



## Certification Policies for Concrete Construction Sustainability and Resilience Assessor

*Last revised by the Certification Programs Committee  
December 22, 2022*

The statements contained herein are a consolidation of approved policies and procedures. This policy statement supersedes all previous action regarding Concrete Construction Special Inspector certification.

The certification program policies are organized into seven sections as follows:

- |             |                           |
|-------------|---------------------------|
| Section 1.0 | Certification Criteria    |
| Section 2.0 | Examination Criteria      |
| Section 3.0 | Appeals Criteria          |
| Section 4.0 | Sponsoring Group Criteria |
| Section 5.0 | Examiner/Proctor Criteria |
| Section 6.0 | ACI Responsibilities      |
| Section 7.0 | Recertification Criteria  |

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**SECTION 1.0 CERTIFICATION CRITERIA**

- 1.1 The American Concrete Institute (ACI) shall recognize individuals certified as Concrete Construction Sustainability and Resilience Assessor (CCSRA).
- 1.2 Certification as a CCSRA shall require:
- A) Successful completion of a written examination.
  - B) Demonstrate satisfactory education and work experience.
- 1.3 The education and work experience required for CCSRA certification is as follows:
- A) ACI University Concrete Fundamentals Certificate or equivalent;  
OR
  - B) A B.S. degree in Architecture from an accredited program;  
OR
  - C) A B.S. degree in Engineering or Engineering Technology from an accredited program that includes at least one course in construction materials;  
OR
  - D) Have been certified, at one time, as one of the following:
    - 1. ACI Concrete Quality Technical Manager  
  
ACI Concrete Quality Technical Manager certification program content and operation are described in ACI Certification Policies for Concrete Quality Technical Manager, Annex C692.1-1.
    - 2. ACI Concrete Construction Special Inspector  
  
ACI Concrete Construction Special Inspector certification program content and operation are described in ACI Certification Policies for Concrete Construction Special Inspector, Annex C692.1-2.
    - 3. ACI Concrete Transportation Construction Inspector  
  
ACI Concrete Transportation Construction Inspector certification program content and operation are described in ACI Certification Policies for Concrete Transportation Construction Inspector, Annex C692.1-3.

- 1.4 ACI certification shall be valid for a period of five [5] years from the date of completion of all certification requirements.

## SECTION 2.0 EXAMINATION CRITERIA

- 2.1 The written examination shall consist of approximately eighty [80] multiple choice questions, with nine [9] sections.
- 2.2 The CCSRA written examination is derived from the information listed in *Job Task Analysis (JTA) for ACI Concrete Construction Sustainability and Resilience Assessor Certification*, Annex 692.1-4.
- 2.3 The written examination is closed-book. Simple function (non-programmable) calculators shall be permitted.
- 2.4 A maximum time of two [2] hours shall be allowed to complete the written examination.
- 2.5 The examination shall be supervised by an ACI-approved Examiner, assisted, when necessary, by a proctor appointed by the Examiner.
- 2.6 The Examiner, proctors, and members of the Sponsoring Group have no jurisdiction over the content of questions on any specific examinations.
- 2.7 Verbal administration of the examination shall be permitted, contingent upon prior approval by the ACI Certification Department.
- 2.8 Successful completion of the written examination shall be considered as meeting both of the following requirements:
- A) Score a minimum of 50% correct on each individual section of the examination (e.g., five correct out of ten questions);
  - AND
  - B) Score a minimum of 70% for the overall examination (e.g., 56 correct out of 80 total questions).
- 2.9 Examinations shall be graded by ACI.

## SECTION 3.0 APPEALS CRITERIA

- 3.1 An appeal procedure shall be available if the examinee feels some aspect of the examination process is unclear, incorrect, or unfair.
- 3.2 Appeals regarding the conduct of the examination should be referred initially to the Examiner. If the Examiner cannot satisfy the complaint, it should be referred to the Sponsoring Group.

3.3 Appeals referred to ACI are handled in order by the following people or groups:

1. Sponsoring Group
2. ACI Managing Director of Certification
3. The Certification Appeals Committee [consisting of the Managing Director of Certification; the Certification Programs Committee Chairman, and the Chairman of Committee C692]
4. Committee C692, Concrete Construction Sustainability Assessor
5. Certification Programs Committee

#### **SECTION 4.0 SPONSORING GROUP CRITERIA**

Groups desiring to conduct ACI Certification program(s) shall adhere to the current *Policy on Sponsoring Groups for Certification*, Annex 692.1-5.

#### **SECTION 5.0 EXAMINER/PROCTOR CRITERIA**

- 5.1 The Examiner must be authorized by ACI to conduct sessions for this program. Examiner applications must be submitted by the Sponsoring Group and will be evaluated based on the applicant's experience and familiarity with this and/or other ACI Certification programs.
- 5.2 In order to be considered for examiner status, the applicant shall have assisted in the administration of at least two (2) ACI examination sessions (any program including written and performance components where applicable), performing to the satisfaction of the examiner of record.
- 5.3 The Examiner shall be present and in full supervision during the examination session.
- 5.4 Proctors adjudged trustworthy and conscientious by the Examiner shall be permitted to assist the Examiner in conducting the written examination.
- 5.5 Examiners and proctors shall be unrelated professionally and personally to the examinees. Government organizations may petition ACI, in writing, and request a waiver of this requirement. Waivers shall be granted only if it can be shown that the intent of the policy will be maintained.
- 5.6 The Examiner shall:
  1. Verify the identity of each examinee and ensure that the examinees are aware of the certification criteria.
  2. Confirm the suitability of the facilities selected by the Sponsoring Group.
  3. Maintain exam security and secrecy of the examination content.
  4. Not define terms or interpret examination questions while conducting the examination.

**SECTION 6.0 ACI RESPONSIBILITIES**

6.1 ACI shall:

1. Authorize the Sponsoring Group to conduct examination sessions for:  
  
Concrete Construction Sustainability and Resilience Assessor
2. Approve the Examiner.
3. Grade the examinations and notify the examinee of the final results in writing.
4. Evaluate education and work experience and determine conformance with requirements of applicants as a CCSRA.
5. Issue certification credentials to successful examinees.
6. Process appeals.

**SECTION 7.0 RECERTIFICATION CRITERIA**

Recertification criteria shall be the successful completion of the then-current requirements for certification. Reevaluation of work experience is not required for recertification.

**End of Policy Text**

ANNEX 692.1-1



**Certification Policies  
for  
Concrete Quality Technical Manager (CQTM)**

*Last approved by the Certification Programs Committee  
December 29, 2014*

The statements contained herein are a consolidation of proposed policies and procedures. This policy statement supersedes all previous action of the ACI Board of Direction with respect to CQTM certification and is effective December 29, 2014.

The certification program policies are organized into nine sections as follows:

- |             |   |
|-------------|---|
| Section 1.0 | Certification Criteria                  |
| Section 2.0 | Examination Criteria                    |
| Section 3.0 | Education/Work Experience               |
| Section 4.0 | Reexamination Criteria                  |
| Section 5.0 | Appeals Criteria                        |
| Section 6.0 | Sponsoring Group Criteria               |
| Section 7.0 | Examiner/Supplemental Examiner Criteria |
| Section 8.0 | ACI: Duties and Responsibilities        |
| Section 9.0 | Recertification Criteria                |

**SECTION 1.0 CERTIFICATION CRITERIA**

1.1 The American Concrete Institute (ACI) certification program shall recognize two classifications for Concrete Quality Technical Manager (CQTM):

- Associate CQTM
- CQTM

- 1.2 Certification as an Associate CQTM and CQTM requires that the individual has received a passing grade on the written examinations for each of the following ACI Certifications at some time in the candidate's professional career:
- ACI Concrete Field Testing—Grade I
  - ACI Concrete Strength Testing Technician
  - ACI Concrete Flatwork Technician
- 1.3 Certification as an **Associate CQTM** requires compliance with Section 1.2 and passing grades on the CQTM written and practical exams.
- 1.4 Certification as a **CQTM** requires compliance with Section 1.2, compliance with requirements for education and work experience, and:
- a) Passing grades on the CQTM written and practical exams, or
  - b) Previously having passed the ACI Level III Nuclear Exam (retired program).
- 1.5 The education and work experience required for **CQTM** is as follows:
- a) Professional Engineer and 3 years applicable experience, or
  - b) Bachelor of Science in Engineering, Math, Physics, or Construction Management and 4 years applicable experience, or
  - c) Associates Degree in Engineering, Math, Physics, or Construction Management and 5 years applicable experience, or
  - d) 6 years applicable experience
- 1.6 The applicable experience for **CQTM** must include:
- a) Decision making authority and responsibility
  - b) Verification of compliance with plans, specifications, and codes
  - c) Knowledge in administration of a concrete QA/QC plan
  - d) Documentation and reporting of test results
  - e) Proficiency in preparation of concrete mix proportions
  - f) Proficiency in evaluation of concrete and concrete materials test reports and documents
- 1.7 Certification for Associate CQTM and CQTM is valid for a period of 5 years from the date of completion of both parts of the examination, but is not conferred until all additional required documentation has been verified.
- 1.8 An Associate CQTM shall be upgraded to full CQTM upon completion of appropriate certification requirements.

## **SECTION 2.0 EXAMINATION CRITERIA**

### **GENERAL**

- 2.1 The content of all CQTM examinations shall be derived directly from the material listed in Appendix 1.0.
- 2.2 The CQTM examination consists of two parts:
  - a) Written exam containing six (6) subsections covering mixture proportioning and basic and advance concrete technology, and
  - b) Practical exam involving application of ACI 318 and ACI 301 requirements, and ACI 211 guidelines to concrete mixture proportioning and design.

### **WRITTEN EXAMINATION**

- 2.3.1 The CQTM written examination shall consist of approximately one-hundred (100) multiple choice questions.
- 2.3.2 The written examination is open book.
- 2.3.3 A maximum of four (4) hours shall be permitted for completion of the written examination.
- 2.3.4 Successful completion of the written examination shall be considered as meeting both the following requirements:
  - a) Score sixty percent [60%] or higher on each subsection, and
  - b) Score a minimum of seventy percent [70%] for the overall examination.

### **PRACTICAL APPLICATION EXAMINATION**

- 2.4.1 The CQTM practical application examination shall consist of approximately twenty-five (25) multiple choice questions.
- 2.4.2 The practical application examination is open book.
- 2.4.3 A maximum of two (2) hours shall be permitted for completion of the practical examination.
- 2.4.4 The examinee shall conduct the practical examination in the direct presence of the examiner or proctor(s).
- 2.4.5 Successful completion of the practical examination shall be considered as scoring a minimum of 70% on the exam.

## **SECTION 3.0 EDUCATION/WORK EXPERIENCE**

- 3.1 Candidates seeking certification as a CQTM must submit a signed affidavit or affidavits (ACI Form D5) from current and/or previous employers or other qualified individual(s) attesting that the applicant possesses the required amount and range of education/work experience as described in 1.5 and 1.6, and that the candidate's performance of those responsibilities was satisfactory.



- 3.2 In cases where the examinee is self-employed and cannot furnish proof of employment, letters of reference from three Professional Engineers covering experience/performance may be accepted.
- 3.3 ACI will verify all submitted affidavits or letters of reference.

#### **SECTION 4.0 REEXAMINATION CRITERIA**

- 4.1 Failure of either the written exam or practical applications exam by the criteria cited under Section 2.3.4 and 2.4.5 shall require a reexamination on the exam that was failed. Reexamination must be taken within one [1] year of the initial examination.

#### **SECTION 5.0 APPEALS CRITERIA**

- 5.1 An appeal may be lodged by an examinee to address an administrative issue (procedural or environmental) that may have an adverse impact on the examinee's ability to participate in the testing process in a fair and equitable manner. An appeal shall be directed initially to the examiner at the time of testing to provide the examiner with an opportunity to document and resolve the issue.
- 5.2 In the event that the examinee is not satisfied with the action of the examiner regarding an appeal, the examinee may pursue an appeal following the examination 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 690]
  4. Committee C 690, Concrete Quality Technical Manager Certification
  5. Certification Programs Committee
- 5.3 Appeals submitted to ACI for consideration must be received in writing within sixty [60] days of the receipt of the examination at ACI Headquarters. Appeals that are not first brought to the attention of the examiner during the exam session will not be considered.

#### **SECTION 6.0 SPONSORING GROUP CRITERIA**

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

#### **SECTION 7.0 EXAMINER AND PROCTOR CRITERIA**

- 7.1 The Examiner shall be authorized by ACI to conduct the ACI certification examinations for:
1. Associate Concrete Quality Technical Manager
  2. Concrete Quality Technical Manager
- 7.2 The Examiner shall be present and in full supervision during the examination session.

- 7.3 The Examiner shall be approved by ACI. Qualifications shall be submitted using a current ACI Examiner Application.
- 7.4 The Examiner shall meet the following requirements:
1. Be a registered professional engineer,
  2. Have had a minimum of 5 years of recent experience in the evaluation, investigation and application of concrete materials and concrete mix designs, and
  3. Be judged qualified by ACI.
- 7.5 Proctors shall be permitted to assist the Examiner in conducting the written examination.
- 7.6 Proctors shall be selected by the examiner by virtue of their being trustworthy, conscientious and having some knowledge of concrete materials and mix design.
- 7.7 Examiners and proctors shall not be related professionally and/or personally to the examinees.
- 7.8 The Examiner shall be directly responsible for the following:
1. Final approval of the proctors;
  2. Verify conformance to Sections 7.6 and 7.7 of this Policy;
  3. Order and receive examinations;
  4. Verify the identity of each examinee (government issued identification), and assure that the examinees are aware of the certification criteria;
  5. Return all written examinations (used and unused), and all other required session documentation to ACI Headquarters.
- 7.9 Examiners or proctors are not allowed to define terms or interpret examination questions during the written examination.
- 7.10 The examination session(s) must be supervised constantly by the Examiner, and/or proctor(s).
- 7.11 Approved Examiners, proctors and sponsoring groups shall not have any jurisdiction over the content of the examination(s), or over the grading of the written examination.

## **SECTION 8.0 ACI DUTIES AND RESPONSIBILITIES**

- 8.1 ACI shall approve the sponsoring group.
- 8.2 ACI shall approve the examiner.
- 8.3 ACI shall authorize the sponsoring group to conduct examination sessions for:
1. Concrete Quality Technical Manager
  2. Associate Concrete Quality Technical Manager

- 8.4 ACI shall grade the written and practical examinations and notify the examinee and the examiner of the final results in writing.
- 8.5 ACI shall evaluate education and work experience and determine conformance with requirements of applicants as a Concrete Quality Technical Manager.
- 8.6 ACI certifies and authorizes the issuance of certificates of certification to examinees that have satisfied the certification requirements.
- 8.7 ACI shall issue a certificate and wallet card to successful examinees.
- 8.8 ACI shall participate in the appeal process as outlined in Section 5.0.

### **SECTION 9.0 RECERTIFICATION CRITERIA**

- 9.1 Individuals who have been certified by ACI as either a Concrete Quality Technical Manager or Associate Concrete Quality Technical Manager are eligible for recertification using the methods prescribed in 9.2 A or B, except that individuals who have allowed their certification to lapse by more than 1 year, shall use the method prescribed in 9.2 A.
- 9.2 Recertification shall extend the ACI certification as Concrete Quality Technical Manager or Associate Concrete Quality Technical Manager for a period of five (5) years, beginning the date recertification requirements are completed.  
  
Recertification can be obtained by one of the following methods:
  - A. Successful passing of the then-current CQTM written and practical application exams.
  - OR
  - B. By fulfilling the continuing education requirements as per Section 9.3.
- 9.3 Continuing Education: To maintain certification each CQTM or Associate CQTM must complete 40 Professional Development Hours (PDH) of concrete-related continuing education every 5 years. The CQTM or Associate CQTM is responsible for maintaining documentation of PDH activities and submitting the PDH summary form with the renewal form available through the Certification area of the ACI website. PDH activity may be subject to audit with documentation maintained for a period of 6 years. PDH programs may include e-learning, seminars, convention sessions, concrete or engineering-related college or university-sponsored courses and certification programs. See Appendix 2.0 for more information.
- 9.4 ACI is the sole auditor in confirming these requirements have been met.

*Note: A suggested list of approved courses will be provided by ACI's Certification department on an annual basis. Courses/Seminars will be considered for their approval based on their content's relevance to the areas of work experience/responsibility described in Sections 1.5 and 1.6.*

**APPENDIX 1.0 BODY OF KNOWLEDGE**

The content of all CQTM examinations shall be derived directly from the material listed below:

- A. Tolerances (ACI 117/ASTM C94)
- B. Quality Assurance Systems for Concrete (ACI 121R) / ISO 90001:2000
- C. Concrete Durability (ACI 201.2R)
- D. Proportioning Normal, Heavyweight and Mass Concrete (ACI 211.1)
- E. Proportioning No-Slump Concrete (ACI 211.3R)
- F. Proportioning High-Strength Concrete HSC (ACI 211.4R)
- G. Submittal of Concrete Proportions (ACI 211.5R)
- H. Chemical Admixtures for Concrete (ACI 212.3R)
- I. Guide for Structural Lightweight Concrete (LWC) ( ACI 213R)
- J. Guide for Obtaining Cores and Interpreting Compressive Strength Results (ACI 214.4R)
- K. Guide to Evaluation of Strength Tests (ACI 214)
- L. Guide for Use of Normal Weight and Heavy Weight Aggregates in Concrete (ACI 221R)
- M. Guide to the Selection and Use of Hydraulic Cements (ACI 225R)
- N. Controlled Low Strength Materials (CLSM) (ACI 229R)
- O. Use of Fly Ash in Concrete (ACI 232.2R)
- P. Slag Cement in Concrete and Mortar (ACI 233R)
- Q. Guide for the Use of Silica Fume in Concrete (ACI 234R)
- R. Self-Consolidating Concrete (ACI 237R)
- S. Specifications for Structural Concrete (ACI 301)
- T. Building Code Requirements (ACI 318) [*Chapter 1 through 6 and Chapter 21*]
- U. Guide to Pervious Concrete (ACI 522R)



## APPENDIX 2.0 CONTINUING EDUCATIONAL ACTIVITIES

Professional Development Hours (PDH) means a contact hour of not less than 50 minutes of instruction or presentation which meets the requirements of this section.

Continuing educational activities may include.

1. Attending professional or technical concrete related presentations at meetings, conventions or conferences;
2. Attending in-house technical concrete related programs sponsored by corporations or other organizations;
3. Successfully completing concrete related seminars, tutorials, short courses, correspondence courses, televised courses or video-taped courses
4. Authoring published papers, articles or books;
5. Successfully completing concrete or engineering related college or university sponsored courses
6. Successfully completing concrete or engineering related courses which are awarded continuing educational units.
7. Approved Sources for PDH Programs include (in no particular order);
  - American Concrete Institute (ACI)
  - National Ready Mix Concrete Association (NRMCA)
  - Portland Cement Association (PCA)
  - Slag Cement Association (SCA)
  - Post Tension Institute (PTI)
  - American Concrete Pavement Association (ACPA)
  - American Society of Concrete Contractors (ASCC)
  - Expanded Shale, Clay and Slate Institute (ESCSI)
  - International Concrete Repair Institute (ICRI)
  - Concrete Reinforcing Steel Institute (CRSI)
  - National Precast Concrete Association (NPCA)
  - Precast/Prestressed Concrete Institute (PCI)
  - American Coal Ash Association (ACAA)
  - World of Concrete(WOC) - Classes and Seminars
  - Engineering Colleges and Universities

**END OF DOCUMENT**

ANNEX 692.1-2



# Certification

## Certification Policies for Concrete Construction Special Inspector <sup>®</sup>

*Last revised by the Certification Programs Committee  
March 21, 2014; effective January 1, 2015*

The statements contained herein are a consolidation of approved policies and procedures. This policy statement supersedes all previous action regarding Concrete Construction Special Inspector certification.

The certification program policies are organized into seven sections as follows:

- |             |                           |
|-------------|---------------------------|
| Section 1.0 | Certification Criteria    |
| Section 2.0 | Examination Criteria      |
| Section 3.0 | Appeals Criteria          |
| Section 4.0 | Sponsoring Group Criteria |
| Section 5.0 | Examiner/Proctor Criteria |
| Section 6.0 | ACI Responsibilities      |
| Section 7.0 | Recertification Criteria  |

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**SECTION 1.0 CERTIFICATION CRITERIA**

1.1 The American Concrete Institute (ACI) shall recognize two classifications of certification for inspectors:

- Concrete Construction Special Inspector
- Associate Concrete Construction Special Inspector

1.2 Certification as an Associate Concrete Construction Special Inspector shall require:

- A) Successful completion of respective written examinations on inspection and plans reading.
- B) Fulfillment of requirements in ACI Concrete Field Testing Technician—Grade I (CFTT) as follows:

- 1. Be currently certified as an ACI Concrete Field Testing Technician—Grade I

OR

- 2. Have been certified as an ACI Concrete Field Testing Technician—Grade I at one time

AND

- 3. Pass the current ACI Concrete Field Testing Technician—Grade I written exam within one year of passing the Inspector exam.

If the Concrete Field Testing Technician—Grade I requirement is not held at the time of testing for Associate Concrete Construction Special Inspector, the requisite Concrete Field Testing Technician—Grade I certification or validation of prior Concrete Field Testing Technician—Grade I certification with successful completion of the current Concrete Field Testing Technician—Grade I written examination must be obtained within one year of the first examination passed for Inspector. Otherwise, the written inspection and plans reading examinations must be retaken in their entirety. No specific education or work experience shall be required to sit for the examination for Associate Concrete Construction Special Inspector.

ACI CFTT certification program content and operation is described in *ACI Certification Policies for Concrete Field Testing Technician – Grade I*, Appendix C630.1-1.

1.3 Certification as a Concrete Construction Special Inspector shall require:

- A) Successful completion of respective written examinations on inspection and plans reading.
- B) Fulfillment of requirements in ACI Concrete Field Testing Technician—Grade I as follows:

- 1. Be currently certified as an ACI Concrete Field Testing Technician—Grade I ACI Certification Concrete Construction Special Inspector


OR

2. Have been certified as an ACI Concrete Field Testing Technician—Grade I at one time

AND

3. Pass the current ACI Concrete Field Testing Technician—Grade I written exam within one year of passing the Inspector exam.

If the ACI Concrete Field Testing Technician—Grade I requirement is not held at the time of testing for Concrete Construction Special Inspector, the requisite ACI Concrete Field Testing Technician—Grade I certification or validation of prior ACI Concrete Field Testing Technician—Grade I certification with successful completion of the current ACI Concrete Field Testing Technician—Grade I written examination must be obtained within one year of the first examination passed for Inspector. Otherwise, the written inspection and plans reading examinations must be retaken in their entirety.

ACI CFTT certification program content and operation is described in *ACI Certification Policies for Concrete Field Testing Technician – Grade I*, Appendix C630.1-1. 

- C) Demonstrate satisfactory education and work experience.

1.4 The education and work experience required for Concrete Construction Special Inspector certification is as follows:

- A) A B.S. degree in Civil Engineering, Civil Engineering Technology, Engineering Technology, Construction Engineering or Construction Engineering Technology from a program accredited by ABET (aka Accreditation Board for Engineering and Technology), including courses in concrete materials, design or construction, plus six months satisfactory work experience, or
- B) A B.S. degree in an engineering program, plus one year of satisfactory work experience, or
- C) A minimum of two years of college or technical school, earning at least 60 credit hours, plus two years of satisfactory work experience, or
- D) A high school diploma, or equivalent, plus a minimum of three years of satisfactory work experience, or
- E) Five years of satisfactory work experience.

1.5 Satisfactory work experience must include:

- A) Decision making responsibility and authority.
- B) Verification of compliance with plans, specifications, and codes. ACI Certification Concrete Construction Special Inspector
- C) Evaluation of concrete construction in the field.
- D) Documentation and reporting of inspection results.



E) Construction Special Inspector Certification requires proficiency in the following areas of inspection: formwork installation and removal, reinforcement, embedments, sampling and testing of freshly mixed concrete, conveying, placement, consolidation, finishing, jointing, curing, and protection.

1.6 ACI certification shall be valid for a period of five years from the date of completion of all certification requirements. An Associate Inspector shall be upgraded to full Inspector upon completion of appropriate certification requirements.

## SECTION 2.0 EXAMINATION CRITERIA

2.1 The written inspection examination shall consist of approximately 80 multiple choice questions pertaining to inspection and reporting of inspection information for pre-placement, placement, and post-placement periods of concrete construction. The written plans reading examination shall consist of approximately 20 multiple choice questions designed to test the examinee's ability to read and understand engineering drawings.

2.2 The written inspection examination includes questions on formwork installation and removal, reinforcement, embedments, conveying, placement, consolidation, finishing, jointing, curing, protection, drilled piers, pilings, pavements and soil cement, as appropriate. The written plans reading examination includes questions on terminology, reinforcement, tolerances, and special requirements as expressed on engineering drawings.

2.3 The Concrete Construction Special Inspector written inspection examination is derived from the information listed in *Job Task Analysis (JTA) for ACI Concrete Construction Special Inspector Certification*, Appendix 630.1-2.

2.4 The examinations are open book. The technical materials allowed into the examination room are limited to the resource materials listed in Appendix 630.1-2.

2.5 A maximum time of three hours shall be allowed to complete the written inspection examination. A maximum time of one hour shall be allowed to complete the written plans reading examination.

2.6 The examination shall be supervised by an ACI-approved Examiner, assisted, when necessary, by a proctor appointed by the Examiner.

2.7 The Examiner, proctors, and members of the Sponsoring Group have no jurisdiction over the content of questions on any specific examinations.

2.8 Oral administration of the examinations shall be permitted, contingent upon prior approval by the ACI Certification Department.

2.9 Successful completion of each written examination requires a minimum grade of 70%.

- 2.10 The written inspection and plans reading examinations may be taken separately, but must be passed within one [1] year of each other. Otherwise, both the written inspection and plans reading examinations must be retaken in their entireties.
- 2.11 Examinations shall be graded by ACI.
- 2.12 Multiple versions of the examinations, of approximately equal difficulty, may be provided.
- 2.13 Arrangements for reexamination shall be made with the Sponsoring Group.

### **SECTION 3.0 APPEALS CRITERIA**

- 3.1 An appeal procedure shall be available if the examinee feels some aspect of the examination process is unclear, incorrect, or unfair.
- 3.2 Appeals regarding the conduct of the examination should be referred initially to the Examiner. If the Examiner cannot satisfy the complaint, it should be referred to the Sponsoring Group.
- 3.3 Challenges regarding specific questions shall be referred to ACI in writing.
- 3.4 A challenge form shall be provided with each exam on which the examinee may describe a complaint involving specific questions. It should be returned with the completed examination.
- 3.5 ACI will consider a written challenge/appeal if it is received by the ACI Certification Department within 60 days from the receipt of the examination by ACI.
- 3.6 Appeals referred to ACI are handled in order by the following people or groups:
1. Sponsoring Group
  2. ACI Managing Director of Certification
  3. The Certification Appeals Committee [consisting of the Managing Director of Certification; the Certification Programs Committee Chairman, and the Chairman of Committee C 630]
  4. Committee C 630, Construction Inspector Certification
  5. Certification Programs Committee

### **SECTION 4.0 SPONSORING GROUP CRITERIA**

Groups desiring to conduct ACI Certification program(s) shall adhere to the current *Policy on Sponsoring Groups for Certification*, Appendix 630.1-3.

## SECTION 5.0 EXAMINER/PROCTOR CRITERIA

- 5.1 The Examiner shall be authorized by ACI to conduct the ACI certification examinations for:
- Concrete Construction Special Inspector
  - Associate Concrete Construction Special Inspector
- 5.2 The Examiner shall be present and in full supervision during the examination session.
- 5.3 The Examiner shall be approved by ACI. Qualifications shall be submitted on the Examiner Application.
- 5.4 The Examiner shall meet the following requirements:
1. Be a registered professional engineer,
  2. Have had five years of recent experience in inspection of concrete construction, and
  3. Be adjudged qualified by ACI.
- 5.5 Proctors shall be permitted to assist the Examiner in conducting the written examination.
- 5.6 Proctors shall satisfy the following requirements:
1. Have some knowledge of concrete construction,
  2. Be trustworthy and conscientious, and
  3. Be adjudged qualified by the examiner.
- 5.7 Examiners and proctors shall be unrelated professionally and personally to the examinees. Government organizations may petition ACI, in writing, and request a waiver of this requirement. Waivers shall be granted only if it can be shown that the intent of the policy will be maintained.
- 5.8 The Examiner shall:
1. Select the proctors and inform ACI of their names.
  2. Verify the identity of each examinee, and ensure that the examinees are aware of the certification criteria.
  3. Confirm the suitability of the facilities selected by the Sponsoring Group.
  4. Receive inspector applications, evaluate education and work experience, and determine if requirements for certification are met. This responsibility may be performed by ACI, if delegated by the Sponsoring Group.
  5. Maintain secrecy of the examination content.
  6. Refrain from defining terms or interpreting examination questions while conducting the examination.

**SECTION 6.0 ACI RESPONSIBILITIES**

6.1 ACI shall:

1. Approve the Sponsoring Group.
2. Approve the Examiner.
3. Grade the examinations and notify the examinee and the examiner of the final results in writing.
4. Evaluate education and work experience and determine conformance with requirements of applicants as a Concrete Construction Special Inspector if requested by the Sponsoring Group.
5. Authorize the Sponsoring Group to conduct examination sessions for:

Concrete Construction Special Inspector  
Associate Concrete Construction Special Inspector

6. Issue a certificate and wallet card to successful examinees.
7. Process appeals.

**SECTION 7.0 RECERTIFICATION CRITERIA**

Recertification criteria shall be the successful completion of the then-current requirements for certification. Reevaluation of work experience is not required for recertification at the same certification level.

**End of Policy Text**

ANNEX 692.1-3



American Concrete Institute

**Certification Policies for  
Concrete Transportation Construction Inspectors**

*Approved by the ACI Board of Direction  
March 28, 2006*

*Last revised by the Certification Programs Committee  
March 21, 2014; effective January 1, 2015*



The statements contained herein are a consolidation of approved policies and procedures. This policy statement will supersede all previous action of the ACI Board of Direction with respect to Concrete Transportation Construction Inspector Certification and is effective March 28, 2006. The certification program policies are organized into seven sections as follows:

The certification program policies are divided into eight sections as follows:

- Section 1.0 Certification Criteria
- Section 2.0 Examination Criteria – Associate Inspector
- Section 3.0 Examination Criteria – Inspector
- Section 4.0 Appeals Criteria
- Section 5.0 Sponsoring Group Criteria
- Section 6.0 Examiner/Proctor Criteria
- Section 7.0 ACI Responsibilities
- Section 8.0 Recertification Criteria

## SECTION 1.0 CERTIFICATION CRITERIA

- 1.1 The American Concrete Institute (ACI) shall recognize two classifications of certification for Concrete Transportation Construction Inspectors:

Concrete Transportation Construction Inspector; and  
Associate Concrete Transportation Construction Inspector

- 1.2 Certification as an Associate Concrete Transportation Construction Inspector shall require:

A) Successful completion of respective written examinations on inspection and plans reading.

B) Fulfillment of requirements in ACI Concrete Field Testing Technician—Grade I as follows:

1. Be currently certified as an ACI Concrete Field Testing Technician—Grade I

OR

2. Have been certified as an ACI Concrete Field Testing Technician—Grade I at one time

AND

3. Pass the current ACI Concrete Field Testing Technician—Grade I written exam within one year of passing the Inspector exam.

- 1.3 If the Concrete Field Testing Technician—Grade I requirement is not held at the time of testing for Associate Concrete Transportation Construction Inspector, the requisite Concrete Field Testing Technician—Grade I certification or validation of prior Concrete Field Testing Technician—Grade I certification with successful completion of the current Concrete Field Testing Technician—Grade I written examination must be obtained within one year of the first examination passed for Inspector. Otherwise, the written inspection and plans reading examinations must be retaken in their entireties. No specific education or work experience shall be required to sit for the examination for Associate Concrete Transportation Construction Inspector.

- 1.4 Certification as a Concrete Transportation Construction Inspector shall require:

A) Successful completion of respective written examinations on inspection and plans reading.

B) Fulfillment of requirements in ACI Concrete Field Testing Technician—Grade I as follows:

1. Be currently certified as an ACI Concrete Field Testing Technician—Grade I

OR

2. Have been certified as an ACI Concrete Field Testing Technician—Grade I at one time

AND

3. Pass the current ACI Concrete Field Testing Technician—Grade I written exam within one year of passing the Inspector exam.

If the ACI Concrete Field Testing Technician—Grade I requirement is not held at the time of testing for Concrete Transportation Construction Inspector, the requisite ACI Concrete Field Testing Technician—Grade I certification or validation of prior ACI Concrete Field Testing Technician—Grade I certification with successful completion of the current ACI Concrete Field Testing Technician—Grade I written examination must be obtained within one year of the first examination passed for Inspector. Otherwise, the written inspection and plans reading examinations must be retaken in their entirety.

- C) Demonstrate satisfactory education and work experience.

1.5 The education and work experience required for Concrete Transportation Construction Inspector certification is as follows:

1. A minimum of two years of college or technical school, earning at least 60 credit hours, plus two years of satisfactory work experience, or
2. A high school diploma, or equivalent, plus a minimum of three years of satisfactory work experience, or
3. Five years of satisfactory work experience.

1.6 Satisfactory work experience must include:

1. Decision making responsibility and authority.
2. Verification of compliance with plans, specifications, and codes.
3. Evaluation of concrete construction in the field.
4. Documentation and reporting of inspection results.
5. Concrete Transportation Construction Inspector Certification requires proficiency in the following areas of inspection: formwork installation and removal, reinforcement, embedments, sampling and testing of freshly mixed concrete, conveying, placement, consolidation, finishing, jointing, curing, protection, drilled piers, pilings, pavements and soil cement.

1.7 ACI certification shall be valid for a period of five years from the date of completion of all certification requirements.

## SECTION 2.0 EXAMINATION CRITERIA

### Certification as an Associate Concrete Transportation Construction Inspector

- 2.1 The written inspection examination shall consist of approximately 40 multiple choice questions pertaining to inspection and reporting of inspection information for pre- placement, placement, and post-placement periods of concrete construction. The written plans reading examination shall consist of approximately 10 multiple choice questions designed to test the examinee's ability to read and understand engineering drawings.
- 2.2 The written inspection examination includes questions on formwork installation and removal, reinforcement, embedments, conveying, placement, consolidation, finishing, jointing, curing, protection, as appropriate. The written plans reading examination includes questions on terminology, reinforcement, tolerances, and special requirements as expressed on engineering drawings.
- 2.3 The body of knowledge covered on the Associate Concrete Transportation Construction Inspector examination is contained in the publications listed in Appendix "A", Resource Materials.
- 2.4 The examinations are open book. The technical materials allowed into the examination room are limited to the resource materials listed in Appendix "A" as appropriate.
- 2.5 A maximum time of 90 minutes shall be allowed to complete the written inspection examination. A maximum time of 30 minutes shall be allowed to complete the plans reading examination.
- 2.6 The examination shall be supervised by an ACI-approved Examiner, assisted, when necessary, by a proctor appointed by the Examiner.
- 2.7 The Examiner, proctors, and members of the Sponsoring Group have no jurisdiction over the content of questions on any specific examinations.
- 2.8 Oral administration of the examinations shall be permitted, contingent upon prior approval by the ACI Certification Department.
- 2.9 Successful completion of each written examination requires a minimum grade of 70%.
- 2.10 The written inspection and plans reading examinations may be taken separately, but must be passed within one [1] year of each other. Otherwise, both the written inspection and plans reading examinations must be retaken in their entireties.
- 2.11 Examinations shall be graded by ACI.
- 2.12 Multiple versions of the examinations, of approximately equal difficulty, shall be provided.



- 2.13 Arrangements for reexamination shall be made with the Sponsoring Group

### SECTION 3.0 EXAMINATION CRITERIA

#### Certification as a Concrete Transportation Construction Inspector

- 3.1 The written inspection examination shall consist of approximately 80 multiple choice questions pertaining to inspection and reporting of inspection information for pre-placement, placement, and post-placement periods of concrete construction. The written plans reading examination shall consist of approximately 20 multiple choice questions designed to test the examinee's ability to read and understand engineering drawings.
- 3.2 The written inspection examination includes questions on formwork installation and removal, reinforcement, embedments, conveying, placement, consolidation, finishing, jointing, curing, protection, drilled piers, pilings, pavements and soil cement, as appropriate. The written plans reading examination includes questions on terminology, reinforcement, tolerances, and special requirements as expressed on engineering drawings.
- 3.3 The body of knowledge covered on the Concrete Transportation Construction Inspector examination is contained in the publications listed in Appendix "B" Resource Materials.
- 3.4 The examinations are open book. The technical materials allowed into the examination room are limited to the resource materials listed in Appendix "B" as appropriate.
- 3.5 Other technical materials may be allowed into the examination room if they contain one or more of the references listed in Appendix "B" and have been pre-approved by ACI.
- Pre-approved references are: The Annual Book of ASTM Standards, Section 4, Volume 04.02; ACI SP-15, "Specifications for Structural Concrete for Buildings"; and the ACI Manual of Concrete Practice, Parts 2 and 3.
- 3.6 A maximum time of three hours shall be allowed to complete the written inspection examination. A maximum time of one hour shall be allowed to complete the written plans reading examination.
- 3.7 The examination shall be supervised by an ACI-approved Examiner, assisted, when necessary, by a proctor appointed by the Examiner.
- 3.8 The Examiner, proctors, and members of the Sponsoring Group have no jurisdiction over the content of questions on any specific examinations.
- 3.9 Oral administration of the examinations shall be permitted, contingent upon prior approval by the ACI Certification Department.
- 3.10 Successful completion of each written examination requires a minimum grade of 70%.

- 3.11 The written inspection and plans reading examinations may be taken separately, but must be passed within one [1] year of each other. Otherwise, both the written inspection and plans reading examinations must be retaken in their entireties.
- 3.12 Examinations shall be graded by ACI.
- 3.13 Multiple versions of the examinations, of approximately equal difficulty, shall be provided.
- 3.14 Arrangements for reexamination shall be made with the Sponsoring Group.

#### SECTION 4.0 APPEALS CRITERIA

- 4.1 An appeal procedure shall be available if the examinee feels some aspect of the examination is unclear, incorrect, or unfair.
- 4.2 Appeals regarding the conduct of the examination should be referred initially to the Examiner. If the Examiner cannot satisfy the complaint, it should be referred to the Sponsoring Group.
- 4.3 Appeals regarding specific questions shall be referred to ACI in writing.
- 4.4 A challenge form shall be provided with each exam on which the examinee may describe a complaint involving specific questions. It should be returned with the completed examination.
- 4.5 ACI will consider a written appeal if it is received by the ACI Certification Department within 60 days from the receipt of the examination by ACI.
- 4.6 Appeals referred to ACI are handled in order by the following people or groups:
  - 1. ACI Director of Certification
  - 2. The Certification Appeals Committee [consisting of the Director of Certification, the Certification Programs Committee Chairman, and the Chairman of Committee C631.]
  - 3. Committee C631, Concrete Transportation Construction Inspector Certification.
  - 4. Certification Programs Committee

#### SECTION 5.0 SPONSORING GROUP CRITERIA

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

## SECTION 6.0 EXAMINER/PROCTOR CRITERIA

- 6.1 The Examiner shall be authorized by ACI to conduct the ACI certification examinations for:
- Concrete Transportation Construction Inspector; and
  - Associate Concrete Transportation Construction Inspector
- 6.2 The Examiner shall be present and in full supervision during the examination session.
- 6.3 The Examiner shall be approved by ACI. Qualifications shall be submitted on the Examiner Application.
- 6.4 The Examiner shall meet the following requirements:
1. Be a registered professional engineer.
  2. Have had five years of recent experience in inspection of concrete construction.
  3. Be adjudged qualified by ACI.
- 6.5 Proctors shall be permitted to assist the Examiner in conducting the written and plans reading examinations.
- 6.6 Proctors shall satisfy the following requirements:
1. Have some knowledge of concrete construction.
  2. Be trustworthy and conscientious.
  3. Be adjudged qualified by the examiner.
- 6.7 Examiners and proctors shall be unrelated professionally and personally to the examinees. Government organizations may petition ACI, in writing, and request a waiver of this requirement. Waivers shall be granted only if it can be shown that the intent of the policy will be maintained.
- 6.8 The Examiner shall:
1. Select the proctors and inform ACI of their names.
  2. Verify the identity of each examinee, and assure that the examinees are aware of the certification criteria.
  3. Confirm the suitability of the facilities selected by the Sponsoring Group.
  4. Maintain secrecy of the examination content.
  5. Refrain from defining terms or interpreting examination questions while conducting the examination.

## SECTION 7.0 ACI RESPONSIBILITIES

### 7.1 ACI SHALL:

1. Approve the Sponsoring Group.
2. Approve the Examiner.
3. Certify the successful examinees and issue certificates to them.
4. Grade the examinations and notify the examinee and the examiner of the final results in writing.
5. Evaluate education and work experience and determine conformance with requirements of applicants as a Concrete Transportation Construction Inspector.
6. Authorize the Sponsoring Group to conduct examination sessions for:  
Concrete Transportation Construction Inspector; and/or  
Associate Concrete Transportation Construction Inspector
7. Issue a certificate and wallet card to successful examinees.
8. Process appeals.

## SECTION 8.0 RECERTIFICATION CRITERIA

- 8.1 Recertification criteria shall be the successful completion of the then current requirements for certification. Reevaluation of work experience is not required for recertification at the same certification level.

Appendix A -- Resource Materials  
ACI Associate Concrete Transportation Construction Inspector  
Certification Program

**Document**

SP-2

ACI Terminology

ACI 117

ACI 213R

ACI 301

ACI 304R

ACI 304.2R

ACI 305R

ACI 306R

ACI 308R

ACI 309R

ACI 325.9R

ACI 347R

ASTM C 94/C 94M

*CRSI Manual of Standard  
Practice, (MSP)*



APPENDIX B — Resource Materials  
ACI Concrete Transportation Construction Inspector  
Certification Program

**Document**

SP-2

ACI Concrete Terminology

ACI 117

ACI 213R

ACI 301

ACI 304R

ACI 304.2R

ACI 305R

ACI 306R

ACI 308R

ACI 309R

ACI 318

ACI 325.9R

ACI 325.10R

ACI 336.3R

ACI 345R

ACI 347R

ACI 543R

*PCA Soil-Cement Construction  
Handbook*

*PCA Soil-Cement Inspector's  
Manual*

*CRSI Manual of Standard  
Practice (MSP)*



## ANNEX 692.1-4

### Job Task Analysis (JTA) for ACI Certification of Concrete Construction Sustainability and Resilience Assessor

#### HOW TO USE THIS JTA:

For the written examination, the Candidate must:

- **Understand** the following general concepts, which may not have specified values, procedures, or measurements; *and*
- **Know** the following specific procedures or values; performance of these items may also be assessed on the performance examination.

#### RESOURCES IN THIS PROGRAM:

ACI 130R

The Sustainable Concrete Guide, Applications (SCGA)

The Sustainable Concrete Guide, Strategies and Examples (SCG1)

DN33 Sustainability from Precast Concrete Association

Climate Change Evidence Impacts and Choices (CC)

Linking Disaster Resilience and Sustainability (LDRAS)

Disaster Resilience and Sustainability (DRS)

Primary Protection: Enhancing Health Care Resilience for a Changing Climate (PPHC)

Carbon Leadership Forum - Life Cycle Assessment of Buildings (CLF)

Whole Building Design Guide: Life-Cycle Cost Analysis (WBDG)

AIA Guide to Building Life Cycle Assessment in Practice (AIA 2010)

#### AREAS OF COMPETENCY:

Materials

Ratings

Concrete Production and Delivery

Service Life and LCCA

Design and Construction Practice

Social, Environmental, Economic

Climate Change

Resilience

Life-Cycle Analysis

#### Materials

- Understand that the majority of a concrete mixture is aggregates
- Know the chemical process of calcination
- Know the relative balance of CO<sub>2</sub> emissions for cement production
- Know the relative annual global amount of CO<sub>2</sub> generated by cement manufacture
- Know the approximate specific CO<sub>2</sub> emissions intensity of cement production
- Understand the historical trend of the specific energy requirement to produce clinker
- Understand cement industry initiatives to reduce the environmental impact of cement production

- Know alternate raw materials used in cement production
- Know conventional raw materials used in cement production
- Know the efforts undertaken by the Cement industry to reduce the environmental impact of cement
- Understand how specifications have helped reduce the environmental impact of cement
- Understand the role white cement plays in improving concrete sustainability
- Understand what a blended cement is
- Understand the emissions of cement manufacture relative to those of other industries
- Understand how the clinker contributes to the carbon footprint of cement
- Understand how portland limestone cements reduce the carbon footprint of concrete
- Understand how grinding aids reduce the carbon footprint of concrete
- Know examples of supplementary cementitious materials
- Know the meaning of the terminology SCM
- Know examples of SCMs
- Know the material performance and durability impacts of using SCMs
- Understand the impact of SCM usage on life cycle
- Understand the "reduce, reuse, recycle" benefits of using industrial byproducts as SCMs
- Understand how Coal Fly Ash acts as an SCM
- Know fly ash sources, usage and properties
- Understand how slag acts as an SCM
- Know slag cement sources, usage and properties
- Understand how silica fume acts as an SCM
- Know silica fume sources, usage and properties
- Understand how alternative supplementary materials (ASCMs) can be considered
- Understand why  $TiO_2$  would improve concrete sustainability
- Know examples of Non-Portland Cement binders
- Understand sustainability aspects of aggregate selection
- Understand the transportation impacts of aggregate selection
- Understand how aggregate selection can impact transportation requirements
- Understand sustainability aspects of using Natural Aggregate
- Know the minimum yield strength of various forms of reinforcement
- Know that nearly all reinforcing steel is composed of recycled material
- Know that the issue of  $CO_2$  emissions from cement production is the most commonly cited reason to criticize concrete as environmentally unfriendly
- Understand the scale of water usage to produce concrete
- Know acceptable qualities of mix water
- Understand the use of reclaimed mixing water
- Know what contributes to the carbon footprint of cement
- Understand approaches to reduce the carbon footprint of cement
- Understand the carbon footprint of cement as a component of concrete
- Understand the embodied energy of cement relative to concrete
- Know conventional raw materials used in cement production
- Know alternate raw materials used in cement production
- Know the chemical process of calcination
- Know the relative balance of  $CO_2$  emissions for cement production (i.e. calcination vs fuel for kilns)



- Know the annual global amount of CO<sub>2</sub> generated by cement manufacture, relative to total anthropogenic emissions
- Understand the emissions of cement manufacture relative to those of other industries
- Understand the contribution of cement specifications to green cements
- Understand blended cements and ternary blended cements
- Know components of blended cements
- Understand CO<sub>2</sub> reabsorption over service life
- Know characteristics of white cement
- Understand the historical trend of the specific energy requirement to produce clinker
- Understand cement industry initiatives to reduce the environmental impact of cement production
- Know the meaning of the terminology SCM
- Know examples of SCMs
- Understand the difference between Recycled Mineral Components and SCMs
- Know fly ash sources, usage, and properties
- Know slag cement sources, usage, and properties
- Know silica fume sources, usage, and properties
- Know the material performance and durability impacts of using SCMs
- Understand the impact of SCM usage on life cycle
- Know the health impacts of SCMs
- Understand the "reduce, reuse, recycle" benefits of using industrial byproducts as SCMs
- Understand how SCM selection can impact transportation requirements
- Understand sustainability aspects of aggregate selection
- Understand the difference between natural and manufactured aggregates
- Understand what recycled concrete aggregates are
- Understand what virgin aggregates are
- Understand the transportation impacts of aggregate selection
- Know the sources, usage, and properties of lightweight aggregates
- Understand the labor impact of concrete made with lightweight aggregates
- Know what is meant by recycled concrete aggregates
- Know the sources, usage, and properties of recycled concrete aggregates
- Understand the impacts of using recycled concrete aggregates
- Understand how aggregate selection can impact transportation requirements
- Understand the relationship between steel strength and viable bar diameter
- Understand the durability impacts of reinforcement selection
- Know ways to improve the durability of steel reinforcement
- Understand the use of non-ferrous reinforcement
- Understand that steel bars contain recycled content
- Understand how reinforcement selection can impact production and labor requirements
- Understand how reinforcement selection can impact transportation requirements
- Understand the potential sustainability impacts of chemical admixtures
- Understand how admixture usage can impact production and labor requirements
- Understand emerging technologies that have been developed

### Ratings

- Understand the different rating systems and their applications

- Understand Environmental Product Declarations, their purpose, and use
- Know why ASHRAE 189.1 was developed
- Know the scope of ASHRAE 189.1 (2014)
- Understand conditions to meet the performance option for ASHRAE 189.1
- Know the approaches the LEED v4 toward building performance
- Know the categories for LEED performance evaluation for BD+C
- Know the 6 versions of LEED v4
- Know the purposes of Product Category Rules
- Know topics of focus for the International Green Construction Code
- Understand the parameters of a Whole Building Life Cycle Assessment according to the IgCC
- Know the scope of the Energy Star rating system
- Know what types of buildings are eligible for Energy Star Certification
- Understand the difference between Green Globes and LEED
- Know qualifying items for durability with respect to service life under rating systems
- Know the impact categories eligible for CO<sub>2</sub> reduction credits
- Understand purpose and options for material resource credits in LEED
- Know concrete resiliency benefits for which LEED credits can be earned
- Understand options for materials and resource Credit 4 on building product disclosures and optimization-sourcing raw materials
- Understand options for materials and resource Credit 4 on building product disclosures and optimization-material ingredients
- Understand the criteria for earning LEED credits on Minimum Energy Performance
- Know the methods for earning LEED credits for Indoor Air Quality

### **Concrete Production and Delivery**

- Know the relative contribution of building operation and building construction to CO<sub>2</sub> emissions
- Understand the approaches that can be implemented to improve the “greenness” of concrete
- Understand which aspects of concrete production contribute the most to CO<sub>2</sub>
- Know factors impacting sustainability in transportation of concrete raw materials
- Understand methods for reducing the carbon footprint of concrete
- Understand methods for placement of fresh concrete
- Understand the advantages of pumping fresh concrete
- Identify opportunities for managing waste materials during production and transportation of concrete
- Know the amount and requirements of water used in the production of concrete
- Understand the industry goals to reduce use of potable water in the production of concrete
- Know waste materials that can be used to improve the “greenness” of concrete
- Know the impact of SCC on the properties of concrete
- Understand potential changes in properties of concrete with recycled aggregate
- Know tips for mixture proportioning concrete design mixtures with recycled aggregate
- Understand special requirements for production of concrete with recycled aggregate

### **Service Life and LCCA**

- Understand trade-off between initial and long-term costs
- Know operational and embodied energy of buildings
- Understand the relative carbon footprint of building life phases
- Understand heat transfer through building envelopes

- Know thermal mass
- Understand effect of longevity on total CO<sub>2</sub> emissions
- Understand service life
- Understand maintenance needs of exposed concrete surfaces
- Know beneficial aspects of integrating concrete elements
- Know maintenance and repair of concrete structures
- Understand repair design
- Know adaptive reuse
- Know mechanisms of and solutions to corrosion of reinforcement
- Know the benefits of pervious concrete for stormwater management
- Know the effects of concrete color on lighting requirements

### **Design and Construction Practice**

- Know the energy performance characteristics of forming systems
- Know how to calculate R-value of building assemblies
- Understand methods for considering the impact of thermal bridging
- Understand the impact of thermal mass on energy performance
- Know the different methods for utilizing solar gain and thermal mass to enhance building performance
- Understand the influence of climate in relation to thermal mass
- Know components that can be considered in building design and their impact
- Know how acceptance age requirements can vary with mix design
- Know about different codes and standards bodies and their sphere of influence
- Understand that ACI 318 is primarily a life safety code with enhancements for critical building types
- Know the five primary measures for assessment of successful sustainable design
- Understand BIM and its application to building design
- Know different forming systems and their characteristics
- Know characteristics for considering form system selection
- Understand how specification of concrete can impact its carbon footprint
- Know how over design can negatively impact concrete's carbon footprint
- Understand the difference between codes and rating systems
- Understand the relationship between standards and codes or law
- Understand that architectural precast panels may be used in blast resistant design to absorb the energy of a blast through cracking and deflection
- Insulated architectural precast panels can use concrete mix designs for the back-up layer of the panel that are specifically chosen to limit environmental impact
- Understand the impact of post-tensioned concrete on member design
- Understand the differences between bonded and unbonded post-tensioning tendons
- Know the differences between prestressed concrete and post-tensioned concrete
- Know the scope of the respective codes and standards

### **Social, Environmental, Economic**

- Understand the meaning and components of the "triple bottom line"
- Know and define the various stakeholders impacted by a structure or a system
- Understand the meaning of VOC
- Understand the impact of Indoor Air Quality on Health and Productivity
- Understand the role of concrete in safety

- Understand the role and function of concrete in aesthetics

### **Environmental**

- Understand the environmental impacts associated with different concrete constituents
- Understand the different phases of the lifecycle of concrete
- Understand the impact of concrete on climate change
- Understand the impact of GHG and CO<sub>2</sub> emissions
- Understand the definition of Heat Island effect
- Understand and identify mitigation means for heat island effect
- Understand the definition and calculation of SRI
- Understand the impact of material selection on heat island effect
- Understand the role of concrete in water management
- Understand the water consumption components in concrete production and use

### **Economic**

- Understand the importance of durability in construction and the role of concrete thereof
- Understand the definition and functions of thermal mass in energy saving
- Understand U and R values
- Understand various insulation systems
- Understand the difference between initial cost, maintenance cost, and lifecycle cost
- Understand the meaning of service life and design life

### **Climate Change**

- Understand carbon footprint
- Understand effect and mitigation of heat islands
- Know the primary causes of climate change
- Understand global temperature change
- Understand the metrics that are monitored for climate change
- Know the primary greenhouse gasses and their relative impact
- Know current and historic measurement and predictions of atmospheric CO<sub>2</sub>
- Know climate feedback loops
- Understand natural climate cycles
- Understand what impacts of climate change have been observed
- Understand the impact of climate change on the oceans
- Understand the impact of climate change on weather events and seasons
- Understand what ice cores reveal about natural climate change
- Understand how scientists project future climate change
- Know the relative impact of climate change on regional temperatures
- Understand the relative impact of climate change on regional precipitation patterns
- Know the impact of changing ice and snow patterns
- Know the impact of rising sea levels on coastlines
- Understand the impact of climate change on ecosystems
- Understand how climate change will impact agriculture and food production
- Know the choices for reducing greenhouse gas emissions
- Know reasons for undertaking climate change mitigation
- Understand the concept of iterative risk management

## Resilience

- Understand the definition of disaster resilience
- Know the five ways to characterize durability
- Understand the definition of functional resilience
- Understand aspects of resilience related to disaster resistance
- Understand the attributes of concrete bearing walls and shear walls with respect to disaster resistance
- Know the resilient attributes of exposed concrete finishes
- Understand basic requirements for creating durable concrete structures
- Understand what constitutes adaptive reuse
- Understand that building codes and sustainability ratings systems do not consider the benefits of functional resilience
- Know the ways that resilient building structures protect during extreme events
- Understand that the most common hazards for a building
- Know the relationship between sustainability and resilience
- Understand the methods for quantifying resilience and sustainability
- Understand fragility curves
- Understand the difference between infrastructure and disaster resilience
- Know the relation between traditional sustainable design, disaster resilience, and sustainability
- Know the general considerations for resilient design
- Know programs that can be used for resilience against hazards
- Know passive survivability and its relation to concrete
- Know strategies for resilient design in developing countries
- Know the definition of vulnerability
- Understand resilience mitigation versus sustainability mitigation
- Know examples of risk
- Know adaptation measures for resilience
- Know the most frequent hazard across the world
- Know the core attributes of a resilient community
- Know resilient design principles

## Life-Cycle Analysis

### Life Cycle Environmental Impact Assessment (LCA)

- Understand how increased service life with concrete structures impacts an LCA
- Know the impact of material selection on emissions
- Know the life cycle stages to products and buildings and how they differ
- Understand the effect of regular preventative maintenance on the environmental impact of a building
- Know what standards are used in LCAs
- Know what or who determines the reference study period of a building
- Know what steps should be taken if the reference study period and the required service life are not the same
- Know the data sources used to assess impacts
- Know the goals of conducting an LCA
- Understand the difference between embodied (carbon) energy and operating (carbon) energy
- Know carbon sequestration
- Know biogenic carbon

- Know how biogenic carbon is reported in an LCA
- Understand how operational energy can be used to compare buildings
- Know what must be defined in the scope of an LCA
- Know the steps taken in the verification of an LCA
- Understand interchangeable terms for emissions associated with climate change or global warming
- Understand the environmental impact categories used in building initiatives
- Know the five phases of life cycle assessment
- Understand the types or variants of LCA
- Know the different types of process-based LCA methods
- Be able to establish a functional unit
- Be able to establish a system boundary
- Understand the uses of life cycle assessment
- Know how to perform categorization of inventory results, normalization, aggregation, and weighting
- Be able to calculate carbon equivalence
- Understand the role of iterations in life cycle assessment
- Understand LCI
- Know the role of data quality
- Know the life cycle stages as defined in LCA
- Be able to perform the role of energy mixes, water resources, and transportation in environmental impact assessment
- Know end-of-life options
- Know sensitivity assessment of inventory (and environmental impacts)
- Know uncertainty assessment of environmental impacts (and inventory)
- Understand the working definitions of LCA

#### **Life Cycle Cost Assessment (LCCA)**

- Understand Life Cycle Costing
- Know the costs taken into consideration when performing an LCCA
- Know when to conduct an LCCA
- Know how inflation is treated in an LCCA
- Know the parameters for Present-Value Analysis
- Be able to calculate Life Cycle Cost
- Know the supplementary measures of Economic Evaluation
- Understand the detrimental aspects of an LCCA
- Know techniques to assess uncertainty in LCCA

ANNEX 692.1-5

**AMERICAN CONCRETE INSTITUTE**

**Policy on Sponsoring Groups  
for  
Certification**

Approved by the ACI Board of Direction  
March 21, 1991

Last revised by the ACI Certification Programs Committee  
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In developing certification exams for the concrete construction industry, the American Concrete Institute (ACI) has set forth minimum criteria by which an individual's proficiency is to be judged. Typically, ACI is not in a position to deliver certification exams directly to participants; therefore, it is necessary for ACI to have the ability to delegate this authority. However, if the need arises, ACI reserves the right to conduct exam sessions itself according to each program Policy.

In order to allow others to deliver its certification exams, ACI has adopted the "Sponsoring Group" concept. Sponsoring Groups act as agents of ACI in the delivery of ACI certification exams. Therefore, prior to being selected as an ACI Sponsoring Group, and for the duration of the period in which the group is authorized to act as a Sponsoring Group, such groups are subject to the following policies:

1. Sponsoring Groups shall be approved, in writing, by ACI's Certification Department (hereafter referred to as ACI) before they will be permitted to conduct an ACI<sup>1</sup> certification exam session. In all cases, approval of Sponsoring Groups shall be at the sole discretion of ACI.
2. In reviewing applications, ACI will consider, among other factors, the following:
  - A) The ability and willingness of the applicant to include in their constituency segments of the concrete construction industry impacted by the exams which they have applied to conduct. This includes individuals involved in the specification, production, design, construction, testing and inspection of concrete and concrete products. The applicant must establish a governance structure with representation appropriate to all of the exams for which the applicant has applied.
  - B) The interest, experience and technical expertise necessary to conduct exam sessions exhibited by the applicant and/or their certification governance structure.
  - C) The legitimate need for the applicant to conduct a specific ACI certification exam within their approved operational jurisdiction.

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<sup>1</sup> For the purposes of this policy, references to "ACI certification" and "ACI certification program(s)" include only those administered solely by ACI (ACI programs). Programs with cosponsors are not directly addressed by this Policy.

- D) The primary objective of the applicant in applying for sponsorship, which must coincide with ACI's overall mission of improving the quality of concrete construction within the political, social, and cultural dynamics of the intended operational jurisdiction.
3. Sponsoring Groups are required to maintain a governance structure to oversee the delivery of ACI exams. The governance structure shall consist of a committee of at least three (3) individuals, each working for a different employer and each producing a different product or service related to the concrete construction industry. At all times, at least one (1) member of the committee shall be a member of ACI. Further, ACI shall be furnished with a complete and accurate listing of contact information for all committee members including names, employers, type of businesses, physical addresses, email addresses, and both office telephone and cell phone numbers as available.
  4. The certification committee shall obtain the services of ACI-approved examiners. The examiners shall operate under the direct supervision of the certification committee to conduct ACI certification exam sessions. Examiners are permitted to conduct ACI certification exam sessions only under the auspices of ACI or ACI-approved Sponsoring Groups; and they must comply with all ACI certification policies and procedures.
  5. At the time of approval, ACI shall assign Sponsoring Groups specific geographical areas within which they will have authority to conduct ACI certification exam sessions. This area is the approved operational jurisdiction for the Sponsoring Group.
  6. ACI shall approve each Sponsoring Group on a calendar year basis for a period not to exceed two (2) years. Prior to the conclusion of this period, all groups shall reapply to ACI for approval to continue to act as an ACI Sponsoring Group.
  7. In the U.S., in areas where no Sponsoring Group is actively administering a specific ACI examination, the local ACI chapter (not a student chapter) shall have first rights to administer that specific exam. International sponsorship for any ACI examination will be assessed on a case-by-case basis.
  8. If an existing Sponsoring Group or ACI Chapter is solicited to administer an examination and participation is declined, or if a sponsor does not request an examination upon initial availability from ACI, or if a requested examination is not administered within two years following approval, administration of said examination may become available to other potential sponsors.
  9. If more than one applicant wishes to sponsor an ACI certification exam in the same operational jurisdiction and there is documented need for more than one group to conduct the examination in that jurisdiction or portion thereof, a system of coordination between those groups shall be established. A description of this system shall be considered along with any new Sponsoring Group application and must be included in the governance system for any existing Sponsoring Group. In all cases, ACI reserves the right, in its sole discretion, to select a delivery system that in its judgment is best able to serve the interests of ACI.
  10. Applicants wishing to sponsor ACI certification examinations on a "national" or "regional" basis will, in appropriate circumstances, be approved to conduct exams under specific conditions at the discretion of ACI.



11. Approved Sponsoring Groups are responsible for:
  - A) Maintaining control over the administration of ACI Certification exams offered within their operational jurisdiction. This includes, but is not limited to, maintaining control over the ethical and professional integrity of every sponsored examination session and providing ongoing oversight of exam session coordinators, examiners, and other exam delivery personnel.
  - B) Conducting a sufficient number of exam sessions and providing equitable access to those exam sessions for all individuals seeking ACI Certification within the group's operational jurisdiction.
  - C) Conducting all ACI exams in a manner which complies with the intent of ACI's policies and procedures governing certification.
  - D) Formulating, publishing, and enforcing consistent and equitable pricing for ACI Certification exams offered by the Sponsoring Group within their operational jurisdiction.
  - E) Developing and implementing participant registration processes that satisfy the policy requirements of each exam offered by the Sponsoring Group and verifying that each participant has met the eligibility requirements of the program before being allowed to complete an ACI exam.
  - F) Collecting exam fees from participants, paying materials invoices to ACI within 30 days of receipt, and distributing compensation to examiners and other program delivery personnel as warranted.
  - G) Developing a program delivery process that establishes separation between the education/training and testing divisions of the Sponsoring Group.
12. ACI has the right to revoke a Sponsoring Group's authority to conduct an ACI certification exam at any time, with or without cause, and with or without notice.
13. Appeals resulting from the denial or revocation of Sponsoring Group status will be reviewed by ACI Staff for determination of appropriate action on a case-by-case basis.
14. This policy shall become effective sixty (60) days after its approval by the ACI Certification Programs Committee, and shall render all previous Policy versions null and void. Sponsoring

Groups shall be notified of this new policy in writing within thirty (30) days after it is approved by the ACI Certification Programs Committee.

15. The Certification Programs Committee shall review, revise as necessary, and reapprove this Policy at intervals not exceeding two years in length.

