

5.4 Concreting equipment

It is well known that the process of concreting involves batching, mixing, transporting, placing, compacting and curing. Accordingly, common concreting equipment are,

- Concrete mixers
- Concrete Hauling Equipment
- Concrete pumps for placement in different conditions
- Concrete vibrators for compaction

Concrete mixers

These are generally related to their designed output performance. Machines are decided based upon what mixing and placing methods are to be employed to mix and place a certain amount of concrete in a given time period. Generally, a batch mixing time of 5 minutes per cycle of 12 batches per hour can be assumed as a reasonable basis for assessing mixer output.

(b) Concrete Hauling Equipment

(i) Wheel barrows

The usual means of transporting mixed concrete produced in a small capacity mixer is by wheelbarrow. The run between the mixing and placing positions should be kept to a minimum and as smooth as possible by using planks or similar materials to prevent segregation of the mix within the wheelbarrow

(ii) Dumpers

These can be used for transporting mixed concrete from mixers up to 600-litre capacity and are available in two forms,

(iii) Ready Mix Concrete Mixers

These are used to transport mixed concrete from a mixing plant or depot to the site. Usual capacity range of ready mixed concrete trucks is 4 to 6 m³. Discharge can be direct into placing position into some form of site transport such as dumper, crane skip or concrete pump.

(c) Concrete pumps for placement in different conditions

These are used to transport large volumes of concrete in a short time (say up to 100 m³ per hour) in both the vertical and horizontal directions from the pump position to the point of placing. The pump is supplied with pump able special concrete mix or with constant flow of ready mixed concrete lorries throughout the pumping period. Concrete pumps are usually of a twin cylinder hydraulically driven form with a small bore pipeline (100 mm diameter) and can be trailer or lorry mounted. Pumping ranges may be up to 850.00 m vertically and 200 m horizontally depending on the pump model. It generally requires about 45 minutes to set up a concrete pump on site including coating the bore of the pipeline with a cement grout before pumping. After plumbing, the pipeline should be cleared and cleaned. Usually concrete pump and operator are hired for the period required

(d) Concrete vibrators for compaction

(i) Poker or Internal Vibrators

These consist of a hollow steel tube casting in which is a rotating impeller which generates vibrations as its head comes into contact with casing. Poker vibrators should be inserted vertically and allowed to penetrate 75mm into any previously vibrated concrete.

(ii) External Clamp or Tamping Board Vibrators

These vibrators operate by shaking the formwork. Clamp vibrators powered by either compressed air or electricity whereas tamping board vibrators are usually petrol driven. Formwork must be stronger than is traditional to withstand vibration.