

Editorial on Segregation of Concrete

Sushma Pullela*

Department of Biotechnology, Osmania University, Hyderabad, Telangana, India

Introduction

Segregation of concrete is the separation of concrete ingredients so that their distribution in the concrete mix is not uniform. Over-vibration or compaction of concrete can also cause segregation, with cement paste rising to the top and particles sinking to the bottom. Concrete segregation has an impact on construction strength and durability. All concrete aggregates are equally coated with sand and cement paste in good concrete, resulting in a uniform mass.

Causes of segregation of concrete

1. In concrete, there is a high water-to-cement ratio. This is most common when concrete is mixed on the job by inexperienced employees.
2. Heavy particles sink at the bottom of the concrete when it is over-vibrated with mechanical needle vibrators, while lighter cement sand paste rises to the top.
3. When concreting underground foundations and rafts from a height, the concrete segregates. Soil stabilization can be achieved by following methods,

How to control segregation of concrete?

- The segregation can be controlled by using appropriate aggregate

grading and taking care when handling, shipping, and putting concrete.

- Segregation is less likely if the concrete does not have to travel far and is transported straight from the bucket to the final place in the form.
- The concrete should not be vibrated excessively. The vibrator should not be used to disperse a huge amount of concrete.
- Concrete entrainment minimises the probability of segregation.

Concrete segregation tests

Concrete segregation is difficult to quantify quantitatively. When concrete is handled on-site, it is immediately detectable.

The flow table test, which is used to determine concrete workability, can also be used to determine segregation.

Segregation is aided by the jolting used during the test. If the mix isn't cohesive, the larger aggregate particles will separate and travel to the table's edge.

In the test, another type of segregation is conceivable. The coarse aggregates are left behind as the cement paste runs away from the table's centre.

A concrete cylinder or cube is vibrated for roughly 10 minutes and then stripped to check for segregation caused by excessive vibration. Segregation can be discovered by looking at the distribution of coarse particles.

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***Address for Correspondence:** Sushma Pullela, Department of Biotechnology, Osmania University, Hyderabad, Telangana, India, E-mail: pullelasushma20@gmail.com

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