

Methods and equipment for pumping and placing concrete curing

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placing concrete

- Concrete may be mixed on the job site or brought to the site by truck from a concrete batching plant.
- In either case, various methods are available to move the concrete from the **mixer location** or **concrete truck** to the pour location.
- ***Care must be taken to prevent excessive segregation within the concrete mix.***
- The site conditions and the type of POUR will determine how the concrete will be **transported** and **placed**.
- careful **planning** and coordination of the crew and the equipment on site before the concrete arrives will ensure a safe and efficient operation

Methods of moving concrete

- Various methods are used to move concrete on the construction site; however, the **concrete pump** has become the method of choice for many contractors.
- Although traditional methods such as **wheelbarrows**, push **buggies**, power buggies, **chutes**, belt **conveyors**, and crane-hoisted **buckets** have their place on the construction site as viable methods for moving concrete, the **versatility** and **speed** of the concrete pump have relegated them to secondary roles.

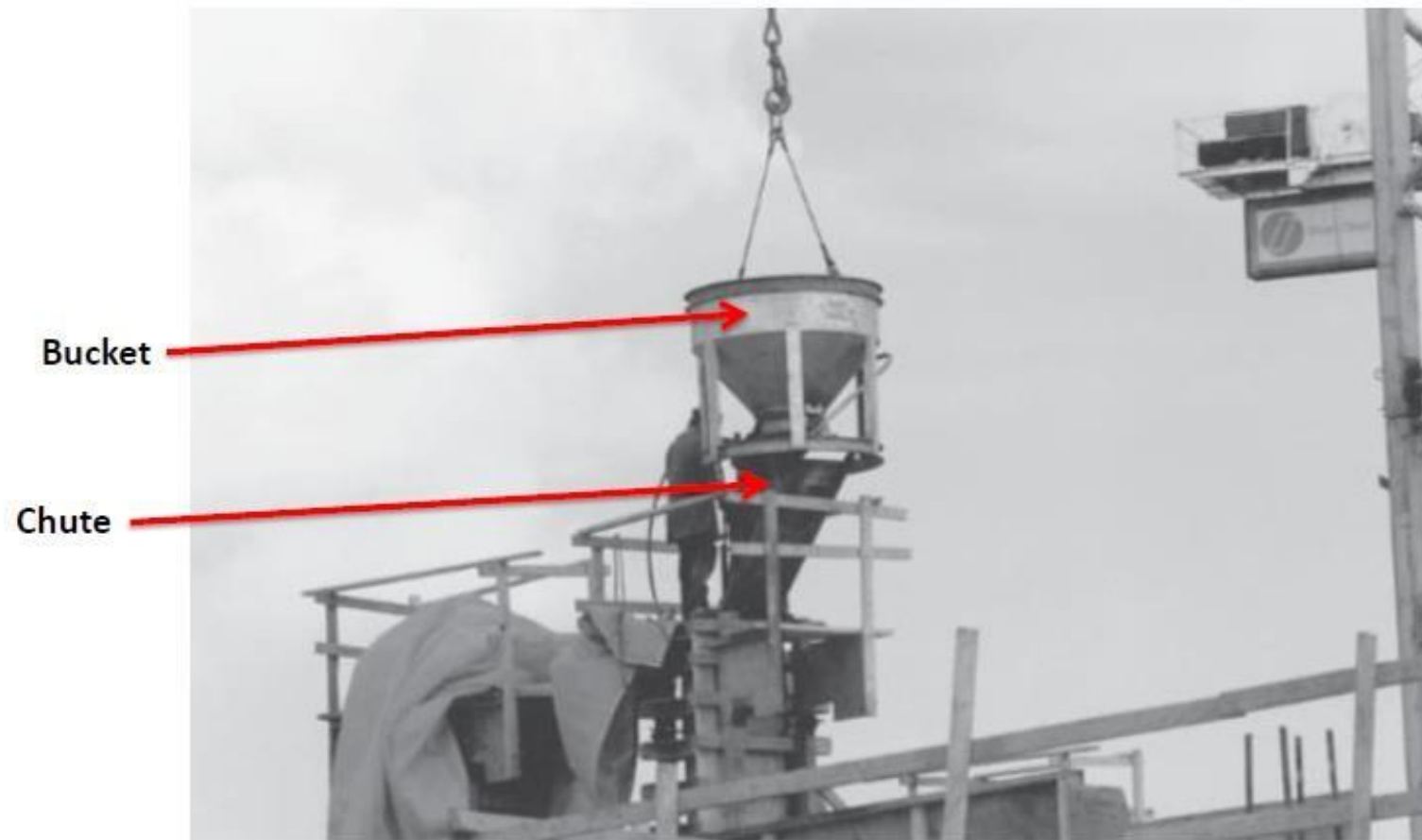
Wheelbarrows and Buggies

- Wheelbarrows are used where concrete **volumes are small** and **the distance** from the supply location to the forms is **short**.
- Smooth runways are required to **minimize segregation** of the concrete mix.
- Because wheelbarrows require manual labor to move them, runways must also have **gradual slopes** and provide a nonslip surface to ensure safe footing for the operator.

Chutes



- Chutes may be used to carry concrete directly from mixer to forms or from a hopper conveniently situated to allow chuting.
- They should be designed so that concrete will travel fast enough to keep the chute clean but not fast enough to cause segregation.
- It is generally recommended that the slope of chutes be between 3 to 1 and 2 to 1, although steeper chutes may be used to carry stiff mixes.



Placing Concrete into a Column Form Using a Bucket Equipped with a Chute

Belt Conveyors

- Belt conveyors used to transfer concrete may be classified into three types:
 1. Portable
 2. Series
 3. Side discharge conveyors
- Series (feeder) conveyors operate at **fairly high belt speeds of 150 m/min**, or higher, whereas the other two conveyors operate best at considerably slower speeds.

- High production capability will spread up to 35 Cum per hour with constant concrete supply and suitable site condition.
- Conveyors should be **covered** to prevent climatic conditions (sun, rain, or wind) from affecting the concrete during its transfer.

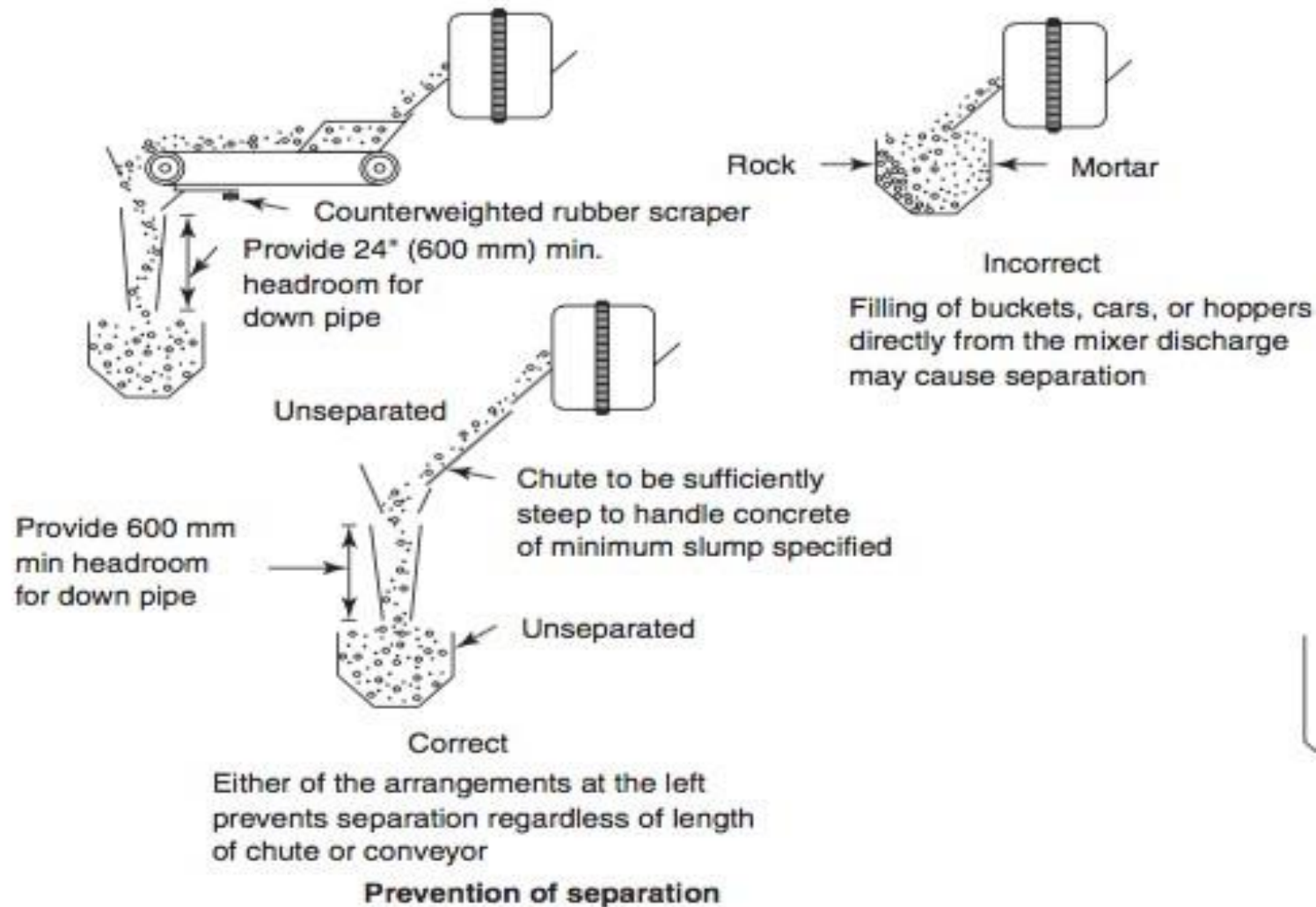


Inaccessible site concreting

If the area of concreting is inaccessible we can use Helicopter supported bucket.



Correct and Incorrect Methods of Handling Concrete



Underwater Concreting

- Placing concrete under water requires special techniques.
- Of course, it cannot be dropped through the water but must be
- conducted to its final position.
- A number of methods are used to place concrete for underwater
- structures, among them the use of a ***tremie***, an ***underwater bucket***, a ***concrete pump***, or ***preplaced aggregate***.

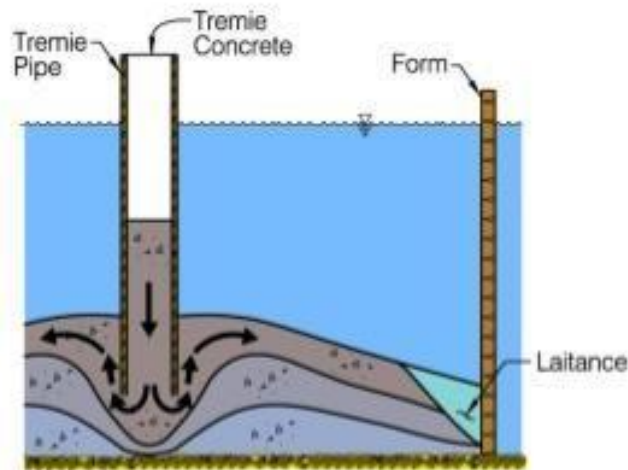
Tremie

- One of the most widely used methods of placing concrete under water is by the use of a tremie.
- This is a pipe with a normal diameter 8 times the maximum size of the coarse aggregate in the concrete being used.
- It is commonly made in 250 and 300 mm diameters in 3 m lengths.

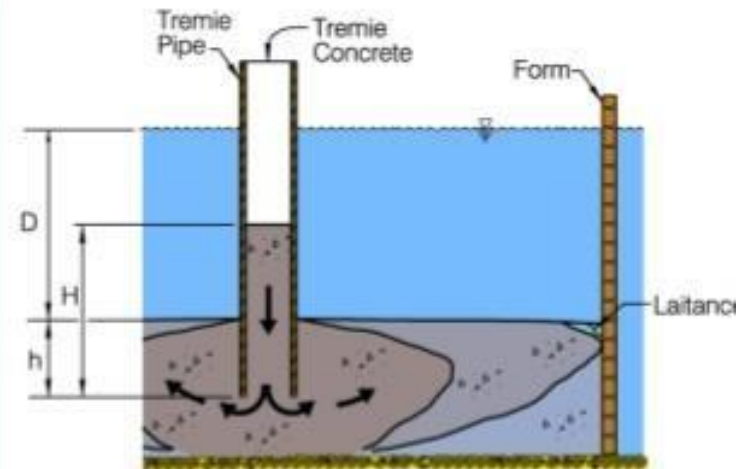
- Tremie

Flow Patterns of Tremie Copncrete

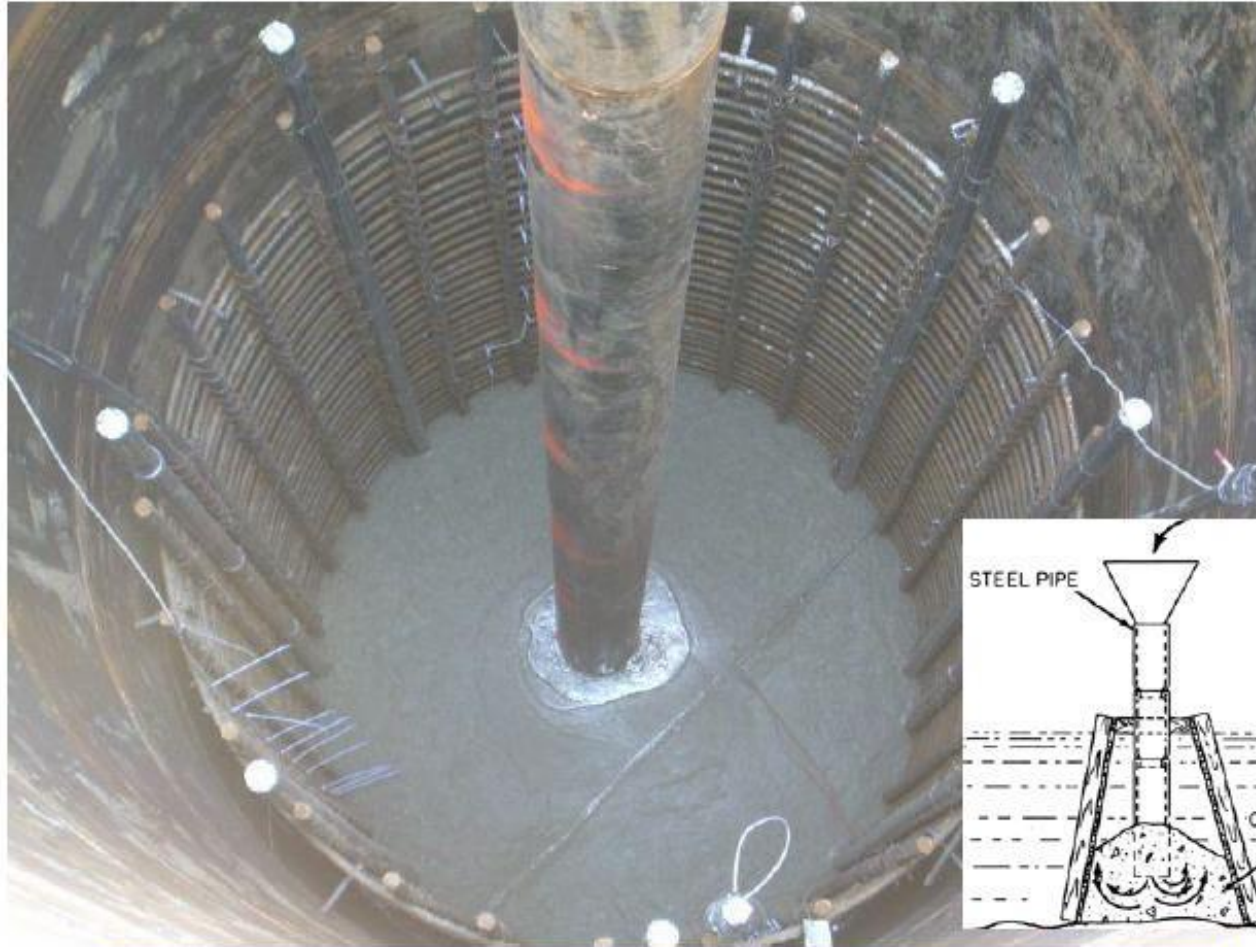
Layered Flow -
Excessive Laitance



Bulging Flow -
Minimum Laitance



Underwater Concreting



Concrete being placed by tremie inside the shaft

Methods of moving concrete

PUMPS

- Concrete pumps have enhanced the placing of concrete by doing away with the need for **special ramps**, runways, containers, and cranes that are needed for some of the traditional methods for moving concrete on the site.
- The concrete pump, complete with its own extendable boom, is normally mounted on a truck equipped with outriggers to maintain stability of the truck when the boom is extended much like a truck-mounted crane.

