

## ***Common Building Stones***

### **1- Granite**

a) **Composition:** It is igneous rock. Its main constituent minerals are quartz, (hard and least affected by carbon dioxide and water) feldspar (crystalline, lustrous, readily attacked by atmospheric agencies) and mica (dark grey, black or brown in colour, soft, readily affected by chemicals and atmospheric agencies).

b) **Characteristics:**

- Its specific gravity is 2.64 and absorption less than 1%.
- It has mottled appearance.
- Significantly strong and durable.
- Finely grained granite takes a fine polish.
- Crushing strength varies from 110 to 140 MN/m<sup>2</sup>.
- It has least fire resistance as it cracks under a strong fire.
- Its colour depends upon that of feldspar.

c) **Uses:**

- Fine grained granite is suitable for ornamental columns, plinth, etc. as it takes a polish.
- Owing to the hardness, weight and durability of granite it is considered most suitable for the construction of sea walls, lighthouses, bridge piers, etc.
- Large pieces are used as building blocks, the smaller as road metals or railway ballast and the chippings for the manufacture of concrete or artificial stone.

### **2. Basalt or Trap**

a) **Composition:** it is an igneous rock (siliceous variety). The main constituent are silica, alumina and feldspar.

b) **Characteristics:**

- Very hard and tough.
- Heavier than granite
- Has greenish grey to dark grey colour.
- Crushing. strength varies from 70 to 80 MN/m<sup>2</sup>.

- Specific gravity = 2.96.

**c) Uses:**

- Suitable for paving sets and as a road metal.
- Used for the manufacture of artificial stone.
- Used as aggregate in concrete.

### 3- Slate

- a) **Composition:** it is a metamorphic rock (Argillaceous variety).

It is composed of alumina mixed with sand or carbonate of lime.

**b) Characteristics:**

- Its specific gravity is 2.8.
- A good slate is hard, tough and fine grained.
- It has grey or dark blue colour.
- It can be split into thin sheets.
- Its crushing strength varies from 60 to 70 MN/m<sup>2</sup>.
- It is non-absorbent.
- When struck with a light hammer, it produces a sharp metallic ring.
- Its durability is good.

**c) Uses:**

- Used for making electrical switch boards.
- Because of its non-absorbent property, it is suitable for use in cisterns, urinals partitions, etc.

### 4- Gneiss

- **Composition:** It is a metamorphic rock. It is also sometimes called stratified granite as it occurs in somewhat parallel layers. Its constituents are the same as granite, i.e. quartz and feldspar.

**a) Characteristics:**

- It can be readily split into slabs.
- It is more easily worked than granite.
- As it is available in different colours it is used for ornamental and decorative purposes.
- It is reasonably good material for street paving.

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## 5- Sand stone

a) **Composition:** It is a sedimentary rock of silicious variety. It contains sand or quartz cemented by lime, mica, magnesium, aluminium, oxide of iron or by a mixture of these materials. Sometimes fragments of limestone, mica, or felspar are also present.

b) **Characteristics:**

- Its structure shows sandy grains.
- Its usual colours are white, grey, brown, pink, etc.
- Its specific gravity is 2.25.
- Crushing strength varies from 35 to 40 MN/m<sup>2</sup>.
- Fine-grained stones are strong and durable.
- The sand stone of thin-bedded variety is called flint. It splits easily into large slabs along the bedding.
- The rock composed of angular sharp edged sand grains is called grit; it is adequately strong and heavy and is used in heavy engineering works.
- The sand stone that can be cut easily with mallet and hammer into blocks for building is referred as free stone.
- Its durability depends upon the nature of cementing material. The quantity of sandstone is poor if it is porous or contains lime.

c) **Uses:**

- The fine grained and compact variety is suitable for ashlar work, mouldings, carvings, etc.
- The rough and coarse grained stone is employed for rubble work.

## 6. Limestone

**Composition:** It is sedimentary rock of calcareous variety. When in pure state it contains  $\text{CaCO}_3$  but frequently is mixed with  $\text{MgCO}_3$  and small amount of silica and alumina. When both  $\text{MgCO}_3$  and  $\text{CaCO}_3$  are present nearly in equal proportion it is known as 'Dolomite'.

## a) Characteristics:

- Its specific gravity is 2.6.
- It is available in brown, yellow and dark grey colours.
- Crushing strength = 52 MN/m<sup>2</sup>.

## b) Uses:

- It is used in large quantities in blast furnaces, bleaching, tanning and other industries.
- If compact and fine grained it may be used as stone masonry for walls and paving set in floor.
- It is used as road metal (when better materials like trap, basalt or granite are not available).

## 7- Marble:

a) **Composition:** It is metamorphic rock of calcareous variety. It is changed from lime stone. It is crystalline hard compact stone having CaCO<sub>3</sub> as the main constituent.

## b) Characteristics

- It is available in white, yellow, grey, green, red, blue and black colours.
- It is very hard and takes a fine polish.
- Its specific gravity is 2.72.
- Crushing strength varies from 50 to 60 MN/m<sup>2</sup>.
- It can be easily worked.

## c) Uses:

- It is used for carving and decoration work.
- It is also used for steps, wall linings, electrical switch boards, table slabs and columns.

## 8) Kankar

a) **Composition:** It is an impure limestone containing 30% of clay and sand.

### **b) Characteristics:**

- It is available in grey or khaki colour.
- It has a porous structure.
- It occurs in solid layers or as irregular shaped modules a few meters below the surface.
- Hard kankar is adequately durable.

### **c) Uses.**

- Nodular kankar when burnt yields excellent hydraulic lime; when clean, hard and tough is used as road metal.
- Hard kankar is employed for foundations of buildings.

## **9- Laterite**

- a) **Composition:** it is basically igneous but not completely metamorphic. it is sandy clay stone containing high percentage of iron oxide.

### **b) Characteristics:**

- It has a porous and cellular structure.
- It is readily quarried in blocks.
- It is of reddish, brown, yellow, dark brown and black colours.
- Its specific gravity varies from 2 to 2.2.

### **c) Uses**

- Laterite blocks are suitable as building stones.
- Nodular laterite proves a very good road metal.

## **10- Moorum**

- a) **Composition:** it is a decomposed laterite.

- b) **Characteristics:** it has deep brown or red colour.

### **c) Uses:**

- Due to its rich red colour, it is used in surfacing fancy paths and garden walks.
- It serves as a fine blindage for metallised rods,

## **11- Gravel**

It is mixture of rounded water worn pebbles of any kind of stone with sand. It is usually available in riverbeds. The size of the pebble varies from minute grains to 8 cm in diameter. It is suitable for surfacing road and is also used in concrete.

## **12- Chalk**

It is pure, white limestone. It is soft and can be easily powdered. It is largely used for the manufacture of Portland cement. It is also used for marking and as a colouring matter. It is unsuitable for building purposes.

## **13- Shingles**

These are large water-worn pebbles found in riverbeds. Broken shingles are used in concrete and as road metal when no better stuff is available at reasonable cost.

## **14- Quartz**

It is composed of silica and is dense, hard and glassy in structure. Some of the varieties are considered as the hardest and strongest type of building stones. It is strong and durable and used as road metal or railway ballast or in concrete.