MIXING

① HAND MIXING

② MACHINE MIXING

Types of Mixers

① Batch mixers → Batch mixer produce concrete, batch by batch with time interval. These type of mixers mix and discharge each load of material seperately. In normal concrete work batch mixers are used.

They are of 2 types → ① Pan type or ② Drum type.

Drum type Batch mixers are of 2 types:-

① Tilting type mixers

② Non-tilting type mixers

② continuous mixers → They produce concrete continuously without stopage till the plant is working. In this type of mixers the materials are fed continously by screw feeders and concrete is discharged continously.

③ Pan Mixers → It contains a circular pan rotating about vertical axis. A set of star paddles are provided in the pan about a vertical axis not coincident with the axis of the pan. The relative movement between the pan and the concrete is the same and the concrete is thoroughly mixed.

The are blades in the pan, called scrapper blades, which prevents the sticking of cement to the pan.

This is suitable for stiff and cohesive mixes.

④ Mobile or Truck Mounted Mixers

This Type of mixers consists of an mixing drum mounted on the truck and are powered with truck engine or from a separate diesel engine.

Type of Mixers	Nominal mixed batch capacity (ltrs)
Tilting (T)	85T 100T 140T 200T
Non-Tilting (NT)	200NT 280NT 340NT 400NT 300NT
continuous	1600

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CURING → The process of keeping the finished concrete surface moist to enable it to gain strength is called curing.

The physical property of concrete depends upon hydration of cement and the resultant micro structure of the hydrated cement

OBJECTIVES OF CURING

① prevents loss of moisture from concrete
② reduces shrinkage in concrete.
③ It improves wear resisting property of concrete.
④ increases weather resisting property of concrete.
⑤ Increases Strength, Durability and Impermeability.

Methods of curing

Ponding ② Membrane curing ③ Steam curing. Chemical curing ⑤ Sprinkling of water ⑥ Curing with moist gunny bags ⑦ shading the concrete surface.

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Non - Destructive Test → The testing of hardened concrete in which the specimen are not loaded to failure.

Here specimen remains intact and undisturbed.

They are indirect method and do not give absolute value of strength.

Methods :-

Surface hardness. ② Dynamic or Vibration tests.
Rebound Hammer ④ Radioactive and Neutron method.
Electrical method ⑥ Acoustic emission technique.
Magnetic methods.

Applications :-

Determination of :-

① Strength ② Durability ③ Homogeneity and Uniformity ④ Moisture content ⑤ Thickness of member ⑥ Clear or nominal cover to reinforcement ⑦ Initiation or growth pattern of cracks.

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FINENESS MODULUS

The fineness modulus is a numerical index which gives an idea about the coarseness or fine of aggregates. It also gives the idea about mean size of particle present in the aggregate whole body.

or

It is the sum of cumulative % retained on IS sieve divided by 100.

Type of Agg	IS sieve used
coarse	80, 40, 20, 10, 4.75mm
Fine	4.75, 2.36, 1.18, 600μ 300μ, 150μ.
All in Aggregate	both of coarse and fine aggregates

→ Aggregates with higher fineness modulus leads to harsh mixes.

→ lower fineness modulus leads to uneconomical mixes.

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Procedure :-

① The sample of aggregates is air dried or heated at temperature of 100°C to 110°C before weighing and sieving.

② The weighed sample is put on the sieve top and sieving is done manually or mechanically.

③ The aggregate retained on various sieves are weighed and cumulative % weight retained is calculated.

④ Fineness modulus is determined by dividing cumulative % weight retained by 100.

Type of Agg:-	Size of Agg.	Recommended F.M	
		Min	Max
Fine	4.75	2.5	3
coarse	10	3	3.5
	20	6	6.9
	40	6.9	7.5
	63	7.5	8.0
All in agg	20	4.8	5.1
	25		5.5

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Proportioning

Finess modulus of fine and coarse aggregates are determind seperately with the help of sieve analysis. The mixing of aggregates is done suitable to get specified grading.

NOW, we have:

$$X' = \frac{F_2 - F}{F - F_1}$$

X = % of fine aggregates to be mixed with coarse aggregats.

F_2 = F.M of coarse agg.

F_1 = F.M of fine agg.

F = F.M of combined aggregats.