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COIMBATORE

DEPARTMENT OF CIVIL ENGINEERING

19CEB201 – CONSTRUCTION MATERIALS

II YEAR / III SEMESTER

Unit 3 : Concrete

Topic 3 : Ready Mixed Concrete



Ready Mixed Concrete

- Ready Mixed Concrete is a tailor – made concrete that is manufactured in a factory or within a batching plant based on the standard required specifications.
- The prepared concrete mix is then taken to the work site within transit mixers mounted over a truck.
- This type of concrete guarantee higher durability and sustainability. As the work is carried out by an expert supplier, the mixture formed is precise and of higher quality.
- Special concrete mixtures too can be made efficiently by this concrete manufacturing method.



Ready Mixed Concrete





Types of RMC

- There are three types of ready mix concrete (RMC) depending upon the mixing of the various ingredients as given below:
 1. Transit mixed concrete
 2. Shrink mixed concrete
 3. Central mixed concrete



Transit Mixed Concrete

- It is also called dry batched concrete because all the basic ingredients including water are charged directly into the truck mixer.
- The mixer drum is revolved fast at charging speed during the loading of the material and after that it continues rotating at a normal agitating speed.
- In this type of ready mix concrete, also three types of variations are possible as given below:



Transit Mixed Concrete

Concrete mixed at job site

While being transported towards the destination, the drum is revolved at a slow or agitating speed of 2 rpm, but after reaching the site just before discharging the material, it is revolved at maximum speed of 12 to 15 rpm for nearly 70 to 100 revolution for ensuring homogeneous mixing.

Concrete mixed in transit

The drum speed is kept medium during the transit time, i.e. approximately 8 rpm for about 70 revolutions. After 70 revolutions, it is slowed down to agitating speed of 2 rpm till discharging the concrete.

Concrete mixed in the yard

The drum is turned at high-speed of 12 to 15 rpm for about 50 revolutions in the yard itself. The concrete is then agitated slowly during transit time.



Shrink Mixed Concrete

- The concrete is partially mixed in the plant mixer and then balance mixing is done in the truck mounted drum mixer during transit time.
- The amount of mixing in transit mixer depends upon the extent of mixing done in the central mixing plant.
- Tests should be conducted to establish the requirement of mixing the drum mixer.



Central Mixed Concrete

- It is also called central batching plant where the concrete is thoroughly mixed before loading into the truck mixer.
- Sometimes the plant is also referred as wet-batch or pre-mix plants.
- While transporting the concrete, the truck mixer acts as agitator only.
- Sometimes, when workability requirement is low or the lead is less, non-agitating units or dump trucks can also be used.



Central Mixed Concrete





Advantages of RMC

- Quality concrete is obtained as a ready-mix concrete mix plant make use of sophisticated equipment and consistent methods.
- There is strict control over the testing of materials, process parameters and continuous monitoring of key practices during the manufacture.
- Poor control on the input materials, batching and mixing methods in the case of site mix concrete is solved in a ready-mix concrete method.
- Speed in the construction practices followed in ready mix concrete plant is followed continuously by having mechanised operations.
- The output obtained from a site mix concrete plant using a 8/12 mixer is 4 to 5 metric cubes per hour which is 30-60 metric cubes per hour in a ready mix concrete plant.



Advantages of RMC

- Better handling and proper mixing practice will help to reduce the consumption of cement by 10 – 12%.
- Use of admixtures and other cementitious materials will help to reduce the amount of cement.
- The concrete mixed is used with high versatility. It is placed by following best concrete placing methods.
- Cement is saved and the dust caused is reduced as ready mix concrete make use of bulk concrete instead of bags of cement.



Advantages of RMC

- Cement saving will conserve the energy and the resources.
- Less consumption result in less production of cement hence less environmental pollution.
- More durable structure is obtained thus increasing the service life and saving the life cycle costs.
- Ready mix concrete manufacture have less dependency on human labours hence the chances of human errors is reduced. This will also reduce the dependency on intensive labours.



Advantages of RMC

- Small or large quantities of concrete as per the specification is delivered timely at the site.
- This demands no space for storing the raw materials at site. There is no delay due to site based batching plant erection/ dismantling; no equipment to hire; no depreciation of costs.
- Petrol and diesel consumed is less thus noise and air pollution is reduced.



Disadvantages of RMC

- The transit time from the time of preparation of concrete to the delivery site, will result in loss of workability.
- This will demand for additional water or admixtures to maintain the workability as per the specification.
- At site, the QA/QC engineer are supposed to check the workability through slump test before using it for construction.
- Traffic during the transit of concrete can result in setting of concrete.
- This will hence require addition of admixtures to delay the setting period. But unexpected traffic is a great problem.
- The formwork and placing arrangement must be prepared in advance in large area as the concrete can be bought in larger amounts.



Thank You!!