



Training and Certification of Concrete Technicians

A CCIL-certified laboratory shall employ:

- i) Laboratory Technicians certified to perform the laboratory test methods for which the laboratory is certified, and
- ii) Field Technicians certified to perform the field tests for which the laboratory is certified.

CSA A283 requires that field and laboratory testing shall only be done by personnel who are certified to meet the requirements of CSA A23.2 and CSA A283.

CCIL certifies concrete testing laboratories and the field and laboratory technicians who work for a certified concrete testing laboratory. CCIL does not provide training or training materials.

Training

There are three ways most commonly used to prepare technicians for the written and practical examinations:

- i) Taking construction technician or technologist courses at a post-secondary institution;
- ii) On-the-job training in combination with self-study of the test methods for which the laboratory is certified;
- iii) Taking a course offered by the American Concrete Institute (ACI). ACI offers a “CSA-Based Field Testing Technician” course. Details can be found at www.concrete.org/certification.

The ACI Concrete Field Testing Technician Grade 1 certificate is recognized in CSA A283-06 as a valid qualification for field technicians who perform basic field tests. CCIL must be notified within 30 days of the employment of an ACI certified technician and provided with a copy of the certificate. The technician is limited to performing test methods A23.2-1C, 3C (compression test specimens only), 4C, 5C, 17C and 19C.

Requirements and Examinations

Mobile phones must be switched off and placed out of sight during examinations. The requirements are given on the cover page of every examination paper.

Field Technicians

Field technicians must complete a written (closed book) examination and a practical examination. The written examination comprises 40 multiple choice questions for Category 0, 60 questions for Category 1 (including the Category 0 questions), and 67 questions for Category 2 (including the Category 0 and Category 1 questions). The written examination for additional tests includes seven questions on each test method.

The practical examination for Category 0 includes the demonstration of test methods CSA A23.2-3C (compression specimens only), 4C, 5C and 17C, and an oral description of test method CSA A23.2-19C. The practical examination for Categories 1 and 2 may include any of the test methods on the written

examination paper and shall comprise oral questions and practical demonstrations chosen by the CCIL Inspector.

The test methods included in the examination papers are as follows:

Category 0: CSA A23.2-1C, 3C (compression specimens only), 4C, 5C, 17C and 19C;

Category 0 plus the flexural test option: Category 0 test methods plus 3C (flexural test specimens) and an open book examination on test method CSA A23.2-8C;

Category 1: Category 0 test methods plus CSA A23.2-1A, 10A, 6C, and 14C;

Category 2: Category 1 test methods plus CSA A23.2-12C

Additional Tests: CSA A23.2-1B*, 6B (Procedure A only), 3C (flexural test specimens only), 7C, 15C and 20C.

** See note in the section "Laboratory Technicians" concerning test method CSA A23.2-1B.*

The maximum duration of the examinations is 30 minutes for Category 0, 45 minutes for Category 1 (including the Category 0 questions) and 50 minutes for Category 2 (including the Category 0 and Category 1 questions). The time allowed to answer questions on the additional tests is 5 minutes for each test method. The maximum duration of the closed book examination for Category 0 plus the flexural test option is 35 minutes, and the time allowed to complete the seven questions on test method A23.2-8C is 5 minutes.

The examinations for Categories 0, 1 and 2 will be marked in aggregate; the additional test methods will be marked individually. The passing grade in all cases is 70%. The examinations for each category must be completed in their entirety: the test methods included in the category examinations cannot be examined and certified individually. A technician certified at Category 1 must pass the Category 0 examinations. A technician certified at Category 2 must pass the Category 0 and Category 1 examinations.

Concrete field technicians passing the written and practical examinations are issued a "CCIL Certified Concrete Field Testing Technician" card which identifies the test methods the technician is certified to perform, and is valid for a period of five years. If a technician upgrades by passing only the examination for the new category, and does not renew his or her certification for lower categories, the new test methods are added to his or her field card with no change in expiry date. The same principle applies to any additional tests.

Laboratories certified at Category 1 or Category 2 must employ one or more field technicians certified in the appropriate category and for each additional field test on the Laboratory Certificate, though this does not have to be the same person. A technician must hold a valid CCIL field card before taking an examination for an additional field test. This includes the flexural test option in a Category 0 laboratory. Any technician holding a valid CCIL field card in any category may be certified for any additional test included on the Laboratory Certificate.

A technician who, as a result of a change in location or employer, is certified for more tests than included on the Laboratory Certificate of the current employer, is limited to performing the tests on the Laboratory Certificate. The technician's certification for the restricted tests remains valid for five years from the date of certification should the technician be employed by a laboratory certified for the applicable test methods.

Laboratory Technicians

Laboratory technicians must complete a written (open book) examination and demonstrate competence in the laboratory test methods. The written examination comprises 20 multiple choice questions for Category 0, 60 questions for Category 1 (including all the Category 0 questions) and 80 questions for a Category 2 (including all the Category 0 and Category 1 questions). The written examination for additional tests comprises seven questions on each test method.

The practical examination for Category 0 includes the demonstration of test method CSA A23.2-9C. The practical examination for Categories 1 and 2 may include any of the test methods on the written examination paper and shall comprise oral questions and demonstrations chosen by the CCIL Inspector.

The test methods included in the examination papers are as follows:

Category 0: CSA A23.2-3C and 9C;

Category 1: CSA A23.2-2A, 3A, 4A, 5A, 6A, 7A, 10A, 11A, 12A, 13A, and 14C;

Category 2: Category 1 test methods plus CSA A23.2-8A, 2C, 11C, and 12C

Additional Tests: CSA A23.2-9A, 14A, 16A & 17A, 23A, 24A, 25A, 26A, 29A, 1B*, 2B, 3B, 4B, 6B (Procedure B only), 8B, 8C, 10C, 13C, 16C, 18C, 21C, 22C and 23C, ASTM C457 and C666.

** Test method CSA A23.2-1B includes field activities (viscosity, expansion, bleeding and the moulding of compression specimens) and laboratory activities (curing and testing compression specimens). The relevant sections of the Laboratory and Field Examinations must be completed, though not necessarily by the same person.*

The maximum duration of the examinations is 15 minutes for Category 0, 45 minutes for Category 1 (including the Category 0 questions) and 60 minutes for Category 2 (including the Category 0 and Category 1 questions). The time allowed to answer questions on the additional tests is 5 minutes for each test method.

The Category 0 examination includes questions on the receipt and curing of concrete cylinders in the laboratory. A technician passing the Category 0 Laboratory Examination is not certified to cast concrete cylinders or perform any of the field activities in test method CSA A23.2-3C. The Category 0 Laboratory Examination was introduced on January 1, 2018. Technicians who passed the Category 0 Field Examinations or the Category 1 or 2 Laboratory Examinations prior to January 1, 2018 are certified to perform test method CSA A23.2-9C until their certification expires.

The examinations for Categories 0, 1 and 2 will be marked in aggregate; the additional test methods will be marked individually. The passing grade in all cases is 70%. The examinations for each category must be completed in their entirety: the test methods included in the category examinations cannot be examined and certified individually. A technician certified at Category 1 must pass the Category 0 examinations. A technician certified at Category 2 must pass the Category 0 and Category 1 examinations.

The laboratory is provided with a written record of the examination results of laboratory technicians passing the written and practical examinations. The certification of a laboratory technician is valid for five years. If a technician upgrades by passing only the examination for the new category, and does not renew his or her certification for lower categories, the new test methods are added to his or her certification with no change in expiry date. The same principle applies to any additional tests. If a technician who is qualified for one or more additional test, but has not qualified as Category 0, 1 or 2, qualifies for another additional test, the expiry date is the earliest date his or her qualification expires for any of the additional tests. This is done so that all the tests for which the technician is qualified are on the same five-year renewal cycle.

The laboratory must employ one or more technicians qualified in the appropriate category, and for each additional test listed on the laboratory's certificate, though this does not have to be the same person. *For example, a laboratory certified for Category 2 plus additional tests must employ one or more technicians who have passed the CCIL Laboratory Exam for Category 2 and demonstrated practical competence in the Category 2 test methods. In addition, the laboratory must employ one or more technicians who have passed the CCIL Laboratory Exam for the additional tests and demonstrated practical competence in the additional tests. The person qualified to perform additional tests does not have to be qualified for the Category 2 tests, and does not have to be qualified to perform all the additional tests included in the laboratory's certificate.* This provision recognizes that some laboratory technicians may perform only specialized or advanced testing. The essential requirement is that the laboratory employs staff certified to execute every test for which the laboratory is certified.

If a laboratory technician is certified for more tests than included on the Laboratory Certificate of the current employer, the same restrictions apply as for field technicians.

Repeating Examinations

If a technician fails the written or practical Field Examination or the Laboratory Examination, both the written and practical examinations must be completed successfully within a 12 month period, otherwise the technician must begin a new application.

If a technician fails the written or practical Field Examination, the technician will be allowed to repeat the examination once during the inspector's visit (subject to the inspector's schedule). The minimum time to be re-examined after the second failure is 21 calendar days. If an examination is failed for the third time, the technician must begin a new application and complete both the practical and written examinations

If a technician fails the written Laboratory Examination, the technician will only be allowed to repeat the examination during the inspector's visit if the technician is successful in the practical Laboratory Examination. The minimum time to be re-examined after failing the practical Laboratory Examination, or failing the written Laboratory Examination a second time, is 21 calendar days. If an examination is failed for the third time, the technician must begin a new application and complete both the practical and written examinations.

Record Keeping

The supervising engineer of the laboratory is responsible for maintaining a record of staff certifications, the expiry date of the certification of field and laboratory technicians, and ensuring that tests are performed by certified staff. The expiry date of the certification of technicians shall be shown on the laboratory's organization chart or as an attachment.

During the annual audit, the inspector will verify that:

- i) All technician certifications are up-to-date.
- ii) The laboratory has staff certified to perform all the test methods on the Laboratory Certificate.
- iii) All testing is performed only by certified personnel.