2. MORTAR

- Building mortar is defined as a mixture of cement, sand and water.
- Mortar is similar to concrete but it does not contain coarse aggregate.
- Mortar are used for filling joints as a binder in stone and brick masonry.

BULKING OF SAND

- In the case of aggregates there is another effect of the presence of moisture viz. bulking which is an increase in the volume of a given mass of sand (fine aggregate) caused by the films of water pushing the sand particle apart. For a moisture content of about 5-8% this increase of volume may be as much as 20-40% depending upon the grading of sand.
- Finer the materials more will be the increase in volume for a given moisture content.

CLASSIFICATION OF MORTARS

Mortars are classified on the basis of the following:

(i) Bulk density
(ii) Kind of binding materials
(iii) Nature of application
(iv) Special mortars

PROPERTIES OF GOOD MORTAR MIX AND MORTAR

The important properties of a good mortar mix are mobility, placeability and water retention.

- **Mobility**
  - It is used to indicate the consistency of mortar mix which may range from stiff to fluid.
  - The mobility of mortar mix depends on the compositions of mortar and the mortar mixes to be used for masonry work are made sufficiently mobile.
- **Placeability**
  - The placeability of mortar mix should be such that a strong bond is developed with the surface of the bed.

PROPERTIES OF A GOOD MORTAR

- It should be capable of developing good adhesion with the building units such as bricks, stones etc.
- It should be capable of developing the designed stresses.
- It should be cheap.
- It should be durable.
- It should be easily workable.
- It should set quickly so that speed in construction may be achieved.

USES OF MORTAR

- To bind the building units such as bricks, stones.
- To carry out pointing and plaster work on exposed surfaces of masonry.
- To form an even and soft bedding layer for building units.
- To form joints of pipes.
- To hide the open joints of brickwork and stonework.
- To improve the general appearance of structure.

FUNCTIONS OF SAND IN MORTAR

1. Bulk 2. Setting 3. Shrinkage 4. Strength.

TESTS FOR MORTARS

1. **Adhesiveness to Building Units**: Mortar is placed to join them so as to form a horizontal joint. If size of bricks is 19 cm × 9 cm × 9 cm, a horizontal joint of 9 cm × 9 cm = 81 cm^2 will be formed. Ultimate adhesive strength of mortar per cm^2 area is obtained by dividing maximum load with 81 cm^2 area.
2. **Crushing Strength:** Brick masonry or stone masonry laid in mortar to be tested are crushed in compression machine. The load at which the masonry crushes gives the crushing strength
3. **Tensile Strength:** The briquettes are tested in a tension testing machine. Cross-sectional area of central portion is 38 mm × 38 mm or 1444 mm^2 or 14.44 cm^2.

GUNITING

- The guniting is the most effective process of repairing concrete work which has been damaged due to inferior work or other reasons. It is also used for providing an impervious layer.
- Gunite is a mixture of cement and sand, the usual proportion being 1 : 3. A cement gun is used to deposit this mixture on the concrete surface under a pressure of about 2 to 3 kg/cm^2.
- The surface to be treated is cleaned and washed. The nozzle of gun is generally kept at a distance of about 75 cm to 85 cm from the surface to be treated and velocity of nozzle varies from 120 to 160 m/sec.

■■■