

## FAQs

### 1. What is cement concrete

- **Concrete** is a composite material composed of **coarse aggregate bonded together with a fluid cement which hardens over time**. Most concretes used are lime-based concretes such as Portland cement concrete or concretes made with other hydraulic cements
- In Portland cement concrete (and other hydraulic cement concretes), when the aggregate is mixed together with the dry cement and water, they form a fluid mass that is easily molded into shape. The cement reacts chemically with the water and other ingredients to form a **hard matrix which binds all the materials together** into a durable stone-like material that has many uses

### 2. Discuss properties of concrete

- Concrete has relatively high compressive strength, but significantly lower tensile strength, and as such is usually reinforced with materials that are strong in tension (often steel).
- The elasticity of concrete is relatively constant at low stress levels but starts decreasing at higher stress levels as matrix cracking develops.
- Concrete has a very low coefficient of thermal expansion, and as it matures concrete shrinks. All concrete structures will crack to some extent, due to shrinkage and tension. Concrete which is subjected to long-duration forces is prone to creep.

### 3. Mention two proportioning methods of concrete

- **Arbitrary method** - The general expression for the proportions of cement, sand and coarse aggregate is  $1 : n : 2n$  by volume. Standard mixes are  $1 : 1 : 2$  and  $1 : 1.2 : 2.4$  for very high strength.  $1 : 1.5 : 3$  and  $1 : 2 : 4$  for normal works.  $1 : 3 : 6$  and  $1 : 4 : 8$  for foundations and mass concrete works.
- **Fineness Modulus Method:** The term fineness modulus is used to indicate an index number which is roughly proportional to the average size of the particle in the entire quantity of aggregates. The fineness modulus is obtained by adding the percentage of weight of the material retained on the following sieve and divided by 100. The coarser the aggregates, the higher the fineness modulus.

#### 4. Mention factors affecting workability of concrete

Factors effecting workability:

- Method and duration of transportation
- Quantity and characteristics of cementing materials
- Concrete consistency (slump)
- Aggregate grading, shape & surface texture
- % of entrained air
- Water content
- Concrete & ambient air temperature
- Admixtures

#### 5. What is curing in concrete work

- Curing is the process in which the **concrete is protected from loss of moisture and kept within a reasonable temperature range**. This process results in concrete with increased strength and decreased permeability. Curing is also a key player in mitigating cracks, which can severely affect durability.
- A concrete element is expected to last a certain number of years. In order to meet this expected service life, it must be able to withstand structural loading, fatigue, weathering, abrasion, and chemical attack. **The duration and type of curing plays a big role** in determining the required materials necessary to achieve the high level of quality.