



American Concrete Institute®

**Certification Policies
for
Concrete Strength Testing Technician**

*Last revised by the Certification Programs Committee
October 23, 2012*

The statements contained herein are a consolidation of approved policies and procedures. This policy statement supersedes all previous action of the ACI Board of Direction with respect to Concrete Strength Testing Technician certification.

The certification program policies are broken down into eight sections as follows:

- Section 1.0 Certification Criteria
- Section 2.0 Examination Criteria
- Section 3.0 Re-examination Criteria
- Section 4.0 Appeals Criteria
- Section 5.0 Sponsoring Group Criteria
- Section 6.0 Examiner/Supplemental Examiner Criteria
- Section 7.0 ACI Responsibilities
- Section 8.0 Recertification Criteria

SECTION 1.0 CERTIFICATION CRITERIA

- 1.1 The American Concrete Institute (ACI) certification program for Concrete Strength Testing Technician requires successful completion of a written examination and a performance examination. No certifications will be granted by ACI without successful completion of both examinations.
- 1.2 No specific education or work experience is required as a prerequisite for Concrete Strength Testing Technician certification.
- 1.3 ACI certification as a Concrete Strength Testing shall be valid for a period of five [5] years from the date all certification requirements are completed.
- 1.4 Certification is renewed by satisfying the recertification requirements.

SECTION 2.0 EXAMINATION CRITERIA**GENERAL REQUIREMENTS**

- 2.1 The content of the written and performance examinations for certification as a Concrete Strength Testing Technician is derived from the following four (4) Test Methods and Practices, or their equivalents, as presented in the most up-to-date version of the ACI Certification CP-19 technician workbook:

ASTM C39/C39M	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C78	Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
ASTM C617	Standard Practice for Capping Cylindrical Concrete Specimens
ASTM C1231/C1231M	Standard Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Concrete Cylinders

Information contained in the footnotes and appendices of the above referenced documents shall not be subject to examination.

ACI will grant certification to examinees who successfully complete both the written and performance examinations within a one (1) year period.

- 2.2 There shall be no questions regarding general concrete technology on the written examination.

- 2.3 The examinations shall be conducted by the examiner, proctors, and/or supplemental examiners as applicable. [See Section 6.0]
- 2.4 The Examiners, Proctors, Supplemental Examiners, and/or Sponsoring Groups have no jurisdiction over the content of any examination or over the grading of the written examination.
- 2.5 All written and performance examinations are closed-book. Notes or other technical material will not be permitted in the examination area. Use of simple-function (*i.e.*, non-programmable) calculators will be permitted, but examinees will not be allowed to share calculators.

WRITTEN EXAMINATION

- 2.6 The written examination for certification as a Concrete Strength Testing Technician shall consist of approximately thirty-five to forty [35–40] multiple choice questions, with eight to ten [8–10] questions on each Test Method and/or Practice.
- 2.7 A maximum of one [1] hour shall be permitted for completion of the written examination.
- 2.8 Oral administration of the written examination is permitted, contingent upon prior approval in writing by the ACI Certification Department.
- 2.9 Successful completion of the written examination shall be considered as meeting both the following requirements:
 - A) Score sixty percent [60%] or higher on each individual Test Method and/or Practice (*i.e.*, six [6] correct out of ten [10] questions); AND
 - B) Score a minimum of seventy percent [70%] for the overall examination (*i.e.*, twenty-eight [28] correct out of a possible forty [40]).

PERFORMANCE EXAMINATION

- 2.10 The performance examination for certification as a Concrete Strength Testing Technician requires the examinee to perform, in their entirety, each of the following Test Methods and Practices: ASTM C39/C39M, ASTM C78, ASTM C617 and ASTM C1231/C1231M.
- 2.11 The examinee shall conduct the performance examination in the direct presence of the examiner or supplemental examiner(s).
- 2.12 The examinee's performance shall be evaluated based on the criteria of the performance examination checklist.

- 2.13 Grading for the individual performance examinations shall be on a pass/fail basis only, with the examiner/supplemental examiner indicating a passing or failing score for each step of the checklist.
- 2.14 Incorrect performance, or omission of one or more of the steps of the performance checklist, shall constitute failure of that trial.
- 2.15 An examinee shall be allowed a second trial for each of the applicable Test Methods and/or Practices, on the same day of the examination, if the first trial was not successfully completed.
- 2.16 The second trial of a particular test shall not be conducted immediately following the first trial.
- 2.17 An examinee shall be permitted to suspend one trial and begin the procedure over again. A voluntary suspension of a trial shall not be counted as a failure of that trial.
- 2.18 The examiner/supplemental examiner shall not stop a trial when an error is made.
- 2.19 A second trial (or voluntary repeat of a trial) shall require performance of the entire Test Method or Practice from the beginning of the test, not from the point the error was made or the trial was suspended.
- 2.20 Immediately following completion of each trial, the examiner/supplemental examiner shall inform the examinee of the results, either pass or fail.
- 2.21 When a failure of a trial has occurred, the examiner/supplemental examiner shall inform the examinee of the particular step(s) performed incorrectly.
- 2.22 The examinee shall be permitted to leave the examining area between trials to consult notes or books.
- 2.23 It shall be the Sponsoring Group's responsibility to provide equipment that conforms to the applicable Test Methods and Practices and to ensure that the equipment is in proper working order. The examinee shall not be penalized as a result of faulty or incorrect equipment.
- 2.24 Failure on any of the prescribed Test Methods and/or Practices after two [2] trials will constitute failure of that part of the performance examination.

SECTION 3.0 RE-EXAMINATION CRITERIA

- 3.1 Failure of the written examination by either of the criteria cited under Section 2.9 shall require re-examination on the entire written examination.

- 3.2 Invalidation of the performance examination (e.g., non-conformance with Section 6.5) or failure on one [1] or more of the four [4] required Test Methods and Practices shall require re-examination on the entire performance examination.
- 3.3 Successful re-examination on the written or performance examination must be completed within one [1] year of the initial examination. Otherwise, both the written and the performance examinations must be retaken in their entireties.

SECTION 4.0 APPEALS CRITERIA

- 4.1 All appeals shall be directed initially to the examiner.
- 4.2 In the event that the examinee is not satisfied with the decision of the examiner regarding an appeal, the examinee may pursue an appeal with ACI according to the following order:
 1. Sponsoring Group
 2. ACI Director of Certification
 3. The Certification Appeals Committee [consisting of the Director of Certification, the Chairman of the Certification Programs Committee, and the Chairman of Committee C 620]
 4. Committee C 620, Laboratory Technician Certification
 5. Certification Programs Committee
- 4.3 Appeals submitted to ACI for consideration must be received, in writing, within sixty [60] days of the receipt of the examination at ACI Headquarters.

SECTION 5.0 SPONSORING GROUP CRITERIA

Groups desiring to conduct ACI Certification program(s) shall adhere to the current Policy on Sponsoring Groups for Certification.

SECTION 6.0 EXAMINER / SUPPLEMENTAL EXAMINER CRITERIA

- 6.1 The examiner shall be approved by ACI. Qualifications shall be submitted on Form D1/D3 and shall be evaluated according to ACI-approved criteria.
- 6.2 The examiner shall be authorized by ACI to conduct the ACI certification examinations for Concrete Strength Testing Technician.
- 6.3 The examiner shall meet the following requirements:
 - A) Be a registered professional engineer;
 - B) Have had at least two [2] years of recent experience in concrete construction, inspection, or testing; and

- C) Be thoroughly familiar with the current applicable Test Methods and Practices.
- 6.4 Examiners, supplemental examiners, examiners acting as supplemental examiners and proctors shall not conduct any portion of the examination for anyone with whom he/she is personally related.
- 6.5 Examiners/supplemental examiners shall not examine anyone on the performance examination who is employed in the same organization. Governmental or other organizations may petition ACI, in writing, and request a waiver of this restriction. ACI may grant waivers, on a case by case basis, only if it can be shown that the intent of the policy will be maintained.
- 6.6 Supplemental examiners shall be permitted to assist in conducting the performance examination, and may be authorized to conduct the performance examination without the direct supervision of an Examiner with prior approval of ACI Committee C 620.
- 6.7 Supplemental examiners shall satisfy the following requirements:
- A) Have recent experience in concrete testing;
 - B) Be selected and adjudged qualified by the examiner or ACI Committee C 620;
 - C) Be considered trustworthy and conscientious.
- 6.8 Proctors shall be permitted to assist the examiner in conducting the written examination.
- 6.9 Proctors shall satisfy the following requirements:
- A) Be considered trustworthy and conscientious by the Examiner.
 - B) Be selected by the Examiner.
- 6.10 The examiner shall be directly responsible for the following activities:
- A) Select the supplemental examiners and proctors, except in cases where the supplemental examiners are approved in advance by ACI Committee C 620;
 - B) Verify the qualifications of the supplemental examiners and proctors according to the criteria outlined in Section 6.4 through 6.9 of this policy;
 - C) Order examinations;
 - D) Verify the identity of each examinee, and ensure that the examinees are aware of the certification criteria;
 - E) Verify that the examinees have signed the release statement on the written and performance examinations prior to testing;
 - F) Verify that the performance evaluations were conducted by approved supplemental examiners, and co-sign the performance checklists where appropriate;

- G) Enter the appropriate grade for the completed performance examination on the checklist report;
 - H) Ensure that all examinees have an opportunity to take a second trial on any failed procedure of the performance examination; and
 - I) Shall not define terms or interpret examination questions during the course of the written examination.
- 6.11 Examiners or supplemental examiners shall not observe more than one examinee conducting tests at any one time during the performance examination.
- 6.12 The examination sessions must be supervised constantly by the examiner, supplemental examiner(s) and/or proctor(s).

SECTION 7.0 ACI DUTIES AND RESPONSIBILITIES

- 7.1 ACI shall approve the Sponsoring Group.
- 7.2 ACI shall authorize the Sponsoring Group to conduct examining sessions for Concrete Strength Testing Technician certification.
- 7.3 ACI shall approve the examiner.
- 7.4 ACI shall grade the written examinations and review the performance examination, and notify the examinee, examiner and the Sponsoring Group of the final results in writing.
- 7.5 ACI shall authorize the issuance of certificates to examinees who have satisfied the certification requirements.
- 7.6 ACI shall certify the examinees who have satisfied the certification requirements.
- 7.7 ACI shall issue a certificate and identification card to successful examinees.
- 7.8 ACI shall keep all written exam scores confidential, unless authorized in writing by the examinee.

SECTION 8.0 RECERTIFICATION CRITERIA

Recertification as a Concrete Strength Testing Technician requires successful completion of the then current certification requirements outlined in Sections 1.0, 2.0 and 3.0 of this policy.

Job-task analysis (JTA) for ACI Certification of Concrete Strength Testing Technician**ASSESSMENT METHODS:**

Written exam—general (understand concepts) or working (know specific facts) knowledge

Performance exam— perform specific tasks (or describe verbally, where allowed)

RESOURCES:

ASTM C617/617M – Standard Practice for Capping Cylindrical Concrete Specimens

ASTM C1231/1231M – Standard Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Concrete Cylinders

ASTM C39/39M – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

ASTM C78/78M – Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)

ASTM C617/617M – Standard Practice for Capping Cylindrical Concrete Specimens

- Understand scope of practice
- Understand significance and use of practice
- Know dimensional requirements of capping plates
- Know criteria for sulfur melting pots
- Understand use of Table 1 for strength and thickness requirements of capping materials
- Understand requirements for qualification of high-strength gypsum plaster
- Understand requirements for qualification of sulfur mortar caps
- Know and perform the procedures for capping hardened concrete specimens
- Know how to protect and store specimens after capping
- Understand safety issues related to melting pots
- Know the requirements for and perform alignment check of cylinders
- Know and perform the procedure for planeness check of caps, including the proper reporting of results
- Know and perform the procedure for thickness measurements of caps, including the proper reporting of results

ASTM C1231/1231M – Standard Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Concrete Cylinders

- Understand scope of practice
- Know compressive strength limits for the use of unbonded caps
- Understand significance and use of unbonded caps
- Know dimensional, material, and hardness requirements of elastomeric pads
- Know dimensional, material, and planeness requirements of pad retainers
- Know requirements governing the use of elastomeric pads
- Know the requirements for and perform perpendicularity check of concrete cylinder ends prior to test
- Know the limits for and perform check for depressions in concrete cylinder ends prior to test

Job-task analysis (JTA) for ACI Certification of Concrete Strength Testing Technician (Continued)

- Know requirements for the use of unbonded caps in combination with other capping methods
- Know wear requirements for pads and perform examination for excessive wear
- Know and perform the procedures for centering, initial loading, and checking specimens for perpendicularity
- Know and perform the procedures for loading, testing, and calculation per Test Method C39/C39M, including the proper reporting of test results
- Understand methodology used to qualify the use of unbonded caps for various strength levels and to qualify the permitted number of pad reuses
- Understand the use of calculations used in qualification testing for computing the difference in strength for each pair of cylinders and computing the average strength of cylinders tested using unbonded caps and the reference capping system
- Know the minimum percentage of reference capping system strength that must be met to qualify unbonded caps for use

ASTM C39/39M – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

- Understand scope of test method
- Understand summary of test method
- Understand significance and use of test method
- Understand calibration requirements of testing machine
- Understand design requirements of testing machine
- Understand accuracy requirements of testing machine
- Understand general requirements for bearing blocks
- Understand requirements for bottom bearing blocks
- Understand requirements for upper spherically-seated blocks
- Understand requirements for load-indicating dials
- Understand requirements for digital load indicators
- Know requirements for allowable variance in cylinder diameter
- Know requirements for and perform check of perpendicularity and planeness of cylinder ends
- Know the requirements for determining daily average diameter
- Understand the requirements for determining density of test specimens (when requested)
- Know the requirements for conducting length measurements
- Know the requirements for maintaining specimens in a moist condition until time of test
- Understand the permissible time tolerances for testing
- Know and perform the procedure for positioning and centering specimens in the machine
- Know and perform the procedures for zeroing the machine and aligning upper bearing block
- Know and perform the procedure for applying the test load at the proper rate
- Know and perform the procedures for applying the load to failure and identifying break type
- Know and perform the calculation of test results, including the proper reporting of compressive strength
- Know how to correct strength values for a given length-to-diameter ratio
- Know which information is to be included on reports

**Job-task analysis (JTA) for ACI Certification of Concrete Strength Testing Technician
(Continued)**

ASTM C78/78M – Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)

- Understand scope of test method
- Understand significance and use of test method
- Understand general requirements for testing machines
- Understand requirements for third-point loading apparatus
- Know requirements for dimensions, shape, and surface conditions of test specimens
- Understand technician qualification requirements
- Know requirements for testing moist-cured specimens
- Know and perform the procedure for positioning specimens on support blocks, including checking and correcting for gap widths at contact points
- Understand how to calculate loading rate
- Know and perform the procedure for applying the test load at the proper rate
- Know and perform the procedure for measuring specimens for average width and depth after specimen fracture
- Know and perform the calculation of modulus of rupture when fracture occurs in the middle third of the span length
- Know and perform the calculation of modulus of rupture when fracture occurs outside the middle third of the span length
- Know the information to be included on reports
- Know and perform the reporting of modulus of rupture with proper precision