

Optional Special Provisions

Contracting Agency Testing:

The following "Contracting Agency Testing" special provision may be used to incorporate contracting agency quality control testing in lieu of contractor quality control testing. This special provision requires the contracting agency to perform acceptance tests for compressive strength, air content, and temperature. The contractor will determine the concrete mix design, provide aggregate quality testing and perform all contractor process control testing.

This special provision modifies the Portland Cement Concrete Pavement and Flatwork Specification requiring contracting agency quality control testing for acceptance of compressive strength, air content, slump, and temperature. The contractor will determine the concrete mix design, provide aggregate quality testing and perform all contractor process control testing.

Replace section 1.2.4 with the following:

1.2.4 Approval by Sampling and Testing

Approval of materials will be based on a combination of the results of the following:

1. Contracting agency testing.
2. Optional contractor assurance testing.
3. Inspections of the materials production, storage, handling, and construction processes.
4. Dispute resolution procedures.

Replace section 1.3 with the following:

1.3 Contracting Agency and Contractor Testing

1.3.1 General

Concrete acceptance tests for compressive strength, air content, slump, and temperature will be performed by the contracting agency. The contractor will be responsible for the concrete mix design, aggregate quality testing and optional process control testing.

1.3.2 Personnel

Perform the material sampling, testing, and documentation required using a certified technician.

1.3.3 Laboratory

Perform the concrete mix design and aggregate testing at a qualified laboratory.

1.3.4 Equipment

Furnish the necessary equipment and supplies for performing quality control testing. Calibrate all testing equipment and maintain a calibration record at the laboratory.

1.3.5 Concrete Mixes

Determine Class I and Class II Concrete mixes for the project conforming to Part 2. Test concrete during mix development at a qualified laboratory.

Submit a concrete pavement mix report at least 3 days before producing concrete in accordance with section **Error! Reference source not found.** or section **Error! Reference source not found.**. On the mix report clearly indicate the type/classification of aggregates per section 2.3.3.1.

1.3.6 Documentation

Submit test results to the engineer and contractor upon request.

1.3.7 Testing

1.3.7.1 General

Perform all quality control tests necessary to control the production and construction processes. Use the test methods identified below to perform the following tests:

Aggregate gradations	AASHTO T 11 & T 27
Aggregate materials finer than the No. 200 sieve	AASHTO T 11
Aggregate moisture	AASHTO T 255
Sampling Freshly mixed concrete	AASHTO R60
Air content	AASHTO T 152
Slump	AASHTO T 119
Temperature	ASTM C1064
Compressive Strength	AASHTO T 22, T 23, M 201

1.3.7.2 Aggregate Gradation

1.3.7.2.1 Sampling and Testing

The engineer may accept aggregate gradation based upon satisfactory records of previous testing.

Randomly sample and test the individual aggregate gradations according to AASHTO T 11 and AASHTO T 27. Have a certified technician sample and test the aggregate and document the results.

Test aggregates during production at a minimum frequency of 1 test per 1000 tons of aggregate produced up to a maximum of 3 tests per day. Production tests may be performed during aggregate production or during load out from aggregate source stockpile to plant site stockpile.

If aggregate production test records are not available or not acceptable to the engineer, sample and test aggregates during concrete production at a minimum frequency of 1 test per 500 cubic yards of concrete produced up to a maximum of 3 tests per day.

1.3.7.2.2 Documentation

Maintain control charts or tables at the laboratory for each aggregate stockpile. Maintain a chart or table for each control sieve for each material. Record contractor test results the same day tests are conducted.

Notify the engineer whenever an individual test value exceeds a control limit. Material is nonconforming when an individual test exceeds the control limit. The quantity of nonconforming material includes the material of the first test exceeding the control limit, continuing to but not including, the material from the first subsequent test that is within the control limits.

1.3.7.3 Aggregate Percent Passing the No. 200 Sieve

1.3.7.3.1 Sampling and Testing

Have a certified technician sample and test the aggregate and document the results.

Measure and record the percent passing the No. 200 sieve of both the fine and coarse aggregates when producing concrete pavement. Conduct tests according to AASHTO T 11.

Sample and test at least one combined aggregate gradation prior to producing concrete for the project. Sample and test aggregates during concrete production at a minimum frequency as follows:

1. One test per 200 CY of concrete production up to a maximum of one test per day.
2. One test per 5 days of concrete production when the previous 5 consecutive p200 test results are less than or equal to 2.0 percent.

Ensure that the combined aggregate gradation, expressed as weight percentages of the total aggregate, for the percent passing the No. 200 sieve is less than or equal to 2.3 percent.

1.3.7.3.2 Documentation

Document testing using a combined gradation control chart or table for the percent passing the No. 200 sieve.

Notify the engineer whenever an individual test value exceeds a control limit. Material is nonconforming when an individual test exceeds the control limit. The quantity of nonconforming material includes the material of the first test exceeding the control limit, continuing to but not including, the material from the first subsequent test that is within the control limits

1.3.7.4 Concrete Sampling

Sample fresh concrete at the point of placement

1.3.7.5 Slump

The contracting agency shall have a certified technician measure slump according to AASHTO T 119.

Slumps for nonslip-formed work shall be 4-inches or less.

1.3.7.6 Concrete Temperature

The contracting agency shall have a certified technician measure concrete temperature according to ASTM C 1064 when concrete temperatures at the point of placement are subject to fall below 60 F.

1.3.7.7 Air Content

1.3.7.7.1 Sampling and Testing

On each day of production the contractor shall test air content at the point of placement at start-up and as frequently as practicable until the concrete meets the specifications and the production process is under control.

The contracting agency shall test air content as follows:

For class I concrete items test air content for each compressive strength test.

For class II concrete items test air content at a minimum frequency of one test per 100 CY of concrete.

The contracting agency shall have a certified technician test air content according to AASHTO T 152. Test concrete taken from the same sample used for strength cylinders.

The concrete air content control limits after applying the aggregate correction factor is as follows:

- Slip-formed concrete 7.0 percent +/- 1.5 percent
- All other concrete 6.0 percent +/- 1.5 percent

Make every attempt to run at or above the target air content.

1.3.7.7.2 Documentation

Ensure that all test results are recorded and become part of the project records. Submit air content test results to the contractor on the compressive strength test reports.

If an individual air test is outside the control limits, notify the contractor, and perform additional air tests as often as it is practical on subsequent loads until the air content is inside the control limits. The material is nonconforming when an individual test exceeds the control limit. Material from the load with the first test exceeding the control limit, continuing to but not including the load with the first subsequent test within the control limits, is nonconforming.

1.3.7.8 Compressive Strength

Acceptance of concrete will be based on 28 day compressive strength of concrete cylinders performed by the contracting agency.

1.3.7.8.1 Sampling and Curing

The contracting agency shall sample according to AASHTO R 60 and cast and initially cure the cylinders according AASHTO T 23.

For class I concrete items randomly select and cast one set of 3 standard 6X12 inch cylinders for each mix grade and placement type at a minimum frequency of one test per 500 CY of concrete, and in any event, not less than one test for each ½ day of placement.

For class II concrete items randomly select and cast one set of 2 standard 6x12 cylinders for each mix grade and placement type at a minimum frequency of one test per 200 CY of concrete.

Do not cast more than one set of cylinders from a single truckload of concrete.

The contracting agency shall provide facilities for initial curing and transport the specimens to a qualified laboratory for standard curing according to AASHTO M 201 for 28 days.

1.3.7.8.2 Compressive Strength Testing

The contracting agency shall have a certified technician, in a qualified laboratory, perform compressive strength testing and document the results. For class I concrete randomly select 2 cylinders to test at 28 days. For class II concrete select 2 cylinders to test at 28 days.

Determine the 28-day compressive strength in psi of each cylinder according to AASHTO T 22. Test each cylinder to failure. Use a compression machine that automatically records the date, time, rate of loading, and maximum load of each cylinder. Include a printout of this information with the compressive strength documentation for each cylinder tested.

For Class I concrete compare the strengths of the 2 randomly selected cylinders and determine the 28-day average strength as follows:

- If the lower strength divided by the higher strength is 0.9 or more, average the 2 cylinders.
- If the lower strength divided by the higher strength is less than 0.9, break one additional cylinder and average the 2 higher strength cylinders.

For Class II concrete determine the 28-day average strength by averaging the 2 cylinders.

1.3.7.8.3 Compressive Strength Evaluation

The contracting agency shall furnish the contractor with a copy of all test reports

For Class I concrete no less than one test for each 500 cubic yards of concrete placed will be required, and in any event, not less than one test for each ½ day of placement.

For Class II concrete no less than one test for each 200 cubic yards of concrete placed will be required.

If the average 28 day compressive strength is less than 3250 psi or if either of the two 28 day cylinders has a compressive strength less than 3000 psi the engineer may direct the contractor to core the subject area to determine its structural adequacy and whether to direct removal. Cut and test cores according to AASHTO T 24 as and where the engineer directs. Have a certified technician perform or observe the coring. Fill all core holes with an approved grout, and provide traffic control during coring at the contractors expense.

The concrete is conforming if the compressive strengths of all cores from the represented area are 3000 psi or greater or the engineer does not require coring.

The concrete is nonconforming if the compressive strength of any core from the represented area is less than 3000 psi.