Triangle Tech Tips
References and resources from Triangle Ready Mix
Publication # 23-06-012

Adding Water to Concrete at the Jobsite

Why add water at the jobsite?

If ready-mixed concrete arrives at the jobsite with a lower slump than specified, or if it is viscous to the point that it adversely affects the placeability of the concrete, the buyer may wish to have the slump adjusted there on-site. This can be done while the concrete is still in the truck's mixer.

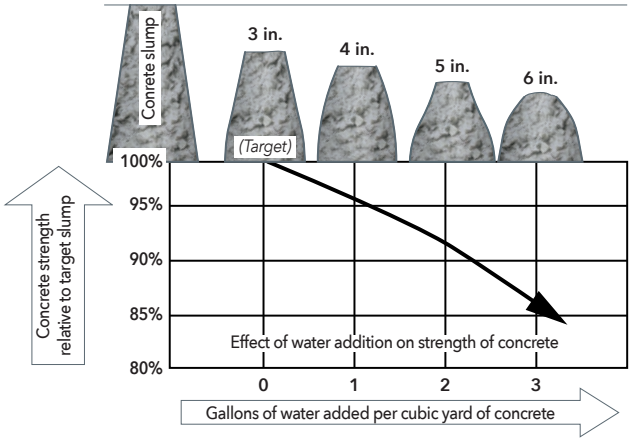
Water can be added to the concrete to bring the slump up to an acceptable or specified level. This can be done as long as the specified slump and/or the water-to-cement ratio is **not** exceeded. Adding water at the jobsite in this manner is in accordance with ASTM C 94, Standard Specification for Ready Mixed Concrete.

Effect on slump and strength

Ready mixed concrete suppliers design concrete mixes according to industry standards. This is to provide the intended performance characteristics of the concrete. Addition of water in excess of that in the mix design will affect the concrete's properties. This can include reducing strength, as shown in **Figure 1**. It can also include increasing the concrete's susceptibility to cracking.

If the buyer requests additional water in excess of the design mix, the buyer assumes responsibility for the resulting quality of the concrete.

Figure 1: Effect of water addition on slump and strength of concrete



An alternative

There is an alternative to adding water to the concrete. A water reducing admixture or superplacticizer can be used to increase the slump of the concrete, rather than adding water to it. As long as segregation is avoided, increasing concrete slump by using admixtures normally will not alter the concrete's properties significantly.

What is involved in the process?

a. The maximum allowable slump of the concrete must be specified, or determined from the specified nominal slump plus tolerances.

b. Before discharging concrete at the jobsite, the actual slump of the concrete must be estimated or determined. If the slump is measured, it should be from a sample taken from the first 1/4 cubic yard of discharged concrete, and the result used as an indicator of concrete consistency — and **not** an acceptance test. Tests for acceptance of concrete should be made in accordance with ASTM C 172.

c. At the jobsite, water should be added to the entire batch of concrete so that the volume of concrete being adjusted is known. A common rule of thumb is: 1 gallon, or roughly 10 pounds, of water per cubic yard for a 1 inch increase in slump.

d. All water added to the concrete on the jobsite must be measured and recorded.

e. ASTM C 94 requires an additional 30 revolutions of the mixer drum at mixing speed after adding the water. In fact, 10 revolutions will be sufficient if the truck is able to mix at 20 revolutions per minute or faster.

f. The amount of water added should be controlled, so that the maximum slump and/or water-to-cement ratio (as indicated in the specification) is not exceeded. After more than 1/4 cubic yard of the concrete is discharged, no water addition is permitted.

g. After obtaining the desired slump and/or maximum water-to-cement ratio, no further addition of water on the jobsite is permitted.

h. It would be wise to hold a pre-concreting conference, in order to establish the proper procedures to be followed, and to determine who is authorized to request water addition. Also, the method to be used for documentation of water added at the jobsite should be clearly defined.

ASTM C 94 Jobsite Water Addition

1. Establish the maximum allowable slump and water content permitted by the job specification.

2. Estimate or determine the concrete slump from the first portion of concrete discharged from the truck.

3. Add an amount of water such that the maximum slump or water-cement ratio according to the specification is not exceeded.

4. Measure and record the amount of water added. Water in excess of that permitted above should be authorized by a designated representative of the purchaser.

5. Mix the concrete for 30 revolutions of the mixer drum at mixing speed.

6. Do not add water if:

- **a.** the maximum water-cement ratio is reached,
- **b.** the maximum slump is obtained, or
- **c.** more than 1/4 cubic yard has been discharged from the mixer.