

CEL 774
IIT DELHI
Construction pRACTICES

(Lecture 2-3)
Concrete: Production
B. Bhattacharjee

CIVIL ENGINEERING DEPARTMENT
IIT DELHI



DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI

General Outline

❖ Concrete Production.

⚙ Mixing.



B. Bhattacharjee

DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI

MIXING

- *Thorough mixing is essential for production of uniform quality concrete.*
- *Equipment and method should be capable of effectively mixing concrete material containing largest specified aggregate to produce uniform mixtures of the lowest slump practical for the work.*

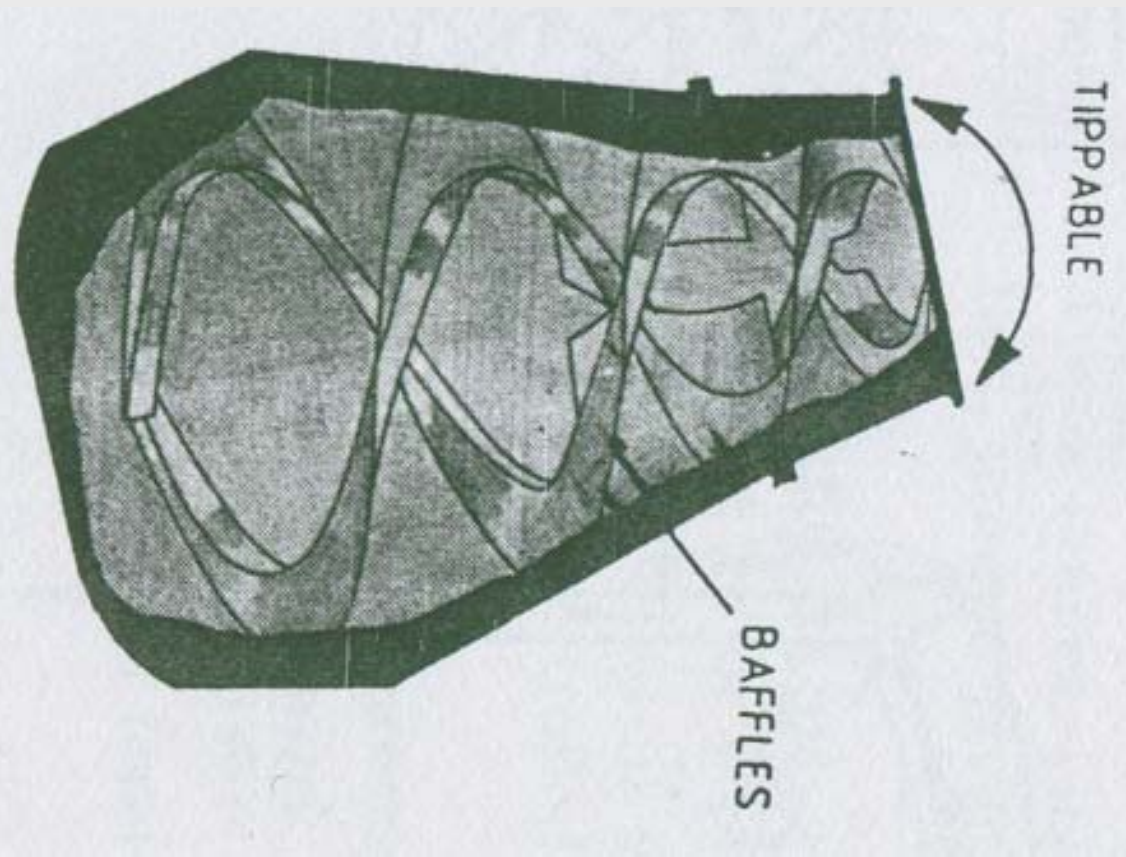


MIXING

- *cyclic or batch mixers, and continuous mixers. .*
- *gravity mixers or mixers with forced movements*
 - *They can be tilting or Non-tilting*
- *Counter-flow mixer or open-pan mixers*



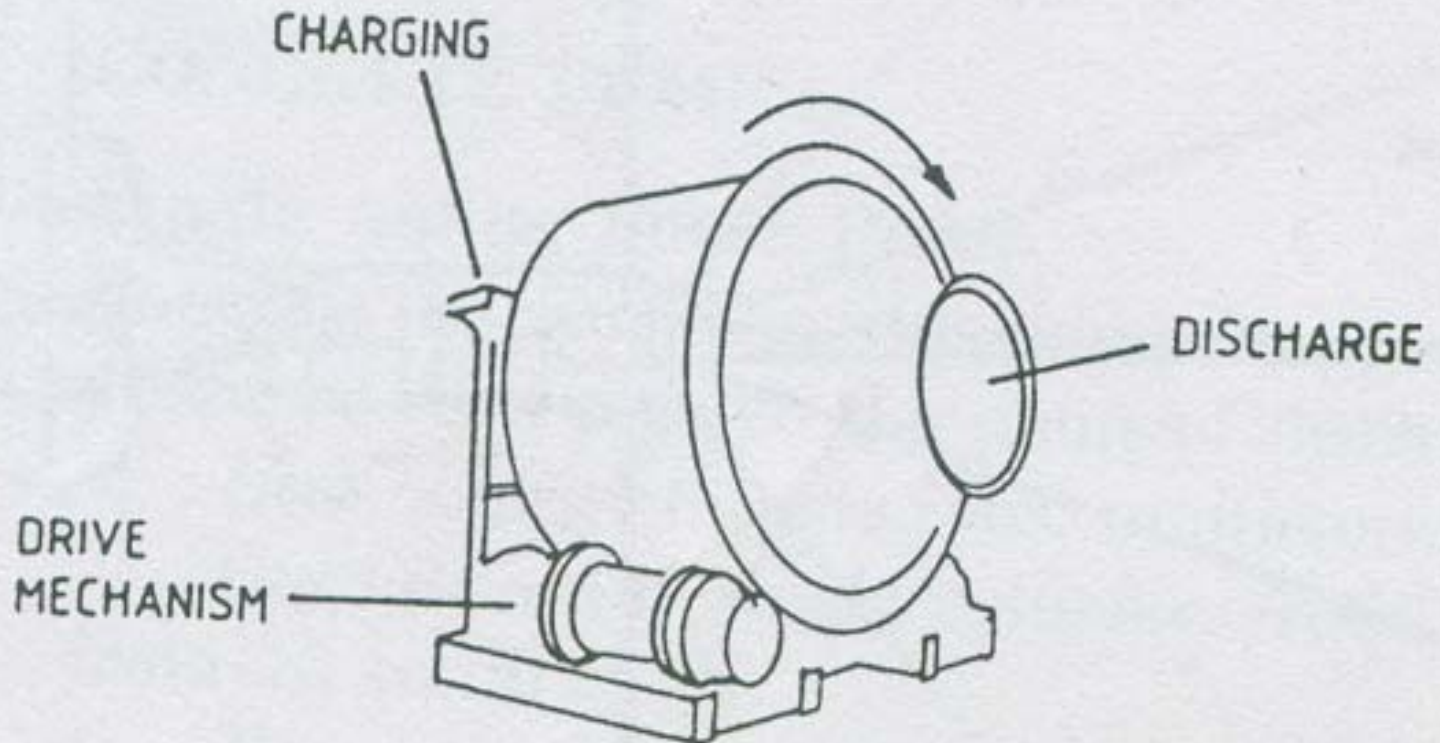
TILTING DRUM MIXER



B. Bhattacharjee

DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI

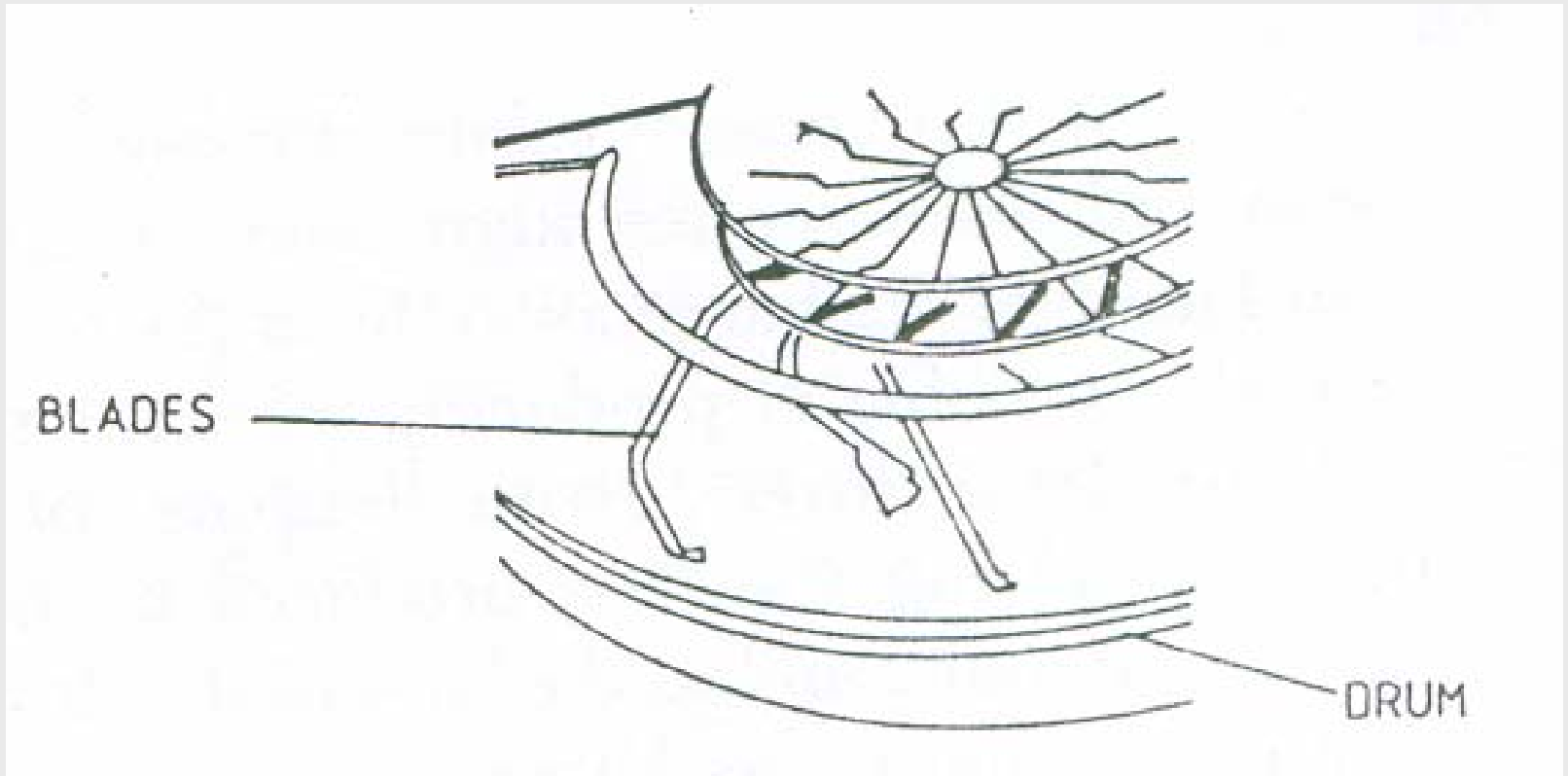
NON-TILTING DRUM MIXER



B. Bhattacharjee

DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI

PAN MIXER



B. Bhattacharjee

DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI

PAN MIXER



B. Bhattacharjee

DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI



DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI



DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI



DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI

MIXING

- *uniformity tests on samples of fresh concrete collected from the mixer at different stages of its discharge from a given batch. .*
- *Charging: pre-blending and ribboning effect*
- *Mixing Time: 1minute is required for 0.75 m³ capacity mixer and 0.25 minute is required for each additional 0.75 m³ capacity*



MIXING TIME

– IS guide lines

■ *IS 4925-1968 “mixing time for each batch of materials, except the full amount of water, provided that all the mixing water shall be introduced before one-fourth the mixing time elapsed” shall be 1½, 2 and 2½ minutes respectively for mixer capacity up to 2 m³, 3 m³ and 4 m³ respectively. IS 456 : 2000 guidelines specifies a overall minimum mixing time of 2 minutes*



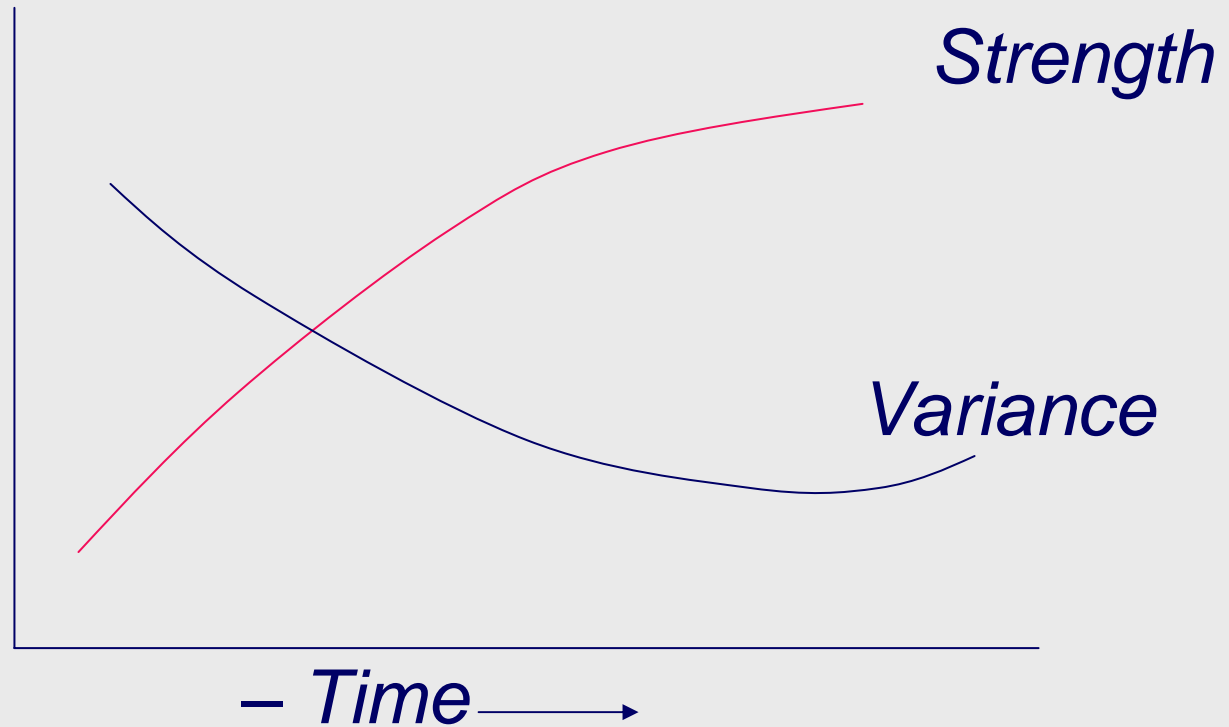
MIXING TIME

- increasing mixing time may result in more uniform distribution of hydration product resulting in higher compressive strength*
- prolonging the mixing process too long may not increase the strength proportionally and may result in a decrease in some cases.*
- over grinding of the material and in some cases may increase the proportion of fines. Quite often excessive mixing leads to segregation in case of leaner concretes.*



MIXING TIME

– Strength & Variance



B. Bhattacharjee

DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI

SUMMARY

- Concrete production process***
- Batching process and its importance in producing quality concrete***
- Mixing process for producing uniform quality concrete***



***THANK YOU
FOR HEARING***



DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI