

Jobsite Concrete Testing

Important discussions to have!



What's covered in the contract for 3rd party testing?

Not all contracts are the same. ASTM C31 requires Slump, Air Content, and Temperature when specimens are made for acceptance testing of strength. Unit Weight & the number of Cylinders made for additional testing varies by project.



How many strength cylinders are needed for acceptance?

- ACI-318 defines a strength test as the average of at least two 4"x8" cylinders sampled, cured, and tested according to ASTM standards.
- The average of any 3 consecutive tests must be equal to or greater than the specified compressive strength, AND...
- Each individual test must be greater than $f'_c - 500$ psi.



Who provides what to cure the specimens?

The Testing Agency (MasterSpec):

- Containers for acceptance testing.
- Reports test results to owner, architect, contractor, and concrete manufacturer within 48 hrs.
- Report to include results of ASTM C31, ASTM C39, and ACI 301, as well as info on storage and curing of samples before testing, including curing methods and max and min temps during initial curing period.
- Curing temp of 60-80 degrees up to 48 hours, until transportation to lab, per ASTM C31.

The Contractor (MasterSpec and ACI 301)

- Provide daily access & secure space for the storage, initial curing (or field curing) of samples.
- Provide source of water & continuous electrical power at project site.



Standard Curing Cylinders

Acceptance test specimens shall be standard cured in accordance with ASTM C31, as stated in ACI 318 and ACI 301. Standard curing consists of initial curing at the site, transportation to lab, and final cure at the lab.



Optional Field Curing Cylinders

Field cured specimens are not to be used as the basis for acceptance of the concrete delivered to the project. Samples are stored on the structure to mimic curing of concrete in the structure to evaluate the adequacy of curing and protection of the concrete in the structure. (ASTM C31)



Unit weight/density. Is it a required test?

Unit weight is not required according to ASTM C31, however, ACI 301 requires unit weight whenever strength specimens are molded.



Key ASTM Specified Testing Methods

- ASTM C31 Standard Practice for Making and Curing Concrete Test Specimens in the Field
- ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens



Key ACI Specifications for Jobsite Testing

- ACI 301 Specification for Structural Concrete
- ACI 318 Building Code Requirements for Structural Concrete
- ACI 311.6 Specification for Testing Ready-Mixed Concrete



Who needs to be included in the pre-con meeting?

Concrete Producer, 3rd Party Testing Company, Concrete Contractor, etc.

All of these topics should be covered in the pre-construction conference!
If curing is not in accordance with ASTM C31,
test data shows there may be up to a 20% reduction in the 28 day compressive strength.