



Concrete Testing Technician Certification Program Description

1. Introduction to CCIL Technician Certification

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 Standard 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. Testing carried out by uncertified individuals who are training can not be used for acceptance purposes.

CCIL only certifies concrete testing field and laboratory technicians who work for a CCIL certified concrete testing laboratory. CCIL does not provide training or training materials. In accordance with Clauses 5.2.1.1 b) and 5.2.2.2 e) of CSA Standard A283 it is the responsibility of the laboratories to train and maintain competent testing personnel and ensure that all concrete tests are done by certified technicians.

2. Training

In accordance with CSA standard A283-19 clause 5.2.1.1 b) and clauses 5.2.2.2 e) & f), CCIL requires the Supervising Professional to ensure and confirm the following prior to the date of certification;

- a. the technicians listed for certification examination are adequately trained and capable of following the current versions of the specified test procedures; and
- b. the Supervising Professional has, in the recent past, reviewed the test procedures with the technicians to be certified.

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 Standard A283-19 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 shown copies of the certificate during annual inspection. The technician is limited to performing test methods A23.2-1C, 3C (compression test specimens only), 4C, 5C, and 17C.

3. Requirements and Examinations

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

Only tests included on the laboratory's certification can be obtained by technicians working for that laboratory.

Laboratories must employ one or more field technicians and laboratory technician certified in the appropriate type and for each additional field test listed on the Laboratory Certificate, though this does not have to be the same person.

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 become employed by a laboratory certified for the applicable test methods.

3.1. Field Technicians

Field technicians must complete a written (closed book) examination and a practical (demonstration) examination.

3.1.1. Field Technician Written Examination

The written examination comprises eight (8) questions for each test method. A mark of 75% on each test method is required to pass.

- Basic Concrete Field Type QF certification has 40 multiple choice questions to be completed in 40 minutes.
- Concrete Aggregate Field Type RF certification has 16 multiple choice questions to be completed in 20 minutes.
- Advanced Concrete Field Type SF certification has 8 multiple choice questions to be completed in 10 minutes.

A technician must be certified for Basic Concrete Field Type QF and Concrete Aggregate Field Type RF before he or she can be certified for Type SF.

Additional field test method certification each have 8 multiple choice questions to be completed in 10 minutes. A field technician must have a valid Basic Concrete Field Type QF certification to add any Type QF additional tests and Advanced Concrete Field Type SF certification is required to add any Type SF additional tests. A field technician must have a valid Basic Concrete Field Type QF certification with 19C to add 20C. A field technician must have a valid Advanced Concrete Field Type SF certification with 18C to add 12C.

Basic Concrete Field Type QF certification is no longer required to obtain Concrete Aggregate Field Type RF certification.

3.1.2. Field Technician Practical Examination

The practical examination for Basic Concrete Field Type QF certification 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 A23.2-1C. A mark of 95% on each test method is required to pass. The practical examination for Concrete Aggregate Field Type RF certification and Advanced Concrete Field Type SF certification may include any or all of the test methods on the written examination paper and shall comprise oral questions and practical demonstrations chosen by the CCIL Inspector to satisfy the Inspector the technician is competent to perform the test methods.

3.1.3. Field Technician Examination Test Methods

The test methods included in the field technician closed book examinations are as follows:

The Field Technician Exam – Closed Book includes the following test methods (provided they are listed on the laboratory's certification):

- Basic Concrete Field Type QF Technician Certification: CSA A23.2-1C, 3C (field compressive), 4C, 5C and 17C;
- Concrete Aggregate Field Type RF Technician Certification: CSA A23.2-1A and 10A;
- Advanced Concrete Field Type SF Technician Certification: requires Type QF and RF plus CSA A23.2- 6C

Additional Tests for Type QF: (Must have Type QF certification to add any of the following) CSA A23.2-1B (field), 6B (Proc A), 3C (flexural), 7C, 14C (field), 15C, 16C, 19C, or 20C (requires 19C).

Additional Tests for Type RF: None

Additional Tests for Type SF: (Must have Type SF certification to add any of the following) CSA A23.2-12C (field) (requires 18C), or 18C

** Please note that test method CSA A23.2-1B, 14C, and 12C include both field and laboratory activities. The relevant sections of the Laboratory Technician and Field Technician Examinations must be completed, though not necessarily by the same person.*

The examinations for each type must be completed in their entirety: the test methods included in the type examinations cannot be examined and certified individually unless specifically listed as additional tests such as 8A and 11C.

3.1.4. Field Technician Results and Cards

The laboratory is provided with a written record of each technician attempting the written and practical examinations.

Concrete field technicians passing the written and practical field 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.

Prior to the expiry year of the technician certification, if a technician upgrades by passing only the examination for a new type, and does not renew his or her certification for the original type(s), the new test methods are added to his or her field card with no change in the original expiry date. The same principle applies to any additional tests.

3.2. Laboratory Technicians

Laboratory technicians must complete a written (open book) examination and a practical (demonstration) examination.

3.2.1. Laboratory Technician Written Examination

The written laboratory technician examination comprises 12, 8 or 4 questions for each test method. A mark of 75% on each test method is required to pass.

- Basic Concrete Laboratory Type QL technician certification has 20 multiple choice questions to be completed in 20 minutes.
- Concrete Aggregate Laboratory Type RL technician certification has 32 multiple choice questions to be completed in 35 minutes.
- Advanced Concrete Laboratory Type SL technician certification has 24 multiple choice questions to be completed in 25 minutes.

There are no pre-requisites for the Laboratory technician certifications. Basic Concrete Laboratory Type QL, Concrete Aggregate Laboratory Type RL, and Advanced Concrete Laboratory Type SL and all laboratory additional test methods may each be obtained by a different individual technician.

The written examination for additional tests includes eight questions on each test method to be completed in 10 minutes.

3.2.2. Laboratory Technician Practical Examination

The practical examination for Basic Concrete Laboratory Type QL Technician certification includes the demonstration of test methods CSA A23.2-3C and 9C. A mark of 95% on each test method is required to pass. The practical examination for Concrete Aggregate Laboratory Type RL and Advanced Concrete Laboratory Type SF technician certification may include any or all of the test methods on the written examination paper and shall comprise of oral questions and practical demonstrations chosen by the CCIL Inspector to satisfy the Inspector the technician is competent to perform the test methods.

3.2.3. Laboratory Technician Examination Test Methods

The test methods included in the laboratory technician open book examinations are as follows:

The Laboratory Technician Exam – Open Book includes the following test methods (provided they are listed on the laboratory's certification):

- Basic Concrete Laboratory, Type QL Technician Certification: CSA A23.2-3C (lab), and 9C;
- Concrete Aggregate Laboratory, Type RL Technician Certification: CSA A23.2-2A, 3A, 4A, 5A, 6A, 7A, 12A, and 13A;
- Advanced Concrete Laboratory, Type SL Technician Certification: CSA A23.2- 8A, 2C, and 11C;

Additional Tests for Type QL: any of the following CSA A23.2- 8A, 1B (lab), 8C, 11C, or 14C (lab);

Additional Tests for Type RL: any of the following CSA A23.2- 9A, 11A, 16A, 17A, 23A, 24A, 25A, 26A, 29A, 2B, 3B, 4B, or 8B;

Additional Tests for Type SL: any of the following CSA A23.2- 14A, 6B (Proc B), 10C, 12C (lab), 13C, 21C, 22C, 23C, 26C, ASTM C457, or C666.

** Please note that test method CSA A23.2-1B, 14C, and 12C include both field and laboratory activities. The relevant sections of the Lab and Field Technician Examinations must be completed, though not necessarily by the same person.*

The Basic Concrete Laboratory, Type QL Technician Certification examination includes questions from CSA-A23.2-3C relating to the receipt and curing of concrete cylinders in the laboratory. A technician passing the Basic Concrete Laboratory, Type QL Technician Certification 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 each type must be completed in their entirety: the test methods included in the type examinations cannot be examined and certified individually unless specifically listed as additional tests such as 8A and 11C.

3.2.4. Laboratory Technician Results

The laboratory is provided with a written record of each technician attempting the written and practical examinations.

The certification of a laboratory technician is valid for five years.

Prior to the expiry year of the technician certification, if a technician upgrades by passing only the examination for a new type, and does not renew his or her certification for the original types, the new test methods are added to his or her certification with no change in the original 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 Type QL, RL or SL, 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.

4. Repeating Examinations

To become certified both the written and practical examinations for the given type or test method must be completed successfully within a 12 month period, otherwise the technician must begin a new application.

If a technician fails, the written examination but obtains an overall grade of at least 70% the technician may be allowed to repeat the written examination once during the inspector's visit (subject to the inspector's schedule).

If a technician fails, the practical exam with 3 or less errors on each test method the technician may be allowed to repeat the practical 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 after another 21-day period and complete both the practical and written examinations.

If a technician obtains an overall grade less than 60% on the written examination the practical examination will not be given.

If a technician fails both the written and the practical examination a same day retest will not be allowed.

5. Record Keeping

The supervising professional of the laboratory is responsible for maintaining a record of staff certifications, including the test methods, the expiry date of the certification of both 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 List of Certified Technicians which is linked to the organization chart as an attachment. Records of the completed certification must be retained by the laboratory to confirm the information listed on the List of certified technicians.

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.
- iv. A request to transfer a technician's certification has been submitted in the CCIL portal for any technicians hired from another CCIL certified laboratory.
- v. CCIL has been informed within thirty days of the employment of technician holding a ACI Concrete Field Testing Technician Grade 1 certification.
- vi. The "CCIL Certified Concrete Field Testing Technician" cards of former employees have been returned to the CCIL Certification Office.

The current versions of the test methods must be available in the laboratory to all staff.