

## **CHAPTER 4**

# **CONCRETE TRAINING AND QUALIFICATION PROGRAM**

4.1 PURPOSE.....	4-1
4.2 BACKGROUND.....	4-1
4.3 QUALIFICATION REQUIREMENTS BY JOB FUNCTION.....	4-1
4.3.1 Concrete Field Technician – Level 1 .....	4-1
4.3.2 Concrete Field Inspector – Level 2.....	4-1
4.3.3 Concrete Laboratory Technician – Level 1 .....	4-2
4.3.4 Concrete Laboratory Technician – Level 2.....	4-2
4.3.5 Concrete Batch Plant Operator.....	4-2
4.4 QUALIFICATIONS AND TRAINING COURSES.....	4-3
4.4.1 Concrete Field Technician Level 1 Qualification Requirements .....	4-3
4.4.2 Concrete Field Inspector Level 2 Qualification Requirements .....	4-5
4.4.3 Concrete Laboratory Technician Level 1 Qualification Requirements .....	4-7
4.4.4 Concrete Laboratory Technician Level 2 Qualification Requirements .....	4-9
4.4.5 Concrete Batch Plant Operator Qualification Requirements .....	4-12
4.5 REQUALIFICATION .....	4-13
4.6 SUSPENSION AND REVOCATION OF QUALIFICATION.....	4-13
4.7 RESPONSIBILITIES.....	4-14

## **4.1 PURPOSE**

The purpose of this section is to describe the *Concrete Training and Qualification Program*. This program is designed to establish a qualification program for persons responsible for the manufacture, testing, placement, and inspection of concrete material on Florida Department of Transportation (Department) highway construction projects. This procedure shall list the details of the qualification program including the associated training courses.

## **4.2 BACKGROUND**

The Department has required American Concrete Institute (ACI) Concrete Field Testing Technician Grade 1 certification for several years. Due to the requirement by the FHWA that, "All sampling and testing data to be used in the acceptance decision or the Independent Assurance program shall be executed by qualified sampling and testing personnel", ACI Concrete Field Testing Technician Grade 1 is no longer sufficient by itself. The Department's Concrete Technical experts have determined that concrete qualifications be divided into three levels with areas of specialization.

In addition, a course has been included to ensure familiarity with current specifications.

## **4.3 QUALIFICATION REQUIREMENTS BY JOB FUNCTION**

### **4.3.1 Concrete Field Technician – Level 1**

This is the QC Technician who must be qualified to perform acceptance tests such as slump, temperature, air content and making/curing concrete cylinders.

Technicians who test concrete material properties or perform Independent Assurance (IA) reviews must also possess this qualification.

### **4.3.2 Concrete Field Inspector – Level 2**

This is the contractor's representative who must be responsible for the quality of the concrete being placed on major bridge projects. These responsibilities are not limited to substructure or superstructure.

The Department's lead inspector on a major concrete bridge structure must have

this qualification.

The ACI Concrete Transportation Construction Inspector certification along with Pile Driving Inspector Qualification and/or Drilled Shaft Qualification, will be required on complex bridge jobs.

### **4.3.3 Concrete Laboratory Technician – Level 1**

This is the Concrete Strength Testing Technician who must be qualified to break samples and record concrete strength for material acceptance.

Any person who tests concrete for material quality compliance or performs Independent Assurance (IA) must also possess this qualification.

Quality Control Manager at the concrete production facilities must have this qualification or alternative qualifications found in Standard Specifications 105-8.7.

### **4.3.4 Concrete Laboratory Technician – Level 2**

The Concrete Laboratory Technician Level 2 qualified technician is a mix designer for concrete mix submittals.

The Department representative responsible for verifying the concrete mix design must have this qualification.

### **4.3.5 Concrete Batch Plant Operator**

This person is an employee of the concrete producer who is identified in the Quality Control Plan as the individual who batches the concrete for the contractor.

Department employees may obtain this qualification for professional knowledge but it is not required for FDOT personnel.

Quality Control Manager at the concrete production facilities must have this qualification or alternative qualifications found in Standards Specifications 105-8.7.

## **4.4 QUALIFICATIONS AND TRAINING COURSES**

There are five concrete qualifications and one "stand-alone" concrete training course:

- (1) Concrete Field Technician Level 1 Qualification
- (2) Concrete Field Inspector Level 2 Qualification
- (3) Concrete Laboratory Technician Level 1 Qualification
- (4) Concrete Laboratory Technician Level 2 Qualification
- (5) Concrete Batch Plant Operator Qualification
- (6) FDOT Concrete Field Inspector Specification Course and Examination

To enable Trainees holding ACI Concrete Field Testing Technician certifications to qualify as CTQP Concrete Field Technician Level 1, a course on FDOT specifications with an examination has been developed. This course along with the criteria for becoming qualified are described in detail in the following text.

Certain qualifications in the FDOT Concrete Field Technician Level 1 program require ACI certification. In these instances, it will be the responsibility of the technician seeking qualification to the CTQP Administrator along with the ACI certification (wallet card) number. The date of qualification shall be the date the last qualification requirement was satisfied.

### **4.4.1 Concrete Field Technician Level 1 Qualification Requirements**

The objective of this qualification is to assure that job site concrete tests including quality control, verification, and resolution tests for concrete construction, used as part of the acceptance program, are performed in accordance with the contract documents.

All trainees seeking Concrete Field Technician Level 1 qualification must:

- (1) Hold a current ACI Concrete Field Testing Technician certification.
- (2) Hold a current FDOT Concrete Field Inspector Specification certification.

After a trainee has successfully met the qualification requirements, the trainee's qualification date shall be added to the CTQP database. The CTQP qualification shall expire in 60 months or on the date of expiration of either the ACI expiration date or the Specification course expiration date, whichever occurs first.

To be adequately prepared for and prior to taking the Concrete Field Technician courses, applicants are encouraged to take and pass the following Department self-study courses: Portland Cement Concrete Testing and Construction Math.

#### **4.4.1.1 ACI Concrete Field Testing Technician Certification Course**

This three day training program includes a class session, written examination (usually one hour), and proficiency examination (usually four hours).

This course uses the standard ACI written examination. Expect the grading and mailing of the examination results by ACI to take two to four weeks. For the most up-to-date requirements, please contact ACI.

##### **Course Prerequisites**

There are no prerequisites for this course; however, applicants are encouraged to take and pass the Department's Portland Cement Concrete Testing and the Construction Math self-study examinations.

##### **Course Written Examination**

A written examination (usually one hour) is administered at the end of the course (usually multiple choice). The examination is electronically graded by ACI. Expect the grading and mailing of the examination results by ACI to take two to four weeks.

##### **Course Proficiency Examination**

A proficiency examination (usually four hours) is administered at the end of the course. Each trainee will be expected to correctly demonstrate skill in performing the proficiency tests. A trainee will be given two chances to pass each test. Failing any proficiency test twice will constitute failure of the proficiency examination. Anyone failing the proficiency examination may reapply for a future proficiency examination; however, a new application must be completed, and the appropriate fee paid.

#### **4.4.1.2 FDOT Concrete Field Inspector Specification Course**

This is a two and one-half day course with a two and one-half hours open book written examination, which covers *Florida Department of Transportation Standard Specifications for Road and Bridge Construction Sections 346, 347, 400 and 415*. The examination is multiple choice. Taking the course is not a prerequisite to taking and passing the examination. Taking the course and passing the examination does not by itself confer qualification. There are additional requirements that must be met to achieve qualification. The FDOT Concrete Field Inspector Specification (CFIS) certificate will expire five years from the date of passing the exam for initial certification, please see Section 1.14.3 of the CTQM for requalification. Where the FDOT CFIS is required for a CTQP Qualification, both the FDOT CFIS and the required ACI certification(s) must be current.

##### **Course Prerequisites**

There are no prerequisites for this course.

##### **Course Written Examination**

A written examination (usually two and one-half hours) is administered at the end of the course. Taking the course is optional and not required for taking the exam.

#### **4.4.2 Concrete Field Inspector Level 2 Qualification Requirements**

The objective of this qualification is to assure that all concrete related tests and inspections in the field including quality control, quality assurance, verification, and dispute resolution tests for concrete construction used as part of the acceptance program are performed in accordance with the contract documents.

All trainees seeking a Concrete Field Inspector Level 2 qualification must:

- (1) Hold a current ACI Concrete Transportation Construction Inspector certification
- (2) Hold a current ACI Concrete Field Testing Technician certification

- (3) Hold a current FDOT Concrete Field Inspector Specification certification

After a trainee has successfully met the qualification requirements, the trainee's qualification date shall be added to the CTQP database. The date of qualification shall be the date the final requirement was satisfied and shall expire when any of the requirements expire.

#### **4.4.2.1 ACI Concrete Transportation Construction Inspector Training Course (CTCI)**

This is a three-day course which includes a half-day written examination. The written examination is offered three to four weeks after the course is completed. For the most up-to-date requirements, please contact ACI.

##### **Course Prerequisites**

There are no prerequisites for this course.

##### **Course Written Examination**

A written examination (usually four hours, multiple choice) is offered three to four weeks after the course. Expect grading and mailing of the examination results by ACI to take two to four weeks.

#### **4.4.2.2 ACI Concrete Field Testing Technician**

This three-day training program includes a class session, written examination (usually one hour), and proficiency examination (usually four hours).

This course uses the standard ACI written examination. Expect the grading and mailing of the examination results by ACI to take three to four weeks. For the most up-to-date requirements, please contact ACI.

##### **Course Prerequisites**

There are no prerequisites for this course; however, applicants are encouraged to take and pass the Department's Portland Cement Concrete Testing and the Construction Math self-study examinations.

## **Course Written Examination**

A written examination (usually one hour) is administered at the end of the course (usually multiple choice). The examination is electronically graded by ACI. Expect the grading and mailing of the examination results by ACI to take two to four weeks.

## **Course Proficiency Examination**

A proficiency examination (usually four hours) is administered at the end of the course. Each trainee will be expected to correctly demonstrate skill in performing the proficiency tests. A trainee will be given two chances to pass each test. Failing any proficiency test twice will constitute failure of the proficiency examination. Anyone failing the proficiency examination may reapply for a future proficiency examination; however, a new application must be completed and the appropriate fee paid.

### **4.4.2.3 FDOT Concrete Field Inspector Specifications Course**

This is a two and one-half day course with a two and one-half hour open book written examination, which covers ***Florida Department of Transportation Standard Specifications for Road and Bridge Construction Sections 346, 347, 400 and 415***. The examination is multiple choice. Taking the course is not a prerequisite to taking and passing the examination. Taking the course and passing the examination does not by itself confer qualification. There are additional requirements that must be met to receive a qualification.

### **4.4.3 Concrete Laboratory Technician Level 1 Qualification Requirements**

The objective of this qualification is to assure that all laboratory strength tests that are used for quality control, quality assurance, verification, dispute resolution, and acceptance of concrete are performed in accordance with the ***Standard Test Methods***, project specifications and other contract documents.

All trainees seeking to become a qualified Concrete Laboratory Technician Level 1 must:

(1) Hold a current ACI Concrete Strength Testing Technician Certification

**OR**

(1) Hold a current ACI Concrete Laboratory Testing Technician Level 1 Certification

After a trainee has successfully met the qualification requirements, the trainee's qualification date shall be added to the CTQP database. The CTQP qualification shall expire in (5) five years (60 months) or on the date of expiration of the earliest required ACI certification, whichever is earlier.

#### **4.4.3.1 ACI Concrete Strength Testing Technician Certification Course**

This course is a one and one-half day training class with a written examination (usually one hour). In addition, the candidate must pass a proficiency examination (usually two to four hours).

##### **Course Prerequisites**

There are no prerequisites for this course. Applicants are encouraged to take and pass the Department's Portland Cement Concrete Testing and Construction Math self-study examinations prior to the Concrete Strength Testing Technician Certification Course.

##### **Course Written Examination**

A written examination is administered at the end of the course (usually multiple choices). The examinations are electronically graded by ACI. Expect grading and mailing of the examination results by ACI to take three to four weeks.

##### **Proficiency Examination**

A proficiency examination (usually four hours) is administered at the end of the course. Each trainee will be expected to correctly demonstrate skills in conducting the tests mentioned previously. Each trainee will be given two chances to pass each test. Failing any proficiency test twice, will constitute failure of the proficiency examination. Anyone failing the proficiency

examination may reapply for a future proficiency examination; however, a new application must be completed, and the appropriate fee paid.

#### **4.4.3.2 ACI Concrete Laboratory Testing Technician Level 1 Certification Course**

This course is a one and one-half day training class with a written examination (usually one hour). In addition, the candidate must pass a proficiency examination (usually two hours).

##### **Course Prerequisites**

There are no prerequisites for this course. Applicants are encouraged to take and pass the Department's Portland Cement Concrete Testing and Construction Math self-study examinations prior to the course.

##### **Course Written Examination**

A written examination is administered at the end of the course (usually multiple choices). The examinations are electronically graded by ACI. Expect grading and mailing of the examination results by ACI to take three to four weeks.

##### **Course Proficiency Examination**

A proficiency examination (usually four hours) is administered at the end of the course. Each trainee will be expected to correctly demonstrate skills in conducting the laboratory tests mentioned previously. Each trainee will be given two chances to pass each test. Failing any test twice, will constitute failure of the proficiency examination. Anyone failing the proficiency examination may reapply for a future proficiency examination; however, a new application must be completed, and the appropriate fee paid.

#### **4.4.4 Concrete Laboratory Technician Level 2 Qualification Requirements**

The objective of this qualification is to assure that all laboratory test results that are used for quality control, quality assurance, verification, dispute resolution and acceptance of concrete are performed in accordance with ***Standard Test***

**Methods**, project specifications and other contract documents.

All applicants seeking Concrete Laboratory Technician Level 2 qualification must:

- (1) Hold a current ACI Concrete Laboratory Testing Technician Level 1 Certification
- (2) Hold a current ACI Concrete Laboratory Testing Technician Level 2 Certification
- (3) Hold a current FDOT Concrete Field Inspector Specification certification  
See **Section 4.4.1.2** for more details about this examination.
- (4) Have one-year experience in laboratory, sampling and testing aggregate for concrete and testing concrete.

After a trainee has successfully met the qualification requirements, the trainee's qualification date shall be added to the CTQP database. The date of qualification shall be the date the final qualification requirement was satisfied and shall expire when any of the requirements expire.

#### **4.4.4.1 ACI Concrete Laboratory Testing Technician Level 1 Certification Course**

This course is a one and one-half day training class with a written examination (usually one hour). In addition, the candidate must pass a proficiency examination (usually two hours).

##### **Course Prerequisites**

There are no prerequisites for this course. Applicants are encouraged to take and pass the Department's Portland Cement Concrete Testing and Construction Math self-study examinations prior to the course.

##### **Course Written Examination**

A written examination is administered at the end of the course (usually

multiple choices). The examinations are electronically graded by ACI. Expect grading and mailing of the examination results by ACI to take two to four weeks.

### **Course Proficiency Examination**

A proficiency examination (usually four hours) is administered at the end of the course. Each trainee will be expected to correctly demonstrate skills in conducting the laboratory tests mentioned previously. Each trainee will be given two chances to pass each test. Failing any test twice, will constitute failure of the proficiency examination. Anyone failing the proficiency examination may reapply for a future proficiency examination; however, a new application must be completed, and the appropriate fee paid.

#### **4.4.4.2 ACI Concrete Laboratory Testing Technician Level 2 Course**

This is a three-day ACI course called ACI Concrete Laboratory Testing Technician Level II. The course includes a written examination (usually two hours) and a proficiency examination (usually four hours). For the most up-to-date requirements please contact ACI.

Also included are the calculations for testing, calibration procedures for the testing devices/equipment and reporting of data using standard report forms. This instruction includes the use of random number tables.

### **Course Prerequisites**

Check the ACI website for current ACI Course prerequisites

### **Course Written Examination**

A written examination (usually two hours) is administered at the end of the course (multiple choice). The examination is electronically graded by ACI. Expect grading and mailing of the examination results by ACI to take three to four weeks.

### **Course Proficiency Examination**

A proficiency examination (usually four hours) is given at the end of the

course. Anyone failing the proficiency examination may reapply for a future proficiency examination; however, a new application must be completed, and appropriate fee paid.

#### **4.4.5 Concrete Batch Plant Operator Qualification Requirements**

The objective of this qualification is to assure that concrete design mixes are prepared in accordance with the ***Standard Specifications***.

All trainees seeking Concrete Batch Plant Operator qualification must:

- (1) Pass the Concrete Batch Plant Operator's written examination.
- (2) Have 90 days work experience in Batch Plant operations including the batching of fresh concrete, proportioning concrete mix designs, determining the moisture content of aggregates and calculating the water to cementitious materials ratio.

After a trainee has successfully met these qualification requirements, the trainee's qualification date will be added to the training database. The qualification date shall be the date the last qualification requirement was satisfied. The qualification expiration date shall be 5 years (60 months) from the date the written examination was passed.

##### **4.4 5.1 Concrete Batch Plant Operator Qualification Course**

This course was developed by the Florida Department of Transportation as an independent self-study. The Concrete Batch Plant Operator Study Guide is available at: [Concrete Batch Plant Operator Study Guide \(https://ftp.fdot.gov/public/folder/Zw\\_b2wEUMEGGEMcCsl\\_IHw/CTQP%20Manuals\)](https://ftp.fdot.gov/public/folder/Zw_b2wEUMEGGEMcCsl_IHw/CTQP%20Manuals)

##### **Examination**

A written examination (usually two hours, multiple choice) is required for this qualification. The examinations (usually 50-70 multiple choice questions) are electronically graded by the CTQP Administrator. Expect grading and posting of the examination results to take a minimum of two weeks.

## 4.5 REQUALIFICATION

The requirements for requalification are the same as those for initial qualification.

Due to constant changes in specifications, materials, and processes, certifications of qualification are issued for no more than 60 months. When the CTQP qualification includes a requirement to maintain an ACI certification, the CTQP qualification shall coincide with the ACI certification. It is the applicant's responsibility to maintain any CTQP qualification. Qualified technicians are required to submit an application for requalification.

The Department does not have a requalification notification program in effect. It is the responsibility for every qualified person to apply for requalification. Any technician who fails to apply for requalification or to satisfy the requirements for requalification shall become disqualified one calendar day after the last day of the qualification period. A previously qualified person, who lets their qualification expire, must reapply for qualification.

Certain qualifications in the FDOT Concrete Field Inspector program require ACI certification or other certifications. In these instances, it will be the responsibility of the technician seeking qualification to report ACI certifications through the Technician's Online Portal's Report a Requirement on the CTQP website. This reporting will include the ACI certification number for verification of the certificate. The date of qualification will be the date the final requirements was satisfied and shall expire when any of the requirements expire.

The CTQP Concrete Laboratory Technician Level 2 Qualification does not require requalification. The qualification in this area is indefinite, unless revoked in accordance with **Section 1.14.7 or 1.14.8. of this Manual**

## 4.6 SUSPENSION AND REVOCATION OF QUALIFICATION

See **Section 1.14.7 or 1.14.8. of this Manual**

## **4.7 RESPONSIBILITIES**

See ***Sections 1.10, 1.11, 1.12, and 1.13. of this Manual***