

Building Construction Materials

- Stone
- Brick
- Lime
- Cement
- Metal
- Timber
- Sand
- Aggregates
- Mortar

Stone

Requirements of Stone..

- Structure
- Appearance - Colour
Texture
- Weight
- Fineness of Grains
- Durability
- Strength
- Hardness
- Facility of Working
and Dressing



Stone

Types of stones are...

- Igneous Rocks, Sedimentary Rocks, Metamorphic Rocks.
- Stratified, Unstratified, Foliated.
- Siliceous, Argillaceous, Calcareous.



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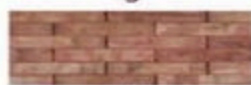
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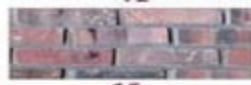
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Stone

- They are used in hydraulic structures like dams and bridges.
- They are used in retaining wall masonry to retain soil.
- They are used as road metal in road construction.
- They are used as ballast for permanent way in railways.
- They are used to make concrete in the form of coarse aggregate.

Brick

Requirements of Bricks...

- The color of the brick should be red or copper and uniform.
- It should be well burnt in kilns.
- The surface should be even and free from cracks.
- The edges should be sharp.

Brick

Standard Sizes of bricks...

- Conventional / Traditional bricks : Size 23 cm x 11.4 cm x 7.6 cm
- Standard / Modular : Size : 19 cm x 9 cm x 9 cm

Brick

- Bricks are used in wall masonry construction of building
- Used in brick lintel construction
- Bats of brick are used in concrete in foundation work.
- They are durable.
- They are low cost material.
- They possess good strength.
- They are easily available.
- Brick are light in compared to stones.

Lime

Requirement of lime...

- it should set easily.
- it should have low shrinkage.
- it should not contain impurities.
- It should be moisture resistant
- It should slake easily with water.



Lime

- It has good workability.
- It stiffens quickly.
- It has low shrinkage.
- It has good resistant to moisture.
- Lime possesses good plasticity.

Cement

Requirements of cement...

- Cement should not possess of alumina which may reduce strength.
- not contain alumina in excess as it weakens the cement.
- A very small amount of Sulphur is added in cement to make sound cement.
- It should found cool when touch by hand.
- it should be in fine powder form while checking with first finger and thumb.



Cement

Types of Cement..

- Ordinary Portland cement (OPC)
- Rapid hardening Portland cement
- Quick setting cement
- Pozzuolana Portland cement
- Low heat cement
- Blast furnace cement
- White cement
- Sulphate resisting cement
- Colored cement



Cement

- It is used in making joints for drains ,pipes.
- It is used to prepare RCC structures of building by using reinforcement with cement concrete.
- it is used in construction of buildings, bridges, tanks, domes, flyovers, dockyard etc.
- It is used to prepare cement mortar for building construction works like masonry, plaster, painting, flooring etc.
- It is used to prepare cement concrete for various construction works.

Metal

Requirements of metal...

- They should provide sufficient strength to bear the loads coming on them
- They should provide resistance to corrosion and weather actions
- They should provided resistance to heat and fire.
- They should have good adhesion with cement concrete.

Metal

- Ferrous metals
 - 1) pig iron
 - 2) cast iron
 - 3) wrought iron
 - 4) steel
- Non ferrous metals
 - 1) Aluminum
 - 2) copper
 - 3) Magnesium
 - 4) Nickel



Timber

Requirements of timber...

- It should be dense.
- It should have uniform texture.
- It should have dark uniform color.
- It should be workable, good machinability.
- The medullary rays should be compact.

Timber

Types of Timber...

- Natural timber
 - babul, oak, pine, mango, sal, teak, neem, palms, chir.
- Industrial timber
 - veneers, plywoods, fiberboards, impreg timber, compreg timber.



Timber

Uses...

- Railway sleepers, bridges, pipes.
- Furniture, decorative pieces, doors.
- Packing material, piles, cart wheels.
- Poles, pen, rafter.
- Roofs, partition walls, boats etc.

Sand

- It should be clean.
- It should be well graded.
- Maximum permissible clay content is 3 to 4% in sand.
- It should contain sharp, angular grains.
- It should not contain salts which attract moisture from the atmosphere.
- Sand is useful in various construction activities like masonry work, plaster work, flooring and concrete work.
- Sand is used in cement mortar, plain cement concrete, reinforced cement concrete and prestressed concrete as key ingredient in building construction

Sand

- It is naturally available material
- It is durable
- It mix with binding material easily
- It has shiny luster
- It is of whitish brown colour.

Sand

Types of sands...

- Natural

natural sand is obtained from pits, river beds and sea beds.

- Artificial

artificial sand is formed by decomposition of sandstone due to various weathering effects.

Aggregate

Requirements of Aggregates...

- Aggregates should be sufficiently strong.
- Aggregate surface should be rough and free from cracks.
- Aggregate should have good soundness.
- Aggregate should have good adhering with binding material.
- Fine aggregates are used to prepare cement mortar, lime mortar and cement concrete.
- Course aggregates are used to prepare cement concrete bituminous pavement, rigid pavement etc.
- They are used in construction of beams, columns, slab, lintel etc.

Aggregate

- Fine aggregates
size of aggregate is 4.75 mm or less is termed as fine aggregates.
- Coarse aggregates
size of aggregates 80mm to 4.75 mm is known as course.



Aggregate

- They are insoluble in water.
- They are of moderate weight.
- They are strong and durable.
- They have resistance to scratches.
- They have resistance to corrosion and decay.

Mortar

Requirements of mortar

- It should have good adhesion with bricks, stones.
- It should resist penetration of rain water.
- It should be cheap, durable, and workable.
- It should be set quickly.
- The joints formed by mortar should not develop cracks.



Mortar

- To bind the bricks or stones firmly in wall construction work.
- They are used in plaster work as finishing material to provide weather resistance joints of masonry work are covered by plaster work. White wash and color are applied on plastered surface easily.

Properties of mortar

- Mobility.
- Place ability.
- Water retention

Concrete

- Concrete is a mixture of cement/lime, sand, crushed rock, water.
- Preparation of concrete
 - <1>Ingredient of concrete
 - <2>Methods of mixing of concrete

*TYPES OF CONCRETE

- <1>Plain cement concrete
- <2>Reinforced cement concrete
- <3> Precast concrete
- <4> prestressed concrete



Concrete

Requirements of concrete...

- Workability
- Strength
- Durability
- Dimensional stability

Uses...

- Foundation to slabe in building
- Coating materil for water proofing

Artificial Or Industrial Materials

- Cement
- Bricks
- Steel
- Tiles
- Ceramic
- Paints and Varnishes
- Glass
- Plastic
- Stone
- Lime