

HCMT CONCRETE CERTIFICATION

KEY ELEMENTS LIST

Release Date: October 2024

PERFORMANCE CHECKLIST

AASHTO R 60 Sampling Freshly Mixed Concrete

Global Constraints

- 1 Total elapsed time allowable between obtaining first and final portions of the composite sample.
- 2 Before starting tests, individual samples must be ____ & ____.
- 3 Temperature, air, and slump tests should be started within how long after obtaining the final portion of the composite sample?
- 4 Protect the sample from sources of ____ & ____.
- 5 What is the minimum sample size for strength tests?
- 6 After fabricating composite sample, samples for strength tests should be molded within _____ minutes.

Sampling from Revolving Drum Truck Mixers or Agitators

- 1 Collect how many portions?
- 2 Specimens for temperature, air, and slump may be taken after at least _____ has been discharged.
- 3 For strength test specimens, avoid sampling what parts of the batch discharge?
- 4 Describe the two methods for obtaining a sample from a revolving drum mixer or agitator.
- 5 Should a sample be taken before or after water is added to mix?
- 6 What is the correct method for regulating rate of discharge out of a drum?

PERFORMANCE CHECKLIST

AASHTO T 309 Temperature of Freshly Mixed Concrete

- 1 Sample must be large enough to provide how much cover around sensor?
- 2 Tolerance (accuracy) of approved thermometer?
- 3 Place thermometer in sample as specified.
- 4 Gently press concrete around sensor.
- 5 Read temperature within time constraints.
- 6 Record temperature to within specified tolerance.

PERFORMANCE CHECKLIST

AASHTO T-119 Slump of Hydraulic Concrete

- 1 Describe proper conditions for base and prepare cone and base.
- 2 Stabilize apparatus as specified.
- 3 Ensure sample is representative.
- 4 Introduce layer of material to specified depth.
- 5 Rod layer specified number, distribution, and depth of strokes using proper rod.
- 6 Repeat steps 4 & 5 for specified number of layers.
- 7 Level of concrete in mold for last layer.
- 8 Strike off excess concrete with proper tool.
- 9 Lift cone as specified.
- 10 Measure slump to specified tolerance.

PERFORMANCE CHECKLIST

AASHTO R-100 Making and Curing Concrete Test Specimens in the Field

- 1 Place mold on surface meeting specification.
- 2 Select a representative sample.
- 3 Place layer in mold as specified.
- 4 Rod layers as specified.
- 5 Consolidate as specified.
- 6 Strike off the surface with a tamping rod or, if necessary, finish with a trowel or float. Use the minimum amount of manipulation necessary to produce a flat even surface.
- 7 Cover specimens with a non absorptive, non reactive sheet, cap, or plate.
- 8 If specimen will be used for acceptance testing, quality control, or trial batching mix designs, which curing method should be used?
- 9 If specimen will be used to determine when a structure can be put into service or when shoring can be removed, which curing method should be used?
- 10 Which three tests must always be performed when making test specimens?

PERFORMANCE CHECKLIST

AASHTO T-121 Weight per Cubic Foot, Yield, And Air Content of Concrete

- 1 Determine the weight of the empty 0.5 ft³ measure.
- 2 Introduce layer of material to specified depth.
- 3 Rod layer specified number, distribution, and depth of strokes using proper rod.
- 4 Consolidate layer properly.
- 5 Repeat steps 2, 3, & 4 for specified number of layers.
- 6 Last layer filled to proper height?
- 7 Strike off the concrete to a smooth surface with a flat strike off plate.
- 8 Clean off all excess concrete and determine the weight of the full measure.
- 9 Calculate net weight.
- 10 Calculate the unit weight in lbs/ft³

PERFORMANCE CHECKLIST

AASHTO T-152 Air Content of Freshly Mixed Concrete by Pressure Method

- 1 Prepare measuring bowl.
- 2 Introduce layer of material to specified depth.
- 3 Rod layer specified number, distribution, and depth of strokes using proper rod.
- 4 Consolidate layer properly.
- 5 Repeat steps 2, 3, & 4 for specified number of layers.
- 6 Last layer filled to proper height?
- 7 Strike off excess concrete with proper tool and prepare bowl for cover.
- 8 Prepare cover and clamp to base.
- 9 Petcocks open or closed?
- 10 Fill with water and remove air as specified.
- 11 Pump up to specified pressure.
- 12 Allow a few seconds for the compressed air to stabilize and adjust the gauge to specified pressure line.

AASHTO T-152 Air Content of Freshly Mixed Concrete by Pressure Method

- 13 Close both petcocks.
- 14 Open air valve between chamber and bowl.
- 15 Relieve local constraints.
- 16 Stabilize the gauge hand.
- 17 Read the air percentage.
- 18 Release pressure as specified and remove cover.
- 19 Calculate air content correctly:

PERFORMANCE CHECKLIST

AASHTO T-196 Air Content of Freshly Mixed Concrete by Volumetric Method

- 1 Prepare measuring bowl.
- 2 Introduce layer of material to specified depth.
- 3 Rod layer specified number, distribution, and depth of strokes using proper rod.
- 4 Consolidate layer properly.
- 5 Repeat steps 2, 3, & 4 for specified number of layers.
- 6 Last layer filled to proper height?
- 7 Strike off excess concrete with proper tool and prepare bowl for cover.
- 8 Clamp the top section into position and add water and alcohol using the funnel.
- 9 Adjust the liquid level using rubber syringe.
- 10 Attach cap as specified.

PERFORMANCE CHECKLIST

AASHTO T-196 Air Content of Freshly Mixed Concrete by Volumetric Method

- 11 Invert and agitate for specified minimum time.
- 12 Tilt, turn, and roll as specified.
- 13 Stabilize liquid level as specified.
- 14 Repeat step 12 and 13 until two consecutive readings do not change by more than specified amount.
- 15 Take reading to specified tolerance.
- 16 Do what if liquid level does not reach window? (Verbal)
- 17 Calculate the air content.

PERFORMANCE CHECKLIST

Type B Air Meter Calibration

- 1 Insert specified tube into proper opening.
- 2 Prepare cover and introduce water.
- 3 Open petcocks and add water through specified opening.
- 4 Pump up to initial pressure.
- 5 Introduce air as specified.
- 6 Verify initial pressure line and adjust if necessary.
- 7 Adjust gauge if? How? (Verbal)
- 8 Insert specified tube and fill vessel to top.
- 9 Bring air to specified %.
- 10 Bring gauge to initial pressure reading.
- 11 Take pressure reading.
- 12 Verify correct reading within specified tolerance.
- 13 If 2 or more determinations show the same variation from the correct air content?

PERFORMANCE CHECKLIST

AASHTO T-22 Compressive Strength of Cylindrical Concrete Specimens

- 1 Check the ends of the cylinder and verify they do not depart from perpendicularity by more than tolerance.
- 2 Check the ends of the cylinder for depressions outside tolerance.
- 3 Measure diameter of specimen at 2 right angles at mid height of cylinder.
- 4 Individual diameters cannot differ by more than _____?
- 5 Examine the pads for splits or cracks.
- 6 Pads may be reused how many times?
- 7 All lab cured cylinders shall be tested in the _____ condition.
- 8 Concrete cylinder, caps, bearing surfaces of extrusion controllers, and bearing blocks of the test machine must be free of _____?
- 9 Align the axis of the cylinder with the center of thrust of the testing machine by centering the upper retaining ring on the spherically seated bearing block.
- 10 Turn on the testing machine and allow it to warm up. When the machine has warmed up, zero reading before applying load to specimen.
- 11 Rotate movable upper bearing block to attain uniform seating on top of specimen.
- 12 Apply load at Full Advance until one-half of the anticipated maximum load is attained, then slow to a rate of movement corresponding to a stress rate of _____?
- 13 Apply the compressive load until _____?
- 14 Record the maximum load and compressive strength to the specified accuracy.
- 15 Note the type of failure and the appearance of the concrete.