



**ASTM C94—  
Jobsite Water Addition**

1. Establish max allowable slump & water content permitted by the specifications.
2. Determine slump from the first portion of concrete discharged (1/4 cu yd).
3. Add amount of water allowed, once, per speciation / design for slump & W/C.
4. Measure & record added water.
5. Mixer drum should mix in water w/ 30 additional revolutions at mixing speed, or 10 revolutions at 20 revolutions per minute.
6. Do not add water if:
  - a. Max W/C has been reached.
  - b. Max slump has been obtained.
  - c. More than 1/4 cu yd has been discharged from mixer.
  - d. Water added shall be completed within 15min. from start of water Addition.



A great deal of thought is taken to design the proportions of concrete mixes to achieve desired performance characteristics that are important to the project. Some of the items that are considered are compressive strength, freeze/thaw resistance, de-icing salts, and water permeability for corrosion protection. It is critical that the entire team understands that these performance characteristics may become negatively altered with additions of water above the design limitations or changes made beyond the acceptable allowances of the codes and standards.

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- ALWAYS REVIEW** INSTALLATION PROCEDURES WITH the Contractor at **Concrete Pre-Installation Meeting**.
- Verify if the specifications allow for additional water to be added at the job site:  
*(the following is a typical paragraph to look for)*  
"CONCRETE PLACEMENT Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect."
- Determine if the maximum slump, air, and water has been delivered...if not, and the specifications do not restrict job site addition of water, additional water could be added within the ASTM C94 Guidelines.
- Identify early with the Concrete Contractor if there might be an issue with the workability of the mix design and discuss with the Engineer any suggestions.
- Higher amounts of water will create greater dispersion of the materials and greater distance between particles, resulting in concrete with properties which will be less dense, lower strength, and higher permeability.
- Concrete strength continues to increase & permeability continues to decrease with a lower W/C ratio.
- A good rule of thumb *(there are various conditions that will affect the properties of concrete to increase slump, such as concrete temperature and air content)* for effect of adding 1 gal of water to 3,000psi mix, at a 4" slump at delivery discharge at 70 degrees with a 1" course aggregate *(per 1 cu yd)*:
  - Increase slump 1".
  - Reduce compressive strength 150-200psi.
  - Waste the effect of 1/4" bag of cement.
  - Increase the shrinkage potential about 10% - leading to more chance of cracking.
  - Decrease the freeze/thaw resistance by 20%.
  - Decrease the resistance of de-icing salt damage.
  - Increase the potential of scaling.
  - Increase potential of reinforcement corrosion.
- There are other ways to increase slump without adding water...such as:
  - Change the aggregate gradation (smaller)
  - Add mid-range water reducers.
  - Add high-range water reducer (superplasticizers).



Sidewalks should have 4,000 -5,000psi for proper corrosion protection and durability to freeze/thaw conditions. 5,000 PSI is recommended.



- You should never use the sprayer to assist the concrete to run down the chute (see photo). This will add an uncontrollable amount of water that will also dilute the concrete considerably.
- Slump results should not be assumed to be the same in each truck delivered...each truck will likely have a different slump, so one should not ask for additional water based on a previous truck delivery.
- Sidewalks are the most vulnerable of over watering the concrete mix & should be avoided.

Note also that a 1% increase in air content will reduce the compressive strength generally by 3-5%.

