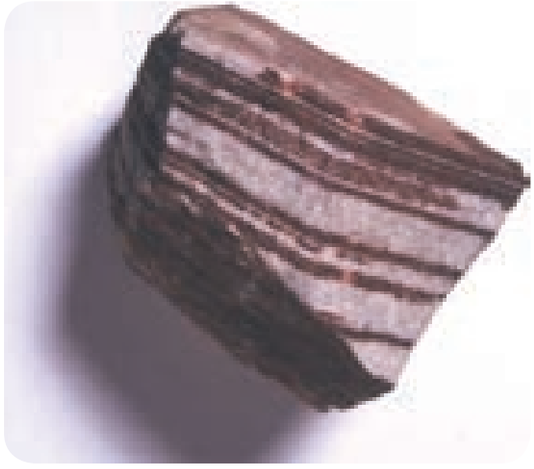
i) Igneous rocks
ii) Sedimentary rocks
iii) Metamorphic rocks

i) **Igneous Rocks** : Stones obtained from these rocks are very strong and durable. It is the result of cooling and consolidation of molten lava released by volcanoes. E.g. Granite, Basalt.

ACTIVITY 1

Collect images of recent volcanoes around the world and make an album.

ii) **Sedimentary Rocks**: They are formed by gradual deposition of broken pieces of rocks which are disintegrated by atmospheric actions. It is migrated from one place to another place and deposited at the bottom of rivers or lakes. These deposits harden due to water pressure. E.g. Limestone, Sandstone



iii) **Metamorphic Rocks:** They are igneous or sedimentary rocks. The change in colour, structure and texture are due to

DO YOU KNOW?

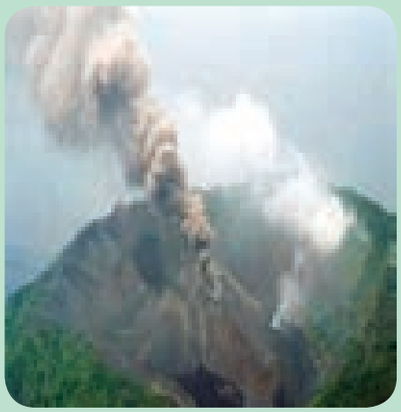
Which is the largest active volcano?

- The largest most active volcano on earth is 'Mauna Loa' in Hawaii(U.S.A), measured about 60 miles long and 30 miles wide (1800 sq. miles).'
- It has erupted 33 times since 1843 in the past 175 years

either pressure or heat or both. Eg. Marbles, Slates.

Which is the active volcano in India

- The only confirmed active volcano in India is Barren Island of Andaman Islands.
- It is located 135 kms north-east of the territory's capital, Port Blair.
- This volcano erupted more than 10 times, with the most recent one being in 2017.



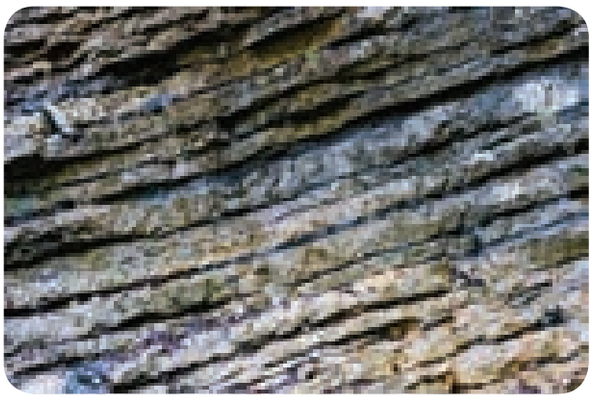
Search link: http://en.m.wikipedia.org>wiki>barrenisland

3.1.2.2 Physical Classification

This classification is based on general structure of rocks. According to this classification rocks are of three types. They are:

i) Stratified Rocks
ii) Unstratified Rocks
iii) Foliated Rocks

i) **Stratified Rocks**: Sedimentary rocks are distinctly stratified rocks. They are formed by series of parallel layers. E.g. Limestone, Sandstone, Slates.



ii) Unstratified Rocks : Igneous and sedimentary rocks affected by movements of earth are of this type of rocks. They cannot be split into thin slabs. E.g. Granite, Marble.

iii) Foliated Rocks : These rocks have a tendency to split up in a definite direction

like leaves of a book. Such foliated structure is very common in metamorphic rocks. E.g. Gneiss.

3.1.2.3 Chemical Classification

This classification is based on their chief constituents. Chemically, rocks are of three types.

They are :

i) Silicious Rocks
ii) Calcareous Rocks
iii) Argillaceous Rocks

i) **Silicious rocks** : These rocks have silica or sand as their main constituent. They are hard and durable. E.g. Sand stone, Granite

ii) **Calcareous Rocks** : These rocks have calcium carbonate as their main constituent. E.g. Lime stone, Marble.

iii) **Argillaceous Rocks** : In these rocks clay predominates. E.g. Slate, Laterite.

ACTIVITY 2

Collect different rocks, name them and display them in your class room.

Most number of Volcano in the world - The top two among them are,

- United States -173
- Russia -166

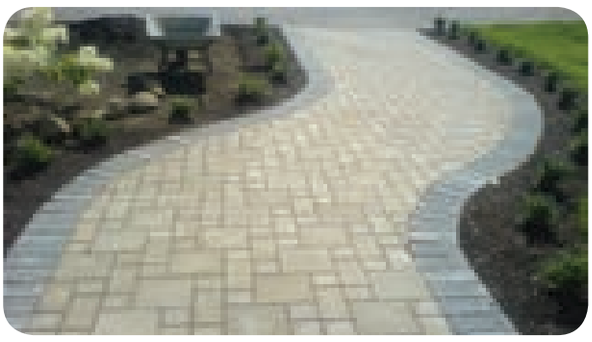
3.1.3 Uses of Stones

Stones are widely used in many permanent engineering works on account of their strength and durability.

The principal uses of stone in construction are:

1. As material for foundation
2. As aggregate for concrete making

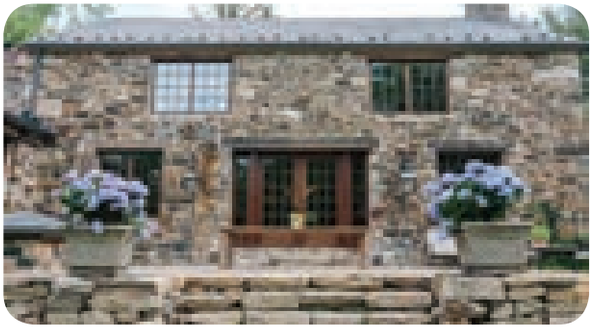
3. As material for road construction



4. As thin slabs for Pavings

5. In Ornamental Works

6. As Wall, Columns, Beams and Lintels in Buildings.



7. Limestone for manufacture of cement
8. As roofing tiles in the form of slates

3.1.4 Characteristics of Good Building Stones

Following are the characteristics of good building stone:

1. **Crushing Strength** : For a good structural stone, the crushing strength should be greater than 100 N/mm^2.
2. **Appearance** : The stones which are to be used for face work, should be decent in appearance and they should be capable of preserving their colour uniformly for a long time. The colour of the stones for face work should be chosen by keeping in mind the general get up of the surrounding area.
3. **Durability :** A good building stone should be durable. The various factors contributing the durability of a stone are its chemical composition, texture, resistance to atmosphere and other influences, location of the structure, etc.

   The important atmospheric agency which affect the durability of a stone is alternate conditions of heat and cold due to difference in temperature.
4. **Dressing of Stones**: Stones should be such that they can be easily carved, moulded out and dressed. Dressing of stones results in economy of construction.
5. **Fracture :** For a good building stone, its fracture should be sharp, even, bright and clear with grains, well cemented together. A dull, chalkey and earthly fracture of a stone, reduces the life span of the building.
6. **Hardness** : The co-efficient of hardness, as worked out in hardness test should be greater than 17 for a stone to be used in road work. If it is between 14 and 17, the stone is said to be of medium hardness.
7. **Attrition** : In attrition test, if wear is more than 3%, the stone is not satisfactory. If it is equal to 3%, the stone is just tolerable.
8. **Fire Resistance** : The minerals composing stone should be fire resistant in such a way that the shape is preserved when a fire occurs.
9. **Seasoning :** The stones should be well seasoned before putting into use. The stones obtained fresh from a quarry, contain some moisture which is known as the quarry sap. The presence of this moisture makes the stone soft.
10. **Specific Gravity** : For good building stone, the specific gravity should be greater than 2.7 or so.
11. **Texture** : A good building stone should have compact, fine, crystalline structure free from cavities, cracks or patches of soft or loose material. These stones with such texture are strong and durable.
12. **Water Absorption** : All the stones are more or less porous, but for a good stone, percentage of water absorption by weight should not exceed 0.60 after 24 hours immersion in water.

Model Questions

PART I (1 Mark)

Choose the correct answer

1. Rock is the result of cooling and consolidation of ….. released by volcanoes.
   a) Lime stone
   b) Molten lava
   c) Marble
   d) Sand stone

2. Sedimentary rocks are distinctly…….
   a) Stratified rocks
   b) Un stratified rocks
   c) Foliated rocks
   d) Silicious rocks

3. The crushing strength for building stone should be greater than ……..
   a) 40 N/mm^2
   b) 25 N/mm^2
   c) 100 N/mm^2
   d) 75 N/mm^2

4. Percentage of water absorption by weight after …… hours should not exceed 0.60 in stones.
   a) 12
   b) 6
   c) 18
   d) 24

5. The hardness should be greater than …… for a stone in road work.
   a) 17
   b) 20
   c) 14
   d) 24

PART II (3 Marks)

Answer in one or two sentences

6. What are the classification rocks?
7. Write the geological classification of rocks.
8. Write about Igneous rocks?

PART III (5 Marks)

Answer shortly

9. What are the uses of stones?
10. Write any five requirements of good building stones.

PART IV (10 Marks)

Answer in detail

11. Explain the requirements of good building stones?

Part – I Answers

1. (b) 2. (a) 3. (c) 4. (d) 5. (a)

3.2 BRICKS

Learning Objectives

At the end of this lesson you shall be able to

- Define brick
- Explain the brick size and weight
- Describe the method of manufacturing of bricks
- Classify the bricks
- Explain the properties of good brick
- Know about the hollow block

3.2.1 Introduction

Clay bricks were used by humans from very early dates. First, it was used without burning as sundried bricks. Burnt brick was a common building material among the Egyptians. Now a days, they are made from specially selected and matured brick earth. It is used to construct the building because of its good bearing capacity, long life and strength. Bricks are made up of blending a good clay, moulded to a rectangular shape of uniform size, dried and burned. As bricks are in uniform size they can be beautifully laid in masonry work.

3.2.2 Definition

Bricks are obtained by moulding clay in rectangular moulds, then by drying and burning them. In places where stones are not easily available, bricks are used in construction. These are preferred because of its durability, strength, reliability, lowcast, etc.

DO YOU KNOW?

When and where the first brick was used?

- The earliest bricks were sun dried and made from mud.
- It was used in 8000 BC in southern Turkey around the city of Jericho.
- In Mesopotamia (modern Iraq) the first true arch of sun baked brick was made about 4000 BC.
- Ceramic or fried (burned) bricks were used as early as 3000 BC in early Indus valley cities.

Brick

ACTIVITY 3

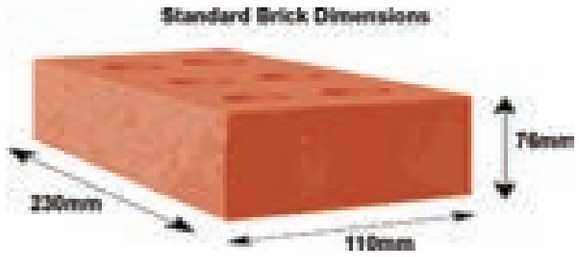
Collect the photos of ancient brick buildings and modern brick buildings and make an album.

3.2.3 Size and Weight of Brick

The Bricks are prepared in various sizes. The custom in the locality is the governing factor to decide the size of brick. Such bricks which are not standardised are known as traditional bricks.

BIS has recommended the bricks of uniform size. Such bricks are known as Modular bricks. The actual size of modular bricks is 190mm × 90mm × 90mm. With mortar thickness (10mm) the nominal size of modular brick is 200mm × 100mm × 100mm.

But practically to match with the beam width, a brick or block of width 230mm is used widely in construction industry. 115 mm is considered for half brick. The brick of size 230 mm × 110mm × 110 mm or 230mm × 110mm × 76mm is generally used in construction industry.



It is found that the weight of $1m^3$ of brick earth is about 1800 kg. Hence the average weight of brick will be about 3.0 to 3.5 kg.

The size of Indian brick we are using is 228mm × 107mm × 69mm.

3.2.4 Brick Earth

Bricks are easily moulded from plastic clays also known as brick clay or brick earth.

Composition of Good Brick Earth

According to IS 2119-1975 the clay or mixture of clay selected should preferably confirm the following composition.

Clay = 20 – 30% by weight
Silt = 20 – 35% by weight
Sand= 35 – 50% by weight

Constituents of Brick Earth

Following are the constituent of good brick earth.

i) Alumina :

It is the chief constituent of clay. A good brick earth should contain 20 to 30% of alumina. This constituent imparts plasticity to earth. So that it can be moulded easily. If alumina is present in excess, raw bricks shrink and warp during drying and burning.

ii) Silica :

A good brick earth should contain about 50 to 60% of silica. Silica exists in clay either as free or in combined form. As free sand, it is mechanically mixed with clay and in combined form, it exists in chemical composition with alumina. Presence of silica prevents cracking, shrinking and warping of raw bricks. It thus imparts uniform shape to the bricks. Durability of bricks depends on the proper proportion of silica in brick earth. Excess of silica destroys the cohesion between particles and brick will become brittle.

iii) Lime :

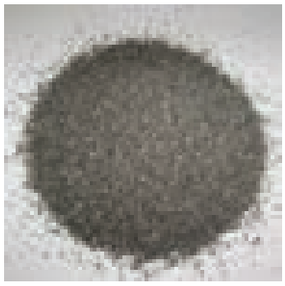
A small quantity of lime is desirable in finely powdered state to prevents shrinkage of raw bricks. Excess of lime causes the brick to melt and hence its shape is lost.

iv) Oxide of Iron :

A small quantity of oxide of iron to the extent of 5 to 6 % is desirable to impart red colour to bricks. Excess of iron oxide makes the bricks dark blue or blackish.

v) Magnesia :

A small quantity of magnesia in brick earth imparts yellow tint to bricks, and decrease shrinkage. But excess of magnesia leads to the decay of bricks.



The ingredients like iron pyrites, alkalies, pebbles, organic matter should not be present in good brick earth.

3.2.5 Manufacture of Brick

The following are various steps involved in the preparation of bricks :

1. Preparation of clay
2. Moulding
3. Drying
4. Burning

3.2.5.1. Preparation of Clay

The preparation of clay involves the following operations:

a) Unsoiling : Top layer of 20 cm depth is removed as it contain impurities.

b) **Digging :** Clay dug out from ground is spread on level ground about 60 cm to 120 cm heaps.

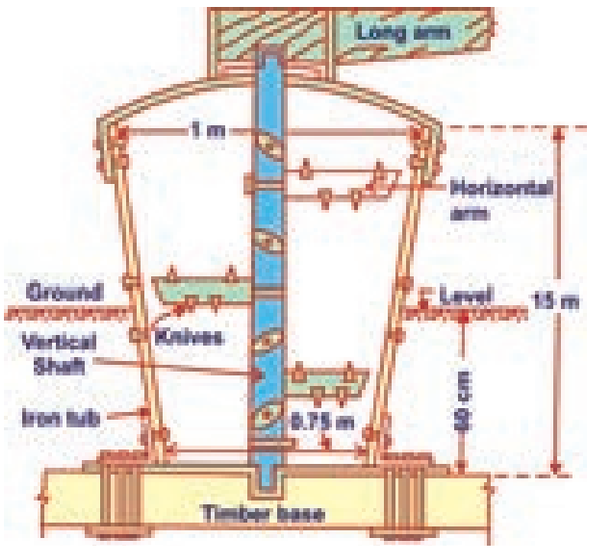
c) **Cleaning :** Stones, pebbles, vegetable matter, etc., are removed and the lumps are converted in to powder form.

d) **Weathering :** Clay is to be exposed to atmosphere from few weeks to full season.

e) **Blending :** Clay is made loose and any ingredient to be added to it is spread out at top and it is turned up and down in vertical direction.

f) **Tempering:** Clay is brought to a proper degree of hardness. Then water is added to the clay and the whole mass is kneaded or pressed under the feet of men or cattle.

For large scale, tempering is usually done in pug mill as shown in the fig.



Pug Mill

Process : Clay with water is placed in pug mill from the top. When the vertical shaft is rotated by using electric power, clay is thoroughly mixed up by the actions of horizontal arms and knives. When clay has been sufficiently pugged, hole at the bottom of tub is opened and the pugged earth is taken out from ramp.

3.2.5.2. Moulding

Clay which is prepared from pug mill is sent to the next operation of moulding.

Following are the two ways of moulding :

1. Hand Moulding
2. Machine Moulding.

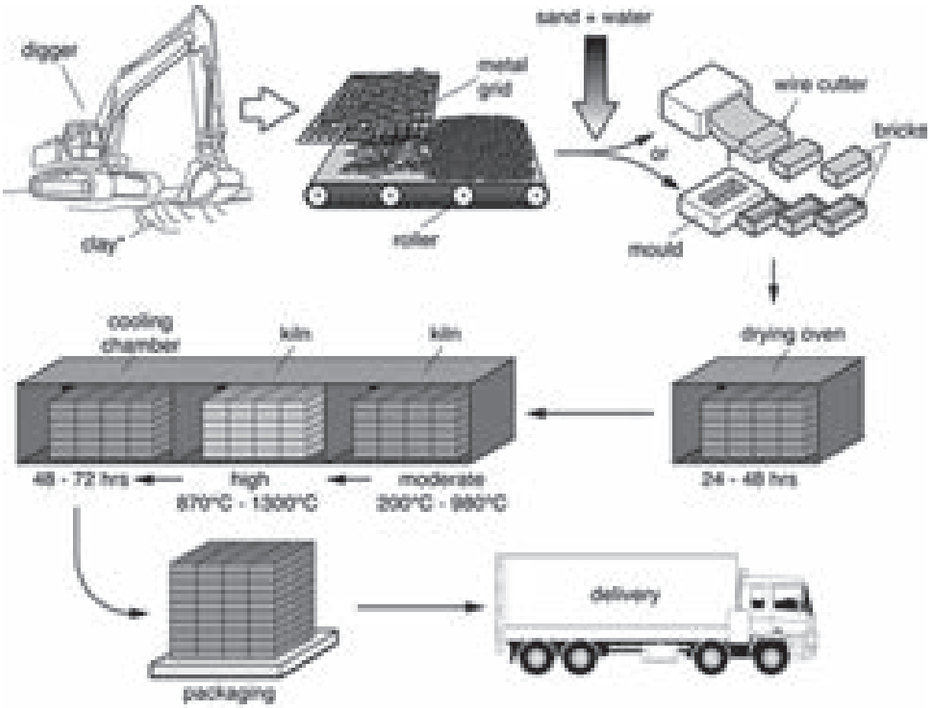
1) Hand Moulding :

Moulds are rectangular boxes made of wood or steel which are open at top and bottom. Steel moulds are more durable and used for manufacturing bricks on large scale as shown in fig. Bricks prepared by hand moulding are of two types.

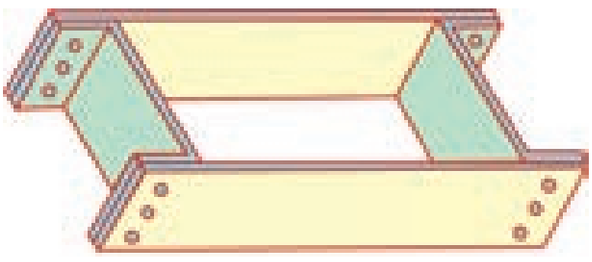
a) Ground Moulding
b) Table Moulding

a) Ground Moulding :

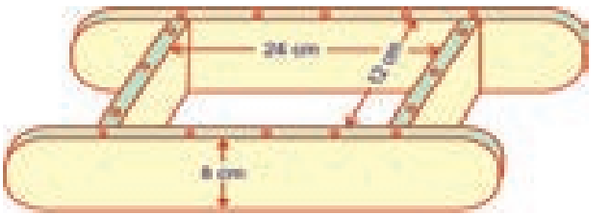
Ground is first made level and fine sand is sprinkled over it. Mould is dipped in water and placed over the ground to fill the clay. Extra clay is removed by wooden or metal strike, after the mould is filled. Mould is then lifted up and raw brick is left on the ground. Mould is then dipped in water every time. Lower faces of



ground moulded bricks are rough and it is not possible to place frog on such bricks. Ground moulded bricks of better quality and with frogs on their surface are made by using a pair of parallel boards and a wooden block.



Steel Mould



Wooden Mould

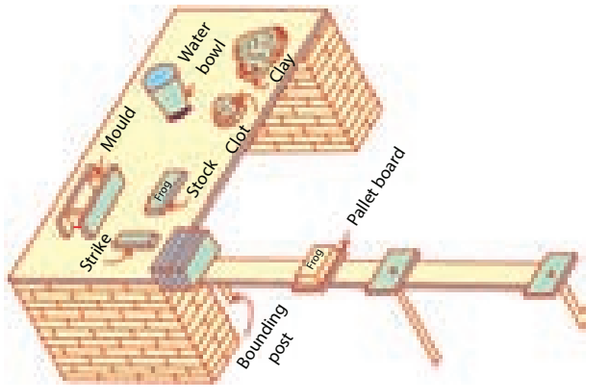
Hand Moulding

Wooden Mould

B) Table Moulding :

Process of moulding these bricks is just similar to ground moulded bricks.These are moulded on a table of size about 2m × 1 m. The clay, mould, water pots, stock board, strikes and pallet boards are placed on the table. The bricks are moulded on the table and sent for the further process of drying.

However the efficiency of moulder decreases gradually because of standing at the same place for long duration. The cost of brick moulding also increases when table moulding is adopted.



2) Machine Moulding :

This method proves to be economical when bricks in huge quantity are to be manufactured at the same spot. It is also helpful for moulding hard and string clay. These machine are broadly classified into two categories

a) Plastic Clay Machine.

b) Dry Clay Machine.

a) Plastic Clay Machine :

This machine containing rectangular opening of size equal to thickness and width of a brick. Pugged clay is placed in the machine and as it comes out through the opening, it is cut into strip of standard length by wires. So these bricks are called **"Wire cut bricks"**.

b.) Dry Clay Machines :

In these machines, strong clay is first converted into powder form and then water is added to form a stiff plastic paste. Such paste is placed in mould and pressed by machine to form hard and well shaped bricks. These bricks are heavier than ordinary hand moulded bricks. They carry distinct frog and exhibit uniform texture.

3.2.5.3. Drying

The damp brick, if burnt, are likely to be cracked and distorted. Hence, moulded bricks are dried before they are taken for the next operation of burning.

Bricks are laid along and across the stock in alternate layers. The drying of brick is done by the following means:

a. **Artificial Drying:** Drying by tunnels usually 120°c about 1 to 3 days.
b. **Circulation of Air:** Stacks are arranged in such a way that sufficient space is left between them for free circulation of air.
c. **Drying Yard**: Special yards should be prepared slightly higher level to prevent the accumulation of rain water.

d. **Period of Drying :** Usually three to ten days for bricks to dry.

3.2.5.4. Burning

This is very important operation in the manufacture of bricks. It imparts hardness and strength to brick and makes them dense and durable. The bricks should be burnt properly.

If bricks are over burnt, they will be brittle and hence break easily. If they are under burnt, they will be soft and cannot carry loads.

During burning, when the temperature of about 650°c is attained, the organic matter contained in the brick is oxidized and also the water of crystallization is driven away.

When the temperature of about 1100°c is reached, the particles of the earth bind themselves together resulting in the increase of strength and density to bricks. Further heating is not desirable and if the temperature is raised beyond 1100°c great amount of fusible glassy mass is formed and the bricks lots its shape.

Bricks are burnt in clamps or kilns.

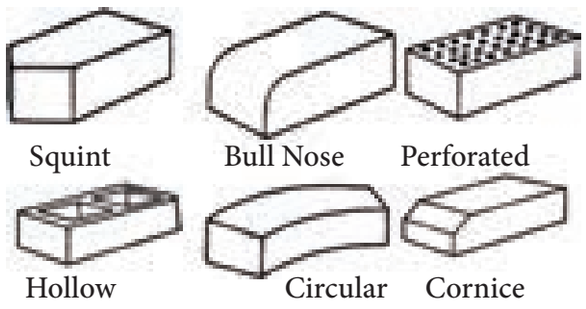
Clamp

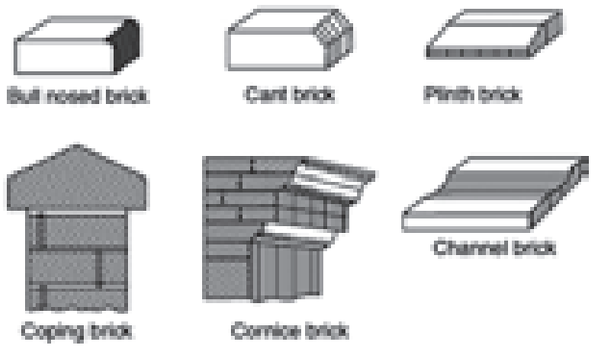
3.2.6 Classification of Brick

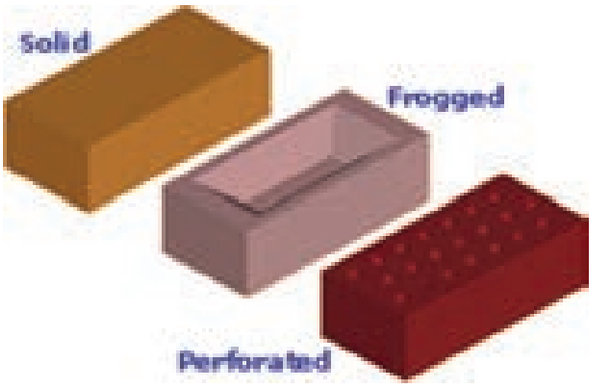
According to use, bricks are classified into five categories.

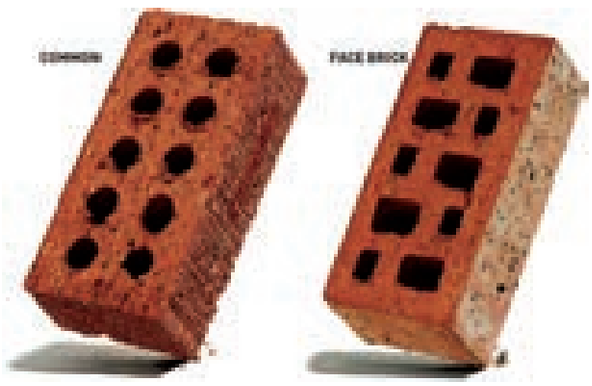
They are,

i) Ordinary Bricks
ii) Engineering Bricks (special bricks for carrying heavy loads)
iii) Facing Bricks
iv) Fire Bricks
v) Special bricks (special shapes)









According to general physical requirements bricks are classified into three categories. They are,

1) Class I
2) Class II
3) Class III

The bricks belongs to these three classification, differ in their general requirements and water absorption property.

As per IS classification, bricks are classified according to their compressive strength. They are 10, 7.5, 5.0 and 3.5 having compressive strength of 10 N/mm^2, 7.5 N/mm^2, 5 N/mm^2 and 3.5 N/mm^{2}respectively.

3.2.7 Properties of Good Bricks

- Good bricks should be of compact structure, free from cracks and flaws such as air bubbles, lumps and stones.
- They should be regular in shape and of uniform size with plane faces and sharp edges.
- Length should be equal to twice the width plus the thickness of mortar joints. (Length = (2 × Width) + thickness of mortar joints).
- The colour should be uniform and of deep red or copper colour.
- When soaked in water for 24 hours, a good brick should not absorb more than 20% of its own weight.
- A well burnt brick should be hard and when scratched with the finger nail, no impression should be formed.
- On striking it with each other, it should give a clear ringing or metallic sound.
- When struck against one another or thrown on end on a hard ground from a height of 1m, the bricks should not break.

➢ The crushing strength should not be less than 55 kg/cm^2.

3.2.8 Hollow Blocks

Concrete blocks are now-a-days used for masonry construction. These blocks are available in three types namely solid blocks, hollow blocks and cellular blocks.

The normal concrete blocks are called as solid blocks.

If the percentage of voids is more than 25% then it is called as hollow blocks, if the percentage of voids is less than 25% it is called as perforated blocks.

Cellular blocks are generally referred as light weight aerated concerte blocks.

When was the first brick house built?

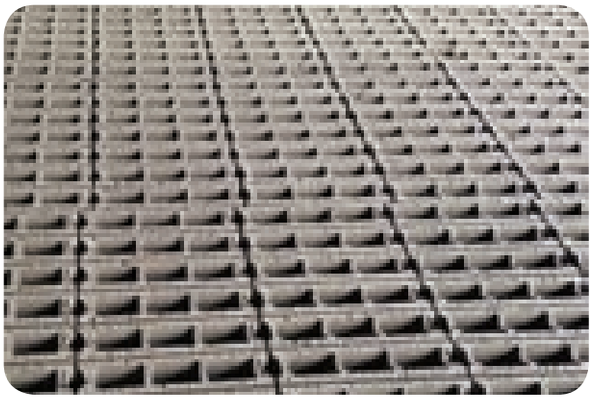
It was built in California in 1847.

Search link: http://www.youtube.com> watch first brick house

ACTIVITY 4

Visit a brick manufacturing unit near by your school and prepare report with photos.

Concrete blocks are usually made large in size. So that the block work is faster and consume less cement in joints than the brick work. Specially made hollow blocks are also used to construct load bearing walls. Such works are useful in reducing the dead load of masonry in buildings.



3.2.8.1 Manufacturing of Hollow Blocks

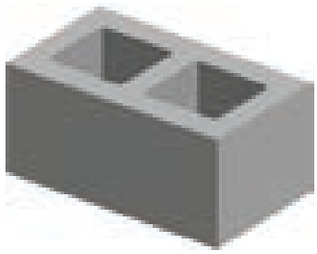
The concrete mix for concrete blocks shall not be richer than one part of cement to six parts of volume of combined aggregate. Lean mixes upto 1:8 are also commonly used. The choice of aggregates for manufacturing these block is of utmost importance as cost of aggregates account for a large part of the total cost. Hence "Baby jelly" aggregates that are not generally used for conventional concrete work are found of much use in making these concrete blocks.

3.2.8.2 Classification of Hollow Blocks

Hollow concrete blocks are classified by IS into the following three grades.

A) **Grade A :** These blocks are used for load bearing walls. They should have a minimum density of 1500 kg/m^3. They should

be manufactured for minimum specified compressive strength of 3.5, 4.5, 5.5 and 7.0 N/mm^2 in 28 days.



B) **Grade B :** These are also used for load bearing walls. They may have a density below 1500 kg / m^3 but, not less than 1000 kg/m^3. They are made for specified compressive strength of 2.0, 3.0 and 5.0 N/mm^2 in 28 days.

C) **Grade C :** These are used for non-load bearing walls, and its density is not less than 1000 kg/m3. They are made for specified strength of 1.5 N/mm^3 in 28 days.

Model Questions

PART I (1 Mark)

Choose the correct answer

1. The actual size of modular brick is …….
   a) 200mm × 200mm × 100mm
   b) 100mm × 100mm × 100mm
   c) 190mm × 90mm × 90mm
   d) 115mm × 100mm × 230mm

2. The size of bricks used in construction industry is ……
   a) 230mm × 100mm × 100mm
   b) 230mm × 90mm × 90mm
   c) 230mm × 110mm × 76mm
   d) 200mm × 100mm × 110mm

3. The size of Indian brick we are using is ……
   a) 190mm × 90mm × 90mm
   b) 228mm × 107mm × 69mm
   c) 200mm × 100mm × 100mm
   d) 100mm × 100mm × 100mm

4. Weight of brick is ……
   a) 2.00 to 3.00 kg
   b) 5.00 to 10.00 kg
   c) 10.00 to 15.00 kg
   d) 3.00 to 3.50 kg

5. Quantity of Alumina in a good brick earth is ……
   a) 20 to 30%
   b) 40 to 50%
   c) 10 to 50%
   d) 25 to 55%

TD7VUD

PART II (3 Marks)

Answer in one or two sentences

6. Define : Bricks.
7. What is nominal size of modular bricks?
8. What is burning of bricks?
9. Write any three raw materials in brick earth.
10. What are the classification of Hollow blocks?

PART III (5 Marks)

Answer shortly

11. Write short notes on drying of bricks.
12. What are the steps involved in the manufacture of brick?
13. Write shorts notes on hollow blocks.

PART IV (10 Marks)

Answer in detail

14. What are the properties of good brick?
15. Explain the composition of good brick earth.
16. Explain any two steps of manufacturing of bricks.
17. Explain the manufacturing process of Hollow blocks.

Part – I Answers

1. (c) 2. (c) 3. (b) 4. (d) 5. (a)

3.3 SAND

Learning Objectives

At the end of this lesson you shall be able to

- Define river sand and manufactured sand (M-sand).
- Compare M-sand and river sand.

3.3.1 Introduction

Sand is a building material used in construction for preparing mortar, concrete and also for filling under floor, basements. It is technically named as fine aggregate. It is used in concrete to fill up the voids leaved by coarse aggregates.

Now-a-days, it is practically impossible to get river sand in large quantities. Hence, M sand (manufactured sand) is introduced in this field to overcome this deficiency.

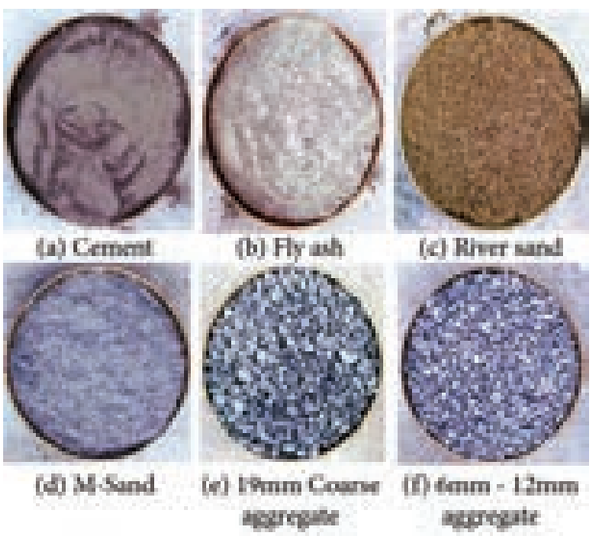
3.3.2 River Sand

Sand is generally composed of rounded particles and may or may not contain clay or other impurities. It is obtained from the banks and beds of rivers.

3.3.3 Manufactured Sand (M Sand)

M Sand is defined as a crushed fine aggregate produced from broken granite blocks. Production of M sand generally involves crushing, screening and possible washing.

Search link: http://www.youtube.com/watch/m-sand



3.3.4 Test For Sand

The following are some of the tests conducted to know the quality of sand.

1) Sieve analysis
2) Bulking of sand
3) Voids Ratio
4) Porosity
5) Bulk density

- The chemical name and formula of sand is silicon dioxide and SiO_2.
- Sand is uncountable. It contains particles from 62.5 micron (0.0625mm) to 2mm in diameter.

ACTIVITY 5

Collect some types of sand available nearby your town and display it in your class room.

3.3.5 Comparison of River Sand & M Sand

S.No	Parameters	River Sand	M-Sand
1	Process	Naturally available on river banks.	Manufactured in factory
2	Shape	Smoother texture with better shape. Demands less water.	Angular and has rougher texture. Angular aggregates demands more water. Water demands can be compensated with cement content.
3	Moisture content	Moisture is trapped in between the particles which is good for concrete purpose.	Moisture is available only in water washed M sand.
4	Concrete Strength	Lesser concrete strength compared to M – sand.	Higher concrete strength compared to river sand.
5	Silt Content	Minimum permissible silt content is 3%.Anything more than 3% is harmful to the concrete's durability. We can expect 5 – 20% silt content in medium quality river sand.	Zero silt. Hence good for construction works.
6	Over sized materials	1 – 6 % of over sized materials can be expected, like pebble, stones, etc.	Since it is artificially manufactured, there is no over sized materials.

7	Marine Products	1 – 2% like sea shells, etc.	0%
8	Eco friendly	Harmful to environment. Eco imbalances, reduce ground water level and river water gets dried up.	Though M sand uses natural coarse aggregates to form, it causes less damage to environment as compared to river sand.
9	Applications	Recommended for RCC plastering and brick / block work.	Highly recommended for RCC purposes and brick / block works.
10	Quality	No control over quality since it is naturally occurring. Same river bed sand can have differences in silt content.	Better quality control since manufactured in a controlled environment.

Model Questions

PART I (1 Mark)

Choose the correct answer

1. …… is defined as a crushed fine aggregate produced from broken granite blocks.
   a) Brick
   b) Wood
   c) Stone
   d) M-Sand

PART II (3 Marks)

Answer in one or two sentences

2. Define : River Sand.
3. Define: M-Sand.
4. What are the tests conducted on sand?

PART III (5 Marks)

Answer shortly

5. Write any three comparison between river sand and M-sand.

PART IV (10 Marks)

Answer in detail

6. What are the difference between river sand and M-sand?

Part – I Answers

1. (d)