

CHAPTER 8

STRUCTURES TRAINING AND QUALIFICATION PROGRAM

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8.1 PURPOSE

The purpose of this chapter is to address all structures related training and qualification programs that pertain to the construction of structures. Five programs are covered in this chapter: (1) Grouting Technician Training and Qualification, (2) Flexible Filler Certification Training, (3) Post-Tensioning (PT) Technician Training and Qualification, (4) Bridge Coating Inspector Training, and (5) Lead Paint Removal Training.

The ***Grouting Technician Training and Qualification Program*** is to make personnel knowledgeable in proper grouting and ensure that job site grouting personnel fully understand grouting technology including methods, materials, and equipment. The program ultimately is to provide assurance to the Department, as the owner of the facility, that grouting is performed and inspected under the supervision of qualified personnel and in accordance with all contract documents.

Flexible Filler Certification Training provides training and certification status to personnel including inspection, supervisory and installer roles in the filler injection process. The flexible filler training is an extension of the grouting course (a prerequisite prior to attendance) and builds upon concepts pertaining to filler injection into PT tendons.

The purpose of the ***Post-Tensioning Technician Training and Qualification Program*** is to ensure the quality installation and inspection of PT steel strands and tendons by making inspection, supervisory and installation personnel aware of proper PT procedures and technology including methods, materials, and equipment as well as the structural significance of PT as the primary structural support for bridge elements.

Bridge Coating Inspector Training provides inspectors and supervisors overseeing bridge painting projects with installation and inspection methods for quality bridge coating/painting operations.

Lead Paint Removal Training provides construction and inspection staff comprehensive training in the complex field of disposal of the hazardous waste produced during lead and other hazardous coating removal operations.

8.2 BACKGROUND

Bridge post-tensioning steel (PT) is a critical structural element that provides a bridge with the capacity to carry the dead load, vehicular, and other live loads it is designed to resist during its service life. If PT is installed improperly, the load carrying capacity of the bridge could be reduced dramatically which could lead to the need for major repairs or even collapse. Because PT has such a critical structural function, its installation must be performed by qualified technicians.

The quality of workmanship during grout placement is an important factor in achieving a quality operation. The training and qualifications of those performing and inspecting the grouting is critical. It is for this reason that formal training and qualification of grouting technicians is required.

The use of flexible filler in lieu of grout as a duct filler is a paradigm shift in post-tensioned bridge construction. Familiarity with the flexible filler injection process and what differentiates it from grouting is key to a proper installation. Having personnel certified in this process is essential to successful installations.

8.3 QUALIFICATIONS REQUIREMENTS BY JOB FUNCTION

8.3.1 Grouting Technician Qualification

This program offers two levels of qualification. Level 1 includes the Construction Engineering and Inspection (CEI) inspection staff as well as the Contractor's non-supervisory crew performing grouting operations. Level 2 is for the Contractor's supervisory personnel overseeing grouting operations. Only CTQP qualified Grouting Technicians will be permitted to function in these roles. Applicants must satisfy the experience and training requirements covered in **Section 8.4.1**.

8.3.2 Post-Tensioning (PT) Technician Qualification

This program offers two levels of qualification. Level 1 includes the CEI inspection staff as well as the Contractor's non-supervisory crew performing PT operations. Level 2 is for the Contractor's supervisory personnel responsible for the PT operation. Applicants must satisfy the experience and training requirements covered in **Section 8.4.2**.

8.4 STRUCTURAL QUALIFICATIONS AND COURSES

There are two structural qualifications with two levels per qualification and three "stand-alone" structural training courses:

- (1) Grouting Technician Training and Qualification (Levels 1 and 2)
- (2) Flexible Filler Certification Training (not a CTQP qualification)
- (3) Post-Tensioning (PT) Technician Training and Qualification (Levels 1 and 2)
- (4) Bridge Coating Inspector Training (not a CTQP qualification)

(5) Lead Paint Removal Training (not a CTQP qualification)

8.4.1 Grouting Technician Requirements

Applicants must satisfy the necessary experience and training requirements to be eligible for qualification as a Level 1 or Level 2. Applicants must attend the ASBI Grouting Certification Training Course or re-qualification course (CBT or classroom) and receive a passing grade on the final examination for the course. A copy of an official certificate issued by the training course provider that confirms a passing examination grade must be submitted to CTQP with the application for qualification.

8.4.1.1 Grouting Technician - Level 1

No experience is required to be eligible for Level 1 Qualification. The Level 1 Qualification expires five (5) years from the date of issuance. See **Section 8.5** for re-qualification requirements.

8.4.1.2 Grouting Technician - Level 2

Applicants for Level 2 must have 2,000 hours of certified experience in grouting of post-tensioning steel. Qualifying experience can include time spent as an inspector, construction worker, or as a construction foreman/supervisor directly involved in the grouting of post-tensioning steel. The hours of experience must be computed by adding up the actual time spent directly involved in grouting operations. Total time spent on a project is permitted only when grouting is underway continuously during the entire duration of the project. The Level 2 Qualification expires at the end of five (5) years. See **Section 8.5** for re-qualification requirements.

8.4.2 Flexible Filler Certification Requirements

Supervisory and installation personnel as well as quality control (QC) inspectors and CEI inspection staff are required to attend the flexible filler course.

CEI inspection staff must present their completion certificate to the appropriate FDOT official (Construction Project Manager, Resident Engineer, etc.) prior to the start of post-tensioned bridge elements using flexible filler to prove that they have received the required training.

8.4.2.1 Flexible Filler Certification Training

Construction personnel on the Contractor's Crew as well as CEI inspection staff must successfully complete the ASBI course entitled "**Flexible Filler Certification Training**". This course is offered in-person or virtually and includes an examination that must be passed in order for ASBI to issue a successful completion certificate.

Consult the ASBI website for the dates Flexible Filler courses are offered. Instructions for how to register for the course are also provided on this website.

8.4.3 PT Technician Requirements

Applicants must satisfy the experience and training requirements to be eligible for qualification as a Level 1 or Level 2. Applicants must attend the Post-Tensioning Institute (PTI) Multistrand and Grouted PT Specialist course and receive a passing grade on the examination for the course. A copy of an official certificate issued by the training course provider that confirms a passing examination grade must be submitted to CTQP along with the application for qualification.

8.4.3.1 PT Technician - Level 1

No experience is required to be eligible for Level 1 Qualification. Level 1 Qualification expires five (5) years from the date of issuance. See **Section 8.5** for re-qualification requirements.

8.4.3.2 PT Technician - Level 2

Applicants for Level 2 must have 2,000 hours of certified experience in PT of steel strand or bar. This experience can include time spent as an inspector and/or as a construction worker directly involved in the PT of steel strand or bar. The hours of experience must be computed by adding up the actual time spent directly involved in PT operations. Total time spent on a project as experience is only permissible when PT is underway continuously during the entire duration of the project. The Level 2 Qualification will expire at the end of five (5) years. See **Section 8.5** for re-qualification requirements.

8.4.4 Bridge Coating Personnel Requirements

Coating personnel must present their completion certificate to the appropriate FDOT official (Construction Project Manager, Resident Engineer, etc.) prior to the start of a bridge coating project to prove that they have received the required training. Department-recognized courses include those offered by:

- The Society for Protective Coatings (SSPC), Bridge Coatings Inspector (BCI) Program or Protective Coatings Inspector (PCI) Program
- The National Association of Corrosion Engineers (NACE) International, Coating Inspector Program (CIP).

Depending on the certification being sought, successful completion may be through a combination of practical and/or written examination. Consult the respective SSPC or NACE websites for the location and time such courses are offered as well as how to register.

8.4.5 Lead Paint Removal Requirements

CEI inspection staff must present their course completion certificate to the appropriate Department official (Construction Project Manager, Resident Engineer, etc.) prior to the start of a coating removal project to prove that they have received the required training.

8.4.5.1 Lead Paint Removal Training

CEI inspection staff must successfully complete the SSPC course entitled "**Lead Paint Removal**" which is designated as SSPC course "C-3". This course includes an examination that must be passed for SSPC to issue a successful completion certificate. Consult the SSPC website for when and where C-3 courses are offered. Instructions for how to register for the course are also provided on the SSPC website.

8.4.6 Grouting and PT Course Accreditation

Courses accredited by the Department must provide at least sixteen hours of combined classroom and laboratory demonstration instruction, provide a comprehensive manual for each student, and require a final examination. Requalification courses must be at least four (4) hours if offered as a classroom course with an in person instructor or they may be offered as a Computer Based Training (CBT) course by the accredited provider.

The Department must approve the course content and final examination and observe a live presentation of the material prior to approving accreditation. Course providers seeking accreditation must contact the Department's State Construction Structures Engineer (Office of Construction) to arrange for Department review of the course.

8.5 REQUALIFICATION GROUTING AND PT COURSES

Applicants must take a re-qualification course (CBT or classroom) and pass the examination to be re-qualified for an additional five (5) years.

8.6 REVOCATION OF QUALIFICATION

See **Sections 1.14.7 CTQP Qualification Revocation Based on Lack of Proficiency** and **1.14.8 CTQP Qualification Revocation Based on Falsification of Records**.

8.7 DEPARTMENT RESPONSIBILITIES

In addition to those found at the end of **Chapter 1**, the following responsibilities are unique to the Grouting and Post-tensioning Technician Training and Qualification Programs. Responsibilities for these qualification programs are distributed among the Office of Construction, Districts, and CTQP Administrator's Office.

8.7.1 Office of Construction

Accredit grouting and post-tensioning training courses and providers.

8.7.2 Districts / District Construction Training Administrators

Provide a CTQP application to Department employees that request it for the Qualified Grouting Technician program and Qualified Post-Tensioning Technician Program.

8.7.3 CTQP Administrator's Office

- (1) Process applications that request Level 1 and Level 2, Grouting and Post-tensioning Technician Qualifications. Verify that the application is filled out correctly and completely and verify that the applicant has passed an

accredited Grouting or Post-tensioning Technician Training Course. Issue the qualification if all paperwork is in order.

- (2) Maintain a database of Level 1 and Level 2, Qualified Grouting and Post-tensioning Technicians.