



## Performance Examination - Concrete

### Standard Practice for Making Curing Concrete Test Specimens in the Field (ASTM C31 / C31M-17) [AASHTO T 23-18]

Candidate Name: \_\_\_\_\_ NICET ID: \_\_\_\_\_

| Apparatus  | Trial<br>1 | Trial<br>2 |
|--|------------|------------|
| <b>Molds</b>   |            |            |
| Shall be constructed in the form of right circular cylinders which stand with the cylindrical axis vertical and the top open to receive the concrete.  |            |            |
| Molds shall be made of materials that do not react with concrete containing Portland or other hydraulic cement.  |            |            |
| Molds shall be watertight and sufficiently strong and tough to permit their use without tearing- crushing- or deforming.   |            |            |
| For reusable molds, coat sides with Mineral Oil or suitable non-reactive form release material before use.   |            |            |
| Molds for casting concrete test specimens shall conform to the requirements of C470.   |            |            |
| Verify the tamping rod is a round, smooth, straight, steel rod and has the tamping end or both ends rounded to a hemispherical tip of the same diameter as the rod.  |            |            |
| If diameter of the cylinder is 6 in. (150 mm) or larger, verify the rod has a diameter of $\frac{5}{8}$ in. $\pm \frac{1}{16}$ in. (16 mm $\pm$ 2 mm) and at least 4 in. greater than the depth of mold being rodded, but not greater than 24 in. (600 mm) in overall length. If diameter of the cylinder is less than 6 in. (150 mm), verify the rod has a diameter of $\frac{3}{8}$ in. $\pm \frac{1}{16}$ in. (10 mm $\pm$ 2 mm) and at least 4 in. greater than the depth of mold being rodded but not greater than 24 in. (600 mm) in overall length.   |            |            |
| <p><b>Internal Vibrators:</b> The vibrator frequency shall be at least 9000 vibrations per minute (150 Hz) while the vibrator is operating in the concrete.</p> <p>The diameter of vibrator shall be no more than one-fourth the diameter of the cylinder mold or one-fourth the width of the beam mold.</p> <p>Other shaped vibrators shall have a perimeter equivalent to the circumference of an appropriate round vibrator.</p> <p>The combined length of the vibrator shaft and vibrating element shall exceed the depth of the section being vibrated by at least 3 in. (75 mm).</p> <p>The vibrator frequency shall be checked periodically with a vibrating-reed tachometer or other suitable device.</p> <p>(For information on size and frequency of various vibrators and a method to periodically check vibrator frequency, see ACI 309R).</p> |            |            |
| <b>Mallet</b> Rubber or Rawhide head weighing 1.25 $\pm$ 0.50 lbs (0.6 $\pm$ 0.2 kg)   |            |            |
| <b>Scoop</b> A size large enough so each amount of concrete obtained from the sampling receptacle is representative and small enough so concrete is not spilled during placement in the mold. For placing concrete in a cylinder mold, the acceptable tool is a scoop. For placing concrete in a beam mold, either a shovel or scoop is permitted. A handheld float or a trowel.   |            |            |

Examiner Name: \_\_\_\_\_ Examiner Signature: \_\_\_\_\_ Date: \_\_\_\_\_



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| Apparatus (continued)   | Trial<br>1 | Trial<br>2 |
|---|------------|------------|
| <b>Sample Receptacle:</b> The receptacle shall be a suitable heavy gauge metal pan, wheelbarrow, or flat, clean, nonabsorbent board of sufficient capacity to allow easy remixing of the entire sample with a shovel or trowel. |            |            |
| <b>Air Content Apparatus:</b> The apparatus for measuring air content shall conform to the requirements of Test Methods C173 or C231.   |            |            |
| <b>Temperature Measuring Device:</b> The temperature measuring devices shall conform to the applicable requirements of Test Method C1064.   |            |            |

| Procedures  | Trial<br>1 | Trial<br>2 |
|---|------------|------------|
| Use a scoop to place concrete in the mold. Use care to distribute the material evenly around the perimeter of the mold.   |            |            |
| <b>For the first layer</b>  |            |            |
| 1. Fill the mold with the appropriate quantity of concrete: approximately 1/2 the volume for a 4-by-8-in. mold or 1/3 the volume for a 6-by-12-in. mold.  |            |            |
| 2. Rod the layer 25 times throughout its depth, using care not to damage the bottom of the mold. Distribute the roddings uniformly over the cross-section of the mold.  |            |            |
| 3. Tap the outsides of the mold lightly 10 to 15 times with the mallet (or open hand if susceptible to denting or other permanent distortion if tapped with a mallet) to close any holes left by rodding and to release any large air bubbles that may have been trapped. |            |            |
| <b>For the second layer</b>   |            |            |
| 1. Fill the mold with the appropriate quantity of concrete to fill a 4-by-8-in. mold or to approximately 2/3 the volume for a 6-by-12-in. mold.   |            |            |
| 2. Rod the layer 25 times, penetrating into the layer below approximately 1 in. Distribute the roddings uniformly over the cross-section of the mold.   |            |            |
| 3. Tap the outsides of the mold lightly 10 to 15 times with the mallet (or open hand if susceptible to denting or other permanent distortion if tapped with a mallet) to close any holes left by rodding and to release any large air bubbles that may have been trapped. |            |            |

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| Procedures (continued)   | Trial<br>1 | Trial<br>2 |
|--|------------|------------|
| <b>For the third layer</b>   |            |            |
| 1. Add an amount of concrete that will fill the mold after consolidation.<br>Rod the layer 25 times, penetrating the layer below approximately 1 in.<br>Distribute the roddings uniformly over the cross-section of the mold.<br>Tap the outsides of the mold lightly 10 to 15 times with the mallet (or open hand susceptible to denting or other permanent distortion if tapped with a mallet) to close any holes left by rodding and to release any large air bubbles that may have been trapped.<br>Adjust the concrete level of under-filled and overfilled molds if necessary. |            |            |
| 2. Strike off any excess concrete with the tamping rod, or with a handheld float or trowel if appropriate, to produce an even flat surface.  |            |            |
| 3. Verify that the specimen mold has been marked to identify the concrete it represents.   |            |            |
| 4. Immediately after finishing, protect to prevent sample moisture loss and move the specimens to an initial curing place for storage.   |            |            |

**First Attempt:** Pass: \_\_\_\_\_ Fail: \_\_\_\_\_ **Second Attempt:** Pass: \_\_\_\_\_ Fail: \_\_\_\_\_

**Exam Administration:** Remote \_\_\_\_\_ In-Person \_\_\_\_\_

**Comments:**

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**Examiner Name:** \_\_\_\_\_ **Examiner Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_